ENVIRONMENTAL ASSESSMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
COASTAL AMERICA FY92 DEMONSTRATION PROJECT

JULY 1992

The U.S. Environmental Protection Agency proposes to issue a $100,000 grant to the State of North Carolina Department of Environment, Health, and Natural Resources for the Coastal America project entitled "Mitigation of Obstructions to Anadromous Fish Migration." A 30-day review period will begin on the date stamped below. Comments received before the end of the review period will be considered prior to the award of the grant.

Comments or inquiries should be directed to:

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Regional Administrator
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AUG 4 1992
Date

N/A 8/11/92

ENVIRONMENTAL ASSESSMENT
FOR
MITIGATION OF OBSTRUCTIONS TO
ANADROMOUS FISH MITIGATION

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1.0 INTRODUCTION

This Environmental Assessment has been prepared in accordance with the National Environmental Policy Act of 1969, as amended, to address environmental concerns associated with a mitigation plan for obstructions to anadromous fish migration in the Albemarle-Pamlico estuarine system of eastern North Carolina. The U.S. Environmental Protection Agency (EPA) plans to issue grant funding for this project which proposes to implement recommendations made in the Albemarle-Pamlico Estuarine Study (A/P Study) Comprehensive Conservation Management Plan (July 1992 Draft).

The following project objectives are being proposed:

a. The removal or modification of dams at four identified sites will be undertaken in an effort to restore considerable anadromous fish habitat. Monitoring to determine the effectiveness of these mitigation projects will be conducted upon their completion. In addition, an assessment will be made of the effects of existing culvert installations on anadromous fish migration and future mitigation needs in the Albemarle/Pamlico region.

b. The preparation of maps to aid in documenting the following:

(1) Areas of historical anadromous fish spawning habitat

(2) The distribution of anadromous fish during recent or current spawning seasons

(3) An inventory of existing obstructions to fish passage including dams and culverts.

c. The development of interagency consensus documents which will present guidance for future dam and culvert installations, retrofits, and future restoration efforts.

Proposed grant funded items b. and c. do not involve any construction activities and are not addressed in this Environmental Assessment. All construction activities will be conditioned in the grant issued by EPA to assure best management practices and regulatory compliance in accordance with the National Environmental Policy Act.

In the fall of 1991, this project - "Mitigation of Obstructions to Anadromous Fish Migration" - was selected as a demonstration project under the Coastal America Program (for Fiscal Year 1992). The Coastal America Program is a cooperative Federal agency partnership for providing accelerated response to significant coastal programs. Existing institutional frameworks and ongoing programs are used to facilitate the proposed Coastal America projects. Interagency coordinating efforts at the national, regional, and local levels provide cooperative planning and implementation for the projects. Each participating agency is responsible for its part in a project, with funding administered through existing mechanisms.

2.0 BACKGROUND ON APPLICANT'S PROPOSED PROJECT

2.1 DAM REMOVAL AND MODIFICATION PROJECTS

Anadromous fish, including striped bass, hickory shad, American shad, alewife, blueback herring, shortnose sturgeon, and Atlantic sturgeon, have historically formed a significant component of the fishery resource of the Albemarle-Pamlico estuarine system. The presence of many species of anadromous fish in this region is documented in the Freshwater Fishes of North Carolina (Menhinick, 1991).

There has been, however, an unprecedented decline in the populations of all anadromous species throughout much of their historic ranges in the Albemarle-Pamlico region (Street, 1988; Steel, 1991). Water quality degradation, alteration and destruction of the estuary's habitats, alteration of river flow, and commercial and recreational overfishing are factors thought to contribute to these declines in population. In addition, physical obstructions to anadromous fish migration have been identified as significantly decreasing the historically available spawning areas. Declines are expected to continue unless causes can be more completely understood and corrective measures taken.

Environmental agencies involved with anadromous fish management describe dams as the most detrimental obstruction to migration. Many abandoned mill pond dams and hydroelectric dams remain in eastern North Carolina and Virginia and obstruct many hundreds of miles of historic anadromous fish habitat.

This project proposes mitigative efforts to restore access to these blocked historical spawning habitats. Four sites have been targeted for the removal or modification of dams for the purpose of reopening considerable anadromous fish habitat.

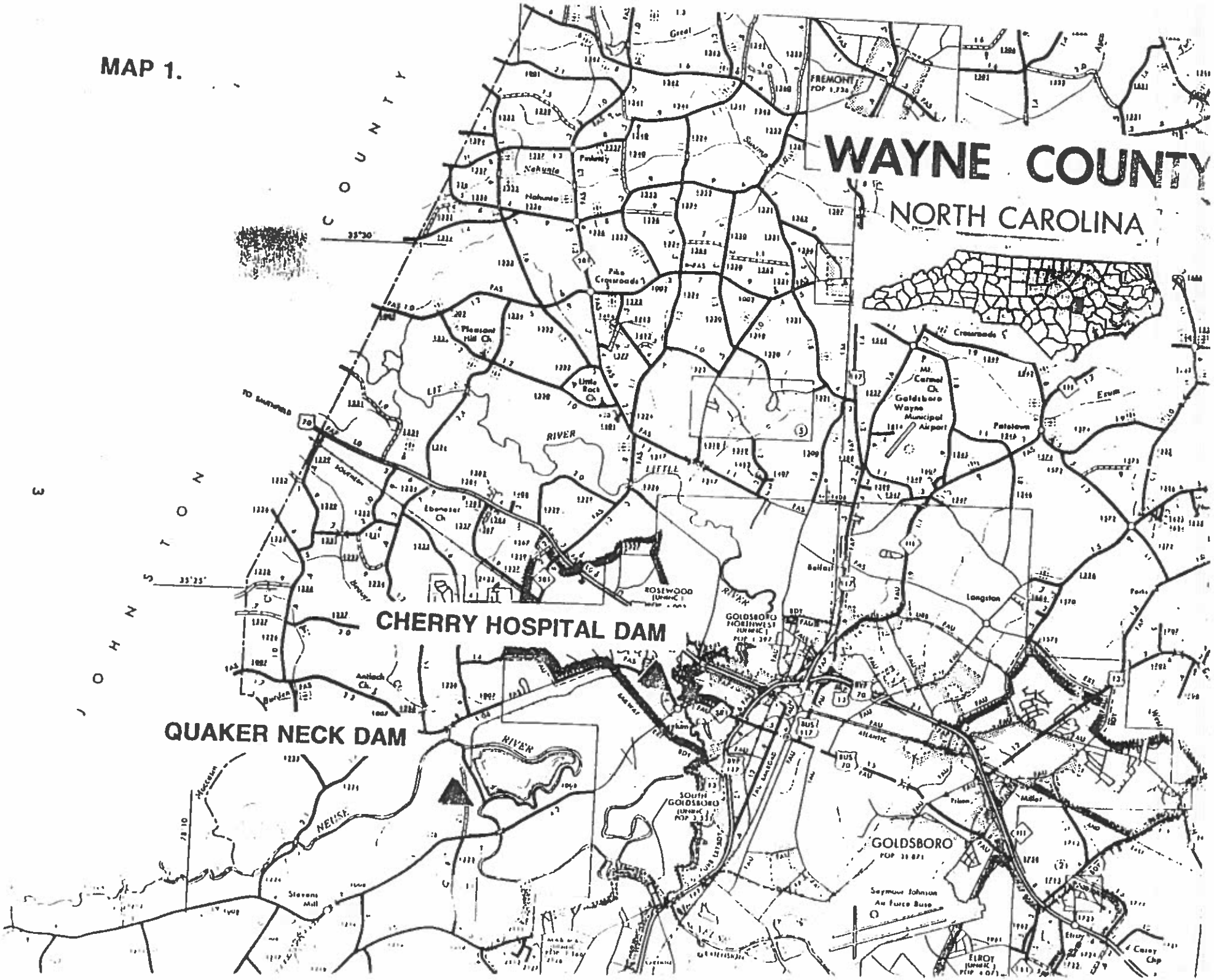
Project Sites

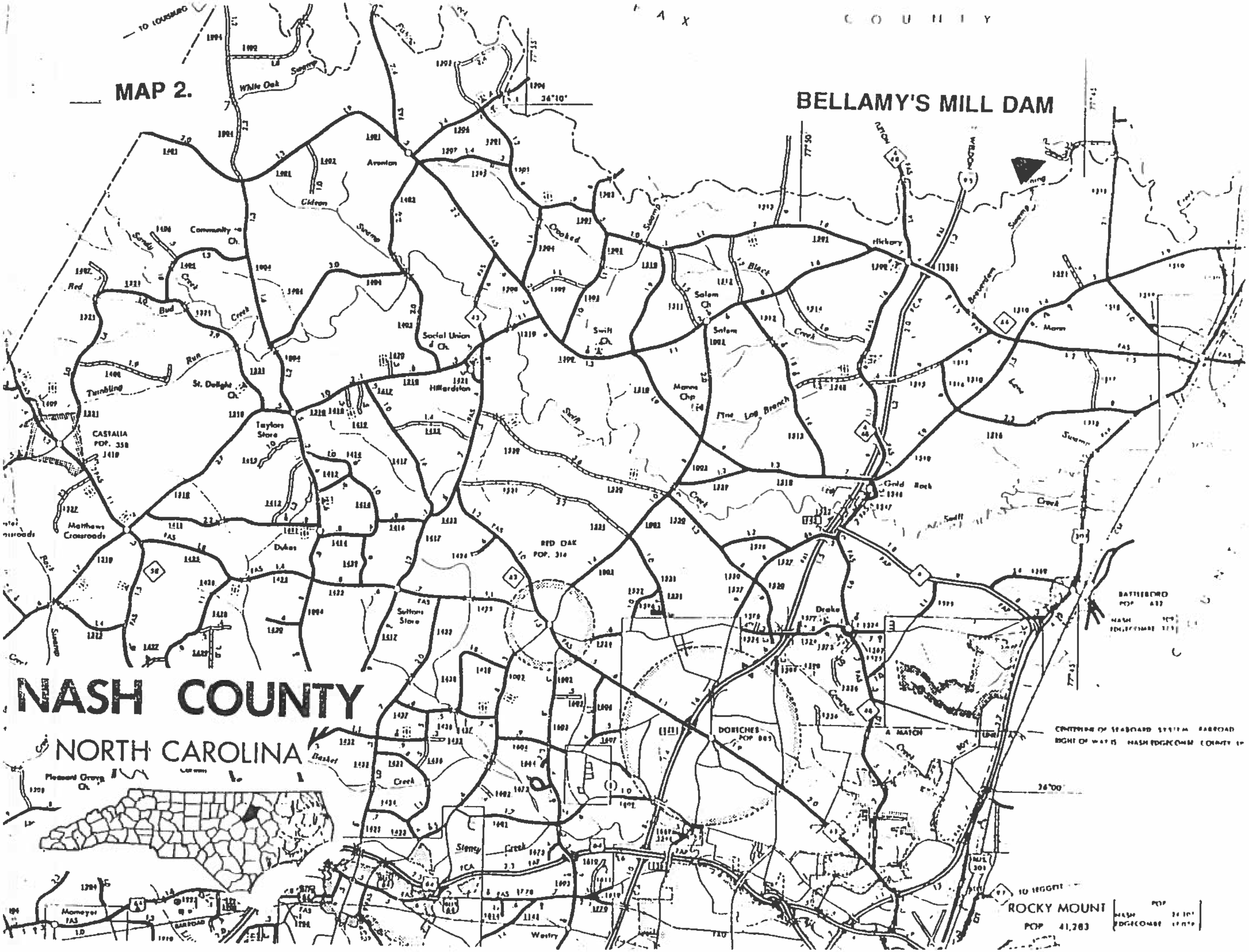
The Cherry Hospital Dam is a 1-foot head dam on the Little River in Goldsboro, North Carolina (see site location maps 1-3). The average annual flow in this river is 300-350 c.f.s., and the width of the river at this site is 100 feet. The dam is owned by the state of North Carolina and was once used for surface water intake for the hospital, but serves no function at this time. The proposed removal of this dam would restore anadromous fish access to an additional 20 river miles from this site upstream to another dam outside of Princeton, North Carolina.

A second dam proposed for removal is a 2-foot head dam, called the Quaker Neck Dam, located on the mainstem of the Neuse River, near Goldsboro. The average annual flow in this river is 1700-1800 c.f.s. and the width of the river at this site is 200 feet. This dam, owned by Carolina Power and Light (CP&L), is used to ensure a supply of cooling water for the operation of CP&L's Lee Steam Electric Power Plant. The removal of this dam would restore access to an area of 64 river miles on the mainstem of the Neuse River upstream to the fall line at Milburnie Dam outside of Raleigh, North Carolina, as well as approximately 75 miles of tributaries to the mainstem. This would result in the restoration of most of the historic anadromous fish spawning habitat in the Neuse River basin.

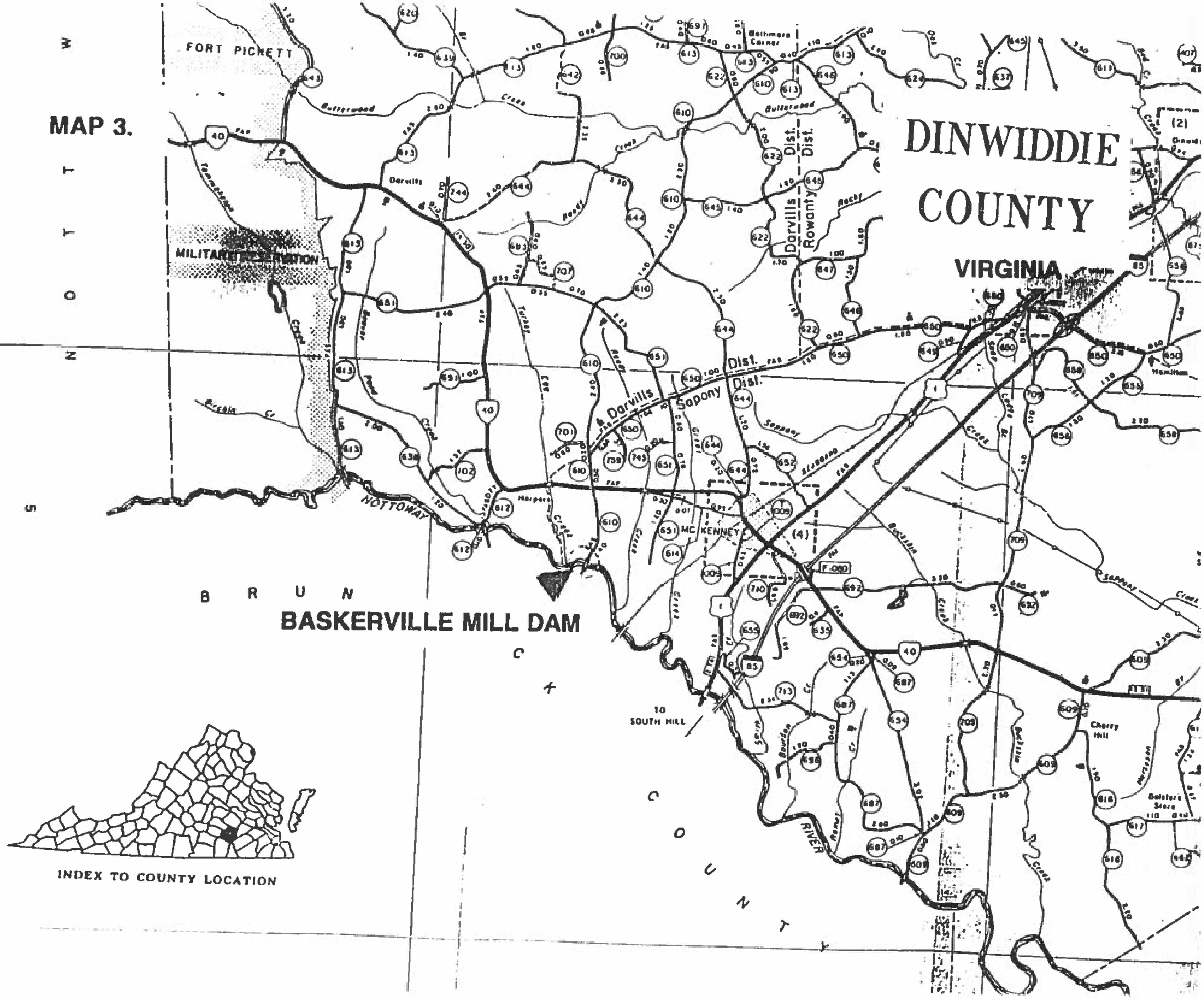
Two other dams within the Albemarle-Pamlico estuarine system have been selected to be retrofitted with fish ladders. These include two privately-owned facilities, Bellamy's Mill Dam on Fishing Creek, within the Tar River basin near Rocky Mount, North Carolina, and Baskerville's Mill Dam on the Nottoway River near McKenney, Virginia. Construction of a fish ladder at the

MAP 1.


WAYNE COUNTY
NORTH CAROLINA
CHERRY HOSPITAL DAM
QUAKER NECK DAM
GOLDSBORO
FREMONT
ROSEWOOD
GOLDSBORO NORTHWEST
SOUTH GOLDSBORO
Goldsboro Wayne Municipal Airport
Seymour Johnson Air Force Base
RIVER
NEUSE
JOHNSTON COUNTY


MAP 2.
BELLAMY'S MILL DAM
NASH COUNTY
NORTH CAROLINA
HALIFAX COUNTY
TO LOUISBURG
White Oak Swamp
Aventon
Community Ch.
Gideon Swamp
Red Bud Creek
Tumbling Run
St. Delight Ch.
CASTALIA POP. 358
Taylors Store
Matthews Crossroads
Social Union Ch.
Hilliardston
Crooked Creek
Swift Ch.
Salem Ch.
Salem
Mann's Chp.
Pine Log Branch
Hickory
Beaverdam Swamp
Black Creek
Gold Rock
Swift Creek
RED OAK POP. 314
Dukes
Sutton Store
DORTCHES POP 863
Drake
Stony Creek
Pleasant Grove Ch.
Momeyer
Westry
BATTLEBORO POP 432
ROCKY MOUNT POP 41,283
TO LEGGETT
CENTERLINE OF SEABOARD SYSTEM RAILROAD RIGHT OF WAY IS NASH-EDGECOMBE COUNTY LINE
36°10'
36°00'
77°50'

MAP 3.


DINWIDDIE COUNTY
VIRGINIA
BASKERVILLE MILL DAM
FORT PICKETT
MILITARY RESERVATION
NOTTOWAY
RIVER
MC KENNEY
Darvills Dist.
Rowanty Dist.
Sapony Dist.
TO SOUTH HILL
Cherry Hill
Baltimore Corner
N O T T O W
B R U N S W I C K C O U N T Y
INDEX TO COUNTY LOCATION

Baskerville Mill site would open 14 miles of upstream spawning habitat. It is well documented that American shad migrate up to the Baskerville Mill site at river mile 110, which is upstream of the fall line (Odom et al., 1986).

The Bellamy's Mill Dam is approximately 4 miles downstream of the fall line. It can be noted that the historic usage of areas upstream of the fall line on Fishing Creek is not documented here, but the use of these areas by American shad is considered to be very likely (Mike Wicker, U.S. Fish and Wildlife Service, personal communication, 1992). The documented usage at the Baskerville Mill site gives support to this conclusion.

The sites selected for the dam removals and modifications are considered to be those where the greatest benefit can be realized to anadromous fish populations. This is especially true for the Quaker Neck site which would restore most of the historically important upstream fish spawning habitats in one of the largest river basins in North Carolina.

Monitoring studies will be conducted as a multi-agency effort upstream of the mitigation sites during the 1993 or 1994 spawning season. The initial effectiveness of these restoration projects will be determined. Indices to be monitored include abundance of adults, egg production, and juvenile abundance counts.

2.2 MAPPING

A preliminary report by the U.S. Fish and Wildlife Service has identified twenty-seven physical obstructions known to impede the migration of anadromous fish within the Albemarle-Pamlico Estuarine Study area (Collier and Odom, 1989). An additional thirty obstructions were identified on stream reaches where anadromous fish usage is predicted, but not yet documented. In the report, dams were identified as the most common obstruction and road culverts as the second most common obstruction.

Another project objective is to continue the identification process of physical obstructions and to prepare comprehensive maps of the documented obstructions. Maps would also be prepared to delineate the areas of historical anadromous fish spawning habitat and the distribution of anadromous fish during current or recent spawning seasons. Maps will be given to the Center for Geographic Information and Analysis, the state geographic information system, for digitization and entry into the Albemarle-Pamlico Estuarine Study database.

3.0 ALTERNATIVES

Available alternatives to the proposed project involve the award of the grant and options for improving anadromous fish stocks.

3.1 NO ACTION ALTERNATIVE

The U.S. Environmental Protection Agency could decide not to award the grant for this project. This alternative is not expected, due to the environmental benefits anticipated by the project, the immediate availability of funds to accomplish the work, and the potential of losing these available funds in future years. Also, EPA would not award this grant for one or more project objectives, if the owners of the identified obstructions were not agreeable to the proposed actions, or if insurmountable impediments or adverse impacts were identified. These situations are not expected to occur.

3.2 PARTIAL REMOVAL OF OBSTRUCTIONS

Partial removal of the two low-head dams was considered as an alternative to their complete removal. This was determined to be potentially dangerous to boaters and swimmers, because of the resulting changes in hydraulic conditions. Considerable engineering analyses would be required in order to develop a suitable design for partial removal. The installation of gates, which would allow the passage of anadromous fish, would also present dangerous conditions for the duration of the migration season, and present long-term maintenance and liability problems.

3.3 MITIGATION OF OBSTRUCTIONS TO ANADROMOUS FISH MIGRATION, as discussed herein

3.4 ALTERNATIVE FISH PASSAGE TECHNOLOGIES

Mechanized devices known as "fish elevators" are often used for large dams. Fish are attracted by flow into a confined space and elevated in a volume of water over the dam. It has been determined that fish ladders at the Bellamy's Mill and Baskerville Mill dam sites would, however, be more cost-effective for the size of these dams. Fish ladders are also more environmentally benign, unlike the elevators which require a power source and daily operation and maintenance.

Special tank trucks are sometimes used to transport fish around dams until they can be fitted with passage facilities. This would not be an appropriate long-term solution to fish passage and would be costly in terms of energy use and work hours.

3.5 FISHERIES MANAGEMENT ALTERNATIVES

Some fisheries populations, such as striped bass, are augmented by stocking rivers with fishes cultured in hatcheries. This would be a costly alternative to the proposed obstruction mitigations if considered for all species of anadromous fishes. Further, it would not allow for the potential long-term benefits to the distribution of a variety of indigenous anadromous fishes. Stocking programs could be used to expedite the recolonization of upstream areas after the blockages are removed.

4.0 AFFECTED ENVIRONMENT

4.1 FISHERIES RESOURCES

Fishing Creek, the location of Bellamy's Mill Dam, is a frequently turbid, highly fluctuating stream which is the largest tributary to the Tar River. The dam is within Nash County and also borders Halifax County, NC. The stream in this area has light fishing pressure and is generally fished from the bank or light boat. The area includes populations of Roanoke bass, redbreast sunfish, bluegill, and largemouth bass. Additional nongame fish species here include longnose gar, bluehead chub, American eel, pirate perch, channel catfish, and various shiners, darters, and bullheads.

Quaker Neck Dam is located on the Neuse River in Wayne County, NC, and at this point is a large, highly fluctuating river of the Upper Coastal Plain. The fishing pressure in this area is moderate and is particularly good fishing for large channel catfish. Other fish species here include longnose gar, carp, shiners, redhorse, largemouth bass, glassy darter, and black crappie.

The Cherry Hospital Dam is located on the Little River which a tributary to the Neuse River, also in Wayne County, NC. The Little River at this dam is a moderate-size stream of the Upper Coastal Plain. Fishing pressure here is

moderate, with redbreast sunfish as the dominant game species. Other fish species include pickerel, bluehead chub, shiners, redhorse, white and channel catfish, madtoms, pirate perch, largemouth bass and darters.

Baskerville Mill Dam is located on the Nottoway River in Brunswick and Dinwiddie Counties, VA. Game and nongame fish species found in this area include largemouth and smallmouth bass, American eel, chain pickerel, flat bullhead, bluegill, shiners, redbreast sunfish, and various darters. The fishing pressure in the area is light. (Local fishes checklist provided by Bud LaRoche, VA Department of Game and Inland Fisheries, Vinton office, from 1984 and 1968 records).

4.2 ANADROMOUS SPECIES SPAWNING HABITATS

The location of anadromous spawning habitat is species specific. Striped bass spawn in the mainstem portions of major rivers, while blueback herring and alewife spawn in headwater creeks and the adjacent swamps, as well as along the edges of the major rivers. Hickory and American shad spawn in all areas of the river. Within the Albemarle-Pamlico Estuarine Study area, the primary rivers used by striped bass and American shad include the Roanoke River of Albemarle Sound and the Neuse and Tar Rivers of Pamlico Sound.

Hickory shad also spawn in these rivers, as well as in the Chowan River of Albemarle Sound. River herring (blueback herring and alewife) spawn in many of the smaller tributaries bordering Albemarle Sound. Specific spawning locations within these river systems have been presented in the Status and Trends Report of the Albemarle-Pamlico Estuarine Study (Steel, 1991).

4.3 TRENDS IN FISHERIES OF ANADROMOUS SPECIES

Trends in the fisheries of anadromous fish species are apparent from commercial and recreational landings data, juvenile abundance surveys, and spawning stock estimates. The American shad fisheries, in particular, have declined in Pamlico Sound and the Neuse and Pamlico Rivers. The specific reasons for this decline of American shad are unknown; however, the entire Atlantic coast stocks have been impacted by loss of spawning areas, habitat degradation, and overfishing. American shad catches have plummeted from more than 8 million pounds in 1896 to only 270 thousand pounds in 1989.

In recent years, striped bass catches have dropped from over 740 thousand pounds in the early 1970's to a regulated annual harvest of 98 thousand pounds from 1988 to 1990 (Mike Wicker, U.S. Fish and Wildlife Service, from 1992 records, personal communication, 1992). River herring catches are also declining, and the shortnose sturgeon is included on the Federal list of endangered species.

There is considerable interest in some states along the Atlantic coast in pursuing stocking programs in an effort to restore anadromous fish populations. There is currently a shad stocking program on the James River which is a cooperative venture between the states of Virginia and Pennsylvania. Stocking efforts for the shortnose sturgeon were started in 1990 in the Savannah River near Orangeburg, SC. The U.S. Fish and Wildlife Service has two striped bass hatcheries, and the NC Wildlife Resources Commission has a new striped bass hatchery in eastern North Carolina.

4.4 WATER QUALITY

Water quality changes in the Albemarle-Pamlico estuarine system threaten or have already negatively impacted the productivity of the anadromous fisheries. Some of the water quality-associated problems in the estuary include algal blooms, fish kills, hypoxia and anoxia, increased sediment loads, toxic substances, loss of critical habitats (such as the losses due to

obstructions, including dams and culverts), and freshwater discharge. Increased freshwater discharges, as a result of large-scale land clearing and draining for agricultural purposes have altered flow regimes in the spawning and critical nursery areas of the striped bass (Manooch and Rulifson, 1989).

Corrective pollution abatement actions are now occurring and are expected to accelerate in this region. These actions should show system-wide benefits to water quality.

4.5 MANAGEMENT STATUS OF ANADROMOUS SPECIES

Commercial harvest of anadromous species in North Carolina and Virginia is regulated at both the state and federal levels. Regional fisheries councils, such as the Atlantic States Marine Fisheries Commission, have implemented coast-wide fishery management plans for ocean harvest of anadromous alosine (shad and river herring) and striped bass. A management plan for Atlantic sturgeon harvest is currently in preparation by this Commission. In North Carolina, the Division of Marine Fisheries is responsible for commercial and recreational harvest regulations within 3 miles of the coast, and within the sounds and estuaries. The NC Wildlife Resources Commission regulates harvest of these species in inland waters.

5.0 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED PROJECTS

5.1 AQUATIC RESOURCES - BENEFICIAL IMPACTS

This project will result in the reopening of significant upstream habitats of four streams within three watersheds to the migration of anadromous fish for their critical reproductive and early developmental life stages. More than 140 miles within the Neuse River, 25 miles within the Little River, several miles within Fishing Creek, and 13 miles within the Nottoway River will be opened to use. The projects would restore access to much of the historically important anadromous spawning habitats in these river basins and would constitute a tremendous achievement to anadromous fish restoration efforts. Table 1 lists the occurrence of anadromous fishes at the various project sites and their time of spawning.

Evaluation, mitigation, and restoration efforts have been very successful in other states. Dam removal and breaches have been used in some locations. Work has been done on the James River in Virginia to remove impediments to anadromous fishes as part of a collaborative project with Virginia Institute of Marine Sciences (VIMS) and Virginia Game and Inland Fisheries. Dams on this river have had breaches engineered, fish ladders installed, and fish elevators improved. These changes have resulted in improved passage for the anadromous fishes of the area (Dr. Joseph Loesch, VIMS, personal communication, 1992).

Effective fish passage structures have been installed in the New England states and their benefits to the fisheries resources documented. In Massachusetts, nearly 130 fishways maintain fish migrations on approximately one hundred tributaries. On the Connecticut River, migratory fishes have been restored to 174 miles of historic habitat as a result of fishway operations at three dams. On the Pacific coast in Alaska and the northwestern states, steeppass fishways have successfully passed anadromous nonsalmonid fishes, including the American shad.

The fish ladder proposed for use at the Bellamy's Mill and Baskerville Mill dam sites is a prefabricated aluminum structure manufactured by Sheepscot Machine Works of Boothbay, Maine. This steeppass fishway has been shown to be very effective in estuarine and inland areas.

TABLE 1
Checklist of Anadromous Fishes at Project Sites

Species (Common name)	Spawning[1] (week-month)	Occurrence at Project Site
Acipenseridae		
Acipenser brevirostrum (Shortnose Sturgeon)	1 Mar - 2 May	Quaker Neck Dam[2] Cherry Hospital Dam[2]
Acipenser oxyrhynchus (Atlantic Sturgeon)	Mar - 3 Apr	Quaker Neck Dam Cherry Hospital Dam
Clupeidae		
Alosa mediocris (Hickory Shad)	1 Apr - 1 May	Quaker Neck Dam Cherry Hospital Dam
Alosa sapidissima (American Shad)	Mar - Apr	Baskerville Mill Bellamy's Mill Dam Cherry Hospital Dam Quaker Neck Dam
Percichthyidae		
Morone saxatilis (Striped bass)	3 Apr - 4 Apr	Bellamy's Mill Dam Cherry Hospital Dam Quaker Neck Dam

[1]Information on spawning from Menhinick, 1991

[2]There are no data available indicating the presence of this species here; however, see further description in text under Section 5.3 Threatened and Endangered Species.

The Maine Department of Marine Resources has used this ladder with great success in the passage of alewifes since 1989. The Sheepscot ladder has been used in inland areas in Maine on low-head dams ranging in height between 4 feet and 14 feet. The ladders have effectively passed brook trout, land-locked salmon and tautog on these dams (Malcolm Smith, Maine Department of Marine Resources; and Don Taylor, Maine Inland Fisheries and Wildlife, personal communications, 1992). The ladders are effective for shad and herring passage, however are not used by striped bass. The prefabricated ladders are a less-expensive alternative to concrete fishways and are a much longer-lasting alternative to wooden fishways.

5.2 REGULATORY CONSIDERATIONS

Appropriate permit applications will be submitted for the proposed projects. A Department of the Army permit is required under § 10 of the Rivers and Harbors Act of 1899 (33 USC 403) for any work in, over, or under a navigable water of the U.S. The removal of the Cherry Hospital Dam and the Quaker Neck Dam will require a permit under § 10. The use of explosive charges at the Quaker Neck Dam would create a discharge of material, requiring authorization under § 404 of the Clean Water Act (33 USC 1344).

5.3 AQUATIC RESOURCES - POTENTIAL NEGATIVE IMPACTS

Various techniques are available for the removal of the low-head dams. Crane and cable is the preferred technique for the removal of the Cherry Hospital Dam. The concrete cap sections of the dam and the associated sheetpile would be removed from the stream. In an effort to minimize turbidity, little or no dredging of the stream bottom sediments is anticipated. Any bottom materials remaining from behind the dam upon completion of the project would be allowed to gradually erode back to pre-dam conditions.

Removal of the Quaker Neck Dam would involve substantially more concrete material. The use of crane and cables is possible; however, a more probable alternative technique for removal is the use of low-charge explosives. Explosives would result in a fish kill on either side of the dam for approximately 10 meters (Mike Wicker, U.S. Fish and Wildlife Service, personal communication, 1992). Post-explosive monitoring will be conducted by state and federal agencies, including the NC Division of Environmental Management, the NC Wildlife Resources Commission, and the U.S. Fish and Wildlife Service. After the explosion, dead fish from the site will be collected, identified to species and preserved for the archives of the North Carolina Museum of Natural Science.

The Quaker Neck Dam is proposed for complete removal down to the footer of the dam. Short-term changes in turbidity levels in the immediate vicinity of the project site would occur with the dam removal. Approximately 2 - 3 feet of sediments are present on the upstream side of the dam resulting from accumulations since the time of the dam's construction. The sediments behind the dam are mostly coarse grained sands. Fine, organic sediments at the site are suspended during seasonally high flows. Appropriate silt and erosion control devices will be used at the downstream and, where necessary, upstream locations during the removal of the dam. This removal process would result in the restoration of the natural river channel elevation.

An alternative to complete removal of the Quaker Neck Dam would be the partial removal of the upper portion of the dam. This would be accomplished by cutting the dam using a line of explosives at the upstream sediment level of the dam. This will prevent the disturbance of the upstream sediments. This alternative will be considered only if the project eliminates all safety hazards from the dam site. A complete engineering evaluation of the removal alternatives is planned.

Both the Quaker Neck Dam and the Cherry Hospital Dam will have small sections removed at the beginning of the construction process. This will allow the water levels on either side of the dams to equilibrate before proceeding with the complete removal. The river banks are anticipated to remain unaltered in the vicinity of the dams, with the exception of the immediate juncture of the river bank and the dam. Best management practices for sediment control will be used at these junctures to prevent erosion to the rivers.

The proposed removal of these dams will not result in long-term impacts to the wetland areas in the vicinity. Accordingly, these projects are in compliance with the requirements of Executive Order 11990 - Protection of Wetlands.

The proposed removal of the Quaker Neck and Cherry Hospital Dams will not affect the seasonal cycle of flooding within the adjacent floodplains of these rivers, in accordance with Executive Order 11988 - Floodplain Management. The entry points for construction equipment in the vicinity of these dams will be existing road accesses only.

Baskerville Mill Dam and Bellamy's Mill Dam will be retrofitted with prefabricated fish ladders, as previously discussed. The installation of these prefabricated units is comparatively simple, with mounting brackets as part of the unit. Installation of the ladders is not expected to require any dredging or filling (Mike Wicker, U.S. Fish and Wildlife Service, and Malcolm Smith, Maine Marine Resources, personal communication, 1992). U.S. Fish and Wildlife Service hydraulic engineers, specializing in fish ladder construction will evaluate the sites.

5.4 THREATENED AND ENDANGERED SPECIES

The potential impacts of this project on threatened and endangered species have been assessed. The shortnose sturgeon (Acipenser brevirostrum) is on the Federal Endangered Species List. The proposed dam removals could reopen potential upstream spawning habitat for the shortnose sturgeon and therefore facilitate recovery efforts for this species.

Recent telemetric studies (conducted by the NC Cooperative Fish and Wildlife Research Unit) south of the project areas on the Cape Fear River have shown the shortnose sturgeon to be present. The Albemarle-Pamlico region could provide suitable habitat for the shortnose sturgeon, based on the findings of these studies (Dr. Mary Moser, NC State University, personal communication, 1992). Therefore, for the purposes of this environmental assessment the species is assumed to occur in the NC project areas.

Impacts of the short-term disturbances resulting from the dam removal and modification procedures proposed in this Albemarle-Pamlico study on the shortnose sturgeon have been considered. Consultation regarding this endangered species in will be initiated with the National Marine Fisheries Service, as required under Section 7 of the Endangered Species Act of 1973, as amended.

Shortnose sturgeon use fast-flowing sections of rivers for spawning, with gravel, rubble, and boulder river bottoms. This type of habitat is mostly found upstream of the Quaker Neck Dam in the Neuse River basin. Several precautionary actions would be taken in an effort to minimize any potential impacts to this fish species.

Removal of the dams on the Little River and on the Neuse River would be conducted during the nonspawning season, when the shortnose sturgeon is in the estuarine areas of their range. These fish have been reported to initiate spawning migration as early as late December and spawn in the spring from mid-

February to early May. They have been reported to remain in the deeper, cooler water such as that impounded by the Cape Fear Dam during the summer months (Dr. Mary Moser, NCSU, personal communication, 1992). Based on these factors, the timing of the dam removal should be between September to December. This period of time would also be the nonspawning season for all of the species of anadromous fish endemic to the region.

A preliminary gill net survey of the dam removal project sites will be conducted to determine the presence of the shortnose sturgeon. This survey will be completed prior to use of explosives or crane and cable. If the preliminary survey indicates concentrations of sturgeon, a plan to capture and remove the sturgeon from the immediate vicinity of the projects would be implemented. Screening or nets would be used during the dam removals if recommended by fisheries management experts, in order to isolate the explosion area. If necessary, a safety zone can be established away from the site of explosive charges as calculated by the weight of explosive, size of the fishes to be protected, and the depth of the explosion.

The dwarf wedge mussel (Alasmidonta heterodon), also listed as a federally endangered species, occurs upstream but not at the immediate sites of both dam removal projects (John Alderman, Piedmont North Carolina Wildlife Resources Commission, Project Leader, Nongame and Endangered Wildlife, personal communication, 1992). It was once widely distributed in river systems from New Brunswick, Canada, south to the Neuse River in North Carolina. Its disappearance is strongly correlated with the population declines of anadromous fishes. It relies on a host fish, to which larval mussels attach, to complete its life history. The proposed dam removals and modifications may benefit the recovery of the dwarf wedge mussel, by restoring populations of fishes that serve as an intermediate host.

The Tar River spiny mussel (Elliptio steinstansana) is listed as a federally endangered species and occurs in Nash County, North Carolina, a county which borders the Fishing Creek site proposed for a fish ladder installation. However, it does not occur in Fishing Creek. The Atlantic pigtoe mussel (Fusconaia masoni) and the yellow lance mussel (Elliptio lanceolata) have been documented to occur in Southampton County, Virginia. These species are currently listed as candidate species (under status review of U.S. Fish and Wildlife Service as endangered or threatened) on the federal level and threatened species on the state level.

As recommended by the Division of Natural Heritage in Virginia, a rare mussel survey will be conducted directly below the Baskerville Mill Dam site. If a mussel concentration is found to exist at this site, strict adherence to best management practice erosion and sediment control standards will be followed during the fish ladder mounting process.

The Roanoke logperch (Percina rex), a federally endangered species, has been found in the Nottoway River, in Sussex and South Hampton Counties, Virginia (Tom Smith, Division Director, Division of Natural Heritage, personal communication, 1992). The furthest downstream collection of this fish to date is approximately 20 river miles below the Baskerville Mill Dam site. The proposed installation of a fish ladder at this site will have no anticipated impacts to this fish species (Mitchell Norman, Regional Fisheries Manager, Virginia Department of Game and Inland Fisheries, personal communication, 1992).

These projects have the potential of benefitting threatened and endangered avian species (such as eagles and other piscivores) by increasing the abundance of their prey, including alosa adults and juveniles.

Consultation regarding these threatened and endangered species in the project areas (in addition to the consultation regarding shortnose sturgeon)

will be initiated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

5.5 SOCIOECONOMIC CONSIDERATIONS

The Quaker Neck Dam, owned by Carolina Power and Light, is used to supply make-up water for evaporative loss in the cooling reservoir at the Lee Steam Plant. The dam and plant locations are shown on Map 4. The U.S. Army Corps of Engineers (COE) will determine if the proposed dam removal would sufficiently change the river height at CP&L's intake canal to prevent attaining their water needs during a 100-year drought. The COE will evaluate alternative plans (e.g., a riprap weir beneath the intake canal) to ensure that CP&L's water requirements are met and that no impediments to anadromous fish migration remain. CP&L is supportive of the proposed dam removal and will give full consideration to the COE's engineering alternatives.

5.6 CULTURAL RESOURCES

The proposed projects at the four sites in North Carolina and Virginia are not expected to cause any disturbance of archaeological resources. One site, Bellamy's Mill on Fishing Creek, is listed on the National Register of Historic Places. Bellamy's Mill is a turbine grist mill and dam, that was built around 1859 under the joint ownership of John T. Bellamy and William Hunter. The Mill continued to operate until recently, and is now under the ownership of Stewart Gibson, of Rocky Mount, North Carolina. The proposed modification to the Mill, addition of a fish ladder, will enhance the region by restoring the biological function of anadromous fish migration.

Baskerville Mill, on the mainstem of the Nottoway River, was a hydroelectric generation facility, grist mill, and ice company built in 1927. There are currently no hydroelectric generation facilities at the site and the current owner is Channing Baskerville, of McKenney, Virginia. The dam, on River Mile 110.0, is presently blocking the migration of American shad (Odom et al., 1986) which would be mitigated by the proposed addition of a fish ladder.

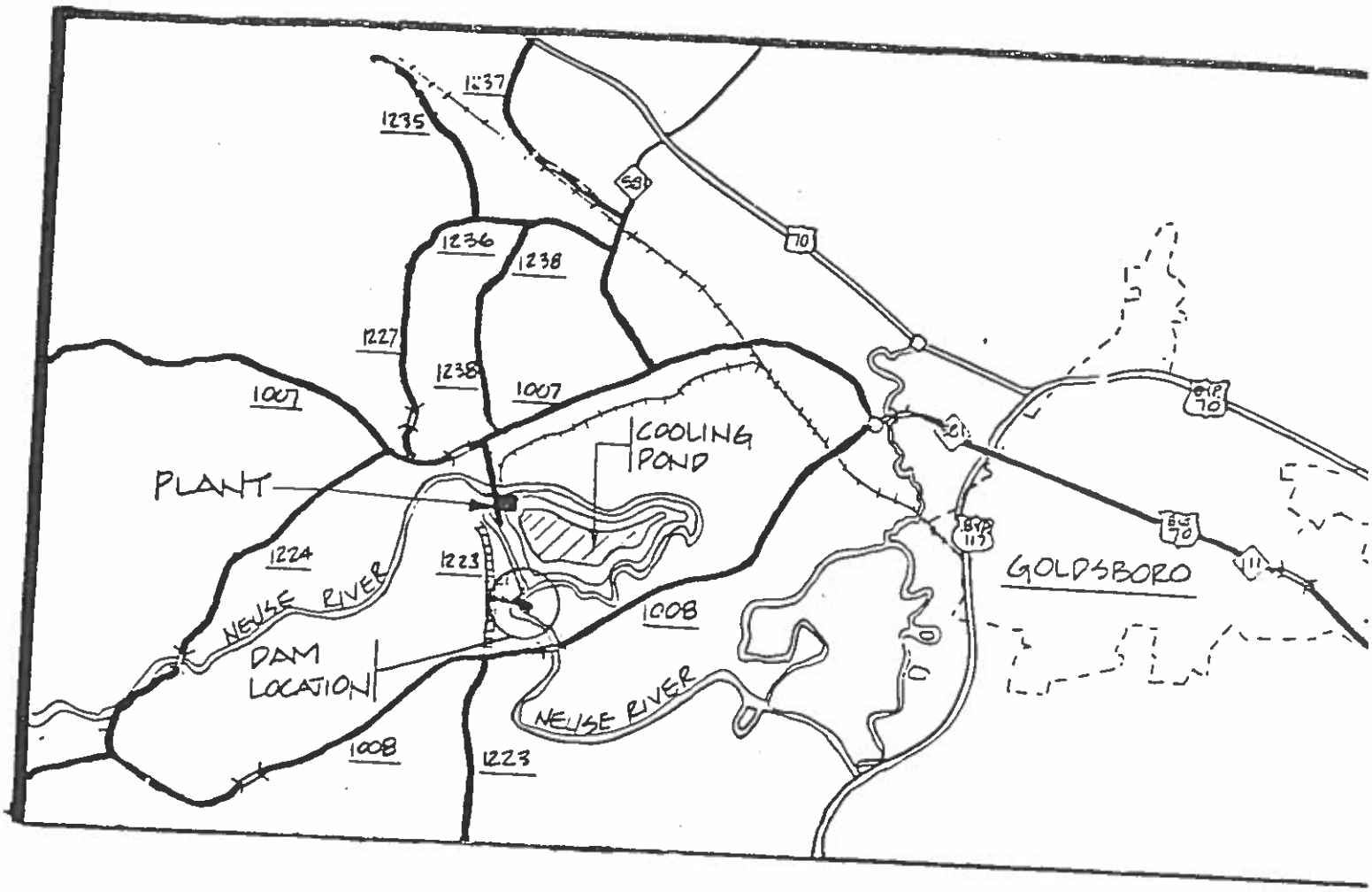
The potential safety concerns of the fish ladder attachments to the Bellamy's Mill and Baskerville Mill Dams have been considered. The NC Department of Environment, Health, and Natural Resources requires dam safety permits for dams over 15 feet in height. Bellamy's Mill Dam, a 10-foot dam, is exempt from this regulation. This dam has a low-hazard status (James Simons, NC Dam Safety Section, DEHNR, personal communication, 1992).

In Virginia, dams of 25 feet or lower are not regulated. The Baskerville Mill Dam (10 feet) is, therefore, exempt. This dam is classified as a Class III or low-hazard dam (Robert Hoshman, Bureau of Flood Protection, Division of Soil and Water Conservation, personal communication, 1992).

The potential noise and vibration impacts from the use of explosives at the Quaker Neck Dam site have been considered. Significant noise levels would not be expected due to the muffling effect of the water column and the weight of the concrete dam overlying the charge. The Quaker Neck Dam is in an isolated, rural setting; and, therefore, no problems are anticipated by the noise and vibrations of the explosions.

5.7 RECREATION AND AESTHETIC RESOURCES

Recreational fishing is an important activity in the project areas and contributes to the economic resources of the region. A variety of gears and methods for recreational fishing is used, depending on what fish species is sought. Hook and line gear is most commonly used in recreational fishing for anadromous species. Recreational fishermen also use drift gill nets for



Map 4. Location of the Quacker Neck Dam and the Carolina Power and Light Lee Steam Plant. Wayne County, North Carolina.

American shad fishing in the Neuse River. Dipnetting is also used very popular on the Nottoway River in Virginia.

These projects, which would restore many river miles for anadromous fish access, could have very positive long-term impacts on the recreational fisheries. The proposed removal of the two low-head dams will, however, alter fishing which is popular in the impounded areas upstream of these dams and will eliminate the tailrace fisheries beneath the dam site at Quaker Neck Dam. The long-term improvements to the fishes' habitats will be more significant to the region as a whole than the benefits of the conditions in these fishing areas.

The removal of the Cherry Hospital Dam on the Little River will eliminate a waterfall (from the dam spill) which is of aesthetic value to the patients and employees of the hospital. The Cherry Hospital administration has been advised of the proposed project. The river, once it is restored to its natural condition, will remain an aesthetically pleasing site on the hospital grounds.

Both of the dam removal sites are used for recreational boating. Local law enforcement agencies will cordon off the construction areas during the removal to protect boaters from harm.

6.0 APPLICABLE ENVIRONMENTAL REGULATIONS

The proposed project is in compliance with the following environmental regulations:

Clean Water Act

Executive Order 11990 (Protection of Wetlands)

Executive Order 11988 (Floodplain Management)

Coastal Zone Management Act

Estuary Protection Act (PL 90-454)

Preservation of Historic Archaeological Data Act of 1974

National Historic Preservation Act of 1966, as amended

Fish and Wildlife Coordination Act, as amended

Marine Protection, Research, and Sanctuaries Act of 1972, as amended

River and Harbors Act of 1899

Wild and Scenic Rivers Act

Executive Order 11593, Protection and Enhancement of the Cultural Environment

7.0 INTERAGENCY COORDINATION

The following agencies and organizations are a part of this Coastal America project:

U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
National Marine Fisheries Service
U.S. Army Corps of Engineers - Wilmington District

U.S. Army Corps of Engineers
U.S. Marine Corps
NC Department of Environment, Health, and Natural Resources
-Division of Environmental Management
-Division of Marine Fisheries
-Wildlife Resources Commission
-Albemarle-Pamlico Estuarine Study
NC Department of Transportation
Center for Geographic Information and Analysis
North Carolina State University
VA Department of Game and Inland Fisheries

8.0 REFERENCES

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9.0 RECIPIENTS OF THE ASSESSMENT

This assessment is being circulated for review and comment of the following concerned agencies and the public for 30 days. After reviewing the comments received, the Regional Administrator will decide whether to sign the Finding of No Significant Impact (FONSI) and proceed with funding of the project.

U.S. Air Force
U.S. Army Corps of Engineers
U.S. Centers for Disease Control
U.S. Coast Guard, Fifth District
U.S. Department of Agriculture
U.S. Department of Commerce
U.S. Department of Energy
U.S. Department of Health and Human Services
U.S. Department of Housing and Urban Development, Region III
U.S. Department of the Interior
U.S. Department of State
U.S. Department of Transportation, Region III
U.S. Environmental Protection Agency, Headquarters
U.S. Environmental Protection Agency, Region III
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Geological Survey
U.S. Soil Conservation Service
Advisory Council on Historic Preservation
Brunswick County, VA
Cape Fear Group, Sierra Club
Cape Fear Community College
Clarksville, VA
Conservation Council of North Carolina
Conservation Council of Virginia
Council on the Environment
Crater Planning District Commission
Department of Urban and Regional Planning
Dinwiddie County, VA
Ducks Unlimited
Duke University
Environmental Resources Library
Federal Highway Administration
Friends of the Roanoke
General Services Administration
Great Lakes Dredge and Dock Company
Halifax County Board of Commissioners
Kerr Lake Protective Association
Nash County, NC
National Audubon Society
National Marine Fisheries Service
New River Group, Sierra Club
News Progress
North Carolina Chapter of Sierra Club
North Carolina Coastal Federation
North Carolina Collection
NC Department of Environment, Health, and Natural Resources
North Carolina Department of Governments
North Carolina Environmental Defense Fund
North Carolina State Clearinghouse
North Carolina State Library
North Carolina State University
North Carolina Wildlife Federation
Randall Library

Roanoke River Basin Association
Southside Planning District Commission
Union Camp
Virginia Commission of Game and Fish
Virginia Department of Game and Inland Fisheries
Virginia Department of Highways and Transportation
Virginia Historic Landmark Commission
Virginia Marine Resources Commission
Virginia Wildlife Federation
Wayne County Board of Commissioners