

Catawba~Wateree Relicensing Coalition (CWRC)

May 30, 2003

Mr. Mark Oakley
Duke Power
P. O. Box 1006
Mail Code EC12H
Charlotte, NC 28201-1006

RE: First Stage Consultation Comments and Request for Studies
Catawba-Wateree Hydroelectric Project, FERC Project No. 2232

Dear Mr. Oakley:

The Catawba~Wateree Relicensing Coalition has reviewed the February 7, 2003 First Stage Consultation Document (FSCD) for the Catawba-Wateree Project No. 2232. CWRC appreciates this opportunity to be involved with Duke Energy in developing a study plan for this hydroelectric project.

General Introduction

The Catawba-Wateree Relicensing Coalition

The Catawba-Wateree Relicensing Coalition (CWRC) was formed in 1998 for the purpose of protecting, enhancing and restoring the natural, cultural, recreational and economic resources of the Catawba-Wateree river basin. CWRC members represent state, local and tribal governments, and conservation and recreational organizations in both North and South Carolina. A list of members is attached.

The CWRC appreciates this opportunity to work together with Duke Energy to develop a study plan in preparation for Duke's application for relicensing for FERC project 2232. CWRC feels it is critical to work together to conserve the natural resources of the Catawba-Wateree basin, and to ensure the protection of all designated uses for the next 30 to 50 years of a new license. The CWRC will continue to work collaboratively with Duke to develop a study plan. Since Duke has not yet developed a study plan, study requests from the CWRC, as well as other groups, are starting points for discussion in developing that plan. It is to this end that we submit our requests for studies needed to address a variety of issues during the relicensure period leading up to the expiration of Duke Energy's current license in 2008. In order to provide a framework for subsequent discussions, we recommend that Duke compile all study requests into a matrix showing resource impact (or problem or issue), existing information, and related study requests from all groups that submit study requests.

Process used to develop Study Requests

The CWRC has held several public conferences over the past four years to gather information from stakeholders and assemble issues and questions that form the basis for studies needed prior to drafting the new license conditions. Since the issuance of the First Stage Consultation Document early this year, CWRC has attended Duke Energy's public meetings and continued to gather issues and study

requests from members of the public who attended those meetings. On April 7 and May 2 of 2003, CWRC hosted two conferences for the specific purpose of consolidating and discussing issues and then preparing study requests appropriate to all the issues we have become aware of. Attending those conferences was a range of individuals, interest groups, local government representatives, state and federal agencies and Duke Energy representatives. A list of attendees is attached. We listened and worked collaboratively with these attendees to understand and prepare necessary study requests. The attached Study Requests reflect that work. While we won't have included every issue we heard, nor every issue that will arise during this relicensing, and understand that state and federal agencies, local governments and other organizations will file numerous additional requests we feel the process we have followed has done well to capture a broad array of issues requiring further study, and represents a wide range of valid stakeholder interests.

Legal basis for CWRC study requests

When granting a license for the purpose of hydropower generation, the Federal Power Act requires FERC to give equal consideration to the "purposes of energy conservation; protection, mitigation and enhancement of fish and wildlife (including spawning grounds and/or habitat); protection of recreational opportunities; or the preservation of other aspects of water quality." 16 U.S.C. § 797(e). All studies requested by the CWRC fall within these public interest purposes.

In addition, the project must demonstrate compliance with applicable water quality standards through state certification under Section 401 of the Clean Water Act. 33 U.S.C § 1341. Both N.C. and S.C. water quality standards include protection of designated uses as a part of those standards as required under § 303 of the CWA. 33.U.S.C § 1313(c)(2)(a). All studies requested fall within these designated uses as well.

CWRC developed these requests consistent with 18 CFR § 16.8(b). Each request is based on two grounds: (A) the project may cause an adverse impact; and (B) the existing information may not be adequate to determine the significance of the impact, demonstrate the insignificance of the impact, or evaluate the feasibility of any PM&E measures. Duke must eventually generate a record adequate for FERC NEPA review. Therefore, this record must contain substantial evidence about the baseline condition and action alternatives to address any potentially significant adverse impacts on the beneficial uses of these resources. At this early phase, it is not necessary that Duke and other parties agree whether an impact is actually significant, or a measure actually feasible, in order for a study to be done. Instead, a study will help resolve any uncertainty about *potentially* significant impacts and *potentially* feasible measures.

As one example, we have requested studies about the current and potential uses of lands that Duke had originally acquired for this project, but that were subsequently excluded from the project boundaries and transferred to Crescent Resources. We understand that Duke does not agree at this juncture that the project boundary should be adjusted to include any of these lands. However, the cumulative impacts analysis that FERC will undertake plainly will address the ownership and management of the project and adjacent lands. As defined by 40 CFR § 1508.7, such impacts include past, present, and reasonably foreseeable future actions by third parties where the actions have some nexus with the project. Accordingly, our requests do not prejudge what protection, mitigation, and enhancement measures for such lands will be in any settlement or new license: instead, they reflect what we believe is necessary for NEPA review.

General Format of the Study Request Document

The CWRC's study requests are divided into four broad study areas: Aquatic resources, Water Quality/Quantity, Terrestrial/Land Use Planning, and Recreational/Cultural. Within each of the broad

study areas, the document is sub-divided into issues. The requested studies within each issue are then organized in a format that is a combination of FERC proposed Integrated Licensing Process (*see* February 20, 2003 Notice of Proposed Rulemaking, 102 FERC ¶ 61,185, §5.10(b)) and the Duke Energy Relicensing Public Input form. As a coalition of scientists, governmental, and non-governmental organizations, the CWRC felt that the new FERC rules provided the best way to organize the requests of these groups, while at the same time incorporating all of the information requested on the Duke public input form.

Study requests within each of the broad study areas are organized using the following format:

Study Request: A statement of the study requested including the goals of the study and the information to be obtained.

Public Interest: This section includes the relevant public interest considerations with regard to the proposed study. The words “public interest” takes their meaning from the purposes of the regulatory legislation. *NAACP v. Fed. Power Comm.*, 425 U.S. 662, 669 (1976). All study requests describe how the issue is related to one or more of the purposes described in the Federal Powers Act : energy conservation; protection, mitigation and enhancement of fish and wildlife (including spawning grounds and/or habitat); protection of recreational opportunities; or the preservation of other aspects of water quality. 16 U.S.C. § 797(e). Non-resource agencies describe here how the issue is a “public” as opposed to a “private” interest

Nexus between project operation and effects: This section addresses whether the issue directly or indirectly related to the project and its operations, and whether the impacts are direct, indirect, or cumulative. We do not attempt to prove that adverse impacts probably occur, since that would prejudice the study results. Instead, consistent with 18 CFR § 16.8(b), we provide a reasonable basis for concluding that an impact may occur.

Available information: This section includes a list, where known, of information or sources of information that have already been gathered, including, but not limited to: studies initiated by the licensee, public agency studies, non-profit research reports. Duke Power has indicated that it will also be establishing a database of studies that it has performed and/or collected, however, this information is not readily available in time for this study request. A list of target areas is included in this section, however the target area list is not meant to be exhaustive.

Status of additional information/conditions: This section proposes additional studies that need to be done to address each issue or describes where the scope of current studies needs to be expanded. Also addressed are practical issues such as whether the study is an extension of a study requested by another group; whether the study will address multiple issues; if the study is one that is easily accomplished.

Methodologies: Where appropriate, some groups have listed suggested methodologies.

Conclusion

The CWRC appreciates this opportunity with Duke Energy to develop a study plan, and we look forward to continuing to work with Duke, FERC and other stakeholders in developing a plan that will serve to protect the economic, natural and human resources in the Catawba Wateree basin. We look forward to a continuing dialog on all of the issues involved in relicensing, and encourage Duke Energy to contact us if there are any questions about the substance or basis of any request.

Aquatic Resources Workgroup Study Requests

A1. Instream Flow Studies

STUDY REQUEST:

We recommend a study of how project operations affect stream flows and what flow regimen(s) would best meet the requirements of aquatic biota. Flow regimens should be assessed for all remaining unimpounded segments of the Catawba and Wateree rivers, and for the Santee River. Flow regimens should be identified that fully support all lifestages of aquatic biota including spawning, juvenile and adult habitat requirements, and flows for upstream and downstream fish migrations. Flows that attain aquatic habitat values over inter-annual and intra-annual periods that approximate those which would occur under the natural hydrograph should be determined.

PUBLIC INTEREST:

Sufficient instream flow below project dams for aquatic biota is clearly in the public interest and is reflected in the state and federal laws, and in policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT:

Project operations alter the hydrograph; the timing, duration, magnitude, frequency and rate of change of stream flows in the segments listed below; and thereby directly affect habitat and migration needs of aquatic biota. Project operations affect virtually all stream flow in the Catawba and Wateree rivers, and approximately 40% of the stream flow of the Santee River.

AVAILABLE INFORMATION:

No site-specific studies that address this study need are known to exist. There is substantial information on the need for instream flows in scientific literature, state and federal agency policies, and in Comprehensive Plans filed with the FERC by the SCDNR including: Instream Flow Study, Phase I (1986), Instream Flow Study, Phase II (1988), South Carolina Instream Flow Studies: A Status Report (1989) and State Water Plan (1998).

Instream flow studies are anticipated for recreational boating, fishing and swimming, and for water quality and water supply needs. It is possible that portions of those studies could be combined with this study.

BASIC METHODOLOGY:

- Duke should work with interested stakeholders to develop detailed study plans. Study methods should be tailored to meet issues specific to individual stream segments. Multiple metrics will likely be needed at each study segment. Suitable study methods may include – Tennant Method, Instream Flow Incremental Methodology (IFIM), Indicators of Hydrologic Alteration (IHA), Range of Variability Approach (RVA), MesoHABSIM, wetted perimeter, dual flow analysis, etc.
- Sufficient number of transects will be needed for IFIM studies if used. Biota that needs to be addressed include riverine and diadromous fish, macroinvertebrates, rocky shoals spider lilies, etc.
- Assessment should include seasonal base-flow needs, flows for fish passage, and high flows needed for channel maintenance and morphometry. Flows for floodplain inundation needs will be addressed below.
- Assessment of the interaction between water quality parameters (e.g. temperature and dissolved oxygen) and instream habitat quality for target species should also be addressed.

STUDY LOCATIONS:

Stream segments that need to be evaluated under this study include:

- Catawba River below Lake James – approximately 18 miles in length
- Old Catawba River bypass below Lake James – approximately 3 miles in length
- Catawba River below Lake Hickory – approximately 2 miles in length
- Catawba River below Lake Wylie – approximately 30 miles in length
- Great Falls of the Catawba – approximately 2 miles in length
- Wateree River below Lake Wateree – approximately 76 miles in length
- Santee River to Lake Marion headwaters – approximately 10 miles in length

A2. Floodplain Flow Evaluations

STUDY REQUEST:

We recommend a study to assess stream flows needed for incremental levels of floodplain inundation for the Catawba, Wateree and Santee rivers. Inventory of floodplain vegetation sufficient to represent the plant community along the affected reaches of these rivers is a central component of this study. The study should identify flow regimens for all remaining unimpounded segments of the Catawba, Wateree and Santee rivers that fully support the needs of floodplains, and their flora and fauna. Flow regimens that attain floodplain inundation and habitat values approximating those that would occur under the natural hydrograph over inter-annual and intra-annual periods should be determined.

PUBLIC INTEREST:

Sufficient inundation of floodplains and enhancement of their bottomland habitats for botanical resources, and for aquatic and terrestrial fauna are clearly in the public interest; and are reflected in the policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT:

Project operations alter the hydrograph; the timing, duration, magnitude, frequency and rate of change of stream flows and thereby the flooding regimen of bottomland habitats. Project operations affect virtually all stream flow in the Catawba and Wateree rivers, and approximately 40% of the stream flow of the Santee River.

AVAILABLE INFORMATION:

Numerous scientific and guidance publications are available regarding the effects of flow alterations on floodplains and their plant communities. Specific studies that are relevant to the Catawba-Wateree project include:

- Rice, S.K. and Peet, R.K., 1997. Vegetation of the lower Roanoke River floodplain. The Nature Conservancy, Durham, North Carolina.
- Townsend, P.A. and Foster, J.R., 2002. A synthetic aperture radar-based model to assess historical changes in lowland floodplain hydroperiod. *Water Resources Research* 38 (7), pp. 20-1 to 20-10.
- Numerous floodplain assessment studies conducted by the Corps of Engineers for the St. Stephens Rediversion Project.
- Comprehensive plans filed with FERC by the SCDNR including: Instream Flow Study, Phase I (1986), Instream Flow Study, Phase II (1988), South Carolina Instream Flow Studies: A Status Report (1989) and State Water Plan (1998).

BASIC METHODOLOGY:

• Duke should work with interested stakeholders to develop detailed study plans. Study methods should be tailored to meet the specific floodplain characteristics of the different river segments. Recommended methodology is:

A. Evaluation should be conducted using the steps outlined in the section entitled Floodplain Inundation Method in Instream Flows for Riverine Resource Stewardship (2002). This model consists of the following sequential steps:

- Determine representative floodplain cross-sectional elevations through (a) the Federal Emergency Management Agency (FEMA) and/or the U.S. Corps of Engineers (USACOE) flood risk maps; (b) topographic maps; (c) on-site surveys, including aerial photogrammetric techniques;
- Determine cross-section/stage-discharge relation by (a) measuring and surveying, (b) gage calibration rating table, or (c) gage records;
- Determine wetted perimeter versus discharge relation and inflection points for floodplain cross section;
- Tabulate phenology and inundation needs for floodplain and riparian vegetation and timing of floodplain-dependent life stages of fishes and other floodplain-dependent fauna;
- Determine historical, unmodified hydrological timing, and magnitude of high flows;
- Evaluate surface connectivity between main channel and off-channel habitats such as oxbow lakes through review of information obtained in steps 1 and 2, above;
- Evaluate timing and duration needed to address biological needs tabulated in step 4 and historical hydrology, step 5;
- Develop flow recommendations and compare alternatives based on review of information from steps 5 to 7.

B. Inventory of vegetative communities consistent with study methods included in Rice and Peet (1997) including:

- Tallies of tree species and stem densities by diameter class within 20 x 50 m plots;
- Sampling soil within 10cm of the litter layer, and performing standard analyses of nutrients, pH, base saturation, % organic matter, and bulk density;
- Derived geographic variables (floodplain elevation, distance to channel, distance to river mouth). Elevations will become available through Item C (below).

C. Remote inventory of floodplain inundation to evaluate the river discharge - floodplain inundation relationship along the affected floodplain reaches following the methods of Townsend (2002). This includes the following steps:

- Acquisition of Radarsat-1 Synthetic Aperture Radar scenes covering the area of interest, and spanning a minimum of three (3) different river discharges (high, medium, low flows);
- Using this data, a high resolution Digital Elevation Model of the floodplain is then created through interpolation of the discharge - flooded area relationship via GIS ArcInfo processing;
- Use transect information collected in (A) to calibrate and verify this model and its output.

STUDY LOCATIONS:

- We recommend, as part of this study, an inventory of the three rivers affected by project operations to identify significant floodplain tracts and to select specific study locations.
- Multiple study locations should be used to assess areas with extensive floodplains such as the Wateree River below Lake Wateree and the Santee River to Lake Marion headwaters.
- Sufficient study locations and transects are needed to collect information to address (A), (B) and (C), below.

A3. Fish Entrainment

STUDY REQUEST:

We recommend a study to assess fish entrainment at all hydroelectric facilities including the magnitude, intra-annual variation, species composition, size distribution, survival rates and economic value of entrained fish in order to eventually minimize the occurrence of fish entrainment and should assess measures to avoid, minimize and mitigate for project related impacts via fish entrainment.

PUBLIC INTEREST:

An understanding if project impacts via entrainment, impingement and associated mortality of the public's fishery resources is in the public interest and is reflected in the policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT:

It is project's facilities and operations that cause entrainment and impingement of fish.

AVAILABLE INFORMATION:

Numerous fish entrainment studies have been conducted at hydroelectric projects in the Southeast, some of which may be applicable to the Catawba-Wataree Project. We know of no studies that would replace the need for a site-specific evaluation of fish entrainment for these dams. This information will also be needed for diadromous fish/fish passage studies that are addressed below.

BASIC METHODOLOGY:

- We recommend a general framework be developed for all hydroelectric facilities including the assessment of fish entrainment studies from other Southeastern dams that may be applicable to Catawba-Wataree.
- The general framework should be adapted to site-specific considerations of each facility (e.g. species of concern, intake depth, intake velocities, trash rack spacing, etc.).
- Site-specific information needed for each facility include: intake depths, intake velocities, turbine rpm's, trash rack spacings, relative thermocline locations, seasonal water quality, species assemblages, etc.
- Duke should work with interested stakeholders to develop detailed study plans. Methods to be considered include use of doppler velocity measurements, balloon tagging, hydroacoustics, etc.
- Duke should work with interested stakeholders to develop detailed study of avoidance and minimization measures.

STUDY LOCATIONS:

Fish entrainment studies should be conducted at all 13 of the project's hydroelectric facilities unless entrainment is known not to be a concern due existing site-specific information or specific project configuration parameters.

A4. Near-Shore and Shallow-Water Habitats at Reservoirs

STUDY REQUEST:

We recommend a study that objectively evaluates the effects of project operations on the quantity and quality of near-shore and shallow-water habitat in the reservoirs, including water quality needs to maintain/enhance dependent fauna. Adequate near-shore and shallow-water habitat is needed to maintain/enhance fish, macroinvertebrates, reptiles, amphibians, mammals and avian fauna that are dependent on shallow-water/riparian habitats.

PUBLIC INTEREST:

The maintenance/enhancement of the near-shore habitats is an issue clearly in the public interest and is reflected in the policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT:

Project operations affect near shore habitats via lake level fluctuations, recreational uses, shorelands management, and allowing non-project uses of project lands.

AVAILABLE INFORMATION:

Existing information that may contribute to assessing near-shore and shallow-water habitats include: Tennessee Valley Authority's shoreline management plan; shoreline management studies conducted by the Corps of Engineers; Duke's shoreline management plan, and subsequent comments provided by state and federal resource agencies and other stakeholders; Duke's woody debris study; shallow water fish surveys conducted by Duke, SCDNR, and NCWRC and subsequent comments provided by state and federal resource agencies and other stakeholders; riparian buffer studies and regulations including Catawba Basin buffer laws enacted by NC, and the SC Forested Riparian Buffer Task Force report.

STATUS OF AVAILABLE INFORMATION:

No studies that specifically address this information need for the Catawba-Wateree impoundments are known to exist. However, other shoreline studies are anticipated to be conducted as part of this relicensing for recreational needs and water quality protection. It is possible that portions of those studies could be combined with this study.

BASIC METHODOLOGY:

- Duke should work with interested stakeholders to develop detailed study plans. Study methods should be tailored to meet the issues and configurations specific to individual reservoirs.
- The study should include effects of lake fluctuations on spawning/nursery habitat, foraging habitat for fish and birds, sediment deposition in shallow coves/environmentally sensitive areas, and water quality.
- The study should include effects of shoreline fragmentation on habitat availability and utilization by fish, birds, amphibians and reptiles.
- Evaluate the benefits of natural vs. developed shoreline for aquatic habitat, near-shore terrestrial habitat, water quality protection, etc.
- The study should include effects of impounding tributary streams on habitat (water quality) in coves.
- The study should include assessing the effects of full development allowed for in current SMP on the quality and quantity of shallow water habitats of each reservoir and how that would affect fish, birds, amphibians and reptiles dependent on these habitats.
- Evaluate how much undeveloped shoreline is needed (e.g. 35%, 50%, 65% of total shoreline) and how wide a buffer zone is required.
- The study should include potential measures to avoid/minimize impacts to shallow water habitats and potential mitigation measures for new and ongoing impact to shallow water habitats. For example:
 - Can better shoreline stabilization measures and better control of "hard technology" (i.e. seawalls, rip rap) benefit near-shore and shallow water values.
 - Would 100 foot-buffer requirements for dock permits, as on the Yadkin Pee De reservoirs, benefit these habitats?

STUDY LOCATIONS:

Near-shore and shallow-water habitat studies should be conducted at all of the project's reservoirs.

A5. Water Quality Studies

STUDY REQUEST:

We recommend studies that objectively evaluate the effects of project operations (e.g. impoundment of the river and tributary streams, reservoir stratification, hypolimnetic discharges, flow alterations, etc.) on water quality and how that affects habitat requirements of aquatic biota in the reservoirs and river segments. Project operations and enhancements that would result in water quality that fully supports all aquatic life uses in all reservoirs and river segments affected by the Project should be evaluated.

PUBLIC INTEREST:

Good water quality and the maintenance/enhancement of aquatic habitats is an issue clearly in the public interest and is reflected in state and federal laws, as well as in the policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT:

Project operations directly affect water quality and subsequently aquatic habitat by impounding streams, altering flows and releasing poor quality water.

AVAILABLE INFORMATION:

Numerous watershed and water quality publications are available from SC and NC water quality agencies. These agencies also have guidance on the different assimilative capacities of free-flowing versus impounded waters. Effects of water quality alterations on aquatic biota are well documented in the scientific literature.

We know of no existing, site-specific studies that can address this information need. Duke's WARMF model does not address this information need. It is likely that other water quality and fish habitat studies will overlap somewhat with this study, and may result in opportunities to reduce the efforts and costs.

BASIC METHODOLOGY:

- Duke should work with interested stakeholders to develop detailed study plans. Study methods should be tailored to meet issues specific to individual reservoirs, tailwaters and river segments.
- Specific assessments should address key species
 - trout species at Bridgewater
 - striped bass below Wylie, Rocky Creek/Cedar Creek, Wateree
 - walleye in Lake James
 - striped bass in several reservoirs
- Assess project effects on water quality and fish habitat in eutrophic reservoirs including Fishing Creek and Wateree, and identify mitigative measures.
- Assess project effects on water quality and fish habitat, including dissolved oxygen concentrations and sediment deposition in impounded tributary streams, and identify mitigative measures.

STUDY LOCATIONS:

- The effects of project operations on water quality and aquatic habitat should be assessed for all reservoirs, especially in those coves with known water quality concerns.

- The effects of thermal stratification on water quality (dissolved oxygen and temperature) and the availability of habitat for fish species dependent on cool, well oxygenated water should be studied at several reservoirs including James, Norman, Wylie and Wateree.
- The effects of turbine discharges on downstream water quality and subsequent effects on aquatic habitat should be studied at all facilities that discharge poor water quality including Bridgewater, Rhodhiss, Oxford, Lookout Shoals, Wylie, Fishing Creek, Great Falls/ Dearborn, Rocky Creek/Cedar Creek and Wateree for which the FSCD reports low oxygen concentrations.

A6. Diadromous Fish Studies

STUDY REQUEST:

We recommend a study of upstream and downstream diadromous fish passage at project dams, the use of hatchery operations to augment existing stocks, and how to meet their stream flow and water quality requirements. Alternatives should be developed to enhance diadromous fish populations by establishing access to historic spawning grounds and nursery areas, safe downstream passage, and improving stream flow and water quality.

PUBLIC INTEREST:

Enhancement of diadromous fish populations is clearly in the public interest and is reflected in state and federal laws, as well as the policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT:

Project dams and operations directly affect upstream and downstream migration of and habitat quality for diadromous fish by blocking migrations, altering instream flows, and affecting water quality.

AVAILABLE INFORMATION:

Numerous scientific publications exist regarding enhancing diadromous fish populations by establishing fishways, and enhancing instream flow and water quality. Management plans for diadromous fish species that are pertinent to the Catawba-Wateree Project include: Santee-Cooper Diadromous Fish Passage Restoration Plan by USFWS, SCDNR and NMFS which has been filed with FERC as a Comprehensive Plan; ASMFC plans for diadromous species including American Shad; and NMFS recovery plan for the federally endangered shortnose sturgeon.

We know of no information that specifically addresses Project effects on diadromous species, how best to establish fish passage at the Catawba-Wateree dams, use of hatcheries and trap and truck methods to supplement existing stocks, instream flow requirements for these species in river segments and floodplain areas affected by project operations, or project-related water quality effects on these fish.

BASIC METHODOLOGY:

- Duke should work with state and federal fisheries agencies, and interested stakeholders to develop detailed study plans. Study methods should be tailored to meet the issues specific to individual reservoirs and river segments.
- Studies should focus on answering key fish passage and adult and juvenile migration issues in order to craft a specific and scientifically defensible plan to be included in the next license.
- Studies to be conducted by Duke should, at a minimum, include:

A. An evaluation of the feasibility and cost of the most promising fish passage technologies for upstream and downstream migration at the Catawba-Wateree Hydroelectric Project. Duke should

provide conceptual design drawings, including hydraulic information, and estimate of construction, operation and maintenance costs for those designs and measures at each of the three projects. Specific options that should be studied, including a cost analysis for each alternative, include:

- Upstream passage options to be evaluated should, at a minimum, include:
 - Fishways
 - Trap and haul facilities
 - Dam removal

- Downstream passage options to be evaluated should, at a minimum, include:
 - Spillgates
 - Collection and bypass facilities
 - Turbine intake screens
 - Reservoir operations
 - Dam removal

B. A comprehensive analysis of entrainment of diadromous species. Entrainment in project turbines can be a significant source of fish mortality and affect efforts to reintroduce diadromous fishes. An analysis of entrainment at Project facilities is necessary to determine the separate and cumulative impacts on fish populations.

C. An evaluation of the feasibility and cost of hatchery operations to augment existing diadromous fish stocks.

STUDY LOCATIONS:

- Upstream and downstream fish passage facilities at the 4 lower dams have been identified as a high priority of state and federal resource agencies and should be thoroughly assessed.
- Instream flow and water quality affects of project operations on all lifestages of diadromous fish should be addressed at the 5 dams in SC.
- The need for additional fish passage should be assessed at the remaining dams. Based on the outcome of that study, additional assessment of water quality and instream flow effects on diadromous fish requirements may be needed.

A7. Sediment Regimen and Sediment Transport Studies

STUDY REQUEST:

We recommend a study of the current sediment regimen throughout the entire Project area and of Project effects on sediment regimens of unimpounded river segments. The study should focus on sediment composition, bedload movement, gravel deposition, sediment storage behind dams, and bedload changes below dams; and project effects on downstream geomorphometry, sediment availability and streambank erosion. This study should also evaluate and develop appropriate PM&E measures to assure sediment regimens for all remaining unimpounded segments of the Catawba and Wateree rivers fully support all lifestages of aquatic biota including habitat for fish spawning and macroinvertebrates. Alternatives should be developed for inter-annual and intra-annual stream flows for sediment transport, channel maintenance and channel formation processes approximating those that would occur under the natural hydrograph.

PUBLIC INTEREST:

Appropriate sediment regimens and necessary flows for geomorphological processes are recognized as essential components of a healthy river ecosystem, and for the needs of species-specific lifecycle and habitat requirements.

NEXUS TO PROJECT:

Project facilities and operations directly alter the sediment regimen and sediment transport in the Catawba and Wateree rivers.

AVAILABLE INFORMATION:

Numerous scientific papers have been published on the effects of hydropower operations on sediment regimens including downstream erosion and geomorphological effects. A review of study methods can be found in *Instream Flows for Riverine Resource Stewardship* (2002).

We know of no site-specific information on the Catawba-Wateree sediment regimen or the effects of project operations thereon.

BASIC METHODOLOGY:

- Duke should work with interested stakeholders to develop detailed study plans. Study methods should be tailored to meet the issues specific to individual reservoirs and river segments.
- A comprehensive study is needed since there appears to be no information related to the sediment regimen, river geomorphology and any effects the Project may be having on such. (The FSCD contains no information.)
- Identify geomorphological factors that control channel features and biological processes in the river.
- Of particular interest are Project effects on habitat requirements for spawning fishes, including shortnose sturgeon (a federally endangered species) found downstream of the Project, native fishes of the Catawba River below Lake Wylie, and trout found in the Bridgewater section.
- Mitigative measures should be evaluated as part of the study including changes in operations, supplementing gravel budgets in key reaches, protecting riparian buffers to reduce streambank erosion potential, etc.

STUDY LOCATIONS:

The sediment regimen should be studied throughout the entire Project area. Project effects on sediment regimens should be studied at all unimpounded river segments.

A8. Rare, Threatened and Endangered Species

STUDY REQUEST:

We recommend a study that assesses the current condition of RT&E species, how project operation affects those species, and how project operations can be modified to protect, restore or enhance those populations.

PUBLIC INTEREST:

Protection, restoration and enhancement of RT&E species is an issue clearly in the public interest and is reflected in state and federal laws, as well as in the policies and guidance of state and federal agencies charged with protecting these resources for the public good.

NEXUS TO PROJECT:

The project affects RT&E species by ongoing impoundment of the river, and by altering stream flow, water quality and other habitat variables.

AVAILABLE INFORMATION:

Substantial information is available on certain species and should be thoroughly reviewed with stakeholders prior to developing study plans. We are unaware of any studies that directly evaluate the effects of project operations on RT&E species.

BASIC METHODOLOGY:

- Duke should work with interested stakeholders to develop detailed study plans. Study methods should be tailored to meet the issues specific to individual reservoirs and river segments.
- Reservoir studies should assess the status of and project effects on: bald eagle, bog turtle, salamanders, etc.
- Rivers studies should assess the status of and project effects on: plants – e.g. rocky shoals spider lilies; fish – e.g. shortnose sturgeon, Carolina darter, highfin carpsucker, Santee chub, robust redhorse; and mussels – e.g. eastern creekshell, Carolina creekshell, eastern floater, brook floater, squawfoot, southern rainbow, notched rainbow.
- Studies should include assessment of how changes in project operations can avoid or minimize impacts to RT&E species, population enhancement alternatives and other potential mitigative measures.

STUDY LOCATIONS:

Species-specific studies should be conducted in project locales where target species occur or are expected to occur, and where there is enhancement or restoration potential.

A9. Unimpaired Hydrograph

STUDY REQUEST:

We recommend a study that evaluates river flow unimpaired by the Project. The study should include all 11 dams and 13 hydro facilities, and estimate inter-annual and intra-annual stream flow for each unimpounded river reach. This study would provide information to evaluate the full range of project operation alternatives including run-of-river operation, which is important to know when assessing project impacts. This information will be needed for the floodplain flow, instream flow, sediment transport and water quality studies. It will also be important to diadromous fish and RT&E studies for assessing the departure of current operations from the unimpaired flow regimen, and how that affects these populations and distribution of their habitats. Several scientific publications assert that the greater the alteration from that unimpaired hydrograph, the greater the impact on the aquatic ecosystem.

AVAILABLE INFORMATION:

We know of no studies or reports that would provide this information for the Catawba-Wateree system. While the FSCD (pp. 6-7 - 6-39) contains flow-exceedance curves, which constitute a regulated hydrograph, the unimpaired hydrograph has not been located.

NEXUS TO PROJECT:

By its very nature, the Project alters the natural hydrograph by storing water, increasing evaporation and releasing flows on schedules for hydroelectric purposes.

PUBLIC INTEREST:

By providing information about the unimpaired hydrograph, the public would have access to more accurate and complete information on stream flow possibilities and, therefore, would be able to make

better informed choices. Assuring the public and resource agencies charged with protecting the public's interest in these waters understand the full range of flow alternatives is in the public interest.

STUDY LOCATIONS:

It is necessary to conduct the study on the entire watershed area.

BASIC METHODOLOGY:

- Duke should work with interested stakeholders to develop detailed study plans.

A10. Guide Curves for the Operation of Each Reservoir

STUDY REQUEST:

We recommend Duke provide the guide or rule curves for the operation of each storage work to all interested parties. Full understanding of existing operations is a fundamental need for relicensing stakeholders.

NEXUS TO PROJECT:

These guide or rule curves are a fundamental component of Project operations.

AVAILABLE INFORMATION:

The FSCD describes such curves (pp. 4-1 et seq.) but it does not display them in complete form. We are unaware of any other source of this information for the Catawba-Wateree Project.

PUBLIC INTEREST:

Full understanding of existing operations is a fundamental need for the public to understand how the public waters of the river are used by the Project.

STUDY LOCATIONS:

All Project reservoirs.

BASIC METHODOLOGY:

Not applicable.

Land Use and Planning Workgroup Study Requests

L1. The Shoreline Management Plan and Community Values and Objectives

STUDY REQUEST:

Compile all existing land use plans and Natural Heritage Inventories from counties, municipalities and regional governments or organizations; and interview planners and community leaders to fully understand values and goals of surrounding communities with regard to shoreline uses.

PUBLIC INTEREST:

Acquisition of information necessary to develop a Shoreline Management Plan consistent with values and goals of the communities using the shoreline, river and reservoirs. Development patterns, habitat protection and recreation facilities related to the Project should be aligned with plans and needs of the communities.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the reservoirs which act as magnets for development and resource related activities. This attractiveness of reservoirs is well known and predictable. The creation of lakes near metropolitan areas will attract development along the shorelines. This development influences the character of growth in communities and the access to the lakes. Unchecked, this may or may not be consistent with the goals and desires of the community. This development also can affect water quality essential to the health of a community. The First Stage Consultation Document recognizes this on page 5-231 stating that Duke's environmental scientists have studied the effects of development on water quality for several decades. We commend Duke for undertaking these studies but find they may be insufficient to assess the full impacts of the development that results from the existence of the reservoirs. The effects are not limited to water quality but extend to riparian habitat, shallow water fish habitat and public access. Duke Energy has the means to influence the extent and character of development through its Shoreline Classification system, as well as through its own development practices used by its real estate division, Crescent Resources. The management of these reservoirs is subject to federal law and conditions attached to the license. Some relevant sections of the law are:

a) Licensee is required under Section 4(e) of the Federal Power Act to give "equal consideration to the purposes of energy conservation, the protection, mitigation of damage to and enhancement of, fish and wildlife, (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality."

b) Section 10(a) of the Federal Power Act specifies that a hydroelectric project must be "best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water power, for the adequate protection, mitigation, and enhancement of fish and wildlife and for other public beneficial uses including irrigation, flood control, water supply, and recreational and other purposes..." The licensee is required to identify all applicable comprehensive plans developed by state and federal agencies and determine if the project will comply with these plans (18CFR4.38). Local land use plans and recreational plans provide evidence for what uses are to be considered beneficial for the public and should be used in developing the SMP.

AVAILABLE SOURCES OF INFORMATION:

- Land use plans and recreation plans at state, federal, county, municipal and regional level.
- Zoning rules and comprehensive plans and processes.
- Proposed bike and hiking trails in the towns and counties, or from organized groups.
- Hunting and gamelands in project region and adjacent to the project.
- Location of wildlife corridors in the vicinity of the project.
- Open Space Framework created by Voices & Choices of the Carolinas.
- Natural Heritage Inventories.
- Studies, proposals and goals for North and South Carolina state parks and recreation divisions.
- Studies, proposals and goals for North and South Carolina regarding habitat protection.
- Any other studies and documentation pertaining to land use and river/reservoir access from organizations and entities in the Catawba-Wateree region.

BASIC METHODOLOGY:

This should be a jointly designed exercise convened for the purpose of engaging the public in determining the character of development and availability of uses along the project shoreline.

a) Existing information to be compiled; overlays prepared; long term regional goals and perspectives understood.

- b) Interviews and meetings with planners, elected officials, recreation interests, agencies and the public to clarify existing plans, proposals and goals.
- c) Propose and evaluate revisions to the current SMP to reflect the regional goals for the rivers resources.

L2. Available Lands for Recreation, Shoreline control, Protection of Environmental Resources

STUDY REQUEST:

Conduct inventory of land ownership around project boundary to determine feasibility of aggregating desirable parcels for parks, open space, other recreation, habitat preservation and viewshed protection; as well as current and proposed rate of development to determine urgency of assembling valuable parcels for the public benefit.

PUBLIC INTEREST:

Determination of the feasibility of fulfilling open space, habitat, and recreation goals around the river and reservoirs.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The reservoirs act as magnets for development as noted in Study Request Number 1, and this has resulted in changes in land use at a pace faster than many communities had prepared for. The management of these reservoirs is subject to federal law and conditions attached to the license which may be interpreted to require Licensee to add lands to the Project Boundary in order to fulfill public obligations. Determining the potential and feasibility of obtaining lands to ensure the Project is maintained for maximum public benefit is necessary in order to consider alternative methods of compliance with federal law.

AVAILABLE SOURCES OF INFORMATION:

- Data kept by licensee for its land, lake and shoreline management divisions.
- County land ownership records.

SPECIFIC INFORMATION REQUIRED:

- Shoreline miles (feet) of undeveloped land and acreage of those parcels.
- Shoreline miles with hard seawalls.
- Inventory of land ownership around Project boundary, or with access to Project boundary.
- Number of lots developed by licensee's division Crescent Resources that are adjacent to the project boundary, or have access to the project waters, or are in subdivisions with access to Project waters or to marinas located in the project waters.
- Amount of land sold by Licensee's division, Crescent Resources for development by other developers.
- Number of marinas, piers and boat slips approved or constructed before 1990; between 1990 and 1996; and after 1996.

BASIC METHODOLOGY:

- Obtain records from licensee indicating parcels owned by the licensee and/or its division, Crescent Resources, and the location of undeveloped tracts of land.
- Identify other important tracts to potentially be added to the Project Boundary, or purchased to comply with any obligations licensee has under the Federal Power Act, or any other law, or

- resulting from a settlement or mitigation agreement or mitigation.
- Inventory number of lots with reservoir or river access that have been subdivided since 1996 as well as number of boat slips and piers approved and/or constructed to determine accuracy of the statement from the Environmental Analysis for the revised SMP (pending with the FERC) that indicated the environmental impacts of building out according to the current shoreline classifications would continue at a “slow rate of development”.

L3. Buffers and Stabilization Issues

A) BUFFERS STUDY REQUEST:

Conduct location and ownership inventory of natural vegetated buffer areas to determine feasibility of imposing buffer preservation rules and whether sufficient buffer remains to make a difference in sedimentation and non-point source pollution.

PUBLIC INTEREST:

Fisheries, water quality, erosion control, terrestrial habitat, aesthetics.

NEXUS TO PROJECT:

Buffer areas extend to and into the Project boundary and are an accepted means used by other Licensees to ensure water quality, habitat protection, and to control sedimentation. Duke has not imposed buffer rules, nor required buffers as a condition for permits to construct piers, boatslips, marinas or other projections into the project boundary. The feasibility and effectiveness of these alternatives, including the purchase of lands in order to ensure protective buffers exist, deserve to be studied. This would be consistent with 18CFR4.51(f)(6)(iv) which states that applicants for existing hydropower projects must include “A statement including an analysis of costs and other constraints, of the applicant’s ability to provide a buffer zone around all or any part of the impoundment, for the purpose of ensuring public access to project lands and waters and protecting the recreational and aesthetic values of the impoundment and its shoreline.”

AVAILABLE SOURCES OF INFORMATION:

Shoreline data kept by Licensee’s Lake Management Division and/or Scientific Services Division, Crescent Resources, or other divisions; Aerial photography such as the FEMA flood plain photos.

BASIC METHODOLOGY:

- Use Licensee’s records for this
- Use existing aerial photographs such as the FEMA flood plain photos.
- Acquire and use a model to determine effects on sedimentation and non-point source pollution if buffers are retained on undeveloped land.
- Study population trends of aquatic and terrestrial species dependent on vegetated shoreline buffers; compare trends in areas with existing buffers to those without.
- Acquire and use a model to determine species population trends if buffers are retained, developed, or destroyed.

B) IMPACT MINIMIZATION ZONE STUDY REQUEST:

Study impact and effectiveness of the Impact Minimization Zone (IMZ) shoreline classification to determine whether it has reduced shoreline impacts on fish populations.

PUBLIC INTEREST:

Fisheries, water quality, erosion control, terrestrial habitat, aesthetics.

NEXUS TO PROJECT:

Licensee's practice and procedures for granting permits for shoreline modification and construction are part of their obligation to manage the shoreline for beneficial public uses. Continued operation of the project will determine development of the shoreline and license conditions must be appropriately designed to address this impact.

AVAILABLE INFORMATION:

Not known.

BASIC METHODOLOGY:

-Assess fish habitat, spawning activity, erosion, sedimentation and overall water quality in these areas compared to environmentally protected areas and non protected areas.

C) SHORELINE STABILIZATION STUDY REQUEST:

Inventory types of shoreline stabilization used and measure the quality of fish habitat, spawning, sedimentation, erosion, water quality and terrestrial resources at all types of stabilization including natural, bio-engineered, rip rap, or hard sea wall.

PUBLIC INTEREST:

Fisheries, water quality, erosion control, terrestrial habitat, aesthetics

NEXUS TO PROJECT:

Licensee's practice and procedures for granting permits for shoreline modification and construction is part of their obligation to manage the shoreline for beneficial public uses. Continued operation of the project will determine development of the shoreline and license conditions must be appropriately designed to address this impact.

AVAILABLE INFORMATION:

Not known.

BASIC METHODOLOGY:

- Compare effects of different types of shoreline stabilization and model the impact if future development occurs with the same ratio of uses.
- Assess effectiveness of licensee's Riparian Zone Information Brochure in encouraging bioengineered stabilization vs. rigid seawalls where appropriate.
- Conduct 2 year study of effectiveness of Fish Friendly piers compared to natural woody debris in contributing to healthy fish populations
- Study ways to make bio-stabilization a viable and popular option.
- Inventory all beach creations and dredging operations to determine if they are in compliance with Army Corps of Engineers permits.

L4. Adequacy of existing Shoreline Management Plan and future alternatives

STUDY REQUEST:

Study (model) impacts on several variables based on a build-out scenario using the shoreline classifications of the existing SMP, as well as one(s) using an SMP(s) with revised classifications. Compare effects and assess against community goals as determined in Issue and Study Request Number 1.

PUBLIC INTEREST:

Ensure adequate balance of shoreline uses is achieved in the future, and that impacts from Licensee's shoreline decisions are consistent with public values and desired public outcomes.

NEXUS TO PROJECT:

The Shoreline Management Plan should result in uses achieving maximum public benefit. A project approved by the FERC must be "best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of waterpower development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes..." and the FERC must give equal consideration to power and non-power values. (FPA Section 10(a)(1) and FPA Section 4(e). Without monitoring and using predictive technology the development allowed in the existing SMP may be inconsistent with maximum public benefit and with the primary goals of the SMP as stated by Duke Energy in the First Stage Consultation Document on page 5-228: "1. Provide for public and private access without destruction of the Project's natural resources or without compromising the Project's primary function, which is the production of electricity. 2. Ensure that the existing and future public recreational needs of the Project are addressed."

The continued operation of the project and shoreline classification process has a tremendous impact on the future of land use and accessibility and needs to be fully understood and appreciated by the affected communities so they can give informed input and work with Duke Energy for a mutually beneficial outcome.

AVAILABLE SOURCES OF INFORMATION:

Current shoreline classification system.

This study will require the acquisition or building of a modeling program.

BASIC METHODOLOGY:

- Study (model) effect on water quality, recreation and natural habitat if all undeveloped lands are developed according to existing SMP classifications.
- Study (model) effect on water quality, recreation and natural habitat if all undeveloped lands are reclassified as protected by either "natural" or environmental" classifications.
- Study (model) effect on water quality, recreation and natural habitat if a significant number but not all are reclassified to be protected from development.

L5. Relationship between Shoreline Management Classifications and upland uses affecting water quality, recreation and habitat.

STUDY REQUEST:

Study relationship between shoreline classification and upland development.

PUBLIC INTEREST:

Question Licensee's assertion that the Shoreline Management Plan and classifications do not determine upland uses and that they have no control over lands adjacent to the Project Boundary nor their effects on water quality and habitat protection. (FSCD page 5-231)

NEXUS TO PROJECT:

The Shoreline Management Plan’s classification system determines type or existence of access to reservoirs, the extent of shoreline modification allowed and types of construction allowed inside the project boundary. This power to determine the nature of the “gateway” to the reservoir affects value and use of lands adjacent to the Project. The degree that this is serving the public interest and the degree that this power is used equitably are necessary to plan for alternative conditions in a new license.

AVAILABLE SOURCES OF INFORMATION:

The existing shoreline classification system.

Shoreline data kept by Licensee regarding pier permits, construction extending into the Project waters.

Building permits, subdivision and commercial construction permits.

Location of parks.

Location of open space, trails, and naturally protected areas.

BASIC METHODOLOGY:

-Count how often houses and/or commercial buildings are constructed upland when the shoreline is classified as environmental or recreational;

-Count how often is the upland preserved for habitat of recreation when the shoreline is classified as commercial?

-Determine whether there is a “cause-effect” relationship between shoreline classification and upland development.

-Determine whether this is consistent with regional long range plans for open space, recreation and development.

-Review other Licensee’s activities regarding “controlling” or influencing upland development and determine which alternatives are feasible for this Project.

L6. Access Area Initiative

STUDY REQUEST:

Study effectiveness and uptake of Access Area Initiative.

PUBLIC INTEREST:

The Access Area Initiative was developed after a review of Duke’s lease assessment system and development of a new Recreation Management System which was to provide for cooperative partnerships in developing and maintaining public facilities a Duke’s public recreation areas and islands. (Duke SMP Update 7/30/01, page 8). The point is to provide a broader range of access options to different types of resource users by partnering with second parties.

NEXUS TO PROJECT:

Licensee’s obligation to provide adequate access to the public on the reservoirs created by its Project operations.

AVAILABLE SOURCES OF INFORMATION:

Licensee’s records.

BASIC METHODOLOGY:

-Compare number of opportunities presented to counties with number undertaken

-Survey counties to determine how to improve it if it proves to be ineffective.

L7. Hunting leases and Game lands; Wildlife Corridors

STUDY REQUEST:

Inventory existing leases for hunting lands and game lands and game populations, wildlife corridors that depend on access to the river or reservoirs;
Determine effect of reservoir management on wildlife populations cumulatively and predictively.

PUBLIC INTEREST:

Recreation, hunting, healthy wildlife population that depend on access to and resources of the Catawba-Wateree River.

NEXUS TO PROJECT:

Continued operation of the Project and development of the shoreline will impact quality of habitat for terrestrial species dependent on the river. Many of the gamelands and hunting leases belong to the Licensee through its division, Crescent Resources.

AVAILABLE SOURCES OF INFORMATION:

Licensee's land ownership records.
Existence of State and county gamelands.

BASIC METHODOLOGY:

- Obtain records of land leases from licensee (Crescent Resources)
- Inventory private gamelands
- Use aerial photography to identify wildlife corridors
- Study non-point source pollution from wildlife populations concentrated on shore lands
- Inventory availability and feasibility of extending game lands and corridors inland so wildlife impacts are not concentrated at the edge of the river.
- Study population trends of affected species
- Study rate of loss of habitat due to development and due to loss of river/reservoir access
- Develop and run predictive model using a variety of alternatives for reservoir and river management.

L8. Licensee owned strips of land above Project Boundary

STUDY REQUEST:

Inventory cases where licensee owns a strip of land between deeded land and full pond level to determine extent of this situation and feasibility of deeding this land over to upland owner or adding it to the project boundary and/or requiring a buffer zone on this land.

PUBLIC INTEREST:

Resolve uncertainties surrounding land ownership and use

NEXUS TO PROJECT:

These lands are owned by Licensee above the Project boundary and may be subject to addition to the Project boundary or sale to private interests.

BASIC METHODOLOGY:

- Use licensee (Crescent) records and determine alternative actions and benefit analysis.

L9. Boat Access Areas

STUDY REQUEST:

Study cost and effectiveness of various improvements to Access Areas.

PUBLIC INTEREST:

Public conveniences in public places; broader range of recreational uses available; aesthetics and habitat considered in design and maintenance of Access Areas.

NEXUS TO PROJECT:

Boat access areas are a part of Licensee's efforts to fulfill its obligation to provide public access to its Project reservoirs.

BASIC METHODOLOGY:

- Study cost and effectiveness of requiring restrooms to be installed at all licensee maintained access areas as well as building fishing and boat access facilities to comply with Americans with Disabilities Act.
- Study cost and effect on improving habitat and aesthetic values to Boat Access areas, and effect on decreasing non-point source pollution by providing vegetation while minimizing concrete and asphalt parking lots.
- Study cost and effectiveness of enhancing recreation opportunities by providing fishing piers and areas for picnics and bank fishing at or adjacent to Boat Access areas.

L10. Water Quality Issues influenced by Land Use

STUDY REQUEST:

Study instances where licensee has control of lessees or other uses of project lands and how activities that degrade water quality can be stopped and/or improvement measures taken.

PUBLIC INTEREST:

Adequate supply of clean water for drinking, recreation, fisheries.

NEXUS TO PROJECT:

The license to operate the Project contains the following sections:

a) The preamble to Article 39 of the license states "During operation and maintenance of the marinas, the lessees will be required to take all necessary precautions to protect and enhance the environmental values of project lands and waters."

b) Article 39(a) of the license states that licensee's authority to convey interests in project lands and waters is conditioned on those uses being "consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes Licensee shall have continuing responsibility to supervise and control the uses and occupancies, for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for any interests that it has conveyed, under this article." If there are violations of any conditions, the "Licensee shall take any lawful action necessary to correct the violation". Further, the preamble to Article 39 of the license states that "licensee has stipulated that the uses of project land shall not endanger health, create a nuisance, or otherwise be incompatible with the overall recreational use of project lands and waters."

c) The preamble to Article 39 of the license requires licensee to produce a plan “to serve the multiple uses without further impairment of the natural resources involved. Further, the plan must list the criteria used by licensee to evaluate proposed development in terms of protection and enhancement of resource values of the project.”

AVAILABLE SOURCES OF INFORMATION:

Conveyances for wastewater and other discharges into reservoirs and streams.

Number of wastewater or other pollutant spills and number and type of permit violations from Licensee’s lessees and grantees.

BASIC METHODOLOGY:

- Study number of wastewater discharge violations from licensee’s lessees who have violated conditions of their conveyance to see if it is significant enough to warrant compelling action by the Licensee.
- Study level of MTBE and other gasoline related pollution and the effect of installing booms at marinas to capture and mitigate for gasoline spills.
- Study cost and effect of requiring MSD pump out stations to be installed as a condition for marina operation.

L11. Analysis of land acquisition, ownership and use by Licensee for Project use and possible obligation and accounting to the public and to ratepayers.

STUDY REQUEST:

An analysis of methods used to acquire lands, and representations made to the public and to the FERC regarding use of such lands for the building, maintenance, and future use of the Project Operations, as well as deed restrictions or other covenants which may affect title and use of lands, to determine the need for a public accounting of land transfers that resulted in Licensee’s economic benefit but were not related to operation of the Project. These transfers were made through a number of divisions owned by Duke Power and Duke Energy and currently continue through Crescent Resources (a part of Duke Energy operating under Duke Ventures).

PUBLIC INTEREST:

Licensee acquired large amounts of land for the building, operation, maintenance and future use of its Project. Much of this land has been developed and sold providing substantial unregulated revenue to Duke Energy. The manner of acquisition, and representations made, as well as practices over the past 100 years may necessitate a public accounting and a determination as to whether any of the profits need to be returned to the public, to Grantors, or to ratepayers, and whether any of this property should be returned to or added to the Project boundary. In today’s business and regulatory environment, full transparency of these issues is an expected public benefit.

NEXUS TO PROJECT:

Continued operation of the project will result in continued decisions as to shoreline uses that directly affect the value and sale of Licensee owned lands. Whether there is an obligation to account for these sales and whether there is an obligation to grantors, the public or ratepayers continues into the future. For example, if it were determined that Shoreline Classifications unevenly benefited lands held by Licensee through any of its divisions or subsidiaries and therefore adversely affected availability of lands for public recreation, access, wildlife habitat, natural and environmental protection, or other public benefits, an accounting to the public would be necessary to determine if mitigation would be necessary.

AVAILABLE SOURCES OF INFORMATION:

- Licensee's land acquisition records, deeds, deed restrictions, covenants, purchase contracts.
- North Carolina Public Utility records from the 1970's regarding an order addressing possible charging of expenses for managing lands outside of the project boundary to regulated revenue.
- Use of eminent domain.

ADDITIONAL INFORMATION:

Common grantor or licensee policy changes over time to shoreline development including changing from the leasing property to the sale of property and the reasons for both original policies and any changes.

BASIC METHODOLOGY:

- Collect relevant land ownership records.
- Research North Carolina and South Carolina PUC records regarding regulated and non-regulated charges related to lands acquired and/or owned by licensee or its subsidiaries.

Recreation Workgroup Study Requests

INTRODUCTION:

With a project extending over 220 river miles of water, and encompassing eleven reservoirs under one license, Duke has the opportunity to assess recreation needs on a basin-wide basis and develop a model plan for the coordination of recreational activities with dam operations. The waters of the Catawba-Wateree basin have the potential to provide an excellent recreational resource for fishing, canoeing/kayaking, swimming and hunting. The rivers possess long stretches of free-flowing water with the potential for a canoe/kayak trail and some of the best whitewater opportunities in the two states. The lakes are already heavily used, however, the majority of recreational access is currently focused on power boating. Studies are needed to protect and enhance these recreational activities on a basin wide basis and include: 1) Habitat enhancement studies to provide habitat for fish and waterfowl to enhance recreational fishing and hunting; 2) Flow regime studies to determine the operating conditions of the dams that would balance hydropower generation with recreational uses such as fishing, boating, canoeing/kayaking, swimming while at the same time preserving drinking water access; 3) Public access studies to determine the need and location for access for all users now and in the next 30 years, particularly to protect public access to the project waters for people that do not own boats or land on the water; 4) Aquatic weed/mosquito control studies to determine the best strategy to control weeds and mosquitoes that negatively impact fish habitat and limit or prohibit boating access.

R1. Habitat Enhancement Study

STUDY REQUEST:

We recommend studies to determine the appropriate water quality conditions, dam operation parameters or mitigation activities that will enhance fish habitat for anglers in both cold and warm water fisheries, protect migratory bird habitats for waterfowl hunters and protect wildlife habitats for other game hunters. While most studies will need to be done at specific target areas, these studies will then need to be analyzed in a basin wide manner to determine if enhancements at each area can be coordinated to maximize habitat protection throughout the project. Studies are also needed to assess whether some management efforts will need to be targeted to areas currently not within the project in

order to achieve the goals of maintaining the designated uses and protection of habitat within the project boundary. These studies also need to assess how project operations can achieve those goals in areas outside the boundary, but directly impacted by project operation.

PUBLIC INTEREST:

Current habitat areas are predominantly within the project boundary and are used heavily by the public for recreational angling and hunting. All studies requested are for the FPA defined purposes of protection, mitigation and enhancement of fish and wildlife; and protection of recreational opportunities, and will seek to preserve other aspects of water quality. In addition, the requested studies will also provide information to protect the fishing designated use within the project boundary, as required under the CWA.

NEXUS TO PROJECT:

Aquatic habitats in many of these areas are directly managed by the licensee. Other areas such as the Wateree River below the Wateree dam are directly affected by project operations, in particular by flow releases and variations in lake levels. Terrestrial areas where habitat is still in existence are owned primarily by Duke Energy subsidiary Crescent Resources.

AVAILABLE INFORMATION:

Data for tailrace areas is being collected by NC Wildlife Resources Commission and Trout Unlimited. Ducks Unlimited collects data at a small duck habitat area on the western end of Lake Rhodhiss. Many duck blinds are located on Lake James. NCWRC maintains wood duck boxes on Lake James. Refer to *Catawba River Basin Natural Resources Plan*, *Catawba River Basinwide Water Quality Plan*. SCDNR is also developing plans for the area. The Duke First Stage Consultation Document (FSCD) contains summaries of studies including creel surveys in §5.3.2, and assessments of wildlife resources in §5.3.3.

STATUS OF AVAILABLE INFORMATION/CONDITIONS:

While a current Shoreline Management Plan (SMP) exists, the plan provides minimal protection for shoal areas and sandy beach spawning areas, and provides no protection for woody debris. Under the current SMP, operations and land development by Crescent Resources and others damages shoreline, creates excessive sedimentation which compromises water quality and spawning areas, and encroaches on migratory bird habitat. Sedimentation is also causing problems for boat access as coves silt up. We support Duke's efforts in developing this plan, and in initiating enhancements outlined in FSCD §5.4.1, however, we believe more studies are necessary to assess the need for additional action to ensure that the project continues to project beneficial uses over the next licensing period. In addition, studies contained in FSCD §5.3.2, and §5.3.3 are not current in several of the basin areas, and do not address habitat enhancement possibilities in a manner that coordinates information from various types of studies. With regard to the issue of practicality and cost, new habitat enhancement studies could be done in conjunction with various aquatic and terrestrial resources evaluations and studies regarding water quality and sedimentation. Coordinated analysis of all of these studies will be critical in determining the best management plan under a new license.

TARGET AREAS for this study should include: Bridgewater Tailrace (cold water fishery), free-flowing portions of the Catawba and Wateree rivers in NC & SC, warm water fisheries on Lakes Rhodhiss, Norman, Wateree, and Wylie, coves with sedimentation problems on Lake Rhodhiss and Lake Hickory, and migratory bird habitat from Lake James through Lake Rhodhiss.

R2. Flow Regime Study

STUDY REQUEST:

We recommend studies to determine flow levels in the rivers required for: 1) maintaining a healthy aquatic habitat; 2) enhancing recreational opportunities for anglers, paddlers, and swimmers; and 3) ensuring the safety of the public as they pursue these recreational opportunities in the Catawba-Wateree basin. These studies are also needed to determine the flow levels/dam operations that will allow the establishment of a canoe/kayak trail along the entire extent of the project. An additional objective of flow regime studies is to provide information that would allow Duke to develop a system to timely inform the public of flow releases and other operations that could affect the safety of recreational users, and explore the development of a more regular schedule of releases.

PUBLIC INTEREST:

The areas listed are all used for public recreation, and would be more widely used if flow conditions made the rivers safer for use by anglers, paddlers and swimmers. Public interest in recreational uses indicates that dewatered bypass areas should not be removed from the project boundary.

NEXUS TO PROJECT:

Current flows are determined predominately by demand for power generation and controlled entirely by the licensee. While some flows are entirely within the project boundary, flows in other areas outside the project boundary are still predominantly determined by project operations (e.g. the Wateree River below Wateree dam).

AVAILABLE INFORMATION:

Some flow related data is available from NCWRC, NCDENR, and SCDNR. An in stream flow study is requested in the *Catawba River Basin Natural Resources Plan* that was drafted by the NCDENR and NCWRC. SCDNR is also developing plans and will need access to specific studies/plans from Duke in order to coordinate with them. Duke has also compiled a significant amount of data summarized in FSCD §6.

STATUS OF AVAILABLE INFORMATION/CONDITIONS:

Current flows are determined predominantly by demand for power generation. Flow studies in the target areas listed below are needed to coordinate releases to enhance recreational opportunities, and allow these uses to be balanced with hydropower generation. While FSCD §6-5 lists flow rates for all segments of the rivers, and makes historical comparisons of flows, these studies give no indication of how these flow rates relate to allowing the designated recreational uses. New studies are needed to determine those flow rates that would allow angling, swimming, and development of a canoe/kayak trail while still permitting productive dam operations. In addition, the existing studies do not address the issue that current portions of the original river channel are dewatered and provide no recreational opportunities at all. Other areas have diversions within the river that make it unsafe for recreational users. New studies are also needed to determine possible methods to timely disseminate changes in flow to public users of the rivers. Current flow information is available by telephone, but is not predictable. Current operations are unsafe for swimmers, boaters, and anglers, and limit the feasibility of these types of activities, especially in tailrace areas. Much of the information needed for these studies could be gathered in conjunction with water quality and aquatic resource studies, or would be of use for those issues.

TARGET AREAS - listed by river segment:

1. The 20 mile segment of the Catawba River, including the Bridgewater tailrace section below Lake James:

- a. Coldwater fishery in tail race section: In stream flow studies are needed to determine how current flow releases, dissolved oxygen and temperature affect recreational fishing, swimming and wading
 - b. Whole segment, especially portion near the Morganton coffer dam intake: studies are needed to evaluate feasibility of removal or reconfiguration of the weir with the goal of allowing safe canoeing/kayaking in this long segment while at the same time ensure an adequate drinking water supply for Morganton.
2. Old Catawba River channel below Lake James, area above the confluence of the Linville and Catawba Rivers. Studies are needed to determine how to enhance recreation in that area by restoring flow to this segment, or to mitigate the effects of the altered confluence point.
 3. The 30-mile segment of the Catawba downstream of Lake Wylie dam. Current operations result in stream flows that severely limit recreational opportunities. Studies are needed to look at flow rates and release schedules, how they affect safe swimming and river recreation. Studies needed to examine the feasibility of altering flows to avoid big pulses. Studies are also needed to determine how dam operations affect Landsford Canal State Park.
 4. Great Falls of the Catawba, 2-mile segment below Great Falls diversion dam. This is an important natural feature. Studies are needed to determine the feasibility of removing the diversion dam, or altering flow patterns to allow kayaking/canoeing and other river recreation. Studies are needed to determine if these flows can be balanced with lake levels needed for safe lake-based recreation. Studies are need to examine economic benefits of restoring flow and aquatic habitat by increasing tourism in this area of Chester county.
 5. Wateree River downstream of Lake Wateree dam. This 75-mile segment includes the largest segment of the Wateree River. While it is not in project boundary, the current flow regime severely limits navigation at Rocky Shoals, and dam operations determine flow rate from the dam down to the confluence of the Wateree with the Santee River. Studies are needed to determine how operations affect recreational fishing, for example how the poor WQ in late summer/fall affects fishing, and how operations can be modified to improve water quality in the area below the dam.

R3. Catawba and Wateree River Corridor & Tributaries Public Access Study

STUDY REQUEST:

We recommend studies and surveys to assess the public need for recreational facilities on the project waters, and determine the best location and facilities to meet those needs. Studies are needed to determine the amount of shoreline that needs to be protected to preserve sufficient areas of shoreline for current and future recreational needs. These studies are needed to determine locations for additional public access points to project waters that have sufficient parking, restroom facilities, trash receptacles, and lighting; the best location for disabled/handicapped access; the need for shoreline/river fishing access for area residents that do not own boats or land on the lakes; and the need for signage for the growing Hispanic population in the region. Studies are needed to determine the design of a recreation plan that considers enhancing local economic development strategies for tourism. Studies are needed to determine access points/facilities and portages necessary for establishing a canoe/kayak trail throughout the entire project. Studies are needed to determine fringe areas along the free flowing portions of rivers that can be set aside to preserve sufficient areas to ensure access and habitat preservation through the end of the next license period. In addition, studies

are needed to determine if the current project area designations are sufficient to meet the requirement that dam operations give the same consideration to recreational needs as they do to power generation.

PUBLIC INTEREST:

Public access points are needed to meet current public recreational demand required for compliance with FPA or CWA purposes or designated uses; and will be needed to provide adequate access or protect the need for future access for a growing population during the term of the next license.

NEXUS TO PROJECT:

All these areas are directly adjacent to project waters and in many cases, ownership was transferred from the licensee to its subsidiary Crescent Resources.

AVAILABLE INFORMATION:

Duke Power has already conducted a Recreation Use and Needs Study for their most recent SMP. This plan, however, did not adequately involve the public, or reference the numerous local government recreation Master plans that are currently available. Among the plans that need to be considered are the recreation plans of Burke County, City of Hickory, Alexander County and Mecklenburg County in N.C.; York County Comprehensive Plan, Trust for Public Land in Rock Hill, Great Falls Nature Based Tourism Plan, Catawba River Corridor plan and the S.C. State Comprehensive Outdoor Recreation Plan compiled by the S.C. Dept. of Parks and Recreation. Duke Power bears the responsibility to collect and compare the plans of governments/groups along the project, and determine what other studies are needed to complement these plans and enhance recreational opportunities in the project. The NC State Parks and Recreation Department is also looking for a “mega-site” to expand the existing state park on Lake James. Additionally, the Catawba River Basin Natural Resources Plan refers explicitly to recreation enhancements needed around the project. The licensee has promoted an “Access Area Initiative” to local governments, but has resulted in limited success due to their lack of funding commitments and lease length limitations. They also will not commit to long-term maintenance of the sites, leaving that and all liability issues up to local governments to deal with. Studies are needed to determine the feasibility of establishing a trust fund with cooperating agencies for the on-going maintenance of these facilities.

STATUS OF AVAILABLE INFORMATION/CONDITIONS:

FSCD § 5.4.1 summarizes Duke Power’s many contributions toward the development of public facilities and access, however, many existing access areas have insufficient space or facilities (especially restrooms) to accommodate the needs of the public. The access areas also are heavily biased towards power boating, and have little if any bank fishing, swimming areas and safe access points for non-boaters. Shoreline fishing access is continually threatened by increased development along shorelines, and a lack of sufficient public access points and fishing piers. Data tables for each lake, listed in FSCD § 5.3.6, indicate that there are few fishing piers on the lakes, and on some lakes there are none. For example, there are currently only three public fishing piers on 23,000 acres of water, according to SCDNR. SCDNR currently estimates that in S.C., an average of 5% of shoreline is devoted to recreation; 3.8% on Lake Wylie, 4.3% on Lake Wateree, and 6% on Fishcreek Reservoir. While canoe portages exist at several dams, studies are needed to determine whether there is a need for more portages and camping areas to accommodate the Catawba River Canoe Trail so that it can be developed and used throughout the whole basin. This would not only address recreational goals, but may provide economic enhancement to the area through increased tourism throughout the basin. In addition, studies are needed to determine economic impacts of dam

operations. The Unifour Recreation Task Force has specifically asked Duke to assist them in preparing a recreation plan that will address the economic implications of tourism in the area, as well as identifying key sites for future recreation improvements. Studies are also needed to determine whether the design of existing access areas (massive paved areas with concrete ramps) may be modified as they often contribute to heavy storm water and pollution run-off directly into project waters and are a visual impairment to the scenic qualities of the area.

TARGET AREAS:

In N.C.: the mega-site on Lake James, mainstem of the Catawba River between Lake James and Lake Rhodhiss, Johns River trails, City of Hickory riverfront, need for access point between Riverbend Park and the Lake Lookout Access Area. Target areas in S.C. include, but are not limited to: Rock Hill Greenway; Great Falls Nature Based Tourism Area; public fishing piers and parking facilities on all lakes, including the Fairfield County side of Lake Wateree to serve long time residents of the area that continue to lose access to fishing areas due to private development or when bridges were closed to fishing; canoe/kayak accesses between Rock Hill and Landsford Canal State Park and downstream from Landsford Canal State Park, and other areas along the rivers to allow safe access; portage trails along all dams and other river impediments.

R4. Aquatic Weed & Mosquito Controls/Eradication Program

STUDY REQUEST:

We recommend studies to determine the location and strategy for the control and/or eradication of exotic aquatic weeds on project impoundments that negatively impact fish habitat and limit or prohibit boating access.

PUBLIC INTEREST:

All areas affected by weed infestation are within the project boundary. Area impoundments also provide areas prime for mosquito populations that can impact recreational users and nearby communities.

NEXUS TO PROJECT:

Management of the aquatic health of the impoundments is one of the primary responsibilities of the licensee.

AVAILABLE INFORMATION:

Exotic weed infestations have the capacity to dramatically impact fish populations and boating access to the project impoundments. The licensee currently has a limited number of very knowledgeable staff working on this issue, but a study needs to be conducted to determine a long-term strategy to control/eradicate this problem. Mosquito control is another matter that has the potential to pose a serious health threat and a long-term strategy needs to be developed to address that issue as well. A task force composed of the licensee, state agencies, and university representatives has been formed to look at the issue, but so far, they have published no findings for review by the public.

STATUS OF AVAILABLE INFORMATION/CONDITIONS:

Exotic aquatic weeds continue to persist and expand on at least five project impoundments: Lake James, Lake Hickory, Lake Norman, Mountain Island Lake, and Lake Wateree. Grass carp have been introduced into Lake James and Mountain Island Lake. These weeds also have the potential to severely hamper hydropower operations and public drinking water and industrial user water intakes. Duke Power continues to provide mosquito control as well in some areas. We support and encourage

the formation of multi-agency task forces, and recommend that these task forces receive sufficient support to be able to gather data, and report studies in a timely manner for review by the public and interested agencies.

Water Quality Workgroup Study Requests

INTRODUCTION:

The following members of the Water Quality/Quantity workgroup of the Catawba Wateree Relicensing Coalition met and collaboratively developed the study requests contained herein:

Sean Connolly, SC Department of Health and Environmental Control (SCDHEC)

Mark Giffen, SCDHEC

Darlene Kucken, NC Department of Environment and Natural Resources

Ron Bryant, Catawba Riverkeeper Foundation, Inc.

Gary Faulkenberry, Lake Wateree Home Owners Association-Kershaw

James Greene, Lake Wateree Home Owners Association-Fairfield

Barry Gullet-Charlotte Mecklenburg Utilities

Ron Weathers-Charlotte Mecklenburg Utilities

Parker Whedon, Real Running River Protective Society

Suzi Wilkins-Berl, Environmental Consultant

Donna Lisenby-Catawba Riverkeeper

W1. Balanced Use Study

STUDY REQUEST:

To determine the appropriate balance of water use in the Catawba-Wateree system and to provide the baseline for multi-jurisdictional decision-making, a long-term water needs study for the entire river basin should be undertaken. This study would help demonstrate the conflicting and increasing needs for water from the system, assess the impacts on interbasin transfers to other systems, and establish a baseline for future water uses.

PUBLIC INTEREST:

Residents of the Catawba-Wateree basin recognize that there are competing uses for the water in the system (water supply, waste dilution, etc.) and all uses are in the public interest.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for development and resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

In order to establish appropriate water management for power generation, water supplies, waste assimilation, recreation etc., it is necessary to assess all current and projected future water demands to determine the best balance of uses. This issue is directly related to Project operations.

AVAILABLE INFORMATION:

None, of which we are aware. Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

An overall modeling of the water demands alternative scenarios (evaluating weather, land use and future build out, population growth, water use demands, etc.) is needed to establish a balanced use of water in the basin.

W2. Nonpoint Source Runoff: Land Development

STUDY REQUEST:

Conduct various Shoreline Management Plan (SMP) modeling scenarios to determine the impact of existing and future land development - both within and beyond the Project boundary in the watershed - on current and future water quality in the Catawba-Wateree system.

PUBLIC INTEREST:

The citizens of the Catawba-Wateree watershed are directly interested in the water quality of the system – for drinking water, recreation and the health of fish and wildlife.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for development and resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

This issue is directly related to the water quality in the Catawba-Wateree Duke Project. Only when we understand the contribution that comes from both outside and from within the Project boundary can we determine what land development scenarios are appropriate to protect water quality and future water uses of the system.

AVAILABLE INFORMATION:

The Shoreline Management Plan, various models, Crescent Resources Development plans, local government land use plans, population statistics, etc. Duke Energy data has not been made available on the quality of water coming into Project areas, leaving reservoirs and coming from the shoreline. Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Duke Energy should run some selected models on the quality of water coming into Project areas, leaving reservoirs and coming from the shoreline and on other parameters to understand future impacts to water quality from development of reservoir shorelines.

W3. Ambient Water Quality at Tailrace

STUDY REQUEST:

To improve water quality at all of the Project dams' tailraces in order to meet water quality standards and provide for the needs of aquatic life.

Need to obtain and understand existing tailrace study results for **all** tailraces, but especially Bridgewater, Oxford, Wylie and Wateree dams, in order to determine additional system wide and synoptic study needs. Detailed studies may be needed to fully quantify the scale and scope of impacts to tailrace water quality.

PUBLIC INTEREST:

DO standards are not always met in the tailraces. The citizens of the Catawba-Wateree watershed are directly interested in the water quality of the system – for drinking water, recreation and the health of fish and wildlife. Assuring that water quality standards are met assures that the designated uses of these public waters are being met.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for development and resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

The Bridgewater, Oxford, Wylie and Wateree dams and tailraces are integral to the Project and its operations.

AVAILABLE INFORMATION:

Need to share existing data to determine what additional studies are needed at the tailrace. These data should be assessed in conjunction with available data from each state. Existing study results need to be presented so they relate to units/measurements contained in each State's water quality standards. Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Studies are needed on D O and temperature, especially for Bridgewater, Oxford, Wylie and Wateree tailraces. Studies are needed to determine if other water quality standards (e. g. pH, turbidity, etc.) and biological criteria ("balanced indigenous aquatic life" community) are consistently being met.

W4. Flow Regimes at Tail Race

STUDY REQUEST:

To balance flows for power generation and for those needed to maintain adequate water quality for downstream water supply, recreation and wildlife.

PUBLIC INTEREST:

The citizens of the Catawba-Wateree watershed are directly interested in the water quality of the system – for drinking water, recreation and the health of fish and wildlife. There are many uses of water as a resource and the need to establish a balanced use of the waters of the Catawba-Wateree system is imperative, especially under low-flow conditions due to drought.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for development and resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

This issue is directly related to the Project operations.

AVAILABLE INFORMATION:

Instream flow study results from the Bridgewater tailrace currently underway.

Others are unknown. Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Study needed to determine flow regime requirement for meeting downstream water supply, recreation, wildlife needs, especially for Bridgewater tailrace and Lakes Wylie and Wateree (using Instream Flow Incremental Methodology [IFIM] or similar methodology)

W5. Reservoir Water Quality: Reservoir Eutrophication

STUDY REQUEST:

To reduce eutrophication in the reservoirs in the Catawba-Wateree system, especially at Lakes Wylie, Rhodhiss and Wateree.

PUBLIC INTEREST:

The citizens of the Catawba-Wateree watershed are directly interested in the water quality of the system – for drinking water, recreation and the health of fish and wildlife.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for development and resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

This issue is directly related to the Project as it relates to the SMP and possibly to Project operations at Lake Wylie.

AVAILABLE INFORMATION:

States and Duke Energy collect data limited to the mainstem of reservoirs.

South Carolina has developed preliminary Total Maximum Daily Load (TMDL) information for Lake Wateree.

Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Study the flow requirements from Lake James, Mountain Island Lake and Lake Wylie dams needed to determine if different flow regimes will improve water quality in Lakes Rhodhiss, Wylie and Wateree.

Additional sample information needs to be collected from the coves and main tributaries, since these areas are vital for aquatic resource health and for recreational opportunities.

Study what the needs will be to meet water quality standards 30 years from now to reduce nutrients from dam operations or from SMP build out. Since phosphorous is a current concern on the Catawba, the utility should undertake a detailed phosphorous study.

Study the impact of eutrophication from 1) repeated flooding (especially Wateree); 2) on the algal growing season; and 3) as it relates to shoreline build out over the next 30 – 50 years.

Study the nutrient and sediment loading, especially from the Johns River, Lower Creek, South Fork, Crowders Creek, Sugar Creek and various South Carolina locales.

W6. Water Quality

STUDY REQUEST:

To have all of the impoundments on the Catawba be rated good to excellent as measured currently and historically by Duke Energy using the Fusiliers Water Quality Index.

Public Interest:

The citizens of the Catawba-Wateree watershed are directly interested in the water quality of the system – for drinking water, recreation and the health of fish and wildlife. The public has an expectation that the water quality in the lower Catawba reservoirs will be improved to a good to excellent level in order to continually meet the intended uses of drinking water, swimming, and recreation (fishing and boating) over the life of the Project.

Nexus to Project:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for development and resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

The utility has direct control of flow rates, and has impact on both the flooding and shoreline development.

Available Information:

Duke has referenced index data for summers 1993-2001. This information portrayed on a color-coded Catawba River basin map clearly shows a dramatic difference in water quality in the lower Catawba impoundments of Fishing Creek, Great Falls/Dearborn, and Wateree as compared to the other seven impoundments. We are not aware of data after 2001 being available.

Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Duke Energy has not received state certified lab status and does not have a QAPP. It is vital that the utility become a state certified laboratory and develop a QAPP for approval, so that their water quality data can be appropriately integrated with that of North and South Carolina.

To meet water quality standards, the utility needs to undertake studies to understand the following:

- *What are the factors that result in the great difference in water quality, and what are the relative impacts of the factors?
- *What is the impact of flow rates in the lower Catawba?
- *What is the impact of the current shoreline development plan in the lower Catawba?
- *What is the impact of historical flooding on water quality?

W7. Water Quantity: Drought

STUDY REQUEST:

In times of drought, to balance water quantity (reservoir levels) with flow requirements for all uses: adequate public water supply, reservoir water quality, fish and wildlife needs, power generation, etc.

PUBLIC INTEREST:

The citizens of the Catawba-Wateree watershed are directly interested in the water quality of the system – for drinking water, recreation and the health of fish and wildlife. The balanced use of a water resource is clearly of public interest.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for development and resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

Competing uses for limited water: power production, water supply, water to sustain water quality, etc., and, in times of drought, we may experience water shortages.

Current gauging stations are inadequate to provide data necessary to determine future watershed needs and appropriate operations. This issue is both directly and indirectly related to the Project and its operations.

AVAILABLE INFORMATION:

Duke Energy collected intake height data during summer 2002 drought. This information should be used in order to determine the appropriate balance of future uses.

Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Study the impact of drought on Project operations, under varying build out scenarios and the many uses of the water resource. This study would then lead to the development of a drought plan for the Catawba-Wateree system, with involvement of the public, private and nonprofit sectors. Study to include analysis of backflow from the reservoirs into the aquifers.

Study to provide real time information on drought conditions that can be used by utilities to trigger conservation measures; (i. e. a drought trigger study). In addition, Duke Energy needs regularly to publish drought monitor information that provides surface flow and groundwater levels during drought conditions, especially when flows approach 7Q10. This data will allow for coordinated conservation response in times of low flow.

Study to determine what optimum flows through the dams are needed in drought to assimilate NPDES discharges and especially to maintain 7Q10 levels.

Study the need for more flow gauging and groundwater stations throughout the basin (and continue to support existing stations). In order to secure adequate water quantity data, Duke Energy needs to establish and maintain additional permanent groundwater and streamflow stations to monitor water levels for power production and other critical uses.

W8. Water Quantity: Operations

STUDY REQUEST:

To determine the impact of Duke Energy operations (e. g. the timing and volume of water releases) on water quality.

PUBLIC INTEREST:

The citizens of the Catawba-Watauga watershed are directly interested in the water quantity of the system as it impacts the quality of drinking water, recreation and the health of fish and wildlife. The balanced use of a water resource is clearly of public interest.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. The management of these reservoirs is subject to federal law and conditions attached to the license.

We may experience future water shortages in the system, based on the competing uses of: power production, water supply, water to sustain water quality, etc., and, of any future interbasin water transfers. Current gauging stations are inadequate to provide data necessary to determine future watershed needs and appropriate operations. This issue is both directly and indirectly related to the Project and its operations.

AVAILABLE INFORMATION:

Duke Energy's intake height data collected during summer 2002 drought. This information needs to be evaluated in order to determine the appropriate balance of future uses.

Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Study to determine what optimum flows through the dams are needed at all times to assimilate NPDES discharges and especially to maintain 7Q10 levels.

Study the need for more flow gauging and groundwater stations throughout the basin (and continue to support existing stations). In order to secure adequate water quantity data, Duke Energy needs to establish and maintain additional permanent groundwater and streamflow stations to monitor water levels for power production and other critical uses.

Study to evaluate the impact on the system of any future interbasin transfers. (Note: while North Carolina has regulatory oversight and South Carolina's process is unknown, there is no readily available public process to help determine the outcome.) A study is needed to determine appropriate caps for the amount of water that can be transferred from the Catawba to other basins. This study

would be a valuable management tool. The goal would be to base interbasin transfer decision on studies and data that indicate the basin's capacity to share water without detrimental impacts to water quality, aquatic life, hydrogenation, etc.

W9. Security

STUDY REQUEST:

To provide for the safety of water quality within the Project boundary.

PUBLIC INTEREST:

The citizens of the Catawba-Wateree watershed are directly interested in the water quality of the system – for drinking water, recreation and the health of fish and wildlife. The public expects the operators of the Project to manage the reservoirs so as to insure the safety of water for all purposes.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

AVAILABLE INFORMATION:

None, of which we are aware. Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Study security requirements to plan for potential accidents and acts of sabotage within the Project boundary, so as to be able to coordinate effectively with other jurisdictions.

W 10. Flood Control

STUDY REQUEST:

To eliminate, or at minimum to mitigate, the flooding historically experienced on Lake Wateree, the last impoundment in the Catawba River Basin, that currently has no flood control mechanism at the lower dam.

PUBLIC INTEREST:

The impact of flooding on water quality impacts the continued ability of the public's water to meet its intended uses of drinking water for two municipalities, fishing for the general public, and swimming and boating for the general public. The impact to the public is both economic (damage to homes, cars, docks, boats, etc.) and of concern to the public's health and welfare.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for development and resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

Duke Energy controls the levels of the impoundments on the Catawba. Their original decision to not install flood control capability on the lower dam on Wateree and subsequent decisions not to retrofit the dam severely limit their capability to control flooding on Wateree.

AVAILABLE INFORMATION:

Data exist within Duke and from personal data chronicled by homeowners for flood levels experienced both on Lake Wateree and the relative levels on other reservoirs for many years. Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Study is needed to determine the impacts of flooding on Lake Wateree water quality, eutrophic conditions (and high phosphorus). Studies are needed on the impacts 1) of sedimentation, 2) on septic systems, home heating oil tanks and marina gas tanks that become covered by water for multiple days, and 3) of nutrient loading.

Study is needed to determine the economic impact to lake residents and businesses, and the health and welfare impact of residents being stranded for days without access to emergency medical resources.

Study is needed to identify and evaluate the alternatives at the Wateree Dam to provide greater movement of water as a preventative measure in periods of high rainfall in the local area or upstream in the basin.

W11. Nonpoint SourceRunoff: Entire Watershed

STUDY REQUEST:

To determine sources of nonpoint source pollution, especially nutrients and sediment, entering the reservoirs.

PUBLIC INTEREST:

The citizens of the Catawba-Wateree watershed are directly interested in the water quality of the system – for drinking water, recreation and the health of fish and wildlife.

NEXUS TO PROJECT:

The Project created the reservoirs in order to operate hydropower facilities. The continued operation of the Project affects the water quality of the reservoirs. In addition, these reservoirs act as magnets for development and resource related activities, which result in a further impact on water quality. The management of these reservoirs is subject to federal law and conditions attached to the license.

This issue is both related to the Project in terms of loss of Project volume and thus power production; and related in terms of nutrient inputs and their impact on water quality.

AVAILABLE INFORMATION:

North Carolina and South Carolina work being done in conjunction with the development of TMDLs for waters listed on the States' 303(d) lists. (While some waters are outside the Project boundary, they do discharge into the Project area and thus are pertinent.) Duke Energy has collected data on some of these waters, as have the two States and some of the local governments.

Watershed stakeholders are often unaware of what studies Duke Energy has completed to date or plans to undertake, so it is difficult to ascertain what new or supplemental data is needed.

BASIC METHODOLOGY:

Study needed to gain information about pollutants from nonpoint sources in specific watersheds, so as to determine what portion of the source comes from within the Project boundary and which needs to be reduced by other entities. In particular, we need to gain an understanding of how the system functions as a whole and why water quality above and below Fishing Creek are different. (TVA's Integrated Pollutant Source Identification [IPSI] work to study nonpoint source pollutants [using infrared aerial and modeling] is one methodology that Duke Energy may wish to consider.)

We look forward to participating throughout the relicensing process. Please contact the CWRC office (704.295.4400) or our President Vicki Taylor (704.528.0480) with any questions you may have.

Sincerely,

Vicki Taylor
CWRC Board President