

**Alcoa Power Generating Inc. Tapoco Division**  
**Tapoco Hydroelectric Project (FERC No. 2169)**  
**Chilhowee Development Tailwater Fish Monitoring Plan**  
**August 2005**

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## List of Acronyms/Glossary of Terms

APGI	Alcoa Power Generating Inc.
Catadromous	A subtype of diadromous fish that migrate from freshwater to saltwater to spawn
Commission	Federal Energy Regulatory Commission (FERC)
Diadromous	Fish that migrate between freshwater and saltwater
FERC	Federal Energy Regulatory Commission
Forebay zone	The area near Tellico Dam
Licensee	Alcoa Power Generating Inc.
NPS	National Park Service
Plan	Chilhowee Development Tailwater Fish Monitoring Plan
Potamodromous	Freshwater-migrating
Project	Tapoco Hydroelectric Project
Resource Agencies	USFWS, USFS, NPS, TDEC, and TWRA
RSA	Relicensing Settlement Agreement
TDEC	Tennessee Department of Environment and Conservation
Transition zone	The area located mid-reservoir of the Tellico Reservoir
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

## 1.0 Overview

### 1.1 Introduction and Background of Chilhowee Development Tailwater Fish Monitoring Requirements

On January 25, 2005 the Federal Energy Regulatory Commission (FERC) issued an order approving settlement and issuing Alcoa Power Generating Inc. (APGI, Licensee) a new 40-year license for the Tapoco Hydroelectric Project (FERC No. 2169) (Project). Article 403 of the License requires APGI to file a Chilhowee Development Tailwater Fish Monitoring Plan (Plan) to evaluate the presence and status of important potamodromous and diadromous fishes in the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater within six months of the effective date of the license (or September 1, 2005). The License Article reads:

*Article 403. Chilhowee Development Tailwater Fish Monitoring. Within six months of the effective date of the license, the licensee shall file for Commission approval, a tailwater fish monitoring plan for the Chilhowee Development that describes the methods to be used to determine the presence and status of lake sturgeon, black buffalo, smallmouth buffalo, river redhorse, sauger, and American eels in the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Development dam tailrace. The plan shall be developed in consultation with the U.S. Fish and Wildlife Service (FWS), U.S. Forest Service (Forest Service), Tennessee Department of Environment and Conservation (Tennessee DEC), Tennessee Wildlife Resources Agency (Tennessee Wildlife), and the National Park Service (NPS).*

*The plan shall include, at a minimum:*

- (1) a timetable that facilitates tailrace monitoring commencing within five years from the effective date of the license and thereafter in year 10 and 20 of the license;*
- (2) a design that targets detection of the seasonal aggregations of potamodromous and diadromous fishes and includes a combination of sampling techniques, including electrofishing and net gear sampling;*
- (3) reporting monitoring results to the FWS, Forest Service, Tennessee DEC, Tennessee Wildlife, NPS, and the Commission within six months of completing each monitoring effort; and*
- (4) a schedule for implementing the fish monitoring plan.*

*The licensee shall include with the plan documentation of agency consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment before filing the plan with the Commission. If the licensee does not*

*adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.*

*The Commission reserves the right to require changes to the plan. The tailwater fish monitoring shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.*

The January 25, 2005 FERC order also approved a Relicensing Settlement Agreement (RSA) for the Tapoco Project. Section 5.2, Appendix A of the RSA (proposed license article FP-2) reserves the authority of the U.S. Fish and Wildlife Service (USFWS) to prescribe additional fishways at the Chilhowee Development and describes the associated need for tailwater monitoring to determine the need for additional fishways. Similar to the FERC license article, the RSA also outlines the component parts of the tailwater monitoring plan.

This Plan describes the periodic fish monitoring to be conducted by APGI at the Chilhowee Development as required under Article 403 and in accordance with the terms of the RSA.

As of September 1, 2005, APGI operates a “fishway”<sup>1</sup> at the Chilhowee Development to provide for safe, timely, and convenient fish passage for populations of four identified fish species: Spotfin Chub, Yellowfin Madtom, Smoky Madtom, and Duskytail Darter between Citico Creek and Abrams Creek, and between Tellico River and Abrams Creek. This plan recognizes that fish passage (translocation) for the Spotfin Chub, Yellowfin Madtom, Smoky Madtom, and Duskytail Darter is discussed separately, in the Tapoco Project Fish Passage Translocation Plan (August 2005).

## **1.2 Location and Setting**

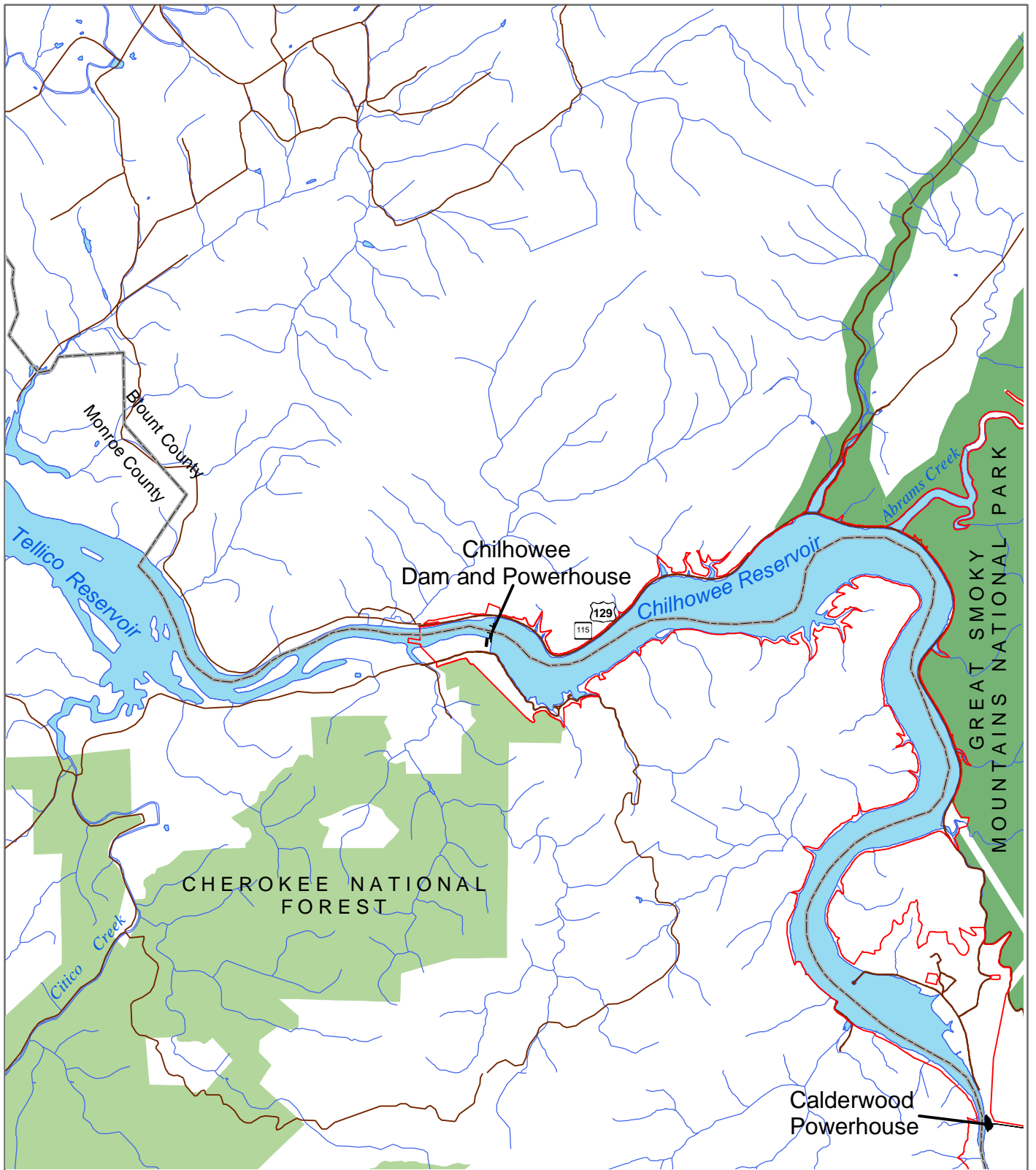
The Tapoco Project is located approximately 15 miles south of Maryville, Tennessee, and approximately 90 miles northeast of Chattanooga, Tennessee. The Project is in the western portion of the Little Tennessee Watershed on the Little Tennessee and Cheoah rivers in Graham and Swain counties in North Carolina and Blount and Monroe counties in Tennessee. The Project includes four hydroelectric developments, the Santeetlah,

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<sup>1</sup> Section 1701(b) of the National Energy Policy Act of 1992, P.L. 102-486, Title XVII, § 1701(b), 106 Stat. 3008, states, “The items which may constitute a ‘fishway’ under Section 18 for the safe and timely upstream and downstream passage of fish shall be limited to physical structures, facilities, or devices necessary to maintain all life stages of such fish, and project operations and measures related to such structures, facilities, or devices that are necessary to ensure the effectiveness of such structures, facilities, or devices for such fish.” Consistent with the Section 18 Prescription and Administrative Record filed by the USFWS with FERC on September 19, 2003, fish passage at the Chilhowee Development entails annual funding by APGI for the trapping and relocation of certain numbers of the target fish species, each season for the purpose of facilitating the exchange of individuals and their genetic material between the Citico Creek, Abrams Creek, and Tellico River populations of these fish.

Cheoah, Calderwood, and Chilhowee developments. The 1,734-acre (surface area) Chilhowee Development is located on the Little Tennessee River between river miles 33 and 34, downstream of the Calderwood Development in Blount and Monroe counties. The Tennessee Valley Authority's (TVA) Tellico Dam is located downstream of the Chilhowee Development and the headwaters of Tellico Reservoir at full pond extend to the Chilhowee tailwater. The Tapoco Project boundary extends 3,000 feet downstream of the Chilhowee Powerhouse and Dam (Figure 1).

In accordance with the terms of the License and RSA, APGI will conduct periodic fish monitoring in the upper end of Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater (the area of the Little Tennessee River just downstream of the Chilhowee Dam and Powerhouse). The Chilhowee tailwater area extends approximately 4,000 feet below Chilhowee Dam and Powerhouse. Areas within the Chilhowee tailwater that may be included in the sampling include the mainstem tailwater area, as well as backwater areas, and along the shoreline.

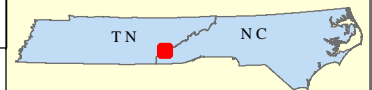


- FERC Project Boundary
- Roads
- County Lines
- Creeks and Streams
- Project Facilities
- National Forest
- National Park

**Chilhowee Tailwater**  
Tapoco Project



0 0.2 0.4 0.8 1.2 1.6 Miles



June 2005

Figure 1

### 1.3 Existing Fisheries

Fisheries data for the Chilhowee tailwater were collected in the 1970s prior to the construction of Tellico Dam and in 1999. In addition to being dated, data collected in the 1970s reflects conditions in the Chilhowee tailwater that have been altered by construction of Tellico Dam in the past 30 years. A total of 19 species were collected during a 1974 fish study conducted by TVA and the Tennessee Wildlife Resources Agency (TWRA). Sculpin (*Cottus bairdii* and *Cottus carolinae* combined) were the dominant fish species collected in both the upper and lower tailwater reaches. Other dominant species were bluegill, northern hog sucker, and brown and rainbow trout. River chub, brook silverside, smallmouth bass, and warpaint shiner were also among the top 10 fish species collected from the upper tailwater area. Fish species that were captured approximately 5 to 10 miles below the Chilhowee Dam included logperch, black, silver, and golden redhorse, carp, central stoneroller, green sunfish, and dusky and greenside darters.

Additionally, fisheries data were collected in Tellico Reservoir in 1999 by TVA from the forebay zone (near Tellico Dam) and the transition zone (mid-reservoir) of Tellico Reservoir. Fish captured in Tellico Reservoir were predominantly warm-water species. In 1999, 34 species were collected in the reservoir. In the forebay zone, bluegill was the dominant fish captured electrofishing followed by gizzard shad, largemouth bass, carp, spotfin shiner, brook silverside, threadfin shad, and smallmouth bass. The dominant fish captured in the forebay zone with gill nets was skipjack herring, followed by alewife, gizzard shad, yellow bass, smallmouth buffalo, white bass, channel catfish, and sauger. Dominant fish species captured during electrofishing in Tellico's mid-reservoir transition zone were similar to those species collected in the forebay zone. Brook silverside was the dominant fish captured electrofishing in this area followed by spotfin shiner, bluegill, carp, smallmouth bass, gizzard shad, largemouth bass, black buffalo, and redbreast sunfish. Fish species captured in the transition zone with gill nets were similar to gill net catches in the forebay zone. Alewife was the dominant species followed by gizzard shad, white bass, yellow bass, carp, smallmouth buffalo, skipjack herring, sauger, walleye, and spotted sucker.

None of the potamodromous and diadromous fish species targeted for monitoring in this Plan were captured during the 1974 survey. However, prior to the impoundment of Tellico Reservoir, upstream migrations of smallmouth buffalo were observed during late April and early May. River redhorse, smallmouth buffalo, black buffalo, and sauger were found in the forebay and/or transition zones of Tellico Reservoir during the 1999 survey. Additional observations of the target fish species have been made in the vicinity of the Chilhowee Dam tailwater. During the spring, black buffalo and other riverine fishes have been observed in Citico Creek, the first large tributary below Chilhowee Dam and at Abrams Creek, the first and largest tributary to Chilhowee Reservoir (see Figure 1).

## 1.4 Plan Goals

Consistent with the terms of the License and RSA, the principal goals of the Chilhowee Development Tailwater Fish Monitoring Plan are to:

1. Develop a comprehensive fish species list for the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater, and
2. Evaluate the presence and status of important potamodromous and diadromous fishes (including but not limited to lake sturgeon, black buffalo, smallmouth buffalo, river redhorse, sauger, and American eel) in the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater.

## 2.0 Chilhowee Development Tailwater Fish Monitoring

### 2.1 Target Fish Species

The Resource Agencies have indicated that they are concerned with the movement and status of several important potamodromous and diadromous fishes upstream and downstream of Chilhowee Dam. While these fish may or may not be present above or below Chilhowee Dam currently, in the future the presence and status of these fish species will be the primary determinant of whether additional fishways may be needed at the Dam. The fish species that have been identified by the Resource Agencies and which are primary targets of this fish monitoring plan include the following:

1. Lake sturgeon (*Acipenser fulvescens*) is a potamodromous species. Although it is not federally listed as endangered, lake sturgeon is a federal species of concern and is considered endangered in Tennessee.
2. Black buffalo (*Ictiobus niger*) is a potamodromous species.
3. Smallmouth buffalo (*Ictiobus bubalus*) is a potamodromous species.
4. American eel (*Anguilla rostrata*) is a diadromous species. More specifically, the American eel is catadromous since it migrates to saltwater to spawn. This species is currently being considered for protection as a federally endangered species.
5. River redhorse (*Moxostoma carinatum*) is a potamodromous species.
6. Sauger (*Sander canadense*) is a potamodromous species.

## 2.2 Fish Monitoring Methodology

In accordance with the terms of the License and RSA, the Chilhowee tailwater will be sampled in 2009, 2014, and 2024 for three four-day periods during the early spring to late summer to capture as many fish species as possible. Since the target fish species, as well as other species, may only be present in the tailwater during certain seasons or in response to certain flow or temperature conditions, sampling will be conducted seasonally, to capture a range of potential tailwater conditions and to increase the likelihood of detecting the presence of the target fish species in the tailwater area. The exact dates and times for each sampling period will be determined closer to the sampling event in consultation with the USFWS, U.S. Forest Service (USFS), Tennessee Department of Environment and Conservation (TDEC), TWRA, and the National Park Service (NPS). At least one month in advance of the actual sampling, the Resources Agencies will be contacted about the field schedule and provided an opportunity to assist with the fieldwork.

The primary objective during the initial sampling to be conducted in 2009 will be to capture as many fish species as possible to produce a comprehensive list of fish species for the Chilhowee tailwater. Sampling will be accomplished by a combination of boat and backpack electrofishing, and gill, trap, and seine netting during the sampling period. The following gear types will likely be used during the sampling:

**Electroshocking** - The shoreline and mid-channel areas will be electrofished with the boat (or person with backpack shocker if depth permits) heading in a downstream direction. When the backpack shocker is used, a blocker seine will be positioned downstream about 20-ft to capture fish stunned by the shocker. Stunned fish will be dip netted from the river.

**Gill nets** – Gill nets will be fished in various locations/habitat types in the tailwater and their location (GPS), depth and habitat type will be recorded. The gill nets may be moved to different locations/habitat types frequently to capture as many fish species as possible.

**Trap nets** – Trap nets will be used as necessary to capture fish species not collected via the electroshocking and gill netting. Seine nets will also be used to collect smaller fish species that may be present.

All habitats present including deeper runs, pools, undercut banks, and shallow shoals will be sampled. Fish sampling stations and electrofishing transects will be established in the tailwater in consultation with the Resource Agencies prior to the sampling event. The tailwater will be sampled during both low and high flow (generation) conditions and during daytime and nighttime periods.

The number of each fish species captured will be recorded. All fish captured will be identified to species, measured (total length, mm), a representative sample will be weighed (total weight, gm) and most fish released alive.

Sampling conducted in years 2014 and 2024 will focus more on determining the presence and status of the target fish species in the Chilhowee tailwater area, as well as any significant changes in the fish community assemblage. Similar sampling gear will be used, but the timing of the three sampling periods, and the locations of sampling within the tailwater will be directed so as to increase the potential for detecting the target fish species.

### **2.3 Conditions Requiring Additional Fishways at the Chilhowee Development**

As discussed in Section 3.0 below, APGI will report the monitoring results to the Resource Agencies and the Commission within six months of completing the monitoring. The USFWS will use the data collected from the three sampling events to set numeric goals for subsequent sampling and to determine the need for additional fishways at the Chilhowee Development (in consultation with the USFS, NPS, TDEC, and TWRA). The need for additional fishways for the targeted potamodromous and diadromous fish species will be determined by the USFWS when certain conditions of populations or congregations occur (as defined by the numeric goals set by the Resource Agencies subsequent to the initial sampling).

The presence of significant populations of the target fish species at Chilhowee Dam will be a condition precedent to the requirement of additional fishways. No additional structural fishway will be required by the USFWS under any circumstances for the passage of the target fish species before year 20 of the License. Subject to this limitation, the Secretary of the Department of Interior reserves the right to require fishways at the Chilhowee Development (see Article 402 of the Project License).

### **3.0 Implementation, Schedule and Reporting**

The tailwater fish monitoring will not begin until the plan is approved by the Commission but must commence within five years of the effective date of the license (or March 1, 2010). The anticipated date of the first tailwater sampling event is early spring to late summer 2009. Subsequent sampling events will occur in Year 10 (or 2014) and Year 20 (or 2024), as required by the License. APGI will report the monitoring results to the USFWS, USFS, TDEC, TWRA, NPS, and the Commission within six months of completing each sampling event.

Consultation, monitoring, and reporting as described in this plan will be done in accordance with the following schedule:

<b>Year</b>	<b>Activity</b>	<b>Completion Date</b>
2009	Consult with the Resource Agencies about the upcoming sampling (review of methodologies,	Provide information to Resource Agencies by

	discussion of sampling dates, etc.).	February 28, 2009.
2009	Sample for three four-day periods in the Chilhowee tailwater area.	Complete sampling by December 31, 2009.
2010	Provide results of 2009 sampling in a report to the Resource Agencies and FERC.	Provide Resource Agencies with draft report for review and comment by March 31, 2010. Provide final report to FERC incorporating agency comments by June 30, 2010.
2014	Consult with the Resource Agencies about the upcoming sampling (review of methodologies, discussion of sampling dates, etc.).	Provide information to Resource Agencies by February 28, 2014.
2014	Sample for three four-day periods in the Chilhowee tailwater area.	Complete sampling by December 31, 2014.
2015	Provide results of 2014 sampling in a report to the Resource Agencies and FERC.	Provide Resource Agencies with draft report for review and comment by March 31, 2015. Provide final report to FERC incorporating agency comments by June 30, 2015.
2024	Consult with the Resource Agencies about the upcoming sampling (review of methodologies, discussion of sampling dates, etc.).	Provide information to Resource Agencies by February 28, 2024.
2024	Sample for three four-day periods in the Chilhowee tailwater area.	Complete sampling by December 31, 2024.
2025	Provide results of 2024 sampling in a report to the Resource Agencies and FERC.	Provide Resource Agencies with draft report for review and comment by March 31, 2025. Provide final report to FERC incorporating Resource agencies' comments by June 30, 2025.

# Appendices

## Appendix A: Consultation Record

<b>Date</b>	<b>Participants</b>	<b>Communication</b>
March 24, 2005	Mark Cantrell, USFWS Wendy Bley, Long View Associates	Telephone Call
May 26, 2005	Jody Cason, Long View Associates Mark Cantrell, USFWS Donley Hill, USFS Lewis Kearney, USFS Dan Eagar, TDEC Mark Fagg, TWRA David McKinney, TWRA Larry Hartmann, NPS	E-mail from Jody Cason to Resource Agencies requesting comments on a draft plan outline
June 1, 2005	Donley Hill, USFS Jody Cason, Long View Associates	E-mail from Donley Hill submitting comments on draft plan outline
June 2, 2005	Matt Kulp, Great Smoky Mountains National Park Jody Cason, Long View Associates	E-mail from Matt Kulp submitting comments on draft plan outline
June 10, 2005	Mark Cantrell, USFWS Jody Cason, Long View Associates	Telephone Call to discuss USFWS thoughts on fish monitoring plan
July 8, 2005	Jody Cason, Long View Associates Mark Cantrell, USFWS Donley Hill, USFS Lewis Kearney, USFS Dan Eagar, TDEC Mark Fagg, TWRA David McKinney, TWRA Larry Hartmann, NPS Matt Kulp, NPS Robert Smet, APGI Tapoco	E-mail from Jody Cason to Resource Agencies transmitting Draft Plan for required 30-day consultation period
August 4, 2005	Matt Kulp, NPS Jody Cason, Long View Associates	E-mail from Matt Kulp providing comments on the Draft Plan
August 8, 2005	Mark Cantrell, USFWS Jody Cason, Long View Associates Robert Smet, APGI Tapoco	E-mail from Mark Cantrell providing comments on the Draft Plan
August 10, 2005	Lewis Kearney, USFS Jim Herrig, USFS Jody Cason, Long View Associates Robert Smet, APGI Tapoco	E-mail from Lewis Kearney providing comments on the Draft Plan from Jim Herrig
August 19, 2005	Jody Cason, Long View Associates Mark Cantrell, USFWS	Telephone Call to discuss USFWS and NPS comments on the Draft Plan

Tapoco Project (FERC No. 2169)  
Phone Log

Call between Wendy Bley, Long View Associates and Mark Cantrell, US Fish and Wildlife Service

Date: March 24, 2005

RE: Discussion of Fish Passage, Fish Monitoring, and Gravel Enhancement Plans at Tapoco

Fish Passage Plan – agreement that a plan outline should be developed based on the requirements of the license and filled in with language from the RSA (as a starting point); then Mark will comment on this draft

A meeting is planned with Conservation Fisheries in mid April 2005 to discuss how the fish passage funding (\$10,000) is dispersed; explore a contract where the \$10,000 would go directly to Conservation Fisheries rather than through the USFWS

Jody to check with Bob Smet about APGI being okay with this; APGI would cut the check to the contractor rather than to the USFWS; would probably need some sort of letter agreement stating that the \$10,000 made payable to Conservation Fisheries satisfies our license/RSA requirement

Wendy made it clear that APGI would want to cut one check – not multiple checks to multiple contractors

Discussion of “operational” fishway requirement – Mark agrees that it will be up to us to define “operational” in the plan; anything we want it to be; probably no agreement to trap and truck by September 1; really meaning a plan in place and a payment by September 1

Fish Monitoring Plan – plan will follow early NAI plan; needs to be more specific re: the seasonality of things; LVA to draft something then he will add detail

Gravel Enhancement Plan – Mark agrees yes, gravel in the first year, but maybe not as much as FERC is requiring; Donley Hill putting a meeting together with R2 in late April (a meeting of the minds); LVA to attend this meeting since we will be drafting the plan? LVA as a scribe

Eel listing – USFWS will have something on the Federal Register in 2-3 weeks; probably going to list and probably going to be controversial (at least a species of concern)

**Jody Johns-Cason**

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**From:** Jody Johns-Cason [jjcason@att.net]  
**Sent:** Thursday, May 26, 2005 10:44 AM  
**To:** 'Mark Cantrell'; donleyhill@fs.fed.us; 'Lewis Kearney'; 'Dan Eagar'; 'Mark Fagg'; 'dmckinney@state.tn.us'; 'larry\_hartmann@nps.gov'  
**Cc:** 'Smet, Robert W'; 'Joyce Brooks'  
**Subject:** APGI Tapoco Project - Chilhowee Dam Tailwater Fish Monitoring Plan  
**Importance:** High

To: Mark Cantrell, USFWS  
Donley Hill, USFS  
Lewis Kearney, USFS  
Dan Eagar, TDEC  
Mark Fagg, TWRA  
David McKinney, TWRA  
Larry Hartmann, NPS

Tapoco's FERC license issued on January 25, 2005 (Article 403) requires APGI to file with FERC a final Chilhowee Dam Tailwater Fish Monitoring Plan. The plan must be filed within six months of the effective date of the license or September 1, 2005 and must be developed in consultation with the USFWS, USFS, TDEC, TWRA, and the NPS.

Attached is a draft annotated outline of the Chilhowee Dam Tailwater Fish Monitoring Plan. We would appreciate it if you would review and comment on the draft outline. Please send any comments on the draft outline to me at [jjcason@att.net](mailto:jjcason@att.net) by Friday, June 3, 2005. We have targeted distributing a draft plan for the required 30-day comment period to you on or before July 8, 2005. This is a very aggressive schedule so we would appreciate hearing back from you as soon as possible.

To help us develop the plan, we would appreciate your input on the following questions:

1. In the MOA executed in March 2005, the RSA signatories agreed that the plan required by Article 403 of the FERC license would be based largely on the Final Study Plan for the Reservoir and Tailwater Fishery Assessment conducted during the relicensing. Did we learn anything from that study, specifically in terms of methodology, that we should consider in developing this plan?
2. Monitoring under the plan must commence within five years of the effective date of the license or March 1, 2010. We anticipate conducting the first tailwater monitoring in late spring/summer 2009. Based upon seasonal aggregations of the target species, is this the best time of year for the monitoring?
3. In Section 2.3 of the attached outline, we state that the need for fishways for the target species will be determined by the USFWS when certain conditions of populations or congregations occur (this language is from the RSA). Mark, can you help us start to define these conditions?
4. Should the tailwater monitoring also be used to determine the effectiveness of the Chilhowee Dam Fish Passage Plan? If so, should the list of target species also include the Spotfin chub, Yellowfin madtom, Smoky madtom, and Duskytail darter?

Please feel free to provide any other additional information that you feel should be included in the plan.

Thanks,

Jody Johns-Cason  
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9507 Brading Lane  
Midlothian, Virginia 23112  
(804) 639-6278 phone  
(804) 639-7345  
[jjcason@att.net](mailto:jjcason@att.net)

**Tapoco Project (FERC No. 2169)  
Chilhowee Dam Tailwater Fish Monitoring Plan  
Draft Outline  
May 17, 2005**

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**Executive Summary**

**1. Introduction and Background**

1.1. Chilhowee Dam Tailwater Fish Monitoring Requirements

1.1.1 Tapoco Project Relicensing Settlement Agreement and FERC License Requirement

Appendix A Section 5.2 of the Tapoco Project Relicensing Settlement Agreement commits APGI to developing a monitoring plan to evaluate the presence and status of important potamodromous and diadromous fishes (including but not limited to lake sturgeon, black buffalo, smallmouth buffalo, river redhorse, sauger, and American eel) in the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater.

January 25, 2005 FERC Order Issuing New License for the Tapoco Hydroelectric Project (FERC No. 2169)

*Article 403 – Chilhowee Development Tailwater Fish Monitoring*

APGI is required to develop a Chilhowee Dam Tailwater Fish Monitoring Plan in consultation with the USFWS, USFS, TDEC, TWRA and NPS and to submit the plan within six months of the effective date of the license to the Commission for approval (on or before September 1, 2005).

1.2. Location and Setting

This section will describe the area where the fish monitoring will be conducted (e.g. the tailwater shoreline, backwater areas, and the mid-channel area). The upper end of the Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater (approximately 300-ft) will be discussed and put into context. A map will also be included in this section.

### 1.3 Existing Fisheries Data

This section will review existing data and information on fish resources in the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater. Data sources will include but not be limited to TWRA, USFS, and TVA.

### 1.4 Plan Goals and Objectives

1.4.1 Plan Goal – To evaluate the presence and status of important potamodromous and diadromous fishes in the Chilhowee Dam tailwater.

1.4.2 Plan Objectives – (1) monitor the Chilhowee Dam tailwater by year five of the license and in years 10 and 20 of the license, (2) capture as many fish species as possible to produce a comprehensive species list, (3) evaluate the condition of the fishery in the vicinity of the Chilhowee Dam tailwater, and (4) determine the need for additional fishways at the Chilhowee Development.

## 2. Chilhowee Dam Tailwater Fish Monitoring

### 2.1 Target Fish Species

This section will describe the fish species targeted for fish monitoring, which include but are not limited to the following important potamodromous and diadromous fishes: lake sturgeon (*Acipenser fulvescens*), black buffalo (*Ictiobus niger*), smallmouth buffalo (*Ictiobus bubalus*), river redhorse (*Moxostoma carinatum*), sauger (*Sander canadense*), and American eel (*Anguilla rostrata*).

### 2.2 Tailwater Fish Surveys

This section will describe the methodology used to conduct the fish monitoring.

In the Memorandum of Agreement executed in March 2005, the RSA signatories agreed that the plan required by Article 403 of the FERC license would be based largely on the Final Study Plan for Reservoir and Tailwater Fishery Assessment.

The Final Study Plan for Reservoir and Tailwater Fishery Assessment outlined the following methodologies:

The Chilhowee tailwater will be sampled during the late spring/summer time period for fish using a modified version of TVA's techniques developed to sample fish in their dam tailwater areas (Scott 1999). TVA's tailwater sampling methodology utilizes multiple passes with backpack electrofishing units, seines, dipnets, and boat electrofishing gear to capture the maximum number of fish. These efforts will be supplemented with gill nets, trap nets, and minnow traps. Areas sampled will include any backwater areas, the tailwater shoreline, and the

mid-channel area so all habitats present will be sampled. The tailwater will be sampled during both low and high flow (generation) conditions. For the electroshocking efforts, sampling will be during the daytime in the late spring or summer when flows are low.

All habitats present will be sampled with respect to depth, current velocity, and substrate. The shoreline and mid-channel areas will be electrofished with the boat (or person with backpack shocker if depth permits) heading in a downstream direction. When the backpack shocker is used, a blocker seine will be positioned downstream about 20-ft to capture fish stunned by the shocker. In addition, fish stunned will be dip netted.

All fish captured will be identified to species, measured, a representative sample will be weighted and most fish released alive.

### 2.3 Conditions Requiring Additional Fishways at the Chilhowee Development

The need for fishways for the target species will be determined by the US Fish and Wildlife Service when certain conditions [to be identified in this monitoring plan] of populations or congregations occur.

The presence of the target fish species at the base of Chilhowee Dam will be a condition precedent to the requirement of additional fishways.

No additional structural fishway will be required by the USFWS for the passage of the target fish species before year 20 of the License. Subject to this limitation, the Secretary of the Department of Interior reserves the right to require fishways at the Chilhowee Development.

## 3. Implementation

The plan must be filed with the Commission no later than September 1, 2005. Upon Commission approval, APGI will implement the plan.

### 3.1 Implementation Schedule

The tailwater fish monitoring will not begin until the plan is approved by the Commission but must commence within five years of the effective date of the license (or March 1, 2010) – anticipated date of first tailwater monitoring is late spring/summer 2009.

Year 10 tailwater monitoring – tailwater fish monitoring will occur in year 10 of the license (or 2014).

Year 20 tailwater monitoring – tailwater fish monitoring will occur in year 20 of the license (or 2024).

### 3.2 Reporting Requirements

Monitoring results will be reported to the USFWS, USFS, TDEC, TWRA, NPS, and the Commission within six months of completing each monitoring effort.

## **4. Effectiveness Monitoring of Fish Passage Translocation Plan**

This section will describe how the tailwater monitoring described herein will be also used as a way to monitor the effectiveness of the Fish Passage Translocation Plan (to be developed).

### **Appendices**

Consultation Summary

Consultation Record

APGI Response to Comments Received on Draft Plan

**From:** Donley Hill [mailto:donleyhill@fs.fed.us]  
**Sent:** Wednesday, June 01, 2005 11:25 AM  
**To:** Joyce Brooks  
**Cc:** 'Donley Hill'; jjcason@att.net; Lewis Kearney; Jim Herrig  
**Subject:** Re: FW: APGI Tapoco Project - Chilhowee Dam Tailwater Fish Monitoring Plan

Jody: I have reviewed the outline for fish monitoring in Chilhowee Tailwater and am copying Lewis Kearney and Jim Herrig with my response in case they want to provide any additional comments.

Since the monitoring is designed primarily to address fish passage concerns the USFWS has, the Forest Service will defer to USFWS biologists in the matter of sampling protocols and target species. I will say that this is going to be a difficult sampling environment and the full complement of sampling techniques mentioned in the outline will probably be necessary. I also believe that it will be important to conduct multiple sampling events over several weeks time during the selected sampling years. Donley

Donley Hill  
National Forests in North Carolina  
P.O. Box 2750  
Asheville, NC 28802  
telephone: 828-257-4212  
e-mail: donleyhill@fs.fed.us

---

**From:**Jody Johns-Cason [mailto:jjcason@att.net]  
**Sent:** Thursday, May 26, 2005 10:44 AM  
**To:** 'Mark Cantrell'; donleyhill@fs.fed.us; 'Lewis Kearney'; 'Dan Eagar'; 'Mark Fagg'; 'dmckinney@state.tn.us'; 'larry\_hartmann@nps.gov'  
**Cc:** 'Smet, Robert W'; 'Joyce Brooks'  
**Subject:** APGI Tapoco Project - Chilhowee Dam Tailwater Fish Monitoring Plan  
**Importance:** High

To: Mark Cantrell, USFWS  
Donley Hill, USFS  
Lewis Kearney, USFS  
Dan Eagar, TDEC  
Mark Fagg, TWRA  
David McKinney, TWRA  
Larry Hartmann, NPS

Tapoco's FERC license issued on January 25, 2005 (Article 403) requires APGI to file with FERC a final Chilhowee Dam Tailwater Fish Monitoring Plan. The plan must be filed within six months of the effective date of the license or September 1, 2005 and must be developed in consultation with the USFWS, USFS, TDEC, TWRA, and the NPS.

Attached is a draft annotated outline of the Chilhowee Dam Tailwater Fish Monitoring Plan. We would appreciate it if you would review and comment on the draft outline. Please send any comments on the draft outline to me at [jjcason@att.net](mailto:jjcason@att.net) by Friday, June 3, 2005. We have targeted distributing a draft plan for the required 30-day comment period to you on or before July 8, 2005. This is a very aggressive schedule so we would appreciate hearing back from you as soon as possible.

To help us develop the plan, we would appreciate your input on the following questions:

1. In the MOA executed in March 2005, the RSA signatories agreed that the plan required by Article 403 of the FERC license would be based largely on the Final Study Plan for the Reservoir and Tailwater Fishery Assessment conducted during the relicensing. Did we learn anything from that study, specifically in terms of methodology, that we should consider in developing this plan?
1. Monitoring under the plan must commence within five years of the effective date of the license or March 1, 2010. We anticipate conducting the first tailwater monitoring in late spring/summer 2009. Based upon seasonal aggregations of the target species, is this the best time of year for the monitoring?
1. In Section 2.3 of the attached outline, we state that the need for fishways for the target species will be determined by the USFWS when certain conditions of populations or congregations occur (this language is from the RSA). Mark, can you help us start to define these conditions?
1. Should the tailwater monitoring also be used to determine the effectiveness of the Chilhowee Dam Fish Passage Plan? If so, should the list of target species also include the Spotfin chub, Yellowfin madtom, Smoky madtom, and Duskytail darter?

Please feel free to provide any other additional information that you feel should be included in the plan.

Thanks,

Jody Johns-Cason  
Long View Associates  
9507 Brading Lane  
Midlothian, Virginia 23112  
(804) 639-6278 phone  
(804) 639-7345  
[jjcason@att.net](mailto:jjcason@att.net)

-----Original Message-----

From: Matt\_Kulp@nps.gov [[mailto:Matt\\_Kulp@nps.gov](mailto:Matt_Kulp@nps.gov)]  
Sent: Thursday, June 02, 2005 4:27 PM  
To: jjcason@att.net  
Cc: Steve\_E\_Moore@nps.gov; Jim\_Renfro@nps.gov  
Subject: Fw: APCI Tapoco Project - Chilhowee Dam Tailwater Fish Monitoring Plan

Jody,

I am sending my comments directly to you as Larry will be out of the office for a while.

I just have a few comments listed below.

1) With regard to your four questions for the group, question 2 references time of year. Spring and early summer would probably work well given discharges was suitable to work, however, i would also include a mid-late summer sample as well to evaluate during the low flow period.

2) Including the four T&E species in the target species for the Fish Passage Plan seems fruitless for at least for the two madtoms and the duskytail darter. These are smaller stream species not typically associated with tailwater habitat. The spotfin chub is known to inhabit mid-size rivers and should be included in the list of target species as it most likely once inhabited the Little Tennessee River in the Chilhowee vicinity.

3) Was curious if any quantitative information was to be collected? Everything I saw was qualitative absence or presence type information.

4) If quantitative information is collected, what steps will be taken if declines in population abundance occur?

These are a few comments in a short period of review time. I hope they are helpful.

Sincerely,

Matt Kulp

Fishery Biologist

Great Smoky Mountains National Park

(865) 436-1254

----- Forwarded by Matt Kulp/GRSM/NPS on 06/02/2005 04:12 PM -----

Larry Hartmann

Moore/GRSM/NPS@NPS, Matt Kulp/GRSM/NPS@NPS  
05/27/2005 01:55

To: Steve E

cc:

PM EDT  
Project - Chilhowee Dam Tailwater Fish Monitoring Plan

Subject: Fw: APCI Tapoco

Steve/Matt - Could you please look this over and give me any comments you have via e-mail? Their due date is June 3, so it looks like it will be up to Matt to comment next week. thanks.

Larry

Lawrence A. Hartmann, Ph.D.  
Chief, Resource Management and Science  
Great Smoky Mountains National Park  
107 Park Headquarters Road  
Gatlinburg, TN 37738  
865-436-1245 office  
865-384-4038 cellphone  
short e-mail to cellphone: larryhartmann@vtext.com

The National Park Service cares for special places saved by the American people so that all may experience our heritage. EXPERIENCE YOUR AMERICA  
----- Forwarded by Larry Hartmann/GRSM/NPS on 05/27/2005 01:54 PM -----

Tapoco Project (FERC No. 2169)  
Phone Log

Call between Jody Cason, Long View Associates and Mark Cantrell, US Fish and Wildlife Service

Date: June 10, 2005

RE: Discussion of details of Chilhowee Fish Passage Translocation Plan, Chilhowee Dam Fish Monitoring Plan, and Cheoah River Gravel Enhancement Plan

#### Chilhowee Fish Passage Translocation Plan

Mark provided a copy of an article recently published in the *Southeastern Naturalist* titled, "Reintroduction of Four Imperiled Fishes in Abrams Creek, Tennessee"

The plan should be flexible and not too detailed.

Mark suggested that APGI, USFWS, and Conservation Fisheries meet annually to discuss the subsequent year's translocations. He suggested meeting during the winter.

We discussed the meaning of "operational" in the USFWS Fishway prescription. He said that the USFWS will consider the fishway operational when the plan has been filed with FERC and provisions for the transfer of the annual funding have been made.

What was done and who was paid will be recorded in a memo format from the USFWS (the USFWS may pass through funds to Conservation Fisheries). The USFWS is still in discussions with CFI.

The first translocation will be scheduled for 2005-2006.

The effectiveness of the translocations could be measured in several ways: 1) functionality – the plan is in place and the payment has been made, 2) the fish are passed safely, timely and effectively (no to low mortality), and 3) was the genetic material transferred?

#### Chilhowee Dam Fish Monitoring Plan

Location and setting – Project boundary extends 3,000 feet below the dam; the placement of the nets should be at the bend in the river at about 4,000 feet below the dam

Methodology should include multiple gear types (hit the area hard with all gear types)

The actual sampling date should be determined closer to the sampling in consultation with the Resource Agencies, describe sampling period generally in the plan

Reference Article 402 – Reservation of Authority as a reason for the sampling

Section 2.3 delete “at the base of the dam”

### Cheoah River Gravel Enhancement

The plan should be flexible and not prescribe certain amounts of gravel, introduction locations, and timeframes; this information should be generally discussed in the plan

Mark is okay with saying that gravel will be introduced within the first three years

Use the R2 memorandum as a starting point

Subsequent gravel introductions would be based on monitoring – where has the gravel been distributed, how much has been retained within the system etc.

**From:** Jody Johns-Cason [mailto:[jjcason@att.net](mailto:jjcason@att.net)]  
**Sent:** Friday, July 08, 2005 2:46 PM  
**To:** 'Mark Cantrell'; [donleyhill@fs.fed.us](mailto:donleyhill@fs.fed.us); 'Lewis Kearney'; 'Dan Eagar'; 'Mark Fagg';  
'[dmckinney@state.tn.us](mailto:dmckinney@state.tn.us)'; '[larry\\_hartmann@nps.gov](mailto:larry_hartmann@nps.gov)'; '[matt\\_kulp@nps.gov](mailto:matt_kulp@nps.gov)'  
**Cc:** 'Smet, Robert W'  
**Subject:** APGI Tapoco Project - Draft Chilhowee Tailwater Fish Monitoring Plan

To: Mark Cantrell, USFWS  
Donley Hill, USFS  
Lewis Kearney, USFS  
Dan Eagar, TDEC  
Mark Fagg, TWRA  
David McKinney, TWRA  
Larry Hartmann, NPS  
Matt Kulp, NPS

Article 403 of Tapoco's FERC license requires APGI to file a Chilhowee Tailwater Fish Monitoring Plan with the Commission within six months of the effective date of the license, or September 1, 2005. APGI is required to consult with the US Fish and Wildlife Service, the US Forest Service, TN Department of Environment and Conservation, TN Wildlife Resources Agency, and the National Park Service. APGI must allow a minimum of 30 days for the agencies to comment before filing the plan with the Commission.

I have attached two copies of the Draft Chilhowee Tailwater Fish Monitoring Plan – one copy is a MS Word version of the Plan without Figure 1 and the other is a pdf version of the Plan with Figure 1. Please provide us any comments on the Draft Plan by Monday, August 8, 2005. We plan to revise and finalize the Plan based on comments received. The Plan will be filed with FERC no later than September 1, 2005.

If you have questions on the draft plan, please contact Bob Smet at 704-422-5644 or [robert.smet@alcoa.com](mailto:robert.smet@alcoa.com) or myself.

Thanks,

Jody Johns-Cason  
Long View Associates  
9507 Brading Lane  
Midlothian, Virginia 23112  
(804) 639-6278 phone  
(804) 639-7345 fax  
[jjcason@att.net](mailto:jjcason@att.net)

**Alcoa Power Generating Inc. Tapoco Division**  
**Tapoco Hydroelectric Project (FERC No. 2169)**  
**DRAFT Chilhowee Dam Tailwater Fish Monitoring Plan**  
**July 2005**

Licensee Contact:



Robert Smet  
APGI, Tapoco Division  
P.O. Box 576  
Badin, NC 28009  
(704) 422-5644  
[robert.smet@alcoa.com](mailto:robert.smet@alcoa.com)

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## List of Acronyms/Glossary of Terms

APGI	Alcoa Power Generating Inc.
Diadromous	Fish that migrate between freshwater and saltwater
FERC	Federal Energy Regulatory Commission (or Commission)
Forebay zone	The area near Tellico Dam
Licensee	Alcoa Power Generating Inc.
NPS	National Park Service
Plan	Chilhowee Dam Tailwater Fish Monitoring Plan
Potamodromous	Freshwater-migrating
Project	Tapoco Hydroelectric Project
Resource Agencies	USFWS, USFS, NPS, TDEC, and TWRA
RSA	Relicensing Settlement Agreement
TDEC	Tennessee Department of Environment and Conservation
Transition zone	The area located mid-reservoir of the Tellico Reservoir
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

## 1.0 Overview

### 1.1 Introduction and Background of Chilhowee Dam Tailwater Fish Monitoring Requirements

On January 25, 2005 the Federal Energy Regulatory Commission (FERC) issued an order approving settlement and issuing Alcoa Power Generating Inc. (APGI, Licensee) a new 40-year license for the Tapoco Hydroelectric Project (FERC No. 2169) (Project). Article 403 of the License requires APGI to file a Chilhowee Dam Tailwater Fish Monitoring Plan (Plan) to evaluate the presence and status of important potamodromous and diadromous fishes in the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater within six months of the effective date of the license (or September 1, 2005). The License Article reads:

*Article 403. Chilhowee Development Tailwater Fish Monitoring. Within six months of the effective date of the license, the licensee shall file for Commission approval, a tailwater fish monitoring plan for the Chilhowee Development that describes the methods to be used to determine the presence and status of lake sturgeon, black buffalo, smallmouth buffalo, river redhorse, sauger, and American eels in the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Development dam tailrace. The plan shall be developed in consultation with the U.S. Fish and Wildlife Service (FWS), U.S. Forest Service (Forest Service), Tennessee Department of Environment and Conservation (Tennessee DEC), Tennessee Wildlife Resources Agency (Tennessee Wildlife), and the National Park Service (NPS).*

*The plan shall include, at a minimum:*

- (1) a timetable that facilitates tailrace monitoring commencing within five years from the effective date of the license and thereafter in year 10 and 20 of the license;*
- (2) a design that targets detection of the seasonal aggregations of potamodromous and diadromous fishes and includes a combination of sampling techniques, including electrofishing and net gear sampling;*
- (3) reporting monitoring results to the FWS, Forest Service, Tennessee DEC, Tennessee Wildlife, NPS, and the Commission within six months of completing each monitoring effort; and*
- (4) a schedule for implementing the fish monitoring plan.*

*The licensee shall include with the plan documentation of agency consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.*

*The Commission reserves the right to require changes to the plan. The tailwater fish monitoring shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.*

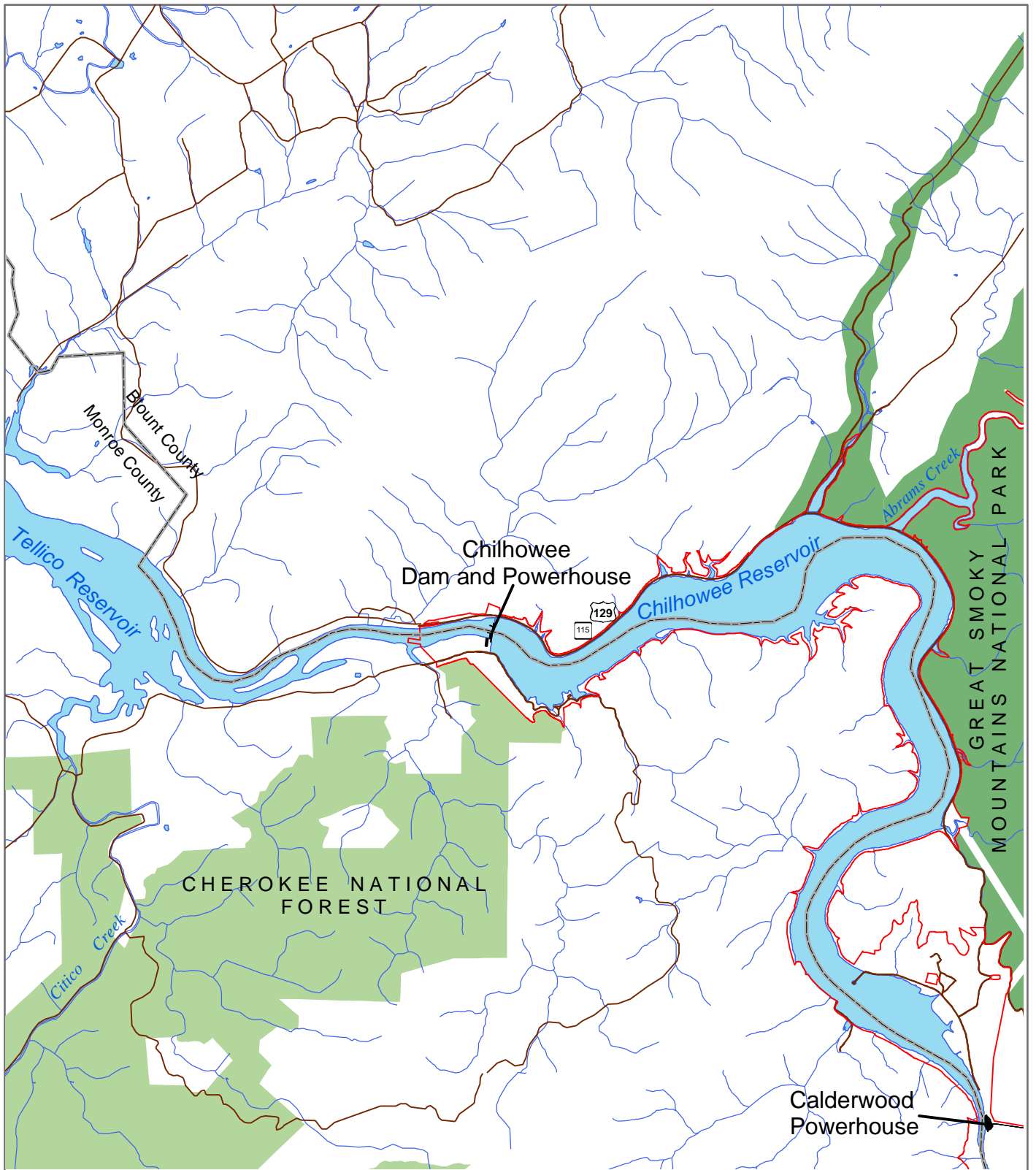
The January 25, 2005 FERC order also approved a Relicensing Settlement Agreement (RSA) for the Tapoco Project. Section 5.2, Appendix A of the RSA (proposed license article FP-2) reserves the authority of the U.S. Fish and Wildlife Service (USFWS) to prescribe additional fishways at the Chilhowee Development and describes the associated need for tailwater monitoring to determine the need for additional fishways. Similar to the FERC license article, the RSA also outlines the component parts of the tailwater monitoring plan.

This Plan describes the periodic fish monitoring to be conducted by APGI at the Chilhowee Development as required under Article 403 and in accordance with the terms of the RSA.

## **1.2 Location and Setting**

The Tapoco Project is located approximately 15 miles south of Maryville, Tennessee, and approximately 90 miles northeast of Chattanooga, Tennessee. The Project is in the western portion of the Little Tennessee Watershed on the Little Tennessee and Cheoah rivers in Graham and Swain counties in North Carolina and Blount and Monroe counties in Tennessee. The Project includes four hydroelectric developments, the Santeetlah, Cheoah, Calderwood, and Chilhowee developments. The 1,734-acre (surface area) Chilhowee Development is located on the Little Tennessee River between river miles 33 and 34, downstream of the Calderwood Development in Blount and Monroe counties. The Tennessee Valley Authority's (TVA) Tellico Dam is located downstream of the Chilhowee Development and the headwaters of Tellico Reservoir at full pond extend to the Chilhowee tailwater. The first 3,000 feet downstream of the Chilhowee Powerhouse and Dam is located within the Tapoco Project boundary (Figure 1).

In accordance with the terms of the License and RSA, APGI will conduct periodic fish monitoring in the upper end of Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater (the area of the Little Tennessee River just downstream of the Chilhowee Dam and Powerhouse). The Chilhowee tailwater area extends approximately 4,000 feet below Chilhowee Dam and Powerhouse. Areas within the Chilhowee tailwater that may be included in the sampling include the mainstem tailwater area, as well as backwater areas, and along the shoreline.

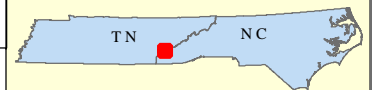


- FERC Project Boundary
- Roads
- County Lines
- Creeks and Streams
- Project Facilities
- National Forest
- National Park

## Chilhowee Tailwater Tapoco Project



0 0.2 0.4 0.8 1.2 1.6 Miles



June 2005

Figure 1

### 1.3 Existing Fisheries

Fisheries data for the Chilhowee tailwater was collected in the 1970s prior to the construction of Tellico Dam and in 1999. In addition to being dated, data collected in the 1970s reflects conditions in the Chilhowee tailwater that have been altered by construction of Tellico Dam in the past 30 years. A total of 19 species were collected during a 1974 fish study conducted by TVA and the Tennessee Wildlife Resources Agency (TWRA). Sculpin (*Cottus bairdii* and *Cottus carolinae* combined) were the dominant fish species collected in both the upper and lower tailwater reaches. Other dominant species were bluegill, northern hog sucker, and brown and rainbow trout. River chub, brook silverside, smallmouth bass, and warpaint shiner were also among the top 10 fish species collected from the upper tailwater area. Fish species that were captured only in the lower tailwater area (approximately 5 to 10 miles below the Chilhowee Dam) included logperch, black, silver, and golden redhorse, carp, central stoneroller, green sunfish, and dusky and greenside darters.

Additionally, fisheries data were collected in Tellico Reservoir in 1999 by TVA from the forebay zone (near Tellico Dam) and the transition zone (mid-reservoir) of Tellico Reservoir. Fish captured in Tellico Reservoir were predominantly warm-water species. In 1999, 34 species were collected in the reservoir. In the forebay zone, bluegill were the dominant fish captured electrofishing followed by gizzard shad, largemouth bass, carp, spotfin shiner, brook silverside, threadfin shad, and smallmouth bass. The dominant fish captured in the forebay zone with gill nets was skipjack herring, followed by alewife, gizzard shad, yellow bass, smallmouth buffalo, white bass, channel catfish, and sauger. Dominant fish species captured during electrofishing in Tellico's mid-reservoir transition zone were similar to those species collected in the forebay zone. Brook silverside was the dominant fish captured electrofishing in this area followed by spotfin shiner, bluegill, carp, smallmouth bass, gizzard shad, largemouth bass, black buffalo, and redbreast sunfish. Fish species captured in the transition zone with gill nets were similar to gill net catches in the forebay zone. Alewife was the dominant species followed by gizzard shad, white bass, yellow bass, carp, smallmouth buffalo, skipjack herring, sauger, walleye, and spotted sucker.

None of the potamodromous and diadromous fish species targeted for monitoring in this Plan were captured during the 1974 survey. However, prior to the impoundment of Tellico Reservoir, upstream migrations of smallmouth buffalo were observed during late April and early May. River redhorse, smallmouth buffalo, black buffalo, and sauger were found in the forebay (near the dam) and/or transition zones (mid-reservoir) of Tellico Reservoir during the 1999 survey. Additional observations of the target fish species have been made in the vicinity of the Chilhowee Dam tailwater. During the spring, black buffalo and other riverine fishes have been observed in Citico Creek, the first large tributary below Chilhowee Dam and at Abrams Creek, the first and largest tributary to Chilhowee Reservoir (see Figure 1).

## 1.4 Plan Goals

Consistent with the terms of the License and RSA, the principal goals of the Chilhowee Dam Tailwater Fish Monitoring Plan are to:

1. Develop a comprehensive fish species list for the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater, and
2. Evaluate the presence and status of important potamodromous and diadromous fishes (including but not limited to lake sturgeon, black buffalo, smallmouth buffalo, river redhorse, sauger, and American eel) in the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater.

## 2.0 Chilhowee Dam Tailwater Fish Monitoring

### 2.1 Target Fish Species

The Resource Agencies have indicated that they are concerned with the movement and status of several important potamodromous and diadromous fishes upstream and downstream of Chilhowee Dam. While these fish may or may not be present above or below Chilhowee Dam currently, in the future the presence and status of these fish species will be the primary determinant of whether additional fishways may be needed at the Dam. The fish species that have been identified by the Resource Agencies and which are primary target of this fish monitoring plan include the following:

1. Lake sturgeon (*Acipenser fulvescens*) is a potamodromous species, migrating entirely in freshwater. Although it is not federally listed as endangered, lake sturgeon is a federal species of concern and is considered endangered in Tennessee.
2. Black buffalo (*Ictiobus niger*) is a potamodromous species.
3. Smallmouth buffalo (*Ictiobus bubalus*) is a potamodromous species.
4. American eel (*Anguilla rostrata*) is a diadromous species. More specifically, the American eel is catadromous since it migrates to saltwater to spawn. This species is currently being considered for protection as a federally endangered species.
5. River redhorse (*Moxostoma carinatum*) is a potamodromous species.
6. Sauger (*Sander canadense*) is a potamodromous species.

## 2.2 Fish Monitoring Methodology

In accordance with the terms of the License and RSA, the Chilhowee tailwater will be sampled in 2009, 2014, and 2024 for three four-day periods during the early spring to late summer to capture as many fish species as possible. Since the target fish species, as well as other species, may only be present in the tailwater during certain seasons or in response to certain flow or temperature conditions, sampling will be conducted seasonally, to capture a range of potential tailwater conditions and to increase the likelihood of detecting the presence of the target fish species in the tailwater area. The exact dates and times for each sampling period will be determined closer to the sampling event in consultation with the USFWS, U.S. Forest Service (USFS), Tennessee Department of Environment and Conservation (TDEC), TWRA, and the National Park Service (NPS).

The primary objective during the initial sampling to be conducted in 2009 will be to capture as many fish species as possible to produce a comprehensive list of fish species for the Chilhowee tailwater. Sampling will be accomplished by a combination of boat and backpack electrofishing, and gill, trap, and seine netting during the sampling period. The following gear types will likely be used during the sampling:

**Electroshocking** - The shoreline and mid-channel areas will be electrofished with the boat (or person with backpack shocker if depth permits) heading in a downstream direction. When the backpack shocker is used, a blocker seine will be positioned downstream about 20-ft to capture fish stunned by the shocker. Stunned fish will be dip netted from the river.

**Gill nets** – Gill nets will be fished in various locations/habitat types in the tailwater and their location (GPS), depth and habitat type will be recorded. The gill nets may be moved to different locations/habitat types frequently to capture as many fish species as possible.

**Trap nets** – Trap nets will be used as necessary to capture fish species not collected via the electroshocking and gill netting. Seine nets will also be used to collect smaller fish species that may be present.

All habitats present including deeper runs, pools, undercut banks, and shallow shoals will be sampled. Fish sampling stations and electrofishing transects will be established in the tailwater in consultation with the Resource Agencies prior to the sampling event. The tailwater will be sampled during both low and high flow (generation) conditions and during daytime and nighttime periods.

The number of each fish species captured will be recorded. All fish captured will be identified to species, measured (total length, mm), a representative sample will be weighed (total weight, gm) and most fish released alive.

Sampling conducted in years 2014 and 2024 will focus more on determining the presence and status of the target fish species in the Chilhowee tailwater area. Similar sampling gear will be used, but the timing of the three sampling periods, and the locations of sampling within the tailwater will be directed so as to increase the potential for detecting the target fish species.

### **2.3 Conditions Requiring Additional Fishways at the Chilhowee Development**

As of September 1, 2005, APGI operates a “fishway”<sup>1</sup> at the Chilhowee Development to provide for safe, timely, and convenient fish passage for populations of four identified fish species: Spottfin Chub, Yellowfin Madtom, Smoky Madtom, and Duskytail Darter between Citico Creek and Abrams Creek, and between Tellico River and Abrams Creek.

The USFWS will use the data collected from the three sampling events to determine the need for additional fishways at the Chilhowee Development (in consultation with the USFS, NPS, TDEC, and TWRA). The need for additional fishways for the targeted potamodromous and diadromous fish species will be determined by the USFWS when certain conditions of populations or congregations occur. The presence of significant populations of the target fish species at Chilhowee Dam will be a condition precedent to the requirement of additional fishways.

No additional structural fishway will be required by the USFWS under any circumstances for the passage of the target fish species before year 20 of the License. Subject to this limitation, the Secretary of the Department of Interior reserves the right to require fishways at the Chilhowee Development (see Article 402 of the Project License).

### **3.0 Implementation, Schedule and Reporting**

The tailwater fish monitoring will not begin until the plan is approved by the Commission but must commence within five years of the effective date of the license (or March 1, 2010). The anticipated date of the first tailwater sampling event is early spring to late summer 2009. Subsequent sampling events will occur in Year 10 (or 2014) and Year 20 (or 2024), as required by the License. APGI will report the monitoring results to the USFWS, USFS, TDEC, TWRA, NPS, and the Commission within six months of completing each sampling event.

Consultation, monitoring, and reporting as described in this plan will be done in accordance with the following schedule:

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<sup>1</sup> Section 1701(b) of the National Energy Policy Act of 1992, P.L. 102-486, Title XVII, § 1701(b), 106 Stat. 3008, states, “The items which may constitute a ‘fishway’ under Section 18 for the safe and timely upstream and downstream passage of fish shall be limited to physical structures, facilities, or devices necessary to maintain all life stages of such fish, and project operations and measures related to such structures, facilities, or devices that are necessary to ensure the effectiveness of such structures, facilities, or devices for such fish.”

<b>Year</b>	<b>Activity</b>	<b>Completion Date</b>
2009	Consult with the Resource Agencies about the upcoming sampling (review of methodologies, discussion of sampling dates, etc.).	Provide information to agencies by February 28, 2009
2009	Sample for three four-day periods in the Chilhowee tailwater area.	Complete sampling by December 31, 2009.
2010	Provide results of 2009 sampling in a report to the Resource Agencies and FERC.	Provide agencies with draft report for review and comment by March 31, 2010. Provide final report to FERC incorporating agency comments by June 30, 2010.
2014	Consult with the Resource Agencies about the upcoming sampling (review of methodologies, discussion of sampling dates etc.).	Provide information to agencies by February 28, 2014.
2014	Sample for three four-day periods in the Chilhowee tailwater area.	Complete sampling by December 31, 2014.
2015	Provide results of 2014 sampling in a report to the Resource Agencies and FERC.	Provide agencies with draft report for review and comment by March 31, 2015. Provide final report to FERC incorporating agency comments by June 30, 2015.
2024	Consult with the Resource Agencies about the upcoming sampling (review of methodologies, discussion of sampling dates etc.).	Provide information to agencies by February 28, 2024.
2024	Sample for three four-day periods in the Chilhowee tailwater area.	Complete sampling by December 31, 2024.
2025	Provide results of 2024 sampling in a report to state and federal fishery agencies and FERC.	Provide agencies with draft report for review and comment by March 31, 2025. Provide final report to FERC incorporating agency comments by June 30, 2025.

# Appendices

-----Original Message-----

From: Matt\_Kulp@nps.gov [[mailto:Matt\\_Kulp@nps.gov](mailto:Matt_Kulp@nps.gov)]

Sent: Thursday, August 04, 2005 4:00 PM

To: jjcason@att.net

Subject: Re: APCI Tapoco Project - Draft Chilhowee Tailwater Fish Monitoring Plan

Jody,

The only comments I have relate to section 2.3 Conditions Requiring Additional Fishways at the Chilhowee Development.

- 1) Is there currently a fishway in place? It appears so but the plan is unclear.
- 2) The plan identifies the 4 T&E fish species as "identified species" for the additional fish passageway. It seems doubtful these fish will be found in the river/impoundment at any time (except possibly for the spotfin chub), so I assume you guys are curious as well to see if they will use a fish passage. If they are identified as potential users, why are they not included (and should they be) in the "targeted" fish section?
- 3) The determination of need for an additional fishway could be more specific. The terms "certain conditions of populations or congregations occur" is pretty vague. In the case of the two madtoms and the duskytail darter, they typically occur as single individuals, whereas many times the spotfin chub aggregate in schools. Perhaps something like "greater than 12 duskytail darter, smoky or yellowtail madtom observed within 3 months" or "greater than 30 spotfin chub observed within 3 months". These aren't perfect either, but they are measurable. The other leaves a lot of room for interpretation and cannot be measured.

Hope these are useful. Please keep me posted.

Sincerely,  
Matt Kulp  
Fishery Biologist  
Great Smoky Mountains National Park  
(865) 436-1254

## Jody Johns-Cason

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**From:** Mark\_A\_Cantrell@fws.gov  
**Sent:** Monday, August 08, 2005 10:05 AM  
**To:** Jody Johns-Cason; Robert.Smet@alcoa.com  
**Subject:** USFWS comments on APGI Tapoco Project - Draft Chilhowee Tailwater Fish Monitoring Plan

We received your July 8, 2005 email and the attached draft **Chilhowee Dam Tailwater Fish Monitoring Plan**. Staff biologists of the U.S. Fish and Wildlife Service are familiar with the fish and wildlife habitats of the vicinity, have been involved with the relicensing of the Tapoco Project (P-2169), and with the development of the relicensing studies. We have reviewed the draft and provide the following comments.

Alcoa Power Generating, Inc., Tapoco Division (APGI) was issued a new project license on January 25, 2005. The Tapoco Project is located in the Cheoah and Little Tennessee River basins in Graham and Swain Counties, North Carolina, and Monroe and Blount Counties, Tennessee. The project is composed of four hydroelectric facilities -- Chilhowee, Calderwood, Cheoah, and Santeetlah. The new project license was effective on March 1, 2005. Article 403 of the license requires the licensee to prepare a plan for monitoring presence and status of important potamodromous and diadromous fishes in the upper end of the Tellico Reservoir in the vicinity of the Chilhowee Development dam tailrace at the Project. These comments are submitted in accordance with the provisions of the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e); Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543); the Federal Power Act (16 U.S.C. 803(a) and (j)); the Migratory Bird Treaty Act (16 U.S.C. 1536, 1538); the National Environmental Policy Act (42 U.S.C. 4321 et seq.); the Clean Water Act (33 U.S.C. 1251 et seq.); the National Park Service Organic Act of 1916; and the Electric Consumers Protection Act of 1986 (100 Stat. 1243).

Overall, we found the draft plan well written and thorough. The plan generally follows the study plan used for other project waters during relicensing of the project.

At 1.2 Location and Setting. Recommend rewording “*The first 3,000 feet downstream of the Chilhowee Powerhouse and Dam is located within the Tapoco Project boundary*” to say “The Tapoco Project boundary extends 3,000 feet downstream of the Chilhowee Powerhouse and Dam.”

At 2.2 Fish Monitoring Methodology we recommend additional verbiage at “Sampling conducted in years 2014 and 2024 will focus more on determining the presence and status of the target fish species in the Chilhowee tailwater area, **as well as any significant changes in the fish community assemblage.**”

I do not know where best to place a statement to effect coordination immediately prior to sampling so that local biologists could participate, like: “At least 1 month in advance of actual sampling, the agencies should be contacted with the field schedule and provided the opportunity to assist with the fieldwork.”

## Conclusion

In summary, we appreciate the hard work that went into compiling the Plan. With the few recommend changes, the Plan will be a valuable tool to guide sampling the Chilhowee tailwaters at the Tapoco Project. If you have any questions or need additional information, please contact me at 828/258-3939

8/8/2005

(ext. 227).

thanks,  
Mark A. Cantrell  
U.S. Fish & Wildlife Service  
160 Zillicoa Street  
Asheville, NC 28801  
828/258-3939, ext 227  
fax: 828/258-5330  
mobile: 828/215-1739  
mark\_a\_cantrell@fws.gov

"Our mission is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people."

-----Original Message-----

From: Lewis Kearney [<mailto:lkearney@fs.fed.us>]  
Sent: Wednesday, August 10, 2005 11:15 AM  
To: jjcason@att.net; jfbrooks@rcn.com  
Subject: Fw: APGI Tapoco Project - Draft Chilhowee Tailwater Fish Monitoring Plan

Lewis Kearney  
Staff Officer for Fire/Lands/Minerals/Cooperative Forestry P.O. Box 2010  
Cleveland, Tn 37320  
423-476-9759 (w)  
423-413-8296 (c)  
[lkearney@fs.fed.us](mailto:lkearney@fs.fed.us)

----- Forwarded by Lewis Kearney/R8/USDAFS on 08/10/2005 11:14 AM -----  
Jim Herrig/R8/USDAFS  
To 07/12/2005 07:52 Lewis Kearney/R8/USDAFS@FSNOTES AM  
cc Keith Lannom/R8/USDAFS@FSNOTES,  
Stephanie Medlin/R8/USDAFS@FSNOTES,  
Susan Shaw/R8/USDAFS@FSNOTES  
Subject Re: Fw: APGI Tapoco Project - Draft  
Chilhowee Tailwater Fish Monitoring Plan(Document link: Lewis Kearney)

I reviewed this plan a few weeks ago and found it to be adequate. It calls for monitoring fish using a variety of techniques at various times of the year. The main purpose is to see if fish passage needs to be improved. The target fish being the federally listed madtoms, duskytail darter, and spotfin chub; large migratory fish such as redhorse suckers and buffalo; and game species such as walleye and sauger. The listed species are unlikely to be detected using any technique. Monitoring for these species will require intensive site specific searches using snorkeling. However, the purpose of this monitoring plan is to detect fish in migration. Suckers will be assemble at the base of the dam and should be easily detected during their migration. A ladder could facilitate their migration over the dam. The game fish are even more likely to a ladder.

Jim Herrig  
Aquatic Biologist  
Cherokee NF  
P.O. Box 2010  
Cleveland, TN 37320  
[jherrig@fs.fed.us](mailto:jherrig@fs.fed.us)  
423 476-9751

Lewis Kearney/R8/USDAFS  
To 07/11/2005 10:46 Jim Herrig/R8/USDAFS@FSNOTES PM  
cc Stephanie Medlin/R8/USDAFS@FSNOTES,  
Keith Lannom/R8/USDAFS@FSNOTES,  
Susan Shaw/R8/USDAFS@FSNOTES  
Subject Fw: APGI Tapoco Project - Draft  
Chilhowee Tailwater Fish Monitoring Plan

Jim, can you provide appropriate comments?

Lewis Kearney  
Staff Officer for Fire/Lands/Minerals/Cooperative Forestry P.O. Box 2010  
Cleveland, Tn 37320  
423-476-9759 (w)  
423-413-8296 (c)  
lkearney@fs.fed.us

Tapoco Project (FERC No. 2169)  
Phone Log

Call between Jody Cason, Long View Associates and Mark Cantrell, US Fish and Wildlife Service

Date: August 19, 2005

RE: Discussion of USFWS and NPS comments on Chilhowee Dam Fish Monitoring Draft Plan (July 2005)

We discussed the language re: determination of need for an additional fishway. Mark suggested adding language about numeric goals being set (x numbers of x species) after the first year's monitoring results are in. He suggested adding an example in a parenthetical (e.g. greater than 12 duskytail darter).

We agreed that the passage of the spotfin chub, yellowfin madtom, smoky madtom, and duskytail darter is described in the Fish Passage Translocation Plan and while referenced in the fish monitoring plan, the species do not have to be discussed in great detail.

## Appendix B: Comments Received on Draft Plan and APGI's Response

Comment	Response
<p>Matt Kulp, NPS, E-mail Dated August 4, 2005</p> <p>Is there currently a fishway in place? It appears so but the plan is unclear.</p>	<p>The last paragraph of Section 1.1. on page 2 notes that fish passage (translocation) for four species (Spotfin Chub, Yellowfin Madtom, Smoky Madtom, and Duskytail Darter) is discussed separately in the Tapoco Project Fish Passage Translocation Plan (August 2005).</p>
<p>Matt Kulp, NPS, E-mail Dated August 4, 2005</p> <p>The plan identifies the four T&amp;E species as "identified species" for the additional fish passageway. It seems doubtful these fish will be found in the river/impoundment at any time (expect possibly for the Spotfin Chub), so I assume you are curious as well to see if they will use a fish passage. If they are identified as potential users, why are they not included (and should they be) in the "targeted" fish section?</p>	<p>See response above. As of September 1, 2005 fish passage (translocation) will be operational for the Spotfin Chub, Yellow Madtom, Smoky Madtom, and Duskytail Darter. The Chilhowee tailwater fish monitoring is designed to determine if an additional fishway is needed at Chilhowee Dam for certain important potamodromous and diadromous fishes.</p>
<p>Matt Kulp, NPS, E-mail Dated August 4, 2005</p> <p>The determination of need for an additional fishway could be more specific. The terms "certain conditions of populations or congregations occur" is pretty vague. . .</p>	<p>The first paragraph of Section 2.3 on page 8 was rewritten to read, "APGI will report the monitoring results to the Resource Agencies within six months of completing the monitoring. The USFWS will use the data collected from the three sampling events to set numeric goals for subsequent sampling and to determine the need for additional fishways at the Chilhowee Development (in consultation with the USFS, NPS, TDEC, and TWRA). The need for additional fishways for the targeted potamodromous and diadromous fish species will be determined by the USFWS when certain conditions of populations or congregations occur (as defined by the numeric goals set by the Resource Agencies subsequent to the initial sampling)."</p>
<p>Mark Cantrell, USFWS, E-mail Dated August 8, 2005</p> <p>At <u>1.2 Location and Setting</u>. Recommend rewording "<i>The first 3,000 feet downstream of the Chilhowee Powerhouse and Dam is located within the Project boundary</i>" to say "The Tapoco Project boundary extends 3,000 feet downstream of the Chilhowee Powerhouse and Dam."</p>	<p>Section 1.2 has been revised accordingly. See page 3.</p>

<p>Mark Cantrell, USFWS, E-mail Dated August 8, 2005</p> <p>At <u>2.2 Fish Monitoring Methodology</u> we recommend additional verbiage at “Sampling conducted in years 2014 and 2024 will focus more on determining the presence and status of the target fish species in the Chilhowee tailwater area, <b>as well as any significant changes in the fish community assemblage.</b>”</p>	<p>Section 2.2 has been revised accordingly. See page 8.</p>
<p>Mark Cantrell, USFWS, E-mail Dated August 8, 2005</p> <p>I do not know where best to place a statement to effect coordination immediately prior to sampling so that local biologists could participate, like: “At least one month in advance of actual sampling, the agencies should be contacted with the field schedule and provided the opportunity to assist with the fieldwork.”</p>	<p>The following sentence was added to the end of the first paragraph in Section 2.2. “At least one month in advance of the actual sampling, the Resources Agencies will be contacted about the field schedule and provided an opportunity to assist with the fieldwork.” See page 7.</p>
<p>Mark Cantrell, USFWS, E-mail Dated August 8, 2005</p> <p>In summary, we appreciate the hard work that went into compiling the Plan. With a few recommended changes, the Plan will be a valuable tool to guide sampling at the Chilhowee tailwaters at the Tapoco Project.</p>	<p>Comment noted.</p>
<p>Jim Herrig, USFS, and Lewis Kearney, USFS, E-mail Dated August 10, 2005</p> <p>I reviewed this plan a few weeks ago and found it to be adequate. . . The listed species are unlikely to be detected using any technique. Monitoring for these species will require intensive site specific searches using snorkeling. However, the purpose of this monitoring plan is to detect fish in migration. Suckers will assemble at the base of the dam and should be easily detected during their migration. A ladder could facilitate their migration over the dam. The game fish are even more likely to use a ladder.</p>	<p>Comment noted.</p>