

Lake Hartwell PCB Settlement  
Draft South Carolina Recreational Fishing Compensation Plan



Prepared by:  
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### Introduction

In 1995, the Lake Hartwell Natural Resource Trustees initiated work to acquire a settlement for natural resource injuries to Lake Hartwell associated with PCB contamination. Their findings indicated two major areas of natural resource injury: (1) Ecological Injury, especially to Twelvemile Creek, and (2) the Recreational Fishery Injury of Lake Hartwell. A settlement with Schlumberger Technology Corporation (STC) was achieved in 2006, resulting in approval of a consent decree in federal court on May 30, 2006. The Ecological Injury is being addressed by removal of the two Woodside Dams and associated stream restoration. The Ecological Injury was further addressed by the funds being provided for biological monitoring of dam removal and some additional stream restoration projects in the watershed.

This document primarily addresses the Recreational Fishery Injury and proposals to use the remaining funds for the injury to Lake Hartwell's recreational fishery. In regards to damage to the recreational fishery, the 2006 federal consent decree states that funds will be used for recreational fishing to *“(1) create opportunities for the public generally to harvest fish that are not subject to fish consumption advisories currently in place for Lake Hartwell and 12-Mile Creek, (2) enhance the recreational fishery of Lake Hartwell, 12-Mile Creek, and the surrounding area, and/or (3) implement projects designed to improve the habitat and natural resources within the 12-Mile Creek corridor.”*

The Natural Resource Trustees have sought to identify projects that comply with the criteria set forth in the consent decree, meets state fisheries management objectives, and satisfies public interests. These projects and their proposed level of funding are:

Project Identifier	Funds Requested	Proposed Allocation
<b>A. Monitoring</b>	\$160,000.00	\$160,000.00
<b>B. Stream Restoration Projects: Twelvemile Creek Watershed</b>	\$800,000.00	\$835,523.00
<b>C 1. Lake Hartwell Fish Habitat Enhancement</b>	\$2,800,000.00	\$2,800,000.00
<b>C 2. Public Access/Fishing Piers (6 to 9)</b>	\$1,100,000.00	\$1,100,000.00
<b>C 3. Hartwell Tailrace Fishing Access</b>	\$300,000.00	\$300,000.00
<b>C 4. Green Pond Event Center (Anderson Cty)</b>	\$3,172,865.00	\$1,500,000.00
<b>C 5. Off-site Recreational Fishing</b>	\$2,300,000.00	\$2,300,000.00
<b>D Unfunded Projects</b>		
D-1 Easley Central Dam (estimated cost)	\$7,700,000.00	\$0.00
D-2 Water Education and Environmental Center	\$7,000,000.00	\$0.00
<b>Totals</b>	<b>\$25,332,865.00</b>	<b>\$8,995,523.00</b>

## Project Descriptions

### A Monitoring

The process of removing Woodside I and Woodside II will have an impact on the aquatic life in the immediate vicinity of the work. It is considered important that these impacts to aquatic life and the recovery from these impacts by aquatic life be monitored. Monitoring will also provide a means to evaluate the effectiveness of the dam removal and the associated stream restoration in improving the habitat and expanding the diversity of aquatic life using the restored stream reach. Funds, in the amount of \$160,000, were identified in the Consent Decree finalizing this settlement for the specific purpose conducting monitoring of dam removal. These funds have been allocated and the sampling has been started to determine the current condition of the stream community.

### B Stream Restoration Projects – Twelvemile Creek Water Shed

Stream corridor restoration includes a broad range of measures designed to enable stream corridors to recover dynamic equilibrium and function at a self-sustaining level. Restoration actions may range from passive approaches that involve removal or attenuation of chronic disturbance activities to active restoration that involves intervention and installation of measures to repair damages to the stream corridor.

A number of conservation/restoration needs can be identified for the Twelvemile Creek stream corridor. These could include riparian management practices (e.g., streambank stabilization, shoreline protection, bendway weirs, riparian buffer plantings, wetlands restoration, and riparian zone conservation easements), woodland management practices (e.g., reforestation, critical area seeding on access roads, waterbars/broad-based dips, and wildlife components), pastureland/hayland conservation management practices (e.g., cross-fencing, barrier fencing, alternative watering facilities, and heavy use areas), cropland management practices (e.g., permanent field borders/buffer strips, grass waterways, and conversion to permanent cover), and urban land management practices (e.g., drop structures for concentrated flows, stormwater detention, and vegetation components).

### C-1 Lake Hartwell Fish Habitat Enhancement

#### **Project Description, Justification and Need**

A second goal of the compensatory restoration plan for recreational fishing is to enhance the recreational fishery on-site on Lake Hartwell. Enhancing fish habitat in Lake Hartwell will in turn enhance the recreational fishery, which will help mitigate the estimated \$18 million in lost services due to PCB contamination.

Lake Hartwell was constructed during the period 1955-1963. Lake Hartwell was created by construction of Hartwell Dam located on the Savannah River seven miles

below the point at which the Tugaloo and Seneca Rivers join to form the Savannah. Extending 49 miles up the Tugaloo and 45 miles up the Seneca at normal pool elevation, Lake Hartwell comprises nearly 56,000 acres of water with a shoreline of 962 miles.

The vast majority of shoreline habitat in Lake Hartwell was cleared of vegetation during the Lake's construction. This clearing activity resulted in greatly reduced littoral fish habitat complexity. Most of the littoral zone of Lake Hartwell is devoid of submersed and emergent aquatic vegetation, which provides important nursery habitat for sportfish and other aquatic species. Years of unabated shoreline erosion has also exposed expanses of clay banks, and increased sediment in the system. Bottom substrate is dominated by hardened clay and sand, neither of which provides optimum spawning substrate for sportfish species. The lack of available gravel substrate in particular is likely a major spawning habitat deficiency in Hartwell. Woody debris (trees and logs) is also very important in providing both littoral and deep-water habitat. Large woody debris provides essential fish habitat because it provides protection from predators, spawning habitat, media on which invertebrates live and fish will feed, and fish concentration areas for prey species, which improve predator (sportfish) success. Some standing timber was left in the depths of Lake Hartwell, near the forebay during construction. However, woody debris is very sparse across most of the lake. The clearing and grubbing of the lake bed, natural aging of the lake over 50 years, and very active shoreline development have all served to greatly reduce woody debris in Lake Hartwell. We believe focusing habitat enhancement efforts toward correcting these deficiencies will improve the Lake Hartwell fish populations and the recreational fishery. Habitat enhancement areas will also serve to concentrate fish, which will improve the success rates and overall angling experience for Hartwell anglers.

### **Project Objective**

Enhance the Lake Hartwell recreational fishery and angling experience through large-scale restoration of habitat focusing on improving habitat features.

### **Approach**

The project purpose is to establish a large-scale fish habitat restoration program on Lake Hartwell. The project is projected to be implemented for 10 years.

The project will use a variety of materials and techniques to enhance fish habitat and recreational angling opportunities. Materials to be utilized may include root wads (stumps), brush, other woody debris, stone, gravel and a variety of aquatic and semi-aquatic vegetation. Appropriate materials will be utilized to construct both deep and shallow water structure to serve as cover habitats, nursery habitats and spawning habitats. Additionally, appropriate materials will be utilized and placed to provide armament and wave attenuation in erosion prone areas (ex. exposed islands).

High velocity and turbulence along the shoreline, specifically near islands, renders these areas inaccessible to fish. The placement of root wads and/or stone will act as

“wave breaks” to create protected areas that will serve as spawning or nursery habitat for fish. Decreased wave action will also encourage shoreline vegetation, which will further develop the habitat complexity. Erosion associated with the high velocity areas has decreased the size of islands as well as increased sediment released into the system. The reduction of wave action will also act to preserve the islands and the subsequent vegetation growth will also enhance shoreline stability.

Large root wads will be placed at sites. The root wads will be anchored to weights and sunk using a barge that has a hydraulic deck to lift and slide the objects into the desired location (Figure 1). The root wads will be placed in moderately deep water (10 to 20 feet deep), in shallow water (5 to 10 feet) and in near-shore waters (2-3 feet deep). Another method of adding large woody debris may include dropping and cabling trees into the lake. This would be a technique most likely to be used adjacent to public lands such as Clemson Forest and Corps lands in non-developed, environmental areas. In appropriate areas stone and/or gravel may be used in concert with woody debris to enhance habitat and provide spawning substrate. A variety of native aquatic and semi-aquatic plants will be employed to enhance habitat diversity. Plantings will primarily be targeted in near-shore waters and shallow water applications to provide spawning and nursery habitat as well as stabilizing eroding areas.

The first year of the project will primarily be spent in planning and mobilization. Mobilization will include but not be limited to project staffing, equipment acquisition and identification of potential staging areas. Efforts will be initiated to identify and prioritize areas which can effectively be enhanced. Years 2 through 10 activities will include implementation of enhancement measures and the continuation of site selection and planning for subsequent years enhancement efforts.

### **Expected Benefits**

Habitat enhancement will provide complex structure that will improve the fish populations by increasing the population density, size structure, reproductive success and survival. The materials employed will function as habitat for numerous functions such as spawning and nesting during reproductive activities, nursery and refuge habitat for larval and immature fish, and foraging and ambush cover to improve feeding efficiency of popular predatory gamefish. The areas created should also serve as fish concentration areas which can be targeted by anglers seeking a variety of species. Also, shoreline stabilization should help reduce the rate of erosion that is occurring in some areas of the reservoirs. The ultimate result will include improvement in the Lake Hartwell recreational fishery, which will help mitigate the damage caused by PCB contamination.



Figure 1. Fish habitat barge with dump bed used to enhance fish habitat (photo courtesy of Arkansas Game and Fish Commission).

### **Fish Habitat Enhancement Budget**

The projected start-up budget for the Hartwell Habitat Enhancement Project is estimated at \$658,000. This includes purchase of all equipment necessary to conduct enhancement efforts. This also includes personnel and all operation and maintenance to conduct the habitat enhancement work.

**Table 1. Habitat Project initial start-up budget**

#### **Habitat Project Budget Summary**

**Start-up (1st Year):**

Facilities development	160,000
Equipment	260,000
O&M Supplies	130,000
Personnel	103,000
Miscellaneous	5,000
<b>Total</b>	<b>658,000</b>

An annual operations budget after the initial start-up is projected at \$230,000. The overall objective is to conduct this habitat enhancement project over a period of 10 years.

**Table 2. Annual budget years 2-10**

#### **Year 2-10 Budget (2010 dollars)**

Facilities development and maint.	10,000
Avg. Equipment	15,000
O&M Supplies	100,000
Personnel	103,000
Miscellaneous	10,000
<b>Total</b>	<b>238,000</b>

Over 10 year life of project      **\$2,800,000**

## C-2 Lake Hartwell Access and Shoreline Fishing Enhancement

### **Project Description, Justification and Need**

A second goal of the compensatory restoration plan for recreational fishing is to enhance the recreational fishery on-site on Lake Hartwell. Enhancing facilities will provide additional angler access and much needed shoreline angling opportunities.

The majority of Lake Hartwell's recreational facilities were developed when the Lake was constructed in the 1960s. These facilities are generally small, with limited parking, and not able to accommodate large angling events such as tournaments. Enhancement of selected boat ramps would provide adequate facilities to handle fishing tournaments or other water-based events requiring a larger facility.

Lake Hartwell currently has limited shoreline angling opportunities. While shoreline angling accounts for a significant portion of recreational fishing activities at Lake Hartwell, there are currently only four developed shoreline fishing facilities available to anglers. In a 1992 creel survey of Lake Hartwell, shoreline anglers made approximately 29,140 fishing trips to the Lake.

### **Project Objective**

Enhance the Lake Hartwell recreational fishery and angling experience through improvement of boat access and shoreline fishing opportunities.

### **Approach**

The project will establish improved angler access and shoreline fishing opportunities by locating enhanced boat access facilities and constructing fishing piers at selected locations around the Lake. Locations of improved boat access facilities will be based on proximity to established infrastructure, location of the facility on the Lake, and willingness of responsible parties to accept both project implementation and continuing operations and maintenance. The shoreline fishing piers will be located in a manner that provides shoreline fishing access at established recreation areas where supporting infrastructure already exists (i.e. access roads, restrooms, parking lots, courtesy lighting, etc.). The selection of established locations provides the opportunity to concentrate available funding resources on fishing facilities without the required development of necessary infrastructure. Operations and maintenance will be accomplished by the current recreational facility managers. Six (6) to eight (8) locations will be selected around the Lake for implementation of these enhancements (Figure 1).



# HARTWELL DAM AND LAKE – PROPOSED SITES - FISHING PIER AND ACCESS IMPROVEMENTS

## I Dam & Lake

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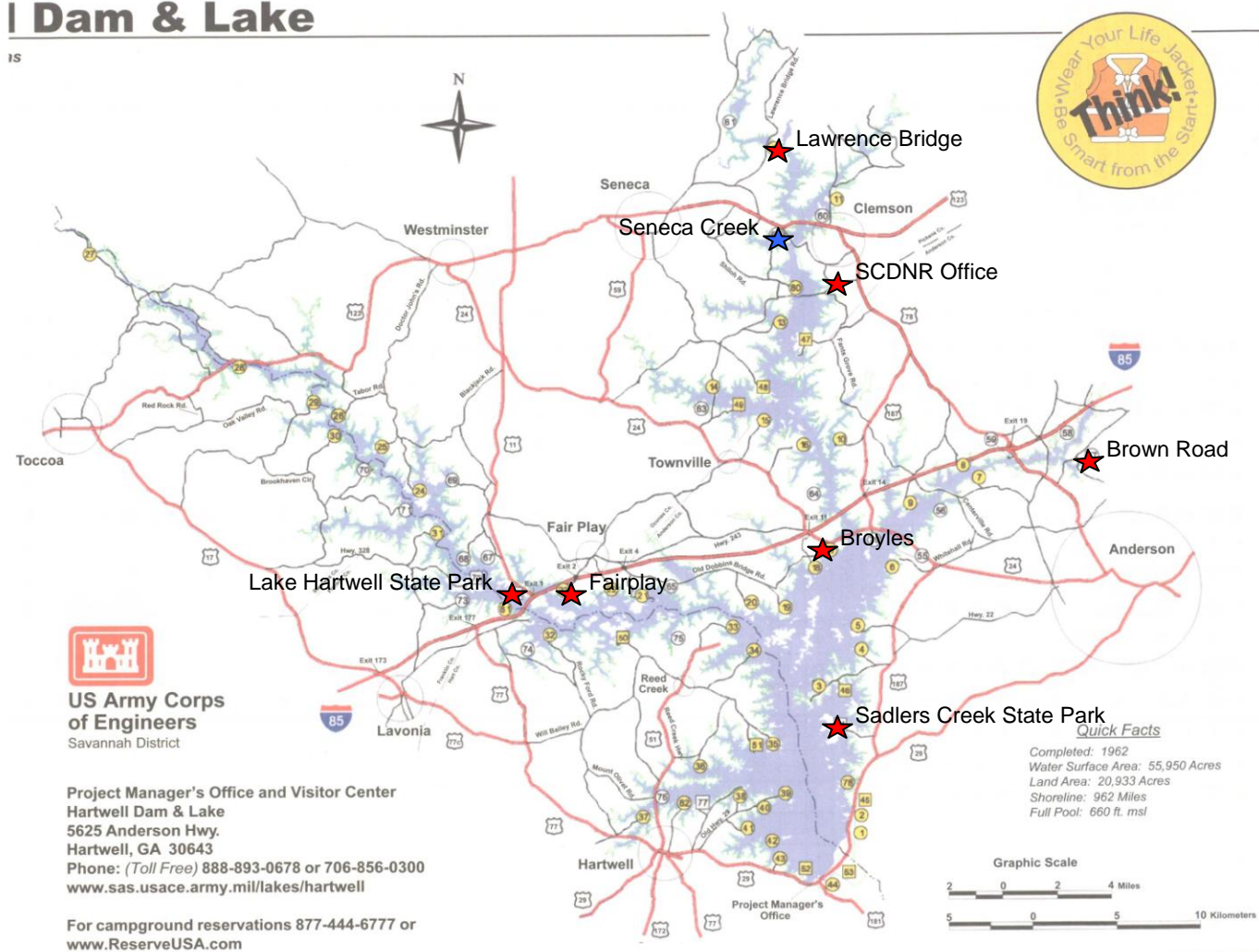


Figure 1. Lake Hartwell locations proposed for implementation of enhancement activities.

**Proposed Location – Improved Boater & Shoreline Fishing Access**



Seneca Creek is 4-acre boat access facility owned by the U.S. Army Corps of Engineers and leased to Oconee County. This facility is located near Clemson University and currently serves primarily the Clemson, SC public in providing boater access and unimproved shoreline fishing opportunities.

This project enhancement would redesign the existing facility to provide an enlarged parking area. The parking area design would allow open views from Seneca Creek Road and provide 50 boat and trailer parking spaces and 10 single-car spaces. The improvements would include new asphalt, improved access ramps, lighting, courtesy dock, restrooms, curbing and appropriate drainage. The open view to Seneca Creek Road and lighting would create a safe environment. The project would also include an accessible fishing pier and/or boardwalk with a potential walking trail with picnic opportunities that would lead to the boardwalk/fishing pier area.



### **Proposed Locations – Improved Shoreline Fishing Access**



Lake Hartwell State Recreation Area is a 680-acre park managed by the S.C. Department of Parks, Recreation, and Tourism located in Oconee County, SC. This facility is located on Highway 11 near its intersection with Interstate 85 and also includes camping, hiking and picnic areas. The park does not currently have a shoreline fishing facility.

This proposed project would include the construction of a fishing pier at Lake Hartwell State Recreation Area. This park is already well-developed, with existing roads, restrooms and other necessary amenities that would limit the required improvements to support a fishing pier. The pier will be sited to provide angler access to deep water and to complement the existing recreational use of the park.







The Broyles Recreation Area is a 24-acre park owned and managed by the U.S. Army Corps of Engineers. The park is located in Anderson County, SC and contains a boat ramp, individual picnic sites and group shelters, single-car parking, swim beach and playground. The park does not currently have a shoreline fishing facility.

This proposed project would include the construction of a fishing pier at Broyles Recreation Area. This park is already well-developed, with existing roads, parking areas, restrooms and other necessary amenities that would limit the required improvements to support a fishing pier. The pier will be sited to provide angler access to deep water and to complement the existing recreational use of the park.





The Brown Road Waterfront Park is a 2.2 acre facility managed by Anderson County, SC. The park is located along Brown Road within ½-mile of the City of Anderson, SC. The park currently contains a boat ramp, car and trailer parking, courtesy dock and lighting. The park does not currently have any shoreline fishing facilities.

This proposed project would include the construction of 260-feet of boardwalk/fishing pier along the shoreline and additional shoreline stabilization and vegetation removal to accommodate the project. The location, visibility and current use of this park make it an attractive site for shoreline fishing access improvements. The boardwalk/pier will be sited to provide angler access to deep water and to complement the existing recreational use of the park.



Sadlers Creek State Recreation Area is a 395-acre park managed by the S.C. Department of Parks, Recreation, and Tourism located in Anderson County, SC. This facility is located near Highway 187 approximately 13-miles from Anderson, SC and includes camping, hiking and picnic areas. The park does not currently have a shoreline fishing facility.

This proposed project would include the construction of a fishing pier at Sadlers Creek State Recreation Area. This park is already well-developed, with existing roads, restrooms and other necessary amenities that would limit the required improvements to support a fishing pier. The pier will be sited to provide angler access to deep water and to complement the existing recreational use of the park.







The Fairplay Recreation Area is a 16-acre park owned and managed by the U.S. Army Corps of Engineers. The park is located in Oconee County, SC and contains a boat ramp, restroom, courtesy dock, individual picnic sites and group shelters, single-car parking, swim beach and playground. The park does not currently have a shoreline fishing facility.

This proposed project would include the construction of a fishing pier at Fairplay Recreation Area. This park is already well-developed, with existing roads, parking areas, restrooms and other necessary amenities that would limit the required improvements to support a fishing pier. The pier will be sited to provide angler access to deep water and to complement the existing recreational use of the park.





The Lawrence Bridge Recreation Area is a 7-acre park owned and managed by the U.S. Army Corps of Engineers. The park is located in Oconee County, SC and contains a boat ramp, restroom, individual picnic sites and single car parking. The park does not currently have a shoreline fishing facility.

This proposed project would include the construction of a fishing pier at Lawrence Bridge Recreation Area. This park is already well-developed, with existing roads and other necessary amenities that would limit the required improvements to support a fishing pier. The pier will be sited to provide angler access to deep water and to complement the existing recreational use of the park.







The South Carolina Department of Natural Resources (SCDNR), Lloyd C. Webb Natural Resources Office is located near Clemson, SC on Hartwell Lake in Oconee County, SC. The facility serves as the Region 1 Office for Wildlife and Freshwater Fisheries, Land and Water Conservation, and Outreach and Support Services. The facility is open to the public, but does not currently include any recreation facilities.

This proposed project would include the construction of a fishing pier at the Lloyd C. Webb Natural Resources Office. To accommodate this facility, a small parking area will be constructed to accommodate the additional visitation to the facility. The current parking area will only accommodate employees and business visitors. The office is located close to Clemson, SC and is a very popular shoreline fishing location.



### **Expected Benefits**

Improved shoreline fishing and boat access facilities will provide recreational fishery enhancement at Lake Hartwell. The improvements to boat access at Seneca Creek are expected to increase visitation at this site by increasing security of the site, improving the parking area and the boat ramp. The proximity to Clemson, SC is expected to provide a convenient and much needed launch location for lake-based events. The establishment of shoreline fishing facilities in developed recreational areas will provide a new activity in locations that already have public visitation. This approach allows for the construction of more facilities by avoiding costly major infrastructure improvements needed to develop new sites. Providing this new recreational opportunity is expected to increase shoreline based fishing trips to Lake Hartwell.

### **Lake Hartwell Access and Shoreline Fishing Enhancement Budget**

The projected budget for the Lake Hartwell Access and Shoreline Fishing Enhancement project is estimated at \$1,100,000. This includes design and construction costs at six (6) to eight (8) of the proposed boat access improvement sites and shoreline fishing sites.

### **C-3 Hartwell Dam Tailrace Fishing Pier**

The Hartwell Dam tailrace is located immediately downstream of Hartwell Dam in Hart County, Georgia and Anderson County, South Carolina. The site is managed as a public recreation area by the U.S. Army Corps of Engineers. Department of Natural Resource agencies from Georgia (GADNR) and South Carolina (SCDNR) manage the tailrace jointly as a put-and-take trout fishery, but a striped bass fishery is also present. A reciprocal fishing license agreement between Georgia and South Carolina allows resident fishing license holders from either state to legally fish from both sides of the river.

The Hartwell tailrace has not reached its fisheries potential because of limited access, especially during high flow conditions. Anglers can wade in the lower section of the tailrace during non-generation periods, but they are restricted to four small fishing piers during generation. Fishing access to the tailrace was further restricted when the Corps closed a popular fishing pier located near the base of Hartwell Dam after the September 11, 2001 terrorist attacks. These factors dramatically reduce present day angler use in the Hartwell Dam tailrace by as much as 10,000 trips per year. In 2007, the Corps expressed interest in re-opening the existing fishing pier near the base of Hartwell Dam, if an alternate pedestrian access route to the pier could be developed. After two public meetings in 2007 hosted by GADNR, local anglers demonstrated strong support for building a fishing pier and walkway along the tailrace to restore and improve access to this once popular fishery.

In 2008, GADNR and the Corps reached an agreement to construct an 800-ft pedestrian fishing trail from the parking lot of the recreation area to the existing fishing

pier at the base of the dam. The trail consists of a 400-ft boardwalk through a wooded section and a 400-ft fishing pier along the river's edge that connects to the existing 100-ft fishing pier. This trail will provide a total of 500-ft of safe shoreline fishing access to the tailrace during all generation periods in locations where fish habitat is best suited for shoreline anglers.

The GADNR is responsible for project construction and committed \$600,000 of its PCB settlement allocation toward the project. The remainder of Georgia's settlement allocation was dedicated for the construction of two large boating access facilities and a second shoreline fishing trail in the upper reaches of Lake Hartwell. When construction is completed, the Corps will assume future operations and maintenance of the Hartwell Dam fishing pier. This partnership greatly extends the value of the settlement dollars.

The project is currently under construction; however, the project is over budget due to a structural problem in the existing concrete pier that was recently discovered by the contractor and the request to build additional amenities. A total of \$667,082.28 has been obligated toward this project, to date. GADNR anticipates spending an additional \$233,000 for re-engineering the pier attachment point, constructing restroom facilities, installing lighting and building a trout stocking release system. The total amount of these cost overruns is expected to exceed the budget by nearly \$300,000. The GADNR is requesting \$300,000 in additional settlement funds to complete the Hartwell Dam fishing pier. The state of Georgia and the Corps do not have additional state or federal dollars to contribute toward the completion of this project.

#### **C-4 Green Pond Event Center (Anderson Cty)**

##### **Project Description, Justification and Need**

To further accomplish the goal of providing a complete compensatory restoration plan for recreational fishing, it is important to consider the access needs for all facets of recreational fishing on Lake Hartwell. The development of a large fishing event facility on Lake Hartwell would satisfy a long-standing recreational fishing facility need.

Though Lake Hartwell contains numerous public boat access facilities, these areas were primarily developed when the Lake was constructed in the 1960s. At the time, large single and multi-day fishing tournaments were not a popular activity and thus were not considered in the design of the boat access points. In a 1992 creel survey of Lake Hartwell conducted by the South Carolina Department of Natural Resources, 52% of the total angler effort (354,079 hours) was in pursuit of largemouth bass, the predominant species targeted in major fishing tournaments. Striped bass, an additional species in the Lake Hartwell fishery, have also become popular with tournament anglers in recent years.

In an effort to provide an adequate facility to host major fishing tournaments, Anderson County has proposed to implement the construction and maintenance of a facility at the Green Pond Recreation Area. This proposed project would include the

construction of six boat launch lanes, 150 car and trailer parking spaces, 50 single-car parking spaces, tournament weigh-in area, courtesy docks, and restrooms. The project may also include bank fishing access, pavilion/amphitheater, playground, and a kayak/canoe launch. Public road improvements to facilitate easier access to the facility would also be included.

### **Project Objective**

Enhance the Lake Hartwell recreational fishery through the establishment of a large-scale boat access facility to host major fishing tournaments.

### **Approach**

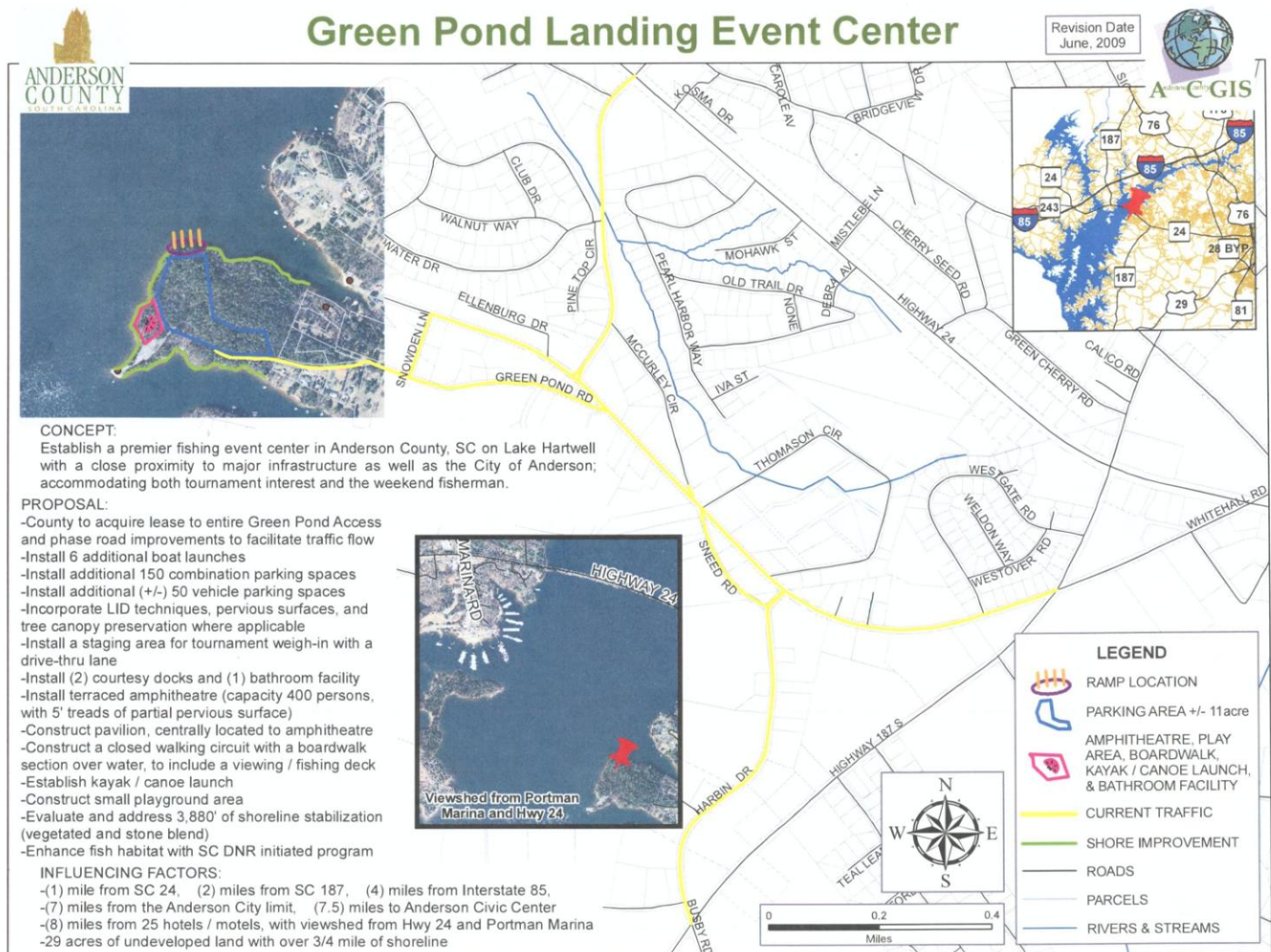
The Green Pond Event Center would be constructed and maintained by Anderson County. The proposed facility location was determined based on its proximity to major roads, including SC 24, SC 187, and Interstate 85. There are 25 hotels/motels and numerous restaurants within 8 miles of the proposed site. The City of Anderson and the Anderson Civic Center are less than 7.5 miles away. The proximity of fishing event facilities to hotels and restaurants is a major factor determining the potential utilization of event facilities. The Green Pond Recreation Area contains 29-acres of land, an adequate amount for the complete development of the proposed facility.

### **Expected Benefits**

The addition of a public access facility capable of accommodating major single and multi-day fishing events will provide a large enhancement to the Lake Hartwell recreational fishery. Tournament angling is a large component of the fishing effort on all large Southeast reservoirs. A 2008 creel survey on Lakes Russell and J. Strom Thurmond reservoirs, just downstream of Lake Hartwell, found that 23% of all anglers interviewed on Lake Russell and 44% of all anglers interviewed on Lake Thurmond were either fishing in or preparing for a tournament. This facility will satisfy a major infrastructure need on Lake Hartwell by providing an adequate facility to host tournament anglers. By concentrating these events at one location an additional benefit will be realized at other Lake Hartwell facilities by reducing crowding and providing parking and adequate access for those anglers and other boaters not participating in these events.







### Green Pond Event Center Budget

The funding request for the Green Pond Event Center is estimated at \$3,172,865.00. The proposed funding allocation for the facility is \$1,500,000. This includes design and construction costs of the recreational fishing aspects of this facility.



## **C-5 Off-site Recreational Fishing (Hartwell State Lakes Proposal)**

### **Project Description and Need**

A goal of the compensatory restoration plan for recreational fishing is to provide off-site recreational fishing services, including fish harvest and fishing effort, to replace an estimated \$18 million in lost services on Lake Hartwell due to PCB contamination. Creating off-site public fishing in counties adjoining Lake Hartwell will provide the greatest opportunity to replace lost recreational fishing services to the majority of anglers affected by the fish consumption advisory. We believe shore-based Lake Hartwell anglers were greatly impacted by the PCB contamination in Lake Hartwell. Most shore-based anglers utilized the Lake Hartwell fishery for both sport and subsistence. The establishment and development of off-site fisheries in the form of intensively managed DNR state fishing ponds and lakes will greatly enhance the opportunity to fish and harvest fish in clean waters unaffected by fish consumption advisories. This program will mitigate the damaged Lake Hartwell shore-based fishery for harvest-oriented anglers. In addition, this program will provide high quality recreational opportunities in extremely close proximity to all of the local communities impacted by the Hartwell fish consumption advisory.

A number of the ponds and lakes proposed for management in this off-site program are currently not available to the public due to lack of resources to effectively manage these water bodies. Furthermore, none of the impoundments which are currently open to the public are intensively managed as fishing lakes, which greatly limits the ability of the lakes to produce quality fisheries. All of the lakes are limited by inadequate facilities to provide public access and a quality recreational experience. Increasing access to public waters and recreational fishing opportunity in the “surrounding area” of Lake Hartwell was also a major compensation objective.

### **Project Objective**

As prescribed in the consent decree our primary objective is to create opportunities for the public to generally harvest fish that are not subject to fish consumption advisories currently in place for Lake Hartwell and 12-Mile Creek. Additionally, we strive to enhance recreational fishing in the area immediately surrounding Lake Hartwell. Secondary benefits such as increased wildlife viewing areas and development of recreational facilities (picnicking, hiking, pleasure boating) will also benefit area residents.

### **Approach**

A wide variety of alternatives were explored to replace lost recreational fishing services, specifically the ability to harvest fish not subject to fish consumption advisories. Alternatives such as new lake construction, purchasing or leasing existing lakes, and constructing sub-impoundments within the Lake Hartwell basin were considered.

Careful assessment of these options identified that leasing and development of currently inaccessible un-managed lakes and ponds, owned by Clemson University and/or SCDNR and surrounding Lake Hartwell, as the best course of action.

Our intent is to negotiate a long-term lease or Memoranda of Understanding (MOUs) with Clemson University to bring suitable existing water bodies on the Clemson University Agricultural Experiment Station and the Clemson University Experimental Forest into South Carolina's public state lake fishing program. The ponds and lakes will be managed in the most effective manner based on the characteristics of the individual water body. Management activities would include but not be limited to liming and fertilization, angler access enhancement (ramps, piers, trails, etc), population manipulation and stocking. Where appropriate, ponds would be managed for bass, bream and catfish. Ponds in which traditional bass/bream management would not be effective would also be managed primarily for put-grow-take catfish fisheries.

SCDNR staff met with Clemson University staff in charge of the Simpson Station and Clemson Forest and discussed the potential for inclusion of ponds and lakes totaling approximately 137 acres into the Department's state lakes program (Figure 1). Initial discussions indicate a willingness to partner to develop a long-term agreement for inclusion of these lakes into SCDNR's state lakes management program.

### **Expected Benefits**

We estimate that intensive management of these 9 ponds and lakes has the potential to yield 29,252 pounds annually of clean fish not subject to fish consumption advisories. A 1992 recreational angler creel survey of Lake Hartwell indicated 16% of Lake Hartwell anglers did not eat Lake Hartwell fish because of the PCB advisory (Bales 1993). In that same study 253,703 pounds of fish were harvested by anglers. A 16% increase from that harvest level would equal 40,592 pounds of fish lost due to the PCB advisory. We believe the intensive management of these off-site lakes has the potential to replace over 70% of the lost harvest of fish from Lake Hartwell due to the PCB advisory, as defined in 1992 (Table 1).



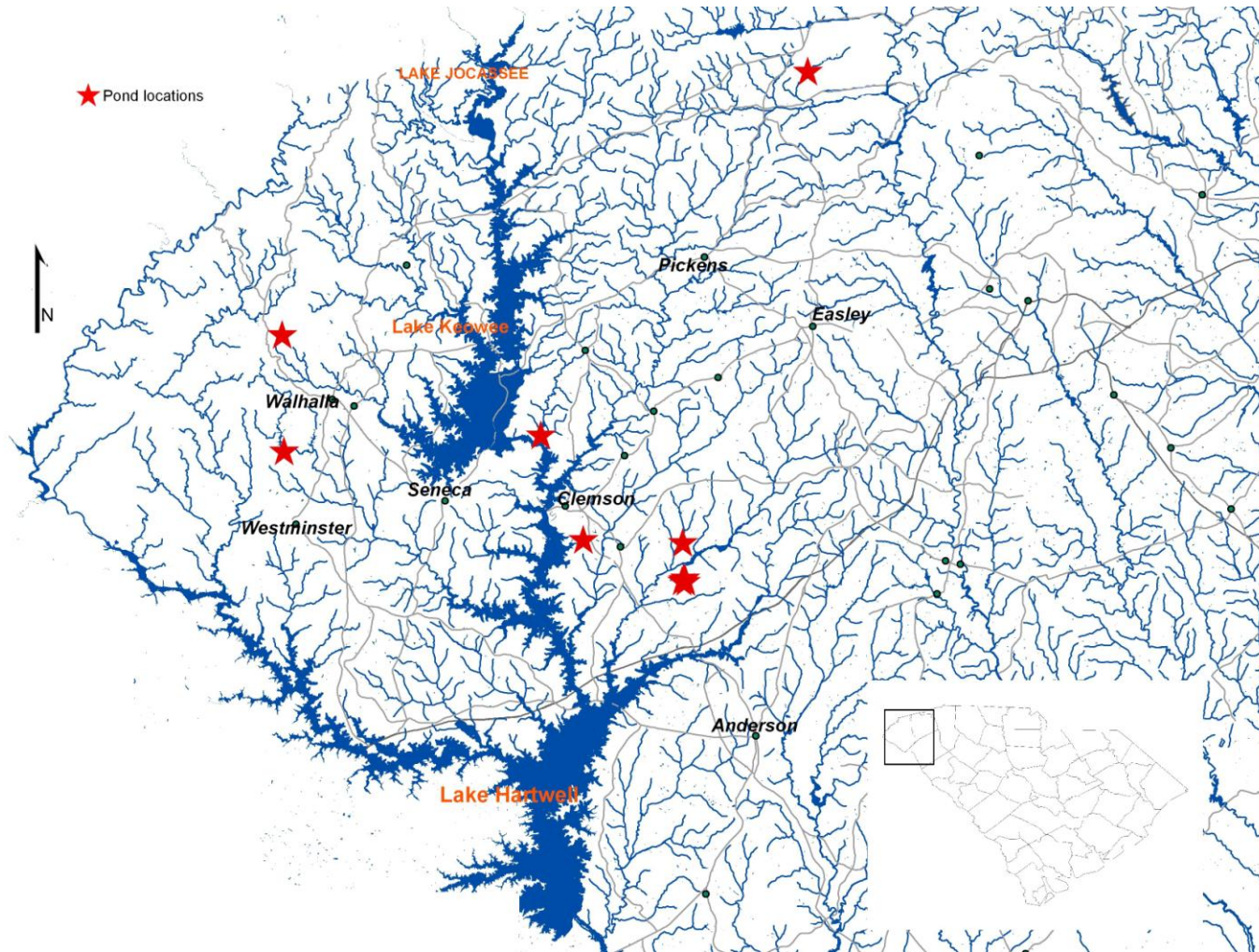


Figure 1. Location of Hartwell ponds and lakes proposed for the off-site program.

Table 1. Lakes and Ponds Proposed for Management in SCDNR's Hartwell Lake Management Program.

Lake or Pond	County	Acreage	Owner	Species Managed For	Possible Yield (lbs of fish/year)
Harper Pond Complex (4 ponds)	Anderson	19	Clemson University (Simpson Agricultural Station)	Bass, bream, catfish	5,030
Danenhower Pond	Anderson	1.5	Clemson University	Bass, bream, catfish	442
Dairy Pond	Pickens	3	Clemson University	Bass, bream, catfish	795
Issaqueena Lake	Pickens	85	Clemson University	Bass, bream, catfish, crappie	15,300
Causey Farm Tract	Pickens	14	Clemson University	Bass, bream, catfish	3,710
Walhalla Reservoir	Oconee	15	City of Walhalla	Bass, bream, catfish, trout	3,975
<b>TOTAL</b>		<b>137.5</b>			<b>29,252</b>

Note – Possible yield (or harvest) numbers are based on harvest recommendations from SCDNR's Fish Pond Management Guide for fertilized lakes. Unfertilized lakes will be intensively managed by supplemental feeding and harvest rates presented above are based on a rate intermediate to unfertilized and fertilized harvest rate recommendations from the same guide.

## **The Ponds and Lakes**

The following provides a summary of each off-site lake or pond proposed for management:

### **Harper Road Ponds Complex (4 Ponds) at Simpson Agricultural Station (Anderson County)**

**Owner:** Clemson University

**Approximate Surface Area:** 19 acres

**Distance from Lake Hartwell:** 4.1 miles

**Public Access Currently:** No

#### **Projected Facility Needs:**

- Parking area (gravel) off Harper Road
- Fishing trail around all four ponds
- Picnic area(s)
- Fishing pier on large ponds
- Dam, riser and spillway improvements (TBD)

#### **Projected Management Actions:**

- Liming and fertilization
- Supplemental feeding
- Maintenance of trails and facilities
- Pond renovation supplies as needed
- Stocking of bass, bream and channel catfish as needed
- Aquatic vegetation control as needed
- Pond aeration systems

#### **Directions:**

**From Anderson:** Take Hwy 178 (Anderson-Liberty Hwy) toward Liberty. Take a left at the intersection of Lebanon Rd (State Hwy S-4-29) and Hwy 178...there is a red light there with a church on the left. Take Lebanon Rd approximately 2 miles until you reach a 4 way stop. At the 4 way stop take a right on Sandy Springs Rd (State Hwy S-4-58) and then take a left onto Harper Rd. The ponds will be on your left.

**From Clemson:** Take Hwy 76 (Clemson Blvd) toward Pendleton. Go through the intersection of Hwy 76 and Hwy 28 then take the first left onto Westinghouse Rd. Take Westinghouse Rd to Lebanon Rd. Take a right onto Lebanon Rd and travel to the second 4-way stop (approximately 2.7 miles). At that 4-way stop take a left onto to Sandy Springs Rd (State Hwy 458) and then a left onto Harper Rd. The ponds will be on your left.



Figure 2. Harper Road Pond Complex on Simpson Agricultural Experiment Station at Clemson University, Anderson County.

### **Danenhower Road Pond (Anderson County)**

**Owner:** Clemson University

**Approximate Surface Acreage:** 1.5

**Distance from Lake Hartwell:** 5.5 miles

**Public Access Currently:** No

**Projected Facility Needs:**

- Parking area (gravel) off Danenhower Road
- Picnic tables
- Dam, riser and spillway improvements (TBD)

**Projected Management Actions:**

- Liming and fertilization
- Supplemental feeding
- Grass cutting
- This pond will likely be managed as a youth fishing pond due to the small size
- Pond renovation as needed
- Stocking of bass, bream, catfish, and trout
- Aquatic vegetation management (grass carp/herbicides) as needed
- Pond aeration system

**Directions:**

**From Anderson:** Take Hwy 178 (Anderson-Liberty Hwy) toward Liberty. You will cross a bridge over Six and Twenty Swamp and take the first left onto Cherry St Ext. (State Hwy S-4-115). Travel about .6 miles and bear to the right onto Passmore Bridge Rd./Danenhower Rd. (State Hwy S-4-300) and the pond will be about half a mile on your left.

**From Clemson:** Take Hwy 76 (Clemson Blvd) toward Anderson. At the intersection of Hwy 76 and Hwy 28 turn left toward Pendleton. Travel approximately 1 mile and take a right onto Cherry St (State Hwy S-4-115). Travel on Cherry St/Cherry St Ext. approximately 4.3 miles and take a left onto Passmore Bridge Rd/Danenhower Rd (State Hwy S-4-300) and the pond will be about one half-mile on your left.





Figure 3. Danenhower Road Pond on Simpson Agricultural Experiment Station, Clemson University, Anderson County.

### **LeMaster Dairy Pond (Pickens County)**

**Owner:** Clemson University

**Approximate Surface Acreage:** 3

**Distance from Lake Hartwell:** 0.6 miles

**Public Access Currently:** No

**Projected Facility Needs:**

- Parking area (gravel) off New Hope Road
- Picnic tables at pond
- Fishing trail around wooded areas
- Dam, riser and spillway improvements (TBD)

**Projected Management Actions:**

- Liming and fertilization
- Supplemental feeding
- Renovation as needed
- Stocking of bass, bream and catfish
- Periodic grass cutting on dam
- Fishing trail around pond in wooded area
- Maintenance of gravel access road
- This will likely be managed as a youth fishing pond due to the small size
- Pond aeration system

**Directions:**

**From Clemson:** Take Hwy 76 (Clemson Blvd) toward Anderson. Pass the intersection of Hwy 76/28 and Old Stone Church Rd and take the next right onto New Hope Rd (State Hwy S-4-343). Parking is located on the left hand side of the road across from the church and the pond is off the dirt road.

**From Anderson:** Take Hwy 76 (Clemson Blvd) toward Clemson. After you pass Tri-County Technical College travel about 1.8 miles and take a left onto New Hope Rd....there will be a small fruit stand there. Parking is located on the left hand side of the road across from the church and the pond is off the dirt road.

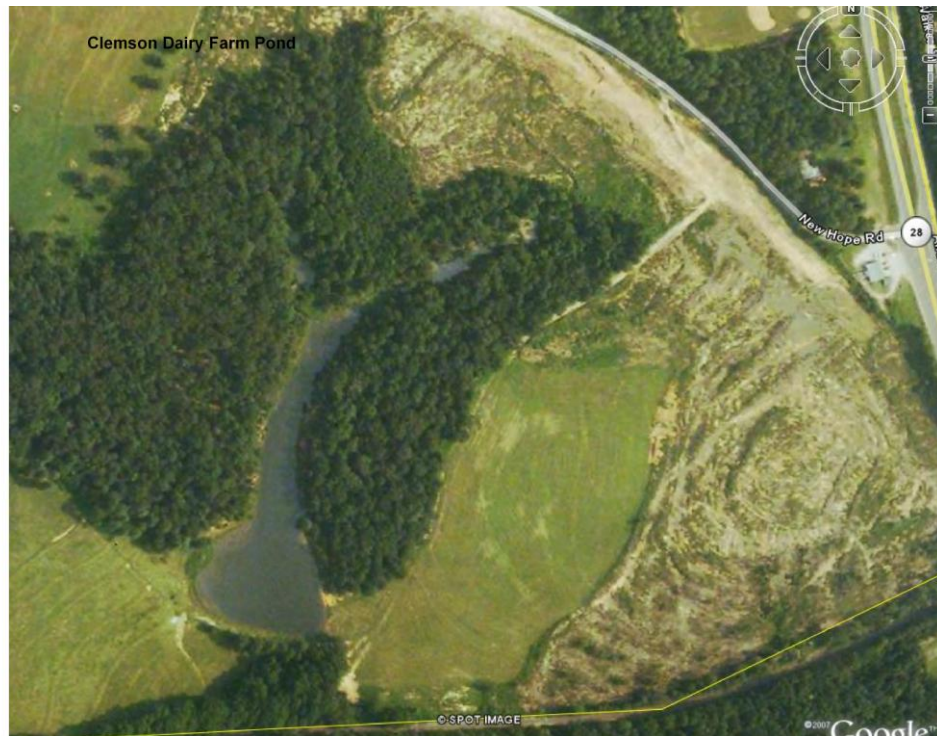


Figure 4. LeMaster Dairy Pond on the Simpson Agricultural Experiment Station at Clemson University, Anderson County.



### **Lake Issaqueena (Pickens County)**

**Owner:** Clemson University

**Approximate Surface Area:** 85 acres

**Distance from Lake Hartwell:** 20 feet (separated only by the Issaqueena Dam)

**Public Access Currently:** No (Gate open March 15 to November 1, but foot access year round)

**Projected Facility Needs:**

- Access road maintenance needed annually
- Parking area upgrade needed
- Boat ramp upgrades needed
- Bank access, fishing pier construction and maintenance, and fishing trail upgrades
- Maintenance of picnic areas
- Dam, riser and spillway improvements (TBD)

**Projected Management Actions (routine):**

- Liming and fertilization (TBD)
- Supplemental feeding
- Population control as needed (marginal rotenone, etc.)
- Stocking of bass, bream, catfish and crappie
- Grass cutting

**Directions:**

**From Clemson:** From Hwy 123 take a right onto Old Clemson Seneca Hwy. Take a right onto SSR 291, cross Lawrence Bridge and entrance is ½ mile on right.

**From Anderson:** Take Hwy 76 (Clemson Blvd) into Clemson. Turn left onto Hwy 123. From Hwy 123 take a right onto Old Clemson Seneca Hwy. Take a right onto SSR 291, cross Lawrence Bridge and entrance is ½ mile on right.



Figure 5. Lake Issaqueena on the Clemson University Experimental Forest, Keowee Wildlife Management Area, Pickens County.

**Causey Farm Lake – Gravely WMA (Pickens County)**

**Owner:** Clemson University

**Approximate Surface Area:** 10 acres

**Distance from Lake Hartwell:** 26 miles

**Public Access Currently:** Yes (Unimproved)

**Projected Facility Needs:**

- Parking area (gravel) construction needed
- Boat ramp construction (gravel)
- Fishing pier construction
- Fishing trail upgrade
- Picnic area development
- Dam, riser and spillway improvements (TBD)

**Projected Management Actions (routine):**

- Liming and fertilization
- Supplemental feeding
- Fish population renovation as needed
- Grass cutting
- Population control as needed (marginal rotenone, etc.)
- Stocking of bass, bream, and catfish
- Pond aeration system

**Directions:**

From SC 11 (northeast of Table Rock) go South on Sec. Road 112 at Cendy's Store. Turn East on Sec. Road 114 and go 0.5 miles. Pond is located on right of road.



Figure 6. Causey Farm Lake on the Clemson University Experimental Forest, Gravelly Wildlife Management Area, Pickens County.

**City of Walhalla Reservoir - (Stumphouse Youth WMA)**

**Owner:** City of Walhalla, conservation easement to Upstate Forever, WMA lease to SCDNR

**Approximate Surface Area:** 15 acres

**Distance from Lake Hartwell:** 16.4 miles

**Public Access Currently:** No

**Projected Facility Needs:**

- Parking area (gravel) construction needed
- Access road (gravel) construction needed
- Boat ramp construction (gravel)
- Fishing pier construction
- Fishing trail construction
- Picnic area development
- Dam, riser and spillway improvements (TBD)

**Projected Management Actions (routine):**

- Supplemental feeding
- Fish population renovation as needed
- Grass cutting
- Stocking of bass, bream, catfish and trout
- Aquatic vegetation management
- Lease on this property is secured (Stumphouse WMA)

**Directions:**

**From Walhalla** go North on SC 28 approximately 6 miles. Take a Right on Tunnel Town Rd (just past Stumphouse/Andrew Pickens Ranger Station). Go approximately 0.5 miles and turn Right on Ross Mountain Rd. Go approximately 1 mile to the entrance to Stumphouse WMA.





Figure 7. City of Walhalla Reservoir - (Stumphouse Youth WMA)

### **Hartwell State Lakes Budget**

The projected start-up budget for the Hartwell State Lakes Project is estimated at \$400,000. This includes projected facility upgrades such as bringing pipes and spillways up to standards, constructing minimally necessary parking and access facilities, purchase of equipment and personnel necessary to maintain the lakes, and an annual operations budget.

#### **Ponds Project Budget Summary**

##### **Start-up (1st Year):**

Facilities development	160,000
Equipment	80,000
O&M Supplies	90,000
Personnel	55,000
Miscellaneous expenses	15,000
<b>Total</b>	<b>\$400,000</b>

Annual operations budget after the initial start-up is projected at \$100,000. The overall objective is to manage this lakes management project for at least a 20-year period to replace lost harvest and recreation over a period when Lake Hartwell is expected to remain under PCB related fish consumption advisories.

##### **Year 2-20 Budget (2010 dollars)**

Facilities development and maint.	9,000
Avg. Equipment	5,000
O&M Supplies	30,000
Personnel	55,000
Miscellaneous	1,000
<b>Total</b>	<b>\$100,000</b>

20-Year Life of Project Total      **\$2,300,000**

## **D Unfunded Projects**

### **D-1 Easley-Central Dam Removal**

The Consent Decree between Schlumberger and the Natural Resource Trustees gave authority to consider using a portion of the funds from the Lake Hartwell Restoration Account for the removal of the dam on Twelvemile Creek presently owned by the Easley-Central Water District, commonly referred to as the “third dam”. In keeping with the Restoration and Compensation Determination Plan (RCDP), the Trustees continue to evaluate options for the removal of the Easley-Central Dam and to restore Easley-Central Water District whole if their intake reservoir is removed. The Trustees have evaluated the issues that would have to be addressed to remove the Easley-Central Dam and provide adequate compensation to the Easley-Central Water District to replace their water intake. At this time, the Trustees have not received a formal proposal from any entity wishing to initiate and implement this project.

The Trustees recognize that the removal of the third dam could be a beneficial project in that it would further enhance the downstream movement of sediment to cover the PCB contaminated sediment in Lake Hartwell, favor a more complete stream restoration project for Twelvemile Creek, increase recreational activities, and enhance fish habitat. The third dam removal project has support from the public, environmental groups, and area leaders.

In pursuing options for the removal of the third dam, the Trustees have encountered several obstacles that complicate the potential for the project to be successful.

1. A complete proposal for removal of the third dam and associated sediments and compensation of the Easley-Central Water District has not been submitted to the Trustees for review and consideration. A group or entity that is interested in the project and agrees to be the project lead to manage completion of the project is needed. The Trustees are not equipped to sponsor this project nor do they have funds to continue the project should costs exceed what is currently available from the settlement. The Trustees also do not want to see all of the funds go to the removal of the third dam. The settlement paid by Schlumberger was for the loss of recreational fishing; as such the Trustees believe that a substantial amount of the settlement should enhance recreational fishing opportunities in the area.
2. The Trustees have seen two estimates of the costs that would be required to compensate the Easley-Central Water District and make them whole. Each quote was a substantial amount and included items that were upgrades above what the Water District currently has and is out of alignment with the amount of water they currently use. Additionally, the two quotes did not include cost estimates for the actual removal of the third dam and the accumulated sediments, or the disposal of the sediments.
3. The sediment behind the dam contains PCB contaminated sediment. The level of contamination is believed to be less than what is found behind Woodside II or I but it is



not at levels considered clean by the Trustees. This sediment would need to be disposed of in the same manner as the other two dams.

4. For this project to be successful it needs to be accomplished at the same time as the decommissioning of Woodside I and II so that the sediment might be disposed of in the same manner. However, without a group sponsoring this project, removal and disposal of the sediment has not been discussed outside of the Trustees. Removal of the sediment would require another Explanation of Significant Difference to the Record of Decision from the United States Environmental Protection Agency. If sediment removal was done at a later date and the sediment could not be disposed of in the same sediment management unit used for Woodside I and II dams, then permitting and disposal issues would have to be evaluated. This would add significant costs to the third dam removal project.

Because of the high cost estimates associated with the removal of the Easley-Central Dam, the Trustees don't believe there is enough direct compensation for the recreational fishing injury to justify absorbing the entire cost of the project. To do so would essentially eliminate the ability of the Trustees to address the injury for which the available funds were intended. If an appropriate entity came forward with a valid proposal the Trustees are still open to providing funds to cover a portion of the project costs.

#### D-2 Water Education and Environmental Center

A 501.c.3 group, Water Education & Environmental Center, has submitted a proposal requesting \$7,000,000 in funds from the Natural Resource Trustees to support the site development and construction of a facility on the banks of Lake Hartwell. The facility is envisioned to be an education and environmental center that "tells the story of water and fisheries". The facility would have multiple purposes and intends to set the standard for sustainable building practices and low impact site design. The emphasis for the facility would be environmental stewardship and education.

While the Trustees feel this is a worthwhile concept it does not appear to fit within the scope of the settlement and does not qualify for use of the recreational fishery injury funds. As the project moves forward there may be amenities associated with the Center that could provide some appropriate compensation for the recreational fishing injury.