



# FINAL LICENSE APPLICATION

## Volume II of IV

### Part 2 - Consultation Appendix Book 2 of 3

Niagara Hydroelectric Project  
(FERC No. 2466)

February 28, 2022

Prepared by:



Prepared for:



An **AEP** Company

BOUNDLESS ENERGY™

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# Appendix H

Consultation Summary  
Book 2 of 3

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September 1, 2020

To: Attached Section 106 Consultation Distribution List

Subject: **Niagara Hydroelectric Project (FERC No. 2466)  
Consultation Regarding the Area of Potential Effects (APE)**

Dear Sir or Madam:

Appalachian Power Company (Appalachian or Applicant), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the run-of-river 2.4-megawatt (MW) Niagara Hydroelectric Project (Project No. 2466) (Project or Niagara Project), located on the Roanoke River in Roanoke County, Virginia (Figure 1). The Project is located about at approximate river mile 355 on the Roanoke River, approximately 6 miles southeast of the City of Roanoke. The reservoir formed by the Project is approximately 2 miles long and includes the confluence with Tinker Creek.

The existing license for the Project was issued by the Federal Energy Regulatory Commission (FERC or Commission) for a 30-year term, with an effective date of April 4, 1994, and expires February 29, 2024. Accordingly, Appalachian is pursuing a new license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5. Section 106 of the National Historic Preservation Act (Section 106) requires the Commission to take into account the effects of issuing a new license for the continued operation of the Project on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment<sup>1</sup>. Pursuant to the regulations implementing Section 106, Appalachian is consulting with the Virginia State Historic Preservation Officer (SHPO), ACHP, Indian Tribes, and other parties included on the attached Section 106 Consultation Distribution List to determine and document the Area of Potential Effects (APE) for Project relicensing.

## **Background**

Pursuant to the regulations implementing Section 106<sup>2</sup>, the Commission has determined that issuing a new license for the Niagara Project is considered an undertaking with the potential to effect historic properties listed in or eligible for inclusion in the National Register of Historic Places.

Appalachian filed a Pre-Application Document (PAD) and associated Notice of Intent (NOI) with the Commission on January 28, 2019, to initiate the ILP. The Commission issued Scoping Document 1 (SD1) for the Project on March 26, 2019. SD1 was intended to advise resource

<sup>1</sup> 54 United States Code § 306108

<sup>2</sup> 36 C.F.R. Part 800

agencies, Indian tribes, non-governmental organizations, and other stakeholders as to the proposed scope of FERC's Environmental Assessment (EA) for the Project and to seek additional information pertinent to the Commission's analysis.

On April 24 and 25, 2019, the Commission held public scoping meetings in Vinton, Virginia. During these meetings, FERC staff presented information regarding the ILP and details regarding the study scoping process and how to request a relicensing study, including the Commission's study criteria. In addition, FERC staff solicited comments regarding the scope of issues and analyses for the EA. Pursuant to 18 CFR §5.8(d), a public site visit of the Project was conducted on April 24, 2019.

Concurrent with the January 28, 2019, PAD and NOI required by the ILP, Appalachian requested designation as the Commission's non-federal representative for carrying out informal consultation pursuant to Section 106. The Commission granted Appalachian's request by notice dated March 26, 2019. While Appalachian is authorized to consult in an informal capacity, the Commission remains legally responsible for all agency findings and determinations under Section 106.

On November 6, 2019, Appalachian filed a Revised Study Plan (RSP) with the Commission describing the studies that the Licensee is proposing to conduct in support of relicensing the Project, including a Cultural Resources Study. As described in the RSP, Appalachian preliminarily proposed to define the Study Area/APE to include lands within the FERC-approved Project boundary. It also includes any lands outside of the Project Boundary where cultural resources may be affected by Project-related activities that are conducted in accordance with the FERC license.

### **Request for Concurrence**

At this time, Appalachian is seeking concurrence from the Virginia SHPO, Indian Tribes, ACHP, and other parties included on the attached Section 106 Consultation Distribution List regarding the APE as defined above and delineated on the attached map (Figure 1). Appalachian believes that this definition is appropriate, as the APE currently encompasses all lands necessary for Project operations. If the results of consultation or studies conducted in support of relicensing indicate that the Project is having a potential effect on lands outside the APE, or if Appalachian proposes to undertake Project-related activities outside of the proposed APE, Appalachian will consult with the parties on the attached Section 106 Consultation Distribution List to refine the geographic extent of the APE and will provide FERC with consultation documentation.

Appalachian respectfully requests that the consulting parties provide written concurrence regarding the APE presented herein within 30 days of the date of this letter (e.g., on or before October 1, 2020). If there are any questions regarding the proposed APE or the relicensing

process, please do not hesitate to contact me at me at (614) 716-2240 or by email  
jmmagalski@aep.com.

Sincerely,

A handwritten signature in black ink that reads "Jonathan M. Magalski". The signature is written in a cursive style with a prominent initial "J" and "M".

Jonathan M. Magalski  
Environmental Specialist Consultant  
American Electric Power Services Corporation

Attachment: Niagara Hydroelectric Project Section 106 Consultation Distribution List  
Figure 1 – Map of Proposed APE

**Niagara Hydroelectric Project (FERC No. 2466)  
Section 106 Distribution List**

**Federal Agencies**

Mr. John Eddins  
Archaeologist/Program Analyst  
Advisory Council on Historic Preservation  
401 F Street NW, Suite 308  
Washington, DC 20001-2637  
jeddins@achp.gov

Ms. Kimberly Bose  
Secretary  
Federal Energy Regulatory Commission  
888 1st St NE  
Washington, DC 20426

Ms. Catherine Turton  
Architectural Historian, Northeast Region  
US National Park Service  
US Custom House, 3rd Floor  
200 Chestnut Street  
Philadelphia, PA 19106

Mr. Harold Peterson  
Bureau of Indian Affairs  
US Department of the Interior  
545 Marriott Dr, Suite 700  
Nashville, TN 37214  
Harold.Peterson@bia.gov

**State Agencies**

Ms. Julie Langan  
State Historic Preservation Officer  
Virginia Department of Historic Resources  
2801 Kensington Avenue  
Richmond, VA 23221

**Tribes**

Chief Bill Harris  
Catawba Indian Nation  
996 Avenue of the Nations  
Rock Hill, SC 29730

Wenonah Haire  
Tribal Historic Preservation Officer  
Catawba Indian Nation  
1536 Tom Steven Rd.  
Rock Hill, SC 29730

Deborah Dotson  
President  
Delaware Nation  
PO Box 825  
Anadarko, OK 73005

Chief Dean Branham  
Monacan Indian Nation  
PO Box 1136  
Madison Heights, VA 24572

Chief Robert Gray  
Pamunkey Indian Tribe  
1054 Pocahontas Trail  
King William, VA 23086

Chief Richard Sneed  
Eastern Band of Cherokee Indians  
P.O. Box 455  
Cherokee, NC 28719

Elizabeth Toombs  
Tribal Historic Preservation Officer  
Cherokee Nation  
22361 Bald Hill Road  
Tahlequah, OK 74464  
elizabeth-toombs@cherokee.org

**Non-Governmental**

Forrest Morgan  
President  
Archaeological Society of Virginia  
12106 Weyanoke Rd.  
Charles City, VA 23030  
(804) 829-2272

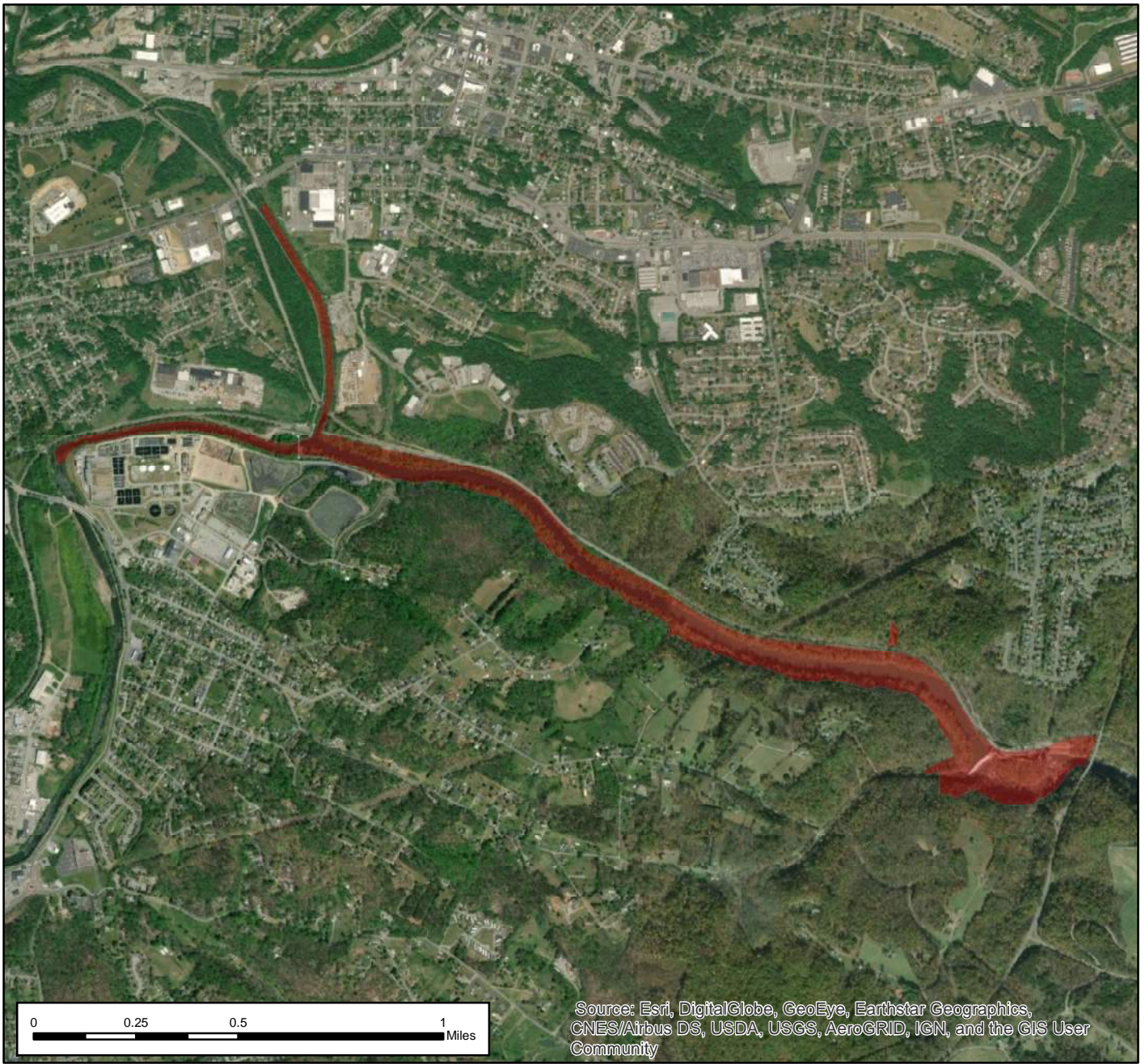
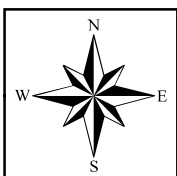
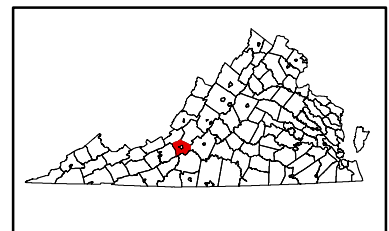


Figure 1. Proposed Niagara Study Area/APE.  
Base Map: ESRI World Imagery.

Proposed Study Area/APE



Project No.	73197282
Date:	August 2020
Drawn By:	BGG
Reviewed By:	BGG

**Terracon**  
521 Clemson Rd. Columbia, SC  
PH. (803) 741-9000 terracon.com

STUDY AREA/APE
NIAGARA HYDROELECTRIC PROJECT ROANOKE COUNTY, VA

Figure
<b>1</b>



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**Subject:** FW: DCR Cave Protection Act Permit for Terracon project  
**Attachments:** 44RN170 Excavation Permit Request 9-8-20.pdf

**From:** Green, William G <Bill.Green@terracon.com>  
**Sent:** Tuesday, September 8, 2020 11:55 AM  
**To:** Orndorff, William <wil.orndorff@dcr.virginia.gov>  
**Cc:** Bulluck, Jason <jason.bulluck@dcr.virginia.gov>; Kirchen, Roger <roger.kirchen@dhr.virginia.gov>; Jonathan M Magalski <jmmagalski@aep.com>; Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>  
**Subject:** RE: DCR Cave Protection Act Permit for Terracon project

**CAUTION: [EXTERNAL]** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning, Wil,

Attached is our request for an excavation permit for archaeological site 44RN170, a rockshelter located along the southern bank of the Roanoke River in Roanoke. If you have any questions about the permit request, please don't hesitate to call or e-mail me. Thank you.

**Bill Green, M.A., RPA # 10387**  
**Principal**  
**Department Manager | Natural and Cultural Resource Services**

**Terracon**  
D (803) 403 1256 | M (803) 354 8126

**From:** Orndorff, William [mailto:wil.orndorff@dcr.virginia.gov]  
**Sent:** Friday, September 4, 2020 1:47 PM  
**To:** Green, William G <Bill.Green@terracon.com>; Bulluck, Jason <jason.bulluck@dcr.virginia.gov>; Kirchen, Roger <roger.kirchen@dhr.virginia.gov>  
**Subject:** DCR Cave Protection Act Permit for Terracon project

Hi Bill,

DCR does not have a formal application for you to complete. We are in the process of developing an online application, as more people seem to be complying with permitting requirements these days, and we appreciate that.

For now, just send me as an email attachment a letter with accompanying map describing what your proposed activities will be. Please include a statement that you will provide us with a summary of your investigations including copies of any photographs or other media. We will need specific location or area, names of cave, and period of performance. Once we have reviewed this, we will issue a letter to you on official DCR letterhead that will serve as your permit. Please note we will also have to get concurrence from Roger Kirchen or the Department of Historic Resources, whom you first contacted.

Thanks again, and I look forward to reviewing your permit request.

Sincerely,

Wil Orndorff



ORIGINAL

American Electric Power  
1 Riverside Plaza  
Columbus, OH 43215  
aep.com

September 1, 2020

To: Attached Section 106 Consultation Distribution List

Subject: **Niagara Hydroelectric Project (FERC No. 2466)**  
**Consultation Regarding the Area of Potential Effects (APE)**

Dear Sir or Madam:

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#### Background

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<sup>1</sup> 54 United States Code § 306108

<sup>2</sup> 36 C.F.R. Part 800



# MONACAN INDIAN NATION

9/16/2020

**AEP**

**Jonathan Magalski  
1 Riverside Plaza  
Columbus, OH 43215**

RE: Request for Consulting Party Status on Niagara Hydroelectric Project, FERC #2466  
(Roanoke, VA)

Dear Mr. Magalski,

Thank you for contacting us regarding the proposed project in Roanoke County, VA.

The Monacan Indian Nation is a federally recognized sovereign tribe, headquartered on Bear Mountain in Amherst County. Citizens of the Nation are descended from Virginia and North Carolina Eastern Siouan cultural and linguistic groups, and our ancestral territory includes Virginia west of the fall line of the rivers, sections of southeastern West Virginia, and portions of northern North Carolina. At this time, the active Monacan consultation areas include:

**Virginia:** Albemarle, Alleghany, Amherst, Appomattox, Augusta, Bath, Bedford, Bland, Buchanan, Buckingham, Campbell, Carroll, Charlotte, Clarke, Craig, Culpepper, Cumberland, Dickenson, Floyd, Fluvanna, Franklin, Frederick, Giles, Goochland, Grayson, Greene, Halifax, Henry, Highland, Lee, Loudoun, Louisa, Madison, Mecklenburg, Montgomery, Nelson, Orange, Page, Patrick, Pittsylvania, Powhatan, Prince Edward, Pulaski, Rappahannock, Roanoke, Rockbridge, Rockingham, Russell, Scott, Shenandoah, Smyth, Tazewell, Warren, Washington, Wise, and Wythe Counties, and all contiguous cities.

**West Virginia:** Greenbrier, Mercer, Monroe, Pendleton, Pocahontas, and Summers Counties.

**North Carolina:** Alamance, Caswell, Granville, Orange, Person, Rockingham, Vance, and Warren Counties.

At this time, the Nation does not wish to actively participate in this consultation project, because:

	This project is outside our ancestral territory
X	The project's impacts are anticipated to be minimal
	The project is more closely related to _____, which should be contacted to participate in consultation
	The tribal office does not currently have the capacity to participate in this project
	Other:





## MONACAN INDIAN NATION

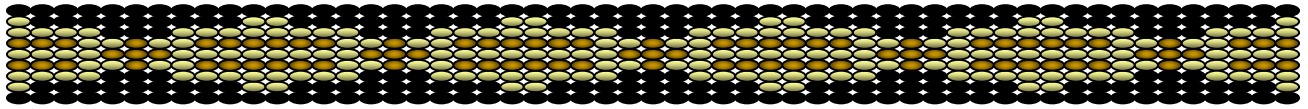
However, the Nation requests to be contacted if:

- Sites associated with native history may be impacted by this project;
- Adverse effects associated with this project are identified;
- Human remains are encountered during this project;
- Unanticipated native cultural remains are encountered during this project;
- Other tribes consulting on this project cease consultation; or
- The project size or scope becomes larger or more potentially destructive than currently described.

Please do not make any assumptions about future consultation interests based on this decision, as priorities and information may change. We request that you send any future consultation communications in electronic form to [TribalOffice@MonacanNation.com](mailto:TribalOffice@MonacanNation.com) AND hard copy to PO Box 960, Amherst, VA 24521. We appreciate your outreach to the Monacan Indian Nation and look forward to working with you in the future.

Respectfully,

  
Chief Kenneth Branham  
Monacan Indian Nation



Catawba Indian Nation  
Tribal Historic Preservation Office  
1536 Tom Steven Road  
Rock Hill, South Carolina 29730

Office 803-328-2427  
Fax 803-328-5791

September 28, 2020

Attention: Jonathan M. Magalski  
Appalachian Power Company  
P.O. Box 2021  
Roanoke, VA 24022

Re. THPO #	TCNS #	Project Description
2020-1169-2		Niagara Hydroelectric Project (FERC No. 2466)

Dear Mr. Magalski,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Rogers at 803-328-2427 ext. 226, or e-mail [Caitlin.Rogers@catawba.com](mailto:Caitlin.Rogers@catawba.com).

Sincerely,

Wenonah G. Haire  
Tribal Historic Preservation Officer



# COMMONWEALTH of VIRGINIA

Matt Strickler  
*Secretary of Natural Resources*

**Department of Historic Resources**  
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan  
*Director*

Tel: (804) 367-2323  
Fax: (804) 367-2391  
[www.dhr.virginia.gov](http://www.dhr.virginia.gov)

October 2, 2020

Mr. Jonathan M. Magalski  
American Electric Power Services Corporation  
1 Riverside Plaza  
Columbus, Ohio 43215

Re: Niagara Hydroelectric Project (FERC No. 2466)  
Roanoke, VA  
DHR File No. 2020 - 0437

Dear Mr. Magalski:

The Department of Historic Resources (DHR) has received your request for review of a proposed area of potential effects (APE) for the run-of-river 2.4-megawatt Niagara Hydroelectric Project (Project) located on the Roanoke River in Roanoke County, Virginia, pursuant to 36 Code of Federal Regulations (CFR) Part 800, Section 106 of the National Historic Preservation Act of 1966, as amended. Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the project. Appalachian is pursuing a new license for the Project pursuant to the Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process, as described in 18 CFR Part 5. The existing FERC license took effect on April 4, 2020 and will expire February 29, 2024.

As described in the Revised Study Plan (RSP) received by our office on September 24, 2020, and echoed in your letter received by our office on September 14, 2020

The APE includes all lands within the Project boundary. The APE also includes any lands outside the Project boundary where cultural resources may be affected by Project-related activities that are conducted in accordance with the FERC license. The Project boundary encompasses all lands that are necessary for Project purposes, all Project-related operations, potential enhancement measures, and routine maintenance activities associated with the implementation of a license issued by the Commission are expected to take place within the Project boundary.

If the results of consultation or studies conducted in support of relicensing indicate that the Project is having a potential effect on lands outside the APE, or if Appalachian proposes to undertake Project-related activities outside of the proposed APE, Appalachian will consult with the parties on the attached Section 106 Consultation Distribution List to refine the geographic extent of the APE and will provide FERC with consultation documentation.

Western Region Office  
962 Kime Lane  
Salem, VA 24153  
Tel: (540) 387-5443  
Fax: (540) 387-5446

Northern Region Office  
5357 Main Street  
PO Box 519  
Stephens City, VA 22655  
Tel: (540) 868-7029  
Fax: (540) 868-7033

Eastern Region Office  
2801 Kensington Avenue  
Richmond, VA 23221  
Tel: (804) 367-2323  
Fax: (804) 367-2391

Based on these statements and our review of the information provided, DHR concurs with the proposed definition of the APE.

The RSP states that an architectural survey is not proposed within the APE since the Project has previously been determined to be ineligible for the National Register of Historic Places. Given that almost 30 years has passed since the Niagara Power Station/Dam (DHR ID No. 080-0095) was recommended not eligible for listing in 1991, DHR recommends that the resource's eligibility be reevaluated. DHR also recommends consideration of the Norfolk Southern/The Virginian Railway (DHR ID No. 128-6160), determined potentially eligible for NRHP listing in 2008 and located adjacent to the western portion of the APE, as well as the unevaluated bridge (DHR ID No. 080-5161-0084) spanning the Roanoke River just east of the APE, a contributing resource to the Blue Ridge Parkway Historic District (DHR ID No. 080-5161).

Thank you for contacting our office and we look forward to continuing consultation regarding this project. If you have any questions regarding these comments, please do not hesitate to contact me at 804-482-6103 or email [Tim.Roberts@dhr.virginia.gov](mailto:Tim.Roberts@dhr.virginia.gov).

Sincerely,



Timothy Roberts, Archaeologist  
Review and Compliance Division



## PAMUNKEY INDIAN TRIBE

Terry Clouthier  
Cultural Resource  
Director

TRIBAL GOVERNMENT  
*Tribal Office*

1054 Pocahontas Trail  
King William, VA 23086

(804) 843-2109  
FAX (866) 422-3387

THPO File Number: 2021-20

Date: 10/05/2020

Johnathan M. Magalski  
Environmental Specialist Consultant  
Appalachian Power  
American Electric Power Services Corporation  
1 Riverside Plaza  
Columbus, Ohio 43215

### **RE: (FERC No. 2466) Niagara Hydroelectric Project, Roanoke, Virginia**

Dear Mr. Magalski,

Thank you for contacting the Pamunkey Indian Tribe regarding the proposed undertaking related to reissuing the license for Niagara Hydroelectric Project in Roanoke, Virginia. My office offers the following comments.

My office agrees with the delineated area of potential effect (APE) to address cultural and historic properties.

My office looks forward to reviewing these cultural studies once they are completed.

Thank you for considering our cultural heritage in your decision-making process.

Please submit all correspondence via email whenever possible to the email below.

If you have any questions feel free to email me at [terry.clouthier@pamunkey.org](mailto:terry.clouthier@pamunkey.org).

Sincerely,

---

**Subject:** FW: Niagara Hydroelectric Project (VA) -- Filing of ILP Study Progress Report  
**Attachments:** Niagara Second Quarterly Progress Report.pdf

**From:** Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>

**Sent:** Tuesday, October 27, 2020 5:29 PM

**To:** ACHP - John Eddins <jeddins@achp.gov>; County of Roanoke - David Henderson <dhenderson@roanokecountyva.gov>; County of Roanoke - David Weir <dweir@roanokecountyva.gov>; County of Roanoke - Lindsay Webb <LWEBB@roanokecountyva.gov>; County of Roanoke - Richard Caywood <rcaywood@roanokecountyva.gov>; Friends of the Blue Ridge Parkway - Audrey Pearson <audrey\_pearson@friendsbrp.org>; Friends of the Roanoke - Bill Tanger <bill.tanger@verizon.net>; Harold Peterson <harold.peterson@bia.gov>; Kevin Colburn - American Whitewater (kevin@americanwhitewater.org) <kevin@americanwhitewater.org>; Roanoke County Parks - Doug Blount <dblount@roanokecountyva.gov>; Roanoke River Blueway <roanokeriverblueway@gmail.com>; Roanoke Valley Alleghany Regional Commission - Amanda McGee <amcgee@rvarc.org>; Roanoke Valley Greenway - Liz Blecher <liz.belcher@greenways.org>; Smith Mountain Lake Assn - Lorie Smith <TheOffice@SMLAssociation.org>; Town of Vinton - Anita McMillan <amcmillan@vintonVA.gov>; Town of Vinton - Bo Herndon <wherndon@vintonVA.gov>; Town of Vinton - Joey Hiner <jhiner@vintonVA.gov>; Town of Vinton - Kenny Sledd <ksledd@vintonVA.gov>; Tri-County Lakes Administrative Commission - Paula Shoffner <paulas@sml.us.com>; VADEQ - Brian McGurk <Brian.McGurk@deq.virginia.gov>; USEPA - Matthew Lee <lee.matthew@epa.gov>; USFWS <richard\_mccorkle@fws.gov>; USFWS - John McCloskey <John\_mccloskey@fws.gov>; USGS - Mark Bennett <mrbennet@USGS.gov>; VA Cooperative Fish and Wildlife Research Unit - Paul Angermeier <biota@vt.edu>; VADCR - Lynn Crump <lynn.crump@dcr.virginia.gov>; VADCR - Natural Heritage <nhrefview@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADEQ - Andrew Hammond <andrew.hammond@deq.virginia.gov>; VADEQ - Anthony Cario <anthony.cario@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; VADEQ - Scott Kudlas <scott.kudlas@deq.virginia.gov>; Virginia Council on Indians - Emma Williams <emma.williams@governor.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; Virginia Department of Game and Inland Fisheries - Scott Smith <scott.smith@dgif.virginia.gov>

**Cc:** Yayac, Maggie <Maggie.Yayac@hdrinc.com>; 'ebparcell@aep.com' <ebparcell@aep.com>; 'jmmagalski@aep.com' <jmmagalski@aep.com>

**Subject:** Niagara Hydroelectric Project (VA) -- Filing of ILP Study Progress Report

Niagara Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Niagara Hydroelectric Project (FERC No. 2466) (Project) located on the Roanoke River in Roanoke County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Pursuant to the ILP, Appalachian filed the second ILP Study Progress Report with the Commission today. We are notifying stakeholders and distributing an electronic copy of this submittal (attached). The filing can also be viewed online at FERC's eLibrary at and will be added to the Project's public relicensing website (<http://www.aephydro.com/HydroPlant/Niagara>) in the coming days.

Thank you for your continued attention to this Project and for your understanding as we navigated a challenging field season. Should you have any questions regarding this filing, please contact Jon Magalski with AEP at (614) 716-2240 or [jmmagalski@aep.com](mailto:jmmagalski@aep.com).

Thank you,

**Sarah Kulpa**



October 27, 2020

***VIA ELECTRONIC FILING***

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

**Subject: Niagara Hydroelectric Project (FERC No. 2466-034)  
Second Quarterly Study Progress Report**

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Applicant), a unit of American Electric Power (AEP) is the Licensee, owner, and operator of the run-of-river 2.4 megawatt (MW) Niagara Hydroelectric Project (Project No. 2466) (Project or Niagara Project), located on the Roanoke River in Roanoke County, Virginia. The Project is currently undergoing relicensing following the Federal Energy Regulatory Commission's (FERC's or Commission's) Integrated Licensing Process (ILP).

On July 27, 2020, Appalachian filed with FERC the First Quarterly Study Progress Report, an Updated ILP Study Schedule, and a Request for Extension of Time to file the Initial Study Report. On August 10, 2020, FERC approved this request. As established by the Updated ILP Study Schedule filed on July 27, the Roanoke Logperch Larval Study (a component of the Fish Community Study) and the Wetland, Riparian, and Littoral Habitat Characterization and Shoreline Stability Assessment Studies are scheduled for 2021.

As proposed in Appalachian's November 6, 2019 Revised Study Plan (RSP) and approved in the Commission's December 6, 2019 Study Plan Determination (SPD), Appalachian hereby files the Second Quarterly Study Progress Report for the Project. This progress report describes the activities performed since the First Quarterly Study Progress Report and in quarter 3 (Q3) of 2020, as well as ILP activities generally expected to be conducted in quarter 4 (Q4) of 2020. Unless otherwise described, all relicensing studies are being conducted in conformance with the approved RSP and the Commission's SPD.

## **General Updates**

- As authorized by FERC order dated September 2, 2020, Appalachian is in the process of replacing the existing bottom-hinged, leaf type gate and hoist system in the Project's sluice structure with a bottom-hinged, inflatable Obermeyer (pneumatically actuated) gate and operating system. The existing gate hoist system has been inoperable in 2020 and was maintained in an open position to provide a flow of at least 50 cfs (the required minimum flow for periods when the powerhouse is not generating) at all times. The gate replacement project was originally scheduled for completion in September 2020. The gate replacement project has encountered construction delays associated with the dewatering method for the sluice gate structure and is currently scheduled for completion by mid-November 2020.
- The Q3 field sampling efforts were impacted by periodic heavy storm events which resulted in prevailing high base flow conditions in the Roanoke River watershed. This was further influenced by Hurricane Sally. The study-specific protocols for sampling fish, mussels, and benthic macroinvertebrate communities (referenced in the RSP) provide guidance on establishing the appropriate target flow scenarios to support sampling efforts in a way that is safe and that will result in quality, representative data. The timing and frequency of the storm events resulted in high flow scenarios delaying field crews. Schedule deviations for the individual studies are discussed below in the study specific Q3 progress updates.
- In Q4 2020, data from the on-going field work and studies will be analyzed and summarized in support of the Initial Study Report (ISR) to be filed with FERC on January 11, 2021.

## **Flow and Bypass Reach Aquatic Habitat Study**

- Desktop aquatic habitat/substrate mapping is complete.
- Hydraulic model development progress:
  - Preliminary terrain mesh has been developed.
  - Habitat Suitability Index curves and information for the guilds have been compiled for future incorporation into the model.
- Field verification of desktop aquatic habitat/substrate mapping, bypass reach test flows, and particle size distribution assessments will be conducted after the sluice gate replacement project is complete as these activities require controlled flows in the bypass reach (via the sluice gate). The sluice gate replacement project is currently scheduled to be completed in Q4 2020, however, higher inflows typically occur over the winter and early



spring months which will likely result in postponement of field activities associated with this study until early-summer 2021. Model development is then expected to be completed in Q3 2021.

- Appalachian plans to consult with the applicable agencies at the ISR meeting to review proposed test flow scenarios that will be used to support model calibration and validation activities.

### **Water Quality Study**

- Water quality instruments (i.e., dissolved oxygen [DO] and water temperature sondes) and level loggers were deployed at the locations identified in the RSP the week of July 27, 2020.
- Data from these instruments were subsequently downloaded on four separate occasions, generally every two to three weeks. Due to instrument malfunction, data was not captured from August 12-26, 2020.
- As proposed in the RSP, water quality data downloads were to occur on a monthly basis; however, significant biofouling was observed at the instruments located in the reservoir downstream from Tinker Creek. Data download and instrument maintenance frequency was modified to a two-week interval; however, the biofouling has resulted in several additional time periods where continuous water quality data is not available at this location.
- During instrument downloads, instantaneous water quality measurements were collected using a handheld multi-parameter data sonde (i.e., hydrolab). The instantaneous water quality data will be used to corroborate and/or adjust data collected by the continuous water quality data sondes.
- Water quality data collection as described in the RSP is scheduled to continue through the end of October 2020, at which time data from the instruments will be downloaded and the instruments will be demobilized from the Project.

### **Fish Community Study**

- Field data collection for the general fish community study was initiated in September 2020 with all but three sites being completed before sampling was interrupted due to increasing precipitation in the watershed. The fish community study sampling was completed the week of October 19, 2020 after flows returned to targeted levels and allowed for safe collection of representative samples.
- The adult and young-of-year Roanoke Logperch sampling effort was postponed to September 2020 as established by the updated ILP study schedule. This field data

collection was further delayed due to high stream flows resulting in unsafe sampling conditions. In addition to safety concerns, these higher level base flows resulted in unfavorable habitat conditions. As such, the Roanoke Logperch sampling effort for adult and young-of-year will be rescheduled to 2021. With this change in schedule, each of the life stage-specific sampling efforts for Roanoke Logperch will be performed in 2021, thus providing a data set that is representative of a full Roanoke Logperch reproduction and recruitment in 2021.

- Data compilation is underway for the desktop impingement and entrainment evaluation. Weather and flow conditions and powerhouse operating conditions have delayed the confirmation of the intake velocities originally scheduled for completion in Q3 2020. An attempt will be made to measure intake velocities in Q4 2020 (November), if conditions allow; if the measurement cannot be taken within the remaining field season the measurements will be rescheduled to as soon as practical in 2021. Intake velocities will be analyzed and support the final impingement and entrainment evaluation.
- Appalachian will initiate the Blade Strike Analysis using the most recent version of the model provided by USFWS and will also incorporate available historical information. The analysis and preliminary reporting will be performed in Q4 based on available information. A tentative list of species to be used in the analysis will be noted in the ISR and will include historical data and results of the fish community study in 2020. The final results and report will be developed in 2021 once all site-specific data is gathered, processed, and verified.

### **Benthic Aquatic Resources Study**

- Field data collection for the macroinvertebrate and crayfish community study began in September 2020 but was interrupted due to increasing precipitation and stream flows. Once stream flows returned to a more acceptable range (allowing for safe in stream work and collection of representative samples), sampling was reinitiated and sampling at the remaining macroinvertebrate and crayfish community study sites were completed on October 5, 2020.
- Field data collection for the mussel community study was completed for all proposed sites between October 6 and October 9, 2020. The majority of the Project exhibited limited mussel habitat as the surveyed habitats consist predominantly of boulder and bedrock substrates. The survey efforts collected a total of 4 Eastern elliptio (*Elliptio complanata*); two were collected in Tinker Creek, and two were collected at the most upstream site near the wastewater treatment plant on the Roanoke River. No other live or relic mussel specimens were observed during the survey efforts.

## **Recreation Study**

- The Recreation Visitor Use Online Survey is on-going and will continue into Q4 2020.
  - From April to September 2020 there have been 118 visitors at recreation sites within the Niagara Project area who completed this survey, with a decrease in response rates over the past few months. Canoeing/kayaking has been documented as the primary activity.
- On September 5, 2020, pictures and videos were captured of the spillway and bypass reach to support the Aesthetic Flow Documentation. A final aesthetic site visit is scheduled to be conducted in Q4 2020, under minimum flow (i.e., 8 cfs in the bypass reach) conditions, if feasible.
- Due to travel and in-person meeting restrictions this fall and winter, Appalachian plans to convene with stakeholders to discuss existing and future recreational opportunities in Q1 2021.

## **Cultural Resources Study**

- Consultation letters requesting concurrence from the Virginia State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation, Indian Tribes, and other parties to determine and document the Area of Potential Effects (APE) for Project relicensing were transmitted via email and mail on September 1, 2020 with responses requested with 30 days of receipt. To date, Appalachian has received responses from the Virginia SHPO, Catawba Indian Nation, Monacan Indian Nation and Pamunkey Indian Tribe who concurred with the definition of the APE. The Virginia SHPO additionally commented they would like additional features within the APE to be evaluated as part of this study.
- The Archeological Phase I Reconnaissance Survey (field effort) of the APE was substantively completed the week of October 12, 2020.

If there are any questions regarding this progress report, please do not hesitate to contact me at (614) 716-2240 or via email at [jmmagalski@aep.com](mailto:jmmagalski@aep.com)

Sincerely,

A handwritten signature in black ink, reading "Jonathan M. Magalski". The signature is written in a cursive style with a prominent initial "J" and "M".

Jonathan M. Magalski  
Environmental Specialist Consultant  
American Electric Power Services Corporation

# Niagara Hydroelectric Project (FERC No. 2466) Distribution List

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*The Delaware Nation*  
**Historic Preservation Department**  
31064 State Highway 281  
Anadarko, OK 73005  
Phone (405)247-2448

November 9, 2020

To Whom It May Concern:

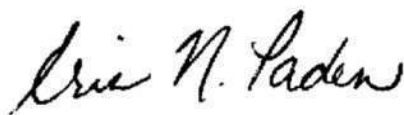
The Delaware Nation Historic Preservation Department received correspondence regarding the following referenced project(s).

**Project(s): Niagara Hydroelectric Project (FERC No. 2466)**

Our office is committed to protecting tribal heritage, culture and religion with particular concern for archaeological sites potentially containing burials and associated funerary objects.

The Lenape people occupied the area indicated in your letter prior to European contact until their eventual removal to our present locations. According to our files, the location of the proposed project does not endanger cultural, or religious sites of interest to the Delaware Nation. **Please continue with the project as planned** keeping in mind during construction should an archaeological site or artifacts inadvertently be uncovered, all construction and ground disturbing activities should immediately be halted until the appropriate state agencies, as well as this office, are notified (within 24 hours), and a proper archaeological assessment can be made.

Please note the Delaware Nation, the Delaware Tribe of Indians, and the Stockbridge Munsee Band of Mohican Indians are the only Federally Recognized Delaware/Lenape entities in the United States and consultation must be made only with designated staff of these three tribes. We appreciate your cooperation in contacting the Delaware Nation Historic Preservation Office to conduct proper Section 106 consultation. Should you have any questions, feel free to contact our offices at 405-247-2448 ext. 1403.



Erin Paden  
Director of Historic Preservation  
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Ph. 405-247-2448 ext. 1403  
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---

**Subject:** FW: AEP Niagara Hydroelectric Project - Proposed Date for ISR Meeting

**From:** Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>

**Sent:** Wednesday, December 2, 2020 11:30 AM

**To:** USFWS - John McCloskey <John\_mccloskey@fws.gov>; USFWS <richard\_mccorkle@fws.gov>; Virginia Department of Game and Inland Fisheries - Scott Smith <scott.smith@dgif.virginia.gov>; Brian McGurk <brian.mcgurk@deq.virginia.gov>; VA Cooperative Fish and Wildlife Research Unit - Paul Angermeier <biota@vt.edu>

**Cc:** 'ebparcell@aep.com' <ebparcell@aep.com>; 'jmmagalski@aep.com' <jmmagalski@aep.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>; John Spaeth <jpspaeth@edge-es.com>; Jon Studio <jastudio@edge-es.com>; Frank Simms <fmsimms51@gmail.com>; 'Allyson Conner (allyson.conner@ferc.gov)' <allyson.conner@ferc.gov>

**Subject:** AEP Niagara Hydroelectric Project - Proposed Date for ISR Meeting

Good afternoon,

I hope you all had a restful and safe Thanksgiving holiday. Pursuant to the ILP schedule, on or by January 11, 2021 Appalachian Power Company plans file the Initial Study Report (ISR) for the Niagara Hydroelectric Project (FERC Project No. 2466). Within 15 days of filing the ISR, Appalachian Power Company is required to have a ISR meeting.

We are planning to virtually host the Niagara ISR meeting on Thursday, January 21, 2021 from 10:00 a.m. - 3:00 p.m. (approx.) with a 30-minute break for lunch. As key stakeholders, we would like to confirm your availabilities so that we can consider making any scheduling adjustments. Once the date is confirmed, a more detailed schedule including proposed times for individual studies will be distributed with the ISR.

Please let me know if you have any unavoidable conflicts with the proposed day or timeframe by December 9<sup>th</sup>, so we can try to adjust.

Thank you,

**Sarah Kulpa**  
*Project Manager*


**HDR**  
440 S. Church Street, Suite 900  
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**D** 704.248.3620 **M** 315.415.8703  
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[hdrinc.com/follow-us](https://hdrinc.com/follow-us)

**Subject:**


FW: Roanoke Loggerch Take Application

Federal Permit Application

 Jon Studio  
To: permitsR3ES@fws.gov; carlita\_payne@fws.gov  
Cc: John Spaeth

 Reply  Reply All  Forward 

Tue 12/22/2020 2:05 PM


 Jon Studio 3-200-59 Application Package.pdf 2 MB  
 Jon Studio 3-200-59 Application Fee.pdf 876 KB

To whom it may concern:

My name is Jon Studio and I am applying for a Federal Permit in my name as I am currently permitted under Dr. Virgil Brack of Environmental Solutions & Innovations, Inc. (ESI) (Permit TE02373A-14). All required application documents are attached (Jon Studio 3-200-59 Application Package) along with payment in the amount \$100 (Jon Studio 3-200-59 Application Fee) to cover the new permit application processing fee. Additionally, a hard copy of the application package and check have been mailed to the Region 3 Endangered Species Permit Office in Bloomington, MN. Please let me know if you have any questions or require additional information.

Thank you,

**JON A. STUDIO**  
Avon, Ohio  
M: 440.413.4609  
[edge-es.com](http://edge-es.com)



**Proof of Delivery**

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

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0.80 LBS

**Service**  
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12/23/2020

**Delivered On**  
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**Delivered To**  
MINNEAPOLIS, MN, US

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UPS

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-Jon  
M: 440.413.4609  
[edge-es.com](http://edge-es.com)

FEDERAL ENERGY REGULATORY COMMISSION

Washington, DC 20426

December 22, 2020

OFFICE OF ENERGY PROJECTS

Project No. 2466-034 – Virginia  
Niagara Hydroelectric Project  
Appalachian Power Company

VIA FERC Service

**Subject: Scoping Document 3 for the Niagara Hydroelectric Project, P-2466-034**

To the Party Addressed:

The Federal Energy Regulatory Commission (Commission) is currently reviewing the Pre-Application Document submitted by Appalachian Power Company (Appalachian) for relicensing the Niagara Hydroelectric Project (FERC No. 2466) (Niagara Project). The project is located on the Roanoke River, in Roanoke County, Virginia. The project does not occupy federal land.

Under the Integrated Licensing Process, Appalachian must file its preliminary licensing proposal or draft license application by October 1, 2021. The final license application must be filed with the Commission by February 28, 2022, two years before the license expires.

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, Commission staff intends to prepare an environmental assessment (EA) or an Environmental Impact Statement (EIS), which will be used by the Commission to determine whether, and under what conditions, to issue a new license for the project. To support and assist our environmental review, we are conducting scoping to ensure that all pertinent issues are identified and analyzed, and that the NEPA document is thorough and balanced.

Our preliminary review of the scope of environmental issues associated with the proposed relicensing of the Niagara Project was described in Scoping Document 1 (SD1), issued March 26, 2019. We requested comments on SD1, conducted an environmental site review, and held scoping meetings on April 24 and 25, 2019, to hear the views of all interested agencies and entities on the scope of issues that should be addressed in the NEPA document. Based on the meetings and the submission of written comments, we updated SD1 and issued SD2 on July 9, 2019.

The Council on Environmental Quality (CEQ) issued a final rule on July 15, 2020, revising the regulations under 40 C.F.R. Part 1500-1518 that federal agencies use to implement NEPA (see Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act, 85 Fed. Reg. 43,304). The Final Rule became effective on and applies to any NEPA process begun after September 14, 2020. An agency may also apply the regulations to ongoing activities and environmental documents begun before September 14, 2020, which includes the Niagara Project. Commission staff intends to conduct its NEPA review in accordance with CEQ's new regulations. Therefore, we have updated SD2, accordingly. SD3 reflects our current view of issues and alternatives to be considered in the NEPA document. ***Key changes from SD2 to SD3 are identified in bold, italicized type.***

SD3 is being distributed to the Commission's official mailing list (see section 7.0 of the attached SD3). If you wish to be added to, or removed from, the Commission's official mailing list, please send your request by email to [ferconlinesupport@ferc.gov](mailto:ferconlinesupport@ferc.gov). In lieu of an email request, you may submit a paper request. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street, N.E., Room 1A, Washington, DC, 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkens Avenue, Rockville, Maryland 20852. All written or emailed requests must specify your wish to be removed from or added to the mailing list and must clearly identify the following on the first page: **Niagara Hydroelectric Project No. 2466-034.**

You may also register online at <http://www.ferc.gov/docs-filing/esubscription.asp> to be notified via email of new filings and issuances related to this or other pending projects. For assistance, please contact FERC Online Support at [ferconlinesupport@ferc.gov](mailto:ferconlinesupport@ferc.gov).

The enclosed SD3 supersedes SD2. SD3 is issued for informational use by all interested parties; no response is required. If you have any questions about SD3, the scoping process, or how Commission staff will develop the NEPA document for this project, please contact Allyson Conner at [allyson.conner@ferc.gov](mailto:allyson.conner@ferc.gov) or (202) 502-6082. Additional information about the Commission's licensing process and the Niagara Project may be obtained from our website ([www.ferc.gov](http://www.ferc.gov)) or Appalachian's licensing website, [www.aephydro.com](http://www.aephydro.com).

Enclosure: Scoping Document 3

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SCOPING DOCUMENT 3  
NIAGARA HYDROELECTRIC PROJECT  
VIRGINIA  
PROJECT NO. 2466-034



Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Hydropower Licensing  
Washington, DC

DECEMBER 2020

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# SCOPING DOCUMENT 3

## Niagara Hydroelectric Project, No. 2466-034

### 1.0 INTRODUCTION

The Federal Energy Regulatory Commission (Commission or FERC), under the authority of the Federal Power Act (FPA),<sup>1</sup> may issue licenses for terms ranging from 30 to 50 years for the construction, operation, and maintenance of non-federal hydroelectric projects. On January 28, 2019, Appalachian Power Company (Appalachian) filed a Pre-Application Document (PAD) and Notice of Intent to seek a new license for the Niagara Hydroelectric Project, FERC Project No. 2466 (Niagara Project or project).<sup>2</sup>

The Niagara Project is located on the Roanoke River in Roanoke County, Virginia. The average annual generation from 2010 to 2014 of the project was 8,853 megawatt-hours (MWh).

A detailed description of the project is provided in section 3.0. The location of the project is shown in figure 1. The Niagara Project does not occupy federal land.

The National Environmental Policy Act (NEPA) of 1969,<sup>3</sup> the Commission's regulations, and other applicable laws require that we independently evaluate the environmental effects of relicensing the Niagara Project as proposed, and also consider reasonable alternatives to the licensee's proposed action.<sup>4</sup> *We will prepare either an environmental assessment (EA) or an Environmental Impact Statement (EIS) that describes and evaluates the probable effects, if any, of the proposed action and*

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<sup>1</sup> 16 U.S.C. § 791(a)-825(r) (2012).

<sup>2</sup> The current license for the Niagara Project was issued on March 25, 1994, and expires on February 29, 2024.

<sup>3</sup> National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4370(f) (2012).

<sup>4</sup> *The Council on Environmental Quality (CEQ) issued a final rule on July 15, 2020, revising the regulations under 40 C.F.R. Parts 1500 – 1518 that federal agencies use to implement NEPA (see Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act, 85 Fed. Reg. 43,304). The Final Rule became effective on and applies to any NEPA process begun after September 14, 2020. An agency may also apply the regulations to ongoing activities and environmental documents begun before September 14, 2020, which includes the Niagara Project. Commission staff intends to conduct its NEPA review in accordance with CEQ's new regulations.*

alternatives. The *Commission's* scoping process will *help determine the required level of analysis and* satisfy the NEPA scoping requirements, irrespective of whether the Commission *prepares* an EA or an EIS.



Figure 1. Location of the project. (Source: Appalachian).

## 2.0 SCOPING

Scoping Document 3 (*SD3*) is intended to advise all participants as to the proposed scope of the *NEPA document*. This document contains: (1) a description of the scoping process and *current processing* schedule for the *license application*; (2) a description of the proposed action and alternatives; (3) a preliminary identification of environmental issues; and (4) a preliminary list of comprehensive plans that are applicable to the project.

### 2.1 PURPOSES OF SCOPING

Scoping is the process used to identify issues, concerns, and opportunities for enhancement or mitigation associated with a proposed action. In general, scoping should be conducted during the early planning stages of a project. The purposes of the scoping process are as follows:

- invite participation of federal, state, and local resource agencies, Indian tribes, non-governmental organizations (NGOs), and the public to identify significant environmental and socioeconomic issues related to the proposed project;
- determine the resource issues, depth of analysis, and significance of issues to be addressed in the *NEPA document*;
- identify reasonable alternatives to the proposed action that should be evaluated in the *NEPA document*;
- solicit, from participants, available information on the resources at issue, including existing information and study needs; and
- determine the resource areas and potential issues that do not require detailed analysis during review of the project.

### 2.2 COMMENTS, SCOPING MEETINGS, AND ENVIRONMENTAL SITE REVIEW

Commission staff issued Scoping Document 1 (*SD1*) on March 26, 2019, to enable resource agencies, Indian tribes, NGOs, and the public to more effectively participate in and contribute to the scoping process. In *SD1*, we requested clarification of the preliminary issues concerning the project and identification of any new issues that needed to be addressed in the *NEPA document*. We revised *SD1* following the scoping meetings, environmental site review, and review of written comments filed during the scoping comment period, which ended May 25, 2019.

We conducted scoping meetings in Roanoke, Virginia on April 24 and 25, 2019, and an environmental site review was conducted on April 24, 2019, to identify potential resource issues associated with the Niagara Project. The scoping meetings and environmental site review were noticed in local newspapers and the Federal Register. A court reporter recorded and transcribed oral comments made during both scoping meetings.

In addition to oral comments received at the scoping meetings, written comments were filed by the following entities:

<u>Commenting Entity</u>	<u>Filing Date</u>
Tri-County Lakes Administrative Commission	May 22, 2019
Federal Energy Regulatory Commission	May 22, 2019
U.S. Environmental Protection Agency	May 23, 2019
Roanoke Valley Greenway Commission	May 23, 2019
U.S. Department of the Interior, National Park Service	May 24, 2019
Virginia Department of Environmental Quality	May 24, 2019
Virginia Department of Game and Inland Fisheries	May 24, 2019
Town of Vinton	May 24, 2019
Dr. Paul Angermeier, Virginia Tech	May 24, 2019
U.S. Department of the Interior, Fish and Wildlife Service	May 28, 2019
Roanoke County	May 28, 2019
Roanoke River Blueway Committee	May 28, 2019

***On July 9, 2019, we issued SD2, which presented our view of issues and alternatives to be considered in the NEPA document based on comments received during scoping.***

***As discussed above, CEQ subsequently issued a final rule on July 15, 2020, revising the regulations under 40 C.F.R. Parts 1500 – 1518 that federal agencies use to implement NEPA. The revised regulations repealed the definition of cumulative effects and provided a new definition for effects to be considered in the environmental analysis. Accordingly, we have revised SD2 to address comments related to cumulative impacts and removed the discussion of cumulative effects from section 4.0, consistent with CEQ’s revised regulations.***

All comments received are part of the Commission’s official record for the project. ***Information in the official file is available for review on the Commission’s website at <http://www.ferc.gov> using the “eLibrary” link. At this time, the Commission has suspended access to the Commission’s Public Reference Room due to the proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID-19) issued by the President on March 13, 2020. For assistance,***



*please contact FERC at [FERCOnlineSupport@ferc.gov](mailto:FERCOnlineSupport@ferc.gov), (866) 208-3676 (toll free), or (202) 502-8659 (TTY).*

### 2.2.1 Issues Raised During Scoping

The issues raised by participants in the scoping process are summarized below. The summaries do not include every oral or written comment made during the scoping process.

#### General Comments

*Comment:* U.S. Fish and Wildlife Service (FWS) requests additional information on the existing project facilities, specifically the bar-spacing on the trash racks, the intake velocity within one foot of the trash racks, and more details pertaining to the turbines (e.g., runner diameter, rated speed, number of blades).

*Response:* As stated in section 4.3.5 of the PAD, the steel trashracks have 3.625-inch bar spacing. Section 5.4.2.1 of the PAD indicates that forebay intake velocities were calculated as part of an entrainment study for the previous re-licensing and ranged from 0.9 to 1.2 feet per second (Appalachian Power Company 1991).<sup>5</sup> Details on the vertical shaft Francis units can be found in section 4.3.9 of the PAD.

#### Cumulative Effects

*Comment:* FWS requests that cumulatively affected resources include the Roanoke logperch (*Percina rex*).

*Response:* ***In SD2, we stated that the cumulative “effects of continued project operation and maintenance on the federally listed...Roanoke logperch” would be analyzed. As discussed above, however, we have removed the discussion of cumulative effects from section 4.0 of SD3 to be consistent with CEQ’s revised NEPA regulations. Commission staff will consider and evaluate effects from the proposed action and alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives. As noted below in section 4.0, Scope of Resource Issues, the environmental analysis will include an assessment of the effects of continued project operation on Roanoke logperch.***

*Comment:* In SD1, staff identified water quality and aquatic habitat as resources that could be cumulatively affected by the continued operation and maintenance of the Niagara Project in combination with other hydroelectric projects and activities in the

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<sup>5</sup> Appalachian Power Company. 1991. Application for License for Major Water Power Project 5 Megawatts or Less (Project no. 2466). Virginia.

Roanoke River. FWS requests that cumulatively affected resources include diadromous fish due to the presence of multiple, stacked hydropower projects on the Roanoke River that have collectively inhibited fish migration. FWS states that barriers to fish migration have affected the dispersal of mussels throughout the Roanoke River.

***Response: In SD2, we stated that, “we have modified sections 4.1.1 and 4.2.2 to include diadromous fishes as resources that could be cumulatively affected by the continued operation of the Niagara Project in combination with other hydropower projects on the Roanoke River.” As discussed above, however, we have removed the discussion of cumulative effects from section 4.0 of SD3 to be consistent with CEQ’s revised NEPA regulations. Commission staff will consider and evaluate effects from the proposed action and alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives. As noted below in section 4.0, Scope of Resource Issues, the environmental analysis will include an assessment of the effects of continued project operation and maintenance on the movement of diadromous fish species (e.g., American eel).***

***Comment:*** FWS requests that the geographic scope of the cumulative effects analysis on aquatic habitat and water quality be expanded downstream to the first hydropower project dam encountered on the river (Roanoke Rapids). FWS states that the nature of multiple stacked hydropower projects on the Roanoke River has caused cumulative impacts on aquatic resources. The series of dams prevent upstream passage of American eel and other migratory fishes, and subjects them to entrainment and impingement during downstream migration. Restricted eel migration has led to diminished freshwater mussel populations and reduced water quality throughout the Roanoke River. Further, FWS states that with dam construction, large stretches of riverine habitat (including run and riffle habitats) have been converted to lacustrine conditions, eliminating habitat for the endangered Roanoke logperch. FWS believes the dams have contributed to the physical and genetic isolation of logperch populations.

***Response: In SD2, staff stated that, “we have modified the geographic scope for the cumulative effects analysis of diadromous fish and aquatic habitat in section 4.1.2 to extend downstream to the Roanoke Rapids Dam.” As discussed above, however, we have removed the discussion of cumulative effects from section 4.0 of SD3 to be consistent with CEQ’s revised NEPA regulations. Commission staff will consider and evaluate effects from the proposed action and alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives.***

### Aquatic Resources

Comment: Several commenters express concern about the adequacy of the existing minimum flow requirement of 8 cubic feet per second (cfs) to support aquatic resources in the bypassed reach of the Roanoke River at the Niagara Dam.

Response: In section 4.2.2 of SD1, staff indicated that the *NEPA document* would evaluate the effects of project operation, including the existing minimum flow requirement, on fish and aquatic habitat downstream of the project and in the bypassed reach. Therefore, no changes have been made to SD2 *or* SD3.

Comment: FWS, Virginia Department of Game and Inland Fisheries (Virginia DGIF), and Virginia Department of Environmental Quality (Virginia DEQ) request that the *NEPA document* account for project effects on freshwater mussels.

Response: We modified a bullet in section 4.2 of this document to indicate that the *NEPA document* will consider the effects of project operation and maintenance on freshwater mussels.

### Threatened and Endangered Species

Comment: FWS states that additional state and federally listed mussel species have the potential to occur in the project area, including Atlantic pigtoe (*Fusconaia masoni*, state threatened and proposed federally threatened), green floater (*Lasmigona subviridis*, state threatened) and James spinymussel (*Pleurobema collina*, federally and state endangered).

Response: In the PAD, the applicant provided a list of threatened or endangered species with the potential to occur in the project area, which included the Indiana bat, northern long-eared bat, and Roanoke logperch. Staff verified this species list using the FWS Environmental Conservation Online System (ECOS) Information for Planning and Consultation (IPaC) website. Although neither Atlantic pigtoe nor James spinymussel were included in the IPaC results for the project area, based on FWS's comments we have included the Atlantic pigtoe and James spinymussel in the bulleted list under section 4.4 of federally listed species that could be affected by project operation and maintenance. State-listed species, including freshwater mussels, will be considered in the Aquatic Resources section.

### Recreation and Aesthetics

Comment: Several commenters describe the existing canoe portage trail as too long and too steep for re-entry into the tailrace. Multiple commenters also state that vehicular access to the portage is restricted by a keyed gate.

Response: In section 4.2.5 of SD1, staff indicated that the *NEPA document* would address the adequacy of existing recreational facilities and public access to meet current and future recreational demand. Therefore, no changes have been made to SD2 *or* SD3.

Comment: Several commenters describe the need for a debris management plan that would incorporate a trash collection system at the dam. The commenters state that trash passed through the project results in unsightly accumulations of trash below the Niagara Dam and further down river.

Response: In section 4.2.5 of SD1, staff indicated that the *NEPA document* would address the effects of continued project operation on aesthetics in the project area. Therefore, no changes have been made to SD2 *or* SD3.

### Comprehensive Plans

Comment: The Roanoke Valley Greenway Commission and Roanoke County request that the Roanoke Valley/Blue Ridge Parkway Trail Plan Environmental Assessment and the Blue Ridge Parkway General Management Plan/Environmental Impact Statement be considered as comprehensive plans. Roanoke County also requests that the Blue Ridge Parkway Foundation Document Overview for Virginia/North Carolina and the Roanoke River Greenway Plan be considered as comprehensive plans.

Response: Entities must file any potential comprehensive plans in accordance with section 2.19 of the Commission's regulations, along with a cover letter indicating that the documents are to be considered as comprehensive plans under section 10(a)(2)(A) of the FPA, with the Commission. State and federal comprehensive plans can be e-filed at: <http://www.ferc.gov/docs-filing/efiling.asp>. Once registered and logged in, click efile, then select 'Hydro: Washington DC' in the first efile menu column, followed by 'Report/Form for Existing Project' in the second column. In the third column, select 'Report/Form' and then click the 'next' button. On the next screen, enter ZZ09-5 as the docket number and click search. Then, select ZZ09-5-000 (using the plus sign) as the appropriate docket for your filing and upload your document or documents.

Comment: FWS identified the Roanoke River Diadromous Fishes Restoration Plan as an existing Commission-approved comprehensive plan that should be considered



during our environmental review. In addition, FWS stated that it will consider filing the Roanoke Logperch Recovery Plan for FERC's consideration as a comprehensive plan.

*Response:* We have added the Roanoke River Diadromous Fishes Restoration Plan to our list of plans that are relevant to the project and have modified section **6.0** accordingly. If FWS submits the Roanoke Logperch Recovery Plan to the Commission as a comprehensive plan pursuant to section 2.19 of the Commission's regulations and it receives approval as a comprehensive plan, in the *NEPA document* we would consider the extent to which the Niagara Project is consistent with the plan.

### **3.0 PROPOSED ACTION AND ALTERNATIVES**

In accordance with NEPA, the environmental analysis will consider the following alternatives, at a minimum: (1) the no-action alternative, (2) the applicant's proposed action, and (3) alternatives to the proposed action.

#### **3.1 NO-ACTION ALTERNATIVE**

Under the no-action alternative, the Niagara Project would continue to operate as required by the current project license (i.e., there would be no change to the existing environment). No new environmental protection, mitigation, or enhancement measures would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives.

##### **3.1.1 Existing Project Facilities**

The Niagara Project consists of: (1) a 52-foot-high, 462-foot-long concrete dam, inclusive of the right non-overflow abutment (70 feet) and main spillway (392 feet); (2) a 62-acre impoundment with a gross storage capacity of 425 acre-feet at the normal pool elevation of 884.4 feet;<sup>6</sup> (3) an 11-foot-diameter, 500-foot-long corrugated metal pipe penstock with associated entrance and discharge structures; (4) a 1,500-foot-long bypassed reach; (5) a 92-foot-long, 58-foot-wide, 42-foot-high concrete powerhouse containing two generating units with a total authorized installed capacity of 2.4 megawatts (MW); (6) a 103-foot-long auxiliary spillway with a crest elevation of 886 feet located downstream of the upstream intake; (7) transmission facilities consisting of 50-foot-long 2.4-kilovolt (kV) generator leads and a 3-phase, 2.4/12-kV, 2,500-kilovolt ampere (kVA) step-up transformer; and (8) appurtenant facilities.

##### **3.1.2 Existing Project Operations**

The Niagara Project operates in a run-of-river mode under all flow conditions, where inflow equals outflow. The project is operated to maintain the impoundment at or near elevation 884.4 feet, which is 0.6 feet below the crest of the spillway. During extreme flow conditions, such as rapidly changing inflows, Appalachian operates the project with a minimum impoundment elevation of 883.4 feet. Run-of-river operation may be temporarily modified by operating emergencies beyond the control of Appalachian and for short periods upon mutual agreement among Appalachian, U.S. Fish and Wildlife Service (FWS), and the Virginia Department of Wildlife Resources (Virginia DWR).

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<sup>6</sup> All elevations herein are referenced to National Geodetic Vertical Datum of 1929 (NGVD 29).

During periods of high flow, all flows exceeding the maximum generation capacity of the powerhouse are passed over and through the main spillway. When the reservoir elevation reaches 886.0 feet, water begins to spill over the auxiliary spillway. When the tailwater elevation at the powerhouse reaches 832.0 feet, the generating units are shut down.

Appalachian releases a minimum flow of 50 cubic feet per second (cfs), or inflow to the impoundment, whichever is less, below the project. Appalachian provides a total minimum flow of 8 cfs into the bypassed reach through the sluice gate or over the spillway. Flows are measured at the U.S. Geological Survey (USGS) gage located approximately 200 feet downstream of the powerhouse (USGS 2056000 Roanoke River at Niagara, Virginia).

### **3.2 APPLICANT'S PROPOSAL**

The proposed action is to continue the existing operation and maintenance of the Niagara Project.

#### **3.2.1 Proposed Project Facilities and Operation**

Appalachian is not proposing any changes to its project facilities or in project operation.

#### **3.2.2 Proposed Environmental Measures**

Appalachian proposes to continue the existing operation and maintenance of the Niagara Project which includes the protection, mitigation, and enhancement (PM&E) measures required by the current license and subsequent amendments. These measures are described below.

#### Geologic and Soil Resources

- There are no existing or proposed PM&E measures related to geology and soils for the Niagara Project. The potential need for PM&E measures will be evaluated during the relicensing process.

### Aquatic Resources

- Continue operating the project in a run-of-river mode, maintaining the elevation of the impoundment at or near 884.4 feet (Article 401).
- Continue providing a minimum flow of 50 cfs, or inflow to the project, whichever is less, to the Roanoke River downstream of the powerhouse (Article 402).
- Continue providing a minimum flow of 8 cfs to the project's bypassed reach (Article 403).<sup>7</sup>

### Terrestrial Resources

- Continue to follow a Commission-approved Wildlife Management Plan that includes monitoring habitat over the term of the existing license (Article 407).

### Threatened and Endangered Species

- There are no existing or proposed PM&E measures related to terrestrial resources for the Niagara Project. The potential need for PM&E measures will be evaluated during the relicensing process.

### Recreation and Land Use

- Continue to provide recreation access via a canoe portage trail (Article 411).

### Aesthetic Resources

- There are no existing or proposed PM&E measures related to aesthetic resources for the Niagara Project. The potential need for PM&E measures will be evaluated during the relicensing process.

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<sup>7</sup> 93 FERC ¶ 62,049 (2000). Order Approving Modification to Flow Monitoring Plan.

### Cultural Resources

- There are no existing or proposed PM&E measures related to cultural resources for the Niagara Project. The potential need for PM&E measures will be evaluated during the relicensing process.

### **3.3 DAM SAFETY**

It is important to note that dam safety constraints may exist and should be taken into consideration in the development of proposals and alternatives considered in the pending proceeding. For example, proposed modifications to the dam structure, such as the installation of flashboards or fish passage facilities, could impact the integrity of the dam structure. As the proposal and alternatives are developed, the applicant must evaluate the effects and ensure that the project would meet the Commission's dam safety criteria found in Part 12 of the Commission's regulations and the Engineering Guidelines (<http://www.ferc.gov/industries/hydropower/safety/guidelines/eng-guide.asp>).

### **3.4 ALTERNATIVES TO THE PROPOSED ACTION**

Commission staff will consider and assess all alternative recommendations for operational or facility modifications, as well as PM&E measures identified by the Commission, the agencies, Indian tribes, NGOs, and the public.

### **3.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY**

At present, we propose to eliminate the following alternatives from detailed study in the *NEPA document*.

#### **3.5.1 Federal Government Takeover**

In accordance with § 16.14 of the Commission's regulations, a federal department or agency may file a recommendation that the United States exercise its right to take over a hydroelectric power project with a license that is subject to sections 14 and 15 of the FPA.<sup>8</sup> We do not consider federal takeover to be a reasonable alternative. Federal takeover of the project would require congressional approval. While that fact alone would not preclude further consideration of this alternative, there is currently no evidence showing that federal takeover should be recommended to Congress. No party has suggested that federal takeover would be appropriate, and no federal agency has expressed interest in operating the project.

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<sup>8</sup> 16 U.S.C. §§ 791(a)-825(r).

### 3.5.2 Non-power License

A non-power license is a temporary license the Commission would terminate whenever it determines that another governmental agency is authorized and willing to assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this time, no governmental agency has suggested a willingness or ability to take over the project. No party has sought a non-power license, and we have no basis for concluding that the Niagara Project should no longer be used to produce power. Thus, we do not consider a non-power license a reasonable alternative to relicensing the project.

### 3.5.3 Project Decommissioning

*As the Commission has previously held, decommissioning is not a reasonable alternative to relicensing in most cases.<sup>9</sup> Decommissioning can be accomplished in different ways depending on the project, its environment, and the particular resource needs.<sup>10</sup> For these reasons, the Commission does not speculate about possible decommissioning measures at the time of relicensing, but rather waits until an applicant actually proposes to decommission a project, or a participant in a relicensing proceeding demonstrates that there are serious resource concerns that cannot be addressed with appropriate license measures and that make decommissioning a reasonable alternative.<sup>11</sup> Appalachian does not propose decommissioning, nor does the record to date demonstrate there are serious resource concerns that cannot be*

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<sup>9</sup> See, e.g., *Eagle Crest Energy Co.*, 153 FERC ¶ 61,058, at P 67 (2015); *Public Utility District No. 1 of Pend Oreille County*, 112 FERC ¶ 61,055, at P 82 (2005); *Midwest Hydro, Inc.*, 111 FERC ¶ 61,327, at PP 35-38 (2005).

<sup>10</sup> *In the unlikely event that the Commission denies relicensing a project or a licensee decides to surrender an existing project, the Commission must approve a surrender “upon such conditions with respect to the disposition of such works as may be determined by the Commission.”* 18 C.F.R. § 6.2 (2020). *This can include simply shutting down the power operations, removing all or parts of the project (including the dam), or restoring the site to its pre-project condition.*

<sup>11</sup> See generally *Project Decommissioning at Relicensing; Policy Statement, FERC Stats. & Regs., Regulations Preambles (1991-1996)*, ¶ 31,011 (1994); see also *City of Tacoma, Washington*, 110 FERC ¶ 61,140 (2005) (*finding that unless and until the Commission has a specific decommissioning proposal, any further environmental analysis of the effects of project decommissioning would be both premature and speculative*).

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*mitigated if the project is relicensed; as such, there is no reason, at this time, to include decommissioning as a reasonable alternative to be evaluated and studied as part of staff's NEPA analysis.*

## 4.0 SCOPE OF RESOURCE ISSUES

In this section, we present a preliminary list of environmental issues to be addressed in the *NEPA document*.<sup>12</sup> We identified these issues, which are listed by resource area, by reviewing the PAD and the Commission's record for the Niagara Project. This list is not intended to be exhaustive or final, but contains the issues raised to date. After the scoping process is complete, we will review the list and determine the appropriate level of analysis needed to address each issue in the *NEPA document*.

### 4.1 Geologic and Soils Resources

- Effects of continued project operation and maintenance on shoreline stability of the impoundment.

### 4.2 Aquatic Resources

- Effects of continued project operation and maintenance on water quality, including dissolved oxygen (DO) and water temperature, upstream and downstream of the impoundment, including the bypassed reach.
- Adequacy of the existing minimum flows for protecting aquatic habitat for resident fishes, including species of special concern (orangefin madtom), and other aquatic resources, including freshwater mussels, downstream of the powerhouse (50 cfs) and in the bypassed reach (8 cfs).
- Effects of continued project operation and maintenance on aquatic resources, including entrainment and impingement mortality of resident fishes.
- Effects of continued project operation and maintenance on the movement of diadromous fish species (e.g., American eel).

### 4.3 Terrestrial Resources

- Effects of continued project operation and maintenance on riparian, wetland, and upland habitat and associated wildlife such as bald eagles.

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<sup>12</sup> *Per CEQ's final rule (July 15, 2020), Commission staff will consider and evaluate effects that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action.*



#### **4.4 Threatened and Endangered Species**

- Effects of continued project operation and maintenance on the federally listed Indiana bat, northern long-eared bat, Atlantic pigtoe, James spiny mussel, and Roanoke logperch.

#### **4.5 Recreation, Land Use, and Aesthetic Resources**

- Effects of continued project operation and maintenance on recreation, land use, and aesthetics within the project area including the project impoundment, tailrace, and bypassed reach.
- Adequacy of existing recreational facilities and public access to the project to meet current and future recreational demand.

#### **4.6 Cultural Resources**

- Effects of project operation and maintenance on historic properties and archeological resources that are included in, eligible for listing in, or potentially eligible for inclusion in the National Register of Historic Places.
- Effects of project operation and maintenance on any previously unidentified historic or archeological resources or traditional cultural properties that may be eligible for inclusion in the National Register of Historical Places.

#### **4.7 Developmental Resources**

- Economics of the project and the effects of any recommended environmental measures on the project's economics.

## 5.0 CURRENT PROCESSING SCHEDULE

*The decision on whether to prepare an EA or EIS will be determined after the license application is filed and we fully understand the scope of effects and measures under consideration.*

A copy of Appalachian's process plan, which has a complete list of relicensing milestones for the Niagara Project, including those for developing the license application, is attached as Appendix A to this **SD3**.

## 6.0 COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA, 16 U.S.C. section 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by a project. Commission staff have preliminarily identified and reviewed the plans listed below that may be relevant to the Niagara Project. Agencies are requested to review this list and inform the Commission staff of any changes. If there are other comprehensive plans that should be considered for this list that are not on file with the Commission, or if there are more recent versions of the plans already listed, they can be filed for consideration with the Commission according to 18 CFR 2.19 of the Commission's regulations. Please follow the instructions for filing a plan at <http://www.ferc.gov/industries/hydropower/gen-info/licensing/complan.pdf>.

The following is a list of comprehensive plans currently on file with the Commission that may be relevant to the Niagara Project.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2016. Roanoke River Diadromous Fishes Restoration Plan. Raleigh, North Carolina. May 2016.

National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.

U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. Environment Canada. May 1986.

U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.

Virginia Department of Conservation and Recreation. The 2007 Virginia outdoors plan (SCORP). Richmond, Virginia.

Virginia Department of Environmental Quality. 2015. Commonwealth of Virginia State Water Resources Plan. Richmond, Virginia. October 2015.

Virginia State Water Control Board. 1986. Minimum instream flow study – final report. Annandale, Virginia. February 1986.

## 7.0 MAILING LIST

The list below is the Commission's official mailing list for the Niagara Project (FERC No. 2466). If you want to receive future mailings for the Niagara Project and are not included in the list below, please send your request by email to [FERCOnlineSupport@ferc.gov](mailto:FERCOnlineSupport@ferc.gov) or by mail. **Submissions sent via the U.S. Postal Service must be addressed to:** Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street, N.E., Room 1A, Washington, DC 20426. **Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkens Avenue, Rockville, Maryland 20852.** All written and emailed requests to be added to the mailing list must clearly identify the following on the first page: **Niagara Project No. 2466-034**. You may use the same method if requesting removal from the mailing list below.

Register online at <https://ferconline.ferc.gov/FERCOnline.aspx> to be notified via email of new filings and issuances related to this or other pending projects. For assistance, please contact FERC Online Support at [FERCOnlineSupport@ferc.gov](mailto:FERCOnlineSupport@ferc.gov) or toll free at 1-866-208-3676, or for TTY, (202) 502-8659.

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**APPENDIX A  
NIAGARA PROJECT PROCESS PLAN AND SCHEDULE**

Shaded milestones are unnecessary if there are no study disputes. If the due date falls on a weekend or holiday, the due date is the following business day. Early filings or issuances will not result in changes to these deadlines.

<b>Responsible Party</b>	<b>Pre-Filing Milestone</b>	<b>Date</b>	<b>FERC Regulation</b>
Appalachian	First Study Season	Spring - Fall 2020	5.15(a)
Appalachian	File Initial Study Report	1/11/2021	5.15(c)(1)
All Stakeholders	Initial Study Report Meeting	1/26/2021	5.15(c)(2)
Appalachian	File Initial Study Report Meeting Summary	2/10/2021	5.15(c)(3)
All Stakeholders	File Disagreements/Requests to Amend Study Plan	3/12/2021	5.15(c)(4)
All Stakeholders	File Responses to Disagreements/Amendment Requests	4/11/2021	5.15(c)(5)
FERC	Issue Director's Determination on Disagreements/Amendments	5/11/2021	5.15(c)(6)
Appalachian	Second Study Season	Spring - Fall 2021	5.15(a)
Appalachian	File Preliminary Licensing Proposal (or Draft License Application)	10/1/2021	5.16(a)-(c)
All Stakeholders	File Comments on Preliminary Licensing Proposal (or Draft License Application)	12/30/2021	5.16(e)
Appalachian	File Updated Study Report	12/5/2021	5.15(f)
All Stakeholders	Updated Study Report Meeting	12/20/2021	5.15(f)
Appalachian	File Updated Study Report Meeting Summary	1/4/2022	5.15(f)
Appalachian	File Final License Application	2/28/2022	5.17
All Stakeholders	File Disagreements/Requests to Amend Study Plan	2/3/2022	5.15(f)

<b>Responsible Party</b>	<b>Pre-Filing Milestone</b>	<b>Date</b>	<b>FERC Regulation</b>
Appalachian	Issue Public Notice of Final License Application Filing	3/14/2022	5.17(d)(2)
All Stakeholders	File Responses to Disagreements/Amendment Requests	3/5/2022	5.15(f)
FERC	Issue Director's Determination on Disagreements/Amendments	4/4/2022	5.15(f)



Via Electronic Filing

January 11, 2021

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

**Subject: Niagara Hydroelectric Project (FERC No. 2466-034)  
Filing of Initial Study Report and Schedule for Virtual ISR Meeting**

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the run-of-river, 2.4-megawatt Niagara Hydroelectric Project (Project) (Project No. 2466), located on the Roanoke River in Roanoke County, Virginia.

The Project is currently licensed by the Federal Energy Regulatory Commission (FERC or Commission). The Project underwent relicensing in the early 1990s, and the current operating license for the Project expires on February 29, 2024. Accordingly, Appalachian is pursuing a subsequent license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5.

Appalachian developed a Revised Study Plan (RSP) for the Project that was filed with the Commission and made available to stakeholders on November 6, 2019. On December 6, 2019 FERC issued the Study Plan Determination (SPD). On July 27, 2020, Appalachian filed an updated ILP study schedule and a request for extension of time to file the Initial Study Report (ISR) to account for Project delays resulting from the COVID-19 pandemic. These delays pushed the start of the 2020 field season into early August 2020 and resulted in some of the spring and summer 2020 field work being rescheduled for 2021. The request was approved by FERC on August 10, 2020, and the filing deadline for the ISR for the Project was extended from November 17, 2020 to January 11, 2021.

During the restricted 2020 field season, Appalachian has conducted studies in accordance with 18 CFR §5.15, as provided in the RSP and as subsequently modified by FERC's SPD. In accordance with 18 CFR §5.15, Appalachian is hereby filing the ISR with the Commission. The ISR describes the Licensee's overall progress in implementing the study plan and schedule, summarizes available data, and describes any variances from the study plan and schedule approved by the Commission.

The Commission's regulations at 18 CFR §5.15(c) require Appalachian to hold a meeting with participants and FERC staff within 15 days of filing the ISR. **Accordingly, Appalachian will hold**

**an ISR Meeting via Webex from 10 AM to 3 PM on Thursday, January 21, 2020.** An agenda for the ISR Meeting is provided in Attachment 2. Participants are free to join the meeting in part based on interests or availability, but please note that the agenda is intended as an approximation and more or less time may be spent on individual studies, as needed.

**Appalachian respectfully requests that the stakeholders interested in participating in the Virtual ISR Meeting contact Maggie Yayac at [maggie.yayac@hdrinc.com](mailto:maggie.yayac@hdrinc.com) on or before close of business Tuesday, January 19, 2021 to obtain instructions to join the virtual meeting.**

If there are any questions regarding this filing, please do not hesitate to contact me at (614) 716-2240 or [jmmagalski@aep.com](mailto:jmmagalski@aep.com).

Sincerely,



Jonathan M. Magalski  
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cc: Distribution List  
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epaden@delawarenation-nsn.gov

Chief Kenneth Branham  
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Terry Clouthier  
Cultural Resources Director  
Pamunkey Indian Tribe  
1059 Pocahontas Trail  
King William, VA 23086  
terry.clouthier@pamunkey.org

### Non-Governmental

American Canoe Association  
503 Sophia Street, Suite 100  
Fredericksburg, VA 22401

Mr. Kevin Richard Colburn  
National Stewardship Director  
American Whitewater  
PO Box 1540  
Cullowhee, NC 28779  
kevin@americanwhitewater.org



## Niagara Hydroelectric Project (FERC No. 2466) Distribution List

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Appalachian Trail Conservancy  
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Roanoke, VA 24016-3627

Blue Ridge Land Conservancy  
27 Church Ave SW  
Roanoke, VA 24011-2001

Blue Ridge Parkway Foundation  
717 South Marshall Street, Suite 105 B  
Winston-Salem, NC 27101

Ms. Audrey Pearson  
Executive Director  
Friends of the Blue Ridge Parkway  
PO Box 20986  
Roanoke, VA 24018  
audrey\_pearson@friendsbrp.org

Friends of the Rivers of Virginia  
257 Dancing Tree Lane  
Hollins, VA 24019

Mr. Bill Tanger  
Chair  
Friends of the Rivers of Virginia  
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Hollins, VA 24109  
bill.tanger@verizon.net

Ms. Juanita Callis  
Director  
Friends of the Roanoke  
PO Box 1750  
Roanoke, VA 24008-1750

Mr. Mike Pucci  
President  
Roanoke River Basin Association  
150 Slayton Avenue  
Danville, VA 24540

Roanoke River Blueway  
313 Luck Avenue SW  
Roanoke, VA 24016  
roanokeriverblueway@gmail.com

---

**Subject:** FW: Niagara Hydroelectric Project (VA) -- Filing of Initial Study Report  
**Attachments:** AEP Niagara ISR Transmittal\_01.11.2021.pdf

**From:** Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>

**Sent:** Monday, January 11, 2021 5:40 PM

**To:** ACHP - John Eddins <jeddins@achp.gov>; Catawba Indian Nation - Wenonah Haire <caitlin.rogers@catawba.com>; County of Roanoke - David Henderson <dhenderson@roanokecountyva.gov>; County of Roanoke - Lindsay Webb <LWEBB@roanokecountyva.gov>; County of Roanoke - Richard Caywood <rcaywood@roanokecountyva.gov>; Delaware Nation - Eric Paden <epaden@delawarenation-nsn.gov>; Friends of the Blue Ridge Parkway - Audrey Pearson <audrey\_pearson@friendsbrp.org>; Friends of the Roanoke - Bill Tanger <bill.tanger@verizon.net>; Harold Peterson <harold.peterson@bia.gov>; Kevin Colburn - American Whitewater (kevin@americanwhitewater.org) <kevin@americanwhitewater.org>; Monacan Indian Nation - Kenneth Branham <TribalOffice@MonacanNation.com>; Pamunkey Indian Tribe - Terry Clouthier <terry.clouthier@pamunkey.org>; Roanoke County Parks - Doug Blount <dblount@roanokecountyva.gov>; Roanoke River Blueway <roanokeriverblueway@gmail.com>; Roanoke Valley Alleghany Regional Commission - Amanda McGee <amcgee@rvarc.org>; Roanoke Valley Greenway - Liz Blecher <liz.belcher@greenways.org>; Smith Mountain Lake Assn - Lorie Smith <TheOffice@SMLAssociation.org>; Town of Vinton - Anita McMillan <amcmillan@vintonVA.gov>; Town of Vinton - Bo Herndon <wherndon@vintonVA.gov>; Town of Vinton - Joey Hiner <jhiner@vintonVA.gov>; Town of Vinton - Kenny Sledd <ksledd@vintonVA.gov>; Tri-County Lakes Administrative Commission - Paula Shoffner <paulas@sml.us.com>; UADEQ - Brian McGurk <Brian.McGurk@deq.virginia.gov>; USEPA - Matthew Lee <lee.matthew@epa.gov>; USFWS <richard\_mccorkle@fws.gov>; USFWS - John McCloskey <John\_mccloskey@fws.gov>; USGS - Mark Bennett <mrbenet@USGS.gov>; VA Cooperative Fish and Wildlife Research Unit - Paul Angermeier <biota@vt.edu>; VADCR - Lynn Crump <lynn.crump@dcr.virginia.gov>; VADCR - Natural Heritage <nhreview@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADEQ - Andrew Hammond <andrew.hammond@deq.virginia.gov>; VADEQ - Anthony Cario <anthony.cario@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; VADEQ - Scott Kudlas <scott.kudlas@deq.virginia.gov>; Virginia Council on Indians - Emma Williams <emma.williams@governor.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; Virginia Department of Game and Inland Fisheries - Scott Smith <scott.smith@dgif.virginia.gov>

**Cc:** Jonathan M Magalski <jmmagalski@aep.com>; 'ebparcell@aep.com' <ebparcell@aep.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>; Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>

**Subject:** Niagara Hydroelectric Project (VA) -- Filing of Initial Study Report

Niagara Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Niagara Hydroelectric Project (FERC No. 2466) (Project) located on the Roanoke River in Roanoke County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP). Pursuant to the ILP, Appalachian filed the Initial Study Report (ISR) for the Project on January 11, 2021. The ISR describes the Licensee's overall progress in implementing the study plan and schedule, summarizes available data, and describes any variances from the study plan and schedule approved by the Commission.

On behalf of Appalachian, we are notifying stakeholders of the availability of the ISR. For your convenience, a copy of the cover letter filed with the ISR is attached. Appalachian encourages stakeholders to view the complete filing online at FERC's eLibrary at [https://elibrary.ferc.gov/eLibrary/filelist?accession\\_num=20210111-5063](https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20210111-5063). Appalachian will also be adding the ISR to the Project's public relicensing website (<http://www.aephydro.com/HydroPlant/Niagara>) in the coming days.

The Commission's regulations at 18 CFR §5.15(c) require Appalachian to hold a meeting with participants and FERC staff within 15 days of filing the ISR. **Accordingly, Appalachian will hold an ISR Meeting via Webex from 10 AM to 3 PM on Thursday, January 21, 2020.** Appalachian requests that the stakeholders interested in participating in the Virtual ISR Meeting contact Maggie Yayac at [maggie.yayac@hdrinc.com](mailto:maggie.yayac@hdrinc.com) on or before close of business Tuesday, January 19, 2021 to obtain instructions to join the virtual meeting.

Should you have any questions regarding this filing, please contact Jon Magalski with AEP at (614) 716-2240 or [jmmagalski@aep.com](mailto:jmmagalski@aep.com).

On behalf of AEP and the Niagara Project relicensing team, thank you for your interest in the Niagara Project, and I hope that the start of the new year finds you well.

**Sarah Kulpa**  
*Project Manager*

**HDR**  
440 S. Church Street, Suite 900  
Charlotte, NC 28202-2075  
**D** 704.248.3620 **M** 315.415.8703  
[sarah.kulpa@hdrinc.com](mailto:sarah.kulpa@hdrinc.com)

[hdrinc.com/follow-us](http://hdrinc.com/follow-us)

---

**Subject:** FW: Niagara Hydroelectric Project (VA) -- Filing of ISR/Prelim Cultural Resources (Sensitive Information)  
**Attachments:** AEP Niagara ISR Transmittal\_01.11.2021.pdf; AEP Niagara Initial Study Report\_Final\_01.11.2021.pdf; App F\_Niagara Prelim Cultural Resources Rpt\_PRIV.PDF

**From:** Green, William G <Bill.Green@terracon.com>  
**Sent:** Sunday, January 17, 2021 1:03 PM  
**To:** terry.clouthier@pamunkey.org; TribalOffice@MonacanNation.com; epaden@delawarenation-nsn.gov; Caitlin.Rogers@catawba.com; Roberts, Timothy <tim.roberts@dhr.virginia.gov>  
**Cc:** Jonathan M Magalski <jmmagalski@aep.com>; 'ebparcell@aep.com' <ebparcell@aep.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>; Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>  
**Subject:** Niagara Hydroelectric Project (VA) -- Filing of ISR/Prelim Cultural Resources (Sensitive Information)

**CAUTION: [EXTERNAL]** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Everyone,

Please find attached some information for American Electric Power's Niagara Hydroelectric Project located in Roanoke County, Virginia (FERC No. 2466). If you have any questions or concerns about the attached information, please do not hesitate to email me at [bill.green@terracon.com](mailto:bill.green@terracon.com) or you can reach me by phone at 803-403-1256.

Respectfully Yours,

**Bill Green, M.A., RPA # 10387**  
**Principal**  
**Department Manager | Cultural Resources**

**Terracon**  
D (803) 403 1256 | M (803) 354 8126

Terracon provides environmental, facilities, geotechnical, and materials consulting engineering services delivered with responsiveness, resourcefulness, and reliability.

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*Private and confidential as detailed here ([www.terracon.com/disclaimer](http://www.terracon.com/disclaimer)). If you cannot access the hyperlink, please e-mail sender.*

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**Subject:** FW: Niagara Hydroelectric Project (VA) -- Filing of ISR/Prelim Cultural Resources (Sensitive Information)

**From:** Green, William G <Bill.Green@terracon.com>

**Sent:** Thursday, January 21, 2021 10:02 AM

**To:** Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>

**Subject:** FW: Niagara Hydroelectric Project (VA) -- Filing of ISR/Prelim Cultural Resources (Sensitive Information)

**CAUTION:** [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hey Sarah and Maggie,

FYI – see below from the Catawba. We'll send out hard copies today for both projects.

**Bill Green, M.A., RPA # 10387**

**Principal**

**Department Manager | Cultural Resources**

**Terracon**

D (803) 403 1256 | M (803) 354 8126

---

**From:** Caitlin Rogers [mailto:caitlin.rogers@catawba.com]

**Sent:** Thursday, January 21, 2021 8:22 AM

**To:** Green, William G <Bill.Green@terracon.com>

**Subject:** Re: Niagara Hydroelectric Project (VA) -- Filing of ISR/Prelim Cultural Resources (Sensitive Information)

Good Morning,

The Catawba THPO are still requesting projects be sent via hard copy. Our address is 1536 Tom Steven Road, Rock Hill, SC 29730. If you have any questions let me know.

Thanks

Caitlin

---

**From:** Green, William G <Bill.Green@terracon.com>

**Sent:** Sunday, January 17, 2021 1:02 PM

**To:** [terry.clouthier@pamunkey.org](mailto:terry.clouthier@pamunkey.org) <[terry.clouthier@pamunkey.org](mailto:terry.clouthier@pamunkey.org)>; [TribalOffice@MonacanNation.com](mailto:TribalOffice@MonacanNation.com) <[TribalOffice@MonacanNation.com](mailto:TribalOffice@MonacanNation.com)>; [epaden@delawarenation-nsn.gov](mailto:epaden@delawarenation-nsn.gov) <[epaden@delawarenation-nsn.gov](mailto:epaden@delawarenation-nsn.gov)>; Caitlin Rogers <[caitlin.rogers@catawba.com](mailto:caitlin.rogers@catawba.com)>; Roberts, Timothy <[tim.roberts@dhr.virginia.gov](mailto:tim.roberts@dhr.virginia.gov)>

**Cc:** Jonathan M Magalski <[jmmagalski@aep.com](mailto:jmmagalski@aep.com)>; 'ebparcell@aep.com' <[ebparcell@aep.com](mailto:ebparcell@aep.com)>; Yayac, Maggie <[Maggie.Yayac@hdrinc.com](mailto:Maggie.Yayac@hdrinc.com)>; Kulpa, Sarah <[Sarah.Kulpa@hdrinc.com](mailto:Sarah.Kulpa@hdrinc.com)>

**Subject:** Niagara Hydroelectric Project (VA) -- Filing of ISR/Prelim Cultural Resources (Sensitive Information)

Hello Everyone,

Please find attached some information for American Electric Power's Niagara Hydroelectric Project located in Roanoke County, Virginia (FERC No. 2466). If you have any questions or concerns about the attached information, please do not hesitate to email me at [bill.green@terracon.com](mailto:bill.green@terracon.com) or you can reach me by phone at 803-403-1256.

---

**Subject:** FW: Niagara Hydroelectric Project (VA) -- Filing of ISR/Prelim Cultural Resources (Sensitive Information)  
**Attachments:** AEP Niagara ISR Transmittal\_01.11.2021.pdf; AEP Niagara Initial Study Report\_Final\_01.11.2021.pdf; App F\_Niagara Prelim Cultural Resources Rpt\_PRIV.PDF

**From:** Green, William G <Bill.Green@terracon.com>  
**Sent:** Sunday, January 17, 2021 1:10 PM  
**To:** debra.hansen@pamunkey.org  
**Cc:** Jonathan M Magalski <jmmagalski@aep.com>; 'ebparcell@aep.com' <ebparcell@aep.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>; Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>  
**Subject:** RE: Niagara Hydroelectric Project (VA) -- Filing of ISR/Prelim Cultural Resources (Sensitive Information)

**CAUTION:** [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Ms. Hansen,

I sent the email below to Terry Clouthier but got an automatic response that correspondence should be directed to you. I have attached the same information for your perusal. Thank you.

**Bill Green, M.A., RPA # 103871**  
**Principal**  
**Department Manager | Cultural Resources**

**Terracon**  
D (803) 403 1256 | M (803) 354 8126

---

**From:** Green, William G  
**Sent:** Sunday, January 17, 2021 1:03 PM  
**To:** terry.clouthier@pamunkey.org; TribalOffice@MonacanNation.com; epaden@delawarenation-nsn.gov; Caitlin.Rogers@catawba.com; Roberts, Timothy <tim.roberts@dhr.virginia.gov>  
**Cc:** Jonathan M Magalski <jmmagalski@aep.com>; 'ebparcell@aep.com' <ebparcell@aep.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>; Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>  
**Subject:** Niagara Hydroelectric Project (VA) -- Filing of ISR/Prelim Cultural Resources (Sensitive Information)

Hello Everyone,

Please find attached some information for American Electric Power's Niagara Hydroelectric Project located in Roanoke County, Virginia (FERC No. 2466). If you have any questions or concerns about the attached information, please do not hesitate to email me at [bill.green@terracon.com](mailto:bill.green@terracon.com) or you can reach me by phone at 803-403-1256.

Respectfully Yours,

**Bill Green, M.A., RPA # 10387**  
**Principal**  
**Department Manager | Cultural Resources**

**Terracon**  
D (803) 403 1256 | M (803) 354 8126



American Electric Power  
1 Riverside Plaza  
Columbus, OH 43215  
aep.com

February 5, 2021

Via Electronic Filing

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

**Subject:       Niagara Hydroelectric Project (FERC No. 2466-034)  
                  Filing of Initial Study Report Meeting Summary**

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the run-of-river, 2.4-megawatt Niagara Hydroelectric Project (Project) (Project No. 2466), located on the Roanoke River in Roanoke County, Virginia.

The Project is currently licensed by the Federal Energy Regulatory Commission (FERC or Commission). The Project underwent relicensing in the early 1990s, and the current operating license for the Project expires on February 29, 2024. Accordingly, Appalachian is pursuing a subsequent license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5.

Pursuant to 18 CFR § 5.15(c), Appalachian filed the Initial Study Report (ISR) with the Commission on January 11, 2021. The ISR filing also included notification of the ISR Meeting date, time, and proposed agenda. As required by the ILP schedule within 15 days of the ISR filing, Appalachian held a virtual ISR Meeting via Webex from 10am to 3pm on Thursday, January 21, 2021.

Pursuant to 18 CFR § 5.15(c)(3), Appalachian hereby files for Commission and stakeholder review the ISR Meeting summary. The ISR Meeting presentation is included as an attachment to the ISR Meeting summary.

If there are any questions regarding this filing, please do not hesitate to contact me at (614) 716-2240 or [jmmagalski@aep.com](mailto:jmmagalski@aep.com).

Niagara Hydroelectric Project (FERC No. 2466-034)  
Filing of Initial Study Report Meeting Summary  
February 5, 2021  
Page 2 of 2

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan M. Magalski". The signature is written in a cursive style with a prominent initial "J" and "M".

Jonathan M. Magalski  
Environmental Specialist Consultant  
American Electric Power Services Corporation, Environmental Services

cc: Distribution List  
Elizabeth Parcell (AEP)



# Niagara Hydroelectric Project (FERC No. 2466)

## Distribution List

### Federal Agencies

Mr. John Eddins  
Archaeologist/Program Analyst  
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jeddins@achp.gov

Blue Ridge National Heritage Area  
195 Hemphill Knob Road  
Asheville, NC 28803

Park Headquarters  
Blue Ridge Parkway  
199 Hemphill Knob Road  
Asheville, NC 28803-8686

Ms. Kimberly Bose  
Secretary  
Federal Energy Regulatory Commission  
888 1st St NE  
Washington, DC 20426

FEMA Region 3  
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One Independence Mall, Sixth Floor  
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5162 Valleypointe Parkway  
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Mr. John Bullard  
Regional Administrator  
NOAA Fisheries Service  
Greater Atlantic Regional Fisheries Office  
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Mr. John A. Bricker  
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US Department of Agriculture  
Natural Resources Conservation Service  
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Mr. Harold Peterson  
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US Department of the Interior  
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Mr. Matthew Lee  
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Ms. Barbara Rudnick  
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US Environmental Protection Agency  
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Mr. Richard C. McCorkle  
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Mr. Martin Miller  
Chief, Endangered Species - Northeast  
Region (Region 5)  
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Field Supervisor, Virginia Field Office  
US Fish and Wildlife Service  
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Ms. Elizabeth Merz  
US Forest Service  
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Marion, VA 24354

## Niagara Hydroelectric Project (FERC No. 2466) Distribution List

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Hon. Ben Cline  
US Congressman, 6th District  
US House of Representatives  
10 Franklin Road SE, Suite 510  
Roanoke, VA 24011

Mr. Michael Reynolds  
Acting Director, Headquarters  
US National Park Service  
1849 C Street, NW  
Washington, DC 20240

Ms. Catherine Turton  
Architectural Historian, Northeast Region  
US National Park Service  
US Custom House, 3rd Floor  
200 Chestnut Street  
Philadelphia, PA 19106

Hon. Tim Kaine  
US Senate  
231 Russell Senate Office Building  
Washington, DC 20510

Hon. Mark Warner  
US Senate  
703 Hart Senate Office Building  
Washington, DC 20510

### **State Agencies**

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Archaeological Society of Virginia  
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Freshwater Mollusk Conservation Center  
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Governor  
Office of the Governor  
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Research Unit  
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Ms. Lynn Crump  
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## Niagara Hydroelectric Project (FERC No. 2466) Distribution List

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Ms. Robbie Rhur  
Virginia Department of Conservation and  
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Water Withdrawal Permit Writer, Office of  
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Virginia Department of Environmental Quality  
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Mr. Andrew Hammond  
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Virginia Department of Environmental Quality  
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Mr. Matthew Link  
Water Withdrawal Permit Writer  
Virginia Department of Environmental Quality  
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Richmond, VA 23218  
matthew.link@deq.virginia.gov

Mr. Brian McGurk  
Water Withdrawal Permit Writer  
Virginia Department of Environmental Quality  
PO Box 1105  
Richmond, VA 23218  
Brian.McGurk@deq.virginia.gov

Blue Ridge Regional Office  
Virginia Department of Environmental Quality  
3019 Peters Creek Road  
Roanoke, VA 24019

Mr. Chris Sullivan  
Senior Area Forester  
Virginia Department of Forestry  
900 Natural Resources Drive  
Charlottesville, VA 22903

Mr. Scott Smith  
Region 2 Fisheries Manager  
Virginia Department of Game and Inland  
Fisheries  
1132 Thomas Jefferson Road  
Forest, VA 24551  
scott.smith@dgif.virginia.gov

Ms. Julie Langan  
Director and State Historic Preservation  
Officer  
Virginia Department of Historic Resources  
2801 Kensington Avenue  
Richmond, VA 23221

### Local Governments

Mr. Sherman P. Lea, Sr.  
Mayor  
City of Roanoke  
Noel C. Taylor Municipal Building  
215 Church Avenue  
Roanoke, VA 24011

Mr. Richard Caywood  
Assistant County Administrator  
County of Roanoke  
PO Box 29800  
5204 Bernard Drive  
Roanoke, VA 24018  
rcaywood@roanokecountyva.gov

Mr. David Henderson  
Engineering  
County of Roanoke  
PO Box 29800  
5204 Bernard Drive  
Roanoke, VA 24018  
dhenderson@roanokecountyva.gov

## Niagara Hydroelectric Project (FERC No. 2466) Distribution List

Ms. Lindsay Webb  
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County of Roanoke  
1206 Kessler Mill Road  
Salem, VA 24153  
LWEBB@roanokecountyva.gov

Mr. Christopher Whitlow  
Interim County Administrator  
Franklin County Administration  
1255 Franklin Street  
Rocky Mount, VA 24151

Mr. Phil North  
Hollins Magisterial District  
5204 Bernard Drive, 4th floor  
Roanoke, VA 24014

Mr. Doug Blount  
Director  
Roanoke County Parks, Recreation and  
Tourism  
1206 Kessler Mill Road  
Salem, VA 24153  
dblount@roanokecountyva.gov

Mr. Bo Herndon  
Town of Vinton  
311 S. Pollard St.  
Vinton, VA 24179  
wherdon@vintonVA.gov

Mr. Joey Hiner  
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311 S. Pollard St.  
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Mr. Nathan McClung  
Town of Vinton  
311 S. Pollard St.  
Vinton, VA 24179  
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Ms. Anita McMillan  
Town of Vinton  
311 S. Pollard St.  
Vinton, VA 24179  
amcmillan@vintonVA.gov

### **Non-Governmental**

American Canoe Association  
503 Sophia Street, Suite 100  
Fredericksburg, VA 22401

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## Meeting Summary

Project:	Niagara Hydroelectric Project (P-2466)	
Subject:	Initial Study Report Meeting	
Date:	Thursday, January 21, 2021	
Location:	WebEx Virtual Meeting	
Attendees:	Jonathan Magalski (AEP) Elizabeth Parcell (AEP) David Bailey (AEP) Kenny Morrison (AEP) Sarah Kulpa (HDR) Maggie Yayac (HDR) Misty Huddleston (HDR) Ty Ziegler (HDR) Erin Settevendemio (HDR) Joe Dvorak (HDR) Jon Studio (EDGE) John Spaeth (EDGE) Frank Simms (YES)	Allyson Conner (FERC) Jeremy Feinberg (FERC) Laurie Bauer (FERC) Woohee Choi (FERC) Rick McCorkle (USFWS) John McCloskey (USFWS) Scott Smith (VDWR) Anita McMillion (Town of Vinton) Nathan McClung (Town of Vinton) Liz Belcher (Greenway Commission - Coordinator) Lindsay Webb (Roanoke County - Parks Planning and Development Manager) Amanda McGee (Roanoke Valley – Alleghany Regional Commission) Paul Angermeier (VA Tech) Brian McGurk (VDEQ) Bill Tanger (FORVA)

## Overview

This document provides the meeting summary for Appalachian Power Company's (Appalachian) Niagara Hydroelectric Project Initial Study Report (ISR) Meeting. The meeting was held via WebEx to review with stakeholders the progress and results of the ISR, which was filed with the Federal Energy Regulatory Commission (FERC) on January 11, 2021. The ISR can be accessed from either FERC's website or from the website: <http://www.aephydro.com/HydroPlant/Niagara>. A copy of the meeting presentation is included with this meeting summary as Attachment 1.

## Welcome and Introductions (Slides 1-7)

Jon Magalski introduced the Niagara Project and the ISR meeting goals and objectives, and encouraged participation and feedback. He provided an overview of the agenda and the completed and upcoming ILP schedule milestones. The studies presented in the ISR meeting correspond to those for which Appalachian made substantive progress toward completion in the first ILP study season (2020) and for which preliminary study reports were filed with the ISR:

- Fish Community Study
- Benthic Aquatic Resources Study
- Bypass Reach Flow and Aquatic Habitat Study
- Water Quality Study
- Recreation Study
- Cultural Resources Study

## Fish Community Study (Slides 8-22)

Misty Huddleston (Study Lead) introduced herself and the study team, including Erin Settevendemio and HDR's sub-consultants, Jon Studio and John Spaeth with EDGE Engineering & Science, LLC (EDGE).

### Study Results

J. Studio presented the fish community study methods and results for the fall survey period (September 15-16; October 20-21, 2020), which included collecting 26 species above Niagara dam and 23 below, found in both riffle/run and pool sites. Several intolerant species were collected. Riffle/run sites had higher catch per unit effort (CPUE) than pool sites. A single adult specimen of the federally endangered Roanoke Logperch was collected from the most upstream sample site in a riffle/run habitat. Roanoke Logperch were collected at this site during the prior relicensing surveys in the early 1990s.

E. Settevendemio discussed the methods and preliminary results of the desktop assessment of impingement and entrainment. Target species and groups were identified from the fall fish community survey by EDGE, previous historical relicensing results, and historical range records for the Roanoke River. The calculated intake approach velocity (1.1 feet per second) was compared to fish swim burst speeds, which indicate that most juvenile and adult species can avoid the intake. Spawning habitat for most target species/groups is not present near the intake structure, therefore, potential for entrainment is considered low for most early life stages.

### Questions/Comments

#### Fisheries

Paul Angermeier asked for clarification regarding units for the calculated CPUEs. J. Studio responded that it is the total number of individuals of species combined per unit of time (Summary). John McCloskey noted it would be valuable to compare CPUE above and below the dam; J. Studio noted these values are presented in the Preliminary Fish Community Study Report.

P. Angermeier asked for additional information about the sampling methodology in riffle/run habitat during high flows (given that prevailing base flows were high throughout the 2020 sampling season). J. Studio noted that the methodology was dependent on flow. For higher flows in complex habitats, EDGE used block nets (seine) in addition to backpack shocking. With larger substrate, EDGE used a mixture of kicking/shocking to move fish downstream into a block net positioned at the end of the transect (in addition to staff with dipnets). P. Angermeier agreed, noting that without the block net it would be hard to catch logperch and madtoms. J. Magalski noted that this survey methodology was strictly for sampling the general fish community and that more complex, life stage-specific methods will be used in 2021 in support of the targeted Roanoke Logperch surveys.

Laurie Bauer noted in the study report, there is a table with raw data for backpack electrofishing. She requested in the Updated Study Report (USR) that those numbers be provided for the boat electrofishing surveys as well. She also requested specific length/weight information. J. Studio confirmed that the requested information and format would be provided in the USR.

A permit from the USFWS will be required for Appalachian's consultants to complete the Roanoke Logperch surveys (multiple life stages) planned for 2021, J. Studio confirmed the permit application was submitted to USFWS Region 5 in late December. J. Magalski asked J. McCloskey if there was anything he could do to move the permit along internally. J. McCloskey confirmed that USFWS is proceeding with processing, based on internal communications he has seen. He noted there is a possibility EDGE may be limited to snorkel surveys (instead of backpack shocking) during seasonal in-stream work restrictions this spring if a waiver could not be provided, but this is to be determined. J. McCloskey recommended that if EDGE has not received the permit or been notified by USFWS regarding the permit by March to check in with him.

### **Impingement and Entrainment**

P. Angermeier asked if swim speed data were only for adults or if it was life stage-specific. E. Settevendemio confirmed that evaluation is based on readily available swim speed data for juvenile and adult life stages. Since most stages of larvae are not actively swimming, little data exists for those life stages. E. Settevendemio clarified that when species-specific swim speed data were unavailable, HDR used swim speeds from a representative or surrogate species.

P. Angermeier asked how HDR estimated qualitative risk for larval entrainment. E. Settevendemio explained that if larvae are potentially being carried in the current and are in the vicinity of the intake then HDR would assume they would be entrained.

Rick McCorkle asked how the approach velocity was determined. E. Settevendemio noted that field work to confirm the approach velocity was planned in 2020, but due to high flows and unit outages, HDR estimated the approach velocity via desktop methods. The calculated approach velocity is comparable to the value presented in a previous relicensing study (also calculated). Ty Ziegler noted that after several trips to the Project, it became apparent that it would be difficult to get an accurate velocity measurement with an acoustic doppler current profiler (ADCP) due to the distance that it would need to be operated from the angled trash racks. In response to a question as to whether debris was taken into account for the calculated intake velocities (e.g., any potential for localized "hot spots" due to trashrack clogging), T. Ziegler noted that the evaluation did not assume any clogging or bio-fouling of the intake structure. David Bailey explained the function of the trash racks and noted that they are run on a timer. J. Magalski clarified that there is a barrier that keeps large debris out of the trash racks and the racks are continually clean/cleared of debris for optimal project operation.

J. McCloskey asked whether HDR considered species that are migrating and dispersing downstream in regard to avoidance. E. Settevendemio confirmed that the model included those fish and noted that the evaluation acknowledges that one of the reasons for potential entrainment is migration and dispersal associated with spawning activity. M. Huddleston also added that if a fish is moving towards the intake structure, size exclusion helps reduce entrainment.

P. Angermeier noted that some species of larvae are known to be carried downstream by drifting in the current, and asked when computing the entrainment were the results stratified by these specific characteristics, or was an average taken across the species. E. Settevendemio explained that by using the entrainment database, the method used is to average across the species group. However, in the



report, HDR provides a qualitative assessment of each species that considers life stage-specific characteristics.

## Variations from FERC-approved Study Plan

HDR was unable to evaluate flows with the ADCP due to high flow events and Project operating conditions throughout the 2020 study season. In lieu of field confirmation of the approach velocity, Appalachian proposes to use the desktop approach velocity calculation in the evaluation of impingement and entrainment susceptibility at the intake structure. J. McCloskey asked whether or not evaluating the approach velocity could be part the 2021 season and noted that a measured velocity may be preferable. T. Ziegler noted that it was difficult to get close enough to the trash racks (they are angled which makes it difficult to measure velocities near the upstream face of the racks, so a measurement would have to be taken 8-10 feet upstream, at which point velocities may be equivalent to Roanoke River velocities in other areas of the reservoir, and would likely be lower than the calculated velocity) to calculate the actual inflow and potentially could result in less accurate approach velocity results.

## Second Field Season (2021)

- Roanoke Logperch adult surveys (August – October 2021), young-of-year surveys (August – October 2021), larval surveys (April – June 2021).
- Turbine Blade Strike Analysis (July – December 2021)

## Benthic Aquatic Resources Study (Slides 23-32)

M. Huddleston reviewed the study goals, objectives, and the status of the study and introduced Jon Studio to discuss the methods and results.

## Study Results

J. Studio presented the macroinvertebrate methods and results for the fall period (September 15-16 and October 5). Macroinvertebrate taxonomic identification is in process and scheduled for completion prior to the spring 2021 sampling event. Crayfish identification was made in the field; 5 crayfish species were collected (2 native and 3 invasive species) at 8 out of 10 sampling sites. J. Studio also presented the mussel habitat and community methods and results of the fall 2020 survey (October 5-8) where commercial divers were used to collect the mussels. Zero live or dead shell specimens were found in the impounded reach. In the abbreviated sites, there were four live Eastern Elliptio found and one dead Notched Rainbow in Tinker Creek. No mussels were collected downstream of the dam.

## Questions/Comments

R. McCorkle noted that the mussel survey approach described by J. Studio does not meet the strict definition of “quantitative” as used in the scientific community, as typically the quantitative methodology is to use quadrats and excavation at the survey locations. J. Spaeth confirmed that they coordinated the methodology with Brian Watson (VDWR) and he further explained that quadrats are more effort, for typically little return, especially where mussels are likely not present (i.e., true quantitative methodology is better used on the Mississippi River or Ohio River or Clinch River, where dense mussel beds are known to be present). J. Spaeth confirmed that the methodology for this study may be better termed “semi-quantitative”, but that it is the preferred method for the Roanoke River. J. Studio clarified that anything that is directly sub-surface would be collected (see additional response below).

P. Angermeier asked about the methodology and noted that some mussel species are known to move up/down in the substrate depending on the temperature during the year. He wondered if the decision not to excavate would still capture mussels that moved down into the substrate. J. Spaeth confirmed that the approach used in the field included probing into the substrate with the diver's hands and fingers and that the commercial divers who conducted the survey with EDGE have significant experience and skill at finding and retrieving mussels in a variety of habitats, even in zero visibility conditions. J. Spaeth confirmed that the survey was completed within the recognized mussel survey window in Virginia, which is from April through the end of October.

P. Angermeier also asked about the macroinvertebrate survey and whether or not VDEQ methods will present taxonomic results and taxonomy based metric scores (i.e., number of EPT, number of intolerant taxa, etc.). J. Studio noted that the study followed state methodology and that the laboratory process and data processing will follow the same standard operating procedures and methodologies described in VDEQ 2008. This includes the presentation of sampling results into multiple metrics based on quantitative sampling methods, qualitative sampling methods, or combination of all collected data.

## 2021 Field Season

- Macroinvertebrate and Crayfish Community Study (April – May 2021)

## Bypass Reach Flow and Aquatic Habitat Study (Slides 34-44)

### Results

T. Ziegler (Study Lead) introduced the study, methodology, and results. The desktop habitat mapping assessment identified significant boulder and bedrock habitat in the bypass reach with approximately 50 percent cover (instream and overhead vegetation). The desktop results will be field verified in 2021 and include the tailrace area. Habitat suitability Index (HSI) curves for the various habitat guilds have been assembled from other instream flow studies in the region and created specifically for Roanoke Logperch based on available literature. T. Ziegler also reviewed the proposed model calibration target flows with stakeholders. Sarah Kulpa noted that one objective of this meeting is to have discussion and seek input from stakeholders regarding the proposed target flows for the model calibration (field measurements at target flow conditions to be conducted in 2021).

### Questions/Comments

P. Angermeier asked how the four calibration flows were determined. T. Ziegler noted that these flows were determined to: a) make sure we have sufficient field data collected at the lower end of the flow regime as model calibration can be more difficult at lower flows, b) capture field data at current relevant licensed minimum flow requirements of 8 cfs and 50 cfs, and c) help reduce safety concerns for the field crews. P. Angermeier noted that his goal would be to have a model produce habitat suitability over seasons/years. He recommended looking at a 30-year hydrograph and identifying typical flows (seasonally dependent). T. Ziegler noted a time series analysis using the most recent 30-yr period of record to evaluate actual Project inflows on a seasonal basis is feasible.

The group discussed whether “common” flows are represented in the model calibration flows. T. Ziegler clarified that the proposed calibration flows are not necessarily the ‘flows of interest’ to the stakeholders but are used to calibrate the 2-D model. The calibrated model will then be used to simulate flows of interest to the stakeholders. Joe Dvorak noted that surface roughness has a stronger influence on the flow dynamics at the lower end of the flow regime which is why the proposed target flows are on the lower end of the flow spectrum. As flows increase, depth increases which lessens the effect of surface

roughness. Level logger data will also be collected at higher flows (during runoff conditions) which will provide additional calibration data as the model is used to extrapolate to high flows.

Brian McGurk questioned how HDR is evaluating and gathering data on historical flows. T. Ziegler noted that the USGS gage downstream of the Project measures the combined flow from the bypass reach and powerhouse. HDR will use the operations model developed specifically for the Niagara Project (i.e., the “CHEOPS model”) to determine the portion of flow in the bypass reach.

J. McCloskey noted that to date there has not been discussion modeling flows over the dam (i.e., sheet flow over the spillway instead of a release through the gated trash sluice). T. Ziegler explained that the model will be able to simulate releases to the bypass reach via the trash sluice gate and/or over the main spillway.

P. Angermeier noted that the last few years have been particularly wet and raised concern as to whether wet conditions again in 2021 would impede the planned fieldwork. T. Ziegler noted that flow conditions were challenging in 2020 and very well could be again in 2021, but we have LiDAR data that is the basis for the terrain model, and HDR expects to be able to collect enough data for model calibration, even if data collection has to be broken into multiple sampling events. B. McGurk asked if it was possible to extend into September and S. Kulpa agreed the time period could be extended earlier or later dependent on when there is a dry period; that is, even during a wet year, we still expect to see brief periods of low flow and minimal precipitation, and HDR will be monitoring weather and flows throughout the 2021 field season to take advantage of such periods.

L. Bauer asked about the habitat/substrate desktop mapping and whether HDR will field verify the mesohabitats. T. Ziegler confirmed the desktop habitat mapping effort will be field verified during the 2021 field season.

## 2021 Study Activities

- Mesohabitat Mapping and Substrate Characterization Field Data Verification (June – August 2021)
- Conduct Flow and Water Level Assessment and Hydraulic Model Development (June – October 2021)

## Water Quality Study (Slides 46-59)

T. Ziegler (Study Lead) introduced the study, methods and results during the period of July 29 – November 10, 2020.

### Results

Water temperature results peaked at approximately 28°C (well below the Virginia Class IV water quality standard of 31 °C). Dissolved oxygen (DO) concentrations (upstream locations) were consistently above the state standard (5.0 mg/L daily average; 4.0 mg/L instantaneous) and increased as water temperatures decreased over the course of the study period. Dissolved oxygen (forebay and tailrace) also remained above the state standards during the entire study period. While there were two brief (less than 1.5 hours) excursions below 4.0 mg/L at the forebay bottom, state water quality standards only apply to the upper portion of the water column which remained above 5.0 mg/L. Dissolved oxygen (bypass reach) was above the state standards during the entire study period. Discrete vertical profiles in the reservoir and forebay area show little to no stratification for temperature, DO, pH, and specific conductivity. Water quality in the streams flowing into the Niagara reservoir, the reservoir itself (including the Project’s forebay

area), tailrace, and bypass reach is consistent with applicable Virginia state water quality standards for temperature, DO, and pH for Class IV (Roanoke River) and Class VII (Tinker Creek) surface waters. While there is no state standard for specific conductivity, concentrations were above 150  $\mu\text{S}/\text{cm}$  and less than 500  $\mu\text{S}/\text{cm}$ , which is generally considered to be suitable for most fish.

## Questions/Comments

J. McCloskey asked about the powerhouse outage noted during the presentation and depicted on the graphs. T. Ziegler confirmed the powerhouse outage began on September 8, 2020 and continued through the remainder of the study period. During this time, all Project inflows were routed to the bypass reach. J. McCloskey noted that as a result, water quality in the bypass reach might not be representative of typical conditions. T. Ziegler agreed and referenced the Preliminary Water Quality Study Report which recommends collection of supplemental temperature and DO data in the bypass reach during lower flow summer and licensed minimum flow conditions (i.e., July – August 2021).

L. Bauer asked about the two data sondes at each continuous monitoring location and wondered how they are presented on the graphs in the report. T. Ziegler explained that data from each sonde was evaluated to determine which was the most representative (based on comparison to discrete measurements using a freshly calibrated data sonde) and only this data is presented in the Preliminary Water Quality Study Report. Deploying two data sondes at each continuous monitoring location was advantageous as biofouling was an issue particularly in the Tinker Creek and reservoir monitoring locations, resulting in brief study data gaps.

B. McGurk asked about the bypass flow vs rainfall graph in Attachment 4 of the Preliminary Water Quality Study Report. He noted it appeared 25-30 cfs was coming through the sluice gate (prior to the powerhouse outage). T. Ziegler confirmed.

J. McCloskey questioned why Appalachian is not proposing to extend the bypass reach water quality monitoring through September (or later) as the lowest flow months can occur in September and/or October. T. Ziegler explained the goal is to collect supplemental temperature and DO data in the bypass reach during a combination of low flow and higher temperatures, which typically occur during July – August. J. McCloskey noted that the supplemental data collection could extend beyond August if water temperatures continue to increase throughout August and into September. T. Ziegler agreed and stated that we would expect not to pull the instruments until temperature trends were on a steady decrease into the fall.

L. Bauer noted that the DO concentrations increased throughout the study period. T. Ziegler explained that this is typical; as water temperature decreases, the water has a higher DO carrying capacity.

R. McCorkle noted the schedule for the continuous monitoring (per the SPD) was to be from May 1 through October. May and June probably aren't that important, but most of July was missed, as was a good chunk of August due to equipment malfunction, bio-fouling, etc. R. McCorkle asked if there was an approved variance to the required monitoring period. S. Kulpa noted that the July filing by Appalachian provided an updated study schedule and a request for extension of the time to file the ISR, Only the latter required approval from FERC; the updated study schedule was simply reported as a variance (Allison Connor confirmed). T. Ziegler explained that while the study didn't commence until late-July, the water quality parameters collected during the first couple of weeks are indicative of warm summer conditions and the measurements were well within state water quality standards. S. Kulpa noted that the field effort and cost to collect additional water quality data at all monitoring locations would be significant, and Appalachian does not believe the return on the effort to be commensurate with the effort, given the results of the 2020 sampling (Project waters well above numerical state water quality standards).

Scott Smith asked if there was a way to model water quality parameters and flows in the bypass reach. S. Kulpa noted it was not the intent of the study, but HDR would consider the possibility of comparing water quality (i.e., temperature and/or DO) to flows in the bypass reach to determine if a correlation exists that would enhance the conclusions provided in the Preliminary Water Quality Study Report.

## 2021 Field Season

- Re-install two bypass reach monitoring locations (July – August) to collect supplemental water quality data under lower flow conditions.

## Recreation Study (Slides 60-102)

Maggie Yayac (Study Lead) introduced the Recreation Study goals and Project and Non-Project Facilities. M. Yayac introduced HDR's sub-consultant, Frank Simms with Young Energy Services, who presented the Recreation Facility Inventory and Conditions Assessment and the Aesthetic Study methods and results. M. Yayac reviewed the online survey methods and results, and T. Ziegler reviewed the Recreation Flow Release desktop assessment.

## Results

F. Simms reviewed each recreation facility (Project and Non-Project) and listed the condition of the amenities. Frank explained that aesthetically pleasing views occur under low to mid flows (50 to 200 cfs) and similarly acoustics are optimal within this range. M. Yayac explained the peak months for recreation at all the facilities were observed to be April and June (based on the online survey), and canoeing/kayaking is the number one reported recreation activity.

## Questions/Comments

Liz Belcher recommended revising the location of the Project canoe portage put-in on the figure included in the presentation and Preliminary Recreation Study Report to show it under the Blue Ridge parkway bridge. Lindsay Webb recommended updating the ownership of some of the parcels and noted she would send comments to Appalachian. **Action Item:** HDR to update canoe portage put-in location on the map and L. Webb to send comments on recreation parcels.

A. Conner asked who owns the Rutrough Rd Canoe/Kayak Ramp? F. Simms confirmed it is owned by Roanoke County.

L. Belcher noted that the Roanoke River and Tinker Creek Greenways are not included in the facility inventory. She explained that boaters often use these locations as a put in/take out providing access to the river and the head of the reservoir. The view from the bridge has an aesthetic overlook of the reservoir. **Action Item:** HDR to add this bridge to the recreation feature map, for reporting in the USR.

L. Belcher also noted that in regard to F. Simms observing little/no recreation activity during the holiday weekends, it was a very wet year and 2020 was an exceptionally unusual year (COVID). She does not predict recreation use will be "normal" in 2021 since the National Park Service (NPS) is closing the Blue Ridge Parkway and replacing the bridge causing closure the Roanoke River trail outlook/trail. F. Simms confirmed the NPS expects to close the parkway and trail from March 2021 – March 2022. Appalachian is not proposing to revise the 2021 field season schedule. L. Webb offered to assist F. Simms with any correspondence with the NPS. She also noted it's likely that U.S. 220 North will also be closed.

Bill Tanger asked if there is a time he could comment on the improvements he would like to see. S. Kulpa confirmed that he can provide them on the call and/or file comments with FERC by March 7<sup>th</sup>. B. Tanger noted that boaters would like to see a take-out on river right just above the dam. That way boaters can float the reservoir and then take out just above the dam to shuttle downstream and put back in at the Parkway steps, Journey's End, or Rutrough Rd. B. Tanger also explained that boaters would like to see flow events on a weekend (3 or 4 times over the summer), assuming full pond and asked if that would be possible. S. Kulpa confirmed that the flow release would be from the powerhouse. B. Tanger responded that a water burst would provide a more enjoyable trip downstream vs. a minimum flow during a low flow period. It would be helpful if there could be some recreation flow events. J. Magalski noted that a flow pulse would require a relatively rapid reservoir drawdown (within the presently authorized reservoir limits) compared to normal run-of-river project operation, which could impact shoreline erosion or littoral habitat, and that such impacts would have to be evaluated. J. Magalski also noted that rapid reservoir drawdowns during spawning periods would have to be avoided.

L. Belcher recommended further consideration regarding trash management. She understands it is not necessarily Appalachian's responsibility, but it's a common issue in the watershed. She asked whether any aspects of the Recreation Study are looking at regional cooperation to pick up litter. E. Parcell commented that there has been a decrease of trash over the years especially with other local trash clean-ups. E. Parcell supports any initiatives to discourage littering, but these studies are not designed to look at this issue.

S. Kulpa noted that the recommendations during this call can also be further discussed at the stakeholder meeting schedule for early 2021.

## Cultural Resources (Slides 104-109)

M. Yayac reviewed the cultural resources methods and results by Terracon Consultants, Inc. (sub-consultant).

### Results

Terracon received five response to the Area of Potential Effects (APE) consultation with no objections. Phase I completed, geomorphological assessment scheduled for 2021. No historic properties are adversely affected by the Project. New construction would require consultation with the State Historic Preservation Office (SHPO).

### Questions/Comments

None.

## Next Steps and Discussion

J. Magalski reviewed key milestones for the ILP including meeting summary, stakeholder requests, FERC determination.

### Questions/Comments

B. McGurk noted that the overall schedule includes filing the draft license agreement (DLA) in October 2021. Brian asked when Appalachian intends to submit the Virginia Water Protection (VWP) Permit (401 certification). Brian noted that the sooner he knows the better so he can gather individuals to support the application processing. J. Magalski noted that Appalachian is aware to set up a meeting 30 days before



filing to discuss the contents of the application, and that Appalachian and their consultants would be giving this further consideration. The FERC deadline for the licensee to file the 401 certification application is after the filing of the Final License Application (i.e., 60 days after FERC's notice of Ready for Environmental Assessment), though Appalachian understands an earlier filing may be preferred by VDEQ. S. Kulpa noted that the VWP application would benefit from completion of the relicensing studies and definition of Appalachian's licensing proposal, so the application will likely be after the DLA filing.

J. Magalski noted that the March 7<sup>th</sup> stakeholder comments filing date is a Sunday, so stakeholder would have until the close of business March 8<sup>th</sup> (Monday) to file comments.



# Attachment 1

Attachment 1 – ISR Meeting  
Presentation



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# Niagara Hydroelectric Project

Initial Study Report Meeting  
January 21, 2021



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# Initial Study Report

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- Appalachian is pursuing a subsequent license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5.
  - The Initial Study Report (ISR) describes the Licensee's overall progress in implementing the study plan and schedule, the data collected, and any variances from the study plan and schedule.
  - The Commission's regulations at 18 CFR § 5.15(c) requires Appalachian to hold an ISR Meeting within 15 days of filing the ISR.
  - The purpose of the ISR Meeting is to discuss available study results and any proposals to modify the study plans in light of the data collected.

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# Meeting Agenda

Topic	Schedule
Welcome and Introduction	10:00 AM – 10:15 AM
Fish Community Study	10:15 AM – 11:15 AM
Benthic Aquatic Resources Study	11:15 AM – 11:45 AM
Morning Break	11:45 AM – 11:50 PM
Bypass Reach Flow and Aquatic Habitat Study	11:50 AM – 12:30 PM
<b>Lunch Break</b>	<b>12:30 PM – 1:00 PM</b>
Water Quality Study	1:00 PM – 1:30 PM
Recreation Study	1:30 PM – 2:30 PM
Afternoon Break	2:30 PM – 2:35 PM
Cultural Resources Study	2:35 PM – 2:50 PM
Discussion, Questions and Next Steps	2:50 PM – 3:00 PM

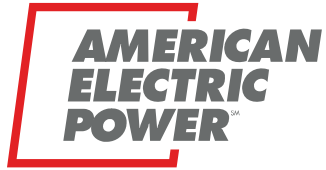
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# Process Plan and Schedule

Date	Milestone
January 28, 2019	Appalachian Filed NOI and PAD (18 CFR §5.5, 5.6)
March 26, 2019	FERC Issued Notice of PAD/NOI and Scoping Document 1 (SD1) (18 CFR §5.8(a))
April 24-25, 2019	FERC Conducted Scoping Meetings and Site Visit (18 CFR §5.8(b) (viii))
May 25, 2019	Stakeholders Submitted Comments on the PAD, SD1, and Study Requests (18 CFR §5.9)
July 9, 2019	FERC Issued Scoping Document 2 (SD2) (18 CFR §5.10)
July 9, 2019	Appalachian Filed Proposed Study Plan (PSP) (18 CFR §5.11(a))
August 1, 2019	Appalachian Held Study Plan Meeting (18 CFR §5.11(e))
October 7, 2019	Stakeholders Submitted Comments on the PSP (18 CFR §5.12)
November 6, 2019	Appalachian Filed RSP (18 CFR §5.13(a))
November 21, 2019	Stakeholders Submitted Comments on the RSP (18 CFR §5.13(b))
December 6, 2019	FERC Issued the SPD (18 CFR §5.13(c))
July 27, 2020	Appalachian Submitted First Quarterly Report, ILP Study Update, and Request for Extension of Time File ISR
August 10, 2020	FERC Issued Order Granting Appalachian Extension of Time for Filing of ISR
August – November 2020	Appalachian Conducted First Season of Field Studies (18 CFR §5.15(a))
October 27, 2020	Appalachian Submitted Second Quarterly Progress Report (18 CFR §5.15(b))
December 22, 2020	FERC Issued Scoping Document 3 (SD3)
<b>January 11, 2020</b>	<b>Appalachian Submitted ISR (18 CFR §5.15(c)(1))</b>



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# Studies Approved in the SPD

FERC's December 6, 2019 Study Plan Determination (SPD) directed Appalachian to conduct eight studies:

1. Bypass Reach Flow and Aquatic Habitat Study
2. Water Quality Study
3. Fish Community Study
4. Benthic Aquatic Resources Study
5. Wetlands, Riparian, and Littoral Habitat Characterization Study
6. Shoreline Stability Assessment Study
7. Recreation Study
8. Cultural Resources Study



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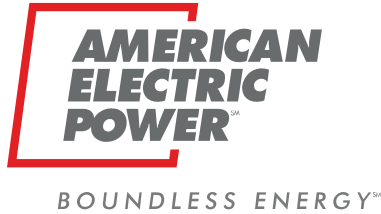


# Proposals to Modify Studies or for New Studies

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At this time, Appalachian is not proposing any modifications to the studies approved and modified in the Commission's December 6, 2019 SPD or any new studies.

Minor variances to the study plans have been previously reported in the ILP quarterly progress reports (July 27, 2020 and October 27, 2020) and are detailed in the sections that follow, as well as within the individual study reports provided as appendices to the ISR.



# Upcoming ILP Milestones

Date	Milestone
January 21, 2020	Appalachian Hosts ISR Meeting (18 CFR §5.15(c)(2))
February 5, 2021	Appalachian File ISR Meeting Summary (18 CFR §5.15(c)(3))
March 7, 2021	Stakeholders File Disagreements with ISR Meeting Summary (18 CFR §5.15(c)(3)) (if necessary)
April 6, 2021	Appalachian File Response to ISR Meeting Summary Disagreements (18 CFR §5.15(c)(5)) (if necessary)
May 6, 2021	FERC Provide Determination on Disputes (18 CFR §5.15(c)(6)) (if necessary)
Spring – Fall 2021	Appalachian Conduct Second Year of Studies
October 1, 2021	Appalachian File Draft License Application (DLA) (18 CFR §5.16(a))
December 5, 2021	Appalachian File USR (18 CFR §5.15(f))
December 20, 2021	Appalachian Host USR Meeting (18 CFR §5.15(f))
December 30, 2021	Stakeholders File Comments on DLA (18 CFR §5.16(e))
January 4, 2022	Appalachian File USR Meeting Summary (18 CFR §5.15(f))
February 3, 2022	Stakeholders File Disagreements with USR Meeting Summary (18 CFR §5.15(f)(4)) (if necessary)
February 28, 2022	Appalachian File Final License Application (18 CFR §5.17)
March 5, 2022	Appalachian File Response to USR Meeting Summary Disagreements (18 CFR §5.15(f)(5)) (if necessary)

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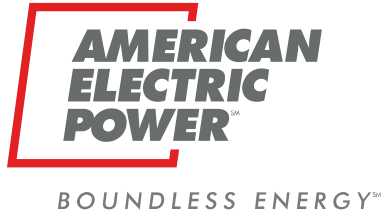
# Fish Community Study



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# Fish Community Study

- **Study Goal:** Obtain current information on the fish community in the Roanoke River in the vicinity of the Project to support an analysis of Project effects
- **Specific Objectives:**
  - Collect comprehensive baseline of the existing fish community in the vicinity of the Project
  - Compare current fish community data to historical data to evaluate changes to species composition, abundance, or distribution
  - Confirm intake velocities to evaluate the potential of fish impingement or entrainment



# Fish Community Study

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## Study Status

- Appalachian initiated the Fish Community Study in accordance with the methods described in the RSP and SPD.
  - General fish community survey completed fall 2020
  - Roanoke Logperch (larval, juvenile, adult) surveys rescheduled for 2021
  - Preliminary assessment of impingement and entrainment at the intake structure

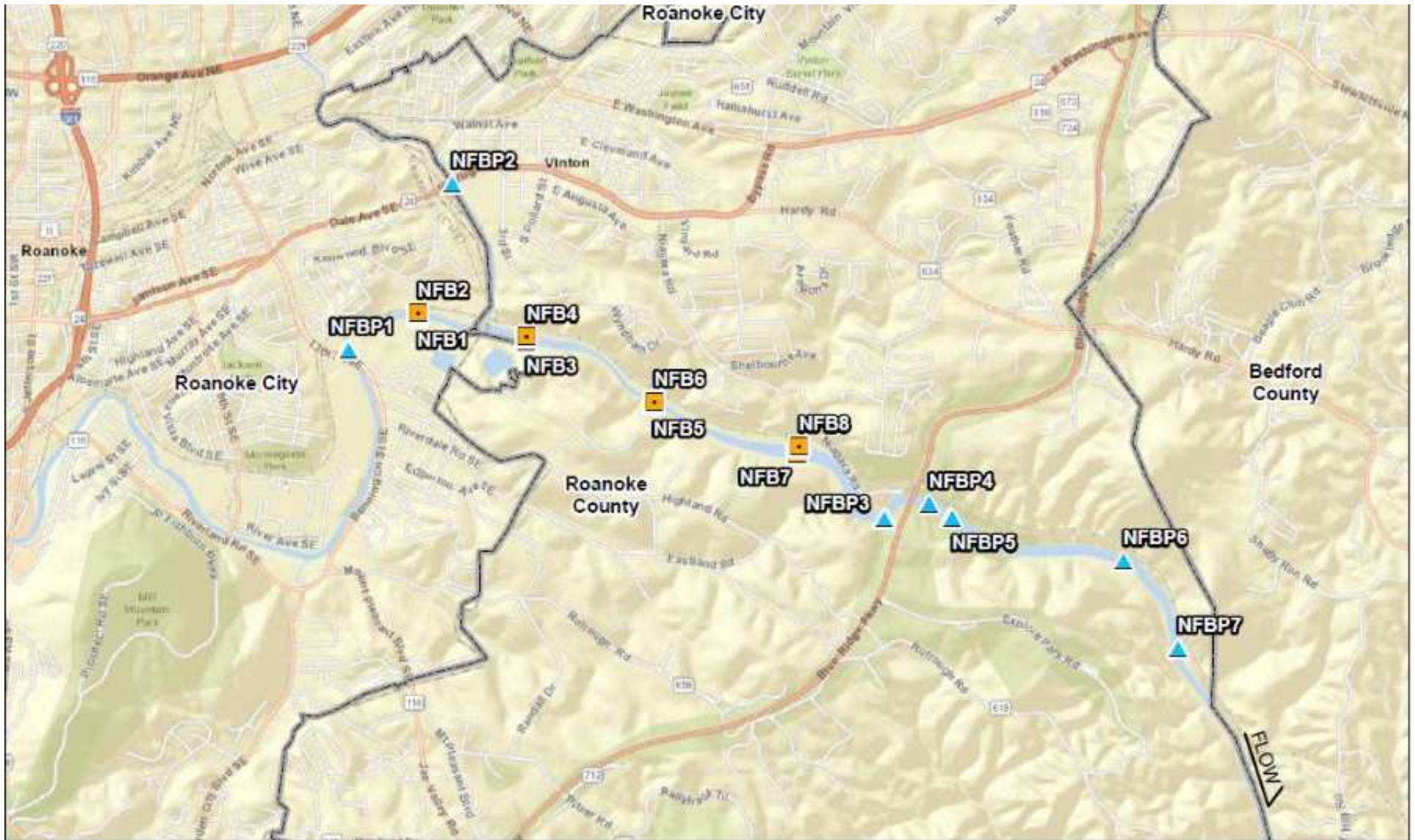
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# Fish Community Study

## General Fish Community Study Methods

- September 15-16 and October 20-21, 2020
  - Eight sites in impoundment electrofished by boat, a minimum of 5 minutes each site
  - Backpack electrofished 100-m transects in riffles/runs for minimum of 5 minutes each, 2 sites upstream and 5 downstream of dam
  - Fish ID to species, enumerated, and examined for anomalies; up to 30 individuals per taxon measured and weighed
  - Calculated catch per unit effort (CPUE) and H'; Shannon index and compared preliminary results to those from historical studies





**Legend**

- ▲ Fish Sample Location  
Backpack Electrofishing
- Boat Electrofishing
- County Boundary

N

0    0.5    1  
Kilometers

Scale: 1:39,370




**American Electric Power  
Niagara Dam Fish Community Study**

Figure 1

Overall Niagara project area including backpack (NFBP) and boat (NFB) electrofishing survey sites on the Roanoke River in Roanoke County, Virginia

# Fish Community Study

## Summary of Fall 2020 Survey Results

- 590 fish representing 32 species
- 26 species above Niagara Dam and 23 below
- Riffle/run sites
  - Average CPUE of 6.55
  - Average diversity (H'; Shannon Index) of 1.83
- Pool sites
  - Average CPUE of 1.44
  - Average diversity of 1.10
- Continued presence of intolerant species observed in prior relicensing

# Fish Community Study

## Summary of Fall 2020 Survey Results

- Dominant Taxa by Relative Abundance at Riffle/Run Sites
  - Central Stoneroller – 27.4%
  - Rosefin Shiner – 25.5%
  - Riverweed Darter – 8.2%
- Dominant Taxa by Relative Abundance at Pool Sites
  - Redbreast Sunfish – 40%
  - Golden Redhorse – 18.5%
  - Bluegill – 16.9%

# Fish Community Study

## Summary of Fall 2020 Survey Results

- No Orangefin Madtom collected during fall sampling efforts
- Single adult specimen of endangered Roanoke Logperch collected
  - Location: upstream-most survey site, above confluence of Tinker Creek and Roanoke River
  - Habitat: riffle/run
  - Sampling Method: backpack electrofishing
  - Site History: prior collections at this site
  - Increased sampling effort in riffle habitats when using RLP specific methods





# Fish Community Study

## Impingement and Entrainment Assessment Methods

- Compiled intake specifications, flow characteristics, and calculated approach velocity
- Identified target species/groups
- Assessed potential of impingement or entrainment
  - Intake avoidance (swim burst speed comparison)
  - Size exclusion (max length:width scaling)
  - Early life stage entrainment (spawning periodicity)
- Evaluated entrainment rate based on EPRI entrainment database

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# Fish Community Study



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# Fish Community Study

- Target species/groups

Common Name	Scientific Name
Largemouth Bass	<i>Micropterus salmoides</i>
Smallmouth Bass/Spotted Bass	<i>Micropterus dolomieu</i> / <i>M. punctulatus</i>
Black Crappie	<i>Pomoxis nigromaculatus</i>
Rock Bass	<i>Ambloplites rupestris</i>
<i>Lepomis</i> Sunfishes	<i>Lepomis</i> spp.
Shiners, Chubs, and Minnows	Leuciscinae
Bullheads and Madtoms	<i>Ameiurus</i> spp. and <i>Noturus</i> spp.
Catfishes	<i>Ictalurus</i> spp.
Suckers and Redhorse	Catostomidae and <i>Moxostoma</i> spp.
Darters	<i>Etheostoma</i> spp.
Roanoke Logperch	<i>Percina rex</i>

# Fish Community Study

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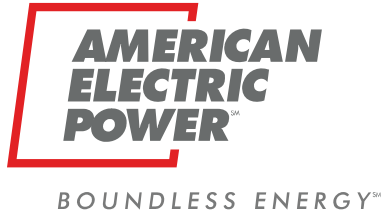
## Impingement and Entrainment Assessment Results

- Intake avoidance
  - Approach velocity - 1.1 fps
  - Swim burst speeds indicate that most juvenile and adult species can avoid the intake
- Size exclusion (impingement assessment)
  - Except for Channel Catfish, all target and surrogate species would pass through the trash racks (and be entrained)
- Early life stage entrainment susceptibility
  - Spawning May-June, subsequent egg and larvae development June-August
  - Many species spawning requirements are not found in the vicinity of the intake structure; therefore, entrainment potential is considered low for most early life stages.

# Fish Community Study

## Impingement and Entrainment Assessment Results

- Fish entrainment rate analysis
  - 88% of entrainment consisted of fish less than six inches in length
  - Dominant species entrained
    - Catfishes, Rock Bass, suckers and redhorses, *Lepomis* sunfishes, and Black Crappie
    - Peak entrainment occurred in April, July, and October
    - Entrainment susceptibility varied temporally and by species
    - Most target species/groups have low entrainment potential for most of the year
    - Roanoke Logperch considered low risk of entrainment due to a lack of required habitat (for any life stage) in the vicinity of the intake



# Variations from FERC-approved Study Plan

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## Variations from FERC-approved Study Plan:

- Intake velocity
  - Unable to evaluate with ADCP due to high low events and station operation
  - Determined using desktop calculation



# Variations from FERC- approved Study Plan

Proposed Changes to the 2020-2021 Study Plan Schedule for the Niagara Project (FERC No. 2466)		
	Activity	Proposed Timeframe for Completion (January 2021 update)
Fish Community Study	Study Planning and Existing Data Review	Completed (July 2020)
	Fish Community Study	Completed (September – November) 2020
	Roanoke Logperch Adult Surveys <i>(spring sampling conditioned on receipt of waiver from USFWS for sampling within time-of-year restriction period)</i>	May – June 2021, August – October 2021
	Roanoke Logperch Young-of-Year Surveys	August – October 2021
	Roanoke Logperch Larval Surveys	April – June 2021
	Desktop Impingement and Entrainment Evaluation and Turbine Blade Strike Analysis	Impingement and Entrainment Evaluation Completed (December 2020) Turbine Blade Strike Analysis (July – December 2021)
	Distribute Draft Study Report with the ISR/USR	ISR Completed (January 2021) USR December 2021



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# Benthic Aquatic Resources Study

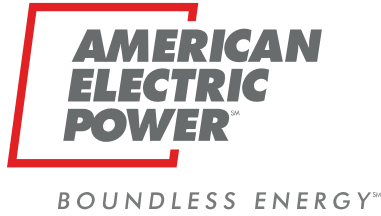


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# Benthic Aquatic Resources Study

- **Study Goal:** Obtain current information on the benthic aquatic community in the Roanoke River in the vicinity of the Project to support an analysis of Project effects
- **Specific Objectives:**
  - Quantify the amount of benthic habitat available for macroinvertebrates, crayfish, and mussels within the bypass reach;
  - Collect a baseline of existing macroinvertebrate and crayfish communities in the vicinity of the Project using two temporally independent sampling efforts (fall 2020 index period and spring 2021 index period); and
  - Identify potential habitat and characterize mussel communities within the Study Area.



# Benthic Aquatic Resources Study

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## Study Status

- Appalachian has partially completed study activities for the Benthic Aquatic Resources Study in accordance with the schedule and methods described in the RSP and SPD.
  - Completed fall 2020 sampling
  - Taxonomic identification in process
  - Spring sampling scheduled for 2021

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# Benthic Aquatic Resources Study

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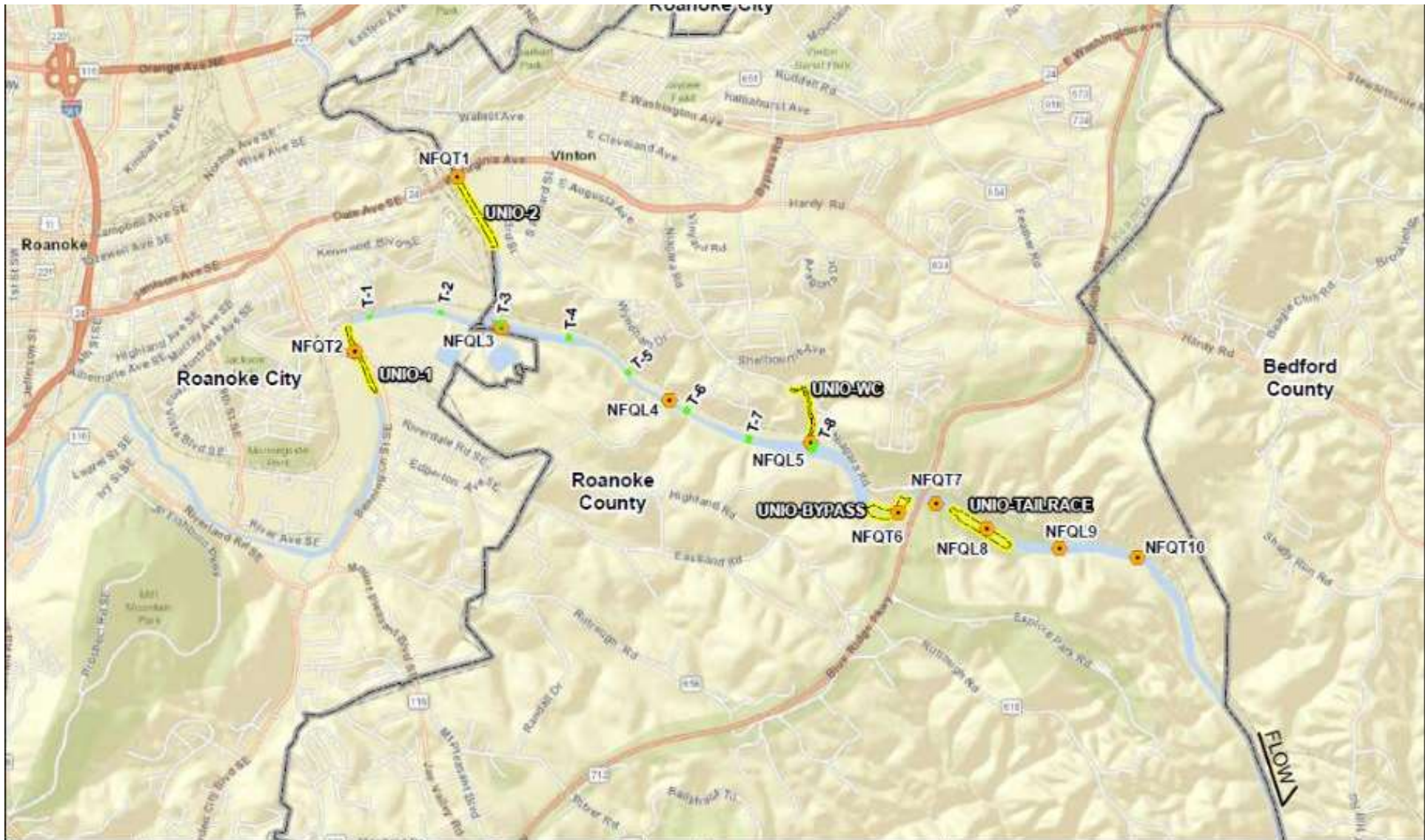
## Summary of Study Methods

- Macroinvertebrates and crayfish:
  - Visual habitat assessment
  - Qualitative and quantitative sampling
  
- Mussels:
  - Literature review
  - Compilation of results of prior surveys completed in Project vicinity
  - Quantitative transects and qualitative abbreviated samples

# Benthic Aquatic Resources Study

## Macroinvertebrate and Crayfish Study Methods

- September 15-16 and October 5, 2020
- Quantitative Transect Samples
  - 5 riffle/run sites along 100-m transects, 2 above and 3 below Niagara dam
  - Each site consists of 6 kick net sets composited into one sample
  - Each sample equals approximately 2 square meters
  - Crayfish data supplemented with seine hauls
- Qualitative Abbreviated Samples
  - 5 pool sites, 3 above and 2 below Niagara dam
  - 20 dip-net grabs of representative habitats in proportion to their availability
  - Each sample covers approximately 1 linear meter of habitat





**Legend**

- Macroinvertebrate Sample Location
- Mussel Survey Transect
- Mussel Survey Area
- County Boundary

N

0    0.5    1  
Kilometers

Scale: 1:39,370

**American Electric Power**  
**Niagara Dam Benthic Aquatic Resource Study**  
 Figure 1

Overall Niagara project area including quantitative (NFQT) and qualitative (NFQL) macroinvertebrate survey sites and transect (T) and abbreviated (UNIO) mussel survey sites on the Roanoke River in Roanoke County, Virginia





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# Benthic Aquatic Resources Study

## Macroinvertebrate and Crayfish Study Results

- Taxonomic identification of macroinvertebrates in process
- 5 species of crayfish collected and identified in the field during survey efforts at 8 of the 10 sites
- *Native Species*
  - Collected two native species upstream and one downstream of dam
  - Appalachian Brook Crayfish (*Cambarus bartoni bartoni*)
  - Atlantic Slope Crayfish (*Cambarus longulus*)
- *Invasive Species*
  - Collected two species upstream and three species downstream of dam
  - Ozark Crayfish (*Faxonius ozarkae*) – present at all sites where crayfish collected
  - Virile Crayfish (*Faxonius virilis*)
  - Red Swamp Crayfish (*Procambarus clarkii*)



Atlantic Slope Crayfish



Virile Crayfish

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# Benthic Aquatic Resources Study

## Mussel Habitat and Community Survey Methods

- October 6-8, 2020
- Snorkeling, viewscope, and/or Surface Supplied Air
- Transect surveys
  - Eight 30-75 meter transects spaced 500 meters apart in impounded reach
  - Divers search approx. 1 min/square meter using surface supplied air
- Abbreviated surveys
  - Five sites outside of impounded reach
  - Divers used viewscopes, snorkeling, and Surface Supplied Air to first identify potential habitat and then search approx. 1 min/square meter

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# Benthic Aquatic Resources Study

## Mussel Habitat and Community Survey Results

- Transect surveys
  - 8 transects covered approx. 430 square meters of impoundment
  - No live mussels nor dead shell specimens
- Abbreviated sites
  - 5 unimpounded sites were searched approximately 1,335 minutes
  - 4 live unionids representing one species, Eastern Elliptio (*Elliptio complanata*)
  - Specimens collected from sites with most suitable mussel habitat, the upper most riffle site in the Roanoke River and a riffle site in Tinker Creek
  - No mussels collected downstream of the dam

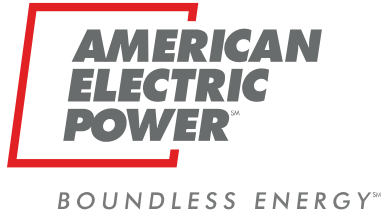


Eastern Elliptio



Notched Rainbow

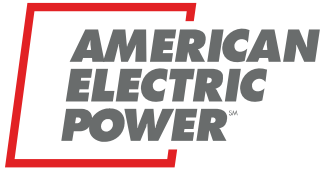




# Variations from FERC-approved Study Plan

Restrictions on non-essential travel and safety considerations for field staff prohibited spring 2020 field efforts.

Proposed Changes to the 2020-2021 Study Plan Schedule for the Niagara Project (FERC No. 2466)		
	Activity	Proposed Timeframe for Completion (January 2021 update)
Benthic Aquatic Resources Study	Study Planning and Existing Data Review	Completed (August 2020)
	Benthic Habitat Assessment	Completed (September 2020)
	Macroinvertebrate and Crayfish Community Study	Completed (September 2020) April – May 2021
	Mussel Habitat and Community Survey	Completed (October 2020)
	Distribute Draft Study Report with the ISR/USR	ISR Completed (January 2021) USR December 2021



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# 5-Minute Break



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# Bypass Reach Flow and Aquatic Habitat Study



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# Bypass Reach Flow and Aquatic Habitat Study

**Study Goal:** Conduct a flow and habitat assessment of the Project's tailrace and bypass reach using desktop, field survey, and hydraulic/habitat modeling methodologies

## Specific Objectives

- Delineate and quantify aquatic habitats and substrate types within the bypass reach
- Identify and characterize locations of habitat management interest within the bypass reach
- Determine surface water travel times and water surface elevation responses at various gate openings to:
  - Evaluate potential available habitat at the existing 8 cfs minimum bypass flow requirement
  - Evaluate potential seasonal minimum flow releases in the bypass reach

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# Bypass Reach Flow and Aquatic Habitat Study

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## Study Status

Appalachian initiated the Bypass Reach Flow and Aquatic Habitat Study in accordance with the methods described in the RSP and SPD

## Preliminary Summary of Study Methods and Results

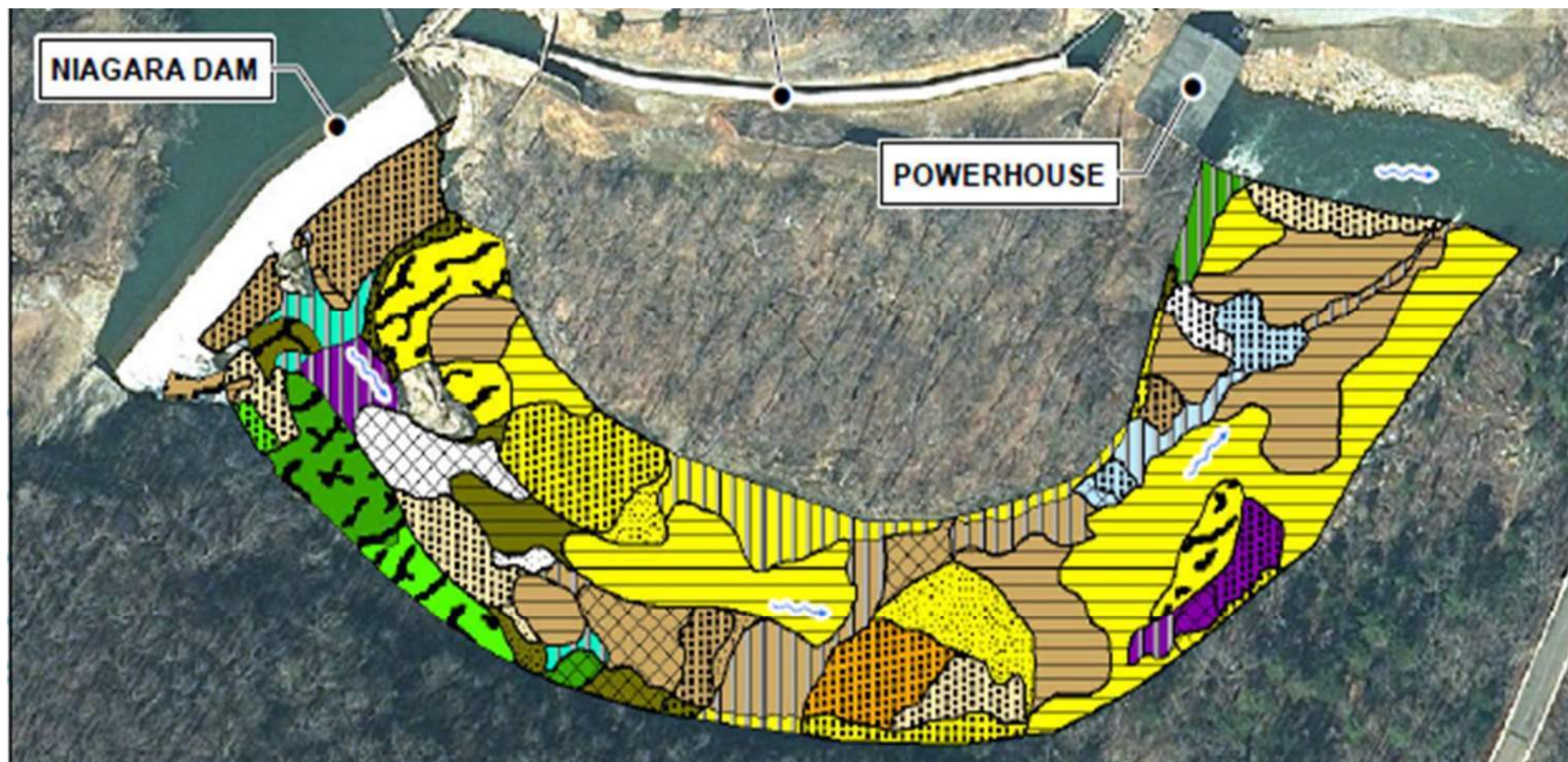
- Completed desktop habitat mapping and evaluation of Project inflows
- Assembled/Developed Habitat Suitability Index (HSI) criteria
- Developed a model calibration target flow recommendation

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**NIAGARA DEVELOPMENT BYPASS REACH STUDY AREA**  
 NIAGARA HYDROELECTRIC PROJECT (FERC NO. 2466)  
 ROANOKE COUNTY, VIRGINIA





Mesohabitat Type Cover, Substrate Categories



Glide

No Cover, and Boulder



Pool

No Cover, and Boulder, Bedrock, or Woody Debris



Riffle



Run



Shoal



Upland

No Cover, and Cobble

No Cover, and Gravel

No Cover, and Mud or Bedrock



No Cover, and Sand



No Cover, and Small Boulder



Overhead Veg and Boulder, Bedrock, or Woody Debris



Overhead Veg, and Cobble



Overhead Veg, and Gravel



Overhead Veg, and Sand



# Summary of Aquatic Habitat Characteristics

Habitat Characteristics	Area (ac.)	Percent
<b>Cover</b>		
Overhead Vegetation	3.45	50.9
No Cover	3.34	49.1
<b>Substrate</b>		
Boulder, Bedrock, or Woody Debris	5.10	75.1
Sand	0.55	8.1
Cobble	0.54	7.9
Gravel	0.42	6.1
Small Boulder	0.19	2.8
<b>Mesohabitat</b>		
Shoal	2.51	37.0
Pool	1.68	24.8
Riffle	1.00	14.8
Upland	0.77	11.3
Run	0.49	7.2
Glide	0.34	4.9





# Species of Interest RLP and Guilds

Species or Guild	Life Stage/ Category	Representative
Roanoke Logperch	Adult	--
	Subadult	--
	Young-of-Year	--
Shallow-Slow Guild	Fine substrate, no cover	Redbreast Sunfish spawning
	All substrate with aquatic vegetation	Silver Redhorse Young-of-Year
	Coarse substrate	Generic shallow-slow guild
Shallow-Fast Guild	Moderate velocity with coarse substrate	Generic shallow-fast guild
Deep-Slow Guild	Cover	Redbreast Sunfish Adult
	No cover	Generic deep-slow guild
Deep-Fast Guild	Slightly weighted for fine substrate, Cover	Silver Redhorse adult
	Coarse-mixed substrate	Shorthead Redhorse adult



Redbreast Sunfish  
Courtesy: Virginia DWR



Silver Redhorse  
Courtesy: USGS



Shorthead Redhorse  
Courtesy: Iowa DNR



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# Roanoke Logperch Habitat Suitability Indices

Habitat Suitability Criteria	Habitat Suitability Index*		
	Adult	Subadult	YOY
<b>Mean Velocity (m/s)</b>			
0	0.00	0.00	0.26
0.01-0.04	0.03	0.00	1.00
0.04-0.1	0.26	1.00	0.08
0.11-0.4	0.70	0.17	0.00
>0.41	1.00	0.24	0.00
<b>Depth (cm)</b>			
0-15	0.00	0.00	0.06
16-30	0.10	0.68	1.00
31-50	0.91	1.00	0.00
>51	1.00	0.25	0.00
<b>Substrate (rank)</b>			
<3	0.03	0.00	0.00
4-6	1.00	1.00	1.00
7	0.10	0.66	0.00
8-9	0.25	0.10	0.00

\*Based on Rosenberger and Angermeier (2003)



Male Roanoke Logperch  
Courtesy: The Roanoke Star News

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# Proposed Model Calibration Target Flows

- Newly Installed Obermeyer Gate Capacity: 7 – 287 cfs
- Proposed steady-state model calibration flows:  
8 cfs, 20 cfs, 50 cfs, and 115 cfs
- Level loggers will be installed to capture water surface elevations during higher bypass flow events



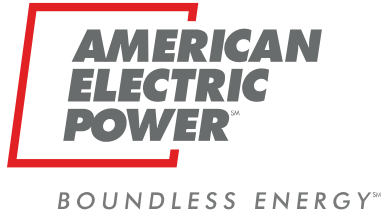
# Bypass Reach Flow and Aquatic Habitat Study

## 2021 Study Activities

- Collect model calibration data at steady-state target flows
- Develop 2-D hydraulic model (Innovyze Infoworks Integrated Catchment Model)
- Simulate potential aquatic habitat under various bypass flow scenarios
- Evaluate existing 8 cfs minimum flow requirement
- Evaluate potential seasonal minimum flow releases in the bypass reach







# Variations from FERC-approved Study Plan

The Bypass Reach and Habitat Assessment Study is being conducted in conformance with the Commission’s SPD.

Proposed Changes to the 2020-2021 Study Plan Schedule for the Niagara Project (FERC No. 2466)		
Bypass Reach Flow and Aquatic Habitat Study	Activity	Proposed Timeframe for Completion (January 2021 update)
	Topographic Mapping and Photogrammetry Data Collection	Completed (January 2020)
	Desktop Habitat Assessment	Completed (December 2020)
	Mesohabitat Mapping and Substrate Characterization Field Data Collection	June - August 2021
	Distribute Proposed Flow Test Scenario Framework to Interested Parties for Review	Completed (January 2021)
	Conduct Flow and Water Level Assessment and Hydraulic Model Development	June – October 2021
	Distribute Draft Study Report with the ISR/USR	ISR Completed (January 2021) USR December 2021

# 30-minute lunch break

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# Water Quality Study



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# Water Quality Study

**Study Goal:** Conduct a study to support an analysis of the potential Project-related effects on water quality

## **Specific Objectives:**

- Gather baseline water quality data sufficient to determine consistency of existing Project operations with applicable Virginia state water quality standards and designated uses
- Provide data to determine the presence and extent, if any, of temperature or dissolved oxygen (DO) stratification in the Niagara impoundment
- Provide data to support a Virginia Water Protection Permit application (CWA Section 401 Certification)
- Provide information to support evaluation of whether additional or modified protection, mitigation, and enhancement (PM&E) measures may be appropriate for the protection of water quality at the Project





# Water Quality Study

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## Study Status

Appalachian has initiated and completed the Water Quality Study in accordance with the schedule and methods described in the RSP and SPD

## Summary of Study Methods and Results

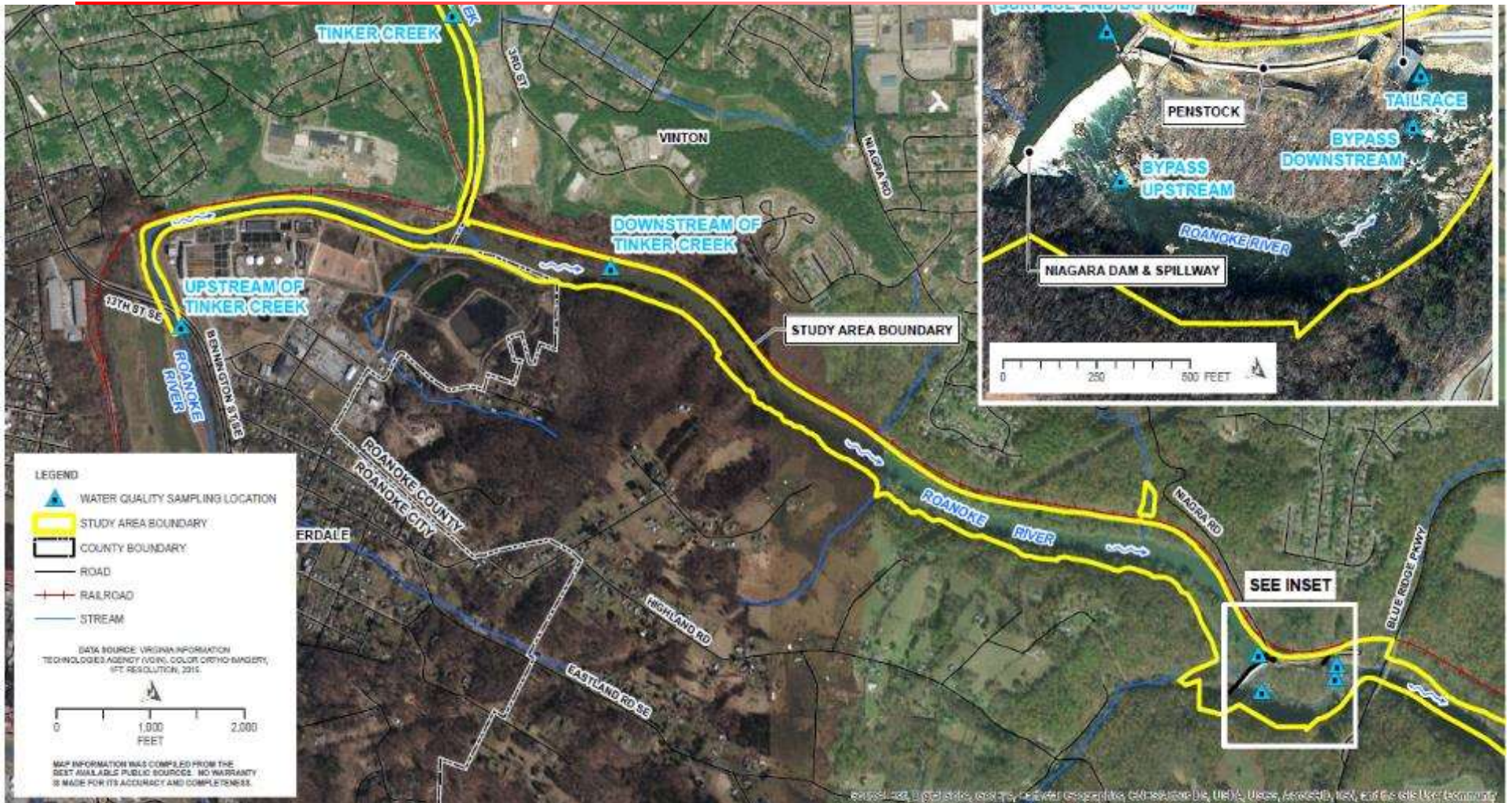
- Study period: July 29 – November 10, 2020
- Temperature and DO data collected at 15-minute intervals
- Discrete data collected during equipment installation, download events, and demobilization (temperature, DO, pH, and specific conductivity)
- Vertical profile data collected during discrete data collection events

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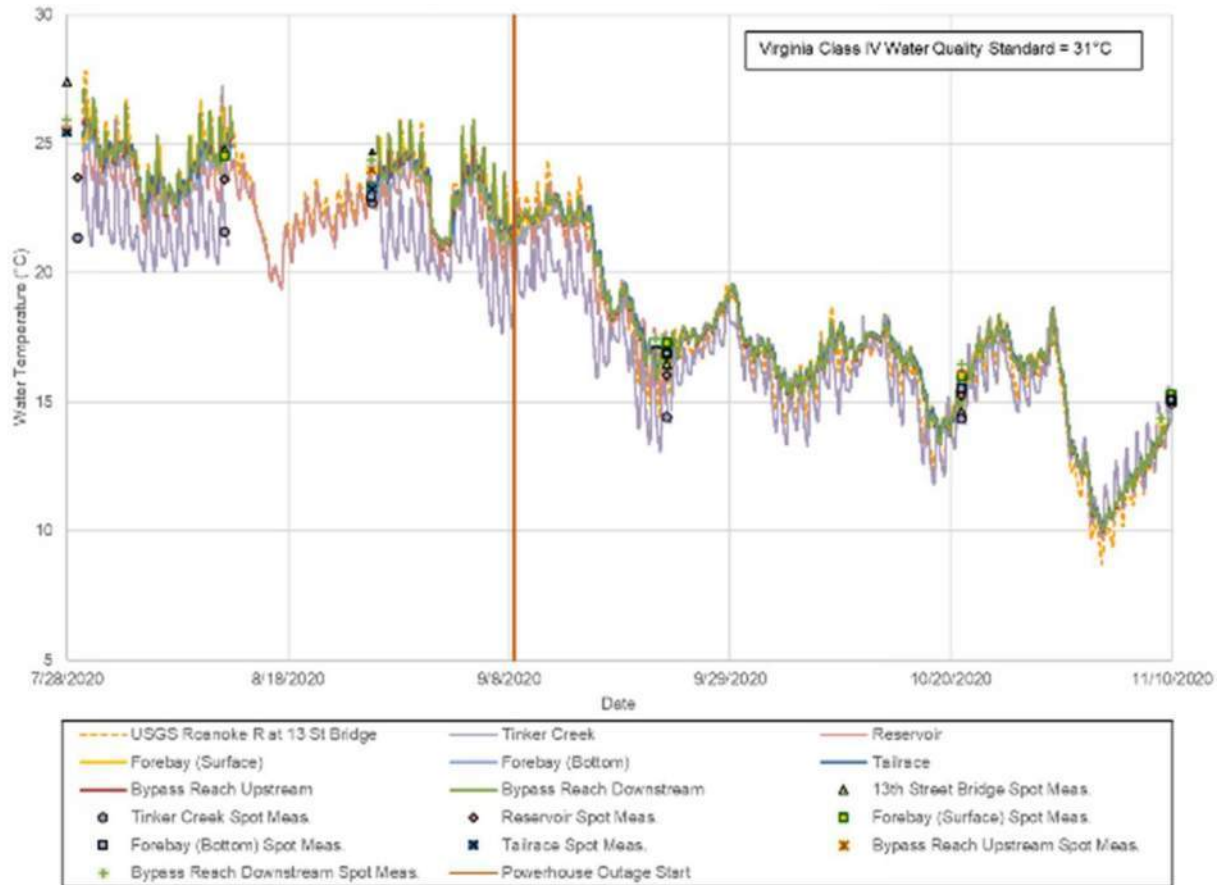
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# Water Quality Study Area



WATER QUALITY INSTRUMENTATION LOCATIONS  
NIAGARA HYDROELECTRIC PROJECT (FERC NO. 2466)

# Water Temperatures

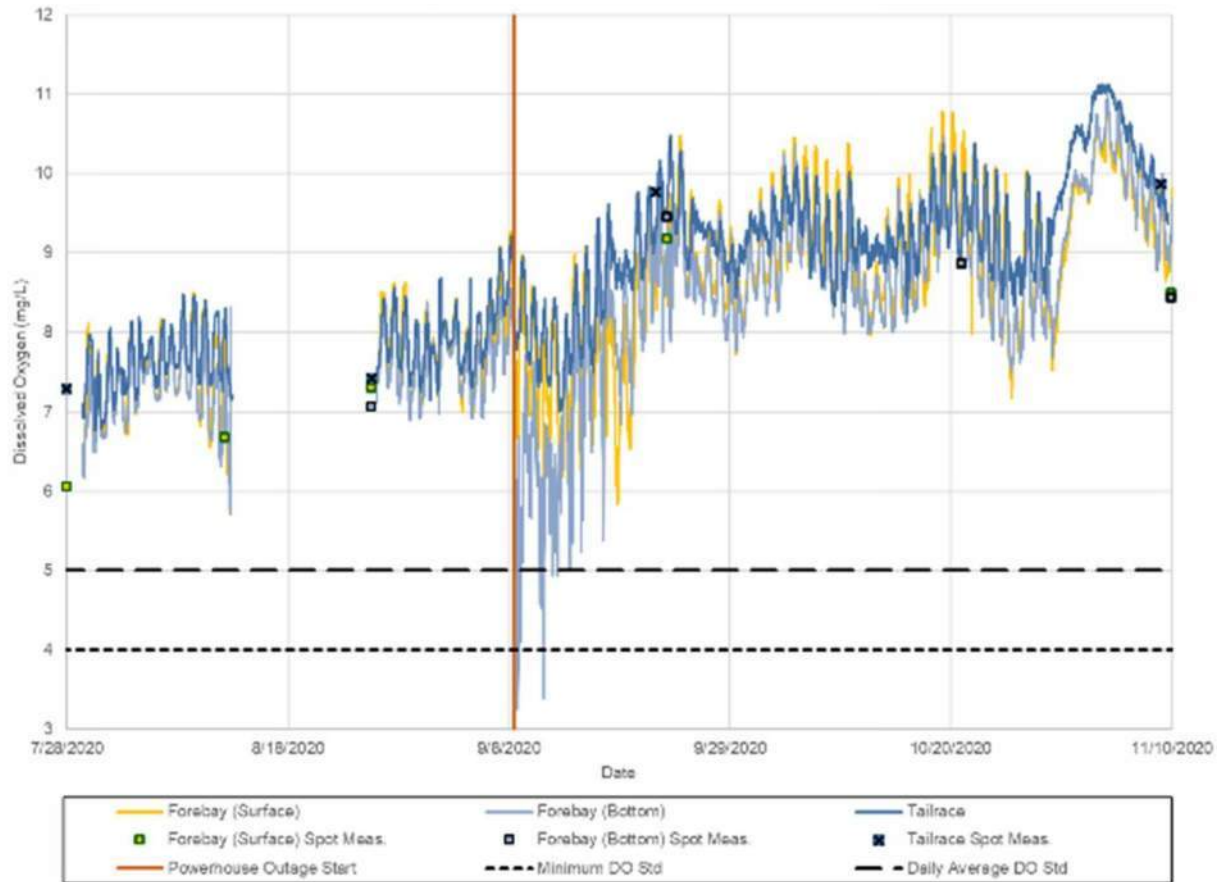




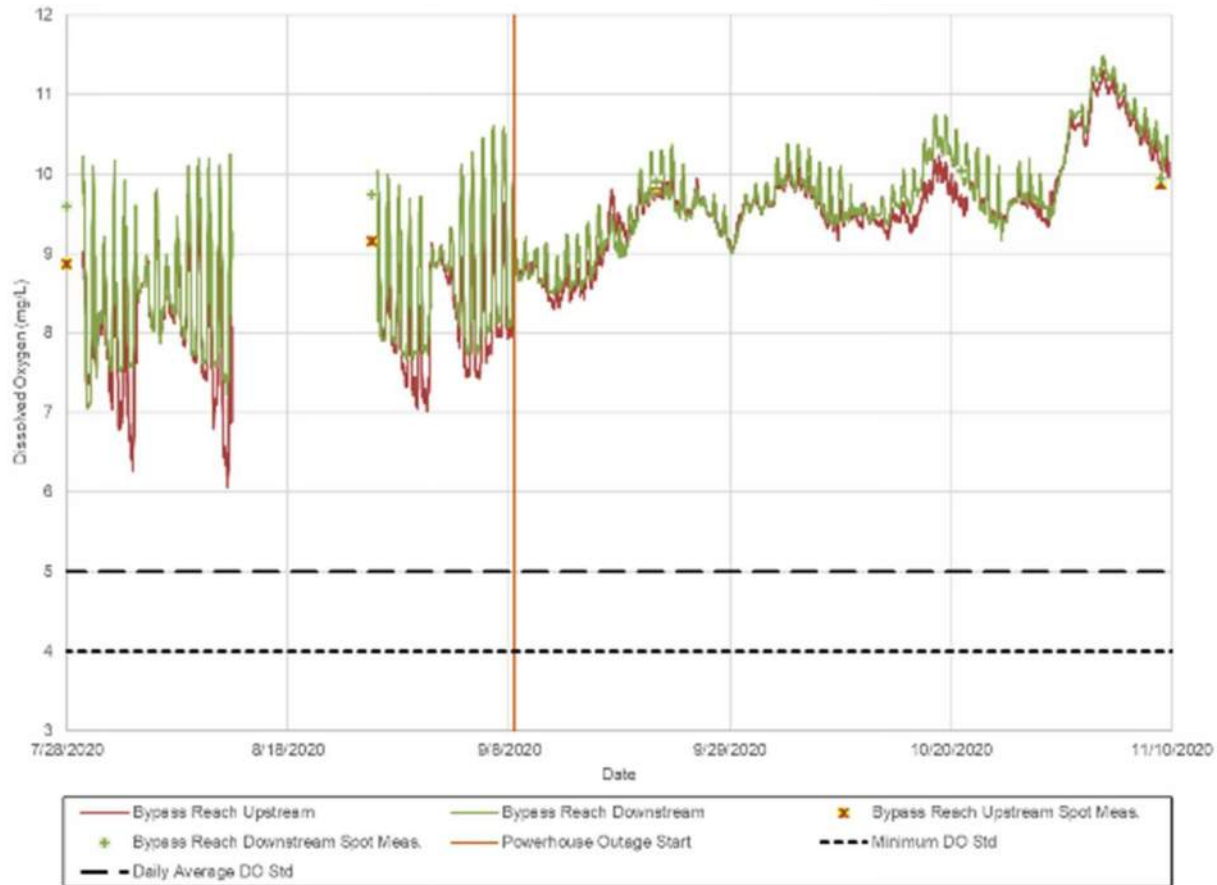
# Dissolved Oxygen Upstream Monitoring



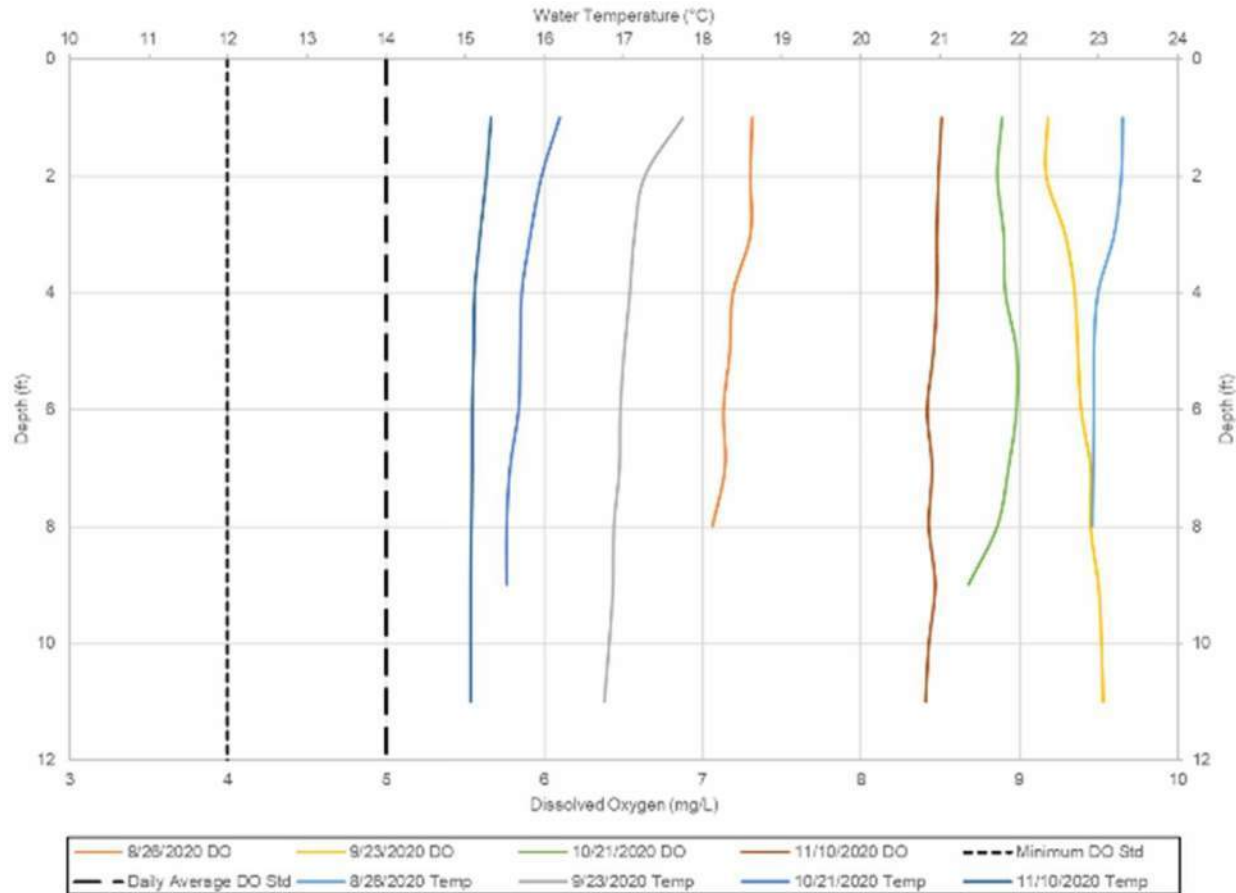
# Dissolved Oxygen Forebay and Tailrace



# Dissolved Oxygen Bypass Reach

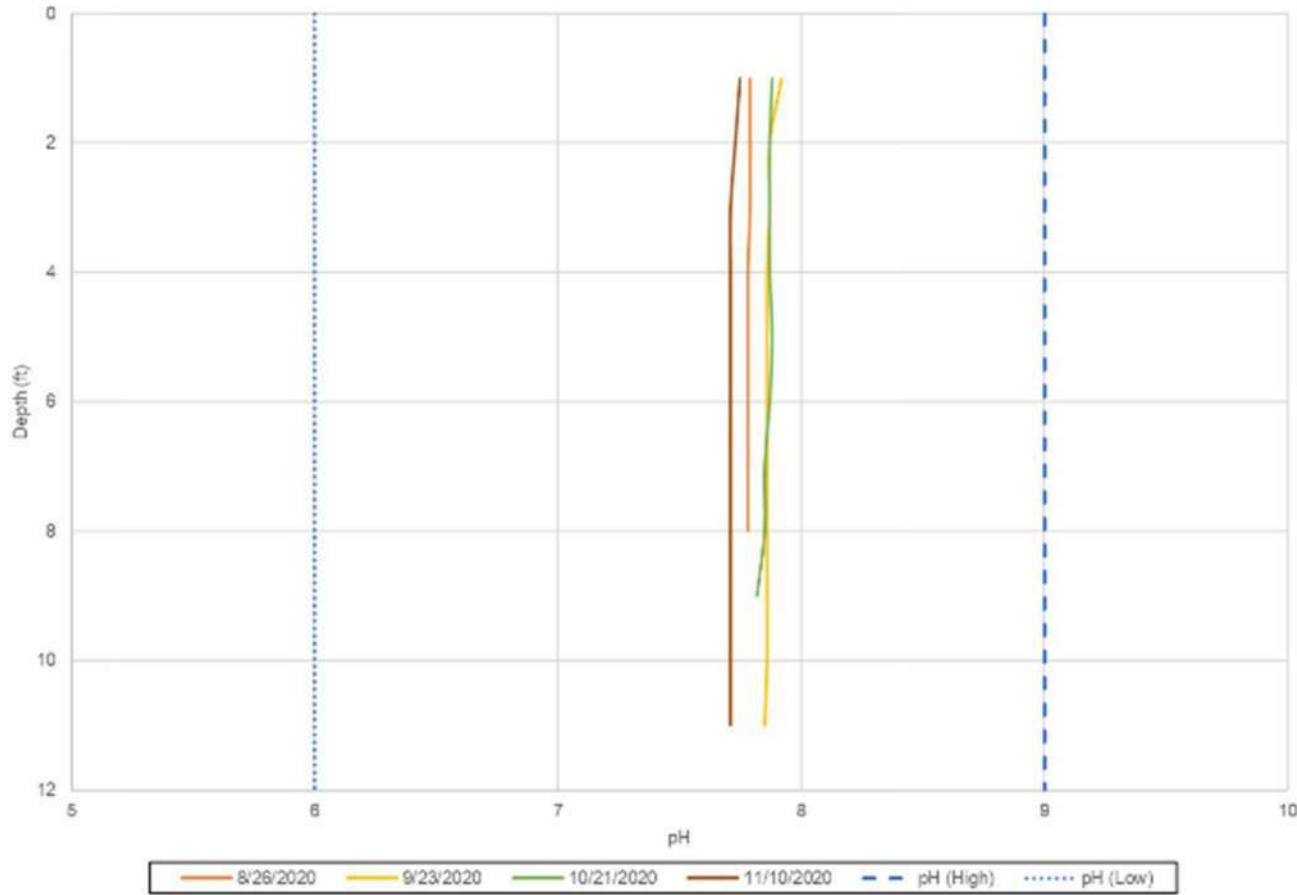


# Forebay Vertical Profiles Temperature and DO

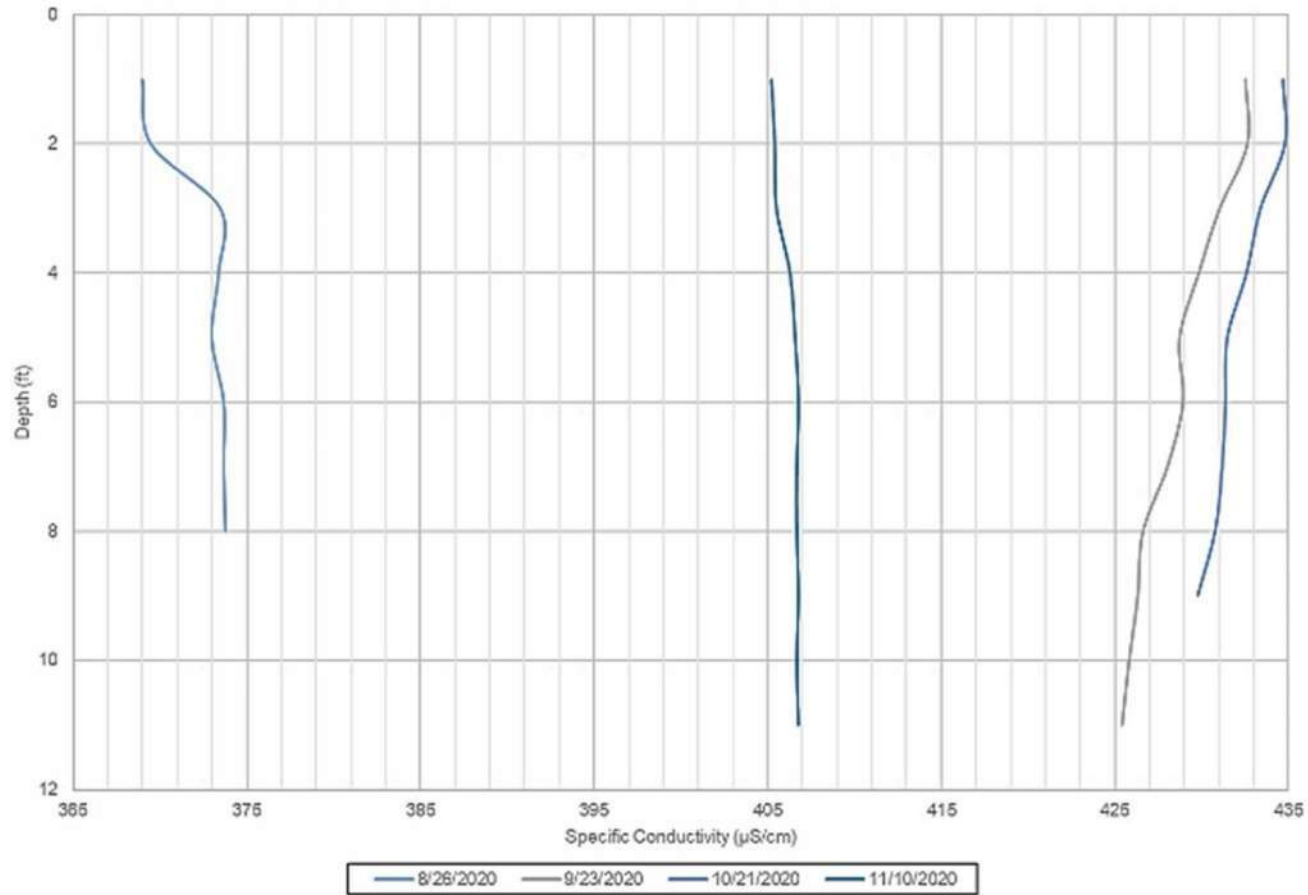




# Forebay Vertical Profiles pH



# Forebay Vertical Profiles Specific Conductivity



# Water Quality Study Summary and Conclusions

- Water temperatures, DO concentrations, and pH measurements met Virginia Class IV (Roanoke River) and Class VII (Tinker Creek) water quality standards
- Specific conductivity range is suitable for aquatic species
- Little to no thermal or DO stratification at the reservoir and forebay monitoring locations
- As a result, no need for additional PM&E measures to protect water quality at the Project

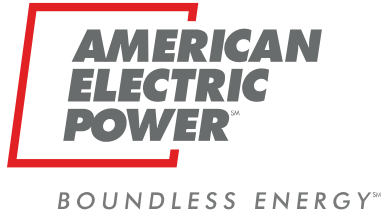


# Additional Water Quality Data Needs (Bypass Reach)



- Water quality measurements in the bypass reach met Virginia Class IV standards
- Bypass reach flows were higher than normal during the 2020 data collection period
- Recommend re-installing the two bypass reach monitoring locations during July-August 2021 to collect supplemental data during the warmest portion of the summer when bypass reach flows should be closer to normal





# Variations from FERC-approved Study Plan

The Water Quality Study was conducted in conformance with the Commission’s SPD.

Proposed Changes to the 2020-2021 Study Plan Schedule for the Niagara Project (FERC No. 2466)		
	Activity	Proposed Timeframe for Completion (January 2021 update)
Water Quality Study	Study Planning and Existing Data Review	Completed (August 2020)
	Continuous and Monthly Water Quality Monitoring (Dissolved Oxygen and Temperature)	Completed (August – November 2020)
	Bypass Reach Continuous Dissolved Oxygen and Temperature Monitoring	July – August 2021 (Supplemental)
	Distribute Draft Study Report with the ISR/USR	ISR Completed (January 2021) USR December 2021

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# Recreation Study



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# Recreation Study

## Study Status

- Appalachian has commenced the Recreation Study in accordance with the RSP and the Commission's SPD.

Task	Status
Recreation Facility Inventory and Condition Assessment	Completed in January 2020.
Existing and Future Recreational Opportunities	Postponed until Q1 2021.
Recreation Visitor Use Online Survey	Preliminary data provided. Survey has been extended through October 2021.
Recreational Use Documentation	Postponed until May 2021.
Aesthetic Flow Documentation	Completed (potential for one more visit to capture bypass reach minimum flow conditions in 2021).
Recreational Flow Release Desktop Evaluation	Completed in November 2020.

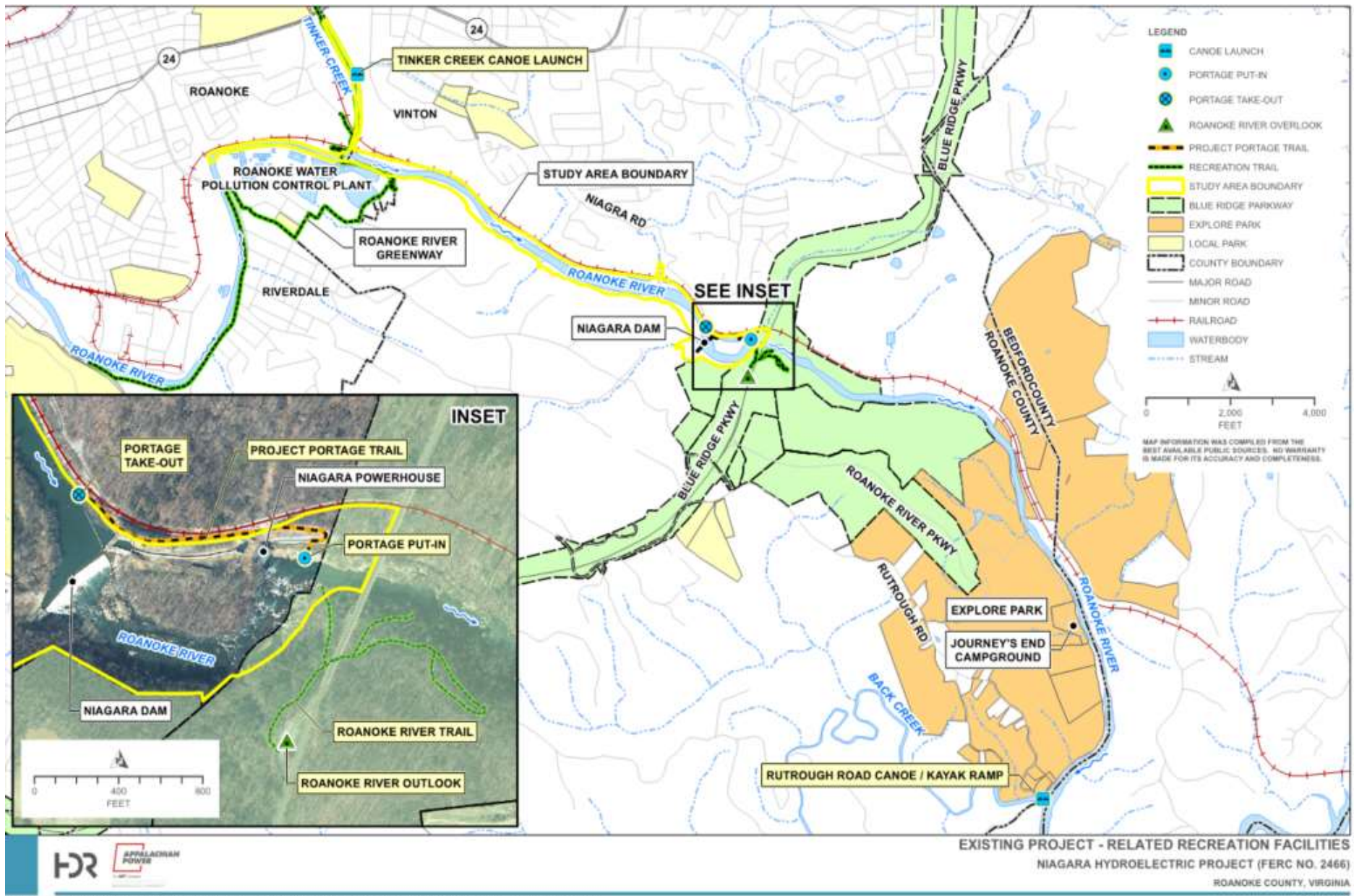


# Recreation Study

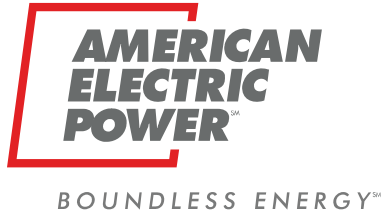
**Study Goal:** to determine the need for enhancement to the existing recreation facility, or the need for additional recreational facilities, to support the current and future demand for public recreation in the Study Area.

**Existing Project and Non-Project facilities:**

- Project Canoe Portage Trail (Project Facility) includes a take-out and put-in below the Niagara dam.
- Tinker Creek Canoe Launch (Non-Project Facility) is upstream of the Niagara dam.
- The Roanoke River Trail (Non-Project Facility) includes a short-inclined trail and access to fishing in the bypass reach.
- Rutrough Road Canoe/Kayak Ramp (Non-Project Facility) is 3RM downstream from the Niagara dam.



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# Recreation Study: Recreation Facility Inventory and Conditions Assessment

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## Summary of Study Methods (October 2019)

- Young Energy Services (YES) staff conducted a field inventory and qualitative assessment of the condition of the four Project and Non-Project facilities.

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# Recreation Facility Inventory and Conditions Assessment: Project Portage Trail

## Existing Facilities:

- Timber steps at take-out.
- Boat barrier upstream of spillway.
- Portage Trail shares access road.
- Rock outcrop at put-in.
- Signage at take-out, put-in and along trail.

## Condition:

- Portage path 10 ft. to 12 ft. wide. Slope up to 10%. Primarily gravel surface. Good condition.
- Take-out poorly signed and difficult to use. Debris and silt on steps.
- Put-in along rocks somewhat difficult to use.
- Number of signs adequate. Some signs are worn and faded.
- No sanitary facilities or trash receptacles.



# Niagara Project Canoe Portage

Steps at Take-Out



Portage Trail at Take-Out







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# Niagara Project Canoe Portage

Boat Barrier



Trail/Access Road



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# Niagara Project Canoe Portage

Put-in at River



Signs at Put-In





## Recreation Facility Inventory and Conditions Assessment: Tinker Creek Canoe/Kayak Access

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### Existing Facilities:

- Parking for 23 vehicles of which 5 designated for boaters (one ADA).
- Concrete ramp to Tinker Creek
- Timber storage rack that can hold 6 canoes/kayaks.
- Excellent signage and postings provided.

### Condition:

- Parking area paved and in good condition.
- Ramp in good condition.
- Put-in rocky and shallow.
- Storage rack in good condition.
- Signage is adequate and kept in good condition.
- No sanitary facilities or trash receptacles.





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# Tinker Creek Canoe Access

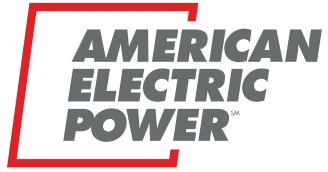
Concrete Ramp



Tinker Creek at End of Ramp



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# Tinker Creek Canoe Access

Canoe/Kayak Storage



Example of An Information Sign



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# Tinker Creek Canoe Access

Shared Parking Area



Boater Only Parking



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# Recreation Facility Inventory and Conditions Assessment: Roanoke River Trail

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## Existing Facilities

- 35 asphalt paved parking spaces.
- Upper trail portion: asphalt paved; Mid-Section: gravel surface; Lower Section has 200 timber steps with gravel fill.
- Rock outcropping providing bank fishing area at end of steps.
- No sanitary facilities. Trash receptacle provided at parking area.
- Information sign and benches provided at observation sites along steps.

## Condition

- Parking area in good condition (No ADA).
- Trail in good condition but maintenance needed along paved upper portion of trail and at steps.
- USGS gage (No. 02056000) located at end of steps.
- Signs and benches in good condition.





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# Roanoke River Trail

Parking Area



Trash Receptacle and Information Sign at Parking Area



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# Roanoke River Trail

Seating at Parking Area



Steps to the Bypass



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# Roanoke River Trail

Bench Mid-Way On Trail



Mid-Portion of Trail



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# Roanoke River Trail

Fishing Area at End of Steps



USGS Gage at End of Steps



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# Recreation Facility Inventory and Conditions Assessment: Rutrough Road Canoe/Kayak Ramp

## Existing Facilities

- 12 gravel surface parking spaces.
- Dirt and gravel surface trail from parking area to put-in/take-out.
- Timber steps at put-in/take-out.
- Bank fishing.
- Access from parking area to Explore Park trails.
- Picnic table and trash receptacles provided.
- Numerous information and directional signs.

## Condition

- Put-in/take-out in good condition.
- Parking area in good condition (No ADA).
- Trail from parking area to put-in/take-out in decent condition. Needs resurfacing.
- Access from parking area to Explore Park trails in good condition with adequate directional signs.
- Picnic table in poor condition.
- Very good signage providing direction and information. No signage directing vehicles along Rutrough Road to parking area.

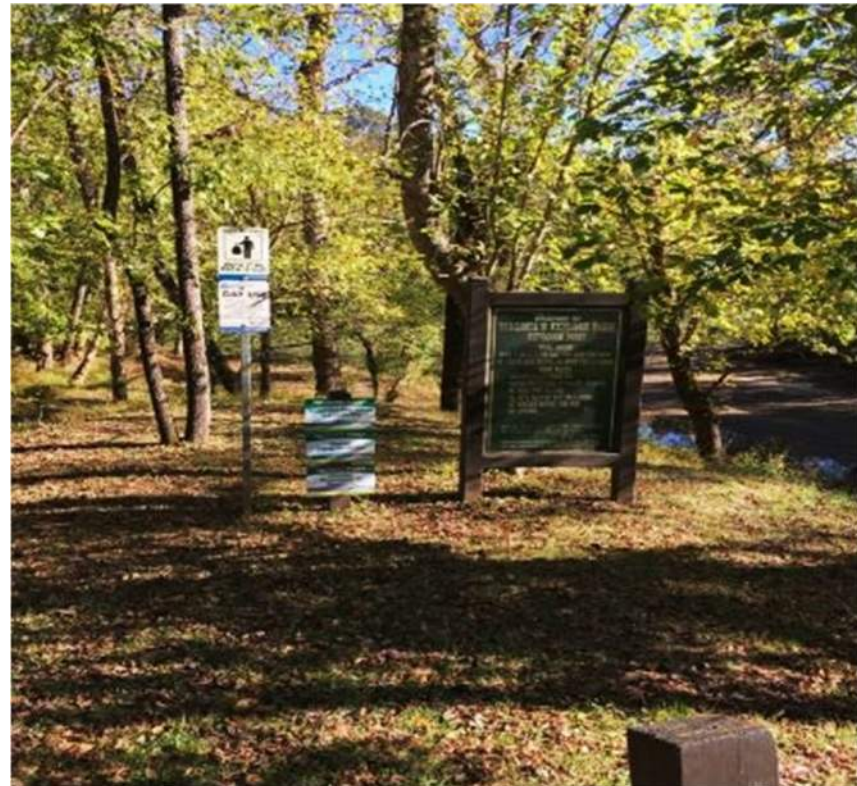


# Rutrough Road Canoe/Kayak Ramp

Parking Area



Information Signs at Parking Entrance





# Rutrough Road Canoe/Kayak Ramp

Trail from Parking Area to Put-in/Take-out



Put-in/Take-out



# Rutrough Road Canoe/Kayak Ramp

Information Board



Explore Park Trails Entrance at Parking Area



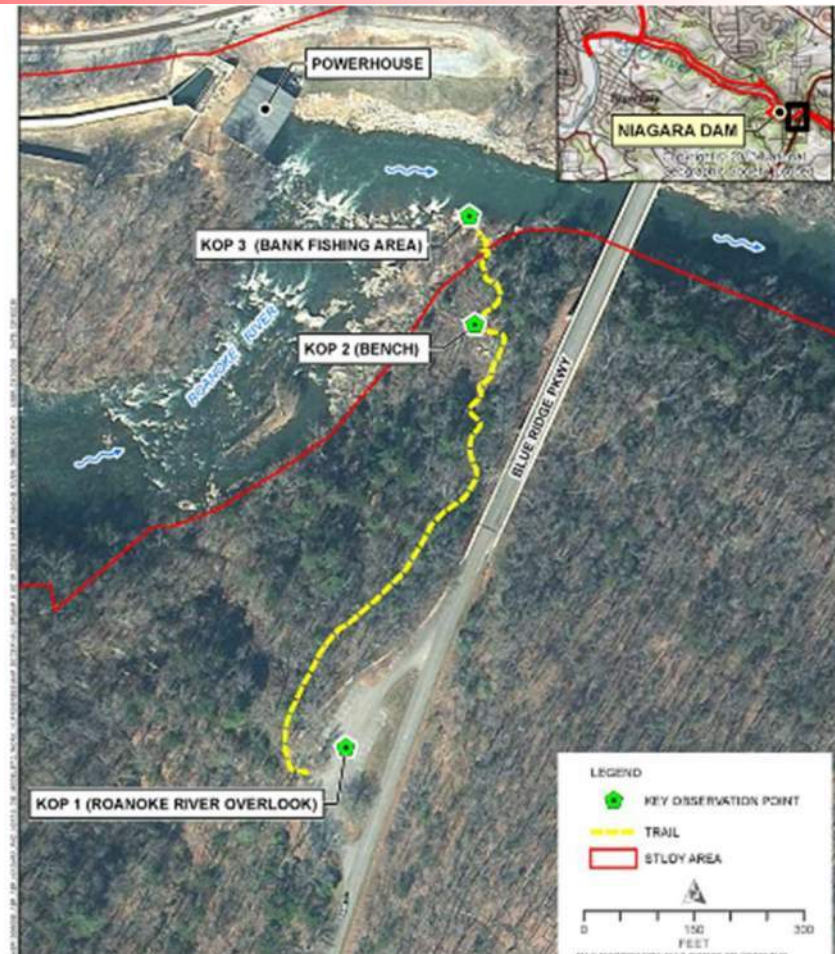


# Recreation Study: Aesthetic Study

## Summary of Study Methods

YES collected photo and video documentation from three key observation points (KOP), including:

- 1) The NPS Roanoke River Outlook adjacent to the Blue Ridge parking lot,
- 2) A bench midway down the stairs to the bypass, and
- 3) The bank fishing area located at the end of the trail steps at the Roanoke River.



# January 1, 2020

Estimated 332 cfs

KOP 1



KOP 2



KOP 3





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# January 1, 2020

## Estimated 332 cfs

### Video of KOP 3



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# May 1, 2020

Estimated 3,317 cfs

KOP 1



KOP 2



KOP 3



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**May 1, 2020**  
**Estimated 3,317 cfs**  
**Video of KOP 1**





# July 11, 2020

Estimated 32 cfs

KOP 1



KOP 2



KOP 3



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**July 11, 2020**

**Estimated 32 cfs**

**Video from KOP 2**



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# September 5, 2020

Estimated 30 cfs

KOP 1



KOP 2



KOP 3



# Aesthetic Study Results

- Optimal time for viewing the Project spillway and bypass reach appears to be late October and early November when leaves are changing colors and falling.
- High flow conditions: spillway may be aesthetically appealing but can cause turbidity in the bypass and cover the unique geological features.
  - Aesthetically pleasing views occur under low to mid flows
- Existing Project operations provide an appropriate aesthetic experience
- In 2021, collect an additional aesthetic flow observation during a period of approximately 8 cfs (minimum flow requirement) bypass reach flow conditions.



# Recreation Study: Online Survey

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## Summary of Study Methods and Results

- Administered through the Project's relicensing website and offered respondents the opportunity to provide survey responses electronically.
- Outreach methods included posted signs at facilities, coordination with stakeholders, and notice in ILP Progress Report.
- From April 21 to October 31, 2020, Appalachian received 120 responses.
- Will continue into 2021.

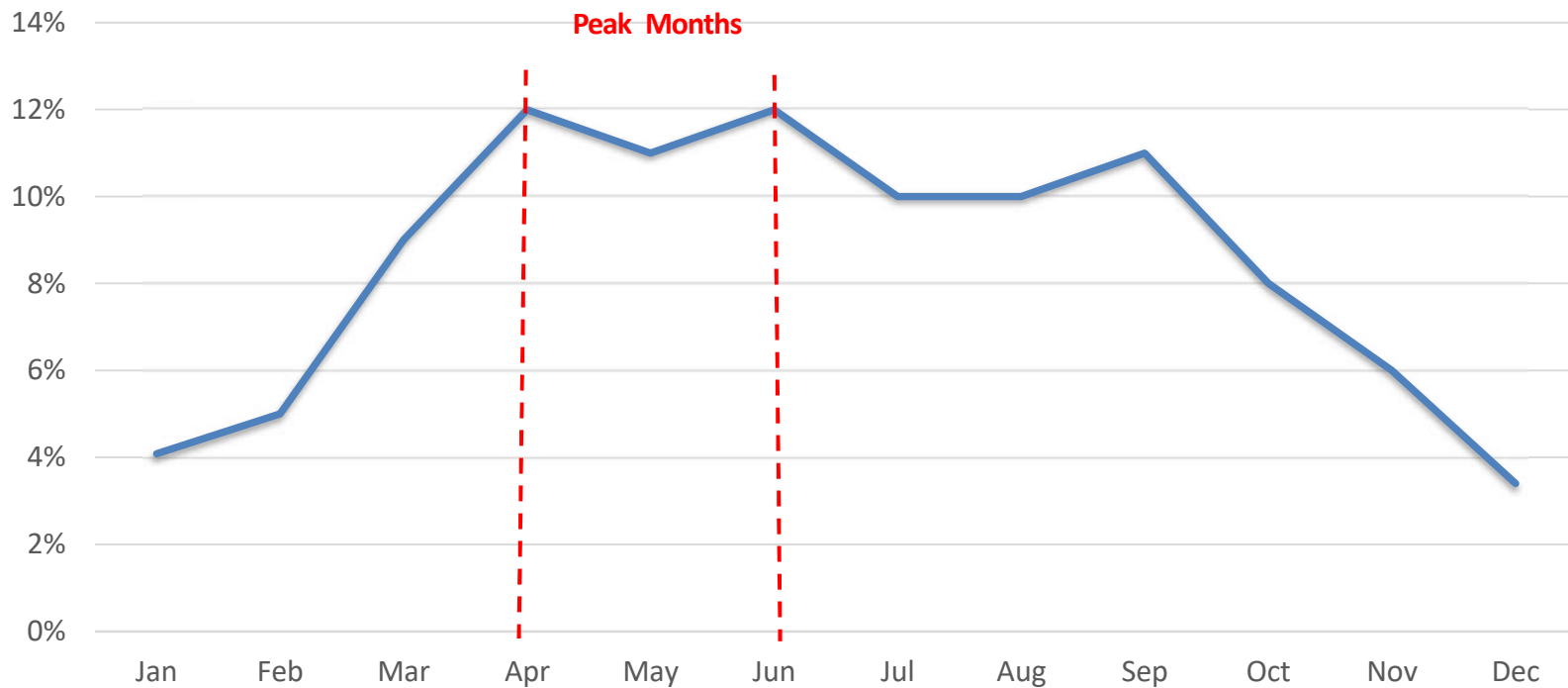
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# Monthly Recreation Activity for Project and Non-Project Facilities

## Trips



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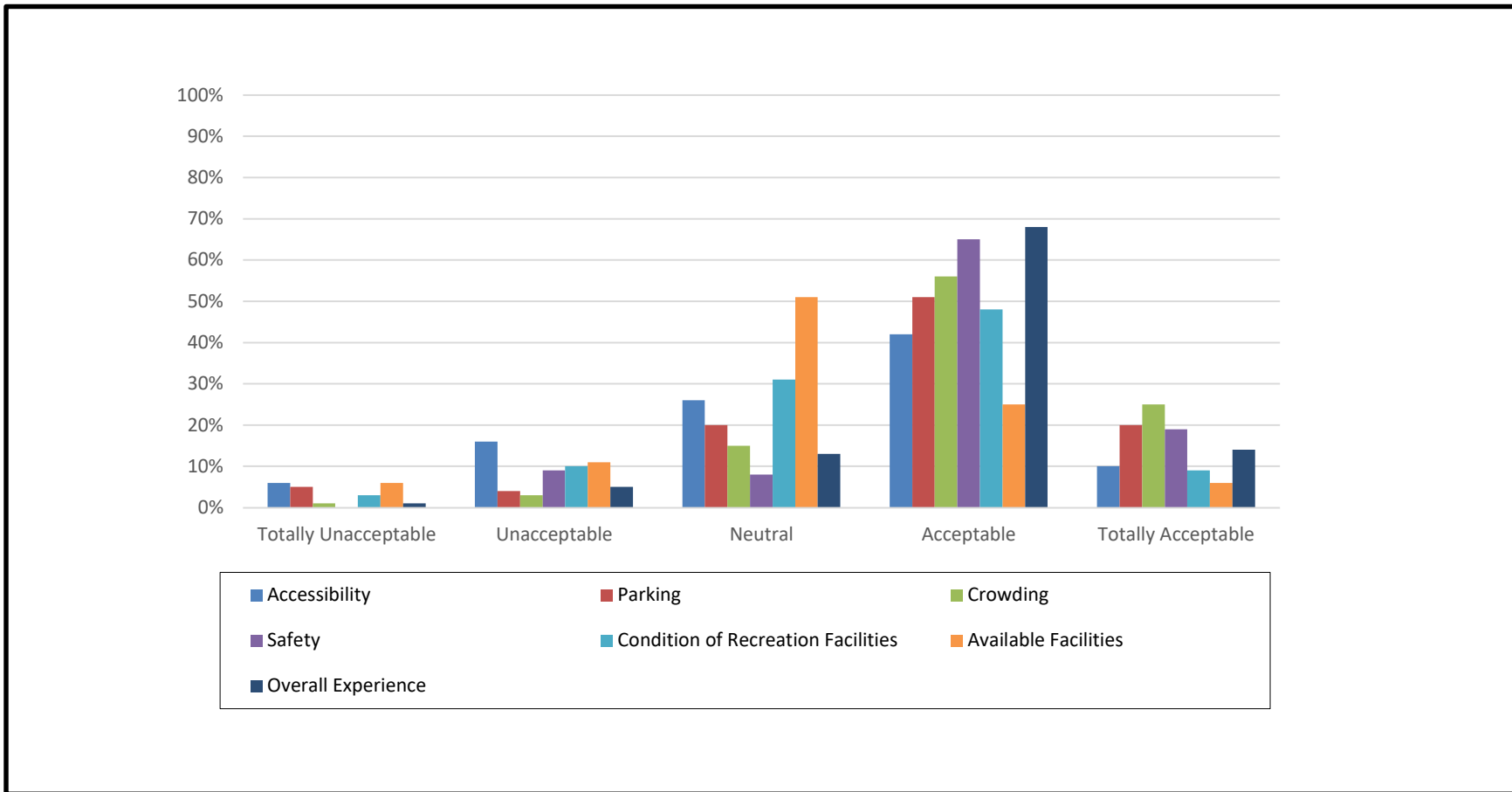
## Summary for Primary Recreation Activities at all Project and Non-Project Facilities

Primary Activity	Percent (%)
Canoeing/kayaking	67
Fishing	17
Hiking	6
Sight-seeing	3
Picnicking	1
Pleasure boating	1
Running	1
Swimming	1
Tubing	1
Wildlife viewing	1



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# Online Survey Summary for Overall Rating on All Visits at Project and Non-Project Facilities



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# Niagara Canoe Portage: Online Survey Suggested Improvements

## ▲ Suggested Improvement Responses from Niagara Portage Trail:

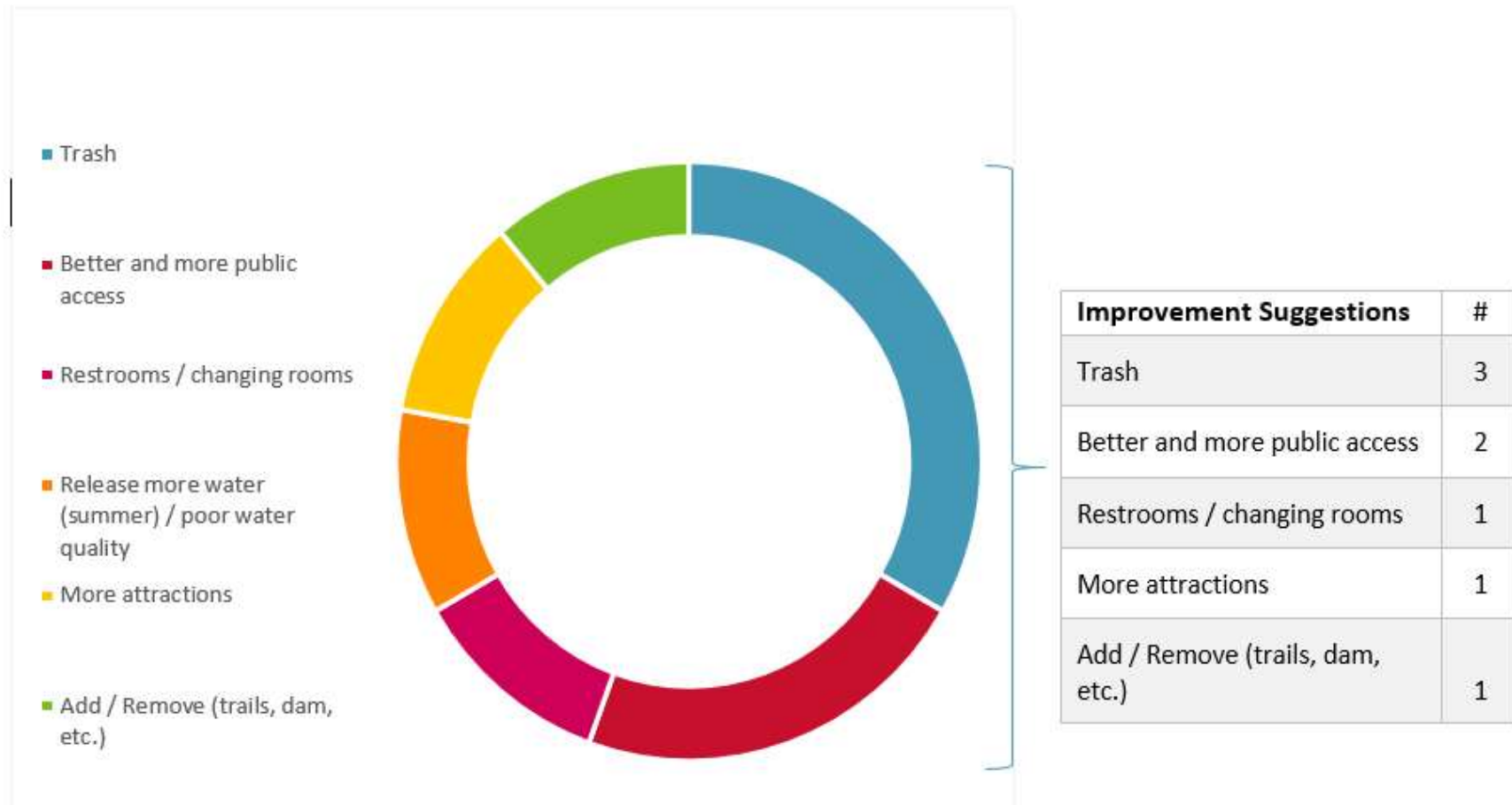
- Better and more public access
- Improvements to boat launches / take-outs
- Parking (more, better, lighting)
- Add / Remove (trails, dam, etc.)
- Restrooms / changing rooms
- Release more water (summer) / poor water quality
- Trash
- Signage & wayfinding
- Access to water release schedule
- More attractions
- Trail work / road improvements



Improvement Suggestions	#
Better and more public access	11
Improvements to boat launches / take-outs	11
Parking (more, better, lighting)	3
Add / Remove (trails, dam, etc.)	3
Restrooms / changing rooms	2
Release more water (summer) / poor water quality	2
Trash	2
Signage & wayfinding	1
Access to water release schedule	1
More attractions	1
Trail work / road improvements	1

# Tinker Creek Canoe Portage: Online Survey Suggested Improvements

## Suggested Improvement Responses from Tinker Creek Canoe Launch:



# Roanoke River Trail/Overlook: Online Survey Suggested Improvements

## Suggested Improvement Responses from Roanoke River Trail / Overlook:

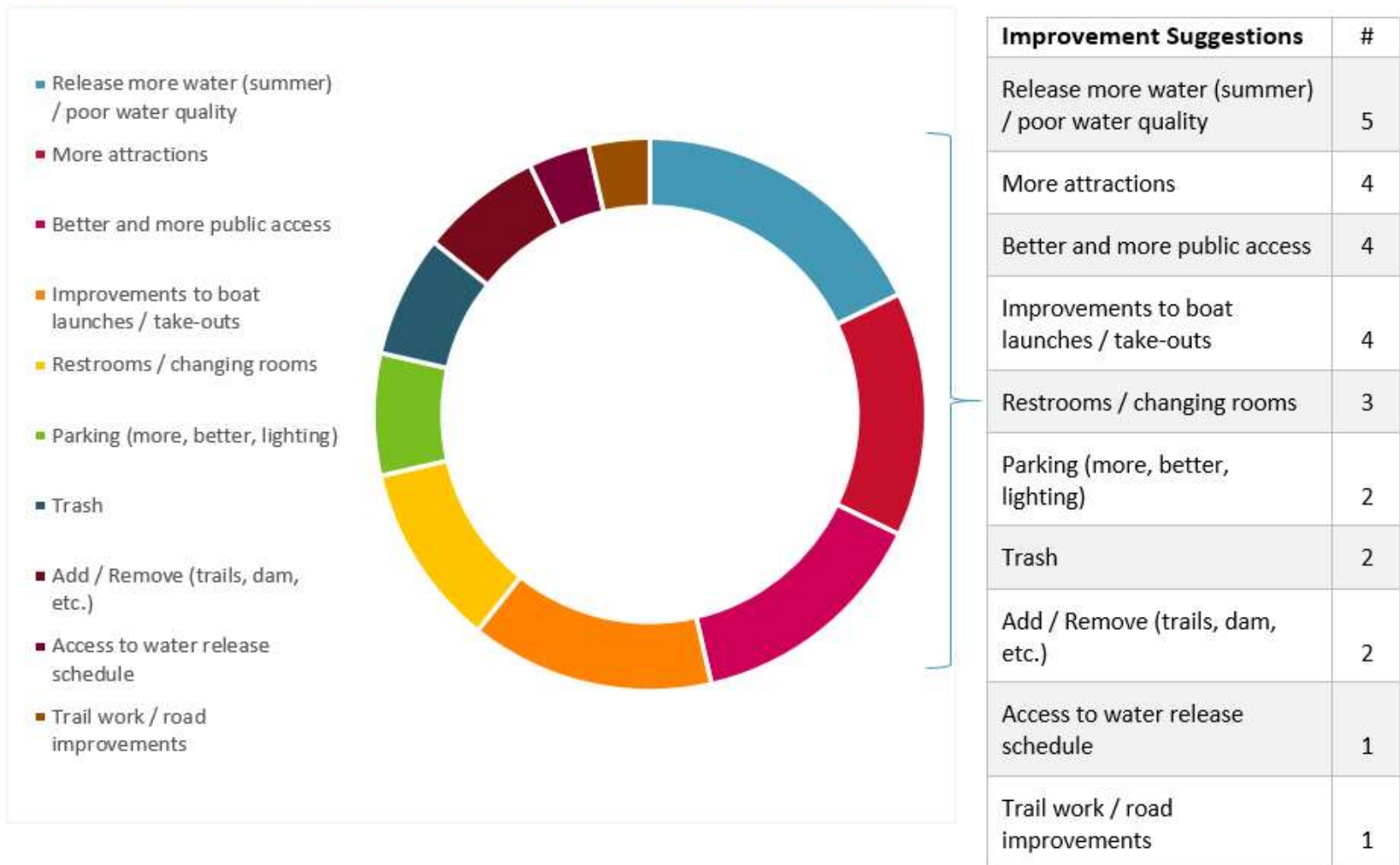
- Restrooms / changing rooms
- Parking (more, better, lighting)
- Release more water (summer) / poor water quality
- Better and more public access
- Access to water release schedule
- Add / Remove (trails, dam, etc.)
- Signage & wayfinding
- Trash
- Improvements to boat launches / take-outs
- More attractions

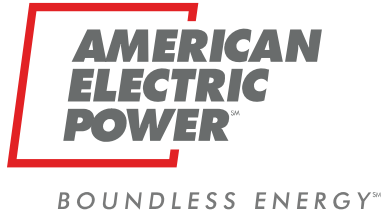


Improvement Suggestions	#
Restrooms / changing rooms	4
Parking (more, better, lighting)	4
Release more water (summer) / poor water quality	4
Better and more public access	4
Access to water release schedule	3
Add / Remove (trails, dam, etc.)	3
Signage & wayfinding	2
Trash	2
Improvements to boat launches / take-outs	2
More attractions	1

# Rutrough Road Canoe/Kayak Ramp: Online Survey Suggested Improvements

Suggested Improvement Responses from Rutrough Road Canoe / Kayak Ramp:





# Recreation Study: Recreational Flow Release Desktop Evaluation Results

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## Summary of Study Methods

To address stakeholders' interests while recognizing Project constraints related to enhancement of downstream flow conditions, HDR conducted a desktop evaluation to assess the potential for Project operations to support short-term enhancement of flow conditions for downstream boating.





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# Recreational Flow Release Results

Parameter	Minimum Downstream Flow Requirement (Project)  50 cfs	Powerhouse Generation		
		Unit 1  379 cfs  (hr:min)	Unit 2  305 cfs  (hr:min)	Unit 1 & 2  684 cfs  (hr:min)
Current Operating Band Volume (56.5 acre-ft) (i.e., under impoundment elevation and fluctuation limits of the existing license)	--	1:46	2:12	1:00
Additional Freeboard Volume (34.3 acre-ft)	--	1:05	1:21	0:36
Total Available Volume (90.8 acre-ft)	--	2:51	3:33	1:36
Roanoke River at Niagara USGS stage	0.99 ft	2.75 ft	2.49 ft	3.61 ft

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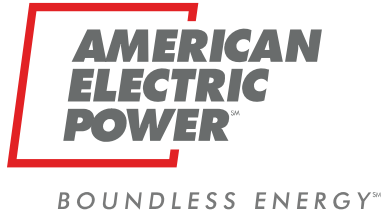


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# Recreation Flow Release Results

- Benefits limited to river reach between Project's portage put-in and the downstream Explore Park/Rutrough Point canoe/kayak access area (3 RM)
- Potential short-term recreation flow release in form of brief flow pulse (1-3 ½ hours).
- Ability to provide bump in flow ("recreational release") subject to sufficient inflow, availability of Project facilities, and availability of operating personnel.
- Operating the reservoir with more fluctuation than is typical may have unintended effects on reservoir littoral habitat.

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# Variations from FERC-approved Study Plan

The Recreation Study has been and will be conducted in conformance with the Commission’s SPD.

Study	Activities	Proposed Timeframe for Completion (January 2021 update)
Recreation Study	Study Planning and Existing Data Review	Completed (March 2020)
	Recreation Facility Inventory and Condition Assessment	Completed (November 2019)
	Convene Meeting with Stakeholders	January – April 2021
	Recreation Visitor Use Online Survey	May 2020 – October 2021
	Recreational Use Documentation (2x/month)	May – October 2021
	Aesthetic Flow Documentation (Quarterly)	Completed (November 2020)
	Recreational Flow Release Desktop Evaluation	Completed (December 2020)
	Distribute Draft Study Report with the ISR/USR	ISR Completed (January 2021) USR December 2021

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# 5-minute break



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# Cultural Resources Study



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# Cultural Resources Study

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## Study Status

- Initiated the Cultural Resources study in accordance with the schedule and methods described in the RSP and SPD.
- Tasks completed to date (late summer – November 2020):
  - Consultation for the APE Determination (Task 1),
  - Background Research and Archival Review of the Study Area (Task 2),
  - Phase I Reconnaissance Survey of the Area of Potential Effects (APE) (Task 3).
- Tasks to be completed in 2021:
  - Inventory of Traditional Cultural Properties (Task 4)
  - Consulting with agencies to determine if a Historic Properties Management Plan is necessary for the Project (Task 5)

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# Cultural Resources Study

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## APE Consultation

On September 1, 2020, Terracon consulted with the SHPO and applicable tribes requesting concurrence on the Project's APE.

APE responses were received from:

- The Catawba Indian Nation
- The Virginia DHR/SHPO
- The Pamunkey Indian Tribe
- The Monacan Indian Nation
- The Delaware Nation

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# Cultural Resources Study: Background Research and On-Site Fieldwork

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- Archaeological assessment of the Project APE, including areas along Tinker Creek.
  - Areas within the APE along Tinker Creek and the Roanoke River west of Tinker Creek have a low potential for containing archaeological resources.
- Niagara powerhouse and dam re-evaluated as historic resources.
  - Terracon confirmed that while much of the footprint of the original 1906 facility remains many of the original components have been removed or modified.
  - Consistent with SHPO's January 1991 finding, this study reinforces the recommendation that the Niagara powerhouse and dam are ineligible for the NRHP
- None of the resources identified during Terracon's research, either within the APE and those within a 0.5-mile radius, will be affected by the Project.

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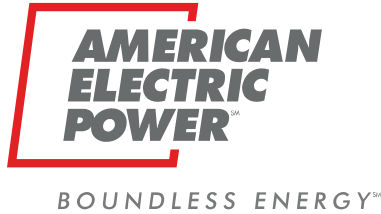
# Cultural Resources Study: Summary

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## Conclusion

- Areas along the Roanoke River east of Tinker Creek may have the potential to yield deeply buried archaeological remains, however, the results of a pending geomorphological assessment are needed to confirm this.
  - Geomorphological assessment scheduled for 2021.
- No historic properties are currently being adversely affected by the Project.
- If new construction were to occur in the areas outlined in the Study Report, then additional archaeological investigations may be warranted and consultation with the SHPO would be necessary.

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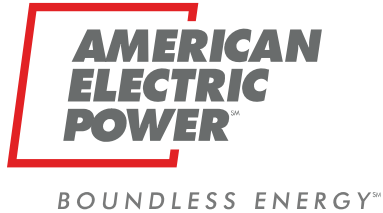


# Variations from FERC-approved Study Plan

The Preliminary Cultural Resources Study has been and will continue to be conducted in conformance with the Commission’s SPD.

Proposed Changes to the 2020-2021 Study Plan Schedule for the Niagara Project (FERC No. 2466)		
	Activity	Proposed Timeframe for Completion (January 2021 update)
Cultural Resources Study	Determination of Area of Potential Effect (APE)	Completed (September 2020)
	Background Research and Archival Review	Completed (August - September 2020)
	Phase I Reconnaissance Survey of APE	Completed (October 2020)
	Inventory of Traditional Cultural Properties	January 2021 – October 2021
	Distribute Draft Study Report with the ISR/USR	December 2021
	Historic Properties Management Plan (if necessary)	With the DLA or Preliminary Licensing Proposal





# ISR Meeting: Stakeholder Participation

- Appalachian will file ISR Meeting Summary with FERC by February 5, 2021.
- Meeting summary disagreements, requests for modifications to studies, or requests for new studies should be filed with FERC by **March 7, 2021**.
  - If requesting modifications to studies, stakeholders must take into account FERC’s Criteria for Modification of Approved Studies (18 C.F.R. § 5.15(d)).
  - If requesting new studies, stakeholders must take into account FERC’s 7 Criteria for New Study (18 C.F.R. § 5.15(e)).
- Appalachian will file responses to meeting summary disagreements by April 6, 2021.
- FERC will make a determination on any disputes/amendments to the approved study plan by May 6, 2020.
- Stakeholders can contact Appalachian with questions or comments:

Jonathan Magalski  
(614) 716-2240

[jmmagalski@aep.com](mailto:jmmagalski@aep.com)

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# Closing



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**Subject:** FW: Niagara Hydroelectric Project (VA) -- Filing of Initial Study Report Meeting Summary

**From:** Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>

**Sent:** Friday, February 5, 2021 2:40 PM

**To:** ACHP - John Eddins <jeddins@achp.gov>; Catawba Indian Nation - Wenonah Haire <caitlin.rogers@catawba.com>; County of Roanoke - David Henderson <dhenderson@roanokecountyva.gov>; County of Roanoke - Lindsay Webb <LWEBB@roanokecountyva.gov>; County of Roanoke - Richard Caywood <rcaywood@roanokecountyva.gov>; Delaware Nation - Eric Paden <epaden@delawarenation-nsn.gov>; Friends of the Blue Ridge Parkway - Audrey Pearson <audrey\_pearson@friendsbrp.org>; Friends of the Roanoke - Bill Tanger <bill.tanger@verizon.net>; Harold Peterson <harold.peterson@bia.gov>; Kevin Colburn - American Whitewater (kevin@americanwhitewater.org) <kevin@americanwhitewater.org>; Monacan Indian Nation - Kenneth Branham <TribalOffice@MonacanNation.com>; Pamunkey Indian Tribe - Terry Clouthier <terry.clouthier@pamunkey.org>; Roanoke County Parks - Doug Blount <dblount@roanokecountyva.gov>; Roanoke River Blueway <roanokeriverblueway@gmail.com>; Roanoke Valley Alleghany Regional Commission - Amanda McGee <amcgee@rvarc.org>; Roanoke Valley Greenway - Liz Blecher <liz.belcher@greenways.org>; Smith Mountain Lake Assn - Lorie Smith <TheOffice@SMLAssociation.org>; Town of Vinton - Anita McMillan <amcmillan@vintonVA.gov>; Town of Vinton - Bo Herndon <wherndon@vintonVA.gov>; Town of Vinton - Joey Hiner <jhiner@vintonVA.gov>; Town of Vinton - Kenny Sledd <ksledd@vintonVA.gov>; Tri-County Lakes Administrative Commission - Paula Shoffner <paulas@sml.us.com>; VADEQ - Brian McGurk <Brian.McGurk@deq.virginia.gov>; USEPA - Matthew Lee <lee.matthew@epa.gov>; USFWS <richard\_mccorkle@fws.gov>; USFWS - John McCloskey <John\_mccloskey@fws.gov>; USGS - Mark Bennett <mrbenet@USGS.gov>; VA Cooperative Fish and Wildlife Research Unit - Paul Angermeier <biota@vt.edu>; VADCR - Lynn Crump <lynn.crump@dcr.virginia.gov>; VADCR - Natural Heritage <nhreview@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADEQ - Andrew Hammond <andrew.hammond@deq.virginia.gov>; VADEQ - Anthony Cario <anthony.cario@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; VADEQ - Scott Kudlas <scott.kudlas@deq.virginia.gov>; Virginia Council on Indians - Emma Williams <emma.williams@governor.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; Virginia Department of Game and Inland Fisheries - Scott Smith <scott.smith@dgif.virginia.gov>

**Cc:** 'ebparcell@aep.com' <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>

**Subject:** Niagara Hydroelectric Project (VA) -- Filing of Initial Study Report Meeting Summary

Niagara Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Niagara Hydroelectric Project (FERC No. 2466) (Project) located on the Roanoke River in Roanoke County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Pursuant to the ILP, Appalachian conducted the Initial Study Report (ISR) Meeting on January 21, 2021 and filed the ISR Meeting Summary for the Project on February 5, 2021. The ISR Meeting Summary is now available for stakeholder review. For your convenience, a copy of the cover letter filed with the ISR Meeting Summary is attached. Appalachian encourages stakeholders to view the complete filing online at FERC's eLibrary at [https://elibrary.ferc.gov/eLibrary/filelist?accession\\_num=20210205-5058](https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20210205-5058). Appalachian will also be adding the ISR to the Project's public relicensing website (<http://www.aephydro.com/HydroPlant/Niagara>) in the coming days.

As established by FERC's regulations at 18 C.F.R. § 5.15, the deadline for filing meeting summary disagreements, requests for modifications to studies, or requests for new studies is March 7, 2021.

Should you have any questions regarding this filing, please contact Jon Magalski with AEP at (614) 716-2240 or [jmmagalski@aep.com](mailto:jmmagalski@aep.com). On behalf of AEP and the Niagara Project relicensing team, thank you for your interest in the Niagara Project.

**Sarah Kulpa**

*Project Manager*

**HDR**

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# ROANOKE COUNTY

OFFICE OF THE COUNTY ADMINISTRATOR  
5204 Bernard Drive, P.O. Box 29800  
Roanoke, Virginia 24018-0798

Richard L. Caywood, P.E.  
Assistant County Administrator

TEL: (540) 772-2004  
FAX: (540) 561-2884

March 3, 2021

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, DC 20426

**Re: Niagara Hydroelectric Project (FERC No. 2466-034)  
Initial Study Report Meeting Summary  
Submission of Comments from Roanoke County, Virginia**

Dear Secretary Bose:

This letter is in response to the Initial Study Report (ISR) virtual meeting hosted by Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), on January 21, 2021. The Roanoke River is a significant outdoor recreational resource and aesthetic amenity in Virginia's Blue Ridge, which includes Roanoke County, Roanoke City, Botetourt County, the Town of Vinton, and the City of Salem. The development of Explore Park, the Roanoke River Greenway, and the Roanoke River Blueway have helped meet the demands for increased outdoor recreational opportunities and have been major contributors to economic growth in the region. These recreational amenities are existing or proposed along the Roanoke River which passes through eastern Roanoke County and fall within or adjacent to both the Niagara (P-2466) and Smith Mountain (P-2210) hydroelectric project areas. It is critical that coordination continue between Appalachian, FERC, federal and state agencies, local governments, and other stakeholders to support development of recreational resources along the Roanoke River.

To demonstrate the importance of recreation in our region, the [USA Today Readers' Choice 2021](#) recently named the Roanoke River Blueway as the third "Best Urban Kayaking Spot". The Roanoke River Blueway received a Virginia [Governor's Environmental Excellence Award](#) (i.e., Silver Medal) for Implementation of the [Virginia's Outdoor Plan](#) in 2016, which identifies development of land and water trails as the third most needed activity in the 2017 Virginia Outdoors Demand Survey. The Roanoke River Blueway was also deemed a [Virginia Treasure](#) by the Department of Conservation and Recreation in 2016.



Pursuant to 18 CFR § 5.15 (c)(3), Roanoke County offers the following public interest considerations in regard to the ISR Preliminary Recreation Study dated January 11, 2021 prepared by HDR for Appalachian for your consideration.

1. As shared during the ISR virtual meeting, the National Park Service-Blue Ridge Parkway has informed Roanoke County that the Roanoke River Overlook and Trail located at Milepost 114.9 will be closed March 2021 through March 2022 for rehabilitation of the bridge over the Roanoke River. Additionally, the section of the Blue Ridge Parkway located between State Route 24/Vinton (Milepost 112) south to the Roanoke River Overlook will be closed for public access. These closures will impact the results of any field work and data collection related to the Recreation Use Survey of the Roanoke River downstream of the Niagara Dam to Roanoke County's Explore Park Rutrough Point. Appalachian indicated during the ISR meeting that revisions to the 2021 field season schedule are not proposed. Roanoke County respectfully requests consideration of revisions to the field season schedule to account for the Parkway closures, such as extension of the field work and data collection through October 2022.
2. Roanoke County appreciates the extension of the Recreation Visitor Use Online Survey through October 2021.
3. The following revisions are needed to Figure 3-1 "Existing Project – Related Recreational Facilities Map":
  - a. Please add the Tinker Creek Greenway located in the City of Roanoke, north of the Roanoke River and west of Tinker Creek.
  - b. The location of the Appalachian Project canoe portage access point/put-in located below the Niagara Dam on the Roanoke River should be shown underneath the Blue Ridge Parkway on the north side of the Roanoke River.
  - c. Roanoke County Tax Parcel IDs 071.03-01-10.00-0000 and 080.00-01-35.00-0000, located west of the Blue Ridge Parkway and south of the Niagara Dam, as are incorrectly shown in green as the Blue Ridge Parkway. These two parcels should be denoted in orange, as the parcels are owned by the Virginia Recreational Facilities Authority (VRFA) and leased by Roanoke County for Explore Park.
  - d. Roanoke County Tax Parcel ID 071.03-01-11.00-0000 should be denoted in orange, as it is owned by the VRFA and leased by Roanoke County for Explore Park. This parcel is located south of the Niagara Dam on Highland Road.
  - e. Roanoke County Tax Parcel ID 071.03-01-15.00-0000 should be denoted in orange, as it is owned by the VRFA and leased by Roanoke County for

Explore Park. This parcel is located upstream of the Niagara Dam, south of the Roanoke River, and adjacent to the Niagara Project Boundary.

- f. Roanoke County Tax Parcel IDs 080.00-05-02.01-0000, 080.00-05-03.00-0000, and 080.00-05-04.00-0000, located east of the Blue Ridge Parkway and south of the Roanoke River, are incorrectly shown in green as the Blue Ridge Parkway, when they are actually owned by the Roanoke Valley Resource Authority.
4. Please provide clarification throughout the ISR that the “Rutrough Road Canoe/Kayak Ramp” is managed by Roanoke County for Explore Park and the appropriate name is “Rutrough Point”.
5. Please amend the “Recreation Facilities Inventory and Condition Assessment” to include the Roanoke River Greenway, Tinker Creek Greenway, Roanoke River Blueway, and Explore Park as Non-Project Recreation Facilities.
6. Roanoke County appreciates Appalachian’s inclusion of a Recreational Flow Release Desktop Evaluation to assess the potential for Project operations to support short-term enhancement of flow conditions for downstream boating in the ISR. Roanoke County encourages Appalachian to continue evaluating the possibility of controlled releases throughout the year for recreational purposes that would be advantageous for paddlers during the lower flow late-summer/early-fall months (i.e., July through October) along the Roanoke River downstream of the dam to Explore Park’s Rutrough Point. Class 1 and II whitewater conditions exist downstream of the Niagara Dam, and the Roanoke County 2016 Explore Park Adventure Plan proposes development of an in-river kayak park downstream near the Smith Mountain lake project boundary.
7. In support of the Roanoke River Blueway, Roanoke County encourages Appalachian to consider supporting development of a public access facility upstream (river right) and adjacent to the Niagara reservoir that will provide vehicular parking. Roanoke County is interested in partnering with Appalachian to make these blueway improvements possibly on land located adjacent to the Niagara project boundary that is owned by the Virginia Recreational Facilities Authority and under a lease for Explore Park.
8. Trash containment, collection, and disposal in the Roanoke River is an impediment to recreational use and has negative effects on wildlife habitat, aquatic resources, and the environmental quality of the Roanoke River. It is Roanoke County’s understanding that under current hydroelectric operations, large debris is removed, but the vast majority of trash is allowed to overtop the spillway, resulting in accumulations below the dam downstream into the Smith Mountain Lake project boundary. Roanoke County acknowledges that Appalachian Power did not generate this trash and debris and that Appalachian Power spends a considerable

amount of time and money removing trash and debris from the Niagara and Smith Mountain Lake project boundaries. Roanoke County has been organizing community volunteer work days to remove trash and debris along the Roanoke River downstream at Explore Park. Roanoke County encourages Appalachian Power to continue evaluating trash and debris removal alternatives.

Roanoke County appreciates the opportunity to provide comments on the ISR prepared for Appalachian and look forward to coordinating with FERC and other stakeholders throughout the duration of this relicensing effort. Roanoke County looks forward to participating in the Recreational Use Stakeholder meeting tentatively proposed during the first quarter of 2021 to discuss existing and future recreational opportunities along the Roanoke River, such as the Roanoke River Greenway, Roanoke River Blueway, and Explore Park.

Please forward any questions, comments, or concerns to Lindsay Webb, Roanoke County Department of Parks, Recreation and Tourism at [lwebb@roanokecountyva.gov](mailto:lwebb@roanokecountyva.gov) or (540) 777-6328.

Sincerely,

A handwritten signature in blue ink, appearing to read "Richard L. Caywood", written over a light blue circular stamp.

Richard L. Caywood, P.E.  
Assistant County Administrator

cc: Elizabeth B. Parcell, American Electric Power  
Jonathan M. Magalski, American Electric Power  
Doug Blount, Roanoke County Director of General Services, Parks, Recreation and Tourism

FEDERAL ENERGY REGULATORY COMMISSION  
WASHINGTON, D.C. 20426  
March 5, 2021

OFFICE OF ENERGY PROJECTS

Project No. 2466-034 – Virginia  
Niagara Hydroelectric Project  
Appalachian Power Company

VIA Electronic Mail

Mr. Jonathan Magalski  
Environmental Specialist Consultant  
American Electric Power  
[jmmagalski@aep.com](mailto:jmmagalski@aep.com)

**Reference: Comments on Initial Study Report and Meeting Summary**

Dear Mr. Magalski,

On January 11, 2021, Appalachian Power Company (Appalachian) filed the Initial Study Report (ISR) for the Niagara Hydroelectric Project (Niagara Project) describing Appalachian's overall progress in implementing the approved study plans. On January 21, 2021, Appalachian held a virtual meeting to discuss the ISR. On February 7, 2021, Appalachian filed its ISR Meeting Summary (Meeting Summary). We have reviewed the ISR and the Meeting Summary and provide our comments in Appendix A, pursuant to 18 C.F.R. § 5.15(c)(4).

If you have any questions, please contact Allyson Conner at (202) 502-6082, or by email at [allyson.conner@ferc.gov](mailto:allyson.conner@ferc.gov).

Sincerely,

John B. Smith  
Mid-Atlantic Branch  
Division of Hydropower Licensing

**APPENDIX A**  
**Comments on the Initial Study Report and Meeting Summary**

**General:**

1. To facilitate our NEPA analysis, please file with the draft license application (DLA) the geospatial data (e.g., exports from Global Positioning System (GPS) devices, or Geographic Information System (GIS) shapefiles), including the sampling locations, mesohabitat, substrate, and cover maps; shoreline habitat classifications; and any other GIS data layers that were created as part of the following studies: 1) Bypass Reach Flow and Aquatic Habitat Study, 2) Benthic Aquatic Resources Study, 3) Fish Community Study, 4) Water Quality Study, 5) Shoreline Stability Assessment Study, and 6) Wetlands, Riparian, and Littoral Habitat Characterization Study.

**Fish Community Study:**

2. In Appendix C of the Preliminary Fish Community Study Report, you provide raw species abundance data for the backpack and electrofishing surveys. As requested in the ISR meeting, please provide summary length and weight information (e.g., size distributions) for each fish species in the updated study report or DLA.





March 5, 2021

RE: Niagara Hydroelectric Project (FERC No. 2466-034)

To whom it may concern,

Please accept our comments to the Initial Study Report meeting hosted by Appalachian Power Company, January 21, 2021.

As a community, we place high value on the region's natural assets and are leveraging them as part of our holistic economic development strategy. The Roanoke River, Explore Park, and Roanoke River Greenway have been identified as key regional outdoor assets, all of which are impacted by the Niagara Hydroelectric Project.

Our region supports sustainable development of recreational resources and opportunities along the Roanoke River and pursuant to 18 CFR § 5.15 (c)(3), we offer the following comments for consideration in response to the ISR Preliminary Recreation Study prepared by HDR for Appalachian Power, dated January 11, 2021.

- The National Park Service, Blue Ridge Parkway, will close the Parkway and overlook/parking at milepost 114.9 to repair the bridge crossing the Roanoke River. This closure will run from March 2021 through March 22. This closure will significantly impact that ability to collect, and subsequent results, of any field work and data collection related to the Recreation Use Survey of the Roanoke River downstream from the Niagara Dam. This overlook/parking is the only access to the river for recreational paddlers and anglers. A revision to the 2021 field season schedule needs to be made, such as an extension through fall 2022. Data will be severely skewed otherwise.
- We fully support that inclusion of a Recreational Flow Release Desktop Evaluation to assess the potential for Project operations to support short-term enhancement of flow conditions for downstream boating in the ISR. We encourage Appalachian to continue evaluating the possibility of controlled releases for recreational paddlers during the lower flow late-summer/early-fall months (i.e., July through October) along the Roanoke River downstream of the dam to Explore Park's Rutrough Point. At a minimum we would request weekend releases during this period. The Roanoke County Explore Park Adventure Plan proposes development of an in-river kayak park downstream near the Smith Mountain lake project boundary and scheduled releases would enhance this.
- In support of the Roanoke River Blueway, we encourage Appalachian to consider supporting development of a public access facility upstream (river right) and adjacent to the Niagara

reservoir that will provide vehicular parking. Roanoke County is interested in partnering with Appalachian to make these blueway improvements possibly on land located adjacent to the Niagara project boundary that is owned by the Virginia Recreational Facilities Authority and under a lease for Explore Park.

- Please add the following revisions to Figure 3-1 “Existing Projects-Related Facilities Map”:
  - Add Tinker Creek Greenway
  - The Appalachian Power canoe portage access point/put in located below the Niagara Dam should be show underneath the Blue Ridge Parkway bridge, on the north side of the river.
- Please add the following to the Recreation Facilities Inventory and Condition Assessment as non-project recreation facilities: Roanoke River Greenway, Tinker Creek Greenway, Roanoke River Blueway, and Explore Park.
- Trash containment, collection, and disposal in the Roanoke River is an impediment to recreational use and has negative effects on wildlife habitat, aquatic resources, and the environmental quality of the Roanoke River. It is our understanding that under current hydroelectric operations, large debris is removed, but most of the trash is allowed to go overtop the spillway, resulting in accumulations below the dam downstream into the Smith Mountain Lake project boundary. We acknowledge that Appalachian Power did not generate this trash and debris and that Appalachian Power spends a considerable amount of time and money removing trash and debris from the Niagara and Smith Mountain Lake project boundaries. Our community organizes community volunteer workdays to remove trash along the river. We encourage Appalachian Power to continue evaluating trash and debris removal alternatives.

The Roanoke Region of Virginia creates economic growth by leveraging natural assets to attract business investment and talent. The Roanoke River is an integral component of this strategy and contribute significantly to the region’s image, tourism, public health, equality, and economic growth.

Please let me know if you have any questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Pete Eshelman", written over a light blue circular stamp.

Pete Eshelman  
Director of Outdoor Branding  
pete@roanoke.org  
(540) 392-6989

# ROANOKE RIVER BLUEWAY COMMITTEE

## COMMENTS

NIAGARA HYDROELECTRIC PROJECT NO. 2466-034

The Roanoke River Blueway Committee exists to support recreational use of the Roanoke River Blueway, a 45-mile long designated water trail located in the Roanoke Valley which passes through the localities of Roanoke County, the Cities of Salem and Roanoke, and the Town of Vinton, and ends in Franklin County at the Hardy Ford DGIF Access at Smith Mountain Lake. The Roanoke River Blueway has received the Governor’s Award for Environmental Excellence for implementation of the *Virginia Outdoor Plan* in 2016, was designated as a Virginia Treasure in 2016, and received recognition in the USA TODAY Reader’s Choice 2021 as the third “Best Urban Kayaking Spot.” The Blueway is a valuable asset to the Roanoke Valley.

The Committee is grateful to be part of the Niagara Dam recertification process, and provides the following comments on the Initial Study Report (ISR) as described by Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), in the virtual meeting on January 21, 2021.

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### EXTEND RECREATION USE DOCUMENTATION OF BLUE RIDGE PARKWAY

On January 13, 2021, the Committee received word that the Blue Ridge Parkway will be closed at the Roanoke River Overlook for the duration of 2021 and the winter of 2022. This overlook houses a key access point which the Committee had hoped to study to assist with AEP’s re-licensing efforts through the placement of an infrared counter provided by the Roanoke Valley – Alleghany Regional Commission (RVARC). The Committee has been informed by the National Park Service (NPS) that placing an infrared counter will be welcome when the Parkway reopens. Planned NPS closures will impact any efforts to assess recreational use of this section of the Blueway. The Committee respectfully requests that any final assessment of recreational use included in the proposed Recreation Study take this into account by extending the window of the Recreation Use Documentation proposed in the ISR into summer and fall of 2022. The Committee offers to provide the results of the infrared counter data collected during this time to support the Recreation Study.

---

### CONSIDER IMPROVEMENTS TO THE PORTAGE

The Committee supports any proposed improvements to the existing portage. Possible improvements to consider include increased or more effective signage, and improvements to the take-out or put-in locations above and below the dam, respectively. Other ideas which should be included in the study of the portage include a phone that could be used to call for assistance and consideration of an access point on river right just above the dam to provide an alternate portage location.

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#### STUDY ACCESS ABOVE THE DAM

Boating recreation could be vastly improved with the creation of a river access on river right just above the dam. A river access at this location might reduce or obviate the need for any portage on river left if boaters could use a shuttle around the dam and put in again below the dam. Such considerations should be included in the Recreation Study. Any proposals from this work should take into account the planned Roanoke River Greenway which is under development in this area. Roanoke County has offered to partner with AEP to consider approaches to implementation of this new access location.

---

#### INCLUDE GREENWAY USERS IN RECREATION STAKEHOLDERS

The *2018 Roanoke Valley Greenway Plan* clearly outlines the proposed Roanoke River Greenway and the existing sections of Tinker Creek Greenway which overlap the Study Area for this project. The Greenway Commission and the Roanoke Valley – Alleghany Regional Commission have access to infrared counters, previously mentioned in discussion of the Blue Ridge Parkway overlook usage, and would be willing to install one of these infrared counters on the Tinker Creek bridge to assess bicycle and pedestrian usage of this facility. The Roanoke Valley -Alleghany Regional Commission can also provide historical data for Roanoke River Greenway users to assess potential future impacts of the Roanoke River Greenway extension.

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#### CORRECT MAPPING AND TERMS

Numerous corrections to the mapping, terms, and referenced recreation plans for the study area are requested.

- Please amend the “Recreation Facilities Inventory and Condition Assessment” to include the Roanoke River Greenway, Tinker Creek Greenway, Roanoke River Blueway, and Explore Park as Non-Project Recreation Facilities.
- Please include the proposed Roanoke River Greenway alignment from the *2018 Roanoke Valley Greenway Plan* in mapping of the Study Area.
- The ISR refers to Rutrough Point as the “Rutrough Road Canoe/Kayak Ramp”. Please correct the name of this access point.
- Please include the full Tinker Creek Greenway alignment in mapping, including the proposed future sections of the greenway relevant to the study area. Please label Tinker Creek Greenway.
- The location of the Appalachian Project canoe portage access point/put-in located below the Niagara Dam on the Roanoke River should be shown underneath the Blue Ridge Parkway on the north side of the Roanoke River.

The Committee thanks AEP and the FERC for considering our comments, and for the adjustments that have already been made to the ISR per our recommendations. The Committee looks forward to participating in stakeholder interviews and meetings as those are held in the coming year.



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Liz.Belcher@greenways.org

[www.greenways.org](http://www.greenways.org)

March 5, 2021

Secretary Kimberly D. Bose  
Federal Energy Regulatory Commission  
888 First Street, NE, Room 1A  
Washington, DC 20426

**Re: Niagara Hydroelectric Project (P-2466-034)**

1. Preliminary Recreation Study Report
2. Initial Study Report Meeting Summary

Dear Secretary Bose:

The Roanoke Valley Greenway Commission provided comments on the Scoping Document, the PAD, and the proposed Recreation Study Plan for Niagara Hydroelectric Project, FERC No. 2466. We feel that the Preliminary Recreation Study Report, January 11, 2021, has addressed some of the concerns previously raised, but has one glaring omission and some inaccurate information on the maps. These concerns were raised at the January 21, 2021 ISR Meeting. I re-iterate them here because the Meeting Summary does not seem to acknowledge the importance of these errors.

**1. Omissions**

a. Roanoke River Greenway and Tinker Creek Greenway, Non-Project Facilities within the Study Area, Not Discussed as Existing Facilities

The Roanoke River Greenway is the main greenway artery through the Roanoke Valley, planned from Montgomery County to Franklin County at Back Creek. The existing portions of the greenway are only partially shown on the Existing Facilities map and are, in places, covered up on the map by the Study Area Boundary. There is an existing greenway bridge, over 600' long, across the river within the Study Area. This links to Tinker Creek Greenway, which extends beyond the Study Area Boundary at VA 24 (inaccurate on the map) and connects to Wise Avenue. These existing facilities within and adjacent to the Study Area are not correctly shown on the map or included in the Facility Inventory and Condition Assessment.

The eastern leg of Roanoke River Greenway in Roanoke County from the City line to Highland Road is within the Project boundary and is engineered; construction is scheduled to begin in 2021-22. The next section under the Blue Ridge Parkway is also nearing construction and the portion within Explore Park to Back Creek is being designed. **This extension of Roanoke River Greenway will dramatically increase recreation use within the Project area.**

Roanoke County and AEP have been cooperating on coordination of Roanoke River Greenway construction. The Study Plan needs to recognize



these facilities and the opportunity they present for **enhancement** of recreational use of the Project area.

b. Existing Use of Roanoke River and Tinker Creek Greenways (Non-Project Facilities within Study Area) Not Acknowledged

When Roanoke River and Tinker Creek Greenways are recognized as existing facilities, then the Recreation Activities analysis (Table 6-1) becomes inadequate, because bicycling is not included and the fishing and boating access these facilities provide is not acknowledged. The Roanoke Valley Greenway Commission and the Roanoke Valley Alleghany Regional Commission have trail use counters on the greenways throughout the region. While there is not currently a counter on the bridge, there certainly could be one if AEP requested it.

c. Other Non-Project Facilities Not Shown on the Map

The canoe launch on Bennington should be shown on the map, even though it is just beyond the Study Area. It provides access to the Blueway. Garden City Greenway links to Roanoke River Greenway and is within the mapping area. It is not shown on the map. These two facilities should be added to the map, in addition to the corrections for Roanoke River and Tinker Creek Greenways.

## **2. Extension of Field Season**

The stated goal of the Recreation Study is to determine the need for enhancement of existing facilities and the need for additional recreational facilities to support the current and future demand. This can only be done with a true picture of the current and future demand. Use of the project area was severely impacted by the 2020 COVID-19 pandemic. Use of the project area in 2021 will be severely impacted by the closure of the Blue Ridge Parkway from March 2021 to March 2022. Not only will the closure prevent access to the Roanoke River Overlook and Fisherman's Trail, the bridge work may require closure of the portage around the dam. Therefore, the use study should be extended at least to fall of 2022.

## **3. Work with Localities on Trash and Debris Removal**

Although AEP has said repeatedly that trash removal at the dam is not its responsibility and not part of this process, trash is a significant issue, a negative impact on recreation, and a recurring comment from the public. AEP should consider removing the trash at the dam or having a small trash barge on the reservoir that functions like the one at Smith Mountain Lake. The localities could cooperate on hauling the refuse and fees for disposal.

We appreciate the inclusion of the Flow Release Evaluation and the Aesthetic Flow Documentation. Both were very interesting and provided important information.

We ask that AEP consider the following solutions to improve recreational opportunities in the Project area:

- a. Purchase property on river right near Niagara Dam to provide parking and boating access.
- b. Provide a portage around Niagara Dam on river right.

- c. Work with the localities to provide debris removal at the dam and sponsor periodic clean ups of trash in the Project Area.
- d. Provide Roanoke County with right-of-way for Roanoke River Greenway on river right on AEP land.
- e. Implement the Flow Release plan for periodic flow increases during summer/fall months.

I look forward to participating in the Recreational Use Stakeholder meeting tentatively proposed during the first quarter of 2021 to discuss existing and future recreational opportunities along the Roanoke River, such as the Roanoke River Greenway, Roanoke River Blueway, and Explore Park.

Thank you for the opportunity to provide comments at this point.

Sincerely,



Liz Belcher

Roanoke Valley Greenway Coordinator  
1206 Kessler Mill Road, Salem, VA 24153  
540-777-6330

[Liz.belcher@greenways.org](mailto:Liz.belcher@greenways.org)



*Commonwealth of Virginia*

***VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY***

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Matthew J. Strickler  
Secretary of Natural Resources

David K. Paylor  
Director  
(804) 698-4000

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E., Room 1A  
Washington, DC 20426

March 8, 2021

**Re: Niagara Hydroelectric Project P-2466-034, Comment on Initial Study Report (ISR) Meeting Summary**

Dear Secretary Bose:

Thank you for the opportunity to provide comments on the Initial Study Report (ISR) Meeting Summary related to the re-licensing of the Niagara Hydroelectric Project. The Virginia Department of Environmental Quality (DEQ) participated in the ISR Meeting held by American Electric Power (AEP) via WebEx on January 21, 2021 to review with stakeholders the progress and results of studies described in the ISR dated January 11, 2021. Following below are comments by DEQ on the Meeting Summary document dated February 5, 2021.

**Water Quality Study**

Flow through the bypass reach was greater than normal during the 2020 sampling period described in the ISR and corresponding Meeting Summary because 1) river flows were often greater than normal, and 2) there was a powerhouse outage during the majority of the sampling period. Consequently, the water quality data collected during 2020 may not be representative of bypass reach flows during normal summer low-flow conditions. AEP noted in the ISR and in the Meeting Summary that additional water quality (temperature and dissolved oxygen, or DO) monitoring is recommended during the summer (July-August) of 2021 in order to collect supplemental data during lower flow conditions. AEP also noted in the Meeting Summary that the 2021 water quality sampling period may be extended into September if high water temperatures and low flows extend through that month. DEQ agrees with the planned extension of bypass reach temperature and DO monitoring during 2021 and recommends that the 2021 water quality monitoring period be extended through October 2021 to ensure that a representative record of bypass reach water quality during low flows is collected.

DEQ will require a new Clean Water Act § 401 certification for the current project in conjunction with the FERC relicensing process. This certification is administered according to the Virginia Water Protection (VWP) Permit regulations ([9VAC25-210](#)). The permit application review for the § 401 certification includes an evaluation of the potential effect of the project, when operated and maintained as designed, upon downstream flow-dependent beneficial uses throughout the drought of record for the watershed. A sufficient record of bypass reach flows and water quality will be critical for that evaluation.

Thank you again for the opportunity to provide comments on the ISR Meeting Summary.

Respectfully,



Brian E. McGurk, P.G.  
DEQ Office of Water Supply  
P. O. Box 1105, Richmond VA 23218  
[Brian.McGurk@deq.virginia.gov](mailto:Brian.McGurk@deq.virginia.gov) (804-698-4180)

Cc: Joseph Grist, VA DEQ – via email  
John McCloskey, US FWS – via email  
Scott Smith, VA DWR – via email



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Virginia Field Office  
6669 Short Lane  
Gloucester, VA 23061

March 4, 2021

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First St., N.E., Room 1A  
Washington, DC 20426

Re: Niagara Hydroelectric Project (FERC  
#2466); Review of the Initial Study  
Report and Meeting Summary

Dear Secretary Bose:

The U.S. Fish and Wildlife Service (Service) participated in an Appalachian Power Company (Appalachian), a unit of American Electric Power, January 21, 2021, Initial Study Report (ISR) meeting for the Niagara Hydroelectric Project (Federal Energy Regulatory Commission [FERC] #2466) (Project) to discuss progress toward completing approved relicensing studies. The Project is located on the Roanoke River in Roanoke County, VA. Pursuant to 18 CFR § 5.15(c)(4), the Service provides the following comments and recommendations on the ISR and Meeting Summary.

### **Section 2.1, Bypass Reach Flow and Aquatic Habitat Study**

**Section 2.1.2, Summary of Study Methods and Results:** This section states that one of the goals of the study was to develop an understanding of surface water travel times and water surface elevation responses for varying Obermeyer sluice gate openings. The proposed target flow scenarios are designed to allow 2-Dimensional (2-D) hydraulic model simulations capable of evaluating the full operating range (i.e., 7 cubic feet per second [ft<sup>3</sup>/s] to 287 ft<sup>3</sup>/s) of the newly installed Obermeyer sluice gate. The Service previously recommended that hydraulic modeling also be performed with water spilling over the dam instead of only through the sluice gate to see how this changes the available habitat within the bypass reach. If the same flow was evaluated using these two different release methods (sluice gate versus dam spillage), a comparison of the available habitat between methods can be made. Section 4.6.3 of the Revised Study Plan (RSP) states that the 2-D model would be capable of simulating different flow release points to the bypassed reach including through the sluice gate and over the spillway crest. The Service requests clarification that this modeling will be performed as part of this study as stated in the RSP.

**Section 2.1.3, Variances from FERC-Approved Study Plan:** This section states that higher than normal seasonal flow conditions in the Roanoke River during 2020 was one of the reasons why the Bypass Reach Flow and Aquatic Habitat Study could not be completed in 2020 and will need to be completed in 2021. The higher than normal flows in 2020 also have implications for the water quality

INTERIOR REGION 1 • NORTH ATLANTIC-APPALACHIAN

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VIRGINIA, WEST VIRGINIA



study and whether the water quality measurements are representative of water quality conditions during more normal or below normal flow conditions in the river. The Service recommends that this issue be addressed as part of the Water Quality Study.

## **Section 2.2, Water Quality Study**

**Section 2.2.2, Summary of Study Methods and Results:** This section states that flows in the bypass reach were atypical (i.e., much higher) than the “normal,” licensed flow regime. To address this issue, Appalachian proposes to install two continuous temperature and dissolved oxygen (DO) data sondes in the bypass reach (one at the upstream monitoring location and the other at the downstream monitoring location) during the warmest portion of the summer in 2021 (typically July and August) to record daily fluctuations in temperature and DO concentrations under a more typical bypass flow regime if feasible. The Service agrees with this proposal. However, the Service recommends that the data collection in the bypass reach be extended until October 31, 2021 to be consistent with the RSP and to capture water quality in the bypass reach during the entire low flow season.

**Section 2.2.3, Variances from FERC-Approved Study Plan:** This section presents variances from the FERC-approved study plan. The Study Plan Determination (SPD) stated that the water quality study was to be performed from May 1 until October 31, 2020. According to this section, the study was not initiated until late July 2020. No data was collected from August 12-26, 2020 because of equipment malfunction. This means that no water quality data was collected for approximately 14 weeks of the originally planned 28 weeks (50% of the planned study period). It was also stated in Section 2.1.3 that water flows were above normal for most of the 2020 season. More specifically, according to Section 2.2.2 of the 2020 Fish Community Survey Results Report in Appendix C, average annual rainfall for Roanoke, VA was approximately 105 centimeters (cm) and, as of December 1, 2020, Roanoke, VA already accumulated over 157 cm of rain (a 47% increase in average precipitation). The Roanoke River did not reach average annual baseflow during most of the low flow period.

Appalachian stated at the ISR meeting that the Project was not operating from September 9, 2020 until the end of the Water Quality Study. This equates to an additional 7 weeks where the Project was not operating where it is not possible to assess the impact of Project operations on downstream water quality. This corresponds to most of the low flow season when water temperatures reach their maximum and DO issues are most likely. The FERC March 26, 2019, Scoping Document 1 (SD1) and July 9, 2019, Scoping Document 2 (SD2) identified the following environmental resource issue to be analyzed in the Environmental Assessment for the Project relicensing: Effects of continued project operation and maintenance on water quality, including DO and water temperature, upstream and downstream of the impoundment, including the bypassed reach. For this analysis to be possible, the Project must be operating during the entire study.

The Service recommends that the Water Quality Study be repeated in 2021. This recommendation is based on the following: (1) data was not collected or available for approximately 50% of the 2020 study period, (2) there was a 47% increase in average annual precipitation, thus the 2020 data was collected during an abnormally wet year, and (3) the Project was not operating for the last two months of the 2020 study, thus it is not possible to assess the impact of Project operations on water quality during this normally low flow period.

**Section 2.2.3, Variances from FERC-Approved Study Plan:** This section states that, as proposed in the RSP, water quality data downloads were to occur on a monthly basis; however, significant biofouling was observed on the instruments located in the reservoir downstream from Tinker Creek. Data download and instrument maintenance frequency was modified to a two-week interval; however, the biofouling resulted in several additional time periods where continuous water quality data is not

available at this location. The Service recommends that Appalachian check and clean data loggers weekly during the data collection scheduled for 2021 to avoid the loss of water quality data from biofouling.

### **Section 2.3, Fish Community Study**

**Section 2.3.2.2, Summary of Study Methods and Results, Preliminary Impingement and Entrainment Study:** This section states that burst swim speeds for target or representative species were compared to the estimated intake velocity to evaluate whether fish may be susceptible to intake flows at the Project. Fish burst swim speeds obtained from literature indicate that all target species and life stages evaluated, with the exception of eggs, larvae, and juvenile spottail shiner (*Notropis hudsonius*), would be able to avoid entrainment at the Project given that estimated burst swim speeds are greater than approach velocities at the intake. The Service recommends this study address the fact that migratory fish species may be attracted to the intake and may not actively avoid the intake. This can lead to higher entrainment rates for migratory species than likely would be predicted by the current study.

**Section 2.3.2.2, Summary of Study Methods and Results, Preliminary Impingement and Entrainment Study:** This section states that entrainment of early life stage fishes (eggs and larvae) is likely minimal given the life history characteristics of species in the vicinity of the Project. This conclusion may not be true for fish in the Family *Percidae*, which includes the federally listed endangered Roanoke logperch (*Percina rex*) (RLP) and other species in the genus *Percina*, as well as species in the genus *Etheostoma*. Larvae from these genera drift for long distances downstream from their spawning habitats (Buckwalter et al. 2019). Dispersal distances for RLP have been estimated to be as much as 55 kilometers (Roberts et al. 2016), although that estimate also includes post-larval dispersal. Therefore, larval RLP spawned above the reservoir have the potential to drift into and through the Project, and thus would have a higher susceptibility to entrainment. The larval drift study planned for 2021 will be useful to assess whether larval RLP are entrained at the Project and to determine the number of larvae passing through the Project.

**Section 2.3.3, Variances from FERC-Approved Study Plan:** This section states that per the Project RSP and FERCs SPD, intake velocities were to be measured immediately upstream of the intake structure using an acoustic doppler current profiler (ADCP). During the 2020 field season, a combination of high flow events and inoperable turbine-generator units at the Project prevented field data collection efforts. The ISR Meeting Summary states that after several trips to the Project, it became apparent that it would be difficult to get an accurate velocity measurement with an ADCP due to the distance that it would need to be operated from the angled trash racks (8-10 feet upstream), at which point velocities may be equivalent to Roanoke River velocities in other areas of the reservoir, and would likely be lower than the calculated velocity. As a result, approach velocity was calculated using the intake structure and trash rack dimensions along with the design maximum flow capacity of the two generating units. Using this approach, the calculated velocity in front of the intake was estimated to be approximately 1.1 feet per second.

Entrainment is driven by the approach and normal velocities in front of an intake, the related phenomenon of impingement is influenced by the open-area velocity, which is generally expressed as the ratio of the normal velocity to screen or rack porosity. If it is not feasible to directly measure the intake velocity using an ADCP, the Service recommends that Appalachian perform a 1-Dimensional (1-D) analysis, which provides a more accurate estimate of intake velocities than the method used above. The 1-D analysis should calculate normal flow (not approach flow) and open-area velocity (also known as impingement velocity) as per the Service's Fish Passage Engineering Design Criteria (Criteria). The Service's Criteria are available at: <https://www.fws.gov/northeast/fisheries/pdf/USFWS-R5-2019-Fish-Passage-Engineering-Design-Criteria-190622.pdf>. Estimating impingement velocity is

also a 1-D exercise but must be based on accurate drawings so that the analysis accounts for structural steel. The Service requests that Appalachian provide the calculations to the Service for review before using the velocities in the entrainment and impingement study.

The estimate of the open-area velocity is important since fish that contact an intake rack will experience a far greater velocity than the approach velocity. Within several inches of the rack, fish will experience the open-area velocity (see Criteria reference plate 9-1). The open-area velocity is influenced by the blockages created by the structure of the rack. For typical intake racks, this translates to an open-area velocity approximately twice that of the approach velocity. Therefore, we recommend that Appalachian also expand its analysis to compare swimming capability to the open-area velocity.

FERC (1995) noted a positive correlation between debris accumulation and fish impingement on modular inclined screens. One effect, if not the primary effect, of debris accumulation is a localized velocity increase due to a decrease in effective open area. It is reasonable then to expect increased impingement on any intake screen that reduces the gross flow area whether that reduction and increased local velocity are due to steel structure, bars, or accumulated debris. The primary time of year for debris accumulation would be during the fall when the high concentration of leaves in the river could accumulate on the debris racks, resulting in localized increases in the intake velocity compared to the calculated velocity. Debris could also accumulate on the trash racks after high flow events. The ISR Meeting Summary states that there is a barrier that keeps large debris out of the trash racks and the racks are continually clean/cleared of debris for optimal project operation. The Service recommends further clarification as it is unclear that debris cleaning is sufficient to prevent an effect on intake velocities.

## **Section 2.4, Benthic Aquatic Resources Study**

### **Section 2.4.2.2.2 Summary of Study Methods and Results, Mussel Survey, Abbreviated Surveys:**

This section states that surveyors targeted habitat(s) suitable for the occurrence of freshwater mussels and searched those areas at an approximate rate of one minute per square meter in heterogeneous substrates. This does not appear to be a correct statement for the area downstream of the Project. According to Section 3.2.2.5 in the Benthic Aquatic Resources Study Report in Appendix D, there is a large riffle at the bottom of UNIO-Tailrace Survey Area that offered the first continuous area of stable gravel/cobble substrate and may represent the beginning of suitable mussel habitat that was not surveyed. The Service recommends this data gap be addressed during the upcoming field season. This issue is discussed below.

## **Appendix C – Fish Community Study Report**

**Section 5.3, Study Results, Qualitative Assessment of Turbine Entrainment Potential:** This section states that none of the habitats preferred by the RLP are found in the vicinity of the intake, and therefore, the likelihood of entrainment of RLP is considered low. Because larvae of RLP drift for long distances downstream from their spawning habitats (Buckwalter et al. 2019), the potential for entrainment for RLP during the spawning season (March to June) would be higher than what is presented in Table 5-10 (Qualitative Monthly Turbine Entrainment Potential for Target Species). This issue should be addressed.

## **Appendix D - Benthic Aquatic Resources Study Report**

**Section 3.2.2.5, Results, Mussel Habitat and Community, Abbreviated, Roanoke River – UNIO-Tailrace:** Both mussel survey areas below the Project in the bypass reach (Roanoke River – UNIO-Bypass) and in the tailrace (Roanoke River – UNIO-Tailrace) appear to provide limited habitat for freshwater mussels based on higher flow rates and coarser substrate. This section states that there is a large riffle at the bottom of the UNIO-Tailrace Survey Area that offered the first continuous area of

stable gravel/cobble substrate and may represent the beginning of suitable mussel habitat. It is unclear why this area was not surveyed for freshwater mussels. The areas of suitable habitat should have been identified prior to performing freshwater mussel surveys to ensure areas of suitable habitat were surveyed. Because this area of suitable habitat was not surveyed, it is not possible to determine whether mussels are present below the Project. To address this data gap, the Service recommends that an additional 500 meter downstream Survey Area be established in this area of suitable habitat below the UNIO-Tailrace Survey Area and surveyed for freshwater mussels.

The RSP stated that the UNIO-Tailrace Survey Area was to start at 500 meters downstream of the tailrace and extend a distance of 500 meters (see Figure 7-2 in the RSP). However, Figure 1 of the Benthic Community Study Report shows the UNIO-Tailrace Survey Area starting at approximately 375 meters downstream of the tailrace and extending 500 meters. Therefore, it appears the UNIO-Tailrace Survey Area was not surveyed at the location specified in the RSP. This appears to have resulted in the first area of suitable habitat for freshwater mussels not being surveyed as Section 3.2.2.5 states that the first area of suitable habitat for freshwater mussels occurs just below the area surveyed. The Service recommends that this area be surveyed following the approach specified in the RSP for the UNIO-Tailrace Survey Area.

Thank you for the opportunity to comment on the ISR and the Meeting Summary. If you have any questions, please contact John McCloskey of this office at (804) 824-2404 or at [john\\_mccloskey@fws.gov](mailto:john_mccloskey@fws.gov).

Sincerely,

Cindy Schulz  
Field Supervisor  
Virginia Ecological Services

cc: Service, State College, PA (Attn: Rick McCorkle)  
Service, Hadley, MA (Attn: Jessica Pica)  
VDEQ, Richmond, VA (Attn: Brian McGurk)  
VDWR, Forest, VA (Attn: Scott Smith)

### Literature Cited

- Buckwalter, J.H., P.L. Angermeier, E.J. Argentina, S.L. Wolf, S.P. Floyd, and E.M. Hallerman. 2019. Drift of larval darters (Family Percidae) in the upper Roanoke River basin, USA, characterized using phenotypic and DNA barcoding markers. *Fishes* 4:59.
- FERC. 1995. Preliminary assessment of fish entrainment at hydropower projects. Vol. 1, A report on studies and protective measures. Report prepared by Stone & Webster Environmental Technology and Services for Office of Hydropower Licensing. Paper No. DPR-10, Washington, DC.
- Roberts, J.H., P.L. Angermeier, and E.M. Hallerman. 2016. Extensive dispersal of Roanoke logperch (*Percina rex*) inferred from genetic marker data. *Ecology of Freshwater Fish*: 25:1-16.



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**Subject:** FW: Self-Certification Letter - Niagara Hydroelectric Project (FERC No. 2466) 2021 Field Sampling TOYR

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**From:** Huddleston, Misty <Misty.Huddleston@hdrinc.com>  
**Sent:** Friday, March 26, 2021 4:01 PM  
**To:** Virginia Field Office, FW5 <virginiafieldoffice@fws.gov>  
**Cc:** Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>; Jonathan M Magalski <jmmagalski@aep.com>; jon Studio (jastudio@edge-es.com) <jastudio@edge-es.com>  
**Subject:** Self-Certification Letter - Niagara Hydroelectric Project (FERC No. 2466) 2021 Field Sampling TOYR

Good afternoon,

On behalf of American Electric Power (AEP), Edge Engineering and Science, LLC (EDGE) and HDR, Inc. (HDR) are providing field sampling services associated with relicensing activities for the Niagara Hydroelectric Project (Project) (FERC No. 2466). EDGE and HDR are requesting time-of-year restriction (TOYR) waivers for the Tinker Creek and Roanoke River in Roanoke County, Virginia within the Project area. Although current study plans do not extend to the Smith Mountain Lake, a TOYR waiver is also requested for the Smith Mountain Lake fish assemblage in the event that there is overlap with fish species protected as part of the Smith Mountain Lake fish assemblage and the assemblage of the mainstem Roanoke River, or that the proposed field effort is extended further downstream than the currently proposed Project extent in response to agency requests.

Aquatic biological studies were requested and refined during the development of the Project's Proposed Study Plan, Revised Study Plan, and Study Plan Determination that included coordination with VDWR, USFWS, and USEPA. Three of the requested studies occur during the recommended TOYRs (Table 1). Documents outlining agency requests and specific Project methodologies are located at <http://www.aephydro.com/HydroPlant/Niagara>, but general methods and rationale are provided below as a quick review. This information is provided in addition to the Self Certification Letter and Project Verification Package, as required per the Virginia TOYR guidance document dated February 2021.

This information is also being submitted to the Virginia Department of Wildlife Resources under separate cover.

The applicable TOYRs in the Project area occur in Roanoke River and Tinker Creek for Roanoke Logperch (*Percina rex*; RLP), stocked trout, and Orangefin Madtom (*Noturus gilberti*). Instream field sampling efforts will target RLP at various life stages and supplemental macroinvertebrate collections. Although additional survey efforts are proposed, those survey activities anticipated during TOYR's are described below.

**RLP larvae:** Drift net sampling methods include three biologists deploying two, 20-minute net sets at five sample sites in shallow water adjacent to riffle-run habitat once per week for a total of ten weeks (Figure 1). The ten consecutive weekly samples will occur between April 1 and June 30 to align with RLP spawning.

**RLP adults and subadults:** A three-day sampling period will occur between June 1 and June 30 to determine RLP occupancy of the Project's bypass reach below Niagara Dam during spring flows. Backpack electrofishing methods include two backpack electrofishing units to sample 64 quadrats (eight meters by four meters) in riffle-run habitat (Figure 1).

**Macroinvertebrate Sampling:** Macroinvertebrates will be collected in the Project area to investigate the temporal changes in macroinvertebrate community. A sampling event is anticipated to occur between March 1 and May 31 to align with Virginia Department of Environmental Quality (VADEQ) stream macroinvertebrate Spring sample index period. Sampling

will involve kick net methods along 100-meter segments of habitat at five quantitative sites (riffle-run) and five qualitative sites (multihabitat) over a three-day period (Figure 1).

**Table 1: Roanoke River and Tinker Creek Time-of-Year Restriction Waiver Requested Activity**

State-Recommended TOYR	Waiver Activity Request	Activity Date Range
<sup>a</sup> March 15 – May 31	Kick Net - Macroinvertebrates	March 1 – May 31
	Drift Net - Larval RLP	April 1 – June 30
<sup>b</sup> March 15 – June 30	Kick Net - Macroinvertebrates	March 1 – May 31
	Drift Net - Larval RLP	April 1 – June 30
	Backpack Electrofishing - RLP	June 1 – June 30
<sup>c</sup> October 1 – June 15	Kick Net - Macroinvertebrates	March 1 – May 31
	Drift Net - Larval RLP	April 1 – June 30
	Backpack Electrofishing - RLP	June 1 – June 30
<sup>d</sup> February 15 – June 15	Kick Net - Macroinvertebrates	March 1 – May 31
	Drift Net - Larval RLP	April 1 – June 30
	Backpack Electrofishing - RLP	June 1 – June 30

<sup>a</sup> No sampling in orangefin madtom waters from March 15<sup>th</sup> through May 31<sup>st</sup>

<sup>b</sup> No sampling in Roanoke logperch waters from March 15<sup>th</sup> through June 30<sup>th</sup>

<sup>c</sup> No sampling in stocked trout waters from October 1<sup>st</sup> through June 15<sup>th</sup>

<sup>d</sup> No fish assemblage sampling in Smith Mountain Lake from February 15 – June 15

**Misty Huddleston**, PhD  
Associate, SR. Environmental Scientist

**HDR**  
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**Subject:** FW: Niagara Hydroelectric Project (FERC No. 2466) - 2021 Field Sampling TOYR Waiver Request

**Attachments:** online\_project\_review\_certification\_SIGNED.pdf; USFWS Project Verification\_Niagara\_20210326.pdf

**From:** Jon Studio <jastudio@edge-es.com>  
**Sent:** Monday, March 29, 2021 3:58 PM  
**To:** amy.ewing@dwr.virginia.gov; collectionpermits@dwr.virginia.gov  
**Cc:** Huddleston, Misty <Misty.Huddleston@hdrinc.com>; John Spaeth <jpspaeth@edge-es.com>  
**Subject:** Niagara Hydroelectric Project (FERC No. 2466) - 2021 Field Sampling TOYR Waiver Request

**CAUTION: [EXTERNAL]** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

To whom it may concern,

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Aquatic biological studies were requested and refined during the development of the Project's Proposed Study Plan, Revised Study Plan, and Study Plan Determination that included coordination with VDWR, USFWS, and USEPA. Three of the requested studies occur during the recommended TOYRs (Table 1). Documents outlining agency requests and specific Project methodologies are located at <http://www.aephydro.com/HydroPlant/Niagara>, but general methods and rationale are provided below as a quick review.

This information is provided in addition to the USFWS Self Certification Letter and Project Verification Package (attached), as required per the Virginia TOYR guidance document dated February 2021. This information was also submitted to the USFWS.

The applicable TOYRs in the Project area occur in Roanoke River and Tinker Creek for Roanoke Logperch (*Percina rex*; RLP), stocked trout, and Orange-fin Madtom (*Noturus gilberti*). Instream field sampling efforts will target RLP at various life stages and supplemental macroinvertebrate collections. Although additional survey efforts are proposed, those survey activities anticipated during TOYR's are described below.

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<sup>d</sup> February 15 – June 15	Kick Net - Macroinvertebrates	March 1 – May 31
	Drift Net - Larval RLP	April 1 – June 30

Backpack June 1  
Electrofishing - RLP – June  
30

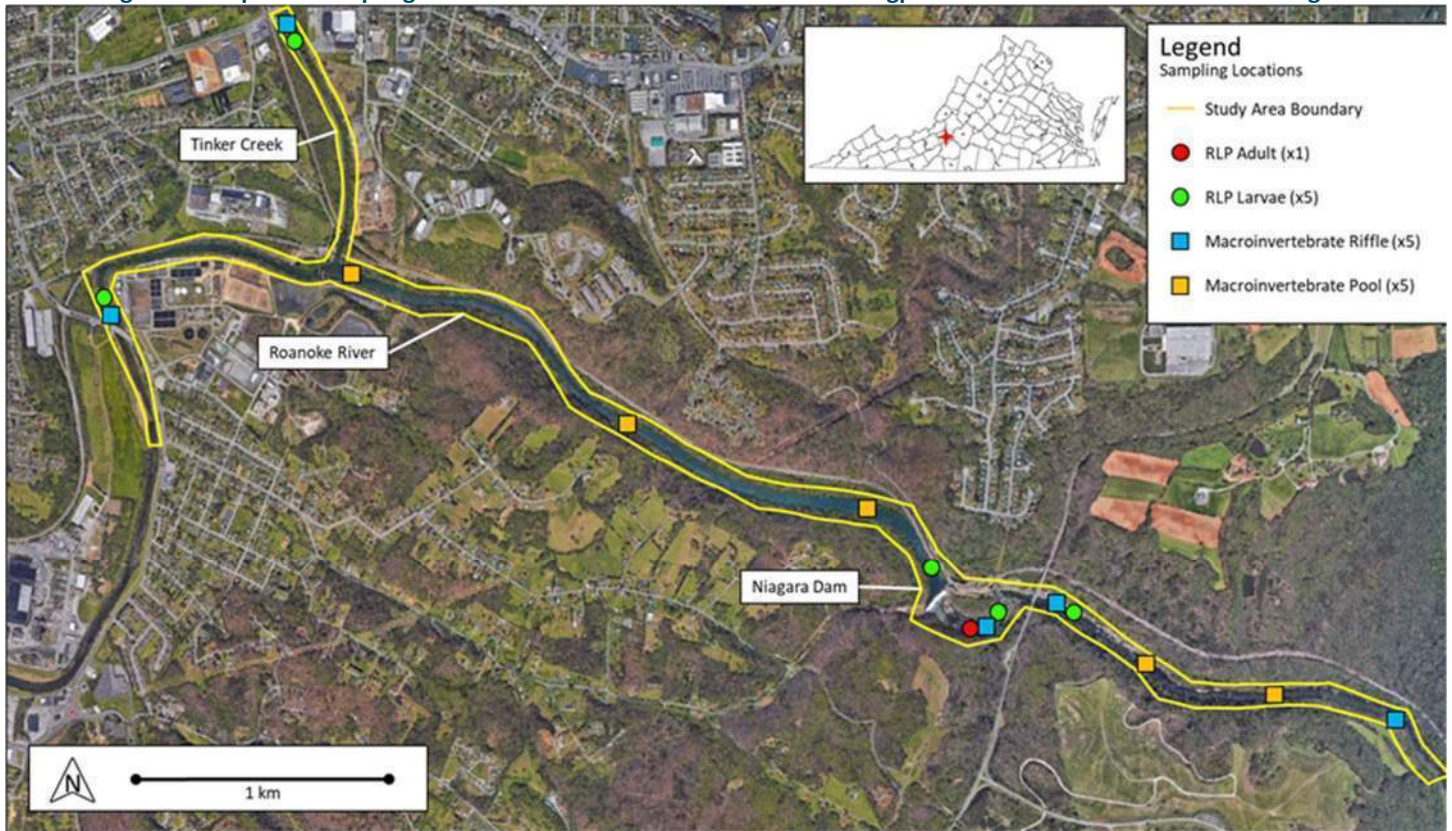
<sup>a</sup> No sampling in orangefin madtom waters from March 15<sup>th</sup> through May 31<sup>st</sup>

<sup>b</sup> No sampling in Roanoke logperch waters from March 15<sup>th</sup> through June 30<sup>th</sup>

<sup>c</sup> No sampling in stocked trout waters from October 1<sup>st</sup> through June 15<sup>th</sup>

<sup>d</sup> No fish assemblage sampling in Smith Mountain Lake from February 15 – June 15

**Figure 1. Proposed Sampling Locations for Adult and Larval Roanoke Logperch and Macroinvertebrates at Niagara**



We appreciate your consideration and request your concurrence on the information herein. Please contact Jon Studio (440-413-4609; [jastudio@edge-es.com](mailto:jastudio@edge-es.com)) or John Spaeth (513-377-0443; [jpspaeth@edge-es.com](mailto:jpspaeth@edge-es.com)) if you have any questions or require additional information regarding this request.

Thanks,

**JON A. STUDIO**  
Avon, Ohio  
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## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
Phone: (804) 693-6694 Fax: (804) 693-9032  
<http://www.fws.gov/northeast/virginiafield/>

In Reply Refer To:

March 24, 2021

Consultation Code: 05E2VA00-2021-SLI-2810

Event Code: 05E2VA00-2021-E-08113

Project Name: Niagara Hydroelectric Project (FERC No. 2466) 2021 Field Sampling TOYR  
Waiver Request

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
  - USFWS National Wildlife Refuges and Fish Hatcheries
-

## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Virginia Ecological Services Field Office**

6669 Short Lane

Gloucester, VA 23061-4410

(804) 693-6694

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## Project Summary

Consultation Code: 05E2VA00-2021-SLI-2810

Event Code: 05E2VA00-2021-E-08113

Project Name: Niagara Hydroelectric Project (FERC No. 2466) 2021 Field Sampling TOYR Waiver Request

Project Type: POWER GENERATION

Project Description: Location: Tinker Creek and Roanoke River in Roanoke County, Virginia within the Niagara Hydroelectric Project FERC Project boundary.  
Scope: Requesting time-of-year-restrictions (TOYR) waiver for proposed field sampling activities for 2021. Although current study plans do not extend to the Smith Mountain Lake, a TOYR waiver is also requested for the Smith Mountain Lake fish assemblage in the event that there is overlap with fish species protected as part of the Smith Mountain Lake fish assemblage and the assemblage of the mainstem Roanoke River, or that the proposed field effort is extended further downstream than the currently proposed project extent in response to agency requests.

Aquatic biological studies were requested and refined during the development of the Project's Proposed Study Plan, Revised Study Plan, and Study Plan Determination that included coordination with VDWR, USFWS, and USEPA. Three of the requested studies occur during the recommended TOYRs (Table 1). Documents outlining agency requests and specific Project methodologies are located at <http://www.aephydro.com/HydroPlant/Niagara>.

### Timing:

Table 1: Roanoke River and Tinker Creek Time-of-Year Restriction Waiver Requested Activity

State-Recommended TOYR Waiver Activity Request Activity Date Range

(a) March 15 – May 31 Kick Net - Macroinvertebrates March 1 – May 31

Drift Net - Larval RLP April 1 – June 30

(b) March 15 – June 30 Kick Net - Macroinvertebrates March 1 – May 31

Drift Net - Larval RLP April 1 – June 30

Backpack Electrofishing - RLP June 1 – June 30

(c) October 1 – June 15 Kick Net - Macroinvertebrates March 1 – May 31

Drift Net - Larval RLP April 1 – June 30

Backpack Electrofishing - RLP June 1 – June 30

(d) February 15 – June 15 Kick Net - Macroinvertebrates March 1 – May 31

Drift Net - Larval RLP April 1 – June 30

Backpack Electrofishing - RLP June 1 – June 30

(a) No sampling in orangefin madtom waters from March 15th through May 31st

(b) No sampling in Roanoke logperch waters from March 15th through June 30th

(c) No sampling in stocked trout waters from October 1st through June 15th

(d) No fish assemblage sampling in Smith Mountain Lake from February 15 – June 15

**Project Location:**

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@37.26009525,-79.887978906288,14z>



Counties: Bedford, Roanoke, and Roanoke counties, Virginia

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## Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is <b>final</b> critical habitat for this species. The location of the critical habitat is not available. Species profile: <a href="https://ecos.fws.gov/ecp/species/5949">https://ecos.fws.gov/ecp/species/5949</a>	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

### Fishes

NAME	STATUS
Roanoke Logperch <i>Percina rex</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/1134">https://ecos.fws.gov/ecp/species/1134</a>	Endangered

### Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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# **Niagara Hydroelectric Project (FERC No. 2466) 2021 Field Sampling TOYR Waiver Request**

## **Biological Assessment**

Prepared using IPaC

March 26, 2021

The purpose of this Biological Assessment (BA) is to assess the effects of the proposed project and determine whether the project may affect any Federally threatened, endangered, proposed or candidate species. This BA is prepared in

accordance with legal requirements set forth under [Section 7 of the Endangered Species Act \(16 U.S.C. 1536 \(c\)\)](#).

In this document, any data provided by U.S. Fish and Wildlife Service is based on data as of March 26, 2021.

Prepared using IPaC version 5.56.1

# Niagara Hydroelectric Project (FERC No. 2466) 2021 Field Sampling TOYR Waiver Request Biological Assessment

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# 1 Description Of The Action

## 1.1 Project Name

Niagara Hydroelectric Project (FERC No. 2466) 2021 Field Sampling TOYR Waiver Request

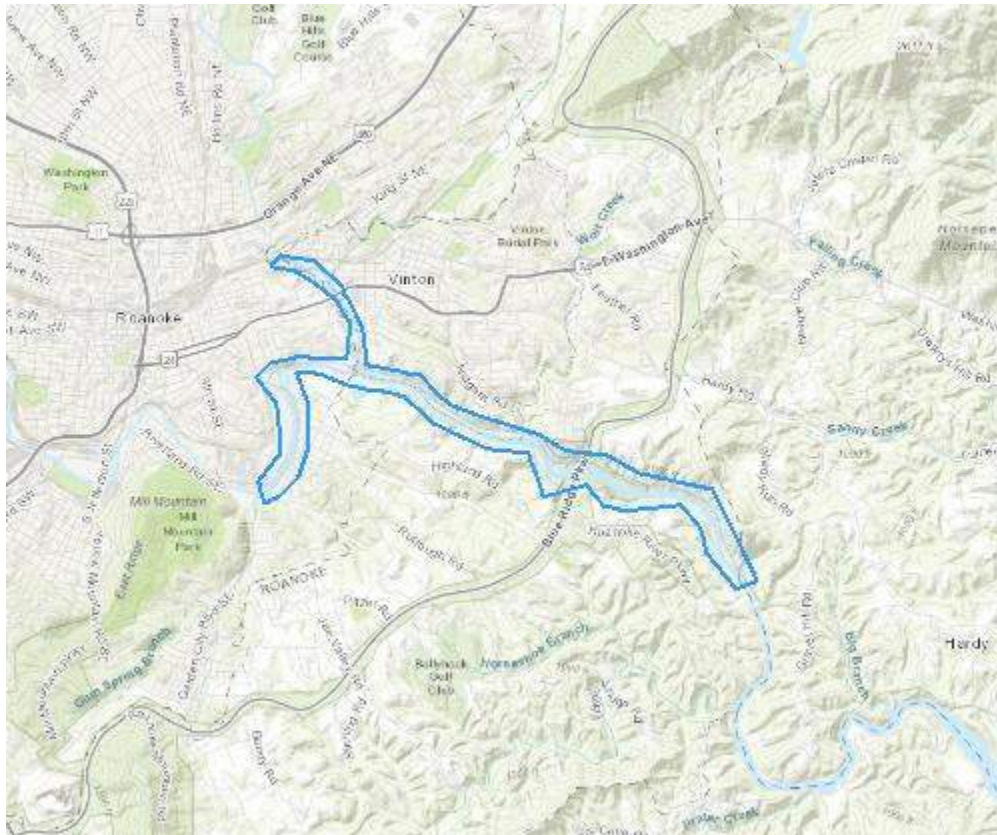
## 1.2 Executive Summary

See attached Application Form/Package

[Effect determination summary](#)

## 1.3 Project Description

### 1.3.1 Location



**LOCATION**

Bedford, Roanoke, and Roanoke counties, Virginia

**1.3.2 Description of project habitat**

Habitat does exist within the Project boundary for Roanoke Logperch and we propose to perform field sampling activities (variety of methodologies) within these habitats, to target Roanoke Logperch specifically, at the request of Virginia Department of Wildlife Resources and US Fish and Wildlife Service (USFWS) in support of the Niagara Dam Hydroelectric Project relicensing activities. See attached Application Form (3-200-59) previously submitted to USFWS for the proposed field sampling activities for detailed information.

This consultation is being initiated to request waiver from the existing time-of-year-restrictions (TOYR) to facilitate completion of the field sampling activities described in the Project Description and in the attached USFWS Application Form (3-200-59).

**Relevant documentation**

- [Jon Studio 3-200-59 Application Package](#)

**1.3.3 Project proponent information**

*Provide information regarding who is proposing to conduct the project, and their contact information. Please provide details on whether there is a Federal nexus.*

**Requesting Agency**

HDR, Inc.

**FULL NAME**

Misty Huddleston

**STREET ADDRESS**

440 S. Church St., Ste 900

**CITY**

Charlotte

**STATE**

NC

**ZIP**

28202-2075

**PHONE NUMBER**

(865) 556-9153

**E-MAIL ADDRESS**

misty.huddleston@hdrinc.com

**Lead agency**

Federal Energy Regulatory Commission

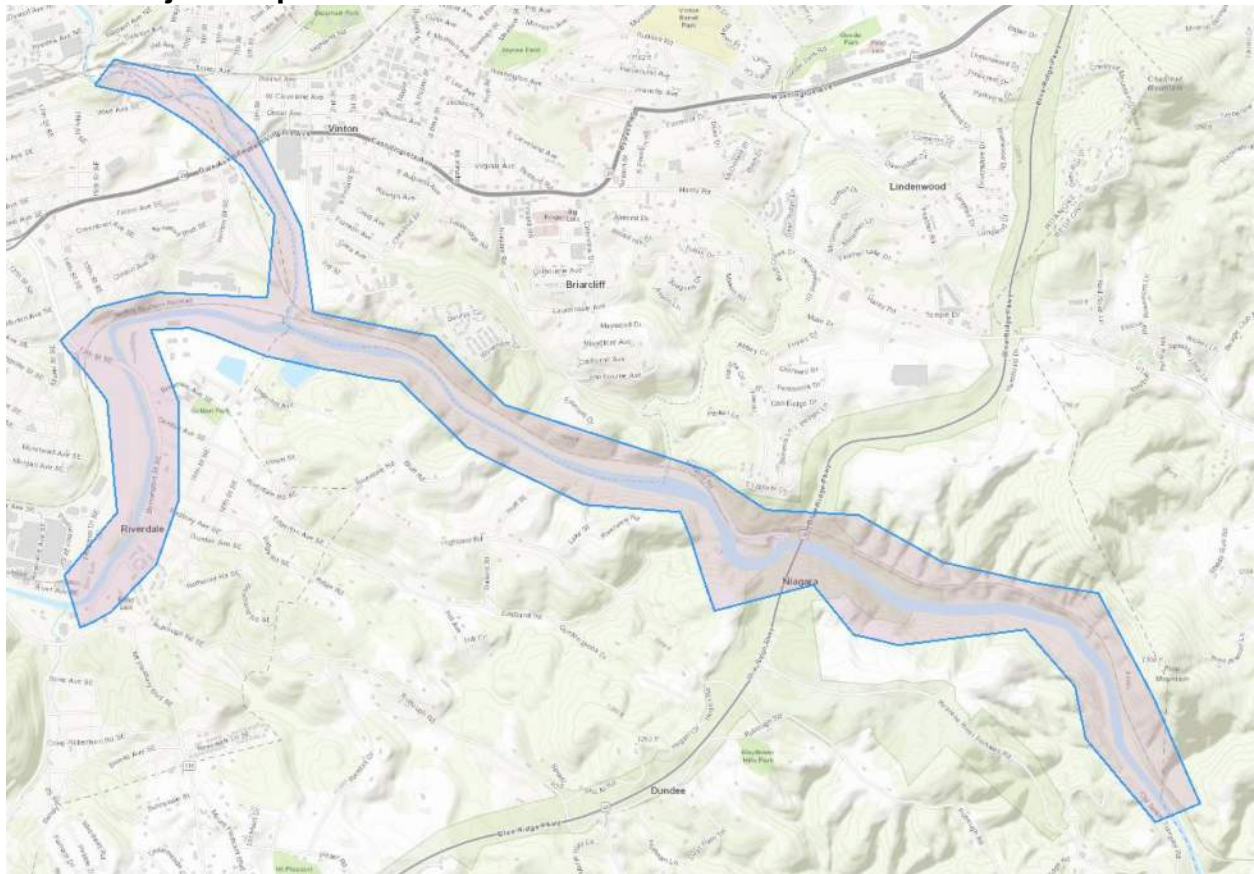
### 1.3.4 Project purpose

In response to stakeholder and agency requests, Appalachian proposes to perform surveys for Roanoke Logperch within the Project boundary using life stage-specific methodologies, as summarized in the attached Application Package (3-200-59).

### 1.3.5 Project type and deconstruction

This project is a field survey project.

#### 1.3.5.1 Project map



**LEGEND**



Project footprint



Fish Community Study Area: Fish community field sampling



### 1.3.5.2 fish community field sampling

**Activity start date**

March 31, 2021

**Activity end date**

June 29, 2021

**Stressors**

This activity is not expected to have any impact on the environment.

**Description**

Aquatic biological studies were requested and refined during the development of the Project's Proposed Study Plan, Revised Study Plan, and Study Plan Determination that included coordination with VDWR, USFWS, and USEPA. Three of the requested studies occur during the recommended TOYRs (Table 1). Documents outlining agency requests and specific Project methodologies are located at <http://www.aephydro.com/HydroPlant/Niagara>, but general methods and rationale are provided below as a quick review.

The applicable TOYRs in the Project area occur in Roanoke River and Tinker Creek for Roanoke Logperch (*Percina rex*; RLP), stocked trout, and Orangefin Madtom (*Noturus gilberti*). Instream field sampling efforts will target RLP at various life stages and supplemental macroinvertebrate collections. Although additional survey efforts are proposed, those survey activities anticipated during TOYR's are described below.

RLP larvae: Drift net sampling methods include three biologists deploying two, 20-minute net sets at five sample sites in shallow water adjacent to riffle-run habitat once per week for a total of ten weeks (Figure 1). The ten consecutive weekly samples will occur between April 1 and June 30 to align with RLP spawning.

RLP adults and subadults: A three-day sampling period will occur between June 1 and June 30 to determine RLP occupancy of the Project's bypass reach below Niagara Dam during spring flows. Backpack electrofishing methods include two backpack electrofishing units to sample 64 quadrats (eight meters by four meters) in riffle-run habitat

### 1.3.6 Anticipated environmental stressors

*Describe the anticipated effects of your proposed project on the aspects of the land, air and water that will occur due to the activities above. These should be based on the*

*activity deconstructions done in the previous section and will be used to inform the action area.*

#### **1.3.6.1 Animal Features**

Individuals from the Animalia kingdom, such as raptors, mollusks, and fish. This feature also includes byproducts and remains of animals (e.g., carrion, feathers, scat, etc.), and animal-related structures (e.g., dens, nests, hibernacula, etc.).

#### **1.3.6.2 Plant Features**

Individuals from the Plantae kingdom, such as trees, shrubs, herbs, grasses, ferns, and mosses. This feature also includes products of plants (e.g., nectar, flowers, seeds, etc.).

#### **1.3.6.3 Aquatic Features**

Bodies of water on the landscape, such as streams, rivers, ponds, wetlands, etc., and their physical characteristics (e.g., depth, current, etc.). This feature includes the groundwater and its characteristics. Water quality attributes (e.g., turbidity, pH, temperature, DO, nutrients, etc.) should be placed in the Environmental Quality Features.

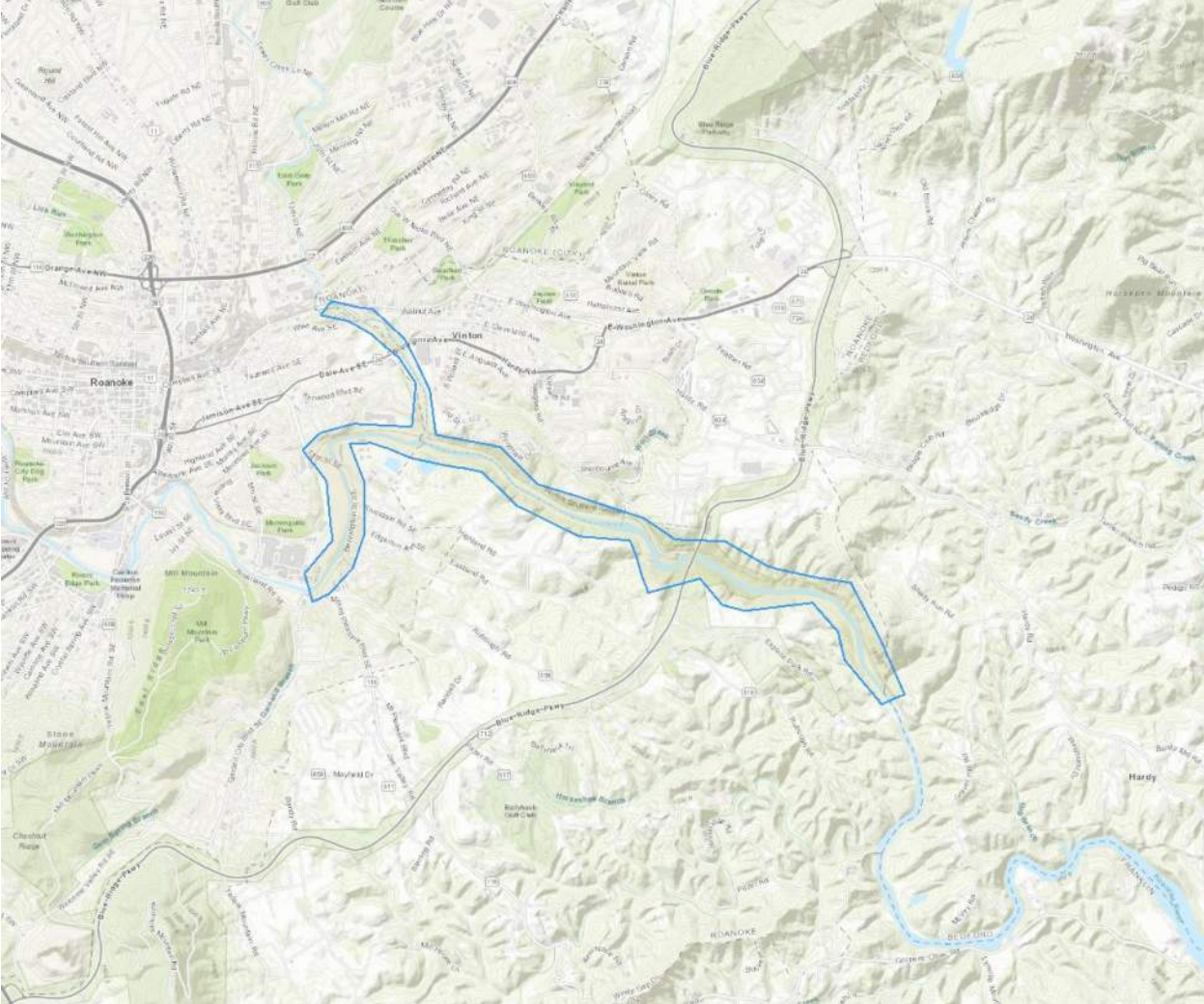
#### **1.3.6.4 Environmental Quality Features**

Abiotic attributes of the landscape (e.g., temperature, moisture, slope, aspect, etc.).

#### **1.3.6.5 Soil and Sediment**

The topmost layer of earth on the landscape and its components (e.g., rock, sand, gravel, silt, etc.). This feature includes the physical characteristics of soil, such as depth, compaction, etc. Soil quality attributes (e.g., temperature, pH, etc.) should be placed in the Environmental Quality Features.

# 1.4 Action Area



## **1.5 Conservation Measures**

### **1.5.1 correct electrofishing techniques**

#### **Description**

See attached Application Package.

Electrofishing will be used in life stage-specific habitats and when feasible, sampling will be performed using snorkel survey techniques.

#### **Direct interactions**

- [electrocution](#)

### **1.5.2 targeted sampling design**

#### **Description**

Larval drift study was designed to use the minimum number of sampling events to confidently document drift of eggs and larvae within the Project area, while minimizing the numbers of organisms collected.

#### **Direct interactions**

- [collection](#)

## **1.6 Prior Consultation History**

See attached Application Form/Package

July 2020 consulted on the proposed gate replacement project at Niagara Hydroelectric Project.

Project was approved and construction has been initiated.

## **1.7 Other Agency Partners And Interested Parties**

Virginia Department of Wildlife

See list provided in attached Application Form/Package

## **1.8 Other Reports And Helpful Information**

[Project Pre-Application Document \(http://www.aephydro.com/Content/documents/2019/NiagaraNoticeofIntentandPre-Application.pdf\)](http://www.aephydro.com/Content/documents/2019/NiagaraNoticeofIntentandPre-Application.pdf)

[Project Revised Study Plan \(http://www.aephydro.com/Content/documents/2019/NiagaraFilingofRevisedStudyPlanforRelicensingStudiesFERCNo2466.pdf\)](http://www.aephydro.com/Content/documents/2019/NiagaraFilingofRevisedStudyPlanforRelicensingStudiesFERCNo2466.pdf)

[Project Study Plan Determination \(http://www.aephydro.com/Content/documents/2020/20191206\\_FERC\\_to\\_AEP\\_StudyPlanDetermination.pdf\)](http://www.aephydro.com/Content/documents/2020/20191206_FERC_to_AEP_StudyPlanDetermination.pdf)

[Project Initial Study Report \(http://www.aephydro.com/Content/documents/2021/NiagaraInitialStudyReport01-11-2021.pdf\)](http://www.aephydro.com/Content/documents/2021/NiagaraInitialStudyReport01-11-2021.pdf)

### ***Relevant documentation***

- [Jon Studio 3-200-59 Application Package](#)



## **2 Species Effects Analysis**

*This section describes, species by species, the effects of the proposed action on listed, proposed, and candidate species, and the habitat on which they depend. In this document, effects are broken down as direct interactions (something happening directly to the species) or indirect interactions (something happening to the environment on which a species depends that could then result in effects to the species).*

*These interactions encompass effects that occur both during project construction and those which could be ongoing after the project is finished. All effects, however, should be considered, including effects from direct and indirect interactions and cumulative effects.*

### **2.1 Indiana Bat**

***This species has been excluded from analysis in this environmental review document.***

#### **Justification for exclusion**

Proposed action involves instream sampling for Roanoke Logperch and benthic macroinvertebrates during established TOYR periods. No upland work is proposed for this effort.

### **2.2 Northern Long-Eared Bat**

***This species has been excluded from analysis in this environmental review document.***

#### **Justification for exclusion**

Proposed action involves instream sampling for Roanoke Logperch and benthic macroinvertebrates during established TOYR periods. No upland work is proposed for this effort.

### **2.3 Roanoke Logperch**

#### **2.3.1 Status of the species**

*This section should provide information on the species' background, its biology and life history that is relevant to the proposed project within the action area that will inform the effects analysis.*

### **2.3.1.1 Legal status**

The Roanoke Logperch is federally listed as 'Endangered' and additional information regarding its legal status can be found on the [ECOS species profile](#).

### **2.3.1.2 Recovery plans**

Available recovery plans for the Roanoke Logperch can be found on the [ECOS species profile](#).

### **2.3.1.3 Life history information**

The Roanoke logperch is a large darter, growing to about 6 inches long. It has a bulbous snout, lateral blotches, back is scrawled, and most fins are strongly patterned. First dorsal fin has an orange band, particularly vivid in mature males. It can be found in larger streams in the upper Roanoke, Smith, Pigg, Otter, Nottoway river systems, and Goose Creek in Virginia and in the Dan, Mayo, Smith river systems and Big Beaver Island Creek in North Carolina. They prefer large sized warm clear streams and riffles, runs and pools with sand, gravel or boulder.

#### ***Identified resource needs***

##### **Dissolved oxygen**

Concentration: normal

##### **Invertebrates**

Species: caddisfly larvae of the hydropsychidae and chironomids and other aquatic insects

##### **Runs**

Depth: moderate to deep, spatial arrangement: connected to shallow to moderate riffles (male spawning-period habitat) and time of year: april and may

##### **Streamflow**

Depth: 16- 30 cm, type: oxbows, backwaters and velocity: slow

##### **Streamflow**

Time of year: spring and velocity: fast-flowing

##### **Substrate structure and characteristics**

Percent silt: 0-25%, sediment/silt embededness: 0-25% embedded and substrate size: small gravel to boulders

##### **Water temperature**

Temperature: 12-14 deg c and time of year: april or may

##### **Water temperature**

Temperature: relatively warm

##### **Woody debris**

#### **2.3.1.4 Conservation needs**

In response to stakeholder and agency requests, Appalachian proposes to perform surveys for Roanoke Logperch within the Project boundary using life stage-specific methodologies, as summarized in the attached Application Package (3-200-59).

### **2.3.2 Environmental baseline**

*The environmental baseline describes the species' health **within the action area only** at the time of the consultation, and does not include the effects of the action under review. Unlike the species information provided above, the environmental baseline is at the scale of the Action area.*

#### **2.3.2.1 Species presence and use**

See information summarized in the attached Application Package (3-200-59).

#### **Relevant documentation**

- [Appalachian Historical Fisheries Surveys 1991 and 1992](#)
- [Jon Studio 3-200-59 Application Package](#)

#### **2.3.2.2 Species conservation needs within the action area**

In response to stakeholder and agency requests, Appalachian proposes to perform surveys for Roanoke Logperch within the Project boundary using life stage-specific methodologies, as summarized in the attached Application Package (3-200-59).

#### **2.3.2.3 Habitat condition (general)**

<http://www.aephydro.com/Content/documents/2021/NiagaraInitialStudyReport01-11-2021.pdf>

#### **Supporting documentation**

- [Appalachian Historical Fisheries Surveys 1991 and 1992](#)
- [Jon Studio 3-200-59 Application Package](#)

#### **2.3.2.4 Influences**

In response to stakeholder and agency requests, Appalachian proposes to perform surveys for Roanoke Logperch within the Project boundary using life stage-specific methodologies, as summarized in the attached Application Package (3-200-59).

**2.3.2.5 Additional baseline information**

In response to stakeholder and agency requests, Appalachian proposes to perform surveys for Roanoke Logperch within the Project boundary using life stage-specific methodologies, as summarized in the attached Application Package (3-200-59).

**2.3.3 Effects of the action**

*This section considers and discusses all effects on the listed species that are caused by the proposed action and are reasonably certain to occur, including the effects of other activities that would not occur but for the proposed action.*

**2.3.3.1 Indirect interactions**

As part of your project description, you identified that there are no anticipated environmental stressors resulting from your proposed project. Because there are no stressors occurring, no resource needs will be exposed to or affected by changes in the environment. Therefore, no indirect interactions will occur that would result in effects to the Roanoke Logperch.

**2.3.3.2 Direct interactions**

DIRECT IMPACT	CONSERVATION MEASURES	INDIVIDUALS IMPACTED	IMPACT EXPLANATION
Collection	<a href="#">Targeted sampling design</a>	Yes	See attached Application Package
Electrocution	<a href="#">Correct electrofishing techniques</a>	No	Aquatic biological studies were requested and refined during the development of the Project's Proposed Study Plan, Revised Study Plan, and Study Plan Determination that included coordination with VDWR, USFWS, and USEPA. Three of the requested studies occur during the recommended TOYRs (Table 1). Documents outlining agency requests and specific Project methodologies are located at <a href="http://www.aephydro.com/HydroPlant/Niagara">http://www.aephydro.com/HydroPlant/Niagara</a> , but general methods and rationale are provided below as a quick review.

DIRECT IMPACT	CONSERVATION MEASURES	INDIVIDUALS IMPACTED	IMPACT EXPLANATION
			<p>RLP adults and subadults: A three-day sampling period will occur between June 1 and June 30 to determine RLP occupancy of the Project's bypass reach below Niagara Dam during spring flows. Backpack electrofishing methods include two backpack electrofishing units to sample 64 quadrats (eight meters by four meters) in riffle-run habitat .</p> <p>Electrofishing equipment will be adjusted to function safely, providing minimum dose to facilitate collection while minimizing risks for fish damage or mortality.</p>

### 2.3.4 Cumulative effects

<http://www.aephydro.com/Content/documents/2021/NiagaraInitialStudyReport01-11-2021.pdf> (<http://www.aephydro.com/Content/documents/2021/NiagaraInitialStudyReport01-11-2021.pdf>)

See attached Application Package

### 2.3.5 Discussion and conclusion

**Determination: NLAA**

#### Compensation measures

See attached Application Package

#### Relevant documentation

- [Appalachian Historical Fisheries Surveys 1991 and 1992](#)
- [Jon Studio 3-200-59 Application Package](#)



### **3 Critical Habitat Effects Analysis**

*No critical habitats intersect with the project action area.*

# 4 Summary Discussion, Conclusion, And Effect Determinations

## 4.1 Effect Determination Summary

SPECIES (COMMON NAME)	SCIENTIFIC NAME	LISTING STATUS	PRESENT IN ACTION AREA	EFFECT DETERMINATION
<a href="#">Indiana Bat</a>	Myotis sodalis	Endangered	No	NE
<a href="#">Northern Long-eared Bat</a>	Myotis septentrionalis	Threatened	No	NE
<a href="#">Roanoke Logperch</a>	Percina rex	Endangered	Yes	NLAA

## 4.2 Summary Discussion

See attached Application Form/Package

## 4.3 Conclusion

See attached Application Form/Package

**Table of Contents:**

1. Application Form (3-200-59)
2. Introductory Statement and Application Form Supplement
3. Species Experience Table
4. Letters of Recommendation
5. Curriculum Vitae

**1. Application Form (3-200-59)**



## FEDERAL FISH AND WILDLIFE PERMIT APPLICATION FORM U.S. FISH AND WILDLIFE SERVICE



Return to: U.S. Fish and Wildlife Service (USFWS)  
[click here for return addresses](#)

**Type of Activity:** Native Endangered and Threatened Species  
Scientific, Enhancement of Propagation, or Survival (i.e.,  
Purposeful Take for Recovery)

Complete Sections A or B, and C, D, and E of this application. A U.S. physical address is required in Section C, see instructions for details.  
**Refer to the Application Form Instructions for information on how to make your application complete and help avoid unnecessary delays.**

<b>A. Complete if applying as an individual</b>					
1.a. Last name		1.b. First name		1.c. Middle name or initial	1.d. Suffix
2. Date of birth (mm/dd/yyyy)	3. Occupation		4.a. Affiliation/Doing business as (see instructions)	4.b. Website URL (if applicable)	
5.a. Telephone number	5.b. Alternate telephone number	6. E-mail address			
<b>B. Complete if applying on behalf of a business, corporation, public agency, Tribe, or institution</b>					
1.a. Name of business, agency, Tribe, or institution			1.b. Doing business as (dba)		
2. Tax identification no.		3.a. Description of business, agency, Tribe, or institution		3.b. Website URL (if applicable)	
4.a. Principal officer (P.O.) last name	4.b. P.O. first name	4.c. P.O. middle initial	4.d. P.O. e-mail address		
5. P.O. title			6. Primary contact name		
7.a. P.O. telephone number	7.b. Alternate phone no.	8.a. Primary contact telephone no.		8.b. Primary contact e-mail address	
<b>C. All applicants MUST complete</b>					
1.a. Physical address (U.S. Street address; Apartment #, Suite #, or Room #; <b>no P.O. Boxes</b> )					
1.b. City	1.c. State	1.d. Zip code/Postal code	1.e. County/Province	1.f. Country	
2.a. Mailing address (if different than physical address) and name of contact person (if applicable)					
2.b. City	2.c. State	2.d. Zip code/Postal code	2.e. County/Province	2.f. Country	
<b>D. All applicants MUST complete</b>					
1. Attach the nonrefundable application processing (check or money order), payable to the U.S. FISH AND WILDLIFE SERVICE <b>in the amount indicated on page 3</b> . Federal, Tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – <b>attach documentation of fee exempt status as outlined in Application Form Instructions</b> (50 CFR 13.11(d)).					
2. Do you currently have or have you ever had any Federal Fish and Wildlife permits (includes named on permit or List of Authorized Individuals)?  <b>Yes.</b> List the number of the most recent permit you have held, or that you are applying to renew or amend: <b>No.</b>					
Certification: I hereby certify that I have read and am familiar with the regulations contained in <b>Title 50, Part 13 of the Code of Federal Regulations</b> and the other <b>applicable parts in subchapter B of Chapter I of Title 50</b> , and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.					
<b>Jonathan Studio</b>			Digitally signed by Jonathan Studio Date: 2020.12.21 10:04:22 -05'00'		
Original or electronic signature of individual applicant/Principal Officer (no photocopied or stamped signatures)				Date (mm/dd/yyyy)	

**E. ALL APPLICANTS MUST COMPLETE.**

Provide the information outlined in Section E. on the following pages. Be as complete and descriptive as possible. Please do not send pages that are over 8.5" x 11," videotapes, or DVDs. See page 9 for information on the Paperwork Reduction Act, Privacy Act, and Freedom of Information Act aspects of your application.

**OTHER FEDERAL, TRIBAL, STATE, OR LOCAL APPROVALS OR AUTHORIZATIONS REQUIRED TO CONDUCT YOUR REQUESTED ACTIVITY**

Please be aware that there may be other requirements necessary to conduct proposed activities such as obtaining permission to work on Federal or Tribal lands, a Federal bird banding permit, a Tribal, State, county or municipal permit, etc.

Have you obtained all required Federal, Tribal, State, county, municipal or foreign government approval to conduct the activity you propose?

**Yes.** Provide a copy of the approval(s). List the Federal agency, tribe, State, county, and/or municipality involved and type of document required. Include a copy of these documents with the application.

**I have applied.** List the Federal agency, tribe, State, county, and/or municipality involved, date of application(s), and type of permit(s). Provide the reasons why the authorizations/permits have not been issued.

**Not required.** The proposed activity does not require issuance of other approvals and/or authorizations.

*No additional permissions are required, as the proposed is a scientific study and not a construction-related or other activity that would disturb additional resources. The study is being conducted in support of the FERC relicensing process for Appalachian Power Company's Niagara Hydroelectric Project. All access to the Roanoke River for study activities will be on lands owned by or covered by easement to Appalachian Power Company. Appalachian Power Company has consulted with federal and state agencies (including USFWS and the Virginia Department of Wildlife Resources) regarding the design of the study, and the study methodology and schedule have been approved by FERC.*



**APPLICATION TYPE AND PROCESSING FEES**

Annual reports and any other required reports under your valid permit(s) must be on file before a permit will be considered for renewal or amendment. Check the appropriate box below for the activity that you are requesting.

- Administrative change:** You may update your name, address, telephone number, fax number, or e-mail address in your current application package on file at any time. These changes are considered administrative changes, and an application processing fee is not required. If you wish to make an administrative change, please complete pages 1-4 and indicate the information you are updating (e.g., address, telephone number, etc.). Submit completed pages 1-4 to the appropriate Regional Office (see <https://www.fws.gov/angered/permits/recovery-permits-contacts.html>).

Requests other than an administrative change require an application processing fee, as described below. Mark the appropriate box and enclose a check or money order payable to the *U.S. Fish and Wildlife Service* in the amount indicated. If you are **fee exempt**, attach evidence or a justification and mark this box  (see section D.1.).

- New.** \$100 permit application processing fee
- Renewal.** \$100 permit application processing fee. If you are applying to renew a valid permit, your complete application package must be received at least **30 days** prior to the expiration of the valid permit ([50 CFR 13.22](https://www.fws.gov/angered/permits/recovery-permits-contacts.html)) to avoid a lapse in permit coverage.

**Renew** my existing valid permit (**without changes**) using my current application on file. Permit no. \_\_\_\_\_. Provide the required information under Option 1 below.

**Renew** my existing valid permit (**with changes**). Permit no. \_\_\_\_\_. Below, indicate your requested amendments(s) and provide the required information under Option 2.

- Amendment.** \$50 permit application processing fee: An amendment to a valid permit is requested at a time other than renewal. Permit no. \_\_\_\_\_.

When the information in your current application package on file has changed, then you must apply for an amendment to your valid permit. For example, **such changes may include the additions of species to the permit and/or changes in location or activities.** Please contact the Regional Recovery Permit Contact within the U.S. Fish and Wildlife Service Region of your proposed activity for technical assistance in making this determination (<https://www.fws.gov/angered/permits/recovery-permits-contacts.html>). Provide the required information under Option 2 below.  \$0 to **transfer** my existing valid permit. Use Option IV. Below to provide the required information.

**Please indicate the amendment(s) you are requesting:**

- Add species (specify) \_\_\_\_\_
- Add new activity) \_\_\_\_\_
- Add a geographic area \_\_\_\_\_
- Change in personnel \_\_\_\_\_
- Other (specify) \_\_\_\_\_

### REFERRAL OF A RECOVERY PERMITTEE'S CONTACT INFORMATION (OPTIONAL)

The U.S. Fish and Wildlife Service often receives requests for contact information Permittees who could conduct endangered and threatened species (e.g., presence/absence surveys) contract work. In accordance with our Privacy Act System of Records Notice ([Permits System, Interior, FWS-21](#)), we may release the name, business address, business email address or business telephone number of those who wish to be contacted by third parties to do commercial survey activities. Such information is not normally released under the Freedom of Information Act - unless a compelling need on the part of the general public can be cited.

Please be aware that provision of Permittee contact information does not represent an endorsement by the USFWS of any particular Permittee. A referral is provided at the discretion of each U.S. Fish and Wildlife Service Regional Office as time and workload allow.

Please indicate below your preference for the release of your contact information to third parties.

- Yes.** The U.S. Fish and Wildlife Service may release my name, business address, business email address and/or business telephone number to third parties as a referral for endangered and threatened species contract work.
- No.** The U.S. Fish and Wildlife Service may not release my name, business address, business email address, and/or business telephone number to third parties.

### SEA TURTLES

If your application involves sea turtles, please be aware that we share jurisdiction with National Marine Fisheries Service (NMF)/National Oceanic and Atmospheric Administration (NOAA) Fisheries for **sea turtles**. We evaluate applications for permits to conduct activities impacting sea turtles on land, or when applicants are conducting activities both on land and in the marine environment, and NMFS/NOAA Fisheries evaluates applications for permits to conduct activities impacting sea turtles in the marine environment. To apply for a permit to conduct activities with sea turtles in the marine environment or other species under NMFS/NOAA Fisheries jurisdiction, please contact the NMFS via their permit web page at <https://www.fisheries.noaa.gov/permits-and-forms>.

### DISQUALIFICATION FACTOR

A conviction, or entry of a plea of guilty or *nolo contendere*, for a felony violation of the Endangered Species Act, Lacey Act, Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act disqualifies any such person from receiving or exercising the privileges of a permit, unless such disqualification has been expressly waived by the USFWS Director in response to a written petition (50 CFR 13.21(c)).

Have you or, if applying as a business, any of the owners of the business, been convicted, or entered a plea of guilty or *nolo contendere*, forfeited collateral, or are currently under charges for any violations of the Endangered Species Act, Lacey Act, Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act?

- No.**
- Yes.** Provide the following (use a separate page(s) if needed to complete your response):
- a) The individual's name:
  - b) Date of charge:
  - c) Location of incident:
  - d) Court:
  - e) Action taken for each violation:

**SPECIFIC RELEVANT ACTIVITY REQUIRED INFORMATION: OPTION 1**

**Option 1. Renew an existing valid recovery permit *without* changes.**

If you are applying to **renew an existing valid recovery permit without changes**, sign the following statement. The individual signing Section D. on page 1 of the application must also sign the following statement. This certification language is required under 50 CFR 13.22(a).

I certify that the statements and information submitted in support of my original application for a U.S. Fish and Wildlife Service Recovery permit no. TE \_\_\_\_\_ are still current and correct and hereby request renewal of that permit without changes. I also certify that all annual reports and any additional reporting requirements have been submitted to the USFWS.

\_\_\_\_\_  
**Original or electronic signature of individual applicant/Principal Officer**

\_\_\_\_\_  
**Please legibly write or type the Signatory's name**

\_\_\_\_\_  
**Date**

Signing the above statement completes your renewal application. Please submit completed pages 1- 5 of this application to the Regional Office covering the location of your proposed activity (see <https://www.fws.gov/endangered/permits/recovery-permits-contacts.html>). Requests for permit renewal must be complete and received by the USFWS no later than 30 days prior to the permit expiration to ensure that your current permit remains in effect while we process your request.

**SPECIFIC RELEVANT ACTIVITY REQUIRED INFORMATION: OPTION 2**

**Option 2. New Recovery Permit, or Renewal with Amendment, or Amendment of an Existing Permit**

General permit regulations for the USFWS are found at 50 CFR 13. Regulations for Recovery permits under the Endangered Species Act (ESA) can be found at 50 CFR 17.22(a)(1) for endangered wildlife species, 50 CFR 17.32(a)(1) for threatened wildlife species, 50 CFR 17.62 for endangered plant species, and 50 CFR 17.72 for threatened plant species.

Applications for a recovery permit must provide the following specific information (relevant to the activity) in addition to the general information on the previous pages of this application form. Please attach separate pages as needed. In order to assist us in processing your application, please provide the item number (i.e., A.1.a., etc.) that corresponds to the required information before each of your responses.

**A. Identify species and activity:**

1. For a new Recovery Permit or Amendment of an Existing Permit:
  - a. Provide the common and scientific names of the species being requested for coverage in the permit and their status (endangered (E) or threatened (T)). If you need to search for the scientific name of the species, please visit [www.fws.gov/endangered/?ref=topbar](http://www.fws.gov/endangered/?ref=topbar). If you are requesting the addition of species to an existing permit, identify the species to be added to your valid permit.
  - b. Provide the number, age, and sex of such species to the extent known.
  - c. Identify the activity(ies) sought to be authorized (i.e., presence/absence survey, nest monitoring, bird banding, etc.) for each species. If you hold a valid permit and you are not requesting changes to authorized activities, indicate "No Changes".
  - d. Provide the project title and project duration (start date/completion date) along with a copy of the study proposal, project funding agreement(s), etc., if applicable.
  - e. If you hold a valid permit and wish to amend it to delete species and/or activities, please identify activities and/or species to be deleted from your valid permit and the reason(s) for the deletion.
2. Also, for the collection of **plants from the wild on lands under Federal jurisdiction**:
  - a. Describe the plant part(s), and the number(s) or other type(s) of indication of material you plan to collect (i.e., whole plant, leaves, pollen, seeds, etc.).
  - b. If the proposed activity involves the collection of seeds from the wild, provide information that evaluates the effects of the seed collection on the reproductive potential of the species at the collection location.

**B. Identify the location of the proposed activity:**

1. Provide the name of each State, county, Tribal land, and the specific location of the proposed activity site(s) below. Include a formal legal description, section/township/range information, county tax parcel number, local address, or any other identifying property designation that will precisely place the location of the proposed activity site(s) below. Because the permit is enforceable; it is *required* that you list each specific State that you wish to work in.

Location	
State, county, tribal land, and the specific location of the proposed activity:	
Location Description:	

2. If the specific study area is known at the time of application, attach a U.S. Geological Survey map of the study area in 7.5 minute quadrangle (1:24,000) scale, or other appropriately scaled map. If you plan to conduct surveys on a contract basis in the future, these maps can be provided once the specific area is known, however, the counties in which you propose to work in must be provided at this time, or at the very least, the State(s).

3. If your request is for aquatic species, identify the aquatic system (river/lake/stream name, river mile information, and drainage basin).
4. For plant species, identify the lands under Federal jurisdiction (name, address) where the proposed activities will be conducted.

**C. Describe the proposed activity:**

Provide a statement justifying the permit request, including the items listed below. A copy of the pertinent research or study proposal that provides the required information should be attached if available. Attach additional separate pages as necessary.

1. Describe how the activities or proposal will help recover each species.
  - a. If there is an approved recovery plan, identify the recovery tasks by number and name, if applicable. Include any additional recovery tasks identified in a Spotlight Species Action Plan, if applicable, or in a 5-year status review of the species.
  - b. Identify or provide copies of any previous or similar research conducted on this species.
  - c. If this information exists, explain how the project will attempt to answer questions not answered by earlier research.
  - d. Explain how you will coordinate your efforts with past and ongoing research studies.
2. Describe in detail the purpose(s) and objective(s) of the activities or project.
  - a. Provide the study design, sampling methods and equipment to be used.
  - b. Identify any null hypothesis or other anticipated results from the project that will support the reasoning that the project will enhance the propagation or survival of the affected species.
  - c. Include planned disposition of specimens upon completion of project.
3. Can this activity or project result in the injury, death, or removal from the wild of any individuals of the species?
  - a. If yes, describe all that apply (i.e., injury, death, removal from the wild).
  - b. For each species, please state the maximum number of individuals that would be injured, killed, or removed from the wild: *[If applicable, please identify, based on a reasonable expectation, the number of individuals likely to be injured or killed per activity.]*
  - c. Please state what will be done to minimize the possibility of injury to or death of individuals.
  - d. If the proposed activity would cause the death of individuals from the wild or removal of individuals from the wild, describe your attempts to obtain the wildlife or plant specimens currently held in captivity/nurseries/museums, or produced in captivity. You must demonstrate conclusively that existing specimens are unavailable or your study objectives require new/additional specimens. *[Provide the identity and telephone number of each contact made in this regard.]*
4. Identify contracts and agreements held for the proposed activities (attach a copy or provide the title, funding organization name and address, date of signature, and duration of the contract).

Indicate whether full funding will be available for the completion of the proposed activity. *[If you do not hold a contract at this time, but foresee receiving one, you may apply for a permit contingent upon receiving the contract(s).]*
5. If live wildlife or plants to be covered by the permit are to be held in captivity:

[Note: Under regulations at 50 CFR 17.22(a)(3) and 17.32(a)(3), escape of wildlife held in captivity must be reported immediately to our appropriate Regional Office (see page 9 - USFWS Regional Contacts or [www.fws.gov/endangered/regions/index.html](http://www.fws.gov/endangered/regions/index.html)).

  - a. Provide a complete description, along with photographs and/or diagrams, of the area and facilities where wildlife or plant(s) will be held and/or maintained in captivity and describe arrangements for care during transportation and maintenance. Include the name and physical address of the area and facilities. *[A separate discussion specific for each species must be provided, when applicable.]*
  - b. Provide the full name and contact information of the person(s) who will care for live specimens, and include a description of their experience in caring for these or similar species, including a resume of their experience in raising, caring for, and propagating these or similar wildlife or plants.
  - c. Provide a copy of any contract or agreement you have secured for care of any live specimens collected under this permit

request if the identified facility is not affiliated with you.

- d. List mortalities and/or injuries resulting from your activities with these or similar species in the last 2 years.
  - e. Provide an explanation of each mortality event and the procedures employed or modified to eliminate any future mortality events.
  - f. Indicate your willingness to participate in a cooperative breeding or propagation program or to contribute data to a database or studbook. Holding wildlife and plants in captivity must comply with our Policy Regarding Controlled Propagation of Species Listed under the Endangered Species Act. This policy can be found on the USFWS Endangered Species web page at [www.fws.gov/endangered/laws-policies/policy-controlled-propagation.html](http://www.fws.gov/endangered/laws-policies/policy-controlled-propagation.html). Briefly describe how the proposed activity will comply with this policy.
  - g. State the planned disposition of the collected and/or propagated species after termination of the project/activity.
6. If working in multiple terrestrial and/or aquatic sites, provide the steps, protocols, and methodologies you will follow to prevent the spread of invasive species, infectious disease agents, and parasitic organisms, and to decontaminate vehicles and equipment.

**D. Identify the persons who will conduct the proposed activity:**

- 1. Provide the full name of all individuals, *including first name, middle initial, and last name*, who you propose will conduct activities under this permit (Please note that only those individuals who will be conducting the proposed activities independently without direct, and on-site supervision of an appropriately permitted individual need be included here).
  - a. If more than one activity is included in the permit application, indicate which activity(ies) will be completed by each individual.
  - b. For each listed individual, please provide a copy of each person's resume and/or curriculum vitae, in addition to specific information on previous professional training and experience conducting the proposed activities with the requested species or similar species. Information must include: dates and locations of previous activities involving these or similar species and the name of the supervising individual(s) under which such activities were conducted, and the approximate number of each species the applicant has worked with at each site.
  - c. For each listed individual, please provide at least two reference letters indicating the name, title, organization, email address, and telephone number preferably from federally permitted persons independent of each individual's place of employment, who can verify the individual's experience with the species.

END OF APPLICATION REQUIREMENTS

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## APPLICATION FORM INSTRUCTIONS

The following instructions pertain to U.S. Fish and Wildlife Service (USFWS) permit applications. The General Permit Procedures in [50 CFR 13](#) address the permitting process. For simplicity, all licenses, permits, registrations, and certificates are referred to as a permit.

### GENERAL INSTRUCTIONS:

- Complete all relevant questions in Sections A or B, C, D, and E.
- **An incomplete application may cause delays in processing or may be returned to the applicant. Be sure you are completing in the appropriate application form for the proposed activity.**
- Print clearly or type the required response. Illegible applications may cause delays.
- Original or electronic signature of the application is required. Faxes or copies of the original signature will not be accepted.
- Mail the original application to the address at the top of page one of the applications or, if applicable, on the attached address list.
- **Keep a copy of your completed application.**
- **Please plan ahead. Allow at least 60 days for your application to be processed; however, some applications may take longer than 90 days to process ([50 CFR 13.11](#)).**
- Applications are processed in the order in which they are received.

### SECTION A OR SECTION B:

#### Section A. Complete if applying as an individual:

- Enter the complete name of the responsible individual who will be the permittee if a permit is issued. Enter personal information that identifies the applicant.
- If you are applying on behalf of a client, the personal information must pertain to the client, and a document evidencing power of attorney must be included with the application.
- **Affiliation or Doing business as (dba):** business, agency, organizational, Tribe, or institutional affiliation directly related to the activity requested in the application (e.g., a taxidermist is an individual whose business can directly relate to the requested activity).

#### Section B. Complete if applying as a business, corporation, public agency, Tribe, or institution:

- Enter the complete name of the business, agency, Tribe, or institution that will be the permittee if a permit is issued. Give a brief description of the type of business the applicant is engaged in. Provide contact phone number(s) of the business. If you are applying on behalf of a client, a document evidencing power of attorney must be included with the application.
- **Principal Officer** is the person in charge of the listed business, corporation, public agency, Tribe, or institution and who is responsible for the application and any permitted activities. Often the Principal Officer is a Director or President. The **Primary Contact** is the person at the business, corporation, public agency, Tribe, or institution who will be available to answer questions about the application or permitted activities. Often, it is the preparer of the application.

### ALL APPLICANTS COMPLETE SECTION C:

- A physical U.S. address is required.
- **Mailing address** is the address to which communications from USFWS should be mailed if different from the applicant's physical address.

### ALL APPLICANTS COMPLETE SECTION D:

#### Section D.1. Application processing fee:

- An application processing fee is required at the time of application, unless exempted under 50 CFR 13. The application processing fee is assessed to partially cover the cost of processing a request. **The fee does not guarantee the issuance of a permit, nor will fees be refunded for applications for which processing has begun.**
- **Documentation of fee exempt status is not required for applications submitted by Federal, Tribal, State, or local government agencies, but must be supplied by those applicants acting on behalf of such agencies.** Such applications must include a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency.

#### Section D.2. Federal Fish and Wildlife permits:

- List the permit number of your most recently issued USFWS permit.

#### Section D.3. CERTIFICATION:

- **The individual identified in Section A, the principal officer named in Section B, or a person with a valid power of attorney (documentation must be included in the application) must sign and date the application using original or electronic signature.** This signature legally binds the applicant to the statement of certification. You are certifying that you have read and understand the regulations that apply to the permit. You are also certifying that all information included in the application is true to the best of your knowledge, as described under 50 CFR 13. Be sure to read the statement and re-read the application and your answers before signing.

## NOTICES

### PRIVACY ACT STATEMENT

**Authority:** The information requested is authorized by the following: the Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22; the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), 50 CFR 17; the Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21; the Marine Mammal Protection Act (16 U.S.C. 1361, et seq.), 50 CFR 18; the Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15; the Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16; Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), 50 CFR 23; General Provisions, 50 CFR 10; General Permit Procedures, 50 CFR 13; and Wildlife Provisions (Import/export/transport), 50 CFR 14.

**Purpose:** The collection of contact information is to verify the individual has an eligible permit to conduct activities which affect protected species. This helps USFWS monitor and report on protected species and assesses the impact of permitted activities on the conservation and management of species and their habitats.

**Routine Uses:** The collected information may be used to verify an applicant's eligibility for a permit to conduct activities with protected species; to provide the public and the permittees with permit related information; to monitor activities under a permit; to analyze data and produce reports to monitor the use of protected species; to assess the impact of permitted activities on the conservation and management of protected species and their habitats; and to evaluate the effectiveness of the permit programs. More information about routine uses can be found in the System of Records Notice, Permits System, FWS-21.

**Disclosure: Response to** the information requested in this form is voluntary. However, submission of requested information is required to process applications for permits authorized under the listed authorities. Failure to provide the requested information may be sufficient cause for the U.S. Fish & Wildlife Service to deny the request.

### PAPERWORK REDUCTION ACT STATEMENT

We are collecting this information subject to the Paperwork Reduction Act (44 U.S.C. 3501) to provide the U.S. Fish and Wildlife Service the information needed to decide whether or not to allow the requested use and to respond to requests made under the Freedom of Information Act and the Privacy Act of 1974. The information that you provide is voluntary; however, submission of the requested information is required to evaluate the qualifications, determine eligibility, and document permit applicants. Failure to provide all required information is sufficient cause for the U.S. Fish and Wildlife Service to deny a permit. We may not conduct or sponsor, and you are not required to respond to a collection of information, unless it displays a currently valid OMB control number. OMB has approved this collection of information and assigned OMB Control No. 1018-0094.

### ESTIMATED BURDEN STATEMENT

Public reporting for this collection of information is estimated to average 3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Service Information Clearance Officer, U.S. Fish and Wildlife Service, 5275 Leesburg Pike, MS: PRB (JAO/3W), Falls Church, VA 22041-3803, or via email at [Info\\_Coll@fws.gov](mailto:Info_Coll@fws.gov). Please do not mail your completed form to this address.

### FREEDOM OF INFORMATION ACT NOTICE (FOIA)

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the USFWS to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.23 and 43 CFR 2.24].

## **2. Introductory Statement and Application Form Supplement**

December 17, 2020

To whom this may concern:

My name is Jonathan A. Studio and I work as an ecological consultant and fish biologist for Edge Engineering & Science, LLC (EDGE). I am applying for a new Federal Scientific Collector's Recovery permit for Roanoke Logperch (*Percina rex*; RLP), which I was previously permitted for while under Virgil Brack's permit (TE02373A-14) at Environmental Solutions & Innovations, Inc. (ESI). The following information is submitted to attain a Federal Scientific Collector's permit that will be used to conduct presence/absence and density surveys for Appalachian Power Company's Niagara Hydroelectric Project (FERC No. 2466-034, Project). The referenced surveys were requested by federal and state agencies to support the FERC relicensing process for the Project. All access to the Roanoke River for study activities will be on lands owned by or covered by easement to Appalachian Power Company. Appalachian Power Company has consulted with federal and state agencies (including U.S. Fish and Wildlife Service [USFWS] and Virginia Department of Wildlife Resources [VDWR]) regarding the design of the study, and the study methodology and schedule have been approved by FERC. All other future project details are unknown until proposed projects are requested, at which point all potential surveys will be coordinated with the proper USFWS Regional and/or Field Office and will receive approval before any work or surveys are conducted.

Before starting my career in environmental consulting, I developed an ichthyological knowledgebase during my undergraduate experiences at Kent State University (2011-2015) in Ohio. I then obtained a master's degree from James Madison University (2016-2018) where I investigated competition between American Eels (*Anguilla rostrata*) and Brook Trout (*Salvelinus fontinalis*) in Virginia streams. During this time, I gained experience leading field crews and conducting backpack electrofishing surveys for stream fishes in Shenandoah National Park and George Washington and Jefferson National Forests. I employed methods such as gastric lavage, PIT tagging, and drift netting that require increased caution and care to safely complete and assure minimal adverse impacts to organisms. I have extensive experience capturing, handling, and accurately identifying fishes in multiple watersheds of multiple states and notably including the Roanoke River.

While employed as an aquatic scientist at ESI, most of my time was spent conducting fish surveys in Virginia, primarily in the Roanoke River basin. I trained and supervised field crews while coordinating with clients and state agencies to successfully complete fish removals in dewatered stream sections for various projects where instream-disturbance activities occurred. I completed fish removals in streams of variable sizes, including many (5+) streams that have suitable habitat or known occupation of RLP, and identified thousands of fishes of more than 30 species. Prior to this Project, I have not handled RLP

during project-related sampling efforts; however, I have performed observations of young-of-year, juvenile, and adult RLP on several occasions while snorkeling for mussel surveys. I also have experience collecting and safely handling a sister species, Common Logperch (*Percina caprodes*) in Ohio.

My role as a vital teammate responsible for drafting a Biological Assessment to comply with ESA Section 7 consultation on a large interstate pipeline project in Virginia required countless hours of research and synthesis of information on RLP from the available literature. This experience increased my familiarity with the autecology of RLP, including its associated assemblage (e.g., status and distribution, habitat requirements, ontogenetic habitat shifts, land-use impacts, effects analysis and determinations, etc.). More recently, I developed a Study Plan with an embedded experimental design for surveying adult, young-of-year, and larval RLP in association with the Niagara Hydroelectric Project on the Roanoke River (in cooperation with the Applicant, VDWR, U.S. Environmental Protection Agency [USEPA], Virginia Department of Environmental Quality [VDEQ], Virginia Tech [Dr. Paul Angermeier], and USFWS – Gloucester Field Office).

In my current role at EDGE, I have managed several hydroelectric relicensing projects (including Niagara) and served as field crew leader in the Roanoke River in Roanoke County, Virginia (September through October 2020). During general fish community backpack electrofishing surveys in September, we captured a single live RLP adult. I safely and successfully handled, evaluated, and returned this individual to the stream. Although I have conducted fish surveys for over seven years, this RLP collection represented a culmination of my experience and preparation.

## **Specific Relevant Activity Required Information: Option 2**

### **A. Identify species and activity (page 6):**

#### **A.1.a. *Percina rex* (Roanoke Logperch; RLP) (Endangered)**

**A.1.b.** Although there is no estimate for abundance of RLP in the Niagara Dam Hydroelectric Relicensing Project (Project) area, Appalachian and AEP (1992) observed 10 RLP and estimated that 24% of the two-mile segment of the Roanoke River below Niagara Dam contained suitable RLP habitat. Further, USFWS (2007) states the upper Roanoke River is occupied by the largest population of RLP.

**A.1.c.** Activities include individualized survey techniques for each life stage. Survey methods are designed around identifying RLP presence/absence and determining RLP densities. RLP adults (Age 1+) are targeted with backpack electrofishing and

seining methods, young-of-year (YOY) are targeted with seine hauls, and larvae are targeted with drift net sets (see Section C below for detailed methodologies).

**A.1.d.** Niagara Hydroelectric Project (FERC No. 2466-034). March 2021 – September 2021. Study plan and other Project materials can be found here: <http://www.aephydro.com/HydroPlant/Niagara>. All other potential surveys will be coordinated with the proper USFWS Field Office and will receive approval before any work or surveys are conducted. For the purposes of this permit application, Niagara Hydroelectric Dam Relicensing Project will be the focus of methods and requests.

**A.1.e.** N/A. No deletions requested.

**A.2.** N/A for all subsections. No plants requested for addition to permit.

**B. Identify location of the proposed activity (page 6):**

**B.1.** The Niagara Hydroelectric Project is located in Roanoke County, Virginia. If additional proposed projects are requested range wide for the species, presence/absence and density surveys may also be conducted elsewhere in Virginia and North Carolina throughout their known and historic range (e.g., Upper Roanoke and Dan Rivers and tributaries in the Roanoke River Drainage in Virginia and North Carolina. Nottoway River and tributaries in the Chowan River Drainage). Exact details are unknown until proposed projects are requested at which point all potential surveys will be coordinated with the proper USFWS Regional and/or Field Office and will receive approval before any work or surveys are conducted.

**B.2.** Current map below (Niagara Hydroelectric Project Area in the Roanoke River, Roanoke County, Virginia):





have a great positive impact on conservation because of how little data there currently is, especially with regards to how dams may potentially impact populations and habitat. Only two larval density studies have ever been completed using drift net methods (Hallerman et al. 2017; Buckwalter et al. 2019), thus there is a large knowledge gap in the early life-stages for this species. The proposed Niagara Hydroelectric Project relicensing studies may potentially lend insight into large-scale population dynamics as USFWS (2007) lists large dams and reservoirs as a potential threat to RLP. Sampling techniques will closely follow methods outlined in these two studies, which has been carefully coordinated with the authors and Virginia Polytechnic Institute and State University (Virginia Tech). Supplementary habitat and water quality parameters documented at the time of surveys will fill existing knowledge gaps and potentially facilitate decisions affecting the recommended actions of the RLP Recovery Plan (USFWS 1992), An Update to the Roanoke Logperch Recovery Plan (Rosenberger 2007), and RLP 5-Year Review (USFWS 2007).

(See Section C.1.c. and C.1.d. for further collaboration efforts)

**C.1.b.** There have been numerous studies identifying habitat suitability, population trends, and conservation needs of adult and young-of-year RLP (e.g., Anderson 2016, Ensign et al. 2000, Lahey and Angermeier 2007, Roberts et al. 2013, and Rosenberger and Angermeier 2002). However, there have only been two larval RLP studies conducted, both concerning drift timing and larval RLP identification methods (Buckwalter et al. 2019 and Hallerman et al. 2017). Drift nets are the most effective sampling methods for *Percina* (Buckwalter et al. 2019) and now that methods of larval RLP identification are being developed, research on this life stage is necessary to further address emergence timing and use of habitat within developed areas of stream ecosystems. Larval survival is a fundamental component in understanding population dynamics for the species and, at present, insufficient information or data are available.

**C.1.c.** Earlier research focuses on topics listed in Section C.1.b.

- The proposed study will supplement current data by applying previous research methods to analyze the abundance and density within the Upper Roanoke system, which is one of the more robust subpopulations (Lahey and Angermeier 2007).
- Studying relatively healthy populations and their habitat will lend insight to population structure and inform potential goals for increasing habitat and range.

- Understanding potential habitat use and movement through impoundments may be useful for informing operation and maintenance decisions for dams on the Roanoke River and throughout RLP range.

**C.1.d.** Coordination and cooperation with research entities drives project-specific experimental design and relevant data is disseminated whenever possible. For example, we have a working relationship with Dr. Paul Angermeier at Virginia Tech who is the leading expert on RLP and has provided invaluable insight to this study and the body of knowledge about the species. Our studies will fill gaps in the current body of research and allow his colleagues to identify and house larval specimens for continued research and educational purposes. Larval specimens will be sent to the lab responsible for publishing the majority of the existing RLP research. The Virginia Tech lab will help refine larval identification methods and add directly to the current knowledge base using the same methods and comparable sites, habitats, and locations. The following are just a few of the individuals who requested these studies and have reviewed and concurred with the proposed methodologies:

Mr. John McCloskey  
Fish and Wildlife Biologist, Virginia Field Office  
US Fish and Wildlife Service  
[John\\_mccloskey@fws.gov](mailto:John_mccloskey@fws.gov)

Mr. Richard C. McCorkle  
Fish and Wildlife Biologist, Pennsylvania Field Office  
US Fish and Wildlife Service  
[richard\\_mccorkle@fws.gov](mailto:richard_mccorkle@fws.gov)

Mr. Scott Smith  
Region 2 Fisheries Manager  
Virginia Department of Wildlife Resources  
[scott.smith@dwr.virginia.gov](mailto:scott.smith@dwr.virginia.gov)

Mr. Brian McGurk  
Water Withdrawal Permit Writer  
Virginia Department of Environmental Quality  
[Brian.McGurk@deq.virginia.gov](mailto:Brian.McGurk@deq.virginia.gov)

**C.2.a.** Study-specific sampling methods for each life stage (adult, YOY, and larvae) are outlined below:

Sampling adult RLP will involve capturing stunned fish in a bag seine that is placed downstream of a backpack electrofishing unit at eight riffle/run sites. Fixed-area quadrat sampling design, which allows for RLP density calculations (Anderson 2016),

will be used to sample sites varying from 500 to 5,000 square meters (1,640 to 16,404 square feet). All eight sites will be sampled between August and October 2021. One of these sites (bypass reach) will include an additional sampling event between May and June 2021, pending approval of a RLP time-of-year restriction waiver from VDGIF and USFWS, because it is hypothesized that more-suitable habitat may be available to RLP during elevated spring flows. A range of habitat parameters (i.e., depth, velocity, silt coverage, and pebble counts) will be measured at each sample site to calculate RLP habitat suitability index (HSI) (Ensign et al. 2000). If RLP are not captured during electrofishing surveys at any of the eight sites, biologists will spend a minimum of one-hour search time snorkeling or diving suitable RLP habitat to augment detectability and minimize false-negative survey efforts. Relative abundance, species richness, body condition, spatial distribution, density, and catch per unit effort will be calculated and compared to historical data and previous studies.

Young-of-year will be sampled between August and October 2021 using life-stage specific techniques outlined in Argentina and Roberts (2014) (i.e., using shoreward seine hauls ( $\geq 20$  per site) in slow moving, shallow, shoreline habitat). Basic water quality and substrate measurements will be collected and recorded at each sample site. All RLP young-of-year individuals will be enumerated and measured for total length and weight. All data will be analyzed with the goal of direct comparison with previously completed YOY RLP studies (e.g., relative abundance, species richness, body condition, spatial distribution, and catch per unit effort).

For adults and young-of-year RLP sampling, the first 30 non-RLP individuals of each species (and all RLP individuals) will be measured for total length and weight. However, all captured individuals will be enumerated and identified to the lowest taxonomic level practicable and released at the location of capture.

RLP larvae will be sampled after dusk from April to June 2021 using two, 20-minute drift net sets per site in riffle/run adjacent habitat. In total, we propose 100 net sets (5 sites, two sets once a week for 10 weeks) using the same methods as Buckwalter et al. (2019). All samples will be preserved in 95% ethanol (resulting in Take) and stored before species identification via morphometric analysis and DNA barcoding at Virginia Tech. All survey protocols and methods were developed in coordination with appropriate state and federal agencies, stakeholders, clients, and RLP experts. Larval RLP data will be analyzed for body condition, spatial distribution, volumetric density, and site-specific habitat parameters will be measured and recorded.

**C.2.b.** Results will inform Project-specific objectives such as establishing a baseline characterization of presence, abundance, density, and distribution throughout this

section of the Roanoke River, support cumulative effects analysis, and support/inform ESA Section 7 consultation. Results of the adult, YOY, and larval surveys may also potentially inform 'future research' needs posed by Buckwalter et al. (2019) by adding to limited understanding of RLP population demographics and year-class strength and recruitment.

**C.2.c.** Sampling efforts targeting adult and young-of-year RLP plans to catch and release all live specimens. However, accidental wounding or killing of an animal (e.g., crushing via substrate shifts or stepping on) could potentially happen due to the nature of sampling methods (e.g., electrofishing, kick sets, benthic seining). In the event an animal does expire during survey efforts, the appropriate state and federal agency offices will be notified within 24 hours and the animal is placed in ethanol before being deposited to the preferred repository per USFWS direction. In the case of drift net collections targeting larval RLP, all specimens collected in the drift net will be preserved, stored, sorted, identified, and deposited at Virginia Tech. Due to the nature of larval sampling and processing techniques, posthumous identifications of larval RLP will be made.

**C.3.a.** Injury, death, and removal from the wild are a possibility when conducting electrofishing, seining, and drift net surveys (see Section C.2.c). Survey activities will only be performed following coordination and approval by the appropriate USFWS Regional and/or Field Office.

**C.3.b.** Larval drift rates may be eruptive and/or pulsed and dependent upon environmental conditions during sampling events; therefore, the variance associated with larval capture rates is unknown, but may be wide. The estimated Take associated with proposed RLP larval sampling is based on the best available science (Buckwalter et al. 2019) in a single preceding study (U.S. Fish and Wildlife Service permit TE-697823). During 2015 and 2018 sampling efforts, a total of 18 sites were sampled via drift nets throughout the upper Roanoke River system and a total of 220 RLP larvae were captured in a total of 965 net sets (average CPUE is 0.228 including both survey years). The 75th percentile was 3.25 RLP per drift net set and maximum captured in one set was 9 (when drift net captured one or more larvae of a given species). We propose 100 total net sets (5 sites, two sets once a week for 10 weeks) using the same methods. Based on the aforementioned CPUE, our estimated Take would be 22 RLP larvae. If all net sets reached 75th percentile catch rate, Take would be 325. If all net sets captured the maximum, Take would be 900 RLP larvae. Based on the above information, for 100 proposed net sets, our estimated Take of larval RLP is 200 individuals. Due to the unknown variability in capture rates associated with drift net surveys, a conservative but reasonable approach has been taken that accounts for a

CPUE that is 8 times greater than previously observed. Adult and young-of-year will be released at the location of capture.

**C.3.c.** To minimize harm to adult RLP, electrofishing units will be calibrated to the conductivity of the water. Surveys will be limited to only what is deemed necessary to collect the data. Captured fish will be placed in large, instream cage nets (but outside of the sampling field) to allow for proper flow-through, temperature, and oxygenation. Care will be taken to minimize handling of specimens to reduce stress and each fish will be released immediately following the collection of morphometric data and photographic ID vouchers.

To minimize harm to young-of-year RLP, only three field personnel will conduct seining efforts to limit potential for trampling. Surveys will be limited to only what is deemed necessary to collect the data. Captured fish will be placed in large, instream cage nets (but outside of the sampling field) to allow for proper flow-through, temperature, and oxygenation. Care will be taken to minimize handling of specimens to reduce stress and each fish will be released immediately following the collection of morphometric data and photographic ID vouchers.

In the case of drift net collections for larval RLP, surveys will be limited to only what is deemed necessary to collect the data scoped by the aforementioned individuals that participated in the study scoping.

**C.3.d.** N/A. Activities requested under this permit are for required, Project-specific presence/absence and/or density surveys to characterize existing extant populations within the Project area. This information cannot be obtained previous research, museum specimens or captive populations.

**C.4.** A contractual agreement is in place as of September 2020 between EDGE Engineering & Science (employer) and HDR, Inc. (consultant to Project owner and operator) to complete this study in association with FERC relicensing and Section 7 obligations (prior to relicensing deadline in 2024). All funding is available to the completion of the proposed surveys. The Project owner and operator is currently coordinating a contract with Virginia Tech for the laboratory component of the study, which also includes funding through the conclusion of the study.

**C.5.** N/A for all subsections. No plants or animals collected under this permit will be held in captivity.

**C.6.** To prevent the spread of aquatic nuisance and/or invasive species/agents, proper decontamination will be a high priority before surveys begin and when moving



between watersheds. Before mobilizing, all aquatic gear will be sprayed with a solution of diluted bleach, salt, or other appropriate decontamination solutions. When possible, all aquatic gear will also be left out to dry for extended periods of time to further prevent spread of invasive species through desiccation. For terrestrial gear, boot bottoms, buckets, etc. will also be sprayed with a bleach solution or other decontaminant. Vehicles will be run through a car wash to dislodge mud and seeds.

**D. Identify the persons who will conduct the proposed activity (page 8):**

**D.1.a.** All surveys related to RLP will be completed by Jonathan A. Studio following coordination with the proper USFWS Regional and/or Field Office and will receive approval before any work or surveys are conducted.

**D.1.b.** I have enclosed my curriculum vitae, species experience spreadsheet, and letters of recommendation.

**D.1.c.** Contact information for my references attesting to competency with fish are listed below. Please also see the attached reference letters.

Casey Swecker  
Protected Species Practice Leader  
Edge Engineering & Science  
(304) 633-5808  
cdswecker@edge-es.com

Dr. Keith Gibbs  
Assistant Professor  
Department of Geosciences and Natural Resources  
Western Carolina University  
(828) 227-3817  
wgibbs@wcu.edu

**Literature Cited**

Anderson, G.B. 2016. Assessment of apparent survival and abundance of Roanoke Logperch in response to short-term changes in river flow. Final Report to the Virginia Department of Game and Inland Fisheries, Blacksburg, VA.

Appalachian Power Company (Appalachian) and American Electric Power Service Corporation (AEP). 1992. An Assessment of the Roanoke Logperch in the Roanoke River Downstream of Niagara Hydroelectric Project. December 1992. 5 pp.

Argentina, J., and J.H. Roberts. 2014. Habitat associations for young-of-year Roanoke logperch in Roanoke River. Final Report to Virginia Department of Game and Inland Fisheries, Blacksburg, VA.

Buckwalter, J., Angermeier, P., Argentina, J., Wolf, S., Floyd, S., and E. Hallerman. 2019. Drift of Larval Darters (Family Percidae) in the Upper Roanoke River Basin, USA, Characterized Using Phenotypic and DNA Barcoding Markers. *Fishes*. (4)59: 1-16.

Ensign, W.E., P.L. Angermeier, B.W. Albanese, and G.H. Galbreath. 2000. Preconstruction monitoring of the endangered Roanoke logperch (*Percina rex*) for the Roanoke River Flood Reduction Project: Phase 3. Final report to the Wilmington District, U. S. Army Corps of Engineers, Wilmington, NC.

Hallerman, E., Wolf, S., Argentina, J., Angermeier, P. and T. Grant. 2017. Phenology and habitat use of larval darters in the upper Roanoke River basin. Final Report to Virginia Department of Game and Inland Fisheries, Blacksburg, VA.

Lahey, A.M. and P.L. Angermeier. 2007. Range-wide assessment of habitat suitability for Roanoke logperch (*Percina rex*). Final report to the Virginia Transportation Research Council.

Roberts, J.H., P.L. Angermeier, and E.M. Hallerman. 2013. Distance, dams, and drift: what structures populations of an endangered, benthic stream fish? *Freshwater Biology*. 58: 2050-2064.

Rosenberger, A.E. 2007. An update to the Roanoke logperch Recovery Plan. Report from University of Alaska Fairbanks to U.S. Fish and Wildlife Service, Gloucester, Virginia.

Rosenberger, A.E., and P.L. Angermeier. 2002. Roanoke logperch (*Percina rex*) population structure and habitat use. Final report to Virginia Department of Game and Inland Fisheries, Blacksburg, VA.

U.S. Fish and Wildlife Service (USFWS). 1992. Roanoke Logperch (*Percina rex*) Recovery Plan. Newton Corner, Massachusetts. 34 pp.

U.S. Fish and Wildlife Service (USFWS). 2007. Roanoke logperch *Percina rex*: 5-year review: summary and evaluation. USFWS, Virginia Field Office, Gloucester, Virginia.

### **3. Species Experience Table**

### Roanoke Logperch (*Percina rex*) Experience

Waterbody	State	Date	Latitude	Longitude	Number Encountered	Survey Method	Supervisor
Roanoke River	VA	Summer 2018	37.277626	-80.110948	20*	Snorkeling while recording video and taking photographs	John Spaeth
Roanoke River	VA	Summer 2018	37.233402	-80.197942	20*	Snorkeling while performing mussel survey	John Spaeth
Roanoke River	VA	Summer 2018	37.233402	-80.197942	5*	Snorkeling while performing mussel survey	John Spaeth
Roanoke River	VA	09/15/2020	37.264589	-79.915833	1	Backpack electrofishing	Casey Swecker

\* denotes approximation during non-tabulated surveys or observations

## **4. Letters of Recommendation**

December 17, 2020

To whom it may concern,

I am writing in support of Mr. Jon Studio's request to obtain a 'new' Federal Scientific Collector's Recovery permit for Roanoke logperch (*Percina rex*; RLP). Jon is listed on an existing federal permit (#TE02373A-14) under his former employer and is currently requesting consideration to possess a federal permit in his own personal name. Before starting his career in environmental consulting, Jon was a master's student at James Madison University where he investigated competition between American eels and brook trout in Virginia streams. During this time, he gained experience leading field crews and conducting backpack electrofishing surveys for stream fish in Shenandoah National Park and George Washington and Jefferson National Forests. He also used methods such as gastric lavage and PIT tagging that require increased caution and care to be completed safely and with minimal adverse impacts to specimens. He has extensive experience capturing, handling, and accurately identifying fishes in multiple Virginia watersheds including the Roanoke River.

I have had the pleasure of working with Mr. Studio at two different entities where he served as a fisheries lead for the past two and a half years. Jon has an extensive background working across many drainages and on large projects dealing with complex issues surrounding endangered species compliance and addressing sedimentation issues. He is methodical in his approach to organization and it shows in his attention to detail when employing fish sampling protocols and addressing resource agency questions. Jon is advancing our understanding of larval fishes and beginning to answer questions that the fisheries community has been questioning for years. As a member of the scientific fisheries community, a qualified surveyor of endangered fishes in Virginia (including *Percina rex*), and someone who is critical in recommending only the best candidates to work with sensitive species; I could not think of a more passionate conservation fisheries biologist than Jon.

I can vouch firsthand in his abilities to correctly employ field protocols, handle and process rare, threatened, and endangered fishes, and retain taxonomic background and skillset necessary to work at a professional level.

Sincerely,



Casey D. Swecker  
Email: cdswecker@edge-es.com  
Mobile: 304.633.5808





**Department of Geosciences and Natural Resources**

331 Stillwell Building  
Cullowhee, NC 28723  
(828) 227-7367

W. Keith Gibbs, Ph.D.  
Department of Geosciences and Natural Resources  
Western Carolina University  
828-227-2817  
wgibbs@wcu.edu

December 17, 2020

To whom it may concern,

I have been working with stream fishes, including rare and protected species, for over fifteen years. I have worked with and for many state and federal agencies, including the U.S. Fish and Wildlife Service, National Park Service, and Environmental Protection Agency, sampling and conserving aquatic resources. I am currently an Assistant Professor in the Department of Geosciences and Natural Resources at Western Carolina University. I am writing this letter in support of Jon Studio to obtain a federal collecting permit for Roanoke logperch (*Percina rex*) as it pertains to conservation and monitoring of this species with his employer, Edge Engineering & Science.

I worked with Jon during summer 2018 collecting and moving fish in the Roanoke River watershed during mitigation efforts related to pipeline installation. We used a variety of sampling gear, including backpack electrofishers, kick seines, and hand nets to collect and remove all fish from a construction right of way. We conducted dozens of fish removals during that time. We encountered a diversity of stream fishes, including many minnows, darters, and madtoms. Jon has substantial experience handling, identifying, releasing, and/or observing live fishes of numerous, and often, sensitive species. We also frequently observed many species, including Roanoke logperch, during snorkel-based mussel surveys.

From my experience with Jon, I am very comfortable recommending him for a Federal Scientific Collector's Recovery permit. He is a diligent, conscientious, and highly knowledgeable biologist who prioritizes fishes' wellbeing and safety. Please feel free to contact me through email or by phone if you have any additional questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "W. Keith Gibbs".

W. Keith Gibbs, Ph.D.  
Assistant Professor – Dept. of Geosciences and Natural Resources  
Western Carolina University

## **5. Curriculum Vitae**

# Jonathan A. Studio

## Project Manager / Aquatic Scientist

Jon Studio is a Project Manager and Aquatic Scientist at Edge Engineering and Science, LLC (EDGE) located in Avon, Ohio and headquartered in Houston, Texas. Mr. Studio has been working with Threatened and Endangered (T&E) species since 2016 including more than 20 species of freshwater fish and mollusks, bumble bees, crayfish, birds, bats, and plants. He developed his knowledgebase through a broad range of concentrated coursework and research efforts during his undergraduate and graduate degree programs. Intensive organismal research and consulting project objectives incorporate competitive interactions, developmental stressors, habitat use, migration, population density, critical habitat, and environmental and anthropogenic impacts. As a result of these experiences, Mr. Studio has acquired a deep understanding of the Endangered Species Act (ESA) along with numerous species-specific permitting and field protocol procedures.

Mr. Studio's primary focus as a consultant has been composing Biological Assessments (BA) and Study Plans and completing subsequent field and reporting efforts. Projects include natural gas pipelines, electric transmission lines, hydroelectric dams, stream restoration sites, dredging sites, and barge facilities. Many of these projects required coordination with federal agencies such as Federal Energy Regulatory Commission (FERC), US Fish and Wildlife Service (USFWS), US Forest Service (USFS), and US Army Corps of Engineers (USACE), as well as individual state agencies such as Department of Transportation (DOT), Department of Environmental Quality (DEQ), Department of Wildlife Resources (DWR), and Division of Natural Resources (DNR). Mr. Studio has contributed to projects located in the following states: California, Illinois, Indiana, Kentucky, Maryland, Michigan, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Virginia, and West Virginia. Mr. Studio has gone above and beyond to advance research and conservation in his field as a Certified Associate Ecologist (The Ecological Society of America).

### EDUCATION:

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JAMES MADISON UNIVERSITY • HARRISONBURG, VA

#### **Master of Science in Biology (2018)**

Master's Thesis "Competition and Predation: Interactions between American eels (*Anguilla rostrata*) and Brook Trout (*Salvelinus fontinalis*) in Virginia Mountain Streams"

KENT STATE UNIVERSITY • KENT, OH

#### **Bachelor of Science in Biology (2015)**

### AREAS OF EXPERTISE:

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- Roanoke Logperch (*Percina rex*)
- Field Experiment and Survey Design
- Technical Writing
- Project Management
- Rusty-Patched Bumble Bee (*Bombus affinis*)
- Scientific Communication
- Statistical Analysis
- Agency and Permit Coordination

### SELECTED PROJECT EXPERIENCE:

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#### Field of Expertise

- **AEP, Niagara Hydroelectric Dam Relicensing (Virginia)**  
Serving as Project Manager for aquatic species field surveys. Completed 2020 general fish, mussel, macroinvertebrate, and crayfish surveys. Planned 2021 Roanoke Logperch (*Percina rex*) species-specific field surveys for larval, young-of-year, and adult life stages. Coordinating with federal and state agencies to satisfy permitting and dam relicensing requirements. (2020 – Present)

- **AEP, Byllesby-Buck Hydroelectric Dam Relicensing (Virginia)**  
Serving as Project Manager for aquatic species field surveys. Completed 2020 general fish, macroinvertebrate, and crayfish surveys. Planned 2021 general fish, macroinvertebrate, and crayfish surveys. Coordinating with federal and state agencies to satisfy permitting and dam relicensing requirements. (2020 – Present)
- **MVP – Mountain Valley Pipeline (Virginia and West Virginia)**  
Co-author of Biological Assessment, and Supplement to the BA, responsible for aquatic T&E Species and Critical Habitat, Effects Analysis, and Effects Determination sections for Roanoke Logperch (*Percina rex*), Candy Darter (*Etheostoma osburni*), Atlantic Pigtoe (*Fusconaia masoni*), James Spiny mussel (*Parvaspina collina*), and Clubshell (*Pleurobema clava*). Section 7 ESA compliance and substantial coordination with USFWS were necessary for completion of this FERC regulated interstate natural gas pipeline BA. (2019 – 2020)
- **AEP, Niagara Hydroelectric Dam Relicensing (Virginia)**  
Co-author of Study Plan for aquatic species surveys and analysis (fish, mussels, macroinvertebrates, and crayfish) including adult, young-of-year, and larval Roanoke Logperch (*Percina rex*). Section 7 ESA compliance and substantial coordination with USFWS were necessary for completion of this FERC regulated hydroelectric dam SP. (2019 – 2020)
- **Rural Action – Walhonding River Purple Catpaw Surveys (Ohio)**  
Served as Field Technician responsible for freshwater mussel surveys and data collection for surveys looking to determine if there are unknown populations of Purple Catpaw (*Epioblasma obliquata*) in the Walhonding River in Coshocton County, Ohio. (2018)
- **Private Property, Reservoir Installation (Oklahoma)**  
Conducted presence/absence snorkel surveys for freshwater mussels including Ouachita Rock Pocketbook (*Arkansia wheeleri*) and Winged Mapleleaf (*Quadrula fragosa*) prior to dam/reservoir installation. (2019)
- **North Fork Holston, Bridge Construction (Virginia)**  
Monitored Spottfin Chub (*Erimonax monachus*) within bridge pillar coffer dam construction footprints in the North Fork Holston River. Backpack electrofishing techniques were used to fully deplete fish from breached coffer dams. Each coffer dam was also surveyed for Spiny River Snails (*Io fluvialis*). (2019)
- **Dominion, Atlantic Coast Pipeline (Virginia, West Virginia)**  
Served as Biologist for the ongoing Federally endangered Rusty-Patched Bumble Bee (RPBB, *Bombus affinis*) surveys along the route in Highland, Bath, and Augusta counties Virginia, and Pocahontas County, West Virginia. Surveys follow 2018 USFWS Survey protocols for the RPBB version 2.2 using non-lethal sampling techniques. One-hour surveys are completed for every three acres of potential habitat along the project. Surveys are completed up to four times per patch and, to date, resulted in surveys covering over 1000 3-acre patches. Survey collections to date include 26 RPBBs and over 1,000 bumble bees representing 11 species. Species collected include: *B. affinis*, *B. auricomus*, *B. bimaculatus*, *B. citrinus*, *B. fervidus*, *B. griseocollis*, *B. impatiens*, *B. pennsylvanicus*, *B. perplexus*, *B. sandersoni*, and *B. vagans*. Surveys incorporate project review protocols and rapid assessment techniques. Bees are collected via netting and placed into glass vials for identification and photo voucher documentation. (2019)
- **MVP – Mountain Valley Pipeline (Virginia, West Virginia)**  
Serving as Field Supervisor for full fish depletions and relocations at all perennial streams along the multi-state pipeline in Virginia via backpack electrofishing and seining. Managed fish removal crews in coordination with environmental and construction leaders to ensure fish removal efforts are compliant with construction timelines. Managed and disseminated all subsequent data and safety information to environmental and construction leaders. (2018-Present)
- **ETC Northeast Pipeline – Revolution Pipeline (Pennsylvania)**  
Served as Team Leader assisting in delineating wetlands as post-construction QA/QC and pre-construction mapping in Pennsylvania. Used wetland plants, hydrology, and soil composition to locate and map wetlands. (2018)
- **Iberdrola – Deruyter Pipeline (New York)**  
Served as Team Leader assisting in delineating wetlands as post-construction QA/QC and pre-construction mapping in New York. Used wetland plants, hydrology, and soil composition to locate and map wetlands. (2018)

- **Mountain Valley Pipeline Southgate, Atlantic Coast Pipeline, USACE Open End, and CRH Barge Tie Mussel Survey**  
Served as Aquatic Scientist preparing and assisting with writing, statistical analysis, and figure generation on a variety of documents including field manuals, study plans, and final reports. (2018)
- **Dominion Energy– Atlantic Coast Pipeline (North Carolina)**  
Served as Field Technician completing snorkel surveys to collect, identify and relocate mussels outside of the limits of disturbance in five streams near Rocky Mount, North Carolina. (2018)
- **TransCanada – Line KA (West Virginia)**  
Served as Field Technician using view scope methods to collect, identify and relocate mussels outside of the limits of disturbance in a stream in Pineville, West Virginia. (2018)
- **MVP – Mountain Valley Pipeline (West Virginia)**  
Served as Field Technician using surface supply air methods to collect, identify and relocate mussels outside of the limits of disturbance in the Greenbrier River near Pence Springs, West Virginia. (2018)
- **Grand River Mussels (Ohio)**  
Served as Field Technician using view scope, snorkel, and surface supply air methods to collect, identify and relocate mussels outside of the limits of disturbance in the Grand River near Painesville, Ohio.
- **Harrison Hub Pipeline (Ohio)**  
Served as Field Technician using surface supply air methods to collect, identify and relocate mussels outside of the limits of disturbance in Wheeling Creek near Harrison County, Ohio.
- **TransCanada – Line KA (West Virginia)**  
Served as Field Technician collecting and identifying crayfish via seining methods for a pre-construction survey in Pineville, West Virginia. (2018)
- **MVP – Mountain Valley Pipeline (Virginia, West Virginia)**  
Served as Field Technician helping to conduct migratory bird point counts in near Roanoke, Virginia and Alderson, West Virginia. (2018)
- **AEP – Ohio Heft Station (Ohio)**  
Served as Field Technician helping to conduct bat emergence surveys in Lancaster, Ohio. (2018)
- **James Madison University Vivarium (Virginia)**  
Served as Trout Room Manager responsible for setting up and maintaining aquatic habitats holding tank and artificial stream channel systems based on the individual needs of a research project. (2016-2018)
- **James Madison University (Virginia)**  
Served as Research Field Assistant monitoring habitat use of endangered James spinymussel in Earlysville, Virginia using an HPR+ PIT tag reader and mark-recapture methods. Manage data, plan all sampling events, and train and supervise undergraduate field assistants. (2016-2018)
- **U.S. Forest Service – Shasta-Trinity National Forest (California)**Served as Field Assistant designing and implementing experimental transplant of freshwater mussels in collaboration with the Trinity River Restoration Program and the Yurok Tribe. (2017)
- **U.S. Forest Service (USFS) – George Washington and Jefferson National Forest (Virginia)**  
PIT tagged eels for a long-term mark-recapture study in cooperation with USFS and Virginia Tech. (2017)
- **James Madison University (Virginia)**  
Studied fish species richness with respect to stream acidification in Shenandoah National Park using a Smith-Root LR-24 Electrofisher and three pass depletion methods. (2016)
- **The De Wildt Shingwedzi Cheetah Ranch (Limpopo, South Africa)**  
As a volunteer, performed daily tasks pertaining to cheetahs, African wild dogs, vultures, and many other vulnerable creatures within 2,100-acre sanctuary. (2013)

## TRAINING/CERTIFICATIONS:

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- ASSOCIATE ECOLOGIST, ECOLOGICAL SOCIETY OF AMERICA, 2019
- OSHA 10 HOUR GENERAL INDUSTRY, 2019
- OSHA 40 HOUR HAZWOPER, 2018

- INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC) CERTIFIED, 2018

## PROFESSIONAL AFFILIATIONS:

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- ECOLOGICAL SOCIETY OF AMERICA
- ASSOCIATION FOR THE SCIENCES OF LIMNOLOGY AND OCEANOGRAPHY
- AMERICAN FISHERIES SOCIETY
- NORTHEAST ASSOCIATION OF FISH AND WILDLIFE AGENCIES

## PUBLICATIONS/PRESENTATIONS:

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### Research Projects

- THOM D. TEEARS, STEVE J. BAEDKE, DANIEL M. DOWNEY, JONATHAN A. STUDIO & CHRISTINE L. MAY (2020) WATER CHEMISTRY AND LIGHT EFFECTS ON SURVIVAL OF HATCHING SALMONIDS IN SPRING CHANNELS, JOURNAL OF FRESHWATER ECOLOGY, 35:1, 13-28
- STUDIO, J.A., & C.L. MAY (2018-PRESENT) COMPETITION BETWEEN TOP PREDATORS IN A SMALL MOUNTAIN STREAM: AN INVESTIGATION OF BROOK TROUT AND AMERICAN EELS. (MANUSCRIPT IN PROGRESS)
- STUDIO, J.A., & M.W. KERSHNER. 2015-PRESENT. HABITAT EFFECTS ON LEAF DECOMPOSITION RATE: IMPLICATIONS FOR SPECIES DIVERSITY. (INDEPENDENT UNDERGRADUATE RESEARCH PROJECT CONTINUED BY LAB ASSOCIATES)

### Poster and Oral Presentations

- VIRGINIA CHAPTER OF AMERICAN FISHERIES SOCIETY, BLACKSBURG, VA. 'COMPETITION AND PREDATION: INTERACTIONS BETWEEN AMERICAN EELS (*ANGUILLA ROSTRATA*) AND BROOK TROUT (*SALVELINUS FONTINALIS*) IN MOUNTAIN STREAMS' 2019.
- ASSOCIATION OF THE SCIENCES OF LIMNOLOGY AND OCEANOGRAPHY, VICTORIA, BC. 'COMPETITION AND PREDATION: INTERACTIONS BETWEEN AMERICAN EELS (*ANGUILLA ROSTRATA*) AND BROOK TROUT (*SALVELINUS FONTINALIS*) IN MOUNTAIN STREAMS' 2018.
- PERRY MIDDLE SCHOOL 7<sup>TH</sup> GRADE SCIENCE SEMINAR, PERRY, OHIO. 2018. A SCIENTIFIC ADVENTURE.
- JAMES MADISON UNIVERSITY BIOSYMPOSIUM, HARRISONBURG, VIRGINIA. 2018. COMPETITION AND PREDATION: INTERACTIONS BETWEEN AMERICAN EELS (*ANGUILLA ROSTRATA*) AND BROOK TROUT (*SALVELINUS FONTINALIS*) IN MOUNTAIN STREAMS.
- VIRGINIA CHAPTER OF AMERICAN FISHERIES SOCIETY, FREDERICKSBURG, VIRGINIA. 2018. COMPETITION AND PREDATION: INTERACTIONS BETWEEN AMERICAN EELS (*ANGUILLA ROSTRATA*) AND BROOK TROUT (*SALVELINUS FONTINALIS*) IN MOUNTAIN STREAMS.
- VIRGINIA SEA GRANT GRADUATE RESEARCH SYMPOSIUM, GLEN ALLEN, VIRGINIA. 2018. AMERICAN EELS (*ANGUILLA ROSTRATA*): RECONNECTING COASTAL AND INLAND WATERS OF APPALACHIA.
- NATURE CAMP, VESUVIUS, VIRGINIA. 2017. COMPETITION AND PREDATION: INTERACTIONS BETWEEN AMERICAN EELS (*ANGUILLA ROSTRATA*) AND BROOK TROUT (*SALVELINUS FONTINALIS*) IN MOUNTAIN STREAMS.
- NORTHEAST ASSOCIATION OF FISH AND WILDLIFE AGENCIES, NORFOLK, VIRGINIA. 2017. THE EFFECT OF ULTRAVIOLET-B RADIATION ON BROOK TROUT (*SALVELINUS FONTINALIS*) EGGS.
- VIRGINIA CHAPTER OF AMERICAN FISHERIES SOCIETY, LEXINGTON, VIRGINIA. 2017. THE EFFECT OF ULTRAVIOLET-B RADIATION ON BROOK TROUT (*SALVELINUS FONTINALIS*) EGGS.
- FRESHWATER ECOLOGY RESEARCH SYMPOSIUM, HARRISONBURG, VIRGINIA. 2016. THE EFFECT OF ULTRAVIOLET-B RADIATION ON BROOK TROUT (*SALVELINUS FONTINALIS*) EGGS.

## EMPLOYMENT HISTORY:

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- EDGE – AQUATIC SCIENTIST – JUNE 2020 TO PRESENT
- ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC. – AQUATIC SCIENTIST – RAVENNA, OHIO – MAY 2018 TO JUNE 2020

## YEARS OF PROFESSIONAL EXPERIENCE:

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- 2018 – PRESENT (2.5 YEARS)



### E 3.3 Fish Resources

Because of the lack of data concerning the status of fish populations in the Niagara vicinity, fisheries surveys were conducted during June-October, 1990. A second objective of these surveys was to determine whether any project-related impact on the fish fauna is evident. A study plan for this work was submitted to appropriate fish and wildlife agency personnel and went forward subsequent to their input (Exhibit E, Consultation Documentation, Initial Stage Consultations, Fisheries Study Plan).

Adult and juvenile fish were sampled in the Niagara reservoir by electrofishing, hoop netting, and gill netting techniques. Upper, middle, and lower portions of the reservoir were sampled (Figure E-3). In addition, riffle/run habitat was sampled upstream and downstream of the project by electrofishing. Each station was sampled six times, during the periods June 4-6, June 25-27, July 24-26, September 4-6, September 25-

27, and October 16-18, 1990. A complete report of this study is provided in Appendix E-1.

This study collected a total of 1,936 fish representing 34 species (Table E-6). Redbreast sunfish and silver redhorse dominated the samples numerically; and common carp, white sucker, spottail shiner, and golden redhorse were also abundant. In terms of biomass, common carp and silver redhorse comprised the majority of the sample. White sucker, golden redhorse, redbreast sunfish, and channel catfish were also biomass dominants.

Overall, collected fish were relatively free of parasites and physical abnormalities (Table E-7), although certain species (e.g., carp, white sucker) exhibited a fairly high incidence of deformities and fin erosion. This condition is most likely related to the adverse effect on water quality of upstream inputs of urban contaminants, as documented in the SWCB 305(b) water quality assessment (Virginia State Water Control Board, 1988).

Table E-8 compares these survey data to historical data from the Virginia Department of Game and Inland Fisheries species list for this general region of the upper Roanoke River drainage. Listed species not collected in the Niagara survey are generally those typically found in stream or cold water habitats uncharacteristic of the riverine habitats sampled in this survey (e.g., trout, dace) or are associated with Smith Mountain Lake downstream of the project (e.g., striped bass, alewife). Species added to the list by the 1990 survey included grass carp and black bullhead.

One federally-listed endangered species was collected during these studies. Three specimens of the Roanoke logperch (*Percina rex*) were collected on September 25, 1990 and one specimen on October 16, 1990, all

at the upstream riffle/run electrofishing site. The specimens were photographically documented and released. Additional sampling was conducted by APCo and VDGIF on September 12, 1991 to determine if the Roanoke logperch occurred in areas downstream of the project that were not sampled during the 1990 survey. Approximately 0.25 mile of riffle/run habitat was sampled by electrofishing at a location approximately 0.5 mile downstream of the Niagara project. Three Roanoke logperch, each measuring approximately 110 mm in length were collected and released. The other species of concern identified by the VDGIF during pre-consultation correspondence, the orangefin madtom (*Noturus gilberti*), was not collected during the survey and may, therefore, be considered extremely rare or absent from the Niagara vicinity. Continued operation of this facility should have no impact on these two species.

The Roanoke logperch is endemic to the Roanoke River drainage in Virginia and predominately occurs in those portions of the drainage within the Piedmont and Ridge and Valley provinces (Jenkins et al. 1978). Typical habitat for this species is riffles, runs, and pools with sandy to boulder-strewn bottoms, but not deep silt, in warm, usually clear, medium-sized streams. This species is not typically known from impoundments or other lentic environments (Jenkins, 1977a), although two specimens were collected in a cove of Leesville Reservoir in 1989 (VDGIF, 1989). According to Jenkins (1979), the healthiest populations of the Roanoke logperch are found in the upper Roanoke River drainage above Salem, Virginia (Figure E-4). These populations exist at fairly low densities that are apparently unchanged from surveys by Jordan in 1888 (Jenkins, 1977a). The range of the Roanoke logperch has been constricted within historical times, including depletion from the Roanoke River from the City of Roanoke to Smith Mountain Lake, a stretch that includes the Niagara project area, due to point and nonpoint municipal and industrial discharges (Jenkins, 1977a).

The orangefin madtom is a widely, but disjunctly, distributed endemic of the upper Roanoke River drainage of Virginia and North Carolina and the upper James River of Virginia (Figure E-5; Jenkins, 1978). This species occupies riffles and runs of cool-to-warm sections of usually clear, medium-to-large streams. It is another of the highly distinctive upper Roanoke River drainage assemblage and has a distribution above Niagara dam similar to that of the Roanoke logperch (Figure E-5). Recent collections of the orangefin madtom at or above Salem, Virginia, appear similar in abundance to older collections, whereas historical populations at the City of Roanoke now appear to be extirpated due to siltation, eutrophication, and chemical waste discharges (Jenkins, 1977b). According to Jenkins (1977b), this species may typically exist at low densities even in favorable habitat and is one of the most sensitive of the upper Roanoke River ichthyofauna to environmental degradation.

The database provided by the fishery study, along with detailed project design and operational data, can be used to analyze the potential for significant project impact on various aspects of the fishery. The Federal Energy Regulatory Commission (FERC, 1988), in its final environmental impact statement for the upper Ohio River basin, analyzed impact by analogy with available literature. The FERC analysis consisted of evaluating 1) the susceptibility of various organisms and life stages to entrainment, 2) the likelihood that damages would occur to entrained individuals and their populations, and 3) methods for preventing or reducing entrainment. Similar types of analyses were performed by WAPORA, Inc. (1987) to evaluate entrainment potential at the Racine and New Martinsville hydroelectric projects on the Ohio River. Cox Lake Carbonton Associates (1987) used a literature review and project and resident fish characteristics, combined with study findings at a similar project, to demonstrate minimal impact at the Carbonton Hydroelectric Plant on the

Deep River, North Carolina. The approach of analyzing indigenous biotic communities for the purpose of impact assessment has been routinely and successfully applied by governmental agencies, industries, and individual researchers (U.S. EPA, 1984; Karr et al., 1986; Van Hassel and Gaulke, 1986; Ohio EPA, 1987; Van Hassel et al., 1988).

Locational differences in the electrofishing catch-per-unit-effort (CPUE) identified during the 1990 survey are detailed in Table E-9. Of particular interest is the catch comparison between the two riffle/run sampling sites. The site located downstream of Niagara provides comparative data to determine whether the project influences fish assemblages there relative to those found upstream. The data show the catch rates of most species were statistically equivalent or greater than catch rates at the upstream riffle/run site. Gizzard shad, satinfish, shiner, northern hog sucker, shorthead redhorse, v-lip redhorse, bluegill, and largemouth bass CPUE at the downstream site were the highest among all sites (pool and riffle/run). This finding would be expected based on the gradual improvement in water quality from the upstream to downstream site. Length frequency distributions of the dominant fish species at the riffle/run sites were very similar. The downstream riffle/run site, although located less than two miles below the Niagara powerhouse, exhibited no evidence of any increased incidence of turbine-related injuries to fish. Only 3.1% of the fish collected at this site bore any type of physical abnormality compared to 1.2-3.0% at the other sites (Table E-7).

Fish species richness and diversity were fairly similar among all pool and riffle/run sites except for the downstream riffle/run site. This site exhibited higher species' richness and diversity, most likely related to its being the furthest removed from upstream water quality impacts.

### E 3.3.1 Entrainment Effects

Analyses were performed to evaluate specific project-related impacts. The potential for entrainment was evaluated based on the known behavioral characteristics and preferred habitat of resident fish species and the potential for adverse effects due to pressure changes, turbulence, shear, and physical contact for the egg-through-adult stages of these species. Other low head hydroelectric projects with many design and operation features similar to those of the Niagara Project have successfully used these types of analyses to evaluate entrainment potential. According to a review by Electric Power Research Institute (1987) of turbine mortality field studies, variability in such studies is too great to allow precise mortality estimates, even on a site-specific basis. Much of this variability can be attributed to unmeasurable factors such as test fish condition, holding and recovery conditions, and subtle environmental and operational effects. Even model experiments often produce unexplained variability. APCo concludes that the analysis of entrainment potential conducted herein, incorporating all of the above-listed factors and supported by field population data, provides a sound assessment of entrainment impact. Analyses were performed based on characteristics of both old turbine Unit 1 and replacement Unit 2, which is planned to be installed in late 1991 (see Exhibit A).

Life history and behavioral characteristics of fish species inhabiting the Niagara pool are important factors in evaluating entrainment potential. Fish species expected to spawn in the pool and their spawning characteristics are listed in Table E-10. Eggs of most of these species possess extremely low entrainment potential because of their adhesive, demersal characteristics and deposition into either nests or sheltered vegetation or other substrate. Similarly, the larvae of most species remain on nest or in sheltered slackwater areas until they become free-



swimming. Only larvae of gizzard shad and the cyprinids can be expected to enter the current in large numbers.

Adult and juvenile fish species of the Niagara pool (Tables E-9 and E-11) differ greatly in their susceptibility to entrainment because of differences in movement behavior. Species such as suckers, flathead catfish, and centrarchids are very unlikely to enter the forebay area in substantial numbers because of their preference for much different habitat (sheltered areas with cover versus open-water habitat of the forebay) and their typically sedentary behavior (except for spawning migrations in some species, which are upstream rather than towards the forebay) (Becker, 1983; FERC, 1988; Scott and Crossman, 1973; WAPORA, 1987). Species that may be found more frequently in the forebay area because of their greater mobility, usually associated with feeding, include gizzard shad, common carp, shiners, white and channel catfish, bullheads, and black crappie.

Fish that approach the plant intake screen have been observed to easily negotiate the moderate current. Screen openings at Niagara are 3 5/8 in. wide. Intake velocities at the face of the intake screen and at the trailing edge of the screen were calculated. These determinations assumed a 600 cfs discharge (steady-state design capacity of the 11 ft.-0 in. ID penstock). Figure E-6 illustrates the component and resultant velocity vectors and how they were derived. Calculated intake screen flow velocities at the screen face and trailing edge are provided in Table E-12. Calculated normal velocities at forebay elevations 885 ft. NGVD and 884 ft. NGVD ranged from approximately 0.9-1.2 feet/sec. This range in intake velocity is very similar to typical current velocity of the free-flowing portion of the Roanoke River measured at the fish survey sites and represents flow conditions easily negotiated by resident species of adult and juvenile fish. Studies of fish swimming speeds have verified their ability to negotiate currents of this magnitude (WAPORA, Inc., 1987) In

addition, similar intake screen standards of 1.5 feet/sec. and 2.5 in. spacing have been applied to low-head (<40 feet) hydros in piedmont and coastal North Carolina warmwater streams (North Carolina Wildlife Resources Commission, 1987).

In the event that a fish enters the penstock and turbine, the greatest opportunity for injury is from contact with a turbine runner blade. Normally, any losses due to turbine passage are due to this factor (Monten, 1985). Loss rates typically increase with fish length in relation to the width of the openings between runner blades. The water passage through the penstock and turbine is designed for smooth, unobstructed flow to the greatest degree possible. The only significant obstructions to flow are twelve stay vanes and twelve wicket gates arranged in a circular pattern preceding the turbine runner. The stay vanes are 21.52 in. in height and 2.25 in. thick at Unit 1, and will be 22.02 in. in height and 2.00 in. thick at Unit 2. The wicket gates are 21.45 in. in height and 3.06 in. thick at Unit 1, and will be 21.48 in. in height and 2.88 in. thick at Unit 2. The opening between fully-open wicket gates is 6.91 in. at Unit 1, and will be 6.47 in. at Unit 2. The relationship between flow rate and wicket gate position achieves smooth relative flow through the turbine. This relationship is essential to efficient unit operation.

Extensive studies of fish orientation to flow past stay vanes and wicket gates have demonstrated that the fish's center of gravity follows the flow line, with the rest of the body oriented to the direction of flow. Collisions of fish with stay vanes and wicket gates are, therefore, negligible (Monten, 1985), as the fish do not contact the vanes perpendicularly but are guided with the flow along the vane surface. As a fish is carried through the wicket gates, its longitudinal axis is most likely to be close to parallel to the gate surfaces, which means close to

a zero angle to flow. Thus, as the fish passes the runner, the probability of striking the leading edge of the blade is dependent primarily upon its length and specific characteristics of the runner.

Probabilities of contact with a runner blade based on specific measurements of the Niagara turbine dimensions are provided in Table E-13 for all fish species of the pools, regardless of entrainment potential. The probability of physical contact of potentially-entrained fish with a turbine runner blade was calculated (Cada, 1990) using the equation

$$P = \frac{l \times n \times R \times a \times \text{COS}\alpha}{f}$$

where P = the probability of blade contact (%)

l = fish length (cm)

n = number of runner blades

R = revolutions per second

a = cross-sectional area of water passage (M<sup>2</sup>)

α = blade angle

f = discharge (M<sup>3</sup>/sec).

Probability of contact is less than 10% for young individuals of all species, which would be more likely to be entrained. Mortality resulting from blade strikes would be much lower than this since contact with a blade would range from slight glancing blows to head-on collisions and because the flexibility of fish presents a smaller target than that predicted assuming rigid length (Cada, 1990). Potential increases in strike probability associated with reduced load would be cancelled out by the accompanying reduction in turbine flow velocity (Monten, 1985). Although early life stages are most likely to be entrained, Cada (1990) states that "turbine passage is not likely to harm fish eggs and larvae if hydroelectric facilities are operating at optimal design conditions and cavitation is not excessive."

Turbine mortality tests have been conducted at three facilities with turbine characteristics similar to Niagara (see below).

	<u>Leaburg</u>	<u>Publishers</u>	<u>Sullivan</u>	<u>Niagara</u>
Turbine Type	Francis	Francis	Francis	Francis
Discharge (cfs)	1,100	275	260	379 (Unit 1); 305 (Unit 2)
Head (ft)	89	42	42	61
Turbine Speed (rpm)	225	300	240	277
Blade Tip Velocity (ft/sec)	88	47	64	60 (Unit 1); 57 (Unit 2)
Location (river)	McKenzie	Willamette	Willamette	Roanoke

These tests at the Leaburg, Publishers, and Sullivan facilities resulted in 13-20% mortality (EPRI, 1987).

The low predicted mortality/blade contact for Niagara compared to many other facilities employing Francis-type units is associated primarily with the relatively low runner speed of the former units (blade tip velocity of 57-60 feet/sec compared to >80 feet/sec for most other units).

Pressure changes through the turbines are typically not problems for fish unless pressure reductions are substantial. This is particularly true for fish eggs and early larvae (Cada, 1990). Pressure gradients and pressure distribution of the flow through the project were calculated for APCo by Kvaerner Hydro Power, Inc., for Unit 1, and American Hydro Corporation for Unit 2, based on configuration and operational characteristics specific to the project. The points at which calculations were made are shown in Figure E-7. Figure E-8 illustrates pressure gradient calculations performed specifically for the Niagara turbines indicating that pressure changes associated with turbine passage are likely to be very small compared to pressure regimes tested in controlled experiments that resulted in little or no fish mortality.

Similarly, turbulence and shear effects are likely to be minimal at this project. A review by Cada (1990) of experimental studies of the effects of these stresses on entrained fish concluded that mortalities are unlikely. When the turbine functions at maximum efficiency, calm and relative turbulence-free conditions prevail (Monten, 1985). "Although fragile early life stages should be sensitive to shear damage, their small size apparently minimizes exposure to velocity changes and shear forces" (Cada, 1990).

Cavitation, if significant, can be a factor in fish survival of turbine passage (Turbak et al., 1981). The tendency toward cavitation is described by the plant sigma, a positive, dimensionless number that defines the required depth of the turbine setting in relation to the plant's net head. Assumptions and plant characteristics used in calculation of the cavitation coefficient are provided in Table E-14. The Niagara plant sigma (Figure E-9) and the absence of historical cavitation problems at this facility indicate that cavitation should not be a significant factor affecting fish survival of turbine passage.

The potential for significant entrainment effects at Niagara is extremely low. Behavioral (movement) characteristics and habitat preferences of resident species minimize the likelihood of substantial numbers of fish frequenting the project forebay. For those fish that do approach the project intake, intake velocities are low and easily negotiated by most fish. Turbine passage effects are likely to be restricted primarily to contact with runner blades. Pressure change, cavitation, turbulence, and shear are not likely to cause substantial harm to fish at Niagara. Because of the low head and relatively slow runner speed at this project, blade contacts should be minimal; and mortality should not exceed about 10%. Cada (1990) also finds that non-migratory fish are not likely to be

exposed to turbine passage. Healthy adult and juvenile fish are strong swimmers, and the eggs of most sedentary species are found in nests or adhering to rocks and vegetation.

The predicted low number of fish passage and minimal associated mortality indicate a negligible impact from turbine entrainment on fish populations in the Niagara vicinity. The lack of turbine-induced injuries in the fish assemblage downstream of the project and the strong catches of fish upstream and downstream of Niagara support a conclusion of no adverse changes to fish productivity or aquatic ecosystem structure and function associated with this project.

#### E 3.3.2 Available Spawning Habitat in the Niagara Pool

Because the Niagara project is not peaked, pool fluctuations do not exceed normal river fluctuation levels. Spawning characteristics of fish species likely to use the Niagara pool for this purpose are provided in Table E-10. Based on these data, fish species were divided into two broad groups according to optimal spawning depth and spawning period. These groups included species spawning at 0.25-6 ft. during March-August (cyprinids, sunfish) and those spawning at 1-8 ft. during April -August (gizzard shad, ictalurids, black basses, black crappie). Spawning habitat available to each of these groups in the Niagara pool was then calculated using recent bathymetry mapping of the pool (Figure E-10) and assuming all areas of the pool at a given depth were usable for spawning. These areas varied by month according to mean monthly fluctuations in river elevation.

The maximum percentage of potential spawning habitat made unavailable due to river fluctuations is summarized in Table E-15 according to spawning group and month. Mean monthly river fluctuations are based on historical data at the Niagara gauge. This analysis indicates that <1-17% of available habitat is potentially exposed under natural riverine



conditions. Highest percentages exposed were for the cyprinid/sunfish group because of their documented selection of often very shallow and easily exposed spawning sites.

No project-related impacts to available spawning habitat in the Niagara pool should occur.

#### E 3.3.3 Effects on Tailwater Habitat

Potential effects of Niagara operation on tailwater habitat were evaluated with respect to erosional/depositional considerations, spring spawning habitat of Roanoke River fishes potentially using the tailwater, and low-flow summer habitat of resident fishes. The Niagara tailwaters are depicted in Figures E-11, E-14, E-15, and E-17. Erosion and deposition impacts are considered negligible in the Niagara tailwaters because of the steep, rocky, and relatively straight river channel.

Fish species likely to spawn in or near the project tailwaters include white sucker, northern hog sucker, redhorses, and white bass. All of these species would be expected to spawn predominantly during the period March-May. According to FERC (1988), there should be little loss of spawning habitat below hydroelectric facilities in the spring because of typically elevated river flows. Monthly mean river flows (in cfs) at Niagara are as follows:

March	891
April	846
May	553

These compare to a mean annual flow of 510 cfs.

Measurement of tailwater characteristics at Niagara indicates that the river channel is approximately 100 feet in width, and depth of the channel downstream of the immediate vicinity of the powerhouse ranges from 6.5-21 feet. Current velocities in the Niagara tailwater at 275 feet downstream of the powerhouse ranged, in 1989 measurements, from 0.25-0.50 feet/sec across the channel at a gauge flow of 325 cfs, to 0.05-1.60 feet/sec at a discharge of 473 cfs. Fluctuations in tailwater elevations at the Niagara powerhouse during the months of March-May should correspond closely to natural river fluctuations (Table E-15) since, under the proposed mode of operation, the project will not autocycle at inflows above 100 cfs.

The combined characteristics of discharge volume, channel depth, current velocities, and tailwater fluctuations at the Niagara facilities should have no adverse effects on spring spawning habitat.

Many of the above considerations apply also to evaluating potential operational effects on tailwater fish habitat during the summer. Monthly mean river flows (in cfs) at Niagara during the summer are as follows:

June	394
July	281
August	352
September	308

Tailwater fluctuations likely closely match normal river fluctuations during this period of 0.4-1.7 feet.

Of greater interest with respect to fish habitat is potential low-flow effects. Under the proposed mode of operation, the Niagara units will discharge inflow to the project by adjusting wicket gate positions until

flows fall below 100 cfs. Operations below 100 cfs inflow will be established upon completion of additional low-flow evaluations to be conducted with representatives of VDGIF.

To evaluate the possible effects of minimum flow releases on downstream habitat, visual evaluations were conducted on November 15, 1989. Virginia Department of Game and Inland Fisheries personnel were present for this evaluation. Downstream river conditions were observed at a 13-minute autocycle mode typical of operation at extreme low flow. Estimated average hourly flow in this mode of operation was 56 cfs. Flows stabilized at 28 cfs at the nearby USGS gauge during the non-generation portion of autocycle operation. It was apparent from this demonstration that river reaches downstream of the powerhouse were receiving adequate flow for fish habitat considerations. Follow-up visual evaluations have been requested by VDGIF to observe low-flow discharge characteristics following installation of the new Unit 2. This will be scheduled when river flow and operating conditions permit.

#### E 3.3.4 Effects of Spillway Use

When river flow exceeds the discharge capacity of the plant, excess flow passes over the spillway, which is a free-overflow structure. This event provides flow to a reach of approximately 1,250 feet of riverbed that normally receives only leakage flows from gated openings in the dam. A potential exists for fish to move up into the area below the spillway while flow is being passed and then to be stranded in this area when spilling ceases.

Spillway use is fairly infrequent at Niagara. Table E-16 indicates that plant discharge capacity was exceeded an average of 62 days per year from 1983-1990, mainly during the wet months of February-April. Because the river substrate in the reach downstream of the spillway is rough (Figures

E-14 and E-16), there is an opportunity for pockets of water to remain following cessation of spill, thereby creating the potential for stranding of fish.

To evaluate this situation, visual observations of flow through the bypass reach were made on November 14-15, 1989. Habitat conditions were observed under conditions of no spill, when flow to the bypass consists of low-level leakage and with flow augmented by lowering the sluice gate, located at the northeast end of the spillway, to a point that allowed a calculated 8 cfs flow to the bypass reach. It was concluded from this demonstration that 8 cfs should be adequate to prevent fish from being stranded in stagnant pools in the bypass.

Additional observations were conducted by APCo and VDGIF on September 12, 1991 to measure water temperature and dissolved oxygen in selected pools throughout the bypass reach. Flow through the bypass at the time of these measurements was estimated at 5-6 cfs. A summary of these measurements is provided in Exhibit E, Documentation of Consultations, Second Stage Consultations, Written Correspondence. Results indicated that summer temperature and dissolved oxygen conditions in the bypass reach should be sufficient for aquatic life using this area.

#### E 3.3.5 Upstream Fish Passage

The VDGIF indicated that a fish passage plan would need to be worked out in the event that oceangoing anadromous fishes reach the project in the future. The 1990 fish survey verified the fact that no fishes requiring upstream passage were present immediately downstream of the project. APCo believes that a standard FERC license article involving reservation of fishways authority is sufficient to address this concern.

#### E 3.4 Measures Recommended by Agencies

Consultation with agencies concerning possible impacts of the Niagara Hydroelectric Project have focused upon two issues: minimum flows through the turbines and potential fish stranding below the spillway (Exhibit E, Consultation Documentation, Initial and Second Stage Consultations, Written Correspondence and Meeting Notes).

With respect to minimum flow, agency personnel have requested additional visual evaluations of low-flow discharges, once Unit 2 has been returned to service, to determine minimum flow levels that are adequate to maintain fish habitat.

To lessen the potential for fish to become stranded in stagnant pools following spillway use, it was recommended that an 8 cfs flow be maintained in the bypass reach.

#### E 3.5 Measures Proposed by Applicant

APCo will initiate a measure to provide spill to the bypass reach to maintain flows of approximately 8 cfs. APCo proposes to file a plan with the FERC detailing the methodology by which the 8 cfs will be maintained and monitored in the bypass subsequent to issuance of a new license for the Niagara Project. The plan will be prepared in consultation with VDGIF. Current concepts under consideration include the installation of a control system that would maintain a constant flow over the sluice gate at the spillway. At this time, a proposed monitoring plan would involve installation of a calibrated staff gauge located in the bypass reach. The location and pertinent details for the staff gauge will be finalized in consultation with VDGIF. Both the proposed sluice gate controls and staff gauge are intended to be operational within approximately two years from the date the new license is issued by FERC. Very preliminary estimates

indicate the capital cost for these items to be approximately \$49,200, in 1996 dollars, while the levelized annual cost is estimated at \$6,770.

It is estimated that maintaining 8 cfs in the Niagara bypass reach will result in a loss of 200 MWh per year from the project. Based on the \$55/MWh levelized cost of alternative source power, as presented in Exhibit H, this generation has a levelized cost to APCo of \$11,000 per year over the term of a new license.

Installation of the new Unit 2 turbine is anticipated to eliminate the need to autocycle at inflows greater than approximately 100 cfs. Additional visual evaluations of low-flow turbine discharges will be conducted with representatives of VDGIF as soon as conditions at the project are conducive to this type of evaluation (See Exhibit A, Section A1.3).

#### E 3.6 Anticipated Continuing Impact

With the measures described in Section E 3.5, there should be no significant continuing impact on any aspect of fish, wildlife, or botanical resources. Following the change to enhance flow to the bypass reach, and pending the outcome of the additional low-flow discharge visual evaluations, no need has been identified for further modification of project operations or facilities.

#### E 3.7 Description of Proposed Operational Procedures

See Exhibit A, Section A 1.3 for a description of the proposed mode of operation.



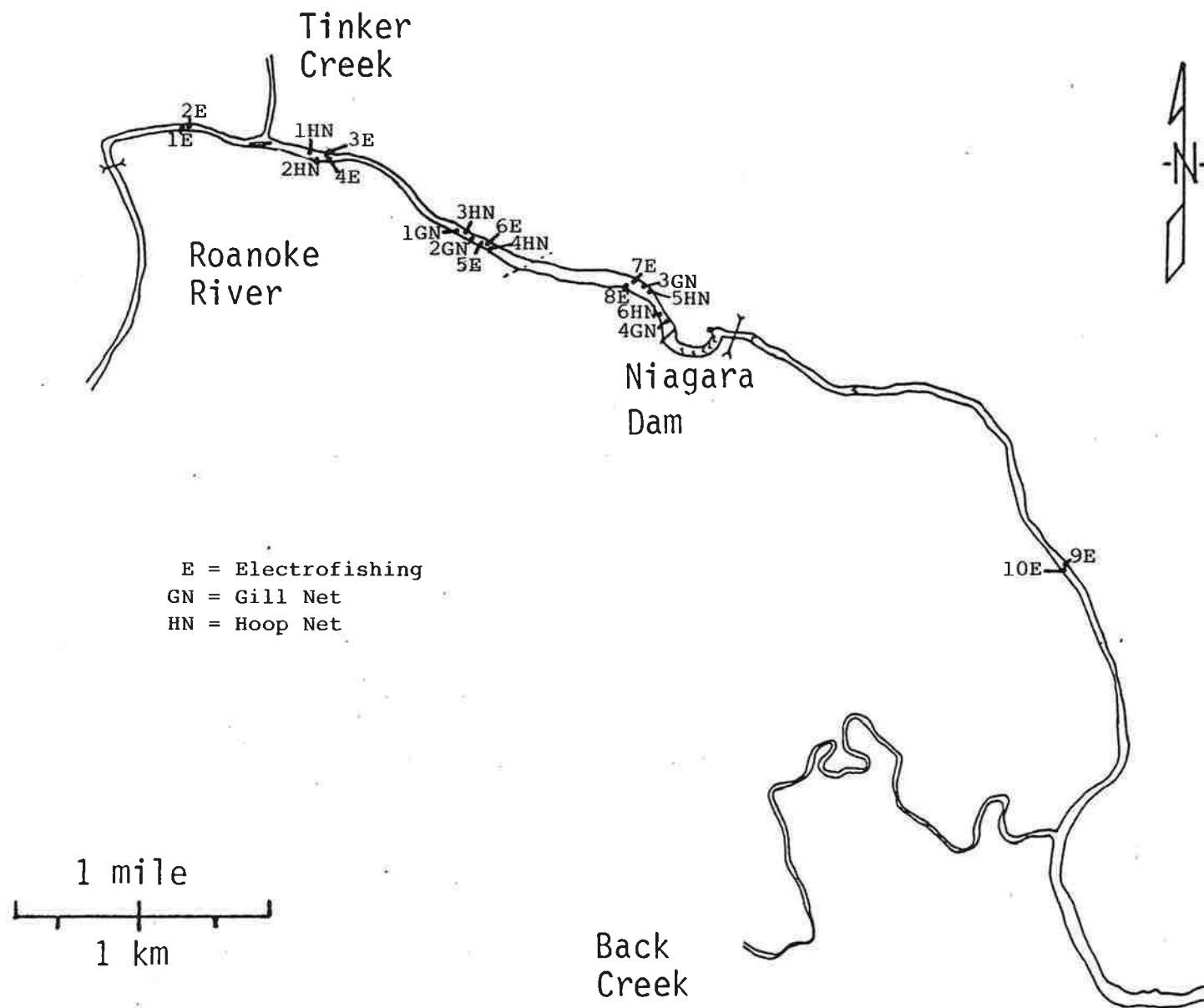


FIGURE E-3

FISH SAMPLING STATIONS IN THE VICINITY OF NIAGARA HYDROELECTRIC PROJECT, 1990.

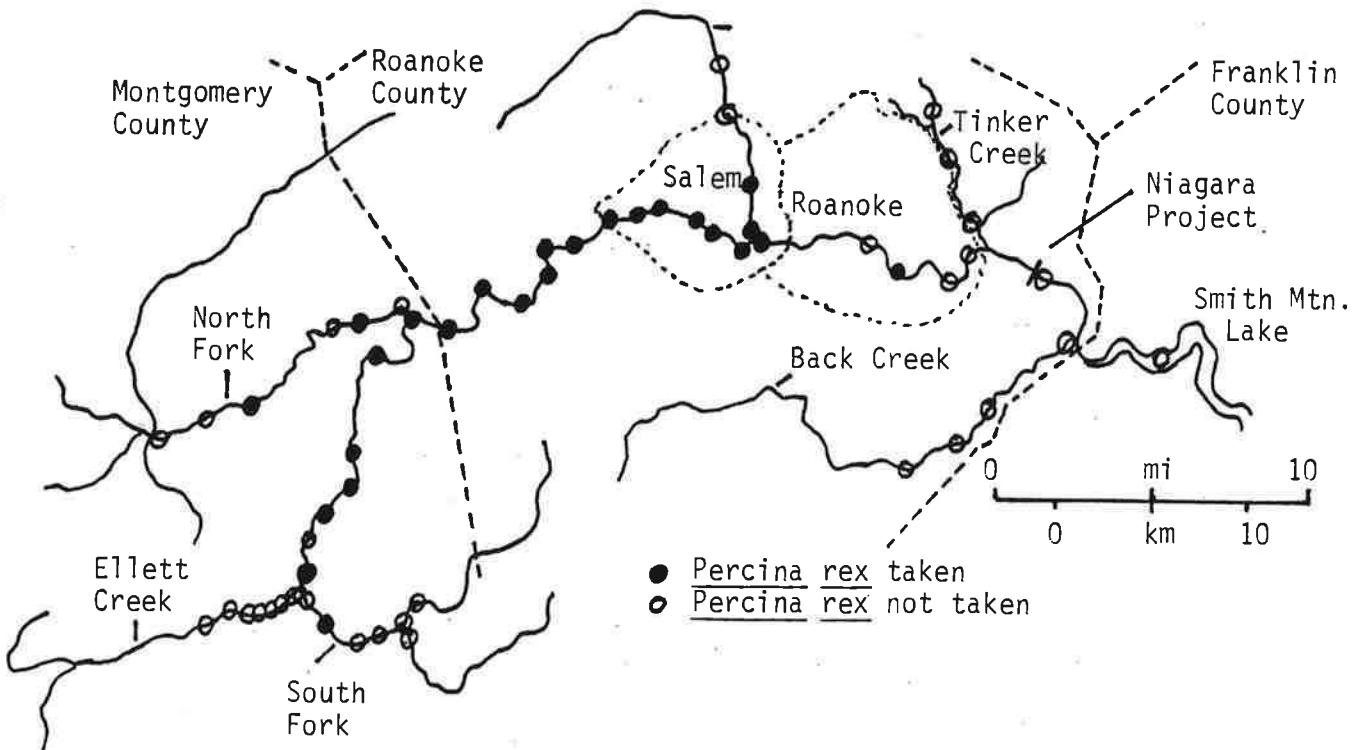
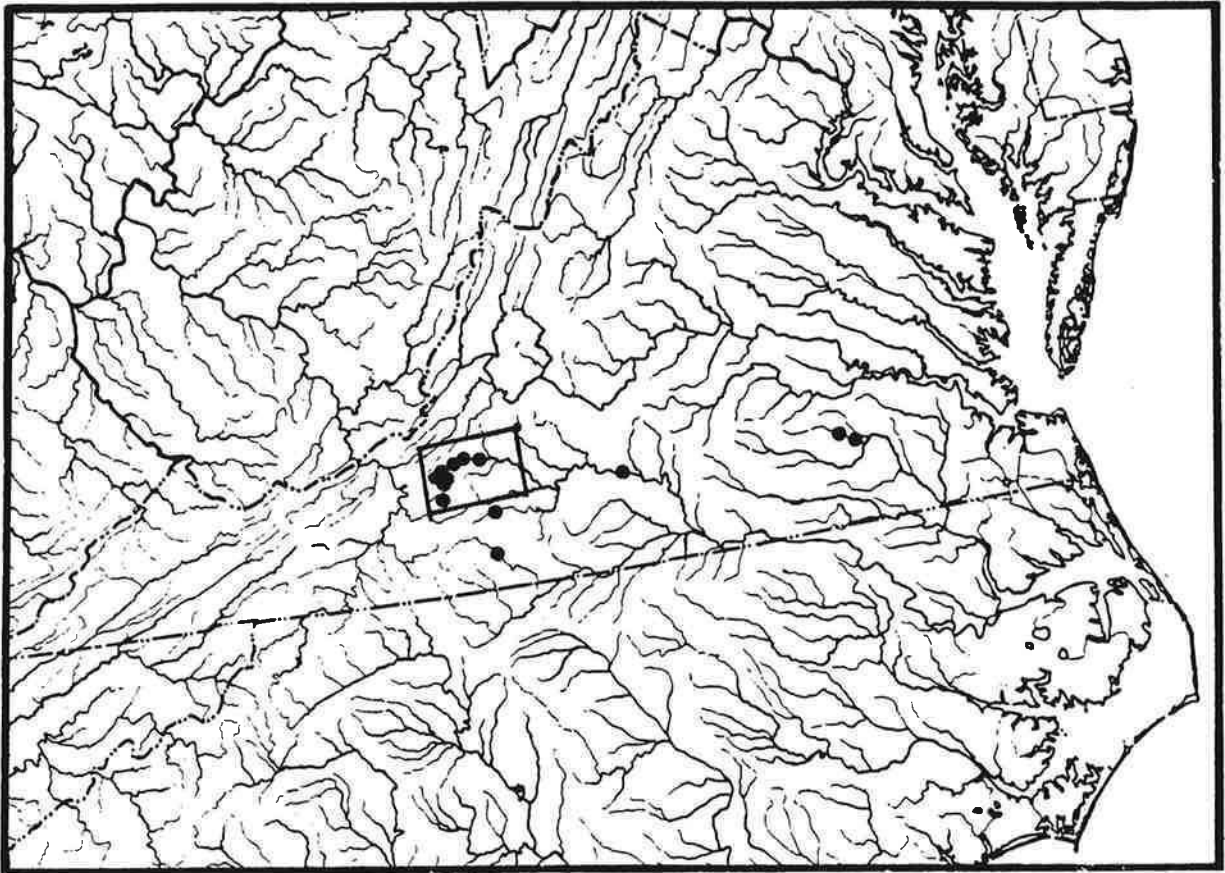


FIGURE E-4

Top: Distribution of the Roanoke logperch (adapted from Jenkins et al. (1978)).

Bottom: Collections of the Roanoke logperch in the upper Roanoke River drainage (boxed area of top map; adapted from Jenkins (1977a)).

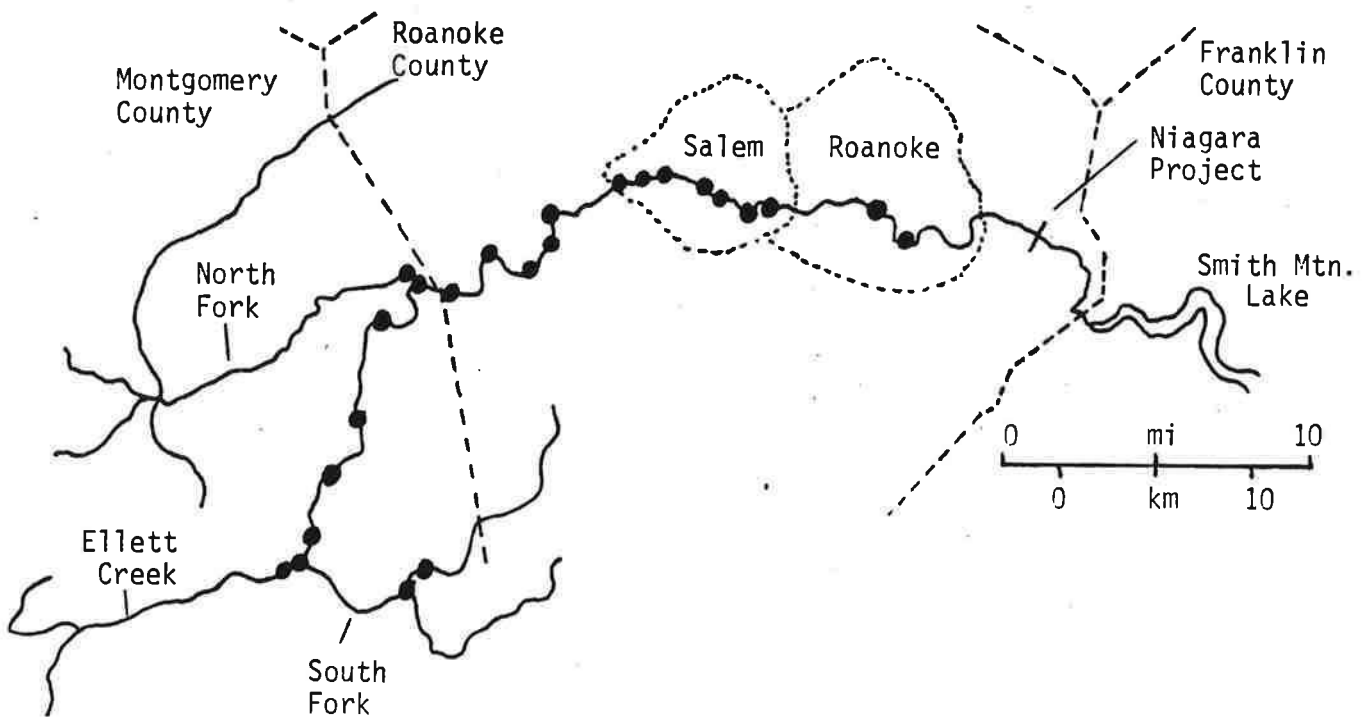
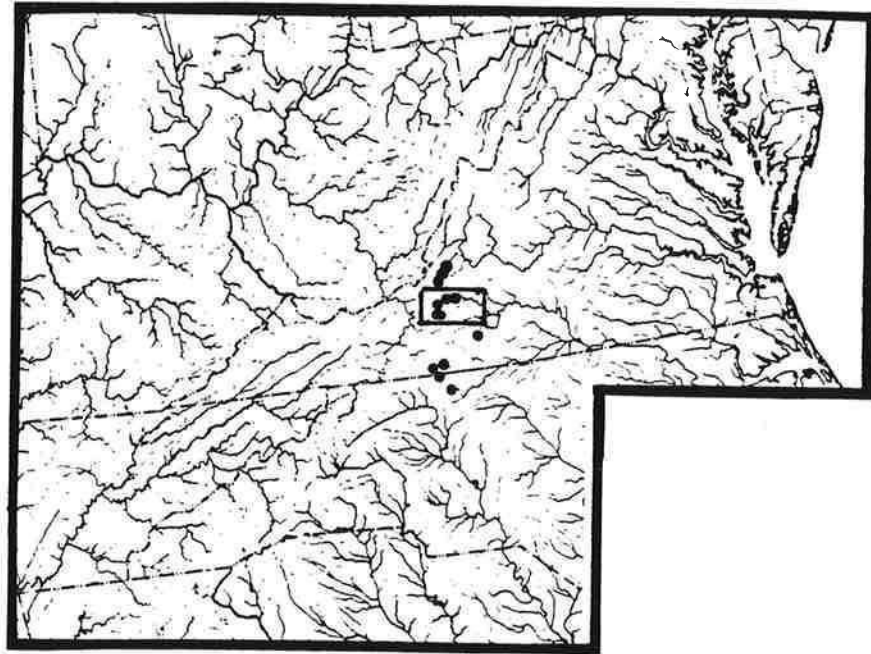
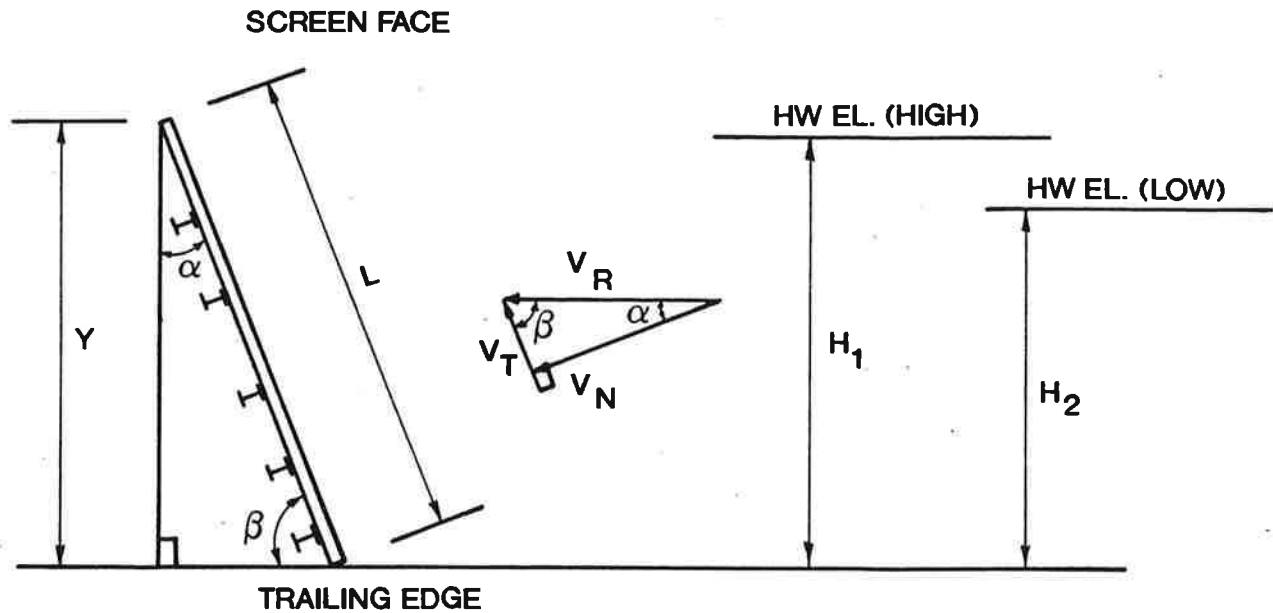


FIGURE E-5

Top: Distribution of the orangefin madtom (adapted from Jenkins 1978).  
 Bottom: Collections of the orangefin madtom in the upper Roanoke River drainage (boxed area of top map; adapted from Jenkins (1977b)).



$\cos \alpha = \frac{Y}{L}$  ,  $\beta = 90^\circ - \alpha$  ,  $W = \text{WIDTH OF INTAKE}$  ,  $Q = \text{FLOW IN CFS}$

**EXAMPLE AT FULL POOL**

AT SCREEN FACE:

INTAKE AREA =  $A_1 = H_1 \times W$

$V_R = Q/A_1$

$V_T = V_R \sin \alpha$

$V_N = V_R \cos \alpha$

AT TRAILING EDGE:

BLOCKED AREA  $\perp = \text{BLOCKED AREA} \angle \alpha \cos \alpha$

CONSTRICTED INTAKE AREA =  $A_2 = A_1 - \text{BLOCKED AREA} \perp$

$V_R = V_R \frac{A_1}{A_2}$

$V_T = V_T \frac{A_1}{A_2}$

$V_N = V_N \frac{A_1}{A_2}$

**VELOCITIES AT INTAKE SCREENS**

FIGURE E-6

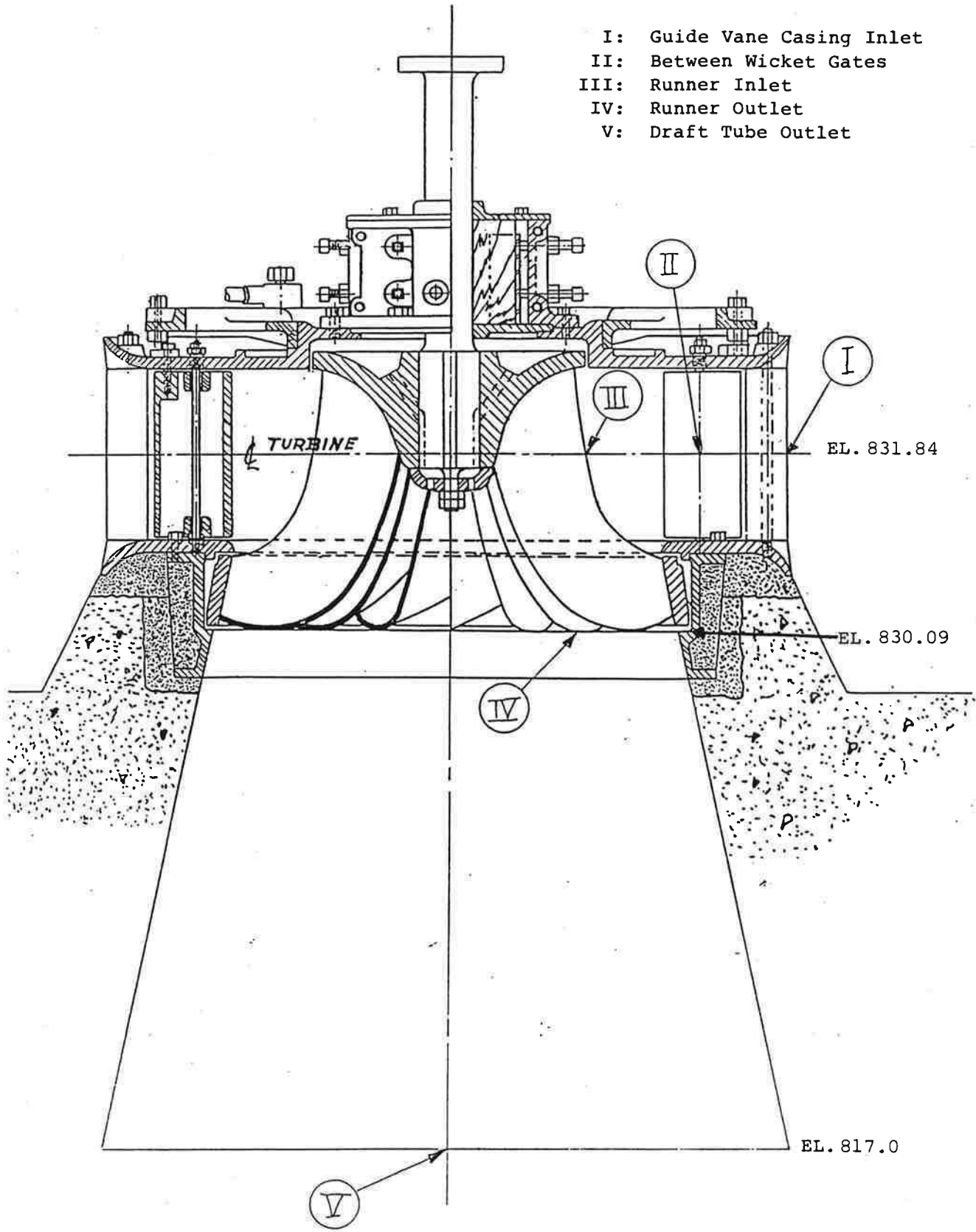


FIGURE E-7

POINTS AT WHICH PRESSURE WAS CALCULATED  
 FOR NIAGARA TURBINE.

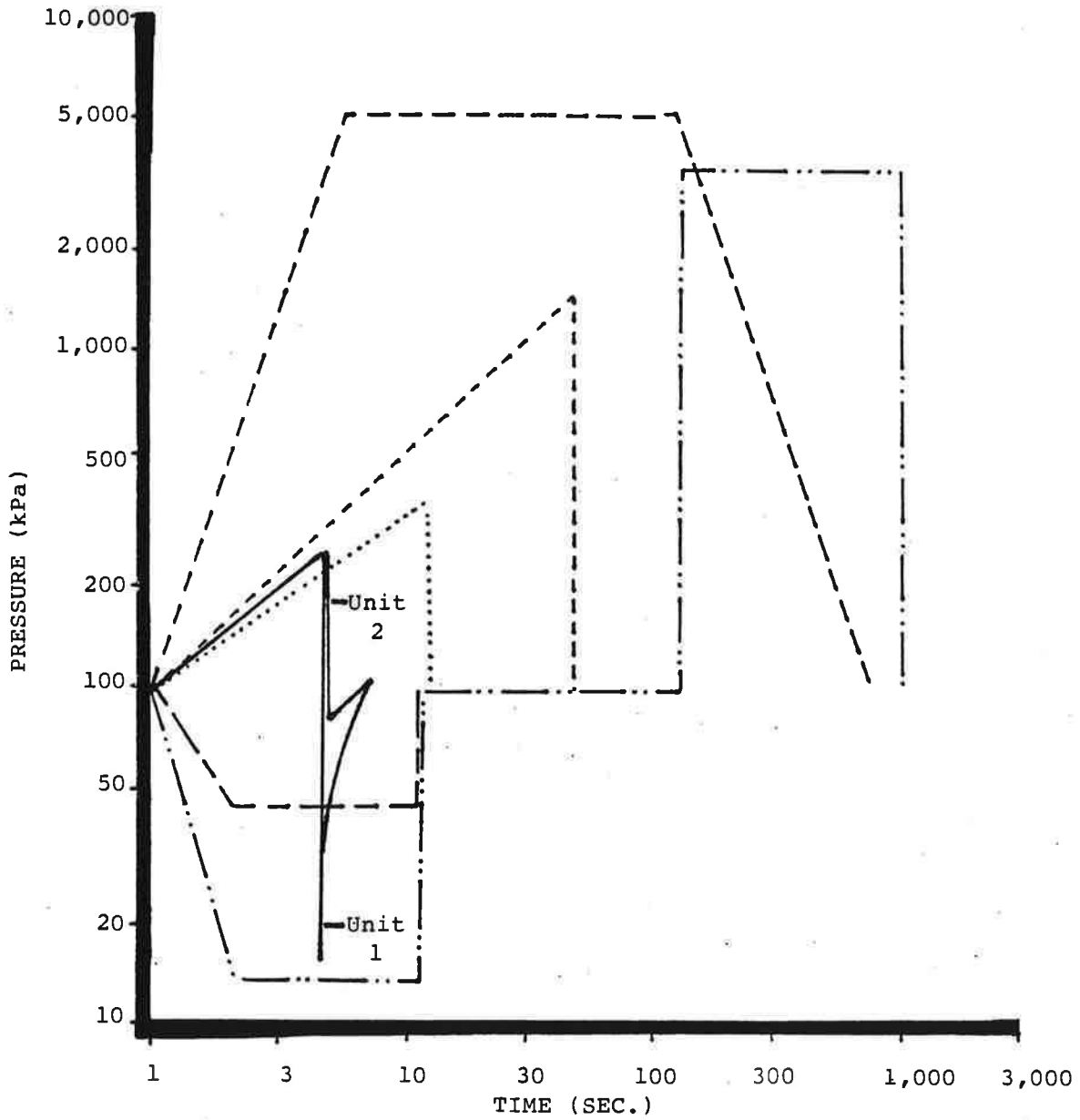


FIGURE E-8

ESTIMATED PRESSURE REGIME THROUGH NIAGARA TURBINE UNITS 1 AND 2 (SOLID LINE) COMPARED TO PRESSURE REGIMES IN EXPERIMENTAL STUDIES WITH FISH (Modified from Cada, 1990).



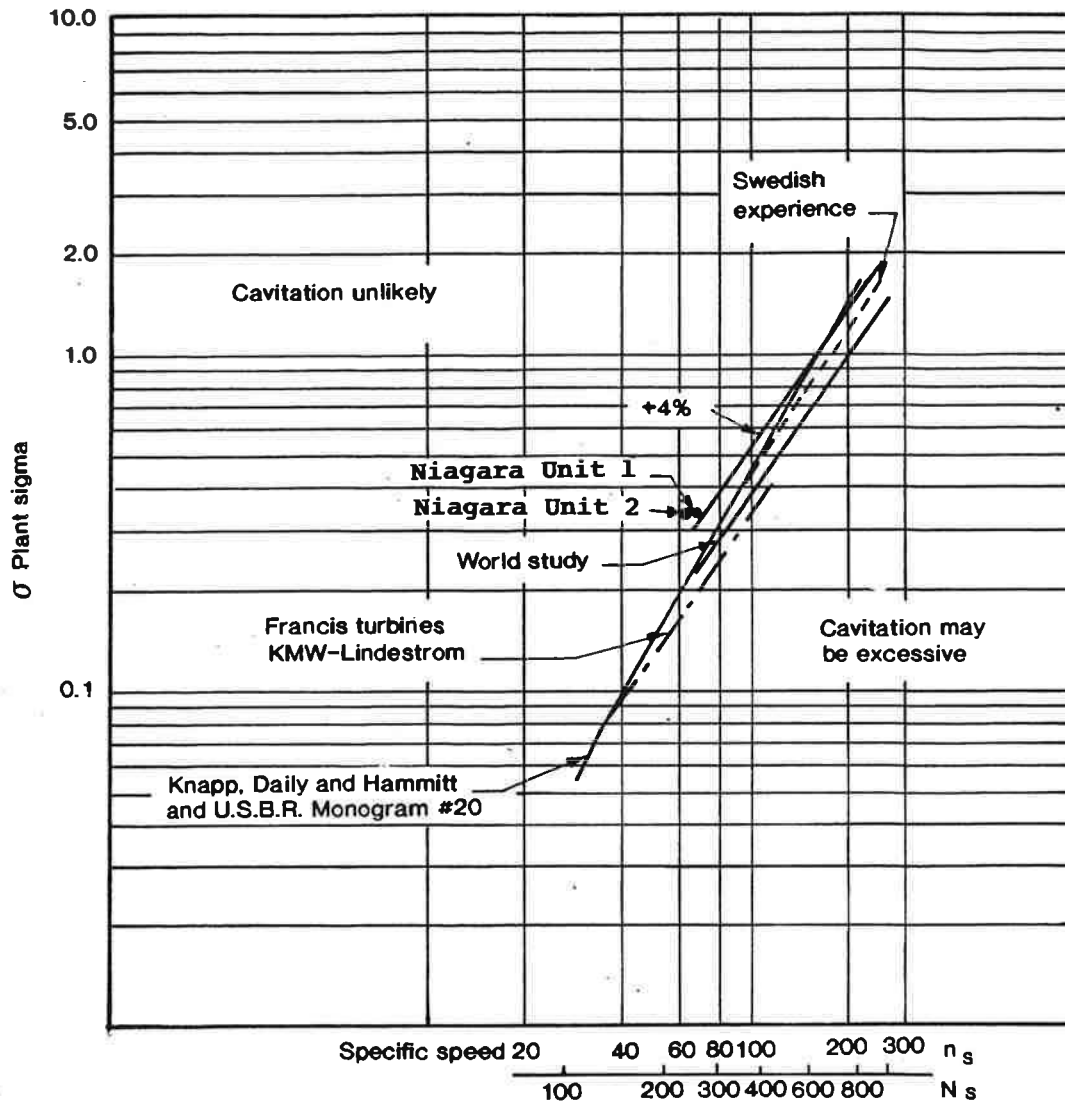
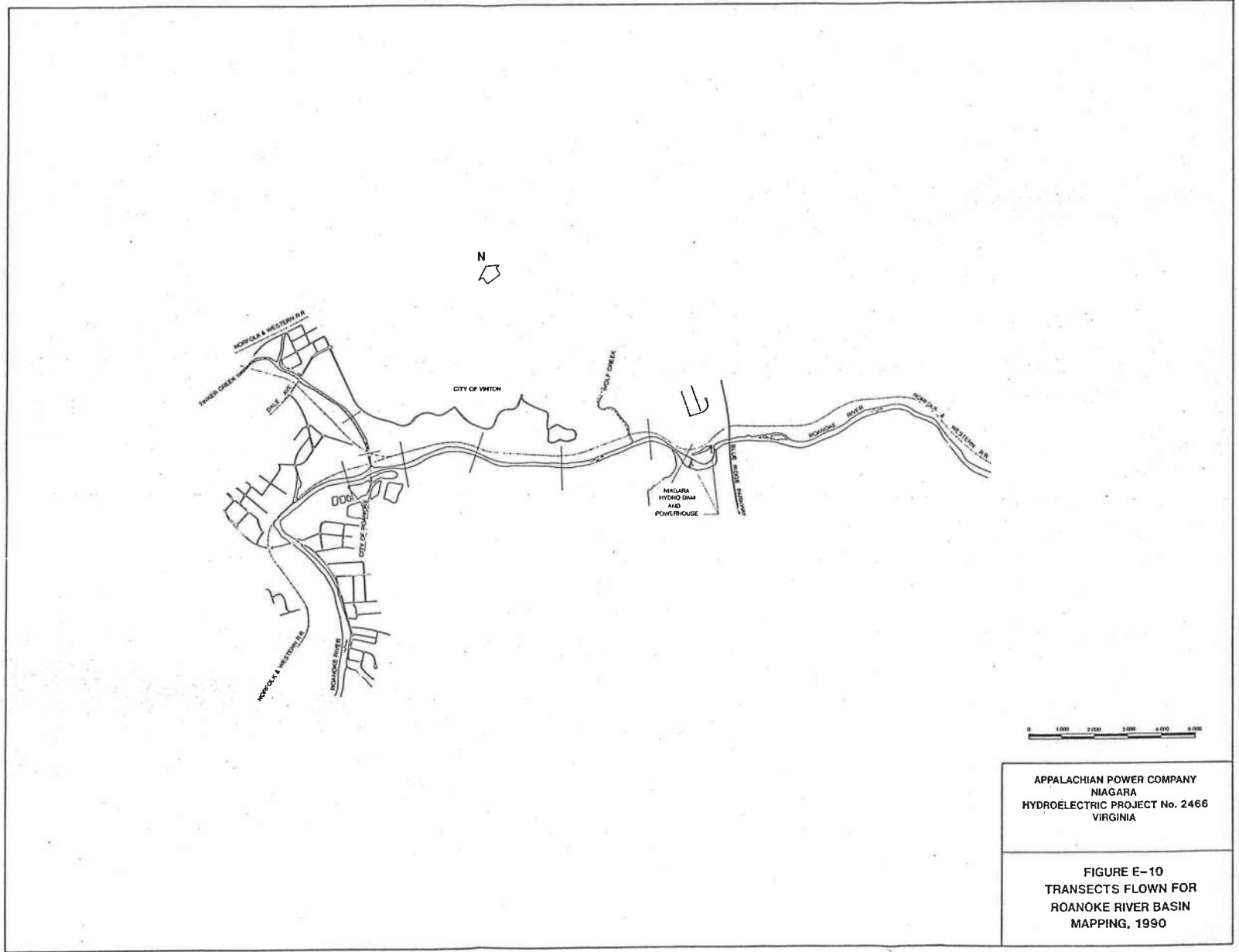


FIGURE E-9

Comparison of experience curves for cavitation coefficient.  
 ( Modified from Warwick et al. 1984)



APPALACHIAN POWER COMPANY  
 NIAGARA  
 HYDROELECTRIC PROJECT No. 2466  
 VIRGINIA

FIGURE E-10  
 TRANSECTS FLOW FOR  
 ROANOKE RIVER BASIN  
 MAPPING, 1990

TABLE E-1  
FLOOD FREQUENCY DATA

<u>Return Interval (yrs)</u>	<u>Flow (cfs)</u>
5	16,885
10	22,029
25	29,647
50	39,186
100	43,510
200	51,723
500	64,131

TABLE E-6  
NUMBER AND BIOMASS OF FISH SPECIES COLLECTED NEAR THE NIAGARA HYDROELECTRIC PROJECT,  
ROANOKE RIVER, JUNE - OCTOBER 1990

<u>Common Name</u>	<u>Scientific Name</u>	<u>Number</u>	<u>Percent of Total Number</u>	<u>Weight (kg)</u>	<u>Percent of Total Weight</u>
Gizzard Shad	Dorosoma cepedianum	36	1.9	3.81	0.6
Goldfish	Carassius auratus	1	<0.1	0.80	0.1
Grass Carp	Ctenopharyngodon idella	1	<0.1	3.95	0.6
Common Carp	Cyprinus carpio	186	9.6	281.07	42.3
Bluehead Chub	Nocomis leptocephalus	1	<0.1	<0.01	<0.1
Bull Chub	Nocomis raneyi	2	0.1	0.34	<0.1
White Shiner	Notropis albeolus	31	1.6	0.16	<0.1
Satinfin Shiner	Notropis analostanus	8	0.4	0.03	<0.1
Rosefin Shiner	Notropis ardens	1	<0.1	0.02	<0.1
Spottail Shiner	Notropis hudsonius	143	7.4	0.43	0.1
Mimic Shiner	Notropis volucellus	3	0.2	0.02	<0.1
Shiner	Notropis species	2	0.1	0.01	<0.1
Bluntnose Minnow	Pimephales notatus	21	1.1	0.06	<0.1
White Sucker	Catostomus commersoni	175	9.0	61.79	9.3
Northern Hog Sucker	Hypentelium nigricans	2	0.1	0.56	0.1
Silver Redhorse	Moxostoma anisurum	343	17.7	187.92	28.3
Golden Redhorse	Moxostoma erythrurum	106	5.5	27.55	4.1
Shorthead Redhorse	Moxostoma macrolepidotum	7	0.4	3.38	0.5
V-lip Redhorse	Moxostoma pappillosum	3	0.2	0.80	0.1
Torrent Sucker	Moxostoma rhothoecum	1	<0.1	1.30	0.2
White Catfish	Ictalurus catus	15	0.8	8.73	1.3
Yellow Bullhead	Ictalurus natalis	20	1.0	4.50	0.7
Brown Bullhead	Ictalurus nebulosus	12	0.6	3.56	0.5
Black Bullhead	Ictalurus melas	6	0.3	2.49	0.4
Channel Catfish	Ictalurus punctatus	18	0.9	19.80	3.0
Flathead Catfish	Pylodictis olivaris	1	<0.1	2.40	0.4
White Bass	Morone chrysops	4	0.2	0.59	0.1
Rock Bass	Ambloplites rupestris	26	1.3	1.34	0.2
Redbreast Sunfish	Lepomis auritus	555	28.7	24.54	3.7
Pumpkinseed	Lepomis gibbosus	48	2.5	0.61	0.1
Bluegill	Lepomis macrochirus	58	3.0	1.99	0.3
Hybrid Sunfish	Lepomis hybrid	1	<0.1	0.03	<0.1
Smallmouth Bass	Micropterus dolomieu	51	2.6	7.33	1.1
Largemouth Bass	Micropterus salmoides	28	1.4	9.49	1.4

TABLE E-6 (cont'd)

<u>Common Name</u>	<u>Scientific Name</u>	<u>Number</u>	<u>Percent of Total Number</u>	<u>Weight (kg)</u>	<u>Percent of Total Weight</u>
Black Crappie	Pomoxis nigromaculatus	16	0.8	3.20	0.5
Roanoke Logperch	Percina rex	4	0.2	0.01	<0.1
<hr/>					
<b>TOTALS</b>		1,936		664.61	
<b>Number of Species</b>		34			

TABLE E-7

PARASITES AND ABNORMALITIES IN FISH COLLECTED NEAR THE NIAGARA HYDROELECTRIC PROJECT, ROANOKE RIVER, JUNE - OCTOBER 1990.

Species	<u>Parasites</u> <sup>a</sup>									
	<u>Riffle/Run Upstream</u>		<u>Upper Pool</u>		<u>Middle Pool</u>		<u>Lower Pool</u>		<u>Riffle/Run Downstream</u>	
	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>
Common Carp	1	4.2	--	--	--	--	--	--	--	--
White Sucker	--	--	--	--	--	--	1	2.0	--	--
Golden Redhorse	--	--	1	14.3	--	--	--	--	--	--
Redbreast Sunfish	1	0.6	2	1.6	--	--	--	--	1	2.5
Pumpkinseed	--	--	--	--	--	--	--	--	1	20.0
Largemouth Bass	--	--	--	--	1	25.0	--	--	--	--
Black Crappie	--	--	--	--	--	--	1	33.3	--	--
TOTALS	2	0.5	3	0.8	1	0.2	2	0.6	2	0.7

Species	<u>Abnormalities</u> <sup>b</sup>									
	<u>Riffle/Run Upstream</u>		<u>Upper Pool</u>		<u>Middle Pool</u>		<u>Lower Pool</u>		<u>Riffle/Run Downstream</u>	
	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>
Common Carp	2	8.3	2	8.0	--	--	3	8.1	3	7.9
White Sucker	1	4.0	6	12.2	2	4.2	--	--	--	--
Northern Hog Sucker	--	--	--	--	--	--	--	--	1	50.0
Silver Redhorse	2	4.4	1	2.4	2	1.4	--	--	--	--
Golden Redhorse	3	6.0	--	--	--	--	--	--	--	--
Shorthead Redhorse	--	--	--	--	--	--	--	--	1	14.3
Black Bullhead	--	--	--	--	--	--	1	33.3	--	--
Yellow Bullhead	--	--	--	--	--	--	1	11.1	--	--
Channel Catfish	--	--	--	--	--	--	1	10.0	--	--
White Bass	--	--	--	--	--	--	--	--	1	25.0
Redbreast Sunfish	1	0.6	2	1.6	1	0.8	--	--	--	--



TABLE E-7 (continued)

<u>Species</u>	<u>Riffle/Run Upstream</u>		<u>Upper Pool</u>		<u>Middle Pool</u>		<u>Lower Pool</u>		<u>Riffle/Run Downstream</u>	
	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>	<u>No.</u>	<u>% of Total</u>
Pumpkinseed	--	--	--	--	--	--	--	--	1	20.0
Bluegill	--	--	--	--	--	--	--	--	1	2.4
Largemouth Bass	--	--	--	--	1	25.0	1	25.0	1	5.9
<b>TOTALS</b>	<b>9</b>	<b>2.1</b>	<b>11</b>	<b>3.0</b>	<b>6</b>	<b>1.2</b>	<b>7</b>	<b>2.0</b>	<b>9</b>	<b>3.1</b>

<sup>a</sup> Parasites recorded: fungus (30%), blackspot (20%), bacterial infection (20%), trematode (10%), leech (10%), anchor worm (10%)

<sup>b</sup> Abnormalities recorded: lesions (42.9%), deformities (23.8%), missing body parts (16.7%), eroded fins (14.3%), scars (2.4%)

TABLE E-8  
 COMPARISON OF FISH SPECIES COLLECTED FROM JUNE - OCTOBER 1990,  
 NEAR THE NIAGARA HYDROELECTRIC PROJECT TO THE VIRGINIA DEPARTMENT  
 OF GAME AND INLAND FISHERIES (VDGIF) SPECIES LIST  
 FOR THE ROANOKE RIVER BASED ON PAST COLLECTIONS.

<u>Family</u> <u>Species</u>	<u>Common Name</u>	<u>Roanoke River</u> <u>(VDGIF)</u>	<u>Niagara</u> <u>(1990)</u>
<b>Amiidae</b>			
<u>Amia calva</u>	Bowfin	x	
<b>Clupeidae</b>			
<u>Alosa aestivalis</u>	Blueback Herring	x	
<u>A. pseudoharengus</u>	Alewife	x	
<u>Dorosoma cepedianum</u>	Gizzard Shad	x	x
<b>Salmonidae</b>			
<u>Oncorhynchus mykiss</u>	Rainbow Trout	x	
<u>Salmo trutta</u>	Brown Trout	x	
<u>Salvelinus fontinalis</u>	Brook Trout	x	
<b>Esocidae</b>			
<u>Esox niger</u>	Chain Pickerel	x	
<b>Cyprinidae</b>			
<u>Campostoma anomalum</u>	Stoneroller	x	
<u>Carrassius auratus</u>	Goldfish	x	x
<u>Clinostomus funduloides</u>	Rosyside Dace	x	
<u>Ctenopharyngodon idella</u>	Grass Carp		x
<u>Cyprinus carpio</u>	Common Carp	x	x
<u>Exoglossum maxillingua</u>	Cutlips Minnow	x	
<u>Nocomis leptoccephalus</u>	Bluehead Chub	x	x
<u>N. raneyi</u>	Bull Chub	x	x
<u>Notemigonus crysoleucas</u>	Golden Shiner	x	
<u>Notropis albeolus</u>	White Shiner	x	x
<u>N. altipinnis</u>	Highfin Shiner	x	
<u>N. amoenus</u>	Comely Shiner	x	
<u>N. analostanus</u>	Satinfin Shiner	x	x
<u>N. ardens</u>	Rosefin Shiner	x	x
<u>N. cerasinus</u>	Crescent Shiner	x	
<u>N. hudsonius</u>	Spottail Shiner	x	x
<u>N. procne</u>	Swallowtail Shiner	x	
<u>N. rubellus</u>	Rosyface Shiner	x	
<u>N. spilopterus</u>	Spotfin Shiner	x	
<u>N. volucellus</u>	Mimic Shiner	x	x
<u>Notropis sp.</u>	Shiner sp.		x
<u>Phoxinus oreas</u>	Mountain Redbelly Dace	x	
<u>Pimephales notatus</u>	Bluntnose Minnow	x	x
<u>P. promelas</u>	Fathead Minnow	x	
<u>Rhinichthys atratulus</u>	Blacknose Dace	x	
<u>R. cataractae</u>	Longnose Dace	x	
<u>Semotilus atromaculatus</u>	Creek Chub	x	
<u>S. corporalis</u>	Fallfish	x	
<b>Catostomidae</b>			
<u>Carpiodes cyprinus</u>	Quillback	x	
<u>Catostomus commersoni</u>	White Sucker	x	x
<u>Hypentelium nigricans</u>	Northern Hog Sucker	x	x
<u>H. roanokense</u>	Roanoke Hog Sucker	x	

Table E-8 (cont'd)

Family <u>Species</u>	<u>Common Name</u>	<u>Roanoke River</u> <u>(VDGIF)</u>	<u>Niagara</u> <u>(1990)</u>
<u>Moxostoma anisurum</u>	Silver Redhorse	x	x
<u>M. ariommum</u>	Bigeye Jumprock	x	
<u>M. cervinum</u>	Black Jumprock	x	
<u>M. erythrurum</u>	Golden Redhorse	x	x
<u>M. macrolepidotum</u>	Shorthead Redhorse	x	x
<u>M. pappillosum</u>	V-lip Redhorse	x	x
<u>M. rthoecum</u>	Torrent Sucker	x	x
<b>Ictaluridae</b>			
<u>Ictalurus catus</u>	White Catfish	x	x
<u>I. melas</u>	Black Bullhead		x
<u>I. natalis</u>	Yellow Bullhead	x	x
<u>I. nebulosus</u>	Brown Bullhead	x	x
<u>I. platycephalus</u>	Flat Bullhead	x	
<u>I. punctatus</u>	Channel Catfish	x	x
<u>Noturus gilberti</u>	Orangefin Madtom	x	
<u>N. insignis</u>	Margined Madtom	x	
<u>Pylodictis olivaris</u>	Flathead Catfish	x	x
<b>Percichthyidae</b>			
<u>Morone americana</u>	White Perch	x	
<u>M. chrysops</u>	White Bass	x	x
<u>M. saxatilis</u>	Stiped Bass	x	
<b>Centrarchidae</b>			
<u>Ambloplites cavifrons</u>	Roanoke Bass	x	
<u>A. rupestris</u>	Rock Bass	x	
<u>Lepomis auitus</u>	Redbreast Sunfish	x	x
<u>L. cyanellus</u>	Green Sunfish	x	
<u>L. gibbosus</u>	Pumpkinseed	x	x
<u>L. gulosus</u>	Warmouth	x	
<u>L. macrochirus</u>	Bluegill	x	x
<u>L. microlophus</u>	Redear Sunfish	x	
<u>Lepomis hybrid</u>	Hybrid Sunfish		x
<u>Micropterus dolomieu</u>	Smallmouth Bass	x	x
<u>M. salmoides</u>	Largemouth Bass	x	x
<u>Pomoxis annularis</u>	White Crappie	x	
<u>P. nigromaculatus</u>	Black Crappie	x	x
<b>Percidae</b>			
<u>Etheostoma flabellare</u>	Fantail Darter	x	
<u>E. maculatum</u>	Spotted Darter	x	
<u>E. nigrum</u>	Johnny Darter	x	
<u>E. podostemone</u>	Riverweed Darter	x	
<u>E. vitreum</u>	Glassy Darter	x	
<u>Perca flavescens</u>	Yellow Perch	x	
<u>Percina peltata</u>	Shield Darter	x	
<u>P. rex</u>	Roanoke Logperch	x	x
<u>P. roanoka</u>	Roanoke Darter	x	
<u>Stizostedion vitreum</u>	Walleye	x	
<b>Cottidae</b>			
<u>Cottus bairdi</u>	Mottled Sculpin	x	

TABLE E-9  
 MEAN CATCH PER UNIT EFFORT (CPUE) FOR ELECTROFISHING (NUMBER OF FISH)  
 NEAR THE NIAGARA HYDROELECTRIC PROJECT, ROANOKE RIVER, JUNE - OCTOBER 1990.  
 FOR SPECIES WITH SIGNIFICANTLY DIFFERENT CATCHES AMONG LOCATIONS (IDENTIFIED BY ASTERISKS),  
 CPUE VALUES FOLLOWED BY THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT (P>0.10).

<u>Species</u>	<u>Electrofishing CPUE (No./Minute)</u>					
	<u>Riffle/Run Upstream</u>	<u>Upper Pool</u>	<u>Middle Pool</u>	<u>Lower Pool</u>	<u>Riffle/Run Downstream</u>	<u>P-Value**</u>
Gizzard Shad*	0A	0A	0A	0.02A	0.61B	0.01
Common Carp*	0.40B	0.16AB	0.39B	0.07A	0.71B	<0.01
Bluehead Chub	0	0	0	0	0.01	0.41
Bull Chub	0.02	0	0	0	0.02	0.54
White Shiner	0.14	0.24	0.07	0.09	0.02	0.45
Satinfin Shiner*	0A	0A	0A	0A	0.15B	<0.01
Rosefin Shiner	0	0	0	0.01	0	0.41
Spottail Shiner	1.04	0.56	0.31	0.10	0.25	0.21
Mimic Shiner	0	0	0	0.02	0.01	0.54
Bluntnose Minnow	0	0.07	0.11	0.03	0.01	0.28
White Sucker*	0.38B	0.54B	0.39B	0.33B	0.06A	0.02
Northern Hog Sucker*	0A	0A	0A	0A	0.04B	0.08
Silver Redhorse	0.73	0.49	0.49	0.18	0.50	0.18
Golden Redhorse*	0.92B	0.12A	0.03A	0.07A	0.35AB	<0.01
Shorthead Redhorse*	0A	0A	0A	0A	0.16B	0.08
V-lip Redhorse*	0A	0A	0A	0A	0.07B	0.01
White Bass	0	0	0	0	0.05	0.41
Rock Bass*	0.10B	0.01A	0.05AB	0.04AB	0A	0.03
Redbreast Sunfish*	2.45B	1.87AB	1.88AB	1.35AB	0.77A	0.09
Pumpkinseed	0.02	0.27	0.20	0.15	0.11	0.14
Bluegill*	0.03A	0.02A	0.03A	0.18B	0.80C	<0.01
Hybrid Sunfish	0.01	0	0	0	0	0.41
Smallmouth Bass*	0.38B	0.10A	0.08A	0.02A	0.08A	<0.01
Largemouth Bass*	0A	0.03A	0.06A	0.04A	0.33B	<0.01
Black Crappie	0.01	0.02	0	0	0.05	0.11
Roanoke Logperch*	0.08B	0A	0A	0A	0A	0.08

\* Species with significantly different catches among locations (P<0.10).

\*\* Significance value for chi-square approximation of Kruskal-Wallis test statistic.

TABLE E-10  
 SPAWNING CHARACTERISTICS OF FISH SPECIES OF THE  
 NIAGARA HYDROELECTRIC PROJECT RESERVOIR\*.

<u>Species</u>	<u>Spawning Period</u>	<u>Spawning Habitat</u>	<u>Spawning Depth (ft)</u>	<u>Egg Deposition</u>	<u>Egg Type</u>
Gizzard Shad	April-August	Vegetation/Margins	1-8	Broadcast	Adhesive, Semi-buoyant
Goldfish	March-August	Vegetation	0.5-6	Broadcast	Adhesive-Demersal
Common Carp	May-August	Vegetation	0.25-6	Broadcast	Adhesive Demersal
Spottail Shiner	May-August	Sandy Shoals	0.25-1.5	Broadcast	Adhesive Demersal
Mimic Shiner	May-July	Vegetation	15-20	Broadcast	Demersal
Bluntnose Minnow	May-July	Sand/Gravel	0.25-8	Nest	Adhesive Demersal
Creek Chub	April-June	Gravel	0.25-6?	Nest	Demersal
White Catfish	May-July	Crevice	1-8?	Nest	Adhesive Demersal
Yellow Bullhead	May-July	Crevice	1-8?	Nest	Adhesive
Brown Bullhead	April-July	Crevice	0.5-8	Nest	Adhesive Demersal
Black Bullhead	May-July	Crevice	2-4	Nest	Adhesive
Channel Catfish	May-July	Crevice	1-8	Nest	Adhesive Demersal
Flathead Catfish	June-July	Crevice	1-8	Nest	Adhesive Demersal
Rock Bass	May-June	Sand/Gravel	0.25-3.5	Nest	Adhesive Demersal
Redbreast Sunfish	May-June	Sand/Gravel	1-5?	Nest	Adhesive Demersal
Green Sunfish	May-August	Sand/Gravel	0.25-1.5	Nest	Adhesive Demersal
Pumpkinseed	May-August	Sand/Gravel	1-2.5	Nest	Adhesive Demersal
Bluegill	May-August	Sand/Gravel	1-5	Nest	Adhesive Demersal
Smallmouth Bass	April-July	Sand/Gravel	1-5	Nest	Adhesive Demersal
Largemouth Bass	April-July	Sand/Gravel	1-5	Nest	Adhesive Demersal
Black Crappie	May-June	Sand/Gravel	1-8	Nest	Adhesive Demersal

\* Information consolidated from Becker (1983), Carlander (1969, 1977), and WAPORA, Inc. (1978, 1987).

TABLE E-11  
 MEAN CATCH PER UNIT EFFORT (CPUE) FOR COMBINED GILL AND HOPP NETTING  
 (NUMBER OF FISH) IN THE NIAGARA HYDROELECTRIC PROJECT RESERVOIR,  
 ROANOKE RIVER, JUNE - OCTOBER 1990. FOR SPECIES WITH SIGNIFICANTLY  
 DIFFERENT CATCHES AMONG LOCATIONS (IDENTIFIED BY ASTERISKS),  
 CPUE VALUES FOLLOWED BY THE SAME LETTER ARE NOT  
 SIGNIFICANTLY DIFFERENT ( $P > 0.10$ ).

Species	Gill/Hoop Netting CPUE (No./Net/Day)			P-Value**
	Upper Pool	Middle Pool	Lower Pool	
Goldfish	0	0	0.02	0.41
Grass Carp	0	0	0.02	0.41
Common Carp	0.58	0.69	0.65	0.86
White Sucker	0.50	0.48	0.58	0.92
Silver Redhorse*	0.54A	2.34B	1.48AB	0.02
Golden Redhorse*	0A	0.33B	0.15AB	0.01
Torrent Sucker	0.02	0	0	0.41
White Catfish	0.29	0.08	0.04	0.19
Black Bullhead	0.08	0.02	0.06	0.42
Yellow Bullhead	0.13	0.06	0.19	0.37
Brown Bullhead	0.18	0.02	0.08	0.30
Channel Catfish*	0.04A	0.06A	0.21B	0.06
Flathead Catfish	0	0	0.02	0.41
Rock Bass*	0A	0.19B	0.06AB	<0.01
Redbreast Sunfish	0.17	0.10	0.04	0.17
Smallmouth Bass	0.04	0.04	0.10	0.24
Largemouth Bass	0.04	0	0.04	0.24
Black Crappie	0.08	0.13	0.06	0.17

\* Species with significantly different catches among locations ( $P \leq 0.10$ ).  
 \*\* Significance value for chi-square approximation of Kruskal-Wallis test statistic.



TABLE E-12

NIAGARA HYDRO PROJECT  
UPPER INTAKE SCREEN FLOW VELOCITIES  
(FPS).

$V_R$  = resultant velocity,  $V_T$  = tangential velocity, and  
 $V_N$  = normal velocity

At Screen Face	$V_R$	$V_T$	$V_N$
HW El. 885 NGVD	1.013	0.405	0.929
HW El. 884 NGVD	1.087	0.434	0.996
At Trailing Edge:			
HW El. 885 NGVD	1.214	0.485	1.113
HW El. 884 NGVD	1.296	0.518	1.188

TABLE E-13

PROBABILITY (%) OF FISH CONTACT WITH TURBINE BLADES AT  
 NIAGARA HYDROELECTRIC PROJECT FOR  
 YOUNG-OF-YEAR AND AVERAGE-SIZED ADULT<sup>a</sup>

<u>Species</u>	<u>Length (mm)</u> <sup>b</sup>	<u>Probability</u>	
		<u>Unit 1</u>	<u>Unit 2</u>
Gizzard Shad	85	9	8
	250	27	23
Goldfish	45	5	4
	250	27	23
Common Carp	80	9	7
	350*	37	32
White Shiner	25	3	2
	90	10	8
Rosefin Shiner	25	3	2
	65	7	6
Spottail Shiner	30	3	3
	60	6	5
Mimic Shiner	20	2	2
	50	5	5
Bluntnose Minnow	25	3	2
	65	7	6
White Sucker	40	4	4
	240	26	22
Silver Redhorse	40	4	4
	300	32	27
Golden Redhorse	40	4	4
	300	32	27
White Catfish	70	7	6
	275*	29	25
Yellow Bullhead	60	6	5
	250	27	23
Brown Bullhead	60	6	5
	250	27	23
Black Bullhead	50	5	5
	225	24	21
Channel Catfish	70	7	6
	275*	29	25
Flathead Catfish	75	8	7
	275*	29	25
Rock Bass	30	3	3
	175	19	16
Redbreast Sunfish	30	3	3
	125	13	11
Pumpkinseed	30	3	3
	150	16	14
Bluegill	30	3	3
	150	16	14
Smallmouth Bass	60	6	5
	275	29	25
Spotted Bass	60	6	5
	240	26	22
Largemouth Bass	60	6	5
	275	29	25
Black Crappie	50	5	5
	210	22	19

Table E-13 (cont'd)

- a) Turbine measurements used in calculations:  
Number of runner blades = 14  
RPM = 277  
Runner diameter = 53.25 (Unit 1), 52 in. (Unit 2)  
Blade angle = 29.2° (Unit 1), 63° (Unit 2)  
Turbine discharge = 379 cfs (Unit 1), 305 cfs (Unit 2)
- b) \* indicates maximum-size fish estimated to pass 3 5/8-inch opening of intake screens

TABLE E-14

DATA USED FOR CALCULATION OF NIAGARA CAVITATION COEFFICIENT

RPM - 277

Runner Diameter (max. - ft.) = 4.17 (Unit 1); 3.94 (Unit 2)

Circumference (ft.) = 13.09 (Unit 1); 12.37 (Unit 2)

Velocity (blade tip - fps) = 60.43 (Unit 1); 57.11 (Unit 2)

Headwater elevation (norm. max. - ft.) = 884.4

Turbine runner elevation (ft.) = 831.97

Tailwater elevation (min. - ft.) = 820.5

Plant sigma = 0.32

Specific speed = 71.9 (Unit 1); 63.4 (Unit 2)

TABLE E-15

AVAILABLE SPAWNING HABITAT ACREAGE AND MAXIMUM % EXPOSED BY  
RIVER FLUCTUATION AT NIAGARA HYDROELECTRIC PROJECT.

<u>Month</u>	<u>Spawning Group</u> <sup>a</sup>	<u>Habitat Available (acres)</u>	<u>Mean River Fluctuation (ft)</u> <sup>b</sup>	<u>% Habitat Exposed</u>
March	A	38.4	2.4	17
April	A	37.9	2.3	17
	B	42.4		9
May	A	34.0	1.2	10
	B	38.5		2
June	A	28.9	0.4	2
	B	35.1		<1
July	A	29.4	0.5	3
	B	35.6		<1
August	A	35.7	1.7	13
	B	40.7		5

---

a) Spawning Groups

A: Cyprinids, sunfish

B: Gizzard shad, ictalurids, black bass, black crappie

b) Difference between mean maximum and mean minimum Roanoke River gage height at Niagara, 1983-1988.

TABLE E-16

RECORDED RIVER FLOWS EXCEEDING NIAGARA PLANT  
HYDRAULIC CAPACITY, 1983-1990

Number of Days Plant Hydraulic Capacity Exceeded

<u>Month</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>Monthly Mean</u>
January	0	0	1	0	6	3	0	21	4
February	13	13	6	2	15	1	2	28	10
March	19	15	0	4	17	0	9	20	11
April	28	24	0	0	27	1	1	16	12
May	1	9	3	3	7	0	17	10	6
June	0	0	0	0	0	0	12	4	2
July	0	0	0	0	0	0	13	3	2
August	0	5	6	1	0	0	0	3	2
September	0	0	0	1	4	0	14	0	2
October	2	0	0	0	0	0	14	16	4
November	0	0	12	1	2	0	7	1	3
December	12	0	4	10	1	0	1	7	4
<b>Annual Total</b>	<b>75</b>	<b>66</b>	<b>32</b>	<b>22</b>	<b>79</b>	<b>5</b>	<b>90</b>	<b>129</b>	



An Assessment of the Roanoke Logperch  
in the Roanoke River Downstream of  
Niagara Hydroelectric Project

Appalachian Power Company  
40 Franklin Road, S.W.  
Roanoke, VA 24011

and

American Electric Power Service Corporation  
1 Riverside Plaza  
Columbus, OH 43216

December 1992

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## Introduction

An application for new license for the Niagara Hydroelectric Project (FERC Project No. 2466) was filed with the Federal Energy Regulatory Commission (FERC) in December 1991. Subsequently, the U. S. Fish and Wildlife Service (USFWS) submitted a Request for Additional Studies to the FERC that requested additional surveys to determine the distribution and abundance of the Roanoke logperch (Percina rex) (Photograph 1) in the approximately two-mile stretch of free-flowing Roanoke River from the Niagara powerhouse to the head of the Smith Mountain Lake pool (Figure 1). This request was based on a previous survey conducted in 1991 by Appalachian Power Company (APCo) and American Electric Power Service Corporation (AEPSC), in cooperation with the Virginia Department of Game and Inland Fisheries (VDGIF), reported in the license application, that verified the presence of this federally listed endangered species in this downstream segment of the river, thereby representing an extension of the known range of the Roanoke logperch. The FERC acted on this request in its May 22, 1992 letter to AEPSC, asking that a study be conducted to assess the population of Roanoke logperch downstream of the Niagara project. A study plan (see Appendix) was developed to include the following objectives:

- 1) systematically survey the Roanoke River for the Roanoke logperch from the Niagara powerhouse to the head of the Smith Mountain Lake pool;
- 2) characterize the type and location of habitat being used by any collected logperch; and
- 3) estimate the amount and identify the location of available habitat in this river segment that is of the type used by Roanoke logperch.

A draft study plan was reviewed and approved by both VDGIF and USFWS. The study plan called for completion of field work by September 15, 1992, with a final report to the FERC by

November 16, 1992. However, scheduled sampling on August 27, 1992, was prevented by heavy rain, allowing only gross habitat characterization to be conducted on that date. All potential participants were aware that successful completion of the survey was dependent upon suitable flow conditions, and thus could be subject to short-notice scheduling. Because of continuing wet weather, that resulted in turbid river conditions downstream of the Niagara Project, sampling was delayed until October 22, 1992, when the survey was completed under ideal flow (105 cfs at the Niagara gauge) and water clarity (5 NTU) conditions.

### Methodology

Fish Sampling. Roanoke logperch were surveyed on October 22, 1992. Present at the survey were Arthur LaRoche, Bob Albrecht, Scott Smith, and Michael Duval (VDGIF), Jerry Zwart (APCo), and John Van Hassel and Ken Wood (AEPSC). USFWS was notified of the planned survey by telephone on October 19, but was unable to send a representative because of schedule conflicts. The area surveyed consisted of a 1 1/4-mile segment of the Roanoke River directly downstream of the Niagara powerhouse. Habitat characterization of the two-mile, free-flowing segment of the river between the powerhouse and the Smith Mountain Lake headwaters on August 27 had determined that the upper 1 1/4 miles of the segment were predominately riffle/run habitat where logperch might be found, while the lower 3/4 mile of the free-flowing segment was dominated by long, silty pools where logperch would not be expected (see Appendix for summary of August 27 activities).

Logperch were surveyed in the river segment by systematic searching of all riffle/run areas characterized by gravel or cobble substrate by two AEPSC snorkelers. Follow-up backpack electrofishing was conducted by VDGIF personnel for species verification, and to sample areas of sub-optimal habitat that were not searched by snorkeling.

Habitat Characterization. A gross determination of the location of riffle/run and pool habitats in the two-mile free-flowing segment of the river was made by canoe on August 27, 1992. On October 22, in conjunction with the logperch survey, the following data were recorded at each location where a logperch was captured: water temperature (YEW Model SC51 meter), surface and bottom current velocity (Marsh-McBirney Model 201D meter, 5 cm below water surface and 5 cm above bottom), turbidity (Bausch & Lomb nephelometer), depth, direction of flow (compass), substrate composition (visual estimate), and an estimate of the total area of similar habitat surrounding the capture location. Additionally, photographs were taken to provide a general profile of the location of riffle/run/pool habitats in the surveyed segment.

## Results

Fish Sampling. A total of ten Roanoke logperch were observed, nine by snorkeling and one (129 mm total length) by electrofishing. Figure 2 depicts the locations where the logperch were found. Other species observed during the survey included gizzard shad (Dorosoma cepedianum), goldfish (Carrassius auratus), common carp (Cyprinus carpio), shiners (Notropis spp.), bluntnose minnow (Pimephales notatus), black jumprock (Moxostoma cervinum), channel catfish (Ictalurus punctatus), margined madtom (Noturus insignis), redbreast sunfish (Lepomis auritus), fantail darter (Etheostoma flabellare), riverweed darter (E. podostemone), and Roanoke darter (Percina roanoka).

Three specimens of the Roanoke logperch collected by electrofishing in September 1991 by VDGIF and AEPSC personnel were from the same area as those observed in the 1992 survey. No other collections of this species are known from this segment of the Roanoke River.

Habitat Characterization. Table 1 provides habitat measurements for each of the nine locations where a logperch was observed by snorkeling. Water temperatures during the survey ranged from 12.6-13.5 C, and turbidity from 5.2-9.7 NTU. Logperch were most often observed on the bottom in locations where the surface current velocity was approximately 0.40 m/sec, and bottom current velocity slightly less. Preferred substrate was cobble/gravel at depths  $\leq$  51 cm. These measurements agree with previous habitat characterizations for this species (Burkhead 1983; Simonson and Neves 1986). There appeared to be no predominate preference for location within a riffle or for the size of the riffle. All of the suitable habitat in the surveyed stretch occurred in eastward-flowing segments of the river channel.

Table 2 provides a general profile of habitat for the surveyed stretch of river. Habitat suitable for the Roanoke logperch was confined to a 2,500-foot segment of the river beginning about 0.5 mile downstream of the Niagara powerhouse (Figure 2: Zones 4-8), and totalling approximately 21,500 ft<sup>2</sup>.

### Summary

A survey of the Roanoke River for 1 1/4 miles downstream of Niagara Hydroelectric Project on October 22, 1992, found ten specimens of the federally endangered Roanoke logperch (Percina rex) using snorkeling and electrofishing techniques. The logperch were most often observed on cobble/gravel riffles less than 51 cm in depth, with current velocities near 0.40 m/sec. The logperch appeared to be confined to a 2,500-foot segment of the river that begins about 0.5 mile downstream of the Niagara powerhouse, and which contains approximately 21,500 ft<sup>2</sup> of available logperch habitat. Based on this survey and the documented habitat specificity of this species, the Roanoke logperch is not likely to populate areas within the two-mile reach of the Roanoke River between Niagara and the head of the Smith Mountain Lake pool that are outside of the 2,500-foot segment where they were collected.



### References Cited

Burkhead, N. M. 1983. Ecological studies of two potentially threatened fishes (the orangefin madtom, Noturus gilberti, and the Roanoke logperch, Percina rex) endemic to the Roanoke River drainage. Report prep. for U.S. Army Corps of Eng., Wilmington Dist., Wilmington, N.C.

Simonson, T.D., and R. J. Neves. 1986. A status survey of the orangefin madtom (Noturus gilberti) and Roanoke logperch (Percina rex). Report prep. for Virginia Comm. Game Inland Fish., Richmond.

FIGURES AND TABLES

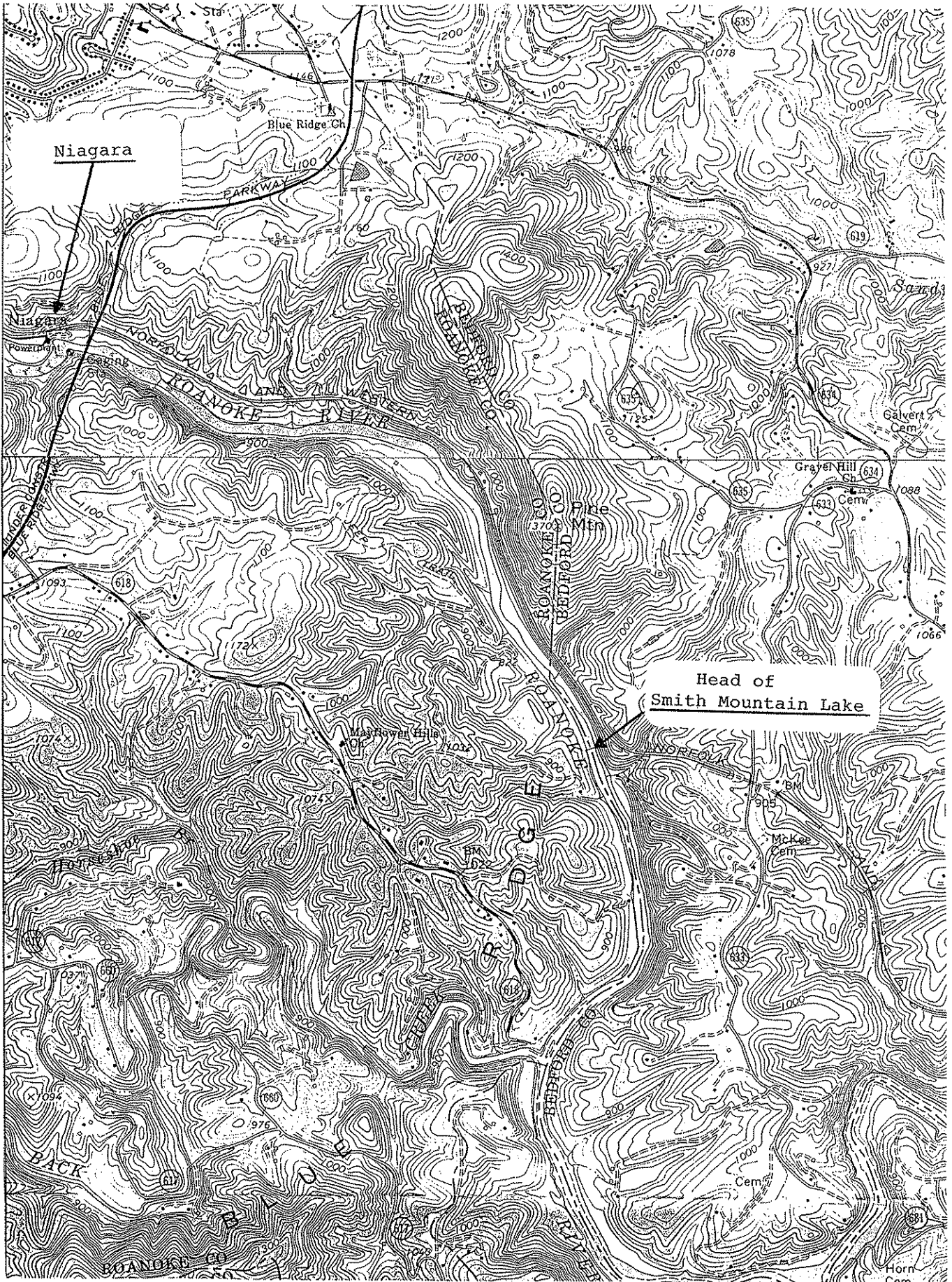


Figure 1

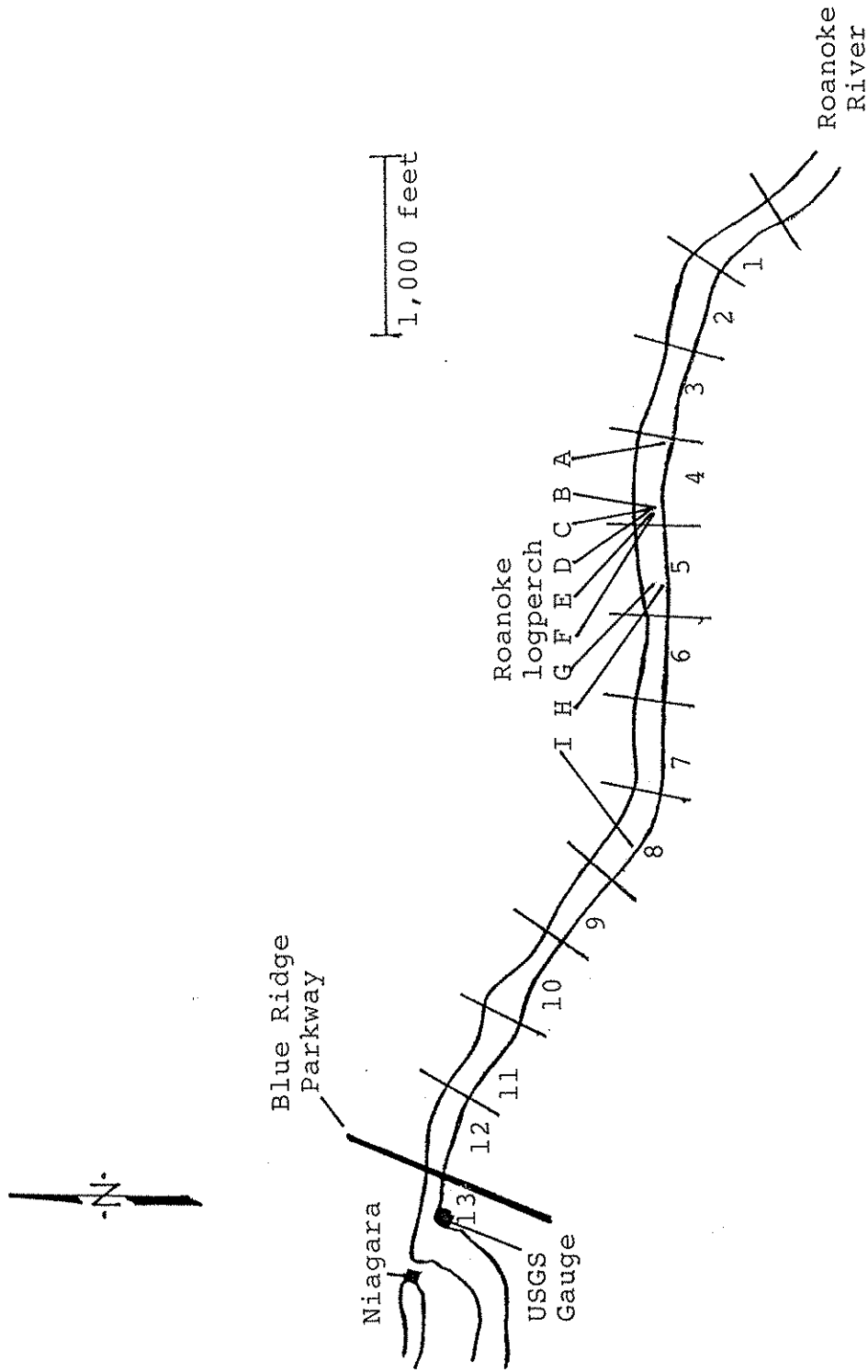


Figure 2  
 Location of survey zones and Roanoke logperch observations,  
 October 22, 1992

Table 1. Habitat measurements at Roanoke logperch collection locations (see Figure 2).

Logperch*	Water Temperature(C)	Current Velocity (Surface) (m/sec)	Current Velocity (Bottom) (m/sec)	Turbidity(NTU)	Depth(cm)	Direction of Flow**	Substrate	Similar Habitat at Capture Location(m <sup>2</sup> )
A	12.6	0.38	0.24	5.2	40	96°E, 105°ESE	large cobble	20
B	12.6	0.40	0.10	5.2	20	90°E, 113°ESE	cobble/gravel	710
C	12.6	0.40	0.24	5.2	10	90°E, 113°ESE	cobble/gravel	710
D	12.6	0.41	0.34	5.2	10	90°E, 129°SE	cobble/gravel	710
E	12.6	0.35	0.21	5.2	10	90°E, 80°E	cobble/gravel	710
F	12.6	0.66	0.66	5.2	10	90°E, 95°E	cobble/gravel	710
G	12.7	0.18	0.30	5.2	40	85°E, 50°NE	cobble over bedrock	240
H	12.7	0.46	0.38	5.2	51	85°E, 75°ENE	cobble/sand over bedrock	240
I	13.5	0.60	0.63	9.7	9	112°ESE, 150°SSE	cobble over bedrock	50

\* see Figure 2 for capture location

\*\* Readings are: Channel orientation, current bearing at capture location

**Table 2.** General profile of habitat for the Roanoke River from Niagara Hydro downstream for a distance of 1.25 miles.

<u>Zone*</u>	<u>Photograph</u>	<u>Description of Habitat</u>	<u>Roanoke logperch Occurrence</u>
1	none	predominately pool	unlikely
2	none	predominately pool	unlikely
3	none	predominately pool	unlikely
4	#2	cobble/gravel riffles at upper and lower ends, shallow run in-between	six observed
5	#3	cobble over bedrock riffle at upper end, shallow run below	two observed, one collected
6	#4	shallow run, predominately bedrock	unlikely
7	#5	riffle and run of cobble over bedrock	possible in riffle
8	#6	riffle and run of cobble over bedrock	one observed
9	#7	riffle and deep pool, swift current, boulders and bedrock	unlikely
10	#8	swift, deep chute through boulders and bedrock	unlikely
11	#9	swift, deep chute through boulders and bedrock	unlikely
12	#10	deep run through boulders and bedrock	unlikely
13	#11	deep run through boulders and bedrock (project tailwaters)	unlikely

---

\* See Figure 2 for location

## Photographs

<u>No.</u>	<u>Description</u> *
1	Roanoke logperch collected by electrofishing, September 12, 1991
2	Roanoke River Survey Zone 4, looking upstream
3	Roanoke River Survey Zone 5, looking upstream
4	Roanoke River Survey Zone 6, looking upstream
5	Roanoke River Survey Zone 7, looking upstream
6	Roanoke River Survey Zone 8, looking upstream
7	Roanoke River Survey Zone 9, looking upstream
8	Roanoke River Survey Zone 10, looking downstream
9	Roanoke River Survey Zone 11, looking upstream
10	Roanoke River Survey Zone 12, looking downstream from the Blue Ridge Parkway
11	Roanoke River Survey Zone 13 (tailwaters), looking upstream from Blue Ridge Parkway

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\* See Figure 2 for location of survey zones

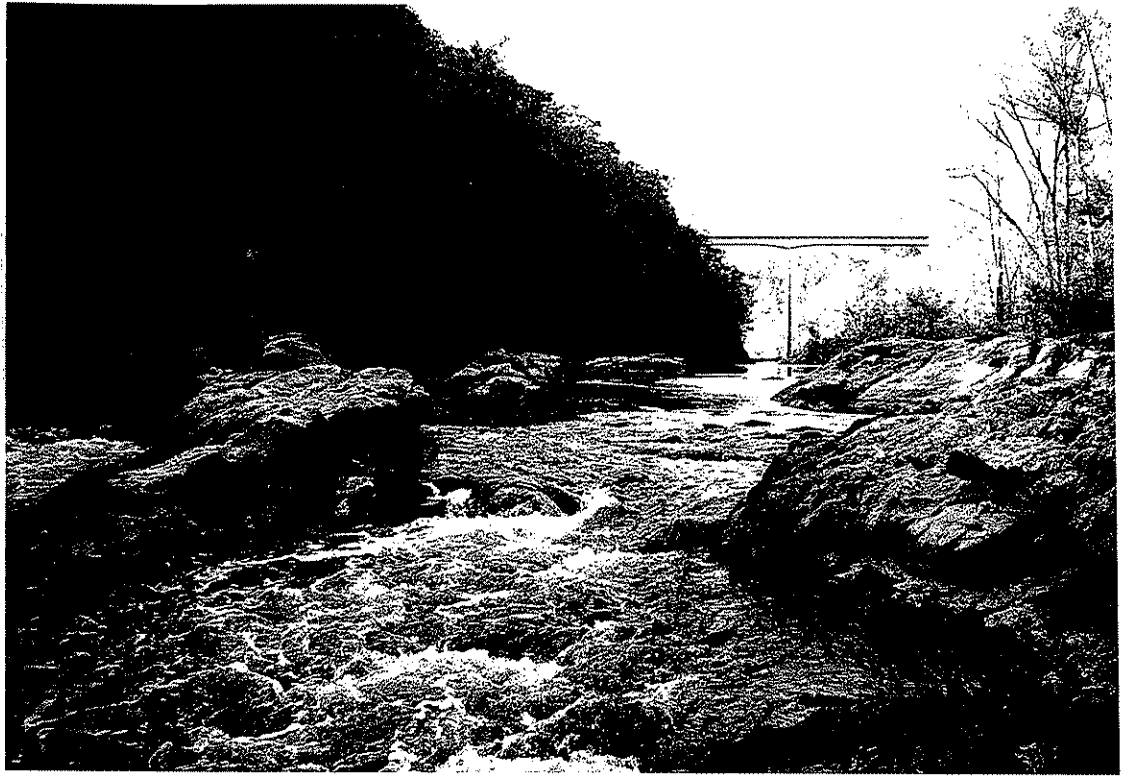




# 11 - Roanoke River Survey Zone 13 (tailwaters),  
looking upstream from Blue Ridge Parkway

3

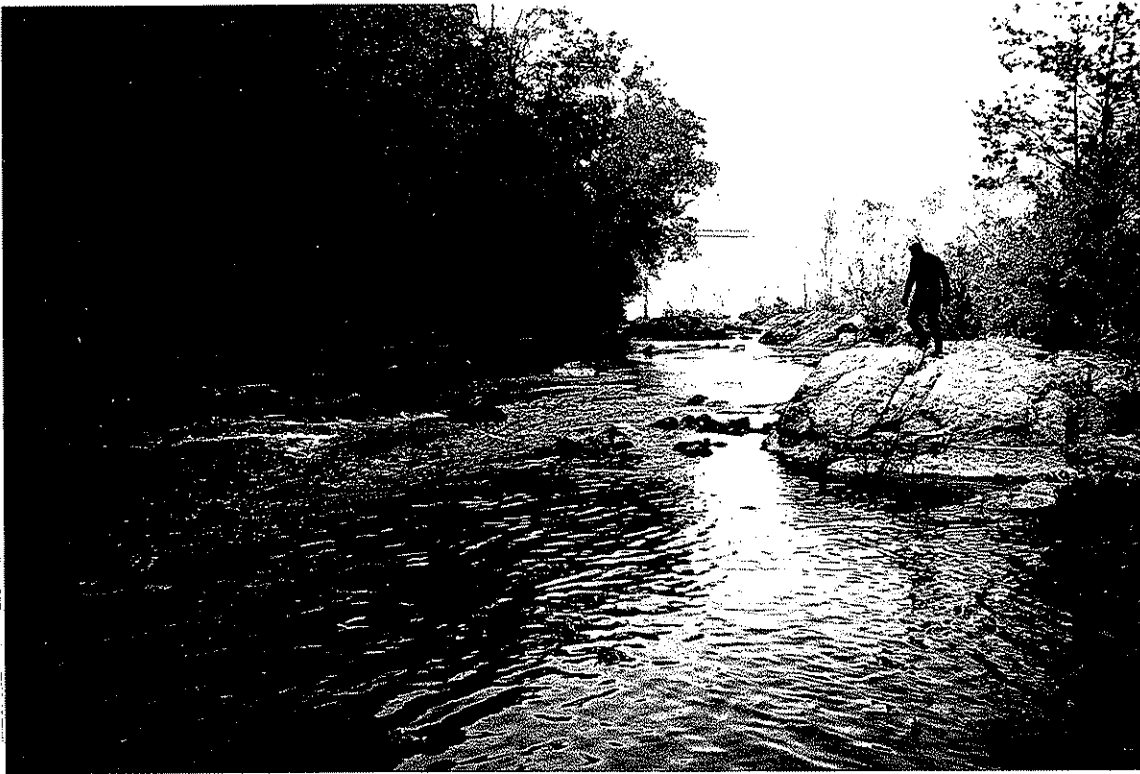
Roanoke River gorge from atop Parkway bridge (opposite of  
Niagara). Note people at Parkway overlook on right side  
of river.



# 9 - Roanoke River Survey Zone 11, looking upstream



# 10 - Roanoke River Survey Zone 12, looking downstream from the Blue Ridge Parkway



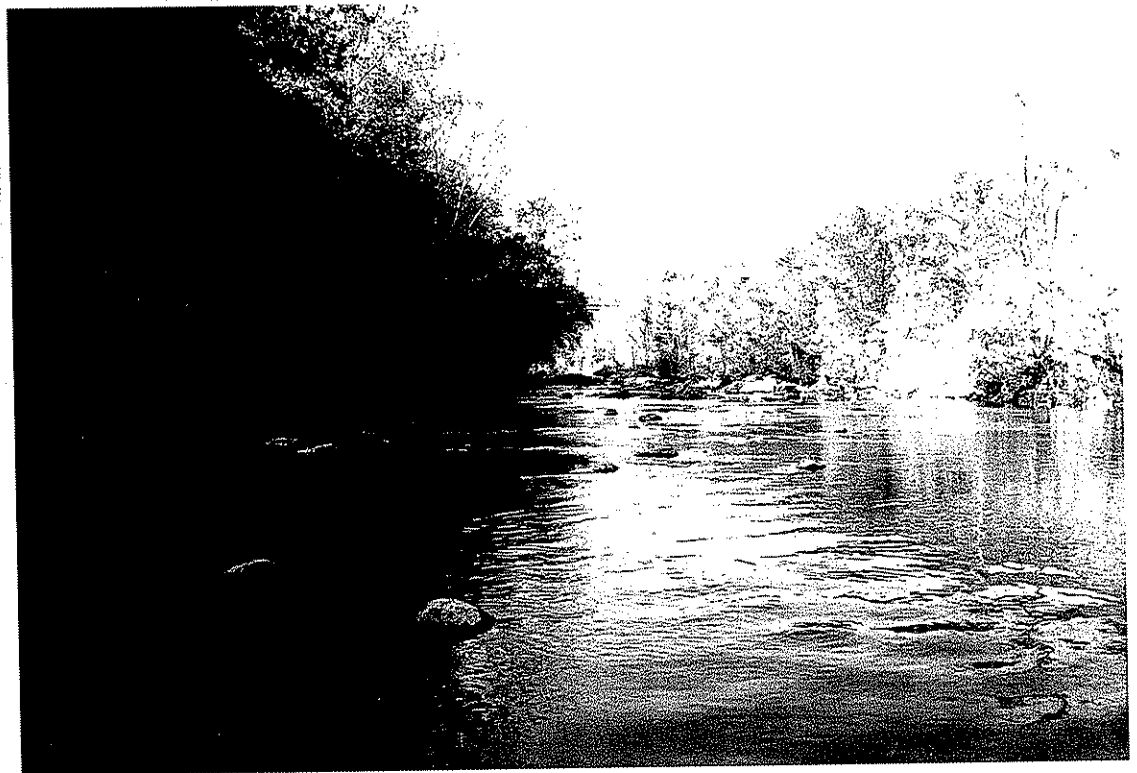
# 7 - Roanoke River Survey Zone 9, looking upstream



# 8 - Roanoke River Survey Zone 10, looking downstream



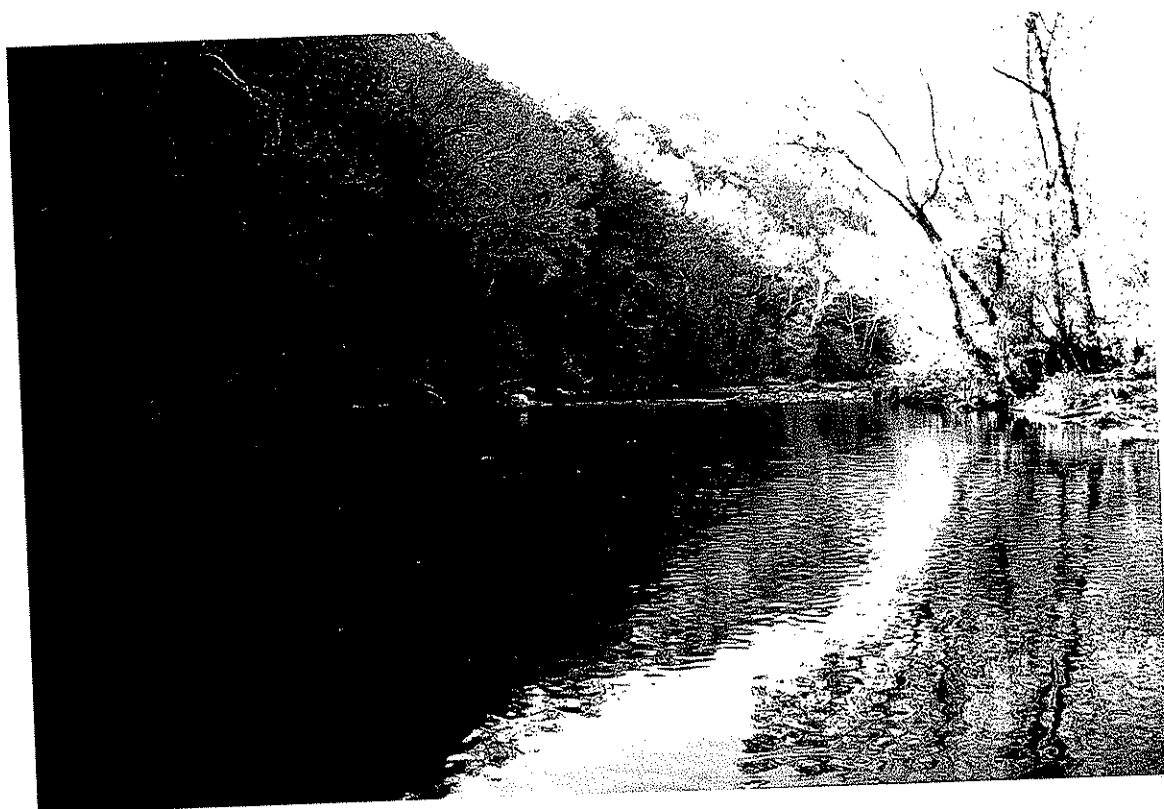
# 5 - Roanoke River Survey Zone 7, looking upstream



# 6 - Roanoke River Survey Zone 8, looking upstream



# 3 - Roanoke River Survey Zone 5, looking upstream



# 4 - Roanoke River Survey Zone 6, looking upstream



# 1 - Roanoke logperch collected by electrofishing,  
September 12, 1991



# 2 - Roanoke River Survey Zone 4, looking upstream

**APPENDIX**



STUDY PLAN

An Assessment of the Roanoke Logperch  
in the Roanoke River Downstream of  
Niagara Hydroelectric Project

Appalachian Power Company  
40 Franklin Road, SW  
Roanoke, Virginia 24011

and

American Electric Power Service Corporation  
1 Riverside Plaza  
Columbus, Ohio 43215

June 1992

## Introduction

An application for new license for Niagara Hydroelectric Project (FERC Project No. 2466) was submitted to the Federal Energy Regulatory Commission (FERC) in December 1991. Subsequently, the U.S. Fish and Wildlife Service (USFWS) submitted a Request for Additional Studies to the FERC that requested additional surveys to determine the distribution and abundance of the Roanoke logperch (Percina rex) in the approximately two-mile stretch of free-flowing Roanoke River from the Niagara powerhouse to the head of the Smith Mountain Lake pool (Fig. 1). This request was based on a survey conducted in 1991 by Appalachian Power Company (APCo) and American Electric Power Service Corporation (AEPSC), in cooperation with the Virginia Department of Game and Inland Fisheries (VDGIF), reported in the license application, that verified the presence of this federally-listed endangered species in this downstream segment of the river, thereby representing an extension of the known range of the Roanoke logperch. The FERC acted on this request in its May 22, 1992 letter to AEPSC, asking that a study be conducted to assess the population of Roanoke logperch downstream of the Niagara project. The following study plan was developed to include these objectives:

- (1) systematically survey the Roanoke River for the Roanoke logperch from the Niagara powerhouse to the head of the Smith Mountain Lake pool;
- (2) characterize the type and location of habitat being used by any collected logperch; and
- (3) estimate the amount and identify the location of available habitat in this river segment that is of the type used by Roanoke logperch.

## Methodology

Fish Sampling. AEPSC/APCo or their hired consultant will coordinate sampling with VDGIF and USFWS. The segment of the Roanoke River from the Niagara powerhouse to the head of the Smith Mountain Lake pool will be surveyed using a small boat during a low-flow period in late summer-early fall of 1992. All

riffle/run areas characterized by gravel or cobble substrate in the segment will be thoroughly sampled using backpack electrofishing equipment. The size (total length), condition, and location of all collected Roanoke logperch will be recorded, and all specimens will be returned to the river.

Habitat Characterization. At each location where a logperch is captured, the following data will be recorded: water temperature, surface and bottom current velocity, turbidity, depth, direction of flow, substrate composition (visual estimate), and an estimate of the total area of similar habitat surrounding the capture location. Additionally, a general profile of the location of riffle/run/pool habitats in the entire segment and the prevalent substrate type in each area will be prepared.

Study Schedule

<u>Activity</u>	<u>Deadline</u>
Complete field work	September 15, 1992
Final report submitted for agency review	September 30, 1992
Agency comments on report due	October 30, 1992
Final report and agency comments submitted to FERC	November 16, 1992

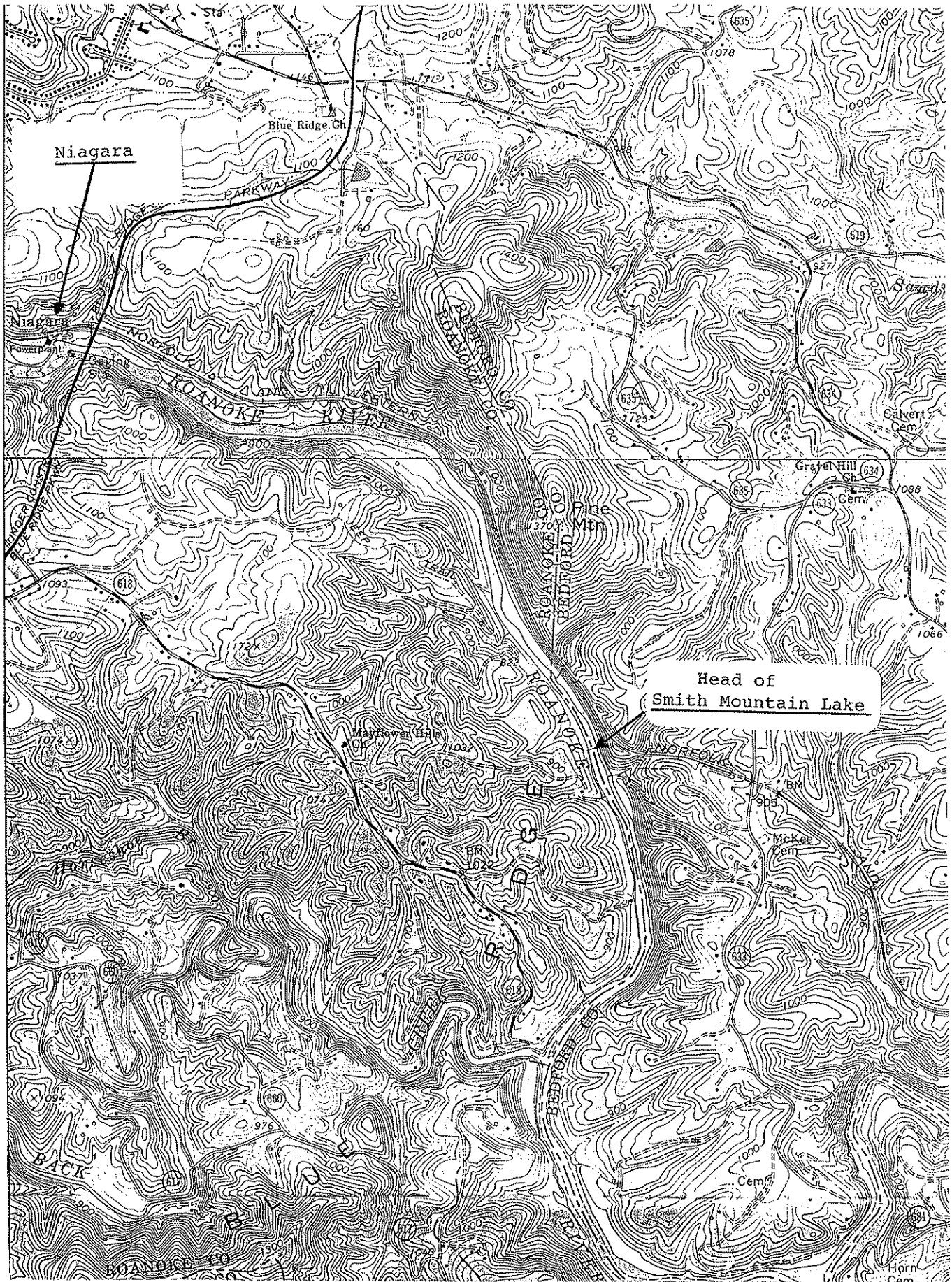


Figure 1

American Electric Power  
Service Corporation  
1 Riverside Plaza  
Columbus, OH 43215  
614 223 1000



TO LIST ATTACHED:

September 9, 1992

Dear Sir:

Re: Applachian Power Company  
Niagara Hydroelectric Project  
FERC Project No. 2466  
Roanoke Loggerch Survey and Visual Evaluation of Powerhouse  
Discharges

Attached is a summary of the activities and discussion that took place on August 27-28 at the referenced project. Representatives of Virginia Department of Game and Inland Fisheries, U.S. Fish and Wildlife Service, Appalachian Power Company, and American Electric Power Service Corporation were in attendance.

It is requested that those in attendance at the Niagara Project on August 27-28 notify me in writing of their concurrence with the attached summary or of any comments related to the summary. Please let me know at (614) 223-1249 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "John H. Van Hassel".

John H. Van Hassel  
Environmental Engineering Group

JHV/wfv/02/1E

Enclosure

cc: Dean Shumway - FERC

bcc: J. D. Zwart/J. L. Fariss  
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R. W. Harmon  
M. Karas

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Newton Corner, Massachusetts 02158



Appalachian Power Company  
Niagara Hydroelectric Project  
FERC No. 2466

Roanoke Logperch Survey and Visual Evaluation of  
Powerhouse Discharges

August 27-28, 1992

ATTENDEES:

Bud LaRoche (8/28 only)	Virginia Department of Game and Inland Fisheries (VDGIF)
Scott Smith	VDGIF
Bob Albrecht (8/27 only)	VDGIF
Robert Kelsey	U.S. Fish & Wildlife Service (USFWS)
Andy Moser	USFWS
Jerry Zwart	Appalachian Power Company (APCo)
John Van Hassel	American Electric Power Service Corporation (AEPSC)
Ken Wood	AEPSC

The meeting took place at the Niagara Hydroelectric Project to assess the population of the federally endangered Roanoke logperch downstream of the project, and to conduct visual evaluations of the adequacy of turbine discharge practices for protecting downstream aquatic habitat when project inflows are less than 100 cfs. These evaluations were to be performed in response to USFWS and VDGIF comments during second stage relicensing consultations, and to a subsequent request for additional information under Schedule A by the FERC.

1. Roanoke Logperch Survey

Sampling of Roanoke logperch was to have been conducted on August 27 by either snorkeling or electrofishing. A heavy rain shower in the upper Roanoke River watershed during the previous afternoon caused a large increase in suspended solids in the river as compared to the clear, low-flow conditions that had been present. The participants agreed that neither snorkeling nor electrofishing for logperch would be effective under these turbid conditions, which were likely to continue to be present in the river for at least a few days. The participants then decided to traverse the two-mile segment of river from the Niagara powerhouse downstream to the Smith Mountain Lake headwaters by canoe in order to obtain a preliminary assessment of available habitat where

Roanoke logperch could be expected to be found. This survey determined that the upper  $1\frac{1}{4}$  miles of the segment were predominately riffle-run habitat where logperch might be found, while the lower  $\frac{3}{4}$  mile of the free-flowing segment and an additional  $\frac{3}{4}$  mile of headwater habitat that was transversed was dominated by long, silty pools where logperch would not be expected. John Van Hassel of AEPSC proposed that the logperch survey should concentrate on the upper, riffle-run portion of the segment. Other attendees indicated that this approach would be acceptable.

The participants agreed that a representative of APCo would track river conditions, and notify the attendees when conditions for sampling logperch were present. This notification would include as much lead time as possible, but it was agreed among the participants that a lead time as short as a day or two could occur if only a brief period of optimum river conditions was expected.

## 2. Turbine Discharge Observations

Additional rainfall on August 28, when visual evaluations were to be conducted, caused the demonstration to be cancelled. Based on inservice performance tests of the new Unit 2, Jerry Zwart of APCo recommended that any proposals to autocycle a unit at project inflows below 100 cfs be abandoned, and that the project be operated to continuously pass flow either through the turbines or over the spillway.

Bud LaRoche of VDGIF suggested that this would be the preferred alternative, and that visual observation of the low-flow discharge would no longer be necessary. He indicated, however, that the demonstration probably still needs to be videotaped in order to satisfy the FERC request for additional studies. Mr. LaRoche indicated that his major remaining concern was that there be no downstream flow lag between unit shutdown and spill flow reaching the river below the powerhouse via the bypass, and suggested that a demonstration of how APCo will handle this situation would be useful. Jerry Zwart of APCo indicated that this could be done by specifying a minimum flow at the downstream Niagara gage of 50 cfs (10% MAF) or inflow, whichever is less, during this

transition period. This transition flow would be provided through the overflow sluice gate located at the main spillway. The participants agreed that this was the only remaining issue to be resolved regarding discharge at river flows below 100 cfs.

Robert Kelsey of USFWS then asked whether ramping of flows when going from two-unit operation to one-unit operation (assuming a 700 cfs discharge with two units versus 350 cfs with one unit) would be necessary to minimize any impact on downstream aquatic habitat. After some discussion, the participants agreed that the likelihood of any impact associated with this situation is very small, but that the issue probably needs to be evaluated. This will be accomplished when the low-flow evaluations are rescheduled.

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**Subject:** FW: Niagara Hydroelectric Project (FERC No. 2466) - RLP Larval Drift Study

**From:** Jon Studio <jastudio@edge-es.com>

**Sent:** Monday, March 29, 2021 4:04 PM

**To:** Angermeier, Paul <biota@vt.edu>

**Cc:** Huddleston, Misty <Misty.Huddleston@hdrinc.com>; John Spaeth <jpspaeth@edge-es.com>

**Subject:** Niagara Hydroelectric Project (FERC No. 2466) - RLP Larval Drift Study

**CAUTION: [EXTERNAL]** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dr. Angermeier,

We wanted to touch base with you and provide an update on the status of the Roanoke Logperch (RLP) Larval Drift Study. We learned from a recent status request that USFWS has the permit application under review for publication in the Federal Register for a required 30 day public comment period (regulation 50 CFR 13.11). The USFWS stated that they are experiencing delays in publishing notices in the Federal Register so they could not provide an estimated timeline for receiving the permit. Based on this information, unless something changes very soon, it is unlikely that the permit will be issued in time to get the project kicked-off on the original timeline. HDR/Edge/AEP are discussing internally how to proceed if the permit is not authorized in time to capitalize on some portion of the 2021 RLP spawning season. We can provide you with an update as we learn more on this issue.

In the meantime, we are moving forward with preparations in case things work out and we are able to initiate the Larval Drift Study. We hope to gain your perspective regarding the timing of RLP larval sampling events this spring for the Niagara Dam project (Project). Your insight will help us employ the methods within the current Project scope most effectively. Based on your previous suggestions, we hope to begin sampling the second week of April. Timing of larval drift is based on the time of year (dates) in numerous studies but we understand that each year may differ slightly. It is generally noted that spawning occurs between 12-14 degrees Celsius, and wondered if our sampling start date should take into account water temperatures? Further, we plan to work around rain/high-flow events whenever possible, but realize we will undoubtedly encounter these weather conditions at some point during the 10-week sampling period. While considering rain events, we plan to sample during the rising limb of the hydrograph if necessary. If your experience informs a more effective time to sample during high-flow events, please let us know. We appreciate your time and consideration.

Thanks,

**JON A. STUDIO**

Avon, Ohio

M: 440.413.4609

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**Subject:** FW: AEP Niagara Hydroelectric Project - Recreation Stakeholder Meeting Invitation

**From:** Yayac, Maggie

**Sent:** Monday, March 29, 2021 5:07 PM

**To:** rcaywood@roanokecountyva.gov; Lindsay Webb <LWEBB@roanokecountyva.gov>; Liz Belcher <LBELCHER@roanokecountyva.gov>; pete@roanoke.org; Anita McMillan <amcmillan@vintonva.gov>; riverdancer1943@gmail.com; Amanda McGee <amcgee@rvarc.org>; michael.clark@roanokeva.gov; dawn\_leonard@nps.gov; Wampler, Jennifer <jennifer.wampler@dcr.virginia.gov> <jennifer.wampler@dcr.virginia.gov>  
**Cc:** Elizabeth B Parcell <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>; Kulpa, Sarah <sarah.kulpa@hdrinc.com>; Frank Simms <fmsimms51@gmail.com>

**Subject:** AEP Niagara Hydroelectric Project - Recreation Stakeholder Meeting Invitation

Good evening,

As you are aware, as part of the relicensing effort for the Niagara Hydroelectric Project (FERC No. 2466), Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is conducting a Recreation Study. As discussed at the ISR Meeting on January 21, 2021, Appalachian plans to host a virtual stakeholder meeting with primary recreation stakeholders this spring.

The purpose of this meeting is to gather information about current and future Roanoke River-oriented recreation initiatives and projects in the vicinity of the Niagara Project. We would like to give each stakeholder group 15 minutes to present to Appalachian and other stakeholders: (1) what your group is currently working on, and (2) your interests in specific recreational improvements in and around the Niagara Project.

If you are interested in participating, please respond to Maggie Yayac ([maggie.yayac@hdrinc.com](mailto:maggie.yayac@hdrinc.com)) with your availability to attend the below dates and times. If your group would like to present during the meeting please let us know (and note your topic(s) of interest) so we can plan a more detailed agenda. Once we have a general consensus on availability and interest in presenting, we will send out a meeting invitation with a link to join the web conference.

Potential dates for the Niagara Project Recreation Stakeholder Meeting:

- Tuesday, April 20<sup>th</sup> from 2-4pm
- Thursday, April 22<sup>nd</sup> from 9-11am
- Wednesday April 28<sup>th</sup> from 9-11am

Please let me know if you have any questions or if anyone has been inadvertently left off this invitation list.

**Maggie Yayac**

*Regulatory Specialist*

**HDR**

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Via Electronic Filing

April 6, 2021

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, D.C. 20426

**Subject: Niagara Hydroelectric Project (FERC No. 2466-034)  
Response to Comments on the Initial Study Report**

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the run-of-river, 2.4-megawatt Niagara Hydroelectric Project (Project) (Project No. 2466), located on the Roanoke River in Roanoke County, Virginia. The Project is currently licensed by the Federal Energy Regulatory Commission (FERC or Commission). The Project underwent relicensing in the early 1990s and the current operating license for the Project expires on February 29, 2024. Accordingly, Appalachian is pursuing a subsequent license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5.

Pursuant to 18 CFR § 5.15(c), Appalachian filed the Initial Study Report (ISR) with the Commission on January 11, 2021. The ISR filing also included notification of the ISR Meeting date, time, and proposed agenda. As required by the ILP schedule, within 15 days of the ISR filing Appalachian held a virtual ISR Meeting via Webex from 10am to 3pm on Thursday, January 21, 2021. The ISR meeting summary was filed with FERC on February 5, 2021. Stakeholder comments on the ISR meeting summary were due by March 7, 2021.

The following parties provided written comments in response to Appalachian's filing of the ISR meeting summary: FERC staff, Roanoke County, United States Fish and Wildlife Service (USFWS or the Service), Roanoke Regional Partnership, Roanoke River Blueway Committee, Roanoke Valley Greenways, and the Virginia Department of Environmental Quality (VDEQ).

Appalachian is hereby providing responses to stakeholder comments received on the ISR, including general comments and requests as well as those that constitute a request for a modified

or new study.<sup>1</sup> Based on the information presented in the ISR and at the ISR meeting and provided by commenting entities in their responses, Appalachian does not believe that any modifications to existing studies or new studies are required. Appalachian has, however, made a good faith effort to accommodate reasonable requests, including extension of certain study activities into the 2021 field season, as explained in detail in Appalachian's responses below.

## **General**

### *Stakeholder Comments:*

FERC requests that in order to facilitate the National Environmental Policy Act (NEPA) analysis, Appalachian should file with the draft license application (DLA) the following: the geospatial data (e.g., exports from Global Positioning System (GPS) devices, or Geographic Information System (GIS) shapefiles), including the sampling locations, mesohabitat, substrate, and cover maps; shoreline habitat classifications; and any other GIS data layers that were created as part of the following studies: 1) Bypass Reach Flow and Aquatic Habitat Study, 2) Benthic Aquatic Resources Study, 3) Fish Community Study, 4) Water Quality Study, 5) Shoreline Stability Assessment Study, and 6) Wetlands, Riparian, and Littoral Habitat Characterization Study.

### *Appalachian's Response:*

Appalachian will submit applicable GIS data directly to FERC staff for the purposes described above in conjunction with the DLA, as available. (Because the DLA will be filed before the Updated Study Report (USR), for certain studies final geospatial data may not be available until and provided concurrently with the FLA).

## **Water Quality Study**

### *Stakeholder Comments:*

Due to concerns that water quality measurements collected during the 2020 study period may not be representative of water quality conditions at normal or below normal flow conditions, the VDEQ and USFWS recommended that bypass reach temperature and dissolved oxygen (DO) monitoring in 2021 be extended through October 2021 to ensure that water quality during low flow periods is captured.

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<sup>1</sup> Pursuant to section 5.15(d) of the Commission's regulations, any proposal to modify a required study must be accompanied by a showing of good cause, and must include a demonstration that: (1) approved studies were not conducted as provided for in the approved study plan; or (2) the study was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way. As specified in section 5.15(e), requests for new information gathering or studies must include a statement explaining: (1) any material change in law or regulations applicable to the information request; (2) why the goals and objectives of the approved study could not be met with the approved study methodology; (3) why the request was not made earlier; (4) significant changes in the project proposal or that significant new information material to the study objectives has become available; and (5) why the new study request satisfies the study criteria in section 5.9(b).



In addition, the USFWS recommends that the Water Quality Study be repeated in 2021 based on the following: (1) data was not collected or available for approximately 50% of the 2020 study period, (2) there was a 47% increase in average annual precipitation, thus the 2020 data was collected during an abnormally wet year, and (3) the Project was not operating for the last two months of the 2020 study, thus it is not possible to assess the impact of Project operations on water quality during this normally low flow period.

USFWS also recommends that Appalachian check and clean data loggers weekly during data collection to avoid the loss of water quality data from biofouling.

*Appalachian's Response:*

Appalachian agrees with VDEQ's and USFWS's statements that flows in the bypass reach during the 2020 water quality study season were not representative of typical or minimum bypass flow conditions at the Project. Appalachian believes this is not primarily due to river flows, but instead to the inoperability (i.e., held in constant open position) of the trash sluice gate and the extended powerhouse outage reported in the Preliminary Water Quality Study Report. Consistent with VDEQ's and USFWS's request for additional water quality data collection in the bypass reach in 2021, for the upcoming 2021 water quality study season, Appalachian proposes to reinstall two continuous temperature and DO data sondes in the bypass reach (one at the upstream monitoring location and the other at the downstream monitoring location) from July – September. Due to the effort and costs associated with extending the field sampling for an additional month relative to the value of the additional data collected to the overall Water Quality Study, Appalachian proposes to continue sampling through October if water temperatures do not appear to be decreasing by the end of September. Appalachian does not believe that the need for continued sampling in the bypass reach beyond September be based on flow conditions, unless the July – September sampling period fails to capture water quality conditions at the approximately required minimum bypass flow of 8 cfs and it is projected (based on Project operating conditions and weather forecasts) that bypass reach flows will decrease to this level in October. To coincide with this additional bypass reach data collection, Appalachian also proposes to reinstall a continuous temperature and DO data sonde in the tailrace to capture additional data during powerhouse operations.

Appalachian will check and clean the data sondes at approximately two-week intervals<sup>2</sup> and adjust accordingly depending on degree of biofouling observed in the field. Based on the 2020 data collection effort, biofouling was less prevalent at the non-reservoir monitoring locations. The existing plan to check and clean the data sondes at these locations at two-week intervals is based on the direct experiences of Appalachian's consultant with instrumentation in these locations in 2020 and takes into appropriate consideration the significant increase in study costs and efforts to perform this task on a weekly basis.

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<sup>2</sup> The term approximately is used here because of the potential for fieldwork to be shifted and rescheduled to accommodate site conditions and field personnel safety.

Except as noted in the paragraph below, Appalachian does not propose to collect additional water temperature, DO, pH, and specific conductivity data at the upstream and reservoir locations in 2021. Appalachian does not believe that doing so would significantly improve the understanding of water quality at these locations, or result in different conclusions than presented in the Preliminary Water Quality Study Report. To evaluate USFWS's comments, Appalachian's consultant conducted a review of water quality data collected at the U.S. Geological Survey (USGS) Roanoke River at Thirteenth Street Bridge gage (USGS 02055080), which is at the upstream end of the Niagara impoundment, to see how water quality parameters measured at the upstream Project locations in 2020 compare to those measured for inflow to the Project in previous years for which (continuous) water quality data is available. This review revealed that **baseflow and episodic significant precipitation events do not appear to impact water quality in the upstream reservoir locations**. Even during 2008, which is the third driest year on record<sup>3</sup>, Roanoke River water temperature and pH upstream of the Project met Virginia Class IV water quality standards. Specific conductivity concentrations recorded in 2008 were also consistent with concentrations measured during the 2020 study period. This indicates that even under very low flow conditions, water temperature, pH, and specific conductivity measurements upstream of the Project are similar to those collected by Appalachian in 2020, under higher prevailing baseflow conditions. DO data were not collected at the Thirteenth Street Bridge location in 2008; however, concentrations at this location during September 2019 ranged from 6.8 – 10.0 milligrams per liter (mg/l) under a monthly average flow of only 108.5 cubic feet per second (cfs), which was less than half the September 2020 monthly average flow of 256.4 cfs. DO concentrations and water temperatures measured at the Thirteenth Street Bridge gage were similar between September 2019 and 2020 indicating that lower project inflows do not necessarily equate to significant differences in water temperatures or DO concentrations.

Based on the results and conclusions presented in the Preliminary Water Quality Study Report and the historic flow and water quality data provided by the Thirteenth Street gage, water temperature, DO concentrations, and pH meet state water quality standards during periods of high and low Project inflows. Additional collection of continuous water quality data, which is largely redundant with that already being done [by others] at the Thirteenth Street gage, is neither warranted nor necessary to evaluate potential Project impacts on water quality.

As stated in the Preliminary Water Quality Study Report, water quality at the Project forebay monitoring location met Virginia Class IV water quality standards for temperature, DO, and pH during the entire 2020 study period. While the generating units were not operating during the last two months of the study period, this resulted in a worse-case scenario whereby 100 percent of the inflow to the Project was routed away from the powerhouse and into the bypass reach. The only significant decrease in DO concentrations observed during the study period occurred during the week immediately after the start of an unplanned outage which began on September 8, 2020 and

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<sup>3</sup> Based on flows recorded at the Roanoke River at Roanoke, VA gage (USGS 02055000) from 1900 – 2020. This gaging station is approximately 2.6 river miles upstream from the Thirteenth Street Bridge gage (USGS 02055080).

lasted through the end of the study period on November 10, 2020. During a more typical year when the units are operating, temperature and DO stratification in the forebay area would be minimized as flow is routed to the powerhouse. Because this “worse case” condition for water quality in the forebay was captured during the 2020 study season, Appalachian does not believe it necessary to repeat continuous water quality data collection at this location in 2021 and does not believe that the return on this effort with respect to informing the results of the Water Quality Study is commensurate with the additional effort and cost. Appalachian appreciates, however, stakeholders’ interests in confirming 2020 Water Quality Study results in the forebay location during the 2021 field season. Therefore, Appalachian proposes that during equipment checks and data downloads for the bypass reach and tailrace monitoring locations, Appalachian will also collect discrete water quality profile data (temperature, DO, pH, and specific conductivity) at the forebay monitoring location. Additionally, Appalachian proposes to reinstall a continuous temperature and DO data sonde in the tailrace that can be correlated with the Thirteenth Street data.

Because Appalachian is not proposing to reinstall the upstream and reservoir continuous monitoring locations in 2021, water quality data (temperature, DO, pH, and specific conductivity) recorded at the Thirteenth Street Bridge USGS gaging station and Tinker Creek above Glade Creek at Roanoke, VA (USGS 0205551614) monitoring location will be included in the USR to represent water quality for Project inflow.

## **Benthic Aquatic Resources**

### *Stakeholder Comments:*

USFWS notes that there is a large riffle at the bottom of the UNIO-Tailrace Survey Area that offered the first continuous area of stable gravel/cobble substrate and may represent the beginning of suitable mussel habitat that was not surveyed. To address this data gap, USFWS recommends that an additional 500 meters of the downstream Survey Area be established in this area of suitable habitat below the UNIO-Tailrace Survey Area and surveyed for freshwater mussels

### *Appalachian’s Response:*

During review of USFWS’s comment summarized above, it came to the attention of Appalachian and Appalachian’s consultants that the ISR figure illustrating the UNIO-Tailrace Survey Area did not accurately represent the area that was actually surveyed (instead portraying a relic shapefile created during the study planning process). Additionally, the ISR text provided an oversimplified summary of the survey effort completed in that location. Appalachian’s consultants have corrected these errors, and Attachment 1 to this filing provides figures illustrating the correct location and extent of the UNIO-Tailrace Survey Area that was evaluated during the 2020 field effort. As shown in these figures, the mussel survey for the UNIO-Tailrace Survey Area was initiated further downstream from the Blue Ridge Parkway Bridge, extended downstream for 500 meters, and covered the full extent delineated in the Revised Study Plan (RSP) methods and maps.

With respect to USFWS's request for expanded mussel survey, Appalachian notes the following:

- The selection of sites and proposed methodology identified in the RSP and completed during the 2020 field season were developed in consultation with specialty staff from the Virginia Department of Wildlife Resources (DWR).
- The UNIO-Tailrace Survey Area is already located well downstream of the Project boundary.
- Results of the 2020 Mussel Survey indicated that very low mussel density and diversity exists throughout the study area, a trend that was consistent above and below Niagara Dam and in Tinker Creek. The low density and diversity observed during the study is attributable to numerous confounding factors in the watershed, including but not limited to: (1) the high proportion of bedrock in the study reach; (2) the Roanoke River flows through the City of Roanoke before reaching Niagara Dam and is influenced by urban point source and non-point source impacts, and (3) the upstream watershed is also influenced by residential and agricultural land uses and runoff.
- The stretch of Roanoke River between the lower extent of the study area and the Smith Mountain Project downstream may offer additional small patches of potential mussel habitat. However, a portion of the area requested for further survey effort was already included in the 2020 survey, as shown in Attachment 1.

On the basis of the following, Appalachian does not propose to perform additional mussel survey as requested by USFWS. (1) The results of the 2020 Mussel Survey indicate mussel density and diversity of the Roanoke River near the Project is very low. (2) The downstream extent of the 2020 field sampling efforts was just over a mile downstream of the Niagara Dam. The requested expanded area is beyond the extent of hydraulic influence of Project operations. Appalachian also does not believe that results of additional survey in this downstream reach would meaningfully inform the development of license requirements for the run-of-river Niagara Project. (3) The 2020 survey was conducted in conformance with the approved Study Plan and included specific agency consultation regarding sampling locations and methods. The completed study fulfills the study objectives and did not result in any new information that is material to the study objectives and merits additional study.

## **Fish Community**

### *Stakeholder Comments:*

FERC requests a summary of length and weight information (e.g., size distributions) for each fish species collected during the backpack and electrofishing surveys (note: this request was made during the ISR meeting as well).

*Appalachian's Response:*

A summary of fish length and weight data by species and sampling methodology will be provided in the final Fish Community Study Report to be submitted with the USR.

*Stakeholder Comments:*

USFWS indicates that if it is not feasible to directly measure the intake velocity using an ADCP, they would recommend that the Licensee perform a 1-Dimensional (1-D) analysis, which would provide a more accurate estimate of intake velocities than the method used in the study. The 1-D analysis should calculate normal flow (not approach flow) and open-area velocity (also known as impingement velocity) as per the Service's Fish Passage Engineering Design Criteria (Criteria). They also request that Appalachian provide the calculations for review before using the velocities in the entrainment and impingement study.

Regarding the susceptibility of fish to impingement/entrainment at the Project based on their burst swim speeds, USFWS recommends that Appalachian address the fact that migratory fish species may be attracted to the intake and may not actively avoid the intake, which can lead to higher entrainment rates for migratory species than would be predicted by the current (entrainment) study. USFWS also recommends that the Licensee expand its analysis to compare swimming capability to the open-area velocity; the estimate of the open-area velocity is important since fish that contact an intake rack will experience a far greater velocity than the approach velocity (within several inches of the rack, fish will experience the open-area velocity per Criteria reference Plate 9-1). The open-area velocity is influenced by the blockages created by the structure of the rack and for typical intake racks, this translates to an open-area velocity approximately twice that of the approach velocity.

*Appalachian's Response:*

Appalachian and Appalachian's consultants appreciate USFWS's technical review and feedback on this study. In the experiences of Appalachian's consultant, approach velocities are typically used in desktop entrainment and impingement analyses and are compared to swim burst speeds of target fish species to determine their ability to escape velocities directly in front of the intake structure. As requested by USFWS, as part of the ongoing Fish Community Study, Appalachian's consultant will calculate open-area velocity at the intake structure trash rack and compare fish swim burst speeds to the open-area velocity, as fish that contact the trash racks would be exposed to an increased intake velocity on the trash rack bars. Corresponding assumptions, inputs, and results for both calculations will be presented in the final entrainment and impingement study report to be submitted with the USR.

*Stakeholder Comments:*

USFWS requests further clarification regarding whether the racks are continually cleaned/cleared of debris for optimal project operation and if debris cleaning is sufficient to prevent an effect on intake velocity.

*Appalachian's Response:*

Appalachian will present, in the USR, the requested additional description of operating protocol for cleaning the trash racks in front of the intake structure. Discussion in the USR will address the frequency and magnitude of the debris clearing process and the expected efficacy of the process at maintaining consistent intake velocities.

*Stakeholder Comments:*

USFWS requests that the following issue be addressed: Section 5.3 states that none of the habitats preferred by the Roanoke Logperch (RLP) are found in the vicinity of the intake, and therefore, the likelihood of entrainment of RLP is considered low. Because larvae of RLP drift for long distances downstream from their spawning habitats (Buckwalter et al. 2019), the potential for entrainment for RLP during the spawning season (March to June) would be higher than what is presented in Table 5-10 (Qualitative Monthly Turbine Entrainment Potential for Target Species).

*Appalachian's Response:*

Although larval RLP may drift large distances downstream from spawning sites, it is unknown if larval RLP in the Roanoke River drift a sufficient distance to become susceptible to entrainment at the Niagara Dam intake structure. In accordance with the approved RSP, an RLP Larval Drift Study is currently proposed and planned for the upcoming 2021 field season, pending issuance of a Section 10(a)(1)(A) permit from the USFWS's regional office to support the field study sampling efforts. An application for this permit was filed by Appalachian's consultant in December and discussed during the ISR meeting. Results of the study will then be used to refine the determination of RLP susceptibility to entrainment at the Niagara intake structure. In the event that the RLP Larval Drift Study is not able to be completed in 2021, the qualitative assessment of larval RLP susceptibility to entrainment will be revised from low to moderate susceptibility to provide a more conservative assessment of risk.

## **Bypass Reach Flow**

*Stakeholder Comments:*

USFWS notes that Section 4.6.3 of the RSP states that the 2-D model would be capable of simulating different flow release points to the bypassed reach including through the sluice gate and over the spillway crest. The Service requests clarification that this modeling will be performed as part of this study as stated in the RSP.

*Appalachian's Response:*

Appalachian will simulate bypass flow releases via the Obermeyer trash sluice gate and across the spillway crest to evaluate differences in depth and flow patterns in the bypass reach. If there are significant differences in depths and velocities that extend below the bedrock pool at the toe of the spillway, habitat modeling results will be developed and evaluated to determine if there are differences in the amount and location of potential available habitat.

While the hydraulic/habitat model will be capable of simulating minimum flows over the spillway crest, Appalachian has not assessed the feasibility or practicality of operating the Project in this manner (i.e., at a constantly higher reservoir level to deliverable minimum flows to the bypass reach via the overflow spillway during certain periods).

## **Recreation Study**

### **Study Plan Revision Requests**

#### *Stakeholder Comments:*

Due to the upcoming scheduled closing of a portion of the Roanoke River Trail and Overlook from March 2021 – March 2022 for rehabilitation of the Blue Ridge Parkway bridge over the Roanoke River, Roanoke County, Roanoke Regional Partnership, Roanoke Valley Greenways, and Roanoke River Blueway Committee request that the final assessment of the Recreation Study be amended to extend the window of field data collection through the fall of 2022.

#### *Appalachian's Response:*

Appalachian does not propose to continue the Recreation Study in 2022 (after the filing of the FLA) to accommodate the abovementioned Blue Ridge Parkway bridge closure. Construction at the Blue Ridge Parkway has been delayed a month already, and the National Park Service estimates construction will continue through Spring of 2022, so a full season of data collection may not even be feasible in 2022. Appalachian's consultant will complete the Recreation Use Documentation task to the best of their ability in 2021 at the Roanoke River Overlook and Trail (Non-Project facility) and expects and to conduct at least two on-site interviews before the closing. Appalachian has also collected relevant information about the Roanoke River Overlook and Trail through the online survey (which will continue through the 2021 study season) as well as anecdotal observations of recreation usage of this area made by Appalachian and Appalachian's consultants in 2020 and 2021.

Postponing the Recreation Use Documentation task (or even a portion of it) until 2022 would constrain Appalachian from completing the Recreation Study on time and in alignment with the ILP schedule. In summary, if planned construction at the Blue Ridge Parkway closes the Roanoke River Outlook and Trail, the Recreation Use Documentation task will not be completed at this location due to circumstances beyond Appalachian's control (i.e. COVID-19 in 2020 and Blue Ridge Parkway construction in 2021). However, the Recreation Use Documentation task will continue as planned to gather use data at the other Non-Project facilities listed in the RSP.

In the RSP, it was assumed that personnel obtaining visitor use data from the Roanoke River Overlook and Trail would also assess usage of the Project canoe portage since the put-in is located directly across the river and is visible from the end of the Roanoke River Trail. However, since Appalachian may not be able to access the Roanoke River Trail throughout the course of the 2021 study, Appalachian proposes to install a trail camera in the vicinity of the portage put-in location



to record any activity during the Recreation Use Documentation timeframe (May through October).

Based on collection of data and relevant information about the Roanoke River Trail through other study activities and stakeholder consultation, Appalachian does not believe that conducting the Recreation Use Documentation task of the Roanoke River Overlook and Trail (a Non-Project Recreation Facility) would meaningfully inform the development of license requirements for the Niagara Project.

*Stakeholder Comments:*

Roanoke Valley Greenways requested that the Roanoke River and Tinker Creek Greenways be included in the Recreation Facility Inventory, which would update the analysis to include bicycling and additional fishing and boating access.

The Roanoke Regional Partnership, Roanoke River Blueway Committee, and Roanoke County requested that the Roanoke River Greenway, Tinker Creek Greenway, Roanoke River Blueway, and Explore Park are added to the Recreation Facility Inventory as Non-Project Recreation Facilities.

*Appalachian's Response:*

Appalachian does not propose to expand or modify the Recreation Facility Inventory task of the Recreation Study. The Recreation Facility Inventory was completed in 2020 in full conformance with the approved RSP, with results provided in the ISR. Appalachian does not believe that the stakeholders' requests to expand this task to include additional Non-Project Recreation Facilities that lack a nexus to Project operation and effects meet the ILP criteria for a modified or additional study.

## **Recommended Recreation Improvements**

*Stakeholder Comments:*

The Roanoke River Blueway Committee, Roanoke County, and the Roanoke Regional Partnership encourage Appalachian to consider supporting development of a public access facility upstream (river-right) and adjacent to the Niagara reservoir that will provide vehicular parking. A river access at this location might reduce or obviate the need for any portage on river left if boaters could use a shuttle around the dam and put in again below the dam.

Roanoke County is interested in partnering with Appalachian to make these blueway improvements possibly on land located adjacent to the Project boundary that is owned by the Virginia Recreational Facilities Authority and under a lease for Explore Park. Roanoke River Blueway Committee concurs with this request and added that any proposals from this work should take into account the planned Roanoke River Greenway which is under development in this area.

Roanoke Valley Greenways has requested that Appalachian consider the following solutions to

improve recreational opportunities in the Project area: purchase property on river-right near Niagara Dam to provide parking and boating access, provide a portage around Niagara Dam on river-right, and provide Roanoke County with right-of-way for Roanoke River Greenway on river-right on AEP-owned land.

*Appalachian's Response:*

Appalachian appreciates the detailed comments provided by stakeholders and looks forward to additional consultation with recreation stakeholders in 2021 to inform Appalachian's licensing proposal and to identify opportunities for practical cooperation regarding regional recreation initiatives with a nexus to the Niagara Project.

*Stakeholder Comments:*

Roanoke River Blueway Committee indicated support for any proposed improvements to the existing portage. Possible improvements to consider include increased or more effective signage, and improvements to the take-out or put-in locations above and below the dam, respectively. Other ideas which should be included in the study of the portage include a phone that could be used to call for assistance and consideration of an access point on river right just above the dam to provide an alternate portage location.

*Appalachian's Response:*

Appalachian will continue to study use of the Project canoe portage in 2021 through installation of a trail camera, as described above. Also as previously noted, Appalachian looks forward to additional consultation with recreation stakeholders in 2021 to inform Appalachian's licensing proposal and to identify opportunities for practical cooperation regarding regional recreation initiatives with a nexus to the Niagara Project.

## **Recreation Flow Releases**

*Stakeholder Comments:*

Roanoke County and Roanoke Regional Partnership encourages Appalachian to continue evaluating the possibility of controlled releases for recreational purposes that would be advantageous for paddlers during the lower flow late-summer/early-fall months (i.e., July through October) along the Roanoke River downstream of the dam to Explore Park's Rutrough Point. At a minimum, Roanoke Regional Partnership request weekend releases during this period. The 2016 Roanoke County Explore Park Adventure Plan proposes development of an in-river kayak park downstream near the Smith Mountain Lake Project boundary and scheduled releases would enhance this. They also note Class 1 and II white water conditions exist downstream of the Niagara Dam.

*Appalachian's Response:*

Appalachian appreciates the additional information provided in these comments and looks forward to additional consultation with recreation and other resource stakeholders in 2021 to inform

Appalachian's licensing proposal.

### **Existing Recreation Facilities Map Updates**

Numerous comments were filed related to figures presented in the Preliminary Recreation Study Report. Appalachian has proactively updated the Existing Recreation facilities map where feasible, and a revised version of this map with the below noted revisions is provided in Attachment 2.

#### *Stakeholder Comments:*

Roanoke County and the Roanoke River Blueway Committee request that the Rutrough Road Canoe/Kayak Ramp Non-Project facility name be updated to Rutrough Point.

#### *Appalachian's Response:*

The Existing Project-Related Recreation Facilities map has been updated to reflect Rutrough Point. Appalachian will use this naming convention in the USR as well.

#### *Stakeholder Comments:*

Roanoke County, Roanoke River Blueway Committee, and Roanoke Regional Partnership request updates to the Existing Project-Related Recreation Facilities map.

#### *Appalachian's Response:*

Appalachian has updated the Existing Project-Related Recreation Facilities map to include the following requests:

- Added the Tinker Creek Greenway Bridge and the Roanoke River Greenway.
- Added a portage location at the Bennington trailhead.
- Moved the Niagara Portage canoe access closer to the Blue Ridge Parkway.
- Appalachian has to the best of their ability aligned the parcel and recreation facility data publicly available and requested by the stakeholders into the Existing Project-Related Recreation Facilities map. If the stakeholders have a GIS file with more specific details requested that what is publicly available, please e-mail geospatial data or figures to Appalachian so the map can be more effectively updated.

Proposed recreational facilities have not been added to the map at this time (e.g., extensions of the greenway) as the map is intended to illustrate existing recreation facilities around the Study Area (Attachment 2). Garden City Greenway was not added to the map, as it is far upstream and outside of the Study Area.

### **Debris and Trash**

#### *Stakeholder Comments:*

Roanoke County, Roanoke Regional Partnership, and Roanoke Valley Greenways encourage

Appalachian to continue evaluating trash and debris removal alternatives; Roanoke Valley Greenways also recommends that Appalachian consider removing trash at the dam or having a small trash barge on the reservoir.

*Appalachian's Response:*

Appalachian supports educational outreach and trash cleanup on the Roanoke River and routinely removes large debris at the intake such as tires. Appalachian appreciates the additional information provided in these comments and looks forward to additional consultation with stakeholders in 2021 to inform Appalachian's licensing proposal and to identify opportunities for practical cooperation, including educational outreach, trash cleanups within the Roanoke River watershed, and removal of large debris (e.g., tires) at the Project intake.

Appalachian sincerely appreciates the detailed comments provided by relicensing stakeholders and has put careful consideration into the proposals and commitments presented in this response. If there are any questions regarding this filing, please do not hesitate to contact me at (614) 716-2240 or [jmmagalski@aep.com](mailto:jmmagalski@aep.com).

Sincerely,



Jonathan M. Magalski  
Environmental Specialist Consultant  
American Electric Power Services Corporation, Environmental Services

**Attachments**

- Attachment 1 – Benthic Aquatic Resources Study Figures
- Attachment 2 – Existing Recreation Facilities Map

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Liz Parcell (AEP)

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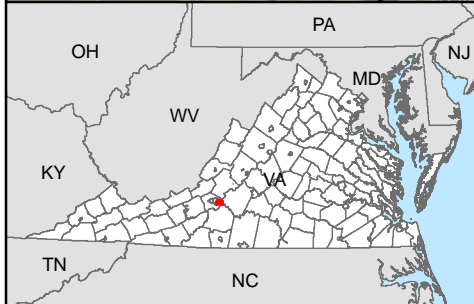
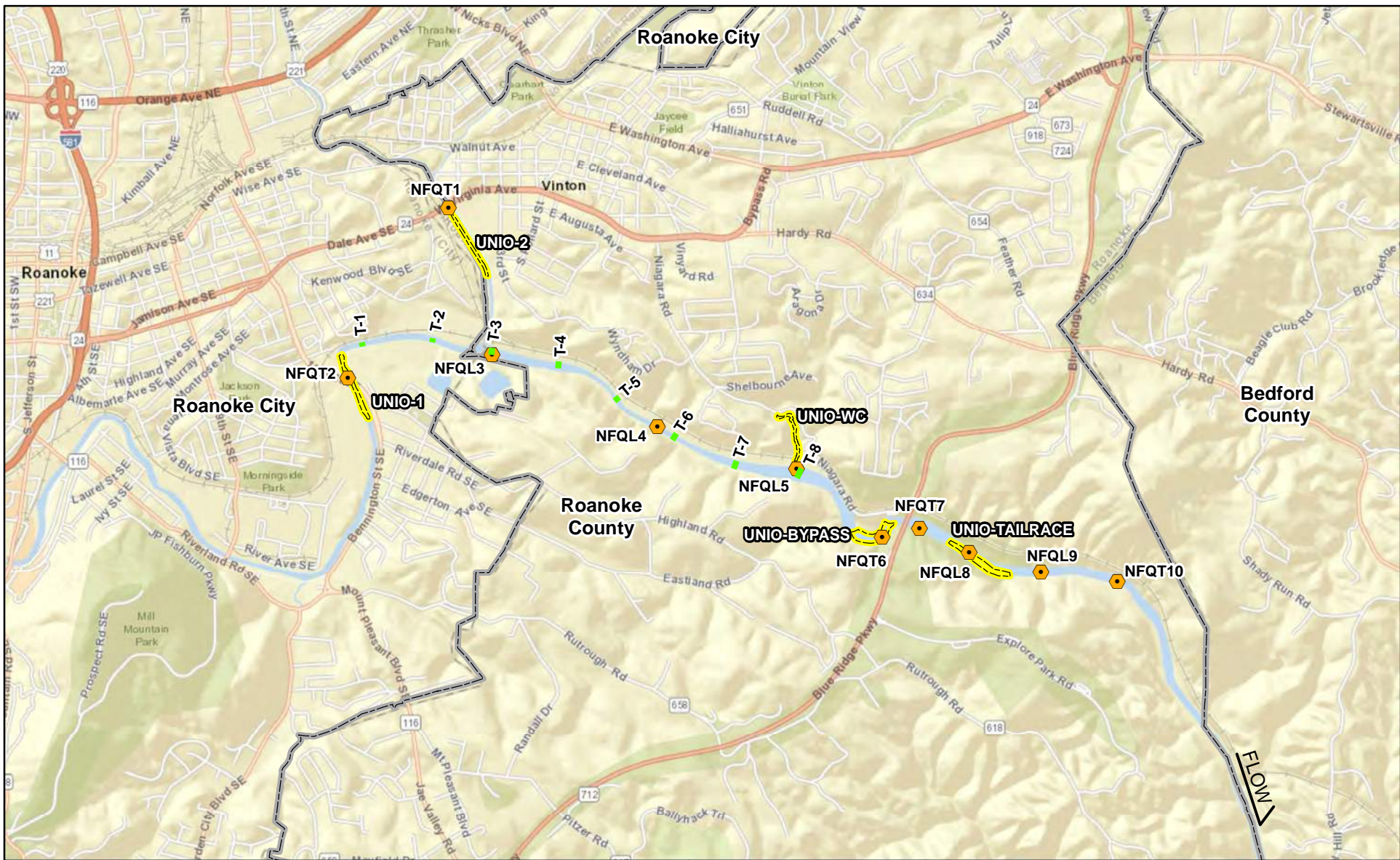
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# Attachment 1

Benthic Aquatic  
Resources Study  
Figures

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**Legend**

- Macroinvertebrate Sample Location
- Mussel Survey Transect
- Mussel Survey Area
- County Boundary

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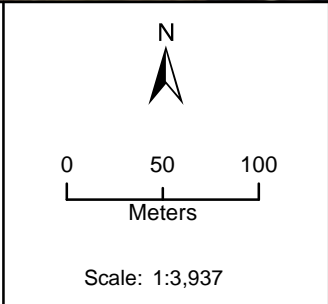
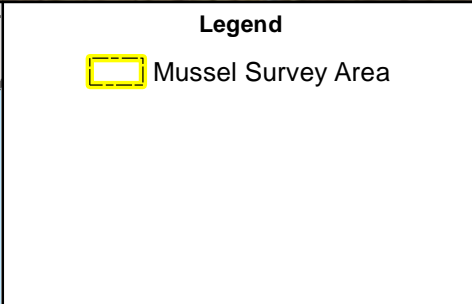
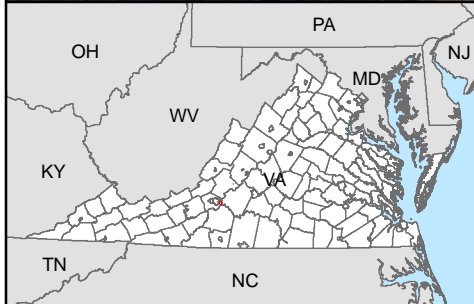
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**American Electric Power**  
**Niagara Dam Benthic Aquatic Resource Study**  
 Figure 1

Overall Niagara project area including quantitative (NFQT) and qualitative (NFQL) macroinvertebrate survey sites and transect (T) and abbreviated (UNIO) mussel survey sites on the Roanoke River in Roanoke County, Virginia





**American Electric Power**  
**Niagara Dam Benthic Aquatic Resource Study**  
 Figure 24  
 Abbreviated mussel survey extent in mixed habitat  
 in Roanoke County, Virginia

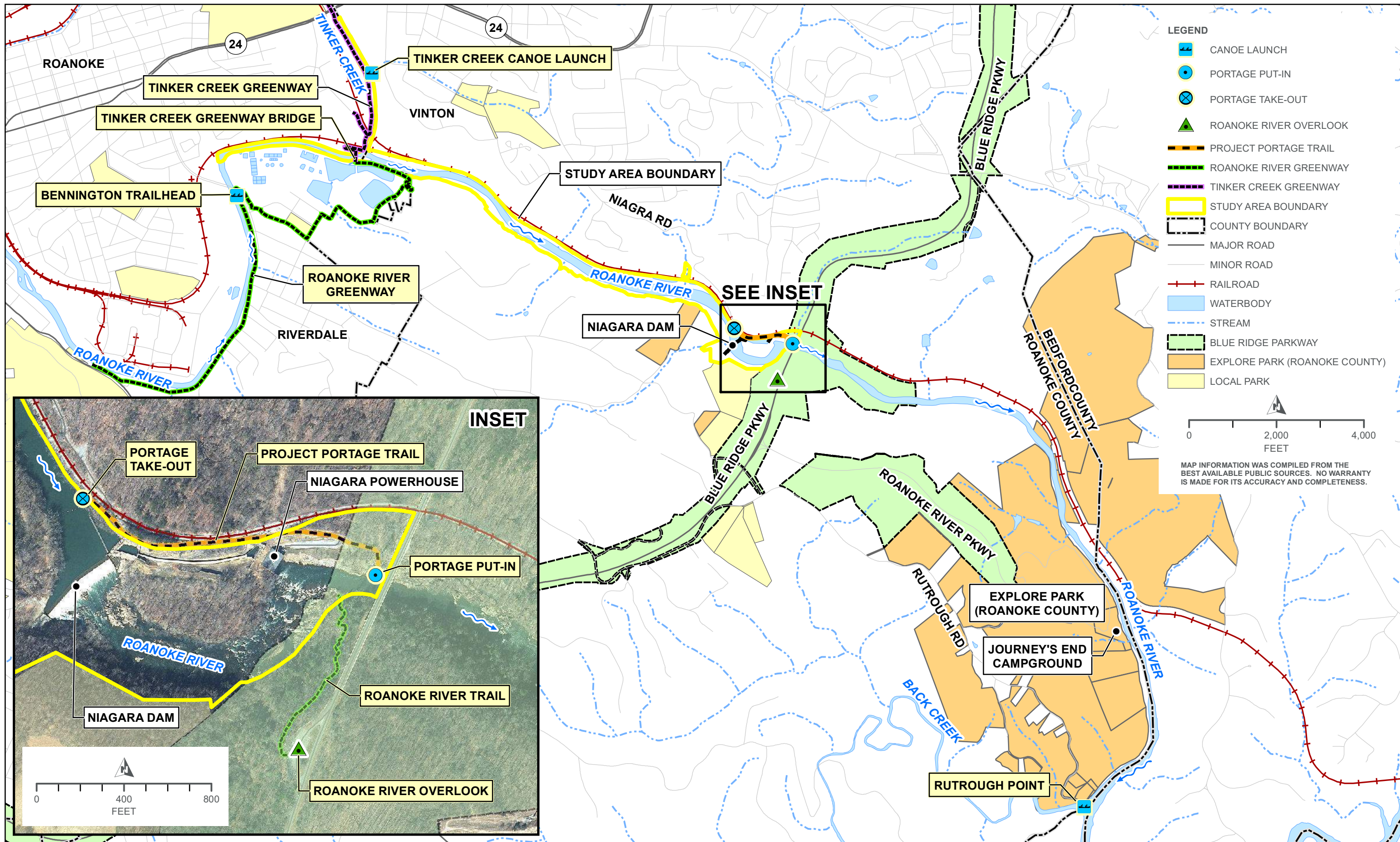


# Attachment 2

Existing Recreation  
Facilities Map



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**EXISTING PROJECT - RELATED RECREATION FACILITIES**

NIAGARA HYDROELECTRIC PROJECT (FERC NO. 2466)

ROANOKE COUNTY, VIRGINIA



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**Subject:** FW: Niagara Hydroelectric Project (VA) -- Filing of Response to Comments on the Initial Study Report

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**Subject:** Niagara Hydroelectric Project (VA) -- Filing of Response to Comments on the Initial Study Report

Niagara Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Niagara Hydroelectric Project (FERC No. 2466) (Project) located on the Roanoke River in Roanoke County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Pursuant to the ILP, Appalachian filed the Initial Study Report (ISR) for the Project on January 11, 2021, held a virtual ISR Meeting on January 21, 2021, and filed a summary of the ISR meeting with FERC on February 5, 2021. Several relicensing stakeholders provided written comments in response to the meeting summary. In accordance with 18 CFR 5.15(c), Appalachian has filed responses to stakeholder comments.

On behalf of Appalachian, we are notifying stakeholders of the availability of this response to comments filing. Appalachian encourages stakeholders to view the filing online at FERC's eLibrary at



[https://elibrary.ferc.gov/eLibrary/filelist?accession\\_num=20210406-5667](https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20210406-5667). Appalachian will also be adding this filing to the Project's public relicensing website (<http://www.aephydro.com/HydroPlant/Niagara>) in the coming days.

On behalf of Appalachian, thank you for your participation in this relicensing. Should you have any questions regarding this filing, please contact Jon Magalski with AEP at (614) 716-2240 or [jmmagalski@aep.com](mailto:jmmagalski@aep.com).

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