



FINAL LICENSE APPLICATION

Volume II of IV

Part 1 - Study Reports

Book 2 of 2

Niagara Hydroelectric
Project (FERC No. 2466)

February 28, 2022

Prepared by:



Prepared for:



An **AEP** Company

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Appendix E - Wetlands, Riparian, and Littoral Habitat Study Report

Niagara Hydroelectric Project
(FERC No. 2466)

February 28, 2022

Prepared by:



Prepared for:
Appalachian Power Company



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Acronyms

Appalachian or Licensee	Appalachian Power Company
CFR	Code of Federal Regulations
EAV	emergent aquatic vegetation
FERC or Commission	Federal Energy Regulatory Commission
GIS	Geographic Information System
HDR	HDR Engineering, Inc.
ILP	Integrated Licensing Process
ISR	Initial Study Report
m	meter
MW	megawatt
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PAD	Pre-Application Document
PEM	Palustrine emergent wetlands
PFO	Palustrine forested wetlands
Project	Niagara Hydroelectric Project
PUB	Palustrine unconsolidated bottom
RSP	Revised Study Plan
SAV	submerged aquatic vegetation
SPD	Study Plan Determination
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USR	Updated Study Report
VDEQ	Virginia Department of Environmental Quality
VDCR	Virginia Department of Conservation and Recreation
WetCAT	Wetland Conditional Assessment Tool

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1 Project Introduction and Background

Appalachian Power Company (Appalachian or Licensee) is the Licensee, owner, and operator of the run-of-river, 2.4-megawatt (MW) Niagara Hydroelectric Project (Project) (Federal Energy Regulatory Commission [FERC or Commission] Project No. 2466), located on the Roanoke River (river mile 355) in Roanoke County, Virginia.

The Project is currently licensed by the FERC under the authority granted to FERC by Congress through the Federal Power Act, 16 United States Code (USC) §791(a), et seq., to license and oversee the operation of non-federal hydroelectric projects on jurisdictional waters and/or federal land. 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. In accordance with FERC's regulations at 18 CFR §16.9(b), the licensee must file its final application for a new license with FERC no later than February 28, 2022.

In accordance with 18 CFR §5.11 of the Commission's regulations, 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. FERC issued the Study Plan Determination (SPD) on December 6, 2019.

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. 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. Appalachian conducted a virtual ISR Meeting on January 21, 2021 and filed the ISR Meeting summary with the Commission on February 5, 2021. Stakeholders provided written comments in response the Appalachian's filing of the ISR meeting summary; these comments were addressed in the Updated Study Report (USR), which was filed December 6, 2021. A USR meeting was held on December 14, 2021 and requests from stakeholders made during the meeting are addressed in this revised USR.

In accordance with 18 CFR §5.15, Appalachian has conducted studies as provided in the RSP as subsequently approved and modified by the FERC. This report describes the methods and results of the Wetlands, Riparian, and Littoral Habitat Study conducted in support of preparing an application for new license for the Project.

2 Study Goals and Objectives

The goal of the Wetlands, Riparian, and Littoral Habitat Characterization Study is to identify and characterize the existing wetlands, waterbodies, and riparian and littoral vegetative habitats (including emergent and submerged aquatic vegetation beds) in the study area. Specific study goals and objectives are to:

- Perform a desktop characterization using the U.S. Fish and Wildlife Service (USFWS) (2019) National Wetlands Inventory (NWI), Virginia Department of Environmental

Quality (VDEQ) Wetland Condition Assessment Tool (WetCAT) (VDEQ 2021), and other resources such as Geographic Information Systems (GIS) based topographic maps, hydrography, aerial imagery, and soil surveys to identify and describe, approximate, and classify wetlands and waterbodies (i.e., streams, creeks, rivers) within the study area (including upland, littoral, and riparian zones);

- Perform a field verification survey to confirm the location, dominant vegetative community and vegetation classification identified in the desktop survey and resulting maps;
- The field verification will include identification of littoral and instream vegetation in the study area to characterize the availability of littoral, submerged, and emergent vegetative habitat;
- Document wildlife utilizing or present within observed areas during the field verification;
- Using the results of the desktop characterization and field verification, develop a GIS-based map identifying wetlands, waterbodies, and riparian, littoral, and instream vegetative community composition according to the Cowardin Classification System (Cowardin et al. 1979). The map will also identify the location and species of any invasive aquatic vegetation identified in the literature review or during the field verification effort;
- Riparian communities will be classified according to the Virginia Department of Conservation and Recreation (VDCR) Natural Communities of Virginia of Ecological Groups and Community Types Third Approximation (Version 3.3); and
- Using the results of the desktop and field verification efforts, evaluate the potential for Project effects on wetlands, riparian, and littoral habitat in the study area, and wildlife species that utilize these habitats.

3 Study Area

The study area for this Wetlands, Riparian, and Littoral Habitat Characterization Study includes 129.6 acres of terrestrial and aquatic habitats shown on Figure 1 including the reservoir, terrestrial areas adjacent to the study area boundary at the normal full pond elevation of the Project reservoir, the bypass reach, and the riverine section of the Roanoke River and its tributary streams within the study area.

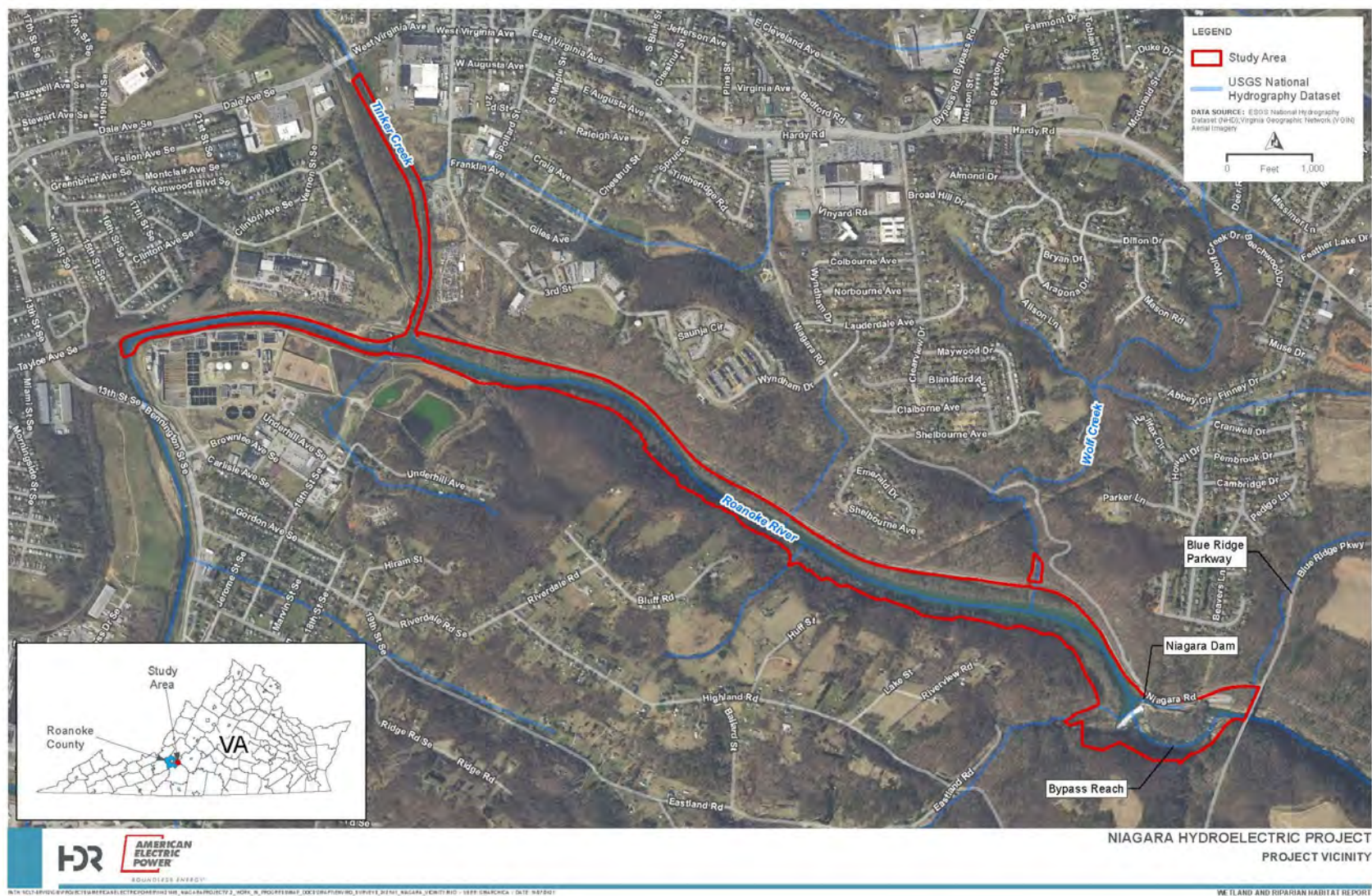


Figure 1. Study Area for Wetlands, Riparian, and Littoral Habitat Study

4 Background and Existing Information

Existing relevant and reasonably available information regarding wetlands in the Project vicinity is presented in Section 5.6 of the Pre-Application Document (PAD) (Appalachian 2019). Wetland, riparian, and littoral habitats within the study area are associated with the margin and near-shore areas of the impoundments. Wetlands are defined as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support... vegetation typically adapted for life in saturate soil conditions” (USACE 1987). The U.S. Army Corps of Engineers (USACE) and the VDEQ have jurisdiction over wetlands in Virginia. The littoral zone, in the context of a large river system, is the habitat between approximately a half-meter of depth and the depth of light penetration (Wetzel 1975). Riparian habitats are areas found along waterways such as lakes, reservoirs, rivers, and streams (NRCS 1996).

4.1 Wetlands and Waterbodies

Due to the relatively steep terrain along much of the Project's shorelines of the Roanoke River and Tinker Creek, there are limited areas in which wetlands may occur within the study area and would likely be confined to floodplain areas. Two wetland and deepwater types are currently mapped by the NWI within the study area: palustrine wetlands and riverine systems as defined by Cowardin et al. (1979). Palustrine wetlands are non-tidal wetlands dominated by trees, shrubs, and/or persistent plants/mosses, generally representing marsh, swamp, and small ponds. According to the NWI, the Roanoke River extending approximately one mile upstream of Niagara Dam is currently classified as a palustrine wetland with an unconsolidated bottom, with “permanently flooded” and “diked/impounded” modifiers. In addition to this area, three emergent wetlands in the floodplain, and one forested wetland associated with a shallow area of the main channel of the Roanoke River may also occur within the study area. There are no other NWI-mapped wetlands associated with the Project.

The main channel of the Roanoke River upstream of the one-mile stretch above Niagara Dam and downstream of the dam is classified as lower perennial riverine system with an unconsolidated bottom. There are also several intermittent tributary streams and one perennial tributary stream within the study area.

4.2 Wetland, Riparian, and Littoral Vegetation and Wildlife

The shoreline and lands surrounding the Project reservoir are mostly forested and undeveloped, except for the CSX Railroad tracks and right-of-way along the northern streambank. Around the Project reservoir, the valley walls are covered with a mixture of deciduous hardwoods and conifers. Forest cover is generally oak-chestnut with many bare rock exposures. There is also a noteworthy percentage of pine and other types of cover, such as maple, hickory, hemlock, locust, dogwood, and basswood (Appalachian 1991).

Previous surveys indicated the presence of several low, forested areas, which, based on their location several feet above the reservoir level on well-drained soil, appeared to be bottomland or riparian forest rather than forested wetland. These riparian forests were found to cover a total of approximately 20 acres (Appalachian 1991).

The majority of riparian habitat within the study area is located within the Deciduous Forest, Mixed Forest, and Developed, Low Intensity cover types (USGS 2016). In the study area, discernible riparian vegetation is located along the Roanoke River and Tinker Creek. These areas typically support forests dominated by silver maple (*Acer saccharinum*), sycamore (*Platanus occidentalis*), black walnut (*Juglans nigra*), hackberry (*Celtis occidentalis*), American elm (*Ulmus americana*), and boxelder (*Acer negundo* var. *negundo*). Herb layers in mixed floodplains/riparian areas are usually very lush with nutrient-demanding, early-season species such as Virginia bluebells (*Mertensia virginica*), Canada waterleaf (*Hydrophyllum canadense*), wild ginger (*Asarum canadense* var. *canadense*), yellow trout-lily (*Erythronium americanum* ssp. *americanum*), large solomon's-seal (*Polygonatum biflorum* var. *commutatum*), and many others (VDCR 2021).

Littoral vegetation (submerged aquatic or emergent) in the Project waters has historically been limited to a few and rooted plant species tolerant of urban contamination from upstream (Appalachian 1991). Based on the NWI maps, a review of aerial photography of the study area, and field verification, potential littoral habitats for wildlife were identified in several locations: the upstream extent of the study area where the Roanoke River decreases in depth at the furthest upstream meander within the Project Boundary, near the confluence of the Roanoke River and Tinker Creek, and in the majority of the bypass reach.

The study area also supports a number of small mammals, avifauna, reptiles, and amphibians. Over 623 species were identified as potentially occurring within a three-mile radius of the Project per the Virginia Department of Wildlife Resources (formerly the Virginia Department of Game and Inland Fisheries) (VDGIF 2017). Section 5.5 of the PAD includes specific species known to occur in the general project vicinity. In the new license term, Appalachian expects to develop and implement a Terrestrial Resources Plan, in part for the protection of riparian forest habitat. A list of wildlife observed during the field assessment is provided in Attachment 1.

The VDCR maintains a list of invasive plant species found within the State (VDCR 2017). The list includes those species that pose a threat to Virginia's forests, marshes, wetlands, and waterways. They are ranked based on the level of threat they present to natural communities and species. There are close to 100 invasive plant species in Virginia (VDCR 2017).

5 Methodology

An initial desktop study was carried out to identify areas likely to contain wetlands, riparian, and littoral habitat and estimate the amount of each resource area. Wetland areas and streams identified in the desktop study were field-verified, but not formally delineated (i.e., no flagging or boundary marking). The study methods proposed by Appalachian outlined below provide adequate information to assess potential Project operations-related effects to wetlands, riparian, and littoral habitats in the study area.

5.1 Desktop Characterization of Wetland, and Riparian, and Littoral Habitats

A desktop characterization of existing and potential wetlands and waterbodies, and existing riparian and littoral vegetation was performed. For the purposes of this study, the riparian zone was defined

as terrestrial areas 100 feet from the shoreline (VDCR 2006) or to the study area boundary, whichever was closer. The littoral zone was defined as the shallow shoreline area of the Roanoke River along the stream bank and within shallow portions of the bypass reach. The littoral zone also includes instream emergent and/or submerged aquatic vegetation beds.

Information sources included the USFWS NWI, the VDEQ Wetland Condition Assessment Tool (WetCAT) (VDEQ 2021), U.S. Geological Survey (USGS) topographic maps and National Hydrography Dataset (NHD), elevation data, and Natural Resources Conservation Service (NRCS) soil surveys. The VDEQ WetCAT was used to determine NWI habitat condition within the study area (VDEQ 2021). WetCAT scores wetland types based on the habitat and water quality stressors associated with surrounding land use types; classifications include slightly stressed, somewhat stressed, somewhat severely stressed, and severely stressed.

Data collected during the desktop study were used to create preliminary habitat characterization maps that were then used to facilitate the field verification efforts.

5.2 Field Verification

5.2.1 Wetlands and Waterbodies

Potential streams and wetland areas not confirmed previously (i.e., through prior licensing studies or other sources) were field-verified by HDR Engineering, Inc. (HDR) wetland scientists between June 22nd and June 24th, 2021. HDR performed field verification of wetlands and waterbodies according to the methodologies and guidance described in USACE 1987 Wetland Delineation Manual (USACE 1987) and USACE Eastern Mountains and Piedmont Regional Supplement (Version 2.0) (USACE 2012) and USACE Regulatory Guidance Letter 05-05 Ordinary High Water Mark Identification (USACE 2005). A visual assessment and field evaluation of wetland hydrology, hydrophytic vegetation, and hydric soils was performed to identify wetlands. Wetland cover types were classified according to dominance by trees (palustrine forested), herbaceous species (palustrine emergent), open water (palustrine unconsolidated bottom), or riverine rocky outcrop/shore and are displayed on Figure 2. Ordinary high water mark indicators including bed and banks, change in sediment texture, deposition, shelving, and change in vegetation were identified in the field to assess the presence of non-wetland waterbodies and streams.

Wetland scientists used hand-held GPS units to estimate the boundaries of wetlands within the Study Area; however, wetlands and waterbodies boundaries were not formally delineated in the field (i.e., no flagging or boundary marking). For wetlands, once the approximate upland boundary of the resource was determined, field personnel identified the edges of the wetland habitat, creating a polygon. In some instances, it was determined that all or a portion of the wetland observed in the field was consistent with boundaries depicted by on the USFWS NWI as well as topography contours. In these instances, the confirmed desktop information including USFWS NHD, USFWS NWI boundaries and topography contours were used to digitize stream and wetlands boundaries in GIS. Photo documentation of representative wetland habitats is provided in Attachment 2 and USACE Wetland Determination Data Sheets are included in Attachment 5.

5.2.2 Littoral Zone

The four main categories of aquatic plants include algae, emergent aquatic vegetation (EAV), submerged aquatic vegetation (SAV), and floating plants. Algae are simple plants without true roots, leaves, or flowers. They are found either free floating in water or attached to other plants, bottom sediments, rocks, or other solid structures. EAV grows along water body edges, with only short portions of their stems and roots are submerged. SAV grows in deeper water and usually are attached to the bottom. They remain underwater until flowers and seeds form out of the water. Floating plants are rooted, with much of their structure, especially leaves, floating on the surface. They can also be unattached, obtaining nutrients through small rootlets that dangle in the water.

A visual assessment was performed to characterize the availability of littoral zone aquatic habitats including emergent aquatic EAV and SAV beds within the bypass reach and reservoir. Spot-check based surveys were performed to characterize the availability of littoral zone aquatic habitats including emergent and submerged aquatic vegetation beds occurring within the study area. The species and general location of invasive aquatic vegetation and evident wildlife usage observed during the field assessment were also noted.

Transect-based surveys were performed to characterize the availability of littoral zone aquatic habitats within the Study area. Four transect lines were evaluated in the reservoir. Transects were oriented parallel to the shoreline in boat accessible areas, with transects distributed to represent both shorelines.

Each transect line was approximately 100 meters (m) in length and 1.0-m² areas spaced equally along the transect line at 10-m intervals were surveyed. The survey at each of the 10-m intervals consisted of a visual presence/absence assessment for emergent or visible submerged aquatic vegetation. A vegetation sampling throw rake was also deployed at each 10-m sample point on transect lines to capture any non-visible submerged aquatic vegetation.

5.2.3 Riparian Zone

Data from the desktop review were used to perform the riparian habitat field verification. To facilitate the field verification of the preliminary vegetative cover maps, the riparian habitat within each vegetative community type was characterized by recording the dominant species of vegetation at three strata (tree, sapling/shrub, and herb). HDR biologists used relevant reference materials including regional field guides and plant identification mobile apps to identify plants to genus and species level. Invasive species identified during the assessment were also recorded. Field data was compared to the general vegetative community types identified in the preliminary map (developed during the desktop study) to verify their accuracy. Documented differences in the vegetation were noted and this information was used to revise the map of riparian vegetative communities. Any general signs of wildlife within the riparian zone were noted in the field and listed in Attachment 1 (Wildlife Species Observed in Niagara Study Area). Vegetative communities documented in riparian zones were categorized using VDCR Natural Communities of Virginia Ecological Groups and Community Types -Third Approximation (Version 3.3) (VDCR 2021).

6 Study Results

6.1 Wetlands and Waterbodies

Wetland and waterbody cover types were classified according to Cowardin et. al (1979) and included palustrine (emergent, forested, and unconsolidated bottom) and riverine systems. Cowardin et al. (1979) classifications (map codes) are directly related to NWI classifications (palustrine emergent = freshwater emergent; palustrine forested = freshwater forested; unconsolidated bottom = freshwater pond). These features were verified in the field and are depicted on Figure 2 and listed in Table 1. Attachment 2 includes a photolog of representative wetland cover types. A description of the general study-related wetland information is provided below.

Approximately 61.36 acres of wetlands and waterbodies identified during the desktop study using the USFWS NWI database were verified, and an additional 12.45 acres of features were delineated in the field. A comparison of NWI-mapped and field verified wetlands is provided in Table 2. A total of 10.37 acres of wetlands were palustrine forested, and 3.33 acres were palustrine emergent, 25.94 were palustrine unconsolidated bottom, and 34.16 acres were riverine.

WetCAT data determined that there is one NWI-mapped wetland in the study area that is severely stressed near the mouth of Tinker Creek, and two wetlands that are somewhat severely stressed near the mouth of Wolf Creek. These wetlands may be considered stressed due to the flooding potential caused by the impounded Roanoke River. WetCAT scores for field verified wetlands are provided in Table 1.

Table 1. HDR Field Verified Wetlands and Waterbodies in Project Area

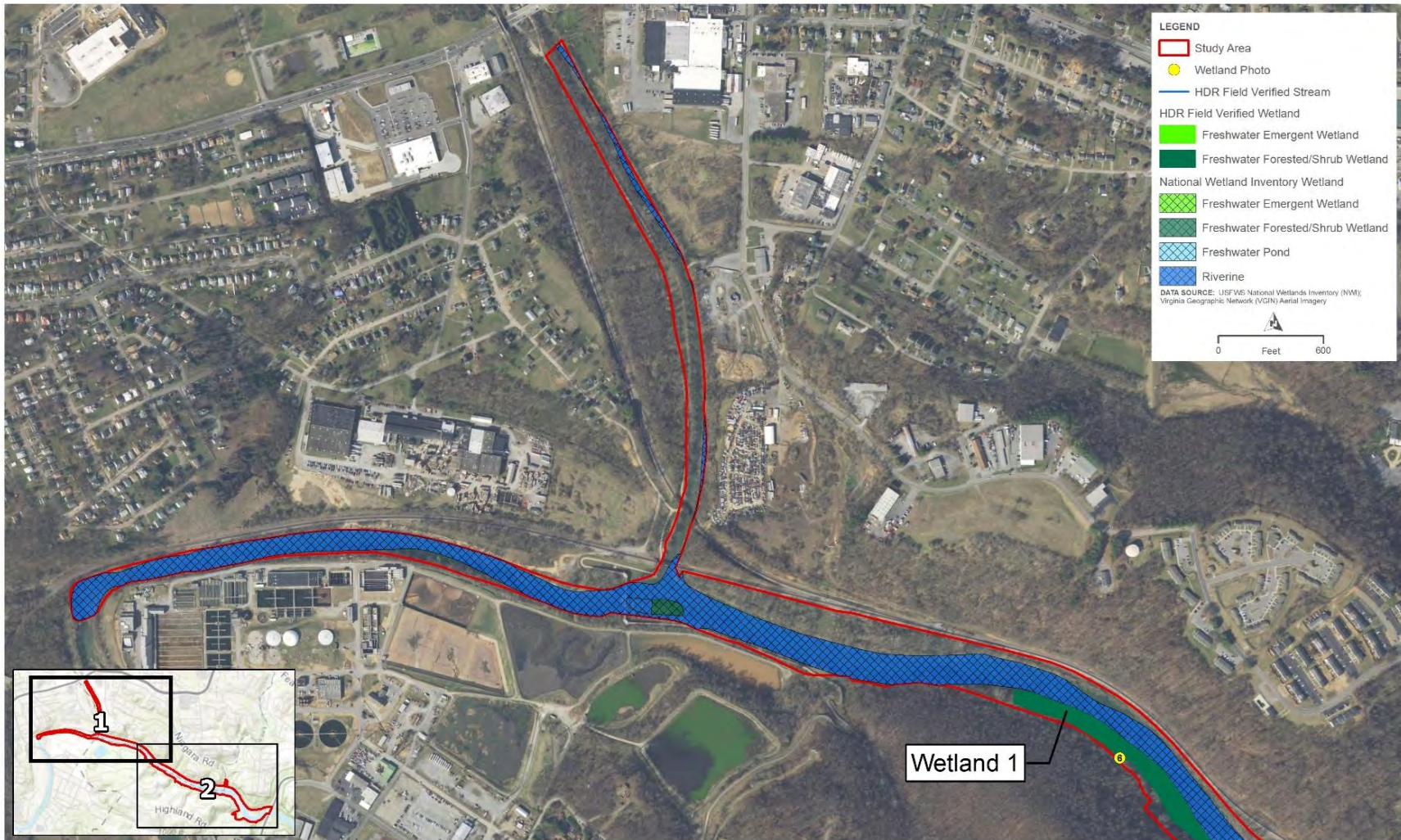
Feature ID	Cowardin Classification ¹	NWI Classification	Latitude (dd)	Longitude (dd)	Area (acres)	WetCat Level
Wetland 1	PFO1A	Freshwater forested	37.26356	-79.8955	3.5	N/A
Wetland 2	PFO1A	Freshwater forested	37.26109	-79.8902	2.1	N/A
Wetland 3	PFO1A	Freshwater forested	37.25898	-79.8878	1.28	N/A
Wetland 4	PFO1A	Freshwater forested	37.25774	-79.8833	0.23	N/A
Wetland 5	PEM1C	Freshwater emergent	37.25861	-79.8812	1.26	Somewhat Severely Stressed
Wetland 6	PEM1C	Freshwater emergent	37.25821	-79.8783	0.29	Somewhat Severely Stressed
Wetland 7	PFO1A	Freshwater forested	37.25549	-79.8772	2.93	N/A
Wetland 8	PEM1F	Freshwater emergent	37.25509	-79.8765	0.85	N/A
Stream 1	R5UBH	Riverine	37.25782	-79.8836	125 (linear feet)	N/A

¹PFO1A= (P) Palustrine, (FO) Forested, (1) Broad-Leaved Deciduous, (A) Temporarily Flooded

PEM1C= (P) Palustrine, (EM) Emergent, (1) Persistent, (C) Seasonally Flooded

PEM1F= (P) Palustrine, (EM) Emergent, (1) Persistent, (F) Semi permanently Flooded

R5UBH= (R) Riverine, (5) Unknown Perennial, (UB) Unconsolidated Bottom, (H) Permanently Flooded



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WETLAND AND RIPARIAN HABITAT

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WETLAND AND RIPARIAN HABITAT REPORT

Figure 2a. Identified Wetlands in the Study Area

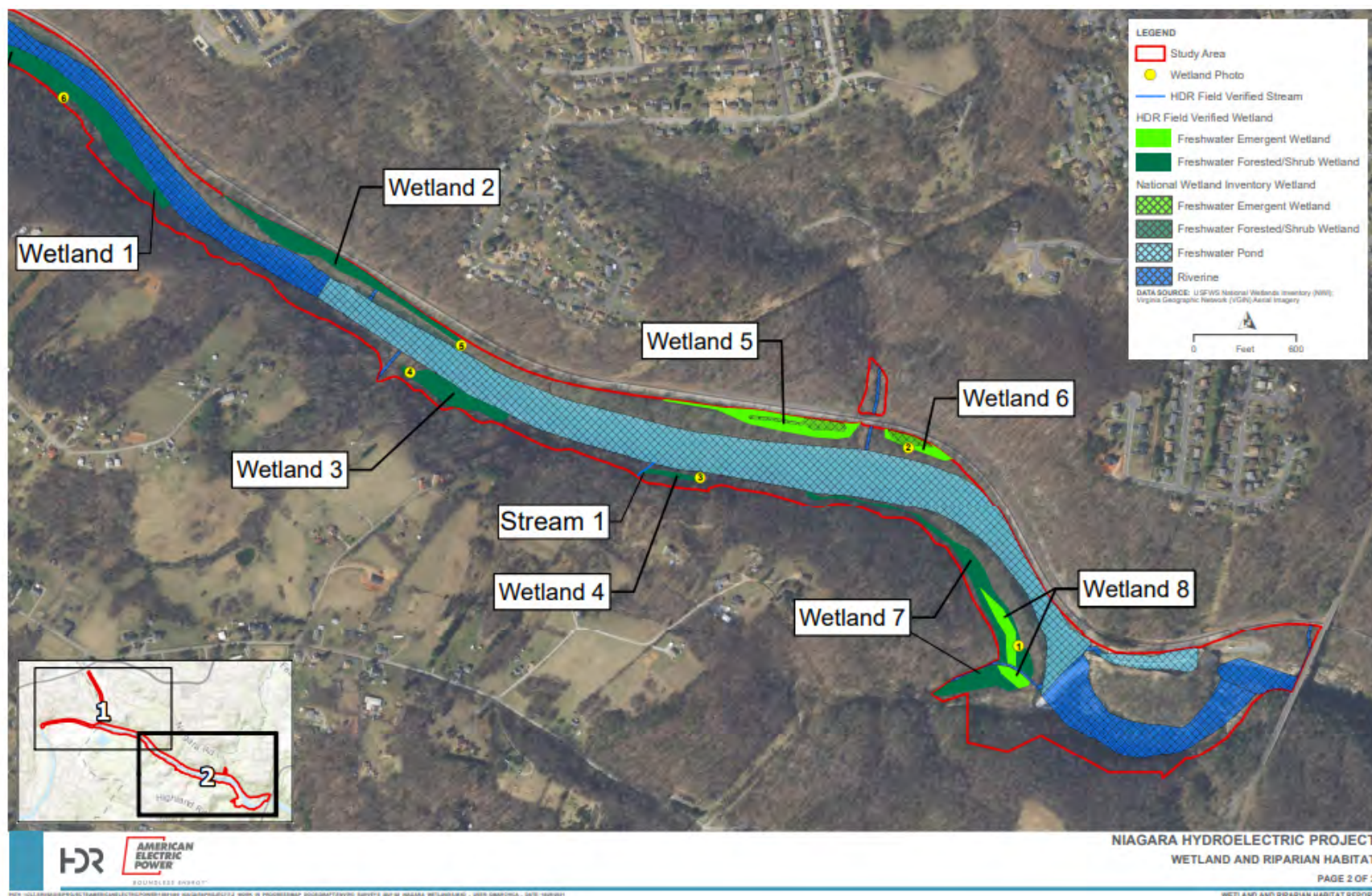


Figure 2b. Identified Wetlands in the Study Area

6.1.1 Palustrine Forested / Freshwater Forested Wetlands

Palustrine forested wetlands (PFO) (or Freshwater Forested Wetlands) within the study area occurred primarily on the higher floodplains and point bars of the Roanoke River. The vegetation found to be dominant in majority of these wetlands were American sycamore (*Platanus occidentalis*), box elder (*Acer negundo*), black walnut (*Juglans nigra*), silver maple (*Acer saccharinum*), and tulip poplar (*Liriodendron tulipifera*). Majority of understory was comprised of spicebush, (*Lindera benzoin*), green ash (*Fraxinus pennsylvanica*) Japanese stilt grass (*Microstegium vimineum*), jewelweed (*Impatiens capensis*), false nettle (*Boehmeria cylindrica*), and wood nettle (*Laportea canadensis*). Canopy composition was moderately diverse with a cover percentage ranging from 10 to 70 percent. Saturation and high water tables were common throughout these wetlands with some standing water, typically near the toe of slope extent. Flooding in these wetlands seemed to be infrequent due to the higher elevation relative to the channels. Soils consisted mainly of silt and clay with hydric soil indicators such as depleted matrix and redox depressions.

6.1.2 Palustrine Emergent / Freshwater Emergent Wetlands

Palustrine emergent wetlands (PEM) (or Freshwater Emergent Wetlands) occurred primarily as fringe wetlands and floodplain wetlands along the shorelines of the Roanoke River. The largest and most representative example of these wetlands occurs upstream of the Niagara Dam across the river from the boat take-out. The dominant herbaceous species for this wetland included Japanese stilt grass (*Microstegium viminium*), falsenettle (*Boehmeria cylindrica*), and maypop (*Passiflora incarnata*). The percent cover of vegetation in these wetlands ranged from 5 to 90 percent with low diversity and had relatively uniform cover. Saturation and high water tables were common throughout these wetlands with many had surface water, particularly at the boundary of the wetland and the stream. Substrate consisted mainly of silt and clay with hydric soil indicators such as depleted matrix and depleted below dark surface.

6.1.3 Palustrine Unconsolidated Bottom / Freshwater Pond

Palustrine unconsolidated bottom (PUB) (or Freshwater Pond) in the study area are permanently flooded habitats with less than 30 percent vegetative cover. This is a result of a portion of the Roanoke River being impounded. Unconsolidated bottoms are characterized by the lack of large stable surfaces for plant and animal attachment and are typically associated with limited wave and current activity. They are usually found in areas with lower energy and may be very unstable (Cowardin et al. 1979).

6.1.4 Riverine

Riverine habitats in the study area include the Roanoke River and associated tributaries. The Roanoke River is riverine, lower perennial on the upstream and downstream limits of the Project Area. The impounded portion of the river in between is considered riverine, lower perennial, with unconsolidated bottom and PUB according to the NWI. Tinker Creek is an upper perennial stream that flows into the Roanoke River. The habitat in Tinker Creek included several areas of scour and dominant vegetation consisted of American sycamore, boxelder, spicebush, and river oats. The dominant substrate included cobble to boulder sized rock along with bedrock. Wolf Creek and four unnamed tributaries are intermittent streambeds that flow into the Roanoke River. There are also three confluences where tributaries join the Roanoke River in which it is unknown whether they are

perennial streams. The flow ranged from high gradient in the intermittent streams, Tinker Creek and the upstream and downstream limit of the study area, to low-gradient in the impounded portion of the study area. Substrates within the impounded area were difficult to determine as depths made observations unattainable. In general, substrates of intermittent streams consisted of gravel and cobble and the streams contained eddy pools and swift currents that provided habitat for mussels and fish species.

Table 2. Wetlands in Project Area

Map Code	System	Subsystem	Class	Subclass	Water Regime/ Chemistry/Special Modifiers	NWI Mapped Wetlands (acres)	Additional Field Mapped Wetlands (acres)
PEM1C	Palustrine	--	Emergent	Persistent	Seasonally Flooded	0.76	1.55
PEM1F	Palustrine	--	Emergent	Persistent	Semi permanently Flooded	0.17	0.85
PFO1A	Palustrine	--	Forested	Broad-Leaved Deciduous	Temporarily Flooded	0.33	10.04
PUBHh	Palustrine (Roanoke River)	--	Unconsolidated Bottom	--	Permanently Flooded, Diked/Impounded	25.94	
R2RSA	Riverine (Roanoke River)	Lower Perennial	Rocky Shore	--	Temporarily Flooded	5.96	
R2UBH	Riverine (Roanoke River)	Lower Perennial	Unconsolidated Bottom	--	Permanently Flooded	26.46	
R2USA	Riverine (Unnamed trib to Roanoke River)	Lower Perennial	Unconsolidated Shore	--	Temporarily Flooded	0.24	
R3UBH	Riverine (Tinker Creek)	Upper Perennial	Unconsolidated Bottom	--	Permanently Flooded	0.80	
R4SBC	Riverine (Wolf Creek)	Intermittent	Streambed	--	Seasonally Flooded	0.60	
R5UBH	Riverine (Unnamed trib to Roanoke River)	Unknown Perennial	Unconsolidated Bottom	--	Permanently Flooded	0.09	0.01
					Total	61.36	12.45

6.2 Littoral Zone

The littoral zone contains seasonally flooded to intermittently exposed herbaceous vegetation of boulder and cobbly depositional bars, or less frequently bedrock exposures, on the shores and islands and in the bypass reach of the Roanoke River, though some were observed at the northern extent of the study area. The substrate of this zone consisted of angular bed rock and depositional bars of sand and organic material. Pools of surface water were present throughout the littoral zone with patchy vegetation growth in areas that were above water level.

As previously described, four transect lines were evaluated in the reservoir utilizing a throw rake. No SAVs were collected in any of the four transects.

Littoral zone vegetation contains water willow, various terrestrial plants, and algae. The majority of the terrestrial plants observed in the bypass reach were located on floating islands that were likely

formed from depositional bars in heavy flow events. Water willow was found to be the most abundant EAV throughout the bypass reach encompassing approximately 1.25 acres, or 2.1 percent of the submerged bottom. Water willow beds grew in low-flow pool areas close to the banks and between the rocky outcropping. Algae was sparse in the bypass reach and was primarily located in stagnant pools along the banks with low amounts of daily sunlight. Littoral vegetation beds are depicted on Figure 3 and representative photographs are included in Attachment 3.



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6.3 Riparian Zone

The riparian area consists of approximately 65 acres and is found along most of the shoreline of the Roanoke River (Figure 3). The riparian regions within the study area fall closely within the VDCR Piedmont/ Mountain Floodplain Forest and Swamps community type (VDCR 2021). Dominant vegetation in the over story includes butternut (*Juglans cinerea*), black walnut, catalpa (*Catalpa speciosa*), elm (*Ulmus* spp.), American sycamore, silver maple (*Acer saccharinum*), box elder, green ash, and swamp white oak (*Quercus bicolor*). The understory typically included white mulberry (*Morus alba*), pawpaw (*Asimina triloba*), elderberry (*Sambucus nigra*), and spicebush. The herbaceous vegetation consisted of jewelweed, Japanese stiltgrass, poison ivy (*Toxicodendron radicans*), river oats (*Chasmanthium latifolium*), and wild geranium (*Geranium maculatum*). Several invasive species were noted within the riparian areas. Tree of heaven, mimosa, and amur honeysuckle (*Lonicera maackii*) were typically seen along the banks in recently disturbed area with open sunlight upstream from the Niagara Dam. Japanese knotweed was found primarily in the forested riparian area of the bypass reach and in several spots along the banks upstream of the dam. Japanese honeysuckle (*Lonicera japonica*) and Johnsongrass (*Sorghum halepense*) were seen in the herbaceous layer throughout the study area.

The majority of the riparian area appeared to be flooded on a seasonal or annual basis. The riparian areas surveyed ranged from early to mid-successional stage, with most trees at an intermediate age and height, between 20 and 70 feet. Diversity and patchiness were generally moderate. In some areas, particularly in the riparian islands, trees, limbs, and other debris washed in during high water events was abundant. Representative photographs of the Project riparian zone habitat are included in Attachment 4.

7 Summary and Discussion

The NWI wetland and waterway boundaries within the study area were ground-truthed and found to generally represent the correct classifications and areal extents. During field verification of the NWI wetlands, 12.45 acres of additional wetlands were identified and mapped and are illustrated on Figure 2. The wetland types in the study area appeared to reflect the natural community expectations for this location.

7.1 Wetland Habitat

Two major types of aquatic habitat systems occur in the study area: (1) riverine systems consisting of open-channel and unconsolidated bottom habitats, and (2) palustrine wetlands dominated by trees, shrubs, or emergent vegetation. Approximately 57 percent of the study area consists of wetlands and waterways. Wetlands, particularly when associated with riverine systems, provide important functions for wildlife and flood storage as well as serving as important recreational resources. The most commonly observed palustrine and riverine wetlands within the study area included unconsolidated bottom wetlands due the Roanoke River being impounded. Unconsolidated bottom wetlands are relatively stable features that self-regulate water flow and temperature. They can house a variety of life not suited for high-flow environments, provide recreational opportunities, and improve the overall quality of the local aquatic system.

Forested floodplain wetlands and emergent wetlands were also observed in the study area. Functions of forested floodplain wetlands are important and are most commonly associated with wildlife habitat, sediment/shoreline stabilization, and flood flow alteration. The forested floodplain wetlands within the study area receive hydrologic input during high flow events (e.g., spring freshet) and then may remain dry for several weeks to months at a time.

The largest emergent wetland habitat areas occur near the shorelines of the upper reservoir. This emergent wetland is subjected to regular water level fluctuations; however, emergent wetland species are often adapted to changes in water surface elevation. In some cases, increased diversity of emergent species can be attributed to regular changes in inundation, provided the duration, magnitude and seasonality of the water level changes are tolerable by those species.

7.2 Riverine Habitat

Riverine habitat occurs in the Roanoke River and associated tributaries throughout the study area. Riverine wetlands can mediate flooding by detaining water during storm events and releasing it more slowly by flow through the saturated subsurface that discharges to the river channel. Dominant water sources are overbank flow from the channel during high water events or subsurface hydraulic connections between the river channel and wetlands. Additional water sources may be groundwater discharge from surficial aquifers, overland flow from adjacent uplands and tributaries, and precipitation. The principal functions and values associated with riverine wetlands include fish habitat, production export, wildlife habitat, recreation, visual quality/aesthetics, and endangered species habitat. The nature of the Project results in the existence of an extensive open-water cover type. As with the palustrine wetland cover type, open-water areas are well represented within the study area. The upper reservoir is an example of open-water wetland cover. The upper reservoir has a relatively simple shoreline. Fringe wetlands are limited by the relatively steep banks of the upper reservoir. Principle wetland functions for the upper reservoir included fish habitat, and wildlife habitat.

7.3 Littoral Habitat

Littoral habitat is an important feature within aquatic systems, particularly for fish and other aquatic wildlife. Observations were undertaken to generally characterize the existence and extent of aquatic vegetation. EAV in the form of water willow beds encompassed the majority of littoral habitat in the study area. SAV was generally absent in the primarily open canopied stream reaches and significant algal growth was minimal (small patches of filamentous green algae formed on rock substrates), although in some of the slower velocity reaches it lightly covered the substrate.

7.4 Riparian Habitat

Riparian habitat is also present in most of the study area adjacent to the Roanoke River. All the mapped wetlands and adjacent forested areas were included in the riparian habitat classification. These areas support a wide variety of communities on the small islands, cobble and boulder laden slopes, and floodplains that formed by river flows and riverine processes. The areas contain a mixture of forests, forested wetlands, emergent wetlands, and scrub-shrub wetland habitat.

7.5 Invasive Plant Species

Invasive vegetation was evident throughout the study area. The majority of observed invasive vegetation (Japanese knotweed [*Reynoutria japonica*], tree of heaven [*Ailanthus altissima*], honeysuckle [*Lonicera japonica*], amur honeysuckle [*Lonicera maackii*], Johnsongrass [*Sorghum halepense*] and mimosa [*Albizia julibrissin*]) were located along the margins of the Roanoke River, along disturbed areas, and within several habitat types within and outside of the study area. These results are reflective of the region-wide invasion of these invasive and non-native species in the eastern U.S.

8 Project Impacts on Wetlands, Riparian, and Littoral Habitat

The Licensee does not anticipate that operation and maintenance of the Project over the new license term will have any long-term, unavoidable, adverse impacts on riparian or and littoral resources. Wetland, riparian, and littoral habitats at the Project are reflective of current Project operations. Appalachian proposes to maintain the run-of-river mode of operation for the Project and existing measures and programs to protect wildlife habitat. There are currently no plans by the Licensee for improvements or activities at the Project that would require disturbance of wetland areas or the clearing of potentially suitable roosting habitat or trees that may support maternity colonies for protected bat species or potential nesting habitat for bald eagles. Protected bat species with potential to exist in and/or near the study area include the Indiana bat (*Myotis sodalist*) and northern long-eared bat (*Myotis septentrionalis*). In addition, the monarch butterfly (*Danaus plexippus*), which was listed as a candidate species in December of 2020, has potential to occur in the study area.

In the event tree-clearing activities were proposed to be undertaken in the future in support of Project operation, modifications, or development of new recreational facilities within the Project Boundary, Appalachian would consult or coordinate with USFWS and VDWR (for sensitive species) or the U.S. Army Corps of Engineers (for wetlands impacts) in advance of the proposed activities.

9 Variances from FERC-Approved Study Plan

The Wetland, Riparian, and Littoral Habitat Study was conducted in conformance with the FERC-approved RSP.

10 Correspondence and Consultation

No coordination with state or federal agencies was undertaken for this updated study report.

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Attachment 1

Attachment 1 – Wildlife
Species Observed in the
Niagara Study Area

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Table 1. Wildlife Species Observed in the Niagara Study Area

Common Name	Latin Name
Birds	
Turkey vulture	<i>Cathartes aura</i>
Canada goose	<i>Branta canadensis</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Killdeer	<i>Charadrius vociferus</i>
Mourning dove	<i>Zenaida macroura</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Blue jay	<i>Cyanocitta cristata</i>
American crow	<i>Corvus brachyrhynchos</i>
American robin	<i>Turdus migratorius</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Great blue heron	<i>Ardea herodias</i>
Osprey	<i>Pandion haliaetus</i>
Wood duck	<i>Aix sponsa</i>
Mammals	
White-tailed deer	<i>Odocoileus virginianus</i>
Muskrat	<i>Ondatra zibethicus</i>
Gray squirrel	<i>Sciurus carolinensis</i>
River Otter	<i>Lontra canadensis</i>
Beaver	<i>Castor canadensis</i>
Amphibians	
Eastern newt	<i>Notophthalmus viridescens</i>
American toad	<i>Anaxyrus americanus</i>
Spring peeper	<i>Pseudacris crucifer</i>
American bullfrog	<i>Lithobates catesbeiana</i>
Green frog	<i>Lithobates clamitans</i>
Wood frog	<i>Lithobates sylvaticus</i>
Reptiles	
Snapping Turtle	<i>Chelydra serpentina</i>
Copperhead	<i>Agkistrodon contortrix</i>

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Attachment 2

Attachment 2 –
Representative Photographs
of Wetland Habitat

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Wetland Photo 1. Palustrine forested/ emergent wetland upstream of Niagara Dam.



Wetland Photo 2. Palustrine emergent wetland on the left bank; downstream of Wolf Creek.



Wetland Photo 3. Palustrine forested wetland on the right bank; upstream of Wolf Creek.



Wetland Photo 4. Example of palustrine forested wetland habitat upstream of Wolf Creek and Wetland Photo 3 on the right bank.



Wetland Photo 5. Example of palustrine forested wetland slightly upstream of Wolf Creek on the left bank.



Wetland Photo 6. Example of palustrine forested wetland habitat downstream of Tinker Creek on the right bank.

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Attachment 3

Attachment 3 –
Representative Photographs
of Littoral Zone Habitat

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Littoral Zone Photo 1. A cluster of water willow beds within the downstream extent of the bypass reach.



Littoral Zone Photo 2. A representative photo showing the mosaic of water willow within the bypass reach looking downstream towards the tailrace and Blue Ridge Parkway Bridge.



Littoral Zone 3. A water willow bed within the central portion of the bypass reach.



Littoral Zone Photo 4. A small water willow bed in the upper half of the bypass reach.



Littoral Zone Photo 5. A fringe water willow bed along the left bank of the bypass reach.



Littoral Zone Photo 6. A large water willow bed in the upstream extent of the bypass reach facing the Niagara Dam.

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Attachment 4

Attachment 4 –
Representative Photographs
of Riparian Habitat

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Riparian Photo 1. A forested riparian area adjacent to the bypass reach below Niagara dam.



Riparian Photo 2. A densely vegetated riparian area along the bank of the Roanoke River.



Riparian Photo 3. A forested riparian area dominated by sycamore and boxelder.



Riparian Photo 4. A densely vegetated riparian area along the right bank of the Roanoke River dominated by sycamore, green ash, boxelder, and paw paw.



Riparian Photo 5. A densely vegetated riparian area across the Roanoke River from the mouth of Tinker Creek. Invasive Japanese knotweed is dominant in the shrub layer with boxelder in the canopy.



Riparian Photo 6. A riparian area upstream of Tinker Creek characterized by steep slopes and dominated by boxelder and green ash.



Riparian Photo 7. An example of a riparian area at the western extent of the study area. This area is dominated by basswood and boxelder.

A decorative graphic consisting of several overlapping rectangles. A large red rectangle is on the left. A grey rectangle is at the top right. A light grey rectangle is at the bottom left. A black rectangle is at the bottom right. The text is positioned to the right of the red rectangle.

Attachment 5

Attachment 5 – Wetland
Determination Field Forms

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U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	OMB Control #: 0710-xxxx, Exp: Pending Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021

Applicant/Owner: AEP State: VA Sampling Point: WL1

Investigator(s): J. Mace, R. Dugger Section, Township, Range: _____

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2631 Long: -79.8949 Datum: NAD83

Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: Backwater slough, overflow area from river.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators</u> (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators</u> (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: WL1

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	60	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Asimina triloba</u>	20	Yes	FAC																	
3. <u>Ulmus americana</u>	10	No	FACW																	
4. <u>Aesculus sylvatica</u>	5	No	FAC																	
5. _____																				
6. _____																				
7. _____																				
95 = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>25</u></td> <td>x 2 = <u>50</u></td> </tr> <tr> <td>FAC species <u>140</u></td> <td>x 3 = <u>420</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>165</u> (A)</td> <td><u>470</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.85</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>25</u>	x 2 = <u>50</u>	FAC species <u>140</u>	x 3 = <u>420</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>165</u> (A)	<u>470</u> (B)	Prevalence Index = B/A = <u>2.85</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>25</u>	x 2 = <u>50</u>																			
FAC species <u>140</u>	x 3 = <u>420</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>165</u> (A)	<u>470</u> (B)																			
Prevalence Index = B/A = <u>2.85</u>																				
50% of total cover: <u>48</u> 20% of total cover: <u>19</u>																				
Sapling/Shrub Stratum (Plot size: <u>30</u>)																				
1. <u>Lindera benzoin</u>	40	Yes	FAC	Hydrophytic Vegetation Indicators: <u> </u> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Aesculus sylvatica</u>	10	Yes	FAC																	
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
50 = Total Cover																				
50% of total cover: <u>25</u> 20% of total cover: <u>10</u>																				
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Boehmeria cylindrica</u>	10	Yes	FACW	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody Vine – All woody vines greater than 3.28 ft in height.																
2. <u>Impatiens capensis</u>	5	Yes	FACW																	
3. <u>Microstegium vimineum</u>	5	Yes	FAC																	
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
20 = Total Cover																				
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>																				
Woody Vine Stratum (Plot size: _____)																				
1. _____				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
2. _____																				
3. _____																				
4. _____																				
5. _____																				
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 4/2	80	7.5YR 5/8	20	C	PL/M	Loamy/Clayey	Prominent redox concentrations
10-16	10YR 5/2	90	7.5YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.						² Location: PL=Pore Lining, M=Matrix.		
Hydric Soil Indicators:						Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)			<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)			<input type="checkbox"/> Coast Prairie Redox (A16)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) (MLRA 136)			<input type="checkbox"/> (MLRA 147, 148)		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			<input checked="" type="checkbox"/> Piedmont Floodplain Soils (F19)		
<input type="checkbox"/> Stratified Layers (A5)			<input checked="" type="checkbox"/> Depleted Matrix (F3)			<input type="checkbox"/> (MLRA 136, 147)		
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)			<input type="checkbox"/> Redox Dark Surface (F6)			<input type="checkbox"/> Red Parent Material (F21)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Dark Surface (F7)			<input type="checkbox"/> (outside MLRA 127, 147, 148)		
<input type="checkbox"/> Thick Dark Surface (A12)			<input checked="" type="checkbox"/> Redox Depressions (F8)			<input type="checkbox"/> Very Shallow Dark Surface (F22)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N,			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> MLRA 136)					
<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> Umbric Surface (F13) (MLRA 122, 136)			³ Indicators of hydrophytic vegetation and		
<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)			wetland hydrology must be present,		
<input type="checkbox"/> Dark Surface (S7)			<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147, 148)			unless disturbed or problematic.		
Restrictive Layer (if observed):								
Type: _____								
Depth (inches): _____						Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks: 								

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	OMB Control #: 0710-xxxx, Exp: Pending Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021

Applicant/Owner: AEP State: VA Sampling Point: WL2

Investigator(s): E. Mularski, J. irvin Section, Township, Range: _____

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2614 Long: -79.8906 Datum: NAD83

Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: Drainage PFO-PEM	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: WL2

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Platanus occidentalis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Acer saccharinum</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
50 = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <thead> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>40</u></td> <td>x 2 = <u>80</u></td> </tr> <tr> <td>FAC species <u>90</u></td> <td>x 3 = <u>270</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>10</u></td> <td>x 5 = <u>50</u></td> </tr> <tr> <td>Column Totals: <u>140</u> (A)</td> <td><u>400</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.86</u></td> </tr> </tbody> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>40</u>	x 2 = <u>80</u>	FAC species <u>90</u>	x 3 = <u>270</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>10</u>	x 5 = <u>50</u>	Column Totals: <u>140</u> (A)	<u>400</u> (B)	Prevalence Index = B/A = <u>2.86</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>40</u>	x 2 = <u>80</u>																			
FAC species <u>90</u>	x 3 = <u>270</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>10</u>	x 5 = <u>50</u>																			
Column Totals: <u>140</u> (A)	<u>400</u> (B)																			
Prevalence Index = B/A = <u>2.86</u>																				
50% of total cover: <u>25</u> 20% of total cover: <u>10</u>																				
Sapling/Shrub Stratum (Plot size: <u>30</u>)																				
1. <u>Lindera benzoin</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
20 = Total Cover																				
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>																				
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Microstegium vimineum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody Vine – All woody vines greater than 3.28 ft in height.																
2. <u>Boehmeria cylindrica</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																	
3. <u>Passiflora incarnata</u>	<u>10</u>	<u>No</u>	<u>UPL</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
70 = Total Cover																				
50% of total cover: <u>35</u> 20% of total cover: <u>14</u>																				
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100					loamy/clayey	clay loam
2-18	10YR 4/2	80	7.5YR 5/6	20	C	M	loamy/clayey	clay loam

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) (LRR N) <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) <input type="checkbox"/> Loamy Mucky Mineral (F1) (MLRA 136) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13) (MLRA 122, 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147, 148)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147) <input type="checkbox"/> Red Parent Material (F21) (outside MLRA 127, 147, 148) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks)
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <u>X</u> No _____
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Remarks:

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	OMB Control #: 0710-xxxx, Exp: Pending Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021

Applicant/Owner: AEP State: VA Sampling Point: WL3PFO

Investigator(s): J. Mace, R. Dugger Section, Township, Range: _____

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2590 Long: -79.8878 Datum: NAD83

Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: Backwater slough, overflow area from river.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: WL3PFO

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Liriodendron tulipifera</u>	<u>5</u>	<u>No</u>	<u>FACU</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
<u>75</u> =Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>65</u></td> <td>x 2 = <u>130</u></td> </tr> <tr> <td>FAC species <u>160</u></td> <td>x 3 = <u>480</u></td> </tr> <tr> <td>FACU species <u>10</u></td> <td>x 4 = <u>40</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>235</u> (A)</td> <td><u>650</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.77</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>65</u>	x 2 = <u>130</u>	FAC species <u>160</u>	x 3 = <u>480</u>	FACU species <u>10</u>	x 4 = <u>40</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>235</u> (A)	<u>650</u> (B)	Prevalence Index = B/A = <u>2.77</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>65</u>	x 2 = <u>130</u>																			
FAC species <u>160</u>	x 3 = <u>480</u>																			
FACU species <u>10</u>	x 4 = <u>40</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>235</u> (A)	<u>650</u> (B)																			
Prevalence Index = B/A = <u>2.77</u>																				
50% of total cover: <u>38</u>		20% of total cover: <u>15</u>																		
Sapling/Shrub Stratum (Plot size: <u>30</u>)																				
1. <u>Fraxinus pennsylvanica</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Lindera benzoin</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>																	
3. <u>Acer negundo</u>	<u>10</u>	<u>No</u>	<u>FAC</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
<u>70</u> =Total Cover																				
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>																		
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Laportea canadensis</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody Vine – All woody vines greater than 3.28 ft in height.																
2. <u>Potentilla indica</u>	<u>5</u>	<u>No</u>	<u>FACU</u>																	
3. <u>Impatiens capensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
<u>90</u> =Total Cover																				
50% of total cover: <u>45</u>		20% of total cover: <u>18</u>																		
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ =Total Cover																				
50% of total cover: _____		20% of total cover: _____																		

 Remarks: (Include photo numbers here or on a separate sheet.)
 In nearby spots there is murdannia keisak

SOIL

Sampling Point: WL3PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 4/2	80	7.5YR 5/8	20	C	PL/M	Loamy/Clayey	Prominent redox concentrations
10-16	10YR 5/2	90	7.5YR 5/8	10	C	M	Loamy/Clayey	Prominent redox concentrations
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.					² Location: PL=Pore Lining, M=Matrix.			
Hydric Soil Indicators:						Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)			<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)			<input type="checkbox"/> Coast Prairie Redox (A16)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) (MLRA 136)			<input type="checkbox"/> (MLRA 147, 148)		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			<input checked="" type="checkbox"/> Piedmont Floodplain Soils (F19)		
<input type="checkbox"/> Stratified Layers (A5)			<input checked="" type="checkbox"/> Depleted Matrix (F3)			<input type="checkbox"/> (MLRA 136, 147)		
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)			<input type="checkbox"/> Redox Dark Surface (F6)			<input type="checkbox"/> Red Parent Material (F21)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Dark Surface (F7)			<input type="checkbox"/> (outside MLRA 127, 147, 148)		
<input type="checkbox"/> Thick Dark Surface (A12)			<input checked="" type="checkbox"/> Redox Depressions (F8)			<input type="checkbox"/> Very Shallow Dark Surface (F22)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N,			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> MLRA 136)					
<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> Umbric Surface (F13) (MLRA 122, 136)			³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)					
<input type="checkbox"/> Dark Surface (S7)			<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147, 148)					
Restrictive Layer (if observed):								
Type: _____						Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____		
Depth (inches): _____								
Remarks: 								

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	OMB Control #: 0710-xxxx, Exp: Pending Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021

Applicant/Owner: AEP State: VA Sampling Point: WL4PFO

Investigator(s): J. Mace, R. Dugger Section, Township, Range: _____

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2577 Long: -79.8836 Datum: NAD83

Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: Backwater slough, overflow area from river. More running water than WL 100 and 101	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: WL4PFO

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	40	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>8</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	20	Yes	FACW																	
3. <u>Acer saccharinum</u>	20	Yes	FACW																	
4. _____																				
5. _____																				
6. _____																				
7. _____																				
80 = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <thead> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species <u>20</u></td> <td>x 1 = <u>20</u></td> </tr> <tr> <td>FACW species <u>80</u></td> <td>x 2 = <u>160</u></td> </tr> <tr> <td>FAC species <u>85</u></td> <td>x 3 = <u>255</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>185</u> (A)</td> <td><u>435</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.35</u></td> </tr> </tbody> </table>	Total % Cover of:	Multiply by:	OBL species <u>20</u>	x 1 = <u>20</u>	FACW species <u>80</u>	x 2 = <u>160</u>	FAC species <u>85</u>	x 3 = <u>255</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>185</u> (A)	<u>435</u> (B)	Prevalence Index = B/A = <u>2.35</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>20</u>	x 1 = <u>20</u>																			
FACW species <u>80</u>	x 2 = <u>160</u>																			
FAC species <u>85</u>	x 3 = <u>255</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>185</u> (A)	<u>435</u> (B)																			
Prevalence Index = B/A = <u>2.35</u>																				
50% of total cover: <u>40</u> 20% of total cover: <u>16</u>																				
Sapling/Shrub Stratum (Plot size: <u>30</u>)																				
1. <u>Asimina triloba</u>	15	Yes	FAC	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> <u>2</u> - Dominance Test is >50% <input checked="" type="checkbox"/> <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Lindera benzoin</u>	10	Yes	FAC																	
3. <u>Sambucus nigra</u>	10	Yes	FAC																	
4. _____																				
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
35 = Total Cover																				
50% of total cover: <u>18</u> 20% of total cover: <u>7</u>																				
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Persicaria hydropiper</u>	20	Yes	OBL	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody Vine – All woody vines greater than 3.28 ft in height.																
2. <u>Boehmeria cylindrica</u>	20	Yes	FACW																	
3. <u>Impatiens capensis</u>	10	No	FACW																	
4. <u>Microstegium vimineum</u>	10	No	FAC																	
5. <u>Echinochloa walteri</u>	10	No	FACW																	
6. _____																				
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
70 = Total Cover																				
50% of total cover: <u>35</u> 20% of total cover: <u>14</u>																				
Woody Vine Stratum (Plot size: _____)																				
1. _____				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
2. _____																				
3. _____																				
4. _____																				
5. _____																				
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				

 Remarks: (Include photo numbers here or on a separate sheet.)
 In nearby spots there is murdannia keisak

SOIL

Sampling Point: WL4PFO

[illegible]

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	OMB Control #: 0710-xxxx, Exp: Pending Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021
 Applicant/Owner: AEP State: VA Sampling Point: WL5-6
 Investigator(s): E. Mularski, J. irvin Section, Township, Range: _____
 Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2588 Long: -79.8826 Datum: NAD83
 Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 5px;"> Is the Sampled Area within a Wetland? </td> <td style="width: 40%; padding: 5px;"> Yes <u>X</u> No _____ </td> </tr> </table>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____		
Remarks: Drainage PFO-PEM			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators</u> (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators</u> (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)		
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>6</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 5px;"> Wetland Hydrology Present? </td> <td style="width: 40%; padding: 5px;"> Yes <u>X</u> No _____ </td> </tr> </table>	Wetland Hydrology Present?	Yes <u>X</u> No _____
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: WL5-6

<u>Tree Stratum</u> (Plot size: <u>30</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Acer negundo</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>
2.				
3.				
4.				
5.				
6.				
7.				
		<u>30</u> =Total Cover		
50% of total cover:		<u>15</u>	20% of total cover:	<u>6</u>

<u>Sapling/Shrub Stratum</u> (Plot size: <u>30</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Lindera benzoin</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
		<u>10</u> =Total Cover		
50% of total cover:		<u>5</u>	20% of total cover:	<u>2</u>

<u>Herb Stratum</u> (Plot size: <u>5</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Grass sp.</u>	<u>40</u>	<u>Yes</u>	
2.	<u>Boehmeria cylindrica</u>	<u>10</u>	<u>No</u>	<u>FACW</u>
3.	<u>Microstegium vimineum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>
4.	<u>Phalaris arundinacea</u>	<u>10</u>	<u>No</u>	<u>FACW</u>
5.	<u>Reynoutria japonica</u>	<u>5</u>	<u>No</u>	<u>FACU</u>
6.				
7.				
8.				
9.				
10.				
11.				
		<u>75</u> =Total Cover		
50% of total cover:		<u>38</u>	20% of total cover:	<u>15</u>

<u>Woody Vine Stratum</u> (Plot size: <u> </u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
5.				
		<u> </u> =Total Cover		
50% of total cover:		<u> </u>	20% of total cover:	<u> </u>

Dominance Test worksheet:

 Number of Dominant Species
That Are OBL, FACW, or FAC: 2 (A)

 Total Number of Dominant
Species Across All Strata: 3 (B)

 Percent of Dominant Species
That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>20</u>	x 2 =	<u>40</u>
FAC species	<u>50</u>	x 3 =	<u>150</u>
FACU species	<u>5</u>	x 4 =	<u>20</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column Totals:	<u>75</u> (A)		<u>210</u> (B)
Prevalence Index = B/A = <u>2.80</u>			

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

**Hydrophytic
Vegetation**

 Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL5-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 2/1	100					loamy/clayey	clay loam
3-20	10YR 4/1	80	7.5YR 5/6	20	C	PL/M	loamy/clayey	clay loam

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) (LRR N) <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) <input type="checkbox"/> Loamy Mucky Mineral (F1) (MLRA 136) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13) (MLRA 122, 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147, 148)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147) <input type="checkbox"/> Red Parent Material (F21) (outside MLRA 127, 147, 148) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks)
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <u>X</u> No _____
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Remarks:

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	OMB Control #: 0710-xxxx, Exp: Pending Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Niagara Hyrdoelectric Dam City/County: Roanoke Sampling Date: 07/2021

Applicant/Owner: AEP State: VA Sampling Point: WL 7-8PEQ/PEM

Investigator(s): J. Mace, R. Dugger Section, Township, Range: _____

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 37.2551 Long: -79.8763 Datum: NAD83

Soil Map Unit Name: Hayesville channery fine sandy loam, 25 to 50 percent slopes, very stony NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: center;"> Is the Sampled Area within a Wetland? </td> <td style="width: 40%; text-align: center;"> Yes <u>X</u> No _____ </td> </tr> </table>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____		
Remarks: Center is dominated by reed canary grass and maple and willow. Fed by streams and nearby stream			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)		
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: center;"> Wetland Hydrology Present? </td> <td style="width: 40%; text-align: center;"> Yes <u>X</u> No _____ </td> </tr> </table>	Wetland Hydrology Present?	Yes <u>X</u> No _____
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: WL7-8PFO/PEM

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer rubrum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Ulmus americana</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
<u>70</u> =Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>90</u></td> <td>x 2 = <u>180</u></td> </tr> <tr> <td>FAC species <u>80</u></td> <td>x 3 = <u>240</u></td> </tr> <tr> <td>FACU species <u>25</u></td> <td>x 4 = <u>100</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>195</u> (A)</td> <td><u>520</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.67</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>90</u>	x 2 = <u>180</u>	FAC species <u>80</u>	x 3 = <u>240</u>	FACU species <u>25</u>	x 4 = <u>100</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>195</u> (A)	<u>520</u> (B)	Prevalence Index = B/A = <u>2.67</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>90</u>	x 2 = <u>180</u>																			
FAC species <u>80</u>	x 3 = <u>240</u>																			
FACU species <u>25</u>	x 4 = <u>100</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>195</u> (A)	<u>520</u> (B)																			
Prevalence Index = B/A = <u>2.67</u>																				
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>																		
Sapling/Shrub Stratum (Plot size: <u>30</u>)																				
1. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must present, unless disturbed or problematic.																
2. <u>Lindera benzoin</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
<u>20</u> =Total Cover																				
50% of total cover: <u>10</u>		20% of total cover: <u>4</u>																		
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Boehmeria cylindrica</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody Vine – All woody vines greater than 3.28 ft in height.																
2. <u>Microstegium vimineum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>																	
3. <u>Mitchella repens</u>	<u>15</u>	<u>No</u>	<u>FACU</u>																	
4. <u>Reynoutria japonica</u>	<u>10</u>	<u>No</u>	<u>FACU</u>																	
5. <u>Echinochloa walteri</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																	
6. <u>Juncus sp.</u>	<u>5</u>	<u>No</u>	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
<u>110</u> =Total Cover																				
50% of total cover: <u>55</u>		20% of total cover: <u>22</u>																		
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ =Total Cover																				
50% of total cover: _____		20% of total cover: _____																		

 Remarks: (Include photo numbers here or on a separate sheet.)
 Vitis rotundifolia and asiatic bittersweet nearby

SOIL

Sampling Point: WL7-8PFO/PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-18	10YR 3/1	80	7.5YR 5/8	10	C	PL	Loamy/Clayey	Prominent redox concentrations
			10YR 6/1	10	D	M		silt loam

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) (LRR N) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) <input type="checkbox"/> Loamy Mucky Mineral (F1) (MLRA 136) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input checked="" type="checkbox"/> Depleted Dark Surface (F7) <input checked="" type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) <input checked="" type="checkbox"/> Umbric Surface (F13) (MLRA 122, 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147, 148)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148) <input checked="" type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147) <input type="checkbox"/> Red Parent Material (F21) (outside MLRA 127, 147, 148) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks)
--	---	---

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <u>X</u> No _____
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Remarks:



Appendix F - Shoreline Stability Assessment Study Report

Niagara Hydroelectric Project
(FERC No. 2466)

December 6, 2021

Prepared by:



Prepared for:

Appalachian Power Company



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1 Project Introduction and Background

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP) is the Licensee, owner, and operator of the 2.4-megawatt (MW) run-of-river Niagara Hydroelectric Project (Project) (Project No. 2466), located on the Roanoke River (River Mile 355) in Roanoke County, Virginia.

The Project is currently licensed by the Federal Energy Regulatory Commission (FERC or Commission) under the authority granted to FERC by Congress through the Federal Power Act, 16 United States Code (USC) §791(a), et seq., to license and oversee the operation of non-federal hydroelectric projects on jurisdictional waters and/or federal land. 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. In accordance with FERC's regulations at 18 CFR §16.9(b), the licensee must file its final application for a new license with FERC no later than February 28, 2022.

In accordance with 18 CFR §5.11 of the Commission's regulations, 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. The Commission issued the Study Plan Determination (SPD) on December 6, 2019.

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. 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. Appalachian conducted a virtual ISR Meeting on January 21, 2021 and filed the ISR Meeting summary with the Commission on February 5, 2021. Stakeholders provided written comments in response to Appalachian's filing of the ISR meeting summary, which are addressed in this Updated Study Report (USR) along with study methods and results.

Appalachian has conducted studies in accordance with 18 CFR §5.15, as provided in the RSP and as subsequently modified by FERC. This USR describes the methods and results of the Shoreline Stability Assessment conducted in support of preparing an application for new license for the Project.

2 Study Goals and Objectives

The goals and objectives of the Shoreline Stability Assessment are to:

- Survey the Project's reservoir, bypass reach, and tailrace area to characterize the shoreline, with the focus on erosion or shoreline instability using the Bank Erosion Hazard Index (BEHI) (Rosgen 2001; WVDEP 2015);
- Inventory, map, and document any areas of erosion or shoreline instability; and
- Prioritize any areas where remedial action or further assessment may be needed.

3 Study Area

The study area for the Shoreline Stability Assessment Study includes the study area shown on Figure 1, including the reservoir shoreline along segments of the Roanoke River and Tinker Creek, bypass reach, and tailrace area downstream of the Niagara powerhouse

4 Background and Existing Information

Existing relevant and reasonably available information regarding geology and soils in the Project vicinity as well as description of the river basin is presented in Section 5.2 of the Pre-Application Document (PAD) (Appalachian 2019). The topography bordering the reservoir is relatively steep in areas, especially along the southern bank. The steeper slopes transition to lower gradients near the shoreline. The majority of the Project reservoir consists of undeveloped riverbanks with steep slopes and tree cover and there is limited upland area within the study area.

Over 62 percent of the Roanoke River basin is forested, about 25 percent is cropland and pasture, and 10 percent is urban (Appalachian 2019). Land use categories within the study area include open water (51%), forest (31%), developed land (0.22% high-intensity; 5.4% medium-intensity; 24% low intensity), and hay/pasture (3%) (USGS 2011). Within the general Project vicinity, land cover along the river is primarily deciduous forest, with low-intensity development along the left descending bank due to the presence of the CSX railroad track. Land use in the western portion of the Project boundary is primarily low- and medium-intensity development. Areas of hay and pastureland exist along areas along Tinker Creek. The upstream portion of the study area (Tinker Creek and the upper reach of the Roanoke River) is located in an urban area associated with the towns of Roanoke and Vinton. These urban areas have a high concentration of impervious surface; therefore, the upper Roanoke River and Tinker Creek in this portion of the study area experience flashy stormwater flows during rainfall events. In general, high flow events increase the probability of stream bank erosion in any watershed, but bank erosion can be accelerated in urban areas. Riparian buffers are limited in the upstream portions of the study area and become wider downstream of the confluence of the Roanoke River and Tinker Creek.

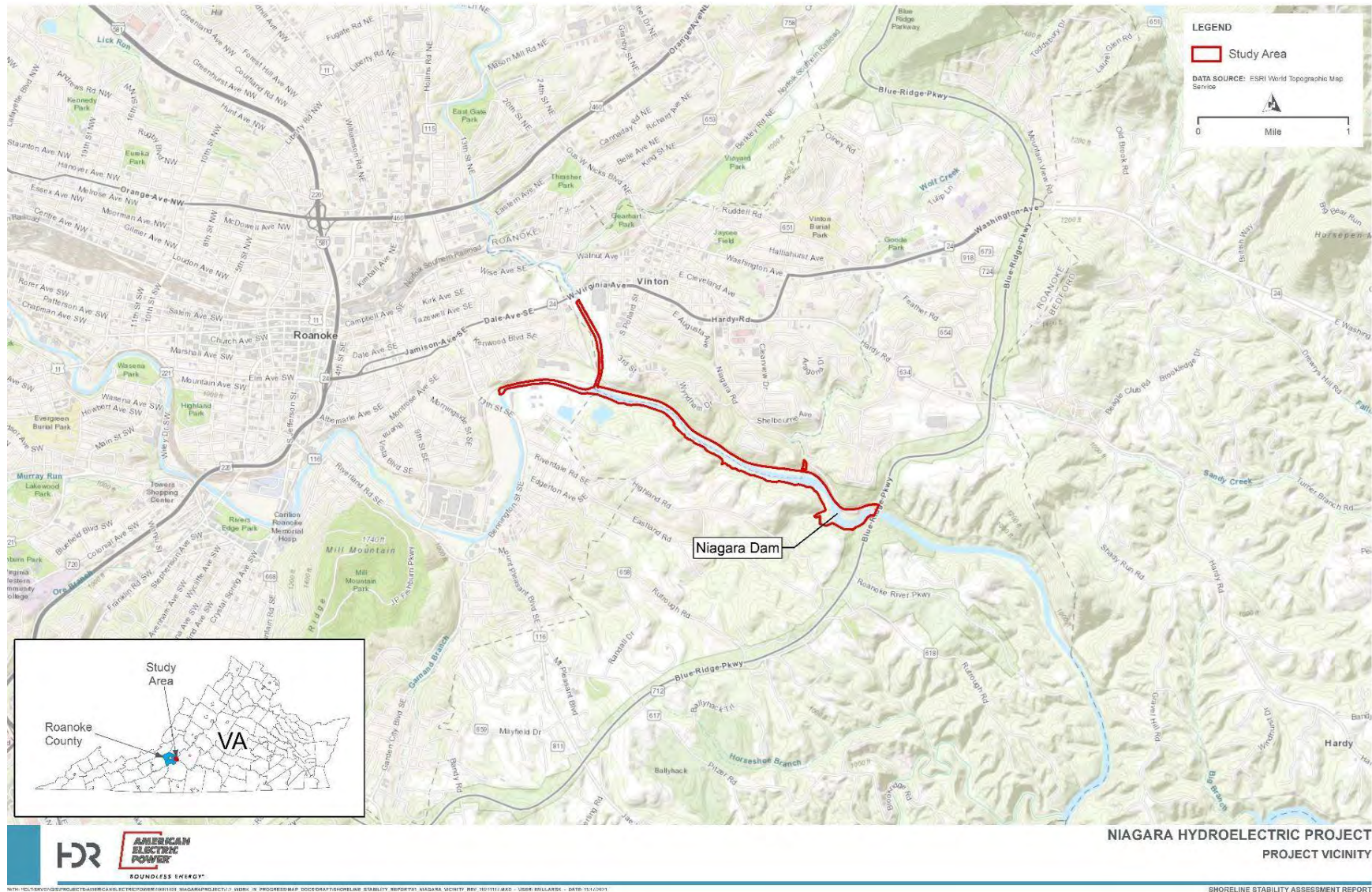


Figure 1. Niagara Shoreline Stability Assessment Study Area

5 Methodology

The Shoreline Stability Assessment was performed as a desktop analysis followed by field confirmation of shoreline areas within the study area, including the reservoir, bypass reach, and the riverine section of the Roanoke River and its tributary streams identified in the desktop analysis as requiring confirmation or additional investigation. The shoreline was assessed in the field for susceptibility to erosion, and for need and potential for remediation. The study methods provide adequate information to assess shoreline-erosion effects by Project operations.

5.1 Literature Review

HDR reviewed Geographic Information System (GIS) layers including ESRI and Virginia Geographic Information Network (VGIN) aerial photos, U.S. Geological Survey topographic maps, and Natural Resources Conservation Service soil surveys to assess bank composition and erosion potential in the study area.

5.2 Shoreline Survey

The field surveys for the Shoreline Stability Assessment Study were conducted on June 22nd and June 23rd, 2021. Streambanks were assessed based on visual observations by two, two-person field crews either by canoe or walking along the bank. Best professional judgement was used to estimate root depths and density since bank materials were not disturbed or removed during the study.

Rivers are dynamic systems and streambank erosion is a natural function of flow, streambank character (i.e., erodibility), and hydraulic/gravitational forces (Rosgen 2001). Some streambank erosion is normal and necessary to maintain habitat and the dynamic equilibrium of a river system; however, excessive streambank erosion can negatively impact the function of a river and the complexity of predicting streambank erosion rates has limited the application of available models. Bank stability and erosion potential for this study effort was analyzed using the Rosgen (2001) BEHI method and the West Virginia Department of Environmental Protection (WVDEP) complete BEHI procedure (WVDEP 2015). The BEHI method assesses physical and geomorphic properties of the streambank to validate the probable sources of bank instability using streambank variables. The metrics used to estimate BEHI include ratio of bank height to bankfull height (BH), ratio of root depth to bank height (RDH), root density percentage (RD), surface protection percentage (SP), and bank angle in degrees (BA) (WVDEP 2015) (see Table 1). These metrics are associated with scores and are totaled to categorize the overall condition of the stream reach assessed. The scores and corresponding categories are shown in Table 2.

Note that the BEHI total score is calculated using scores assigned to five separate physical processes/conditions determined in the field. Field assessments were carried out by HDR field scientists with Rosgen-based training; however, certain criteria in the field (e.g., location of bankfull elevation) may vary slightly between field assessors and results can be subject to user bias. The assignment of streambanks into Rosgen categories is a quantitative process, however, the category assigned to a specific reach (i.e., “high”, “moderate”) should be considered in the context of all other factors that contributed to that score. For example, four out of the five factors for an assessed streambank may yield a favorable score/category (i.e., “low”), however, because that particular

stream bank had a type of vegetation prone to shallow root depth, that one variable alone could drive the score up into the higher category. Therefore, nomenclature such as “high” or “very high” can be misleading; it is important to consider all of the variables that yielded a specific score.

Table 1. Description of Rosgen (2001) Metrics for BEHI Evaluation

Metric	Description
Ratio of bank height to bankfull height	Requires accurate identification of bankfull indicators.
Ratio of root depth to bank height	Root depth (RDH) is the ratio of the average plant root depth to the bank height, expressed as a percent (e.g. roots extending 2 feet into a 4 foot tall bank = 0.50).
Root density	Root density (RD), expressed as a percent, is the proportion of the streambank surface covered (and protected) by plant roots (e.g. a bank whose slope is half covered with roots = 50 percent).
Surface Protection	Surface protection (SP) is the percentage of the stream bank covered (and therefore protected) by plant roots, downed logs, branches, rocks, etc. In many streams surface protection and root density are synonymous.
Bank Angle	Bank angle (BA) is the angle of the lower bank – the bank from the waterline at base flow to the top of the bank, as opposed to benches that are higher on the floodplain. Bank angles great than 90 percent occur on undercut banks. Bank angle can be measured with an inclinometer, though given the broad bank angle categories, visual estimates are generally sufficient. Bank angle is perhaps the metric most often estimated incorrectly.

Table 2. Streambank Characteristics used to develop BEHI (Rosgen 2001)

BEHI Category	Bank Height Ratio	BH Score	Root Depth	RDH Score	Root Density	RD Score	Surface Protection	SP Score	Bank Angle	BA Score	Total Score
V. low	1.0-1.1	1.45	90-100	1.45	80-100	1.45	80-100	1.45	0-20	1.45	≤7.25
Low	1.1-1.2	2.95	50-89	2.95	55-79	2.95	55-79	2.95	21-60	2.95	7.26-14.75
Moderate	1.3-1.5	4.95	30-49	4.95	30-54	4.95	30-54	4.95	61-80	4.95	14.76-24.75
High	1.6-2.0	6.95	15-29	6.95	15-29	6.95	15-29	6.95	81-90	6.95	24.76-34.75
V. high	2.1-2.8	8.5	5-14	8.5	5-14	8.5	10-14	8.5	91-119	8.5	34.76-42.50
Extreme	>2.8	10	<5	10	<5	10	<10	10	>119	10	42.51-50

6 Study Results

6.1 Literature Review

The soils in the Project Boundary downstream from the confluence of Tinker Creek, along the shoreline of the Roanoke River, are generally very stony Hayesville channery fine sandy loam with 25 to 50 percent slopes (Figure 2). The Hayesville series consists of very deep, well-drained soils on gently sloping to very steep ridges and side slopes of the Southern Appalachian Mountains. They

most commonly form in residuum weathered from igneous and high-grade metamorphic rocks such as granite, granodiorite, mica gneiss, and schist, but in some places formed from thickly-bedded metagraywacke and metasandstone (USDA 2017).

The soils within the Project Boundary upstream from Tinker Creek vary and primarily include occasionally flooded Speedwell-Urban land complex with 0 to 2 percent slopes, Chiswell-Litz complex with 25 to 50 percent slopes, urban land, and Udorthents-Urban land complex. The Speedwell series consists of very deep, well-drained, moderately permeable soils on floodplains. They formed in medium-textured alluvium. The Chiswell series consists of shallow, well-drained, moderately permeable soils on uplands. They formed in materials weathered from shale, siltstone, and fine-grained sandstone. The Litz series consists of moderately deep, well-drained soils formed in residuum from leached calcareous shale and with widely spaced thin layers of limestone (USDA 2017).

As previously described in Appalachian (2019), canopy vegetation is present in the reservoir area, as well as groundcover layers of vegetation (shrubs, small trees, perennials) that thrive under tree canopies. Grasses and perennial species grow along the shoreline in various areas, and the vegetation located along the shoreline of the reservoir prevents shoreline erosion.

The shoreline downstream of the Project's dam and powerhouse is generally steep and graded in areas (especially near the powerhouse). The downstream shoreline typically consists of relatively steep slopes with forest canopy vegetation and underlain in areas by established shrub and herbaceous layers. Large boulders and exposed bedrock are the prevalent substrates along the downstream shoreline. There is no known evidence of erosion, slumping, or slope instability around bypass reach.

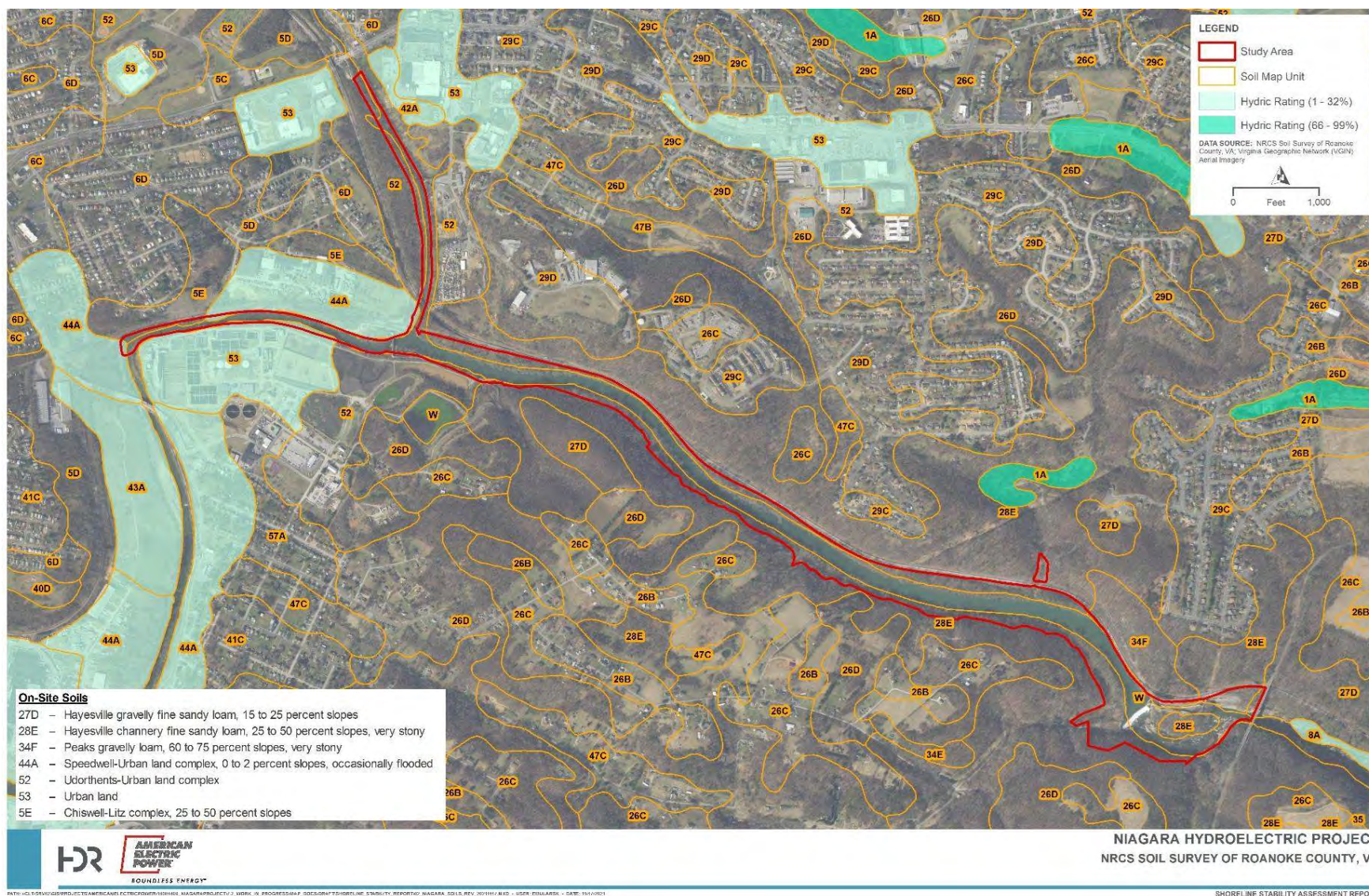


Figure 2. Niagara Shoreline Stability Assessment Soils Map

6.2 Shoreline Survey

Of the approximate seven miles of shoreline assessed, results of the field investigation indicated that approximately 90 percent of the shoreline within the study area exhibited no signs of erosion. The areas identified as having some degree of shoreline erosion had average BEHI scores ranging from 13.75 (low) to 33.85 (high) (see Table 3). There were no areas categorized as having extreme or very high erosion potential. Where erosion was noted, coordinates were recorded on the upstream and downstream side of the erosion area, and in between, if necessary. Individual points within each area of erosion scored into the same total category (i.e., high, moderate, low). The average scores for each area of erosion are provided in Table 3. Figure 3 shows the locations of the erosion areas assessed within the study area.

The majority of the banks with some level of visible erosion had moderate to high root depth, moderate to high surface protection, and moderate to high bank angle. Generally, banks that were steep exhibiting moderate to high channel incision (BH Ratio >1.5) were least stable. High erosion potential was observed in localized areas along both banks of Tinker Creek and immediately downstream of the confluence of Tinker Creek and the Roanoke River. Streambanks in the upstream portion of the Roanoke River exhibited generally moderate erosion potential. Erosion areas were mainly concentrated in areas in the upstream reaches that experienced higher and/or more flashy flows. No active erosional areas were observed further downstream on the Roanoke River (below the confluence of Tinker Creek) or below Niagara Dam and bypass reach (see Figure 3).

Table 3. BEHI Scores for Erosion Areas of Shoreline Stability Assessment

Map	Length (linear ft)	Average of BH Score	Average of RDH Score	Average of RD Score	Average of SP Score	Average of BA Score	Average of Total Score by Category	Category
Erosion Area 1	103	2.95	4.95	4.95	4.95	6.95	24.75	Moderate
Erosion Area 2	45	4.95	4.95	2.95	2.95	8.5	24.3	Moderate
Erosion Area 3	28	1.45	2.95	2.95	6.95	6.95	21.25	Moderate
Erosion Area 4	21	2.95	4.95	4.95	6.95	4.95	24.75	Moderate
Erosion Area 5	107	4.95	1.45	1.45	1.45	8.5	17.8	Moderate
Erosion Area 6	98	2.95	1.45	1.45	1.45	8.5	15.8	Moderate
Erosion Area 7	56	4.95	2.95	4.95	2.95	4.95	20.75	Moderate
Erosion Area 8	72	2.95	2.95	1.45	1.45	4.95	13.75	Low
Erosion Area 9	358	2.95	2.95	4.95	4.95	4.95	20.75	Moderate
Erosion Area 10	128	4.95	8.5	6.95	6.95	4.95	32.3	High
Erosion Area 11	225	2.95	6.95	6.95	6.95	6.95	30.75	High
Erosion Area 12	326	4.95	2.95	6.95	6.95	4.95	26.75	High
Erosion Area 13	261	4.95	4.95	6.95	4.95	4.95	26.75	High
Erosion Area 14	336	2.95	2.95	4.95	4.95	4.95	20.75	Moderate
Erosion Area 15	209	2.95	2.95	4.95	6.95	2.95	20.75	Moderate
Erosion Area 16	176	4.95	6.95	8.5	6.95	6.95	34.3	High
Erosion Area 17	99	4.95	6.95	8.5	8.5	4.95	33.85	High
Erosion Area 18	272	4.95	4.95	4.95	6.95	4.95	26.75	High
Erosion Area 19	289	4.95	6.95	8.5	8.5	4.95	33.85	High



7 Summary and Discussion

The Shoreline Stability Assessment provides an evaluation of the relative stability of approximately seven miles on Project shoreline based on the observed bank conditions. Study results indicated that approximately 90 percent of the shoreline within the study area exhibited no signs of erosion, with remaining areas ranging from “low” to “high” BEHI scores based on Rosgen’s (2001) methods (refer to categories listed in Table 2) under present conditions. Erosion areas that received a “high” bank erosion score (i.e., Erosion Areas 10-13 in the upstream reach of Tinker Creek and Erosion Areas 16-19 downstream of the confluence of Tinker Creek and the Roanoke River) are the most susceptible to high flows during storm events and subsequent potential accelerated erosion rates. The remaining erosional areas were categorized as “moderate” or “low”.

It is important to note that streambank erosion is often a symptom of larger, more complex problems in the watershed and long-term solutions often involve much more than bank stabilization. Streambank erosion is a normal physical process in a river system and is important for creating and maintaining habitat for aquatic resources; however, drivers of erosion are often difficult to determine because they are integrated with other natural and anthropogenic variables and responses within the watershed upstream. Streambed aggradation or degradation is typically a noticeable indicator of system-wide stream channel instability. Overall, visual inspection of the majority of the Project shoreline during this study indicated stable banks, no noticeable aggradation/degradation, and only localized streambank erosion. The most significant signs of erosion observed during the study occurred in the upper Roanoke River reach and Tinker Creek reach, which are located in urban areas. Accelerated shoreline erosion due to anthropogenic impacts is a well-documented phenomenon and is not driven by operations at the Project. Appalachian does not propose remediation of any shoreline areas in the Project Boundary or study area at this time.

8 Variances from FERC-Approved Study Plan

This study was performed in accordance with the FERC-Approved Study Plan.

9 Germane Consultation and Correspondence

No consultation with state or federal agencies was undertaken for the Shoreline Stability Assessment.

10 References

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Attachment 1

Attachment 1 – Erosion Area
Photographs

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Erosion Area 1; Category “Moderate”



Erosion Area 2; Category “Moderate”



Erosion Area 3; Category “Moderate”



Erosion Area 4; Category “Moderate”



Erosion Area 5; Category “Moderate”



Erosion Area 6; Category “Moderate”



Erosion Area 7; Category “Moderate”



Erosion Area 8; Category “Low”



Erosion Area 9; Category "Moderate"



Erosion Area 10; Category "High"



Erosion Area 11; Category “High”



Erosion Area 12; Category “High”



Erosion Area 13; Category “High”



Erosion Area 14; Category “Moderate”



Erosion Area 15; Category “Moderate”



Erosion Area 16; Category “High”



Erosion Area 17; Category “High”



Erosion Area 18; Category “High”



Erosion Area 19; Category "High"



Appendix G - Recreation Study Report

Niagara Hydroelectric Project
(FERC No. 2466)

December 6, 2021

Prepared by:

Young Energy Services

Prepared for:

Appalachian Power Company



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Appalachian Power Company

Niagara Hydroelectric Project (P-2466)

Updated Recreation Study Report



Prepared for:

Appalachian Power Company

Prepared by:



2112 Talmage Drive Leland, NC 28451-9340

youngenergyservices.com

December 2021

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Attachments

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- 2 - Recreation Site Survey Questionnaire and Field Monitoring Results**
- 3 - Aesthetic Flow Documentation Photos**
- 4 - Summary April 20, 2021 Stakeholder Meeting**
- 5 - Niagara Project Canoe Portage Trail Photo Summary**
- 6 - Results from Online Surveys**
- 7 - Notes from Meetings with Various Stakeholders**

1.0 INTRODUCTION

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.

In accordance with 18 CFR §5.11 of the Commission's regulations, 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 its first quarterly study progress report, an updated ILP study schedule, and a request for an extension of time to file the Initial Study Report (ISR) to account for the effects of the Coronavirus (COVID-19) pandemic. Appalachian stated that current restrictions on non-essential travel and safety considerations for its staff, who would be travelling for and performing the fieldwork, prevented several of the studies, including the Recreation Study, from taking place in the spring and summer of 2020, as originally scheduled in the RSP, and would need to take place beginning in the spring of 2021. Appalachian consulted the U.S. Fish and Wildlife Service (USFWS), Virginia Department of Wildlife Resources (VDWR), Virginia Department of Conservation and Recreation (VDCR), and the Virginia Department of Environmental Quality (VDEQ) via conference call to discuss potential changes to the study schedule. All participants concurred with Appalachian's proposed schedule revisions. By Order issued August 10, 2020, the Commission approved the schedule changes requested by Appalachian.

In accordance with 18 CFR §5.15, Appalachian filed the ISR with the Commission on January 11, 2021. On January 21, 2021, a meeting was held with stakeholders and Commission staff to discuss study results and any proposals of Appalachian and/or stakeholders to modify the study plans based upon progress to date. A summary of the January 21, 2021 meeting was filed with the Commission on February 5, 2021 to which various stakeholders including the Roanoke Regional Partnership, Roanoke County Parks and Recreation, Roanoke River Blueway Committee, and Roanoke Valley Greenways Commission responded regarding the Recreation Study. Appalachian filed with the Commission its responses to the comments received on April 6, 2021, and then held a meeting with stakeholders on April 20, 2021, to address any outstanding issues and discuss the recreational resources for the Niagara Project. Pursuant to 18 CFR §5.15,

the Commission issued its Determination on Requests for Study Modifications for the Niagara Hydroelectric Project. No changes to the Recreation Study were noted as being required by the Commission.

This Recreation Study has been prepared under the requirements of the December 6, 2019 Study Plan Determination and additional Commission Orders by Young Energy Services (YES), the subcontractor to perform the work.

2.0 STUDY AREA

The Niagara Hydroelectric Project is located on the Roanoke River at river mile 355, approximately six miles southeast of the City of Roanoke, in the County of Roanoke, Virginia. The reservoir for the Project is approximately two miles long extending upstream of the Project spillway (Lat. 37.2174; Long. -80.0521) along the Roanoke River and Tinker Creek.

The Project boundary encompasses the Project reservoir upstream of the Project spillway and powerhouse and extends downstream along the Roanoke River to just upstream of the bridge for the Blue Ridge Parkway across the Roanoke River. The study area for the Recreation Study includes the areas described above as being within the Project boundary along with the Project spillway, powerhouse, bypass channel, and the canoe portage trail around the Project powerhouse. The canoe portage is the only existing recreation facility provided and managed by Appalachian under the conditions of its current license for the Niagara Hydroelectric Project.

For certain tasks of this study, the study area has been expanded to include non-project recreation facilities within or adjacent to the Project boundary. Those facilities provide recreation opportunities to the Project and are as follows: (1) a canoe launch located on Tinker Creek (identified as Tinker Creek Canoe Launch) maintained by the Town of Vinton, Virginia; (2) the Roanoke River Trail located just off the Blue Ridge Parkway at mile post 115 which is provided and maintained by the National Park Service (NPS); and (3) a canoe/kayak launch/take-out (identified as Rutrough Point) located approximately three miles downstream of the Project powerhouse at the terminus of Rutrough Road at the Roanoke River operated and maintained by Roanoke County, Virginia. The extent of the study area including the location of the Project and non-project recreation facilities is presented in Figure 2.1.

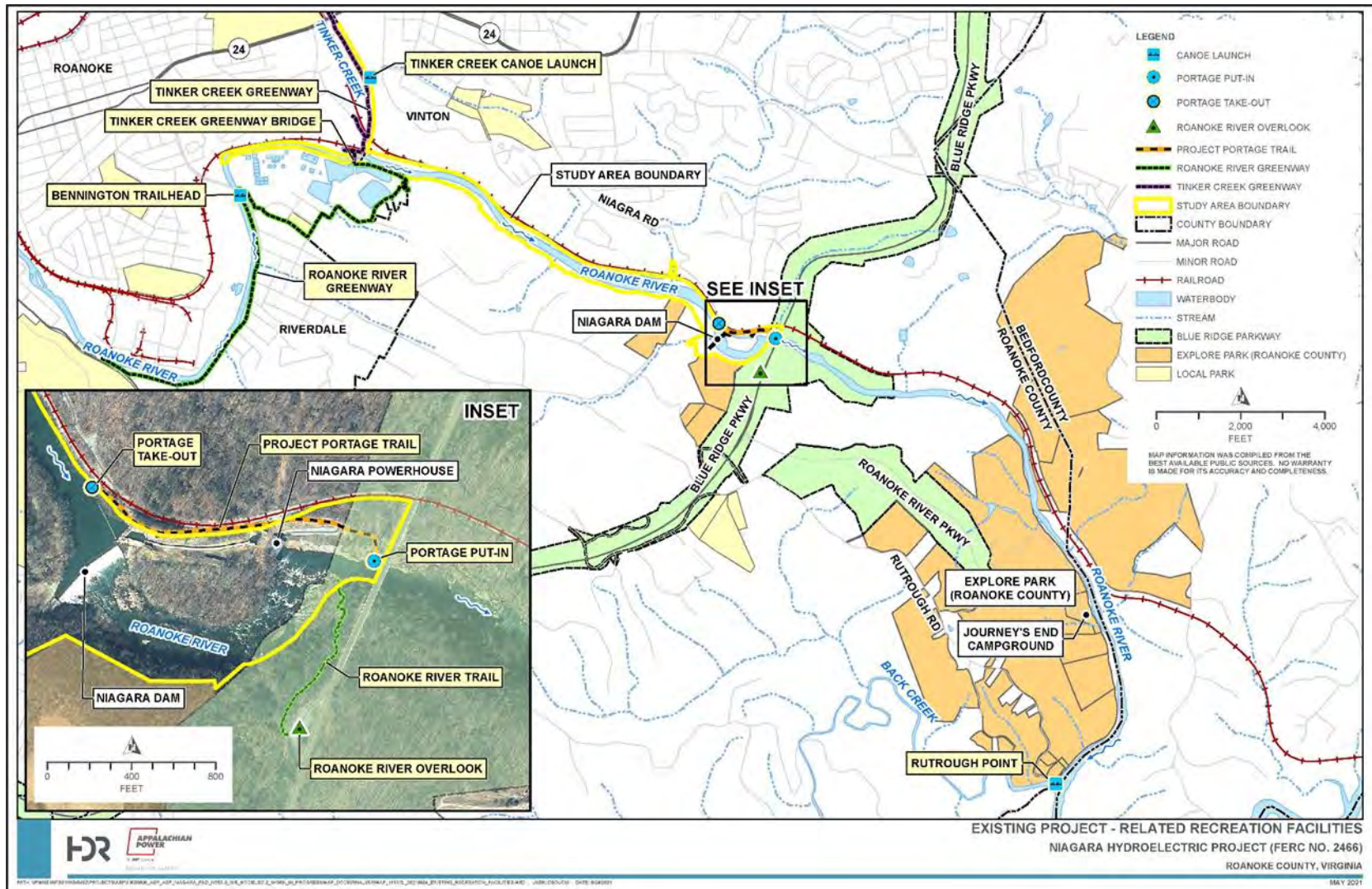


Figure 2.1: Existing Project Related Recreation Facilities

3.0 RECREATION STUDY GOALS AND OBJECTIVES

The goal and objectives of this Recreation Study are to complete the tasks outlined in the Revised Study Plan (RSP) filed November 6, 2019 by Appalachian. Specifically, the goal of the study is 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. The objectives are as follows:

- Gather information on the condition of the FERC-approved canoe portage trail provided and maintained by Appalachian under the conditions of the existing license for the Niagara Hydroelectric Project;
- Gather information on the condition and facilities provided at the non-Project recreation sites;
- Characterize current recreational use of the study area;
- Estimate future demand for public recreation at the Project;
- Evaluate opportunities, processes, and constraints related to short-term temporary modifications to Project operation to facilitate downstream boating flows;
- Solicit comments from stakeholders on potential enhancements or new facilities; and
- Analyze the effects of Project operation on Project-related recreation facilities.

Meeting the described goal and objectives is to be accomplished under seven tasks identified in the (RSP) which are:

- Task 1 - Recreation Facility and Condition Assessment
- Task 2 - Convene Meeting with Stakeholders to Discuss Existing and Future Recreational Opportunities
- Task 3 - Recreation Visitor Use Online Survey
- Task 4 - Recreational Use Documentation
- Task 5 - Aesthetic Flow Documentation
- Task 6 - Recreational Flow Release Desktop Evaluation
- Task 7 - Analysis and Reporting

The methodologies utilized to complete the referenced tasks are included in the relevant portions of this study addressing each.

4.0 METHODOLOGY AND RESULTS

4.1 Task 1 - Recreation Facility and Condition Assessment

Under Task 1 of the Recreation Study, Appalachian was to perform a field inventory to document existing Project and non-Project recreation facilities located within or adjacent to the Project boundary including Tinker Creek Canoe Launch, Niagara Project Canoe Portage Trail, and Roanoke River Trail. The information to be recorded was to include:

- A description of the type and location of the existing facilities;
- The type of recreation provided (boat access, angler access, picnicking, etc.);
- Length and footing materials of any trails;
- Existing facilities, signage, and sanitation;
- Type of vehicle access and parking (if any);
- Suitability of facilities to provide recreational opportunities and access for persons with disabilities (i.e., compliance with current Americans with Disabilities Act (ADA) standards for accessible design); and
- Photographic documentation of the recreation facilities and GPS location.

In addition, a qualitative assessment of the condition of the recreation facilities was to be performed using the Facilities Inventory and Condition Form developed by Appalachian. A copy of the form is included in Attachment 1 of this Recreation Study.

The existing formal Project recreation facility described by the RSP to be inventoried and assessed included the following:

- Niagara Canoe Portage Trail.

The existing formal non-Project recreation facilities described by the RSP to be inventoried and assessed included the following:

- Tinker Creek Canoe Launch located at The Town of Vinton, Virginia along Tinker Creek.
- Roanoke River Trail leading from the parking area along the NPS Blue Ridge Parkway at Milepost 115 to the Roanoke River downstream of the powerhouse for the Niagara Project.

The inventory and assessment information for the described locations is included as part of this report in Attachment 1. This information for each facility includes the Inventory Assessment Forms, photographs, and notes from the field surveys. Coordinates noted for each site represent the connecting points to the Roanoke River and Tinker Creek as appropriate. The locations for which inventory and condition assessments were made are shown in Figure 2.1 which presents recreational facilities within and adjacent to the Project boundary.

The field inventory for the Tinker Creek Canoe Launch occurred on October 18, 2019, while those for the Niagara Project Canoe Portage Trail and the Roanoke River Trail took place on October 24 and October 28, 2019, respectively.

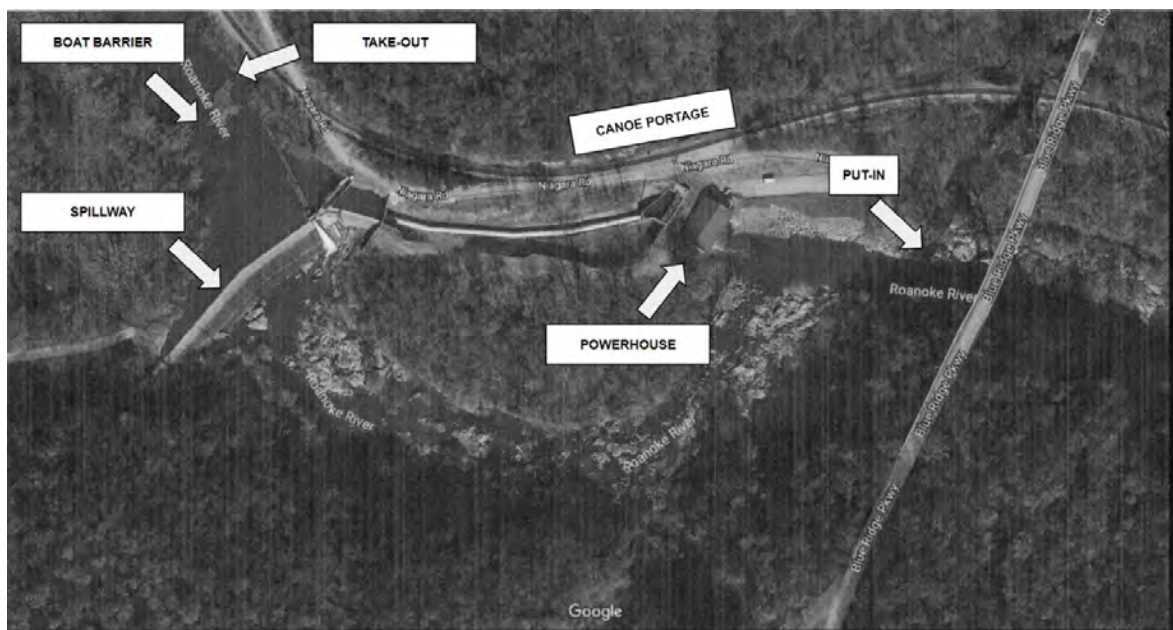
In addition to the formal Project and Non-Project recreation facilities listed above, the canoe/kayak take-out and put-in located at the terminus of Rutrough Road at the Roanoke River, identified as Rutrough Point, was similarly inventoried and assessed. The canoe/kayak access at Rutrough Point is located approximately three miles downstream of the Project Powerhouse and provides a location for canoeists and kayakers to exit and enter the Roanoke River. The Non-Project recreational facility Rutrough Point is part of Explore Park which is operated by the Roanoke County Parks, Recreation and Tourism and includes hundreds of acres along the Roanoke River to bike, hike, canoe, picnic, and more. A portion of Explore Park's shoreline is within the Smith Mountain Project (P-2210) and Rutrough Point is therefore governed by the Smith Mountain Project Shoreline Management Plan.

The field inventory and condition assessment for the Rutrough Point facility was performed on October 28, 2019. The inventory and assessment information for Rutrough Point is included in Attachment 1.

Following for each of the above-described recreation facilities are descriptions and assessments for each based upon the field information obtained as well as comments from stakeholders and those utilizing the facilities.

4.1.1 Niagara Project Canoe Portage Trail (Lat. 37.2677; Long. -80.0263) (Project Facility)

Figure 4.1: Niagara Project Canoe Portage Trail Aerial View



The one FERC-approved Project recreation facility is the canoe portage trail, constructed in 1996 by Virginia Department of Game and Inland Fisheries (VDGIF) (now known as Virginia Department of Wildlife Resources (VDWR)), as part of the Partners in River Access Program. It provides passage around the Project spillway and powerhouse utilizing the existing Project access road for most of its 1,550 feet of length. The Partners in River Access Program is a cooperative effort among VDWR, VDCR, and Appalachian to develop various recreation sites on the Roanoke, New, and James rivers in the vicinity of hydroelectric projects currently and previously owned and operated by Appalachian.

There is no public access to the Project access road which is narrow with steep slopes along one side. Getting from the entrance to the Project powerhouse along the access road also entails going across a railroad crossing that has very limited sight lines. The entrance to the access road is locked. However, emergency response personnel have keys to allow access if necessary.

Use of the canoe portage trail is limited to Project maintenance personnel, emergency response personnel from the surrounding communities, and members of the public canoeing or kayaking on the Project reservoir and desiring to proceed past the Project facilities to continue downstream. The portage itself is open to the public accessing the portage from the Project reservoir with restrictions only occurring if maintenance activities at the Project require closure of the portage.

As previously noted, the field inventory and condition assessment for the Canoe Portage Trail was accomplished on October 24, 2019. Weather at the time of the inventory was near 65°F, mild breeze, and sunny. Flow through the Project was approximately 250 cfs with no flow through the bypass channel below the Project spillway except for the minimum flows provided through the sluice gate in accordance with the existing Project license.

Canoeists and kayakers paddling downstream through the Project reservoir utilize the timber steps (provided by Appalachian in 2014) near the boat barrier located upstream of the Project intake structure and spillway.

On the map of the Roanoke River Blueway provided by the Roanoke River Blueway Committee to the public, the take-out for the canoe portage trail is described as difficult and that consideration should be given to avoiding the take-out if possible. At the take-out, there are three timber steps, each earth-filled and having a width of 48 inches, a depth of 20 inches, and a height of six inches. Accessing the steps to gain access to the canoe portage trail is difficult due to the depth of water at the steps along with the steep side-slope of the reservoir at the take-out point. A rope railing has been provided to assist those exiting the water and ascending the steps. There is a sign located just upstream of the boat barrier for the Project adjacent to the steps identifying the location of the take-out point for those canoeing or kayaking the Project reservoir. Visibility of the sign could be enhanced by relocating it further upstream.

The boat barrier consists of barrels connected by cable. During the inventory, a build-up of debris, both natural and man-made originating from the watershed and estimated to be in excess of what

would fill a dumpster was observed along the boat barrier. Appalachian allows the debris to accumulate and is passed on downstream at times of high river flows. The accumulation of debris during the inventory and condition assessment was insufficient to interfere with those canoeing or kayaking.

Adjacent to the steps there is a short length of shoreline both upstream and downstream that provides some area for bank fishing. Since the canoe portage trail can only be accessed by canoeists and kayakers, bank fishing opportunities are limited. However, there were signs of use by individuals of the shoreline areas.

From the steps, those portaging follow for approximately 140 linear feet a somewhat steep (in excess of 10% grade) gravel and cobble trail that is 10 feet wide and connects to the access road. The canoe portage route then follows the access road for approximately 1,250 feet. The access road has a compacted gravel surface, is 10 to 12 feet wide, and has both flat and downhill sloped sections. The sloped sections have grades ranging from 10 to 12 percent. Of the 1,250 feet of access road that is utilized as part of the canoe portage trail, 800 feet is parallel and near to an active railroad track.

The final portion of the canoe portage trail (approximately 150 feet in length) is not surfaced and consists of a worn path through a natural mulched and grassy area that continues into shallow river boulders on the Roanoke River. Access to the river through the natural setting over the smooth, sometimes wetted boulders could be considered challenging for inexperienced users. Signage is provided along the canoe portage trail. However, there is not a specific put-in location; the natural shallow river shoreline allows users to assess conditions under various flow conditions and put-in at multiple locations. Although not a designated use, bank fishing can be conducted at multiple locations at the put-in location.

The portions of the canoe portage trail sharing the plant access road, as well as the surrounding plant grounds are functional, well-maintained and in good condition. Five directional signs are provided along the canoe portage trail and should be replaced as the plastic coating is beginning to separate from the metal.

Other signs, including those for the canoe take-out and put-in, are in good condition but should be relocated to provide a clearer understanding as to their locations. Discussions during the field surveys with users of the canoe portage indicate that the existing signs are difficult to find and as previously noted, could be relocated upstream to provide additional notice to canoeists and kayakers.

Along the face of the Project powerhouse is a warning sign regarding releases from the generating units. The sign is difficult to read from the canoe portage put-in downstream as well as the fishing area at the end of the Roanoke River Trail directly across from the portage put-in. Above the entrance to the Project powerhouse is a sign providing the FERC identification number and information regarding ownership of the Project. Information provided denoting other recreation opportunities in the area should be included as required under 18 CFR §8.2(a).

Neither trash receptacles nor sanitary facilities are provided. Parking is not required for the portage as access is only available via the Roanoke River. However, parking adjacent to the Project powerhouse is available for Appalachian employees, contractors and individuals granted permission by Appalachian to enter the Project area by vehicle. None of the facilities associated with the canoe portage trail provide accommodations for those with special needs. All facilities associated with the Niagara Project Canoe Portage Trail are maintained by Appalachian.

The Recreation Facility Inventory and Condition Assessment for the Niagara Project Canoe Portage Trail along with photographs taken of the site are included in Attachment 1 of this study.

4.1.2 Tinker Creek Canoe Launch – Vinton, Virginia (Lat. 37.2636; Long. -79.9149) (Non-Project Facility)

Figure 4.2: Tinker Creek Canoe Launch Aerial View



The Tinker Creek Canoe Launch is located along Tinker Creek in the Town of Vinton, Virginia. Tinker Creek is a tributary to the Roanoke River and empties into the Roanoke River approximately two miles upstream of the Project spillway.

The Tinker Creek Canoe Launch is located along the eastern shoreline of Tinker Creek approximately one-third of a mile upstream of its confluence with the Roanoke River. The public entrance to the Tinker Creek Canoe Launch is located off 3rd Street approximately one-third of a mile south of Virginia Avenue (Virginia Rt. 24). Signs providing direction to the boat launch are

provided along Virginia Avenue. Operation and maintenance of the Tinker Creek Canoe Launch is provided by the Town of Vinton. Appalachian, along with VDWR, contributed funds for the upgrade of the canoe launch facilities during the existing license term. Weather during the inventory and condition assessment on October 18, 2019 included sunny skies, mild breezes, and a temperature of 60°F.

The primary facilities provided at the Tinker Creek Canoe Launch include: (1) a concrete boat ramp; (2) parking for vehicles with and without trailers; and (3) one canoe/kayak temporary storage rack that can accommodate 6 canoes and/or kayaks. The facilities are well maintained. At the time of the inventory and condition assessment, the facilities showed no signs of overuse.

The boat ramp is slightly curved having a length of 75 feet, an average slope of 20 percent, and a width of 10 feet. At the end of the ramp, the depth of water is shallow, and the bottom of Tinker Creek is rocky. Flow during the inventory and condition assessment was very low. There is minimal frontage along the creek for bank fishing. The boat ramp is in good condition although some erosion was noticed along the embankment at the left side of the boat ramp looking upstream.

At the upper end of the boat ramp is a timber canoe/kayak rack that can accommodate six canoes/kayaks on a temporary basis. At the time of the condition assessment, the canoe/kayak rack was in good condition. Since then, some damage to the rack had occurred requiring repairs. In addition, there is a wooden kiosk containing regulations for use of the boat launch and information regarding local activities.

There are other signs throughout the boat launch area that provide information regarding contributors to the facility, direction to exits, and the Roanoke River Blueway being included in the Virginia Treasure program. All of the signs are in good condition and can be easily read. At the entrance to the Tinker Creek Canoe Launch from 3rd Street is a sign identifying the facility that is large and easy to read.

Parking is provided for 23 vehicles. The surface of the parking lot is asphalt. Of the 23 spaces provided, five are designated for use by boaters with one of the five is identified for handicap use. The remaining 18 parking spaces are shared by individuals utilizing the boat launch facility and Town of Vinton employees who work at the maintenance facility across 3rd Street. The five parking spaces identified as being for boaters can only accommodate vehicles while the remaining spots can be utilized by vehicles with trailers if necessary. A wooden privacy fence is located along the northern side of the parking area. There are no restrooms. A trash receptacle is provided at the top of the boat ramp.

The Recreation Facility Inventory and Condition Assessment for the Tinker Creek Canoe Launch along with photographs taken of the site are included in Attachment 1 of this study.

4.1.3 Roanoke River Trail (Lat. 37.2531; Long. -79.8716) (Non-Project Facility)

Figure 4.3: Roanoke River Trail Aerial View



The Roanoke River Trail begins at the NPS Roanoke River Overlook located at milepost 115 for the Blue Ridge Parkway in Roanoke County, Virginia. It essentially follows the bypass reach for the Niagara Project and ends at the Roanoke River approximately 100 feet downstream of the Project powerhouse.

The recreation facility inventory and condition assessment was conducted on October 28, 2019. Weather during the inventory and condition assessment was approximately 65°F, clear skies, and mild winds. Flows through the Project were measured at approximately 500 cfs with most of the flow passing through the Project generating units. Flow through the bypass channel was the normal minimum flow provided through the sluice gate at the Project spillway in accordance with the conditions of the existing license.

Facilities provided for the Roanoke River Trail include: (1) parking for 35 vehicles; (2) the trail beginning at the parking area and ending at the Roanoke River; and (3) observation bench along the trail from which flow through the Project bypass channel can be observed. The Roanoke River Trail is situated on NPS property thus the trail and associated facilities are maintained by the NPS. Overall, the facilities for the Roanoke River Trail are well maintained and in good condition.

The parking area is asphalt surfaced. Of the 35 spaces provided, none are designated for handicap use. A trash container and information signs are provided at the entrance from the parking area at the head of the Roanoke River Trail. No restroom facilities are provided.

The Roanoke River Trail is a walking trail that begins at the parking area for the NPS Blue Ridge Parkway Roanoke River Overlook and ends at the Roanoke River. The upper portion of the trail is 200 feet long having an asphalt surface, a width of 36 inches, and an average slope of 16 percent. Views of the Project spillway and the upper portion of the Project bypass channel are available from the parking area and upper portion of the trail. A wooden rail is provided to keep individuals separated from the steep slopes adjacent to the trail. Portions of the wooden rail are in need of repair. The asphalt surface for the trail is cracking at various locations and requires maintenance to prevent tripping.

The next lower segment of the trail is 150 feet long, 48 inches wide, relatively flat, and has a gravel surface. This segment of the trail is in fairly good condition needing the addition of gravel at some areas.

The lower or last segment of the trail is very steep consisting of 200 timber steps with gravel fill. Each step is 48 inches wide, six inches high, and has an average depth of 20 inches. The steps were constructed in 2015 by Pathfinders for Greenways which is a volunteer group associated with the Roanoke Valley Greenway Commission. The gravel fill has settled at certain locations and requires replenishment. There are short landings of various lengths along the lower segment of the trail that provide transition and resting zones. A wood bench is provided at one landing from which the Project bypass channel and powerhouse can be viewed. There also is a large tree trunk that has been carved to allow for sitting for those desiring to rest.

The vertical distance from the top of the steps to their end at the Roanoke River is estimated at approximately 100 feet. The steps are utilized by individuals desiring to fish along the Roanoke River downstream of the Project powerhouse and at the Project bypass. According to individuals representing various governmental agencies, non-governmental organizations, and local businesses, kayakers and canoeists also utilize the Roanoke River Trail and steps to gain access to the Roanoke River. Documentation of discussions with the referenced representatives is provided in Attachment 7 of this study. There is also a narrow and steep non-designated dirt trail utilized to access the bypass channel from the Roanoke River Trail.

The approximate location of the referenced non-designated trail is shown in Figure 4.10.

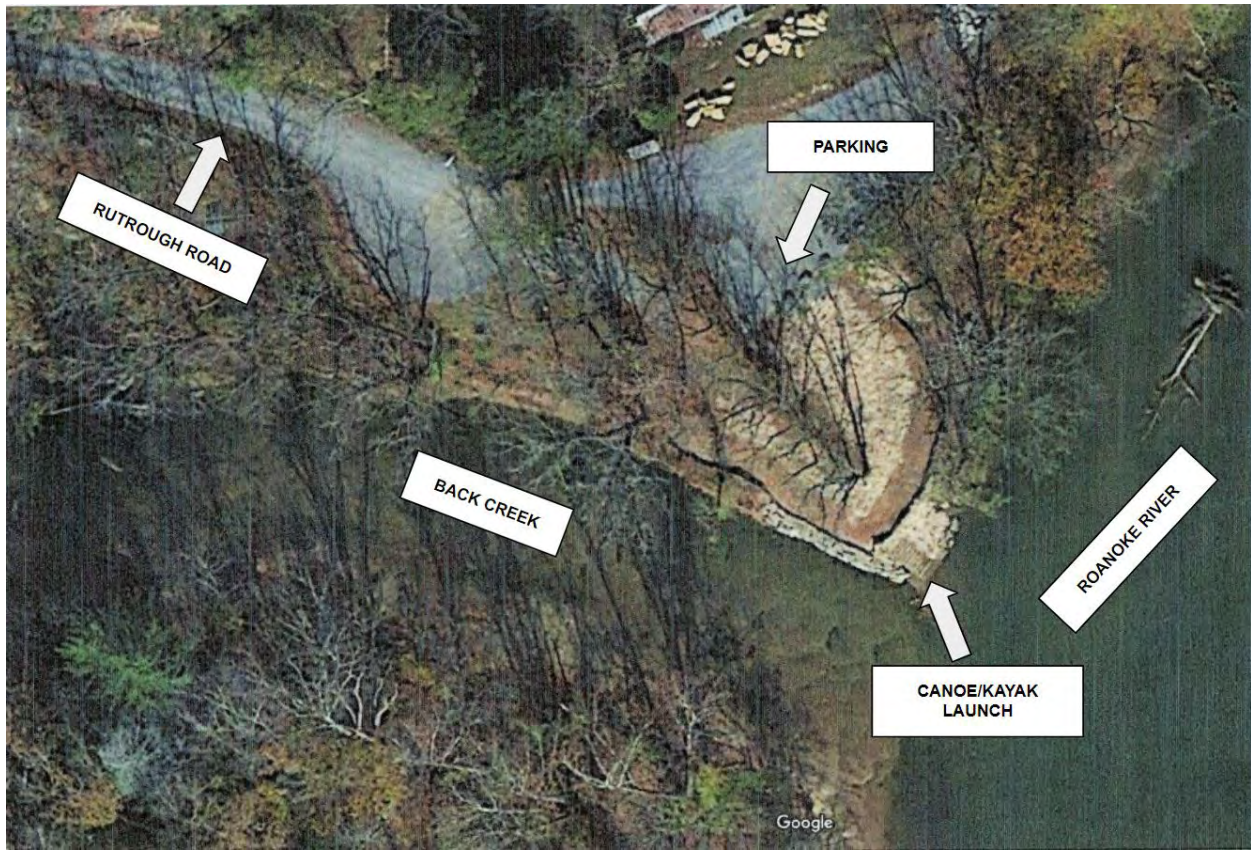
At the end of the steps are large rocks that provide an area for bank fishing. From this area, the bypass channel can be observed as well as the Project powerhouse. The distance from the bank fishing area to the Project powerhouse is approximately 100 feet. A warning sign regarding releases of flow from the powerhouse is situated along the fence adjacent to the powerhouse. The lettering on the sign is difficult to read from the end of the steps. A sign with more predominant lettering should be considered.

Across the Roanoke River from the end of the steps, the put-in for the Niagara Project Canoe Portage Trail can be seen, thus individuals putting their canoe or kayak into the Roanoke River from the Niagara Project Canoe Portage Trail can be observed. USGS gaging station Gage No.

02056000 is also located at the end of the steps. No trash receptacles are provided along the trail or at the bank fishing area.

4.1.4 Rutrough Point (Lat. 37.2259; Long. -79.8474) (Non-Project Facility)

Figure 4.4: Rutrough Point Aerial View



Rutrough Point is a canoe/kayak launch/take-out located in Roanoke County approximately three miles downstream of the Project powerhouse at the confluence of Back Creek and the Roanoke River within Explore Park and operated by the Roanoke County Parks, Recreation and Tourism. Rutrough Point provides access to the Roanoke River at the southern end of Explore Park in Roanoke County. Facilities at that location include: (1) a canoe/kayak launch; (2) parking for 12 vehicles; (3) a picnic area; and (4) connections to trails for Explore Park. The Recreation Facilities Inventory and Condition Assessment was conducted on October 18, 2019. Weather on that day was 70°F, sunny, and mild breezes. Flow for the Roanoke River at the time of the Inventory and Condition Assessment was estimated at approximately 190 cfs. In general, the area is well kept and in good condition.

Parking is provided with the entrance being from Rutrough Road. Signage providing direction to Rutrough Point does not exist along Rutrough Road or at the entrance to the parking area. The

parking lot has a gravel surface and provides spaces for 12 vehicles. None of the spaces are designated for handicap use.

From the parking lot, there is a dirt trail leading to the canoe/kayak launch. The trail is approximately 75 feet long and 30 inches wide. The launch is located near the confluence of Back Creek and the Roanoke River and consists of 12 timber steps each 8 feet wide, 15 inches deep, and 6 inches high. At the time of the inventory and condition assessment, the steps were covered by silt and grasses causing them to be slippery.

Two picnic tables are provided near to the canoe/kayak launch. Trash receptacles are provided at the parking area and canoe/kayak launch as are trash bags and “mutt-mitts”. No restroom facilities are provided. There is a daily fee of \$3.00/person for parking at Rutrough Point. A one-year pass can also be obtained for \$20.00.

Numerous signs containing rules and regulations for use of Rutrough Point are at the site along with others providing direction to the facilities at the site and trails connecting to Explore Park. In addition, there is a sign providing warning to those utilizing the facilities of potential changes in water levels and flow caused by operations at the upstream Niagara Hydroelectric Project. It is evident that bank fishing takes place along the shoreline and the trail leading to Explore Park.

The Recreation Facility Inventory and Condition Assessment, including photographs, is contained in Attachment 1 of this study report.

4.2 Task 2 - Convene Meeting with Stakeholders to Discuss Existing and Future Recreational Opportunities

In accordance with the Recreation Study Plan approved under the December 6, 2019 Order whereby the Commission issued a Study Plan Determination for the Project, Appalachian convened a virtual meeting on April 20, 2021 with interested relicensing participants to have a focused discussion of existing and future recreational opportunities at or associated with the Project. Included were discussions of potential conceptual level recreation enhancements and improvements to the canoe portage trail and other areas of the Project where enhancements may be feasible.

Participating in the meeting were representatives from Friends of the Roanoke River Valley Association (FORVA), Roanoke County Parks and Recreation (RCPR), Roanoke Regional Partnership (RRP), Roanoke River Blueway Committee (RRBC), VDCR, Roanoke Valley Greenways Commission (RVGC), and Appalachian.

After an introductory presentation by representatives for Appalachian, presentations were given on behalf of RCPR, RVGC, and RRBC. Comments were also provided by a representative for FORVA. The presentations by the stakeholder groups primarily focused on the goals and objectives for the Roanoke River Blueway, Roanoke County parks, and the system of greenways

existing and planned for the Roanoke Valley especially as they can impact or be impacted by the Niagara Project.

Participants described the recent growth of outdoor recreation activities and goals for the Roanoke area including at or near the Niagara Project. Participation in fishing, kayaking, tubing, canoeing, and hiking is expected to grow as facilities in the Roanoke Region are expanded toward the Niagara Project. An example is the desired extension of the Roanoke Valley Greenways along the southern shoreline of the Niagara Project reservoir. Also of interest to the stakeholders are the potential for improvements to the Niagara Project Canoe Portage Trail that could improve canoeing and kayaking experiences and opportunities.

The stakeholders also expressed an interest in the potential for an access upstream of the right abutment for the Project spillway. The implied benefit of such an access as expressed by the stakeholders would be to provide canoeists, kayakers, and paddle boarders a location to complete floats emanating from upstream including from the Tinker Creek Canoe Launch. In addition, it was suggested that an alternative portage trail could possibly be developed from that location around the Project spillway.

Appalachian provided a summary of the meeting to the stakeholders that included the presentations made. That summary along with the presentation materials is provided in Attachment 4 of this study.

4.3 Task 3 - Recreation Visitor Use Online Survey

Appalachian developed an interview/survey instrument that draws from general concepts and guidance from the National Visitor Use Monitoring Handbook (USFS 2007) as well as from other relicensing studies approved by the FERC for recreation visitor use surveys.

The online survey was administered through the Project's relicensing website (online) and offered respondents the opportunity to provide survey responses electronically.

Various outreach methods were implemented to allow respondents to complete a survey. The survey could be completed on-site at the Tinker Creek Canoe Launch, Rutrough Point, and the Roanoke River Trail, or later by visitors to the referenced sites upon returning home from their visit. Flyers providing information regarding the survey and the link to it were provided to individuals at those locations. The content of the flyer is provided in Attachment 2. Notice of the survey was also posted on the Project's relicensing website and relevant social media outlets maintained by Appalachian. In addition, contact was also made with local outfitters and regional organizations to provide notice of the survey to their members and clients.

Appalachian reshared the survey link with stakeholders in May 2021, so that they could distribute to their users/groups. Appalachian also posted the survey link on the Claytor Lake and Smith Mountain Facebook pages, as well as the NextDoor application. (The notification was sent to 19

Appalachian serviced neighborhoods, translating to about 3,800 customers in the area of the Niagara Dam and corresponding Project area. These postings were done on June 7, 2021).

In addition to the outreach methods described above, Appalachian posted a brief description of the purpose and intent of the survey, as well as the website address at the Niagara Project Canoe Portage Trail, Tinker Creek Canoe Launch, and Rutrough Point. Figure 4.5 shows the notice posted at each site.

The online questionnaire utilized is the same questionnaire provided in Attachment 2 for the in-person surveys. The questionnaires were designed to collect information about the recreational sites being studied including:

- General user information;
- If the individual filling out the survey was a resident or visitor;
- Purpose and duration of the visit;
- Distance travelled;
- Day use/overnight lodging;
- History of visiting the site or area;
- Types of recreational activities respondents participated in during the visit;
- General satisfaction with recreational opportunities and facilities;
- Areas in need of improvement;
- Effects of Project operations on recreation use and access; and
- Accessibility of facilities.

Figure 4.5: Online Survey Information Posting



4.3.1 Results for the Online Survey

The Recreation Visitor Use Online Survey provided a method for existing and potential recreation visitors to the Study Area to respond and provide feedback on recreation opportunities at the Project, as well as at non-Project facilities. From April 21, 2020 to October 27, 2021, Appalachian received 119 responses to the online survey. A high-level summary of all the recreation facility responses is provided below:

- Seventy-nine percent of the responses primarily came from three recreation facilities: Niagara Portage Trail (owned by Appalachian), Roanoke River Trail/Overlook (owned by NPS), and Rutrough Point (owned by Roanoke County), indicating these sites were the most frequently utilized by online survey respondents.
- Fifty-five percent of the survey respondents came from four zip code locations, averaging 9 miles from the Project. Eighty-three percent considered themselves to be regular visitors to the area (i.e., at least 3 or more visits per year) and stayed at the Project an average length of 4 hours per visit. Ninety-five percent of respondents did not stay overnight at the Project.
- Seventy-three percent of respondents were male.
- Forty-eight percent of respondents were between ages 40 and 59.
- The most frequent months visited were April to September, and April through June were the peak months (Figure 4.6).

- As shown in Table 4.0, canoe/kayaking/stand-up paddle boarding (SUP) and fishing were the most popular activities at the Project documented in the online survey.
- Visitors rated each recreational visit at the Project for its accessibility, parking, crowding, safety, condition, availability, and overall experience. The sliding scale rating system indicated that visitors generally found the individual metrics and overall experience “acceptable.” The only metric that was not rated highest in the acceptable category was the Available Facilities metric, which was rated neutral (Figure 4.7).

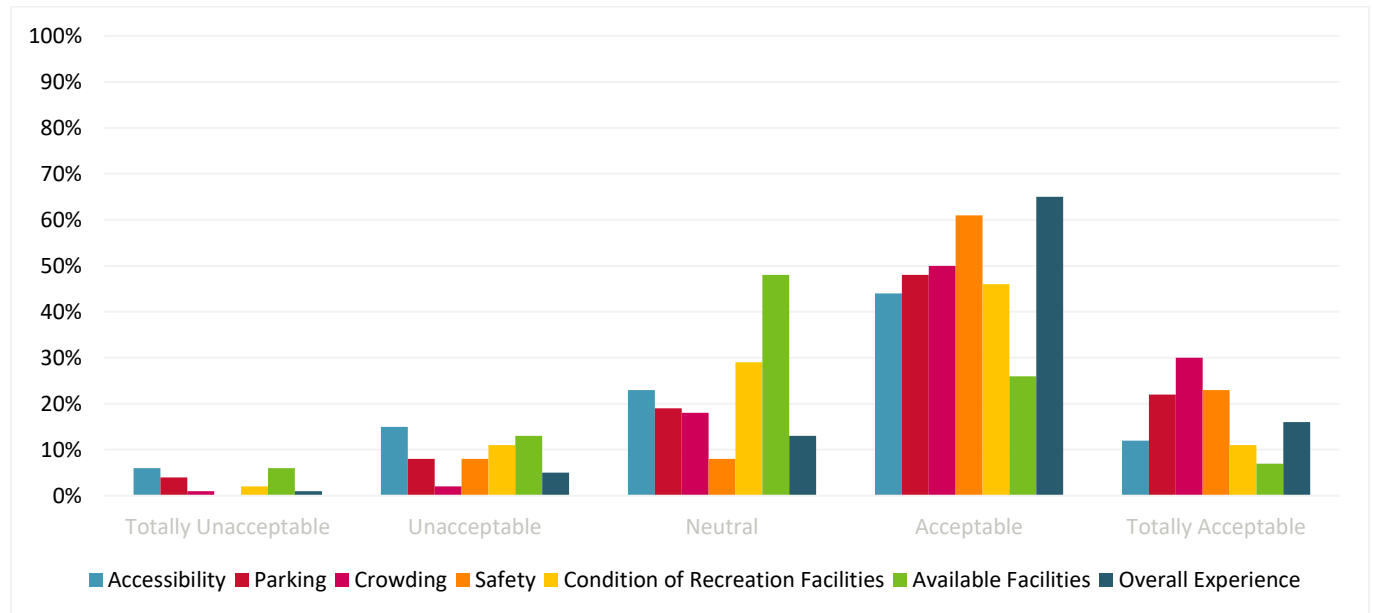
Figure 4.6: Monthly Recreation Activity for Project and Non-Project Facilities



Table 4.0: Online Survey Summary for Primary Recreation Activities at all Project and Non-Project Facilities

Primary Activity	Percent (%)
Canoeing/kayaking/SUP	65
Fishing	17
Hiking	8
Pleasure boating/Tubing/Wake Surfing	3
Sight-seeing/Wildlife Viewing	3
Swimming	2
Picnicking	1
Running	1

Figure 4.7: Online Survey Summary for Overall Rating on All Visits at Project and Non-Project Facilities



The online survey resulted in 24 percent of respondents expressing enthusiasm for having the Niagara Project and Non-Project facilities studied. Several comments included requests or recommendations for flow releases to improve water quality, which was analyzed as part of this study and the results are described in Section 4.6. There were also comments including requests for trash removal. The top two suggestions for improvement included better and more public access and improvements to portages.

Facility-specific summaries and verbatim user comments from the online survey are included in Attachment 6.

4.4 Task 4 - Recreational Use Documentation

Recreation use monitoring was conducted at the Roanoke River Trail, Tinker Creek Canoe Launch, Rutrough Point, and Niagara Project Canoe Portage Trail. For the first three sites referenced, monitoring was accomplished by documenting in the field the number of vehicles parked at the areas provided as well as the number of individuals observed during each visit. In addition, individuals were surveyed regarding their use of the recreation facilities along with opinions of the facilities provided and suggested improvements.

Usage of the Niagara Project Canoe Portage Trail was determined from field observations made from the Roanoke River Trail, recordings from a trail camera placed along the portage route and discussions with Appalachian staff working at the plant.

Visitor use data was obtained at the formal non-Project recreation facilities through a combination of in-person surveys and field reconnaissance. Field reconnaissance and interviews were originally scheduled to take place during the prime recreational months of May 2020 through October 2020 on the schedule provided below:

- May – One weekend day (Memorial Day Weekend) and one randomly selected weekday.
- June – One randomly selected weekend day and one randomly selected weekday.
- July – One weekend day (July 4th Weekend) and one randomly selected weekday.
- August – One randomly selected weekend day and one randomly selected weekday.
- September – One weekend day (Labor Day Weekend) and one randomly selected weekday.
- October - One randomly selected weekend day and one randomly selected weekday.

However, due to study delays and local shelter-in-place directives in 2020 resulting from the COVID-19 pandemic, this task was re-scheduled for May through October 2021. The interview/survey instrument developed by Appalachian and included in Attachment 2 was utilized for the in-field interviews of recreationists. In addition, a windshield flyer directing to the web site those individuals who either did not elect to fill-out the survey forms at the recreation facilities or were not available while YES staff was in the field was distributed to individuals or placed on vehicle windshields at the Tinker Creek Canoe Launch and Rutrough Point. Flyers were distributed to individuals at the Roanoke River Trail, but not placed on vehicle windshields at the request of NPS.

YES personnel rotated between each of the recreation sites listed and spent four hours to complete one rotation within the period from 8:00 AM through 6:00 PM. A rotation consisted of visiting each site twice. The starting time for each field survey varied considering weather conditions and other factors including but not limited to temporary closing of the Blue Ridge Parkway, construction activities at the recreation facilities, and events taking place at the recreation facilities. YES staff stayed a minimum of 30 minutes during each visit to document usage of the facility and perform in-person surveys.

As noted earlier, in-person surveys were not performed in 2020 due to COVID-19 concerns and constraints. However, information was obtained in the field in 2020 for the amount and type of activities taking place at each of the recreation sites. For each location, YES made field observations in 2020 of usage during the holiday weekends (i.e., Memorial Day, Fourth of July, and Labor Day). The intent was to establish a general understanding of the level of activities during what would normally be expected to be higher usage periods at the facilities. In addition, recreation activities were recorded for the Roanoke River Trail while capturing photographs and videos in support of the Aesthetic Flow Documentation performed as part of this Recreation Study. The results of the 2020 observations are presented in Table No. 4.1.

Although the introduction of COVID-19 appeared to have increased outdoor recreation in other areas, weather conditions in 2020 may have kept recreation activities at lower than anticipated

levels. Rainfall in the Project area during 2020 was the highest amount recorded for a year thus impacting river flows. In particular, rainfall for the month of May was the highest ever recorded for that month. Closures of portions of the Blue Ridge Parkway also likely had a negative impact on visits to the Roanoke River Trail.

For the 2020 Memorial Day weekend, rainfall was at historic levels with related high stream flows causing closure of the Tinker Creek Canoe Access. Flow recorded for the Roanoke River below the Project powerhouse was 2,970 cfs while that at Tinker Creek was in excess of 410 cfs. In addition, the heavy rains resulted in damage to portions of the Blue Ridge Parkway resulting in the closure of the Roanoke River Trail. At Rutrough Point, flows for the Roanoke River also limited in-water activities. Weather during the observations was cloudy with temperatures in the mid-60s.

During the July 4th holiday in 2020, portions of the Blue Ridge Parkway remained closed thus negating access to the Roanoke River Trail. Weather on July 3rd was sunny with temperatures near 80 degrees. Activities noted for Rutrough Point and Tinker Creek Canoe Access are shown in Table 4.1. The recorded flow for the Roanoke River downstream of the Project powerhouse was 527 cfs.

On September 26th (Labor Day Weekend), the weather was sunny with temperatures in the mid-70s. All of the recreation sites were open to the public with activities noted at Rutrough Point and Roanoke River Trail. There was no activity observed at Tinker Creek Canoe Access. River flow downstream of the Project was 804 cfs.

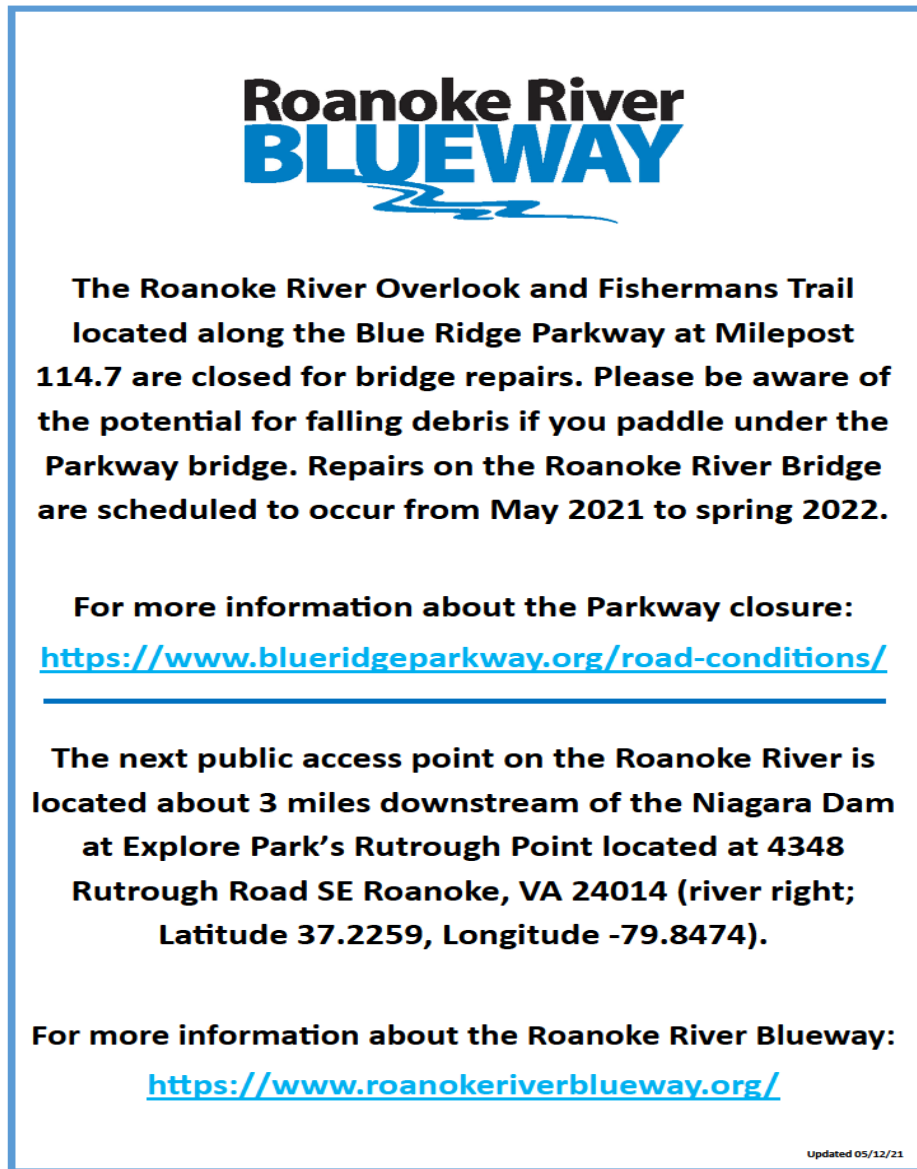
Table 4.1: Niagara Recreation Facilities 2020 Observations

Recreation Site	Date	Time	Vehicles	Parking Spaces	Percentage	Activities
Rutrough Point						
	25-May	11:15 AM	5	12	42%	Two people fishing. High river flows.
	3-Jul	9:45 AM	6	12	50%	One kayak launching. Two people fishing.
	5-Sep	11:15 AM	4	12	33%	One canoe launching.
	26-Sep	3:40 PM	2	12	17%	Two pontoon boats on river. Three people bank fishing.
Tinker Creek						
	25-May	11:35 AM	0	5	0%	Ramp closed due to high water.
	3-Jul	10:15 AM	3	5	60%	No activity.
	5-Sep	12:30 PM	0	5	0%	No activity.
	26-Sep	4:40 PM	2	5	40%	One vehicle with trailer waiting for canoes/kayaks.
Roanoke River Trail						
	1-Jan	9:30 AM	2	35	6%	No activity.
	7-Feb	11:45 AM	0	35	0%	No activity.
	2-Mar	12:45 PM	1	35	3%	Two people hiking.
	25-Mar	12:00 PM	5	35	14%	Two people hiking; two people bank fishing.
	1-May	10:45 AM	3	35	9%	Four people hiking.
	25-May					Closed due to road conditions.
	3-Jul					Closed due to road conditions.
	5-Sep	11:45 AM	4	35	11%	One person bank fishing.
	26-Sep	3:50 PM	10	35	29%	Two people viewing spillway; five people hiking.

The dates and times field monitoring occurred in 2021 are provided in Table 4.2. Field monitoring was conducted for the Roanoke River Trail for the period March 20 through May 23, 2021. The NPS announced early in 2021 that maintenance work planned for the bridge over the Roanoke River just downstream of the Project powerhouse would commence in early April 2021 and continue for approximately one year. The planned work would result in closure of the Blue Ridge Parkway from Route 24 to the entrance to Explore Park as well as the closure of the Roanoke River Trail and associated parking area. Beginning March 20, monitoring was performed at the Roanoke River Trail in order to gather some information regarding recreation activities associated with that location. As the date for the closures changed, YES continued monitoring at the Roanoke River Trail.

When the described closures of the Blue Ridge Parkway and Roanoke River Trail occurred on May 24, monitoring at the closed trail was stopped and the other sites were continued to be monitored in accordance with the Study Plan schedule through October. The Roanoke River Blueway Committee put up signs and provided flyers at the river access points upstream of the Niagara Project Canoe Portage Trail take-out regarding the closure of the Parkway informing paddlers about the bridge repairs. Updates were also provided on the Roanoke River Blueway website. The content of the signs and flyers is shown in Figure 4.8.

Figure 4.8: Roanoke River Blueway Blue Ridge Parkway Closure Notice



Source: Roanoke River Blueway Committee

In contrast, weather and river flow conditions during the days field monitoring took place in 2021 were very good thus allowing for normal activities to take place at each site. Table 4.2 presents field conditions for the dates monitoring occurred along with the time and weather conditions when monitoring began and ended each day. Weather conditions were observed at the sites while flow conditions for the Roanoke River are based upon data provided from the USGS Gage (No. 02056000) located immediately downstream of the Project powerhouse and which captures all through Project flow.

Table 4.2: Field Conditions During 2021 Monitoring

Date	Start Time	End Time	Start Weather	End Weather	Start Flow (cfs)	End Flow (cfs)
3/20/2021*	12:40 pm	1:45 pm	50°-Sunny	52°-Sunny	931	921
3/29/2021*	11:30 am	12:15 pm	55°-Sunny	55°-Sunny	2,220	2,190
4/10/2021*	9:30 am	10:30 am	60°-Cloudy	61°-Cloudy	692	688
4/12/2021*	3:00 pm	5:00 pm	72°-Sunny	72°-Sunny	1,550	1,510
4/24/2021*	9:00 am	10:30 am	45°-Cloudy	49°-Cloudy	531	534
5/1/2021	9:00 am	1:45 pm	55°-Sunny	70°-Sunny	452	458
5/11/2021	9:45 am	4:45 pm	60°-Cloudy	69°-Sunny	377	363
5/31/2021	9:10 am	1:00 pm	64°-Sunny	66°-Sunny	377	383
6/7/2021	8:20 am	11:20 am	74°-Sunny	79°-Cloudy	247	236
6/19/2021	9:51 am	12:52 pm	79°-Pt. Cldy	85°-Pt. Cldy	284	302
7/3/2021	10:38 am	2:30 pm	72°-Sunny	80°-Sunny	484	458
7/23/2021	11:05 am	3:00 pm	80°-Sunny	83°-sunny	188	211
8/14/2021	8:47 am	12:33 pm	82°-Pt. Cldy	88°-Pt. Cldy	193	193
8/19/2021	9:35 am	1:15 pm	76°-Sunny	91°-Sunny	313	334
9/5/2021	9:37 am	12:34 pm	85°-Sunny	85°-Sunny	216	218
9/24/2021	1:39 pm	5:25 pm	73°-Sunny	70°-Sunny	608	567
10/2/2021	9:32 am	1:45 pm	60°-Sunny	79°-Sunny	229	197
10/4/2021	7:06 am	10:45 am	68°-Overcast	70°-Cloudy	383	329

*Field surveys taken at Roanoke River Trail only.

River flows ranging on the monitoring dates were favorable for water related activities with the maximum differential during one monitoring period not exceeding 40 cfs. The associated gage heights varied overall from 2.0ft. to 6.2 ft. but no more than 0.1ft. during any monitoring period.

4.4.1 Results for Roanoke River Trail (Non-Project Facility) - 2021

The following tables present the results of the field surveys relative to activities for the Roanoke River Trail in 2021 which is owned and operated by the NPS. The information obtained from the field surveys taken at the Roanoke River Trail indicate that those recreating at that location primarily partake in bank fishing, hiking, and viewing of the Project spillway, bypass, and powerhouse. Individuals visiting the Roanoke River Trail do so the entire year with most of the visits occurring during the months March through September. Those interviewed also demonstrated their satisfaction with the facilities provided as shown in Table 4.5.

Table 4.3: Months Survey Respondents Typically Visit Roanoke River Trail

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number	5	5	10	13	11	9	8	9	9	7	5	5
Percent	26%	26%	53%	68%	58%	47%	42%	47%	47%	37%	26%	26%

Table 4.4: Primary Activities Participated in by Survey Respondents at Roanoke River Trail

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	4	0	0	0	0	0	12	0	0	3
Percent	21%	0	0	0	0	0	63%	0	0	16%

Table 4.5: Overall Experience of Survey Respondents at Roanoke River Trail

Number (Percent)	Accessibility	Parking	Crowding	Safety	Condition of Facilities	Available Facilities	Overall Experience
Totally Unacceptable	0	0	0	0	0	0	0
Unacceptable	0	0	1 (5%)	0	0	0	0
Neutral	0	1 (5%)	2 (11%)	0	0	0	0
Acceptable	4 (21%)	1 (5%)	3 (16%)	3 (16%)	7 (37%)	6 (32%)	4 (21%)
Totally Acceptable	15 (79%)	17 (89%)	13 (68%)	16 (84%)	12 (63%)	13 (68%)	15 (79%)

Discussions with representatives for FORVA, Roanoke County, Roanoke River Blueway Committee, and others with knowledge of recreation activities at the Roanoke River Trail (see Attachment 7) identified the Roanoke River Trail as being utilized extensively for the launching of kayaks in the Roanoke River just below the Project powerhouse. During the visits to the site as part of the effort to survey individuals regarding recreation activities at the Roanoke River Trail and to obtain aesthetic flow documentation as described elsewhere in this report, there were no observations of activities related to kayaking. However, the stakeholder representatives interviewed along with a few of the individuals that participated in the in-person surveys at the Project recreation facilities did describe the difficulties in hauling kayaks down the steps provided at the Roanoke River Trail to launch the kayaks in the rapids below the powerhouse. Although difficult, most individuals did indicate that taking their kayaks to the river down the steps was doable. Comments made by individuals participating in the in-person surveys are documented in Attachment 2 of this study.

According to the survey results, some individuals who desire to kayak the portion of the Roanoke River from just below the Project powerhouse to Rutrough Point launch at the end of the steps for the Roanoke River Trail. Users park their vehicles at the parking area off the Blue Ridge Parkway and then haul their kayaks along the trail, descending the steps down to the river. It has been

reported that some individuals attempt to utilize unmarked trails beginning above the steps to follow very steep terrain directly to the rocky bypass area for the Project. They then follow the bypass to the put-in at the end of the steps to launch their canoes, or if flows allow, will launch into the bypass reach. During the field monitoring and periods of low flow through the bypass, individuals were observed utilizing the unmarked trails to access the bypass channel for fishing, sunbathing, and climbing on the rocks. Those utilizing the unmarked trails described them as being difficult due to the steep slopes and slippery footing. Photographs of one of the unmarked trails are provided in Figures 4.9 and 4.11. In addition, a sketch of the location of one of the trails is provided in Figure 4.10.

Figure 4.9: Unmarked Trail from Roanoke River Trail to Project Bypass (NPS)

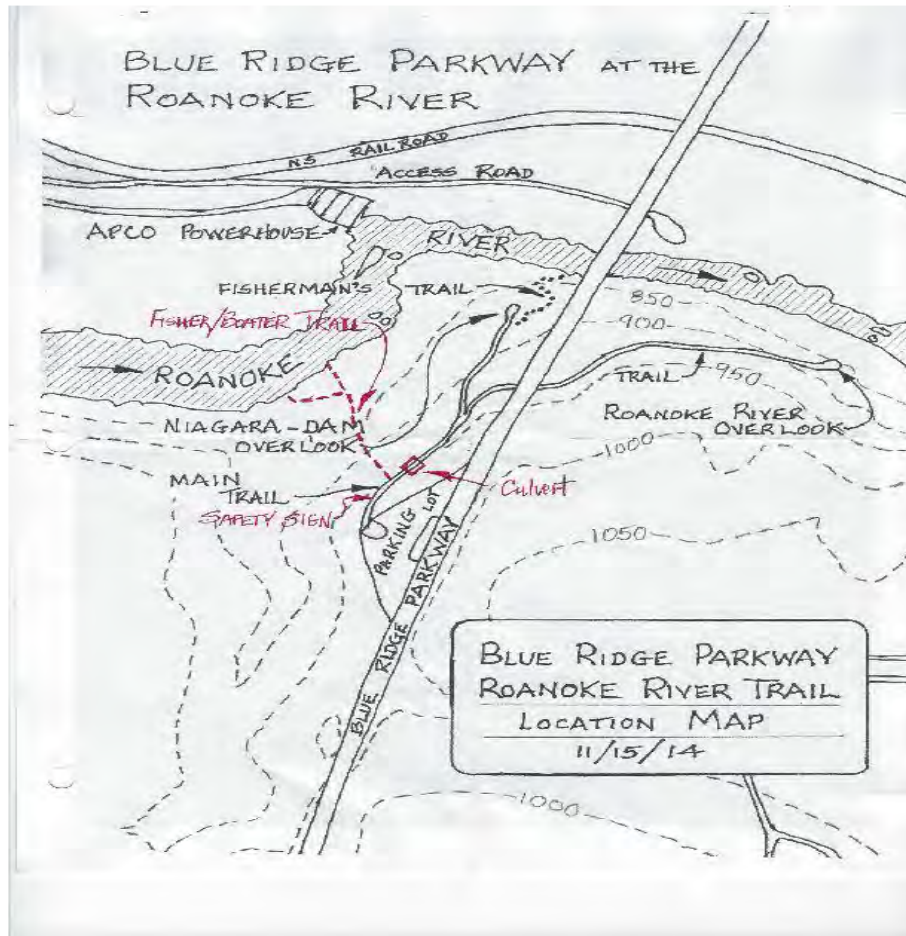


During the monitoring, it was evident that most visits were of short duration during which a break could be taken from traveling along the Blue Ridge Parkway. Vehicles counted at the parking area for the Roanoke River Trail were from numerous locations outside of Virginia based upon the different license plates noted. Various zip codes for locations outside of the Roanoke area were recorded during the in-person surveys. Approximately 25 to 35 percent of the individuals visiting the Roanoke River Trail during the field monitoring were from outside the Roanoke area. Tables in Attachment 2 summarize the locations from which visitors travelled.

The 2021 field monitoring results are similar to the results recorded in 2020 for the Roanoke River Trail. Primary activities observed in 2021 were hiking, viewing, and bank fishing. As noted in

Tables 4.1 and 4.6, the maximum percentage of parking spaces occupied at any one time was recorded at 43 percent, indicating that the parking facilities provided are adequate.

Figure 4.10: Sketch of Unmarked Trail from Roanoke River Trail to Bypass



Source: Bill Tanger – FORVA

Figure 4.11: Individual Utilizing Undesignated Trail from Project Bypass



Table 4.6: Roanoke River Trail Facility Capacity Observations - 2021

Average Facility Capacity Percent			Max. Observed Facility Capacity Percent		
Weekday	Weekend	Holiday	Weekday	Weekend	Holiday
4%	7%	N/A	14%	43%	N/A

4.4.2 Results for Tinker Creek Canoe Launch (Non-Project Facility) - 2021

Individuals utilizing the Tinker Creek Canoe Launch consist of canoeists, kayakers, paddle boarders, and persons participating in boat fishing. The general pattern of their activities is to launch at the Tinker Creek Canoe Launch and float down Tinker Creek to the Roanoke River. From that point, the trip continues either upstream toward the Bennington Canoe Launch or downstream toward the Project spillway. The portion of the Roanoke River that is travelled includes the Project reservoir thus the waters are normally very still. The users return to the Tinker Creek Canoe Launch to end their trip.

The Tinker Creek Canoe Launch is also utilized by river rescue crews for the City of Roanoke and Roanoke County to respond to rescue calls along the Roanoke River upstream of Niagara Dam.

The number of individuals surveyed at the Tinker Creek Canoe Launch was very low. Tables 4.7 and 4.8 present the results of the surveys relative to activities for the Tinker Creek Canoe Launch. From the results obtained, it appears that individuals utilizing the facilities provided at the Tinker Creek Canoe Launch each month of the year with the higher percentage of visits occurring during the months of April through October. The primary activities observed at this location include launching boats for fishing, and canoes and kayaks for paddling along Tinker Creek and the reservoir for the Niagara Project. Those interviewed demonstrated their satisfaction with the facilities provided as shown in Table 4.9.

Table 4.7: Months Survey Respondents Typically Visit Tinker Creek Canoe Launch

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number	3	3	3	5	7	7	7	7	7	7	5	3
Percent	43%	43%	43%	71%	100%	100%	100%	100%	100%	100%	71%	43%

Table 4.8: Primary Activities Participated in by Survey Respondents at Tinker Creek Canoe Launch

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	0	4	0	3	0	0	0	0	0	0
Percent	0%	57%	0%	43%	0%	0%	0%	0%	0%	0%

Table 4.9: Overall Experience of Survey Respondents at Tinker Creek Canoe Launch

Number (Percent)	Accessibility	Parking	Crowding	Safety	Condition of Facilities	Available Facilities	Overall Experience
Totally Unacceptable	0	0	0	0	0	0	0
Unacceptable	0	0	0	0	0	0	0
Neutral	0	0	0	0	0	0	0
Acceptable	0	0	2 (29%)	0	0	0	0
Totally Acceptable	7 (100%)	7 (100%)	5 (71%)	7 (100%)	7 (100%)	7 (100%)	7 (100%)

Based upon the results of this study task, it is evident that the Tinker Creek Canoe Launch is not extensively utilized. From the field monitoring accomplished in 2020 and 2021, the average capacity percentage is less than 30%. On August 14, 2021, an abnormally high number of vehicles were recorded at the Tinker Creek Canoe Launch due to a river cleanup event that took place that day. During the river cleanup event, parking was available in the area normally utilized by employees for the Town of Vinton thus the overall percentage of spaces taken was less than 60% that day.

In contrast to the Roanoke River Trail, the vehicles observed at the Tinker Creek Canoe Launch almost exclusively are from Virginia and most likely local. The results of the field monitoring are provided in Attachment 2 of this report.

Table 4.10: Tinker Creek Canoe Launch Facility Capacity Observations - 2021

Average Facility Capacity Percent			Max. Observed Facility Capacity Percent		
Weekday	Weekend	Holiday	Weekday	Weekend	Holiday
15%	96%	27%	40%	300%	80%

Those individuals interviewed did acknowledge that the Tinker Creek Canoe Launch is well maintained and expressed their overall satisfaction with the facilities provided. None of the individuals interviewed stated that they continued downstream of the Project spillway by utilizing the Niagara Project Canoe Portage Trail or removed their canoe, kayak, paddleboard, or fishing boat from the water at another location. Comments received included the need for better signage directing individuals to the various recreation facilities and a desire for improved connectivity between the portions of the Greenways along the Roanoke River and the river itself thus increasing both in-water and shoreline fishing opportunities. During the field observations there was no evidence of individuals having to wait to either launch or remove their boat from the water.

4.4.3 Results for Rutrough Point (Non-Project Facility) – 2021

Rutrough Point represents the normal endpoint for canoeists and kayakers who have floated through the rapids beginning at the Project put-in. Other activities observed at Rutrough Point include bank fishing and hiking the adjacent trails for Explore Park. Some kayaks and canoes launched from Rutrough Point float to the upper end of Smith Mountain Lake to fish and/or enjoy the still waters and then return to Rutrough Point. Others travel approximately five miles to the Hardy Ford Public Boat Access on Smith Mountain Lake.

Tables 4.11, 4.12, and 4.13 present the results of the surveys relative to activities for Rutrough Point.

Table 4.11: Months Survey Respondents Typically Visit Rutrough Point

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number	5	5	6	7	15	16	15	14	10	8	5	5
Percent	25%	25%	30%	35%	75%	80%	75%	70%	50%	40%	25%	25%

Table 4.12: Primary Activities Participated in by Survey Respondents at Rutrough Point

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	12	0	0	10	0	1	2	0	1	1
Percent	60%	0%	0%	25%	0%	5%	10%	0%	5%	5%

Table 4.13: Overall Experience of Survey Respondents at Rutrough Point

Number (Percent)	Accessibility	Parking	Crowding	Safety	Condition of Facilities	Available Facilities	Overall Experience
Totally Unacceptable	0	0	0	0	0	0	0
Unacceptable	0	0	1 (5%)	0	0	0	0
Neutral	0	0	4 (20%)	0	1 (5%)	1 (5%)	0
Acceptable	2 (10%)	4 (20%)	7 (35%)	2 (10%)	8 (40%)	7 (35%)	5 (25%)
Totally Acceptable	18 (90%)	16 (80%)	8 (40%)	18 (90%)	11 (55%)	12 (60%)	15 (75%)

Rutrough Point is utilized extensively with the highest percentage of users visiting from April through September. From the information provided by those surveyed and observations made in the field, the predominant activity at this location is bank fishing followed by kayaking and canoeing. Many of those visiting Rutrough Point either fish from the open area near the kayak/canoe launch or the riverbank upstream toward Explore Park. The closure of the Roanoke River Trail may have impacted activities, especially for those who normally would put-in just below the powerhouse for the Niagara Project and take out at Rutrough Point. Comments received from interviews with stakeholder representatives (documented in Attachment 7) and individuals surveyed at the site indicate that the number of kayaks is significant at this facility.

YES observed kayaks and canoes that put-in at Rutrough Point in order to travel downstream to the Hardy Road Boat Access on Smith Mountain Lake or to simply float the area of the Roanoke River at the kayak/canoe launch. In addition, numerous kayaks and tubes were taken out of the water by the vendor renting kayaks and tubes at Journeys End located in Explore Park upstream of Rutrough Point. The kayaks and tubes are placed in the Roanoke River by the vendor approximately one mile upstream of Journeys End resulting in a float of approximately three miles.

The number of vehicles counted at Rutrough Point, with the exception of holidays, represent usage between 8 to 92 percent of the parking spaces available. During the July 4th holiday, the entire Rutrough Point parking area was dominated by one family who had a family picnic. This did discourage others from accessing the site for that day. In general, visitors to Rutrough Point are local with some vehicles from out-of-state being recorded. In Attachment 2, zip codes for those responding to the field surveys along with license plates recorded during field visits are summarized to provide information regarding where visitors to Rutrough Point reside.

Table 4.14: Rutrough Point Facility Capacity Observations - 2021

Average Facility Capacity Percent			Max. Observed Facility Capacity Percent		
Weekday	Weekend	Holiday	Weekday	Weekend	Holiday
16%	41%	87%	42%	92%	175%

Overall, those recreating at Rutrough Point are satisfied with the facilities provided and rate their enjoyment of the site as more than acceptable. Comments regarding Rutrough Point reflect the location being somewhat crowded especially during holidays, the need for a restroom facility, and for improved trash control. In addition, comments were received regarding individuals bank fishing from the canoe/kayak launch interfering with individuals attempting to launch or retrieve their canoes and/or kayaks.

During the field observations, there was no evidence of individuals being delayed either launching or removing boats from the water at the ramp provided.

4.4.4 Overall In-Person Survey Results

The results from the in-person surveys taken in 2020 and 2021 at the Roanoke River Trail, Tinker Creek Canoe Access, and Rutrough Point include total of 46 in-person surveys were completed. Nineteen were completed at the Roanoke River Trail, seven at the Tinker Creek Canoe Access and twenty at Rutrough Point.

The individuals surveyed were primarily male and from the Roanoke area. However, there were some visitors from outside the area with the farthest being from Denver, Colorado. Ages ranged from 19 to 80 resulting in an average respondent age of 40. Table 4.15 presents a summary of those surveyed in the field.

Table 4.15: Survey Respondents

Recreation Site	% Male	% Female	% Local	Age Range	Average Age
Tinker Creek Canoe Access	100%	0%	100%	27-64	47
Roanoke River Trail	84%	16%	63%	19-80	40
Rutrough Point	75%	25%	100%	22-67	36
Niagara Project	83%	17%	85%	19-80	39

Table 4.16 presents the months of the year that the survey respondents indicated that they participate in recreation activities at the Project.

Table 4.16: Months Survey Respondents Typically Visit Project Facilities

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number	13	13	19	25	33	32	30	30	26	22	15	13
Percentage	28%	28%	41%	54%	72%	70%	65%	65%	57%	48%	33%	28%

From the information collected, the respondents visit the Project locations throughout the year. The primary months are April through October with the peak months being from May through August.

Activities that respondents indicated they participated in varied upon location. Table 4.17 presents an overall view of activities for the Niagara Project.

Table 4.17: Primary Activities Participated in by Survey Respondents at Niagara Project

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/ Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	16	4	0	8	0	1	14	0	0	3
Percent	35%	9%	0%	17%	0%	2%	30%	0%	0%	7%

From the in-person survey results, the primary activities participated in were bank fishing, canoeing, kayaking, and sight-seeing which includes hiking.

Results of the in-person surveys indicate that those visiting the Niagara Project are quite satisfied with the recreation facilities and opportunities that exist. As shown in Table 4.18, the overall experience at the Niagara Project is considered totally acceptable by 80% of the participants surveyed.

Table 4.18: Overall Experience of Survey Respondents

Number (Percent)	Accessibility	Parking	Crowding	Safety	Condition of Facilities	Available Facilities	Overall Experience
Totally Unacceptable	0	0	0	0	0	0	0
Unacceptable	0	0	2 (4%)	0	0	0	0
Neutral	0	1 (2%)	6 (13%)	0	1 (2%)	1 (2%)	0
Acceptable	6 (13%)	5 (11%)	12 (26%)	5 (11%)	15 (33%)	13 (28%)	9 (20%)
Totally Acceptable	40 (87%)	40 (87%)	26 (57%)	41 (89%)	30 (65%)	32 (70%)	37 (80%)

Based upon the results of the surveys, it appears that crowding and the condition of facilities at the recreation sites received the majority of the negative comments. However, as the results show, the negative comments represent a very small percentage of the number of responses received. Most of the comments addressed the need for improvements to the Project canoe portage, releases of water for kayaking, porta-johns, and control of trash at the facilities.

4.4.5 Results for Niagara Project Canoe Portage Trail (Project Facility) - 2021

The portage for the Niagara Project is located along the left abutment looking downstream for the Project spillway and directs canoeists and kayakers continuing on from upstream of the Project spillway to downstream. As noted earlier, the portage is the only Project recreation facility owned and operated by the Project licensee and within the Project boundary.

The Project portage historically has not been extensively utilized by kayakers and canoeists. Under the approved RSP, usage of the Niagara Project Canoe Portage Trail was to be documented by observing activities from the Roanoke River Trail, however, construction activities associated with the NPS maintenance activities for the bridge over the Roanoke River resulted in closure of the Roanoke River Trail.

During the time period in which in-person surveys of the activities for the Niagara Project Canoe Portage Trail could occur, individuals were observed from the end of the Roanoke River Trail, located directly across from the portage put-in, bank fishing. Discussions with those individuals indicated that access to the portage put-in area was not gained from the portage trail but from paths worn over the years from the nearby residential area and the Blue Ridge Parkway. Access from those areas requires descending steep wooded slopes along worn pathways. It would appear that those individuals photographed during the May through October period accessed the portage area similarly.

In order to document usage of the Project Canoe Portage, a trail camera was installed at the put-in downstream of the Project tailrace. Appalachian's consultant (HDR) documented and reviewed Project recreation facility usage with a motion-activation trail camera. HDR installed the trail camera on May 26, 2021 in the vicinity of the canoe portage put-in to record recreation activity.

Six downloads of the trail camera occurred over the study period and the trail camera was removed on October 27, 2021.

Review of the trail camera data indicates that the Project facility is used during the spring to fall months for non-motorized activity (i.e. kayaks, canoes), bank fishing, and observation of the facility and river. June through August were the most popular months for recreational activity to occur (Table 4.19). Over the course of the study, the Project facility was used for its intended use (portaging) 21 times and viewing and observing occurred 21 other times. The Project facility was most frequently used for bank fishing with 28 uses recorded (Table 4.19). The frequency of visits while perhaps lower than other portages in the area, was higher than anticipated. It is unclear if individuals are accessing the facility via portaging around the dam, or from nearby neighborhoods.

Figure 4.12 shows a representative photo captured from the trail camera. Attachment 5 shows two representative photos for each of the three recreational activities observed at the Project facility. The date, time, and temperature are also provided in the information block at the bottom of each picture for each day. These photos also show that recreation occurs during the weekdays and weekends. However, no recreation activity was observed during the major holidays (Memorial Day, July 4th, and Labor Day). No crowding was observed.

Table 4.19: Trail Camera Primary Recreation and Usage Counts

Primary Recreation Activity(s) Observed	Highest Visitor Count (Month)	Total Visitor Count
Bank Fishing	7 (July)	28
Canoe/Kayak	9 (June)	21
Observation	8 (August)	21

Figure 4.12 Individuals at Canoe Portage Put-In on June 8, 2021



Comments provided by individuals interviewed during the in-person surveys completed at the other facilities included in this study indicate that the condition of the portage put-in and take-out as well as the length of the portage trail contribute to low usage numbers. In addition, it was stated that poor signage and lack of general knowledge by the public of the existence and availability of the portage contribute to usage being minimal. Similar comments were provided by the representatives for the governmental agencies, non-governmental organizations, and businesses interviewed for this study. For example, a sign at an upstream canoe/kayak launch in

the City of Roanoke does not include portage access downstream of the Tinker Creek Canoe Launch.

The results of the surveys taken in the field as well as the online surveys submitted indicate that improvements to the take-out and put-in locations for the Project canoe portage are desired. Other suggested improvements include providing a mechanism to assist individuals conveying canoes/kayaks along the existing trail and having improved messaging to the general public regarding the availability of the portage.

4.5 Task 5 - Aesthetic Flow Documentation

The spillway, powerhouse, and bypass channel for the Niagara Project are visible from the Blue Ridge Parkway which has been designated as an All-American Road. The noted Project features can be viewed from the bridge located approximately 500 feet downstream of the Project powerhouse carrying the Parkway over the Roanoke River as well as from the Roanoke River Trail. In the 2018 Virginia Outdoors Plan, driving for pleasure is recognized as a top recreation activity; thus, protecting and maintaining the visual experience along the Blue Ridge Parkway is important.

To characterize and capture the appearance of the Project spillway and bypass reach under a range of flows, YES collected photo and video documentation from key observation points, the location of which were determined in consultation with interested stakeholders. The photos and videos were collected at various times from November 2019 through November 2020 from the key observation points (KOP) to provide views during the four seasons of the year. The videos and photos were dated, and flow information documented utilizing operations information provided by Appalachian along with data obtained from USGS Gage 02056000 located on the Roanoke River immediately downstream of the Project powerhouse.

The selected KOP were all located along the Roanoke River Trail leading from the parking area to the Roanoke River. Those locations are shown in Figure 4.13 and were as follows: (KOP-1) the parking area overlook which provided views of the Project spillway and bypass; (KOP-2) the bench dedicated to the Pathfinders Midweek Crew located at approximately the mid-point for the steps down to the river providing views of the Project bypass; and (KOP-3) the end of the trail steps at the river which allowed for views of the Project bypass as well as the Project powerhouse and the Roanoke River.

Videos and photographs of the Project spillway and bypass from the KOPs were taken on the dates shown in Table 4.20. Also shown are the start and end times for taking the videos and photos, whether flow was observed over the Project spillway, the number of units operating, flow through the Project as recorded at the downstream USGS gage, and the estimated flow through the bypass channel at the time the photographs and videos were taken. Photographs taken on the dates listed are provided in Attachment 3.

Table 4.20: Aesthetic Flow Documentation Field Conditions

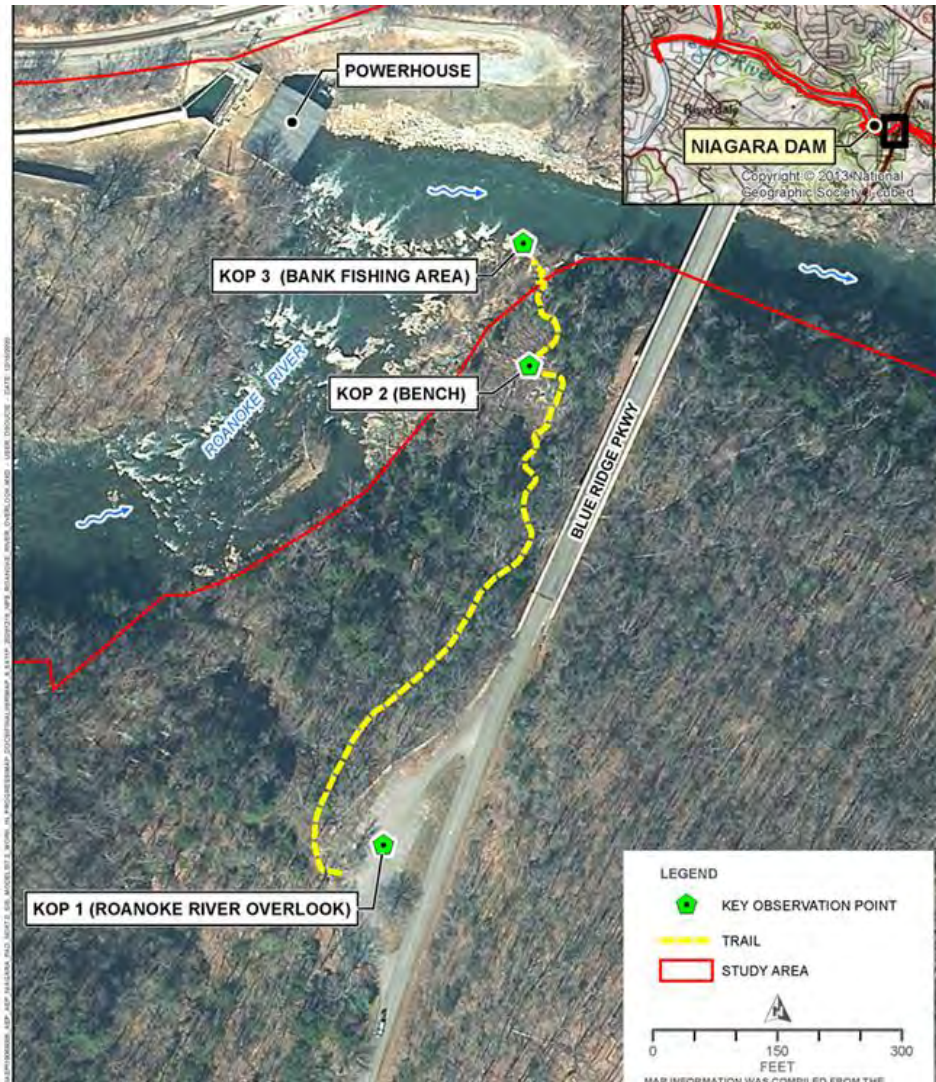
Date	Start Time	End Time	Avg. Project Flow (cfs)*	Flow Over Spillway	Bypass Flow (cfs)**	Units Operating
11/15/2019	9:00 AM	10:00 AM	218	No	24	1
1/1/2020	3:15 PM	4:15 PM	264	Yes	332	0
1/30/2020	9:30 AM	10:15 PM	599	No	31	2
2/7/2020	11:45 AM	12:15 PM	10,700	Yes	11,716	2
3/2/2020	12:445 PM	1:30 PM	458	No	28	2
3/25/2020	12:00 PM	12:45 PM	3,275	Yes	2,638	2
5/1/2020	10:45 PM	11:30 AM	3,288	Yes	3,317	0
7/11/2020	2:50 PM	3:30 PM	385	No	32	1
9/5/2020	11:45 AM	12:15 PM	318	No	30	1
9/26/2020	3:50 PM	4:30 PM	804	Yes	765	0
4/24/2021	7:15 AM	10:30 AM	573	No	24	2

*Project flow as recorded at USGS Gage No. 02056000. ** Bypass flow estimated.

In leaf-off months (approximately October to April), views of the Project spillway and bypass are possible from the three key observation points. However, during the leaf-on months (May to September), views of the bypass and powerhouse are obstructed from KOP-2 due to vegetative growth.

To allow unobstructed views of the Project spillway and bypass from KOP-1 and KOP-2, NPS cleared the viewshed of vegetation in early spring 2020 to allow views of the powerhouse and bypass reach. However, vegetation was not cleared for the remaining leaf-on periods thus resulting in the views from the bench becoming obstructed. Overall, the optimal time for viewing the Project spillway and bypass channel appears to be from late October through early November. The fall colors along with the open views afforded by the leaf-fall create optimal aesthetic conditions.

Figure 4.13: KOP Locations



High flows over the Project spillway and through the bypass channel are aesthetically appealing but can cause turbidity covering the geological features. Visitors to the Roanoke River Trail are known to access the rocky bypass channel due to its unique features being visible during low flow conditions such as during times that minimum flows as required under the existing license are released. In addition to observing the rock formations within the bypass channel, fishing within the bypass is a popular activity when flow conditions allow.

Individuals observing the Project spillway and bypass have not shown a preference to having either high or low flow conditions but express their enjoyment of the views of those areas from the Roanoke River Trail and Blue Ridge Parkway under all Project flow conditions. Sound is an additional aesthetic condition that has also been considered. From the field observations made,

flows of 50 to 200 cfs resulted in similar acoustics. Above 200 cfs sounds from flows through the bypass channel are more pronounced but do not necessarily contribute to a more pleasant experience. Based upon the interviews accomplished along with comments from individuals during the in-person surveys, current Project operations appear to provide an appropriate aesthetic experience.

4.6 Task 6 - Recreational Flow Release Desktop Evaluation

To address stakeholders' interests while recognizing Project constraints related to enhancement of downstream flow conditions, Appalachian conducted a desktop evaluation to assess the potential for Project operations to support short-term enhancement of flow conditions for downstream boating. Results of the online and in person surveys indicate a desire for periodic releases of flows from the Project to benefit recreation in the river reach between the Project portage put-in and Rutrough Point, approximately three miles. That segment of the Roanoke River under various flow conditions provides within the Roanoke area a whitewater type experience for canoeists and kayakers.

Paddlers using the described stretch of river would benefit the most from a potential short-term recreation flow release as a flow pulse between 1 and 3.5 hours which could be maintained depending on the number of units generating and the available reservoir storage volume. This run-time would likely allow paddlers enough time to navigate this stretch of river. Any short-term operational modification to provide flow enhancement downstream of the Project would be subject to sufficient inflow, availability of Project facilities, and availability of operating personnel. Appalachian also notes that operating the reservoir with more fluctuation than is typical (i.e., utilizing the full authorized operating band) to provide what would amount to a very minor "bump" in downstream flow may have unintended effects on reservoir littoral habitat. Table 4.21 provides information from the desktop evaluation relative to potential releases.

Table 4.21. Desktop Evaluation Potential Project Flow Releases

Parameter	Minimum Downstream Flow Requirement (Project) 50 cfs	Powerhouse Generation		
		Unit 1	Unit 2	Unit 1 & 2
		379 cfs (hr:min)	305 cfs (hr:min)	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

On a monthly average basis, there appears to be enough Project inflow to support operation of at least one unit year-round. However, during drier/drought years, there are periods when inflows are too low to operate a unit. During these periods, flow releases would be made via the trash sluice gate into the bypass reach to maintain reservoir levels. The potential for the short-term enhancement of downstream flow conditions, if feasible given the limits of Project operations and reservoir storage, to support recreation activities would be most advantageous to boaters during the typically lower flow late-summer/early-fall months (i.e., July through October).

In the 2018 Virginia Outdoors Adventure Plan, one of the key projects identified for the future is an in-river kayak park planned by Roanoke County Parks and Recreation to be located downstream of the Niagara Project portage put-in as part of Explore Park. Enjoyment of the planned feature would be dependent upon the flows available.

If scheduled short-term releases of flow as discussed above could be planned, a system of notifying the public as to when such releases were to be made would need to be established. One option is to have the information provided on websites for Appalachian, NWS, and the Roanoke River Blueway Committee, amongst others.

To enhance the paddling experience for canoeists and kayakers downstream of the Project powerhouse without requiring modification of run-of-river operation of the Project, it is possible to utilize the flow information provided by river gauges in the watershed. USGS Gage No. 02056000 is located just downstream of the Project powerhouse and the confluence of the bypass channel. At the present time, flows are recorded at the subject gage which reflect total Project outflow. Being that the Niagara Project is operated in a run-of-river mode, the recorded flow data reflect both Project inflow and outflow. Projections for USGS Gage No. 02055000 (Roanoke River at Roanoke, upstream of the Project) could be adjusted to reflect anticipated flows below the Project powerhouse, with that information provided to the public through an existing or new website. Flow information for USGS Gage No. 02055000 is currently provided on the web sites for the National Weather Service – Blacksburg, Va. and the Roanoke River Blueway committee which provides forecasts for river flows. Forecasted flows could provide canoeists and kayakers data for planning trips through the three miles of the Roanoke River from the Niagara portage put-in to Rutrough Point. Deciding when to float the subject segment of the Roanoke River then would be by the canoeists and kayakers based upon their own judgement. The same mechanisms could be utilized to inform canoeists and kayakers of flow releases greater than river flow scheduled specifically for recreation purposes.

5.0 SUMMARY AND DISCUSSION

5.1 Regional Overview – Project Context

The Roanoke River is a significant recreation and amenity resource for the Roanoke Valley providing numerous and varied opportunities for those residing in the area as well as those visiting from outside. Abundant opportunities for canoeing, kayaking, fishing, tubing, wading, wildlife

viewing, and watershed education are available through the length of the Roanoke River including through the Roanoke Metropolitan Area of which the Niagara Hydroelectric Project is a part.

The recreational benefits and the need for environmental stewardship of the Roanoke River have been identified by the residents of the Roanoke Valley resulting in significant volunteer efforts and the formation of various committees and commissions including the Roanoke River Blueway Committee and the Roanoke Valley Greenway Commission.

The Roanoke River Blueway Committee was established in 2013 by the Roanoke Valley-Alleghany Regional Commission to facilitate the planning, development, and marketing of the Roanoke River Blueway. The Roanoke River Blueway provides a unique combination of urban, front country, and back country recreation opportunities in the upper Roanoke River watershed.

The Roanoke Valley Greenway Commission was established in 1997 to provide planning for a greenway plan for the Roanoke Valley and to advise and assist participating governmental agencies in the development of the greenway and associated trails for the area.

Both the Blueway and Greenway pass through or are adjacent to the Project boundary and are important resources near the Project. The 2018 Virginia Outdoors Plan highlights trails and water access as the most-needed outdoor recreation opportunities in the Roanoke Valley-Alleghany region. That plan further identifies the Roanoke Valley Greenways and Roanoke River Blueway plans as featured projects along with the 2016 Explore Park Adventure Plan.

5.1.1 Roanoke River and Tinker Creek Greenways

The Roanoke River Greenway is the backbone of the regional greenway system consisting of paved bicycle/pedestrian paths and trails that provide non-motorized linkages to neighborhoods, industrial facilities, business complexes, parks, schools, and sport complexes. As currently envisioned, it will be a 31-mile long west-east greenway making it possible to travel from western Roanoke County through the City of Salem to the City of Roanoke, Town of Vinton, the Blue Ridge Parkway, and Roanoke County's Explore Park.

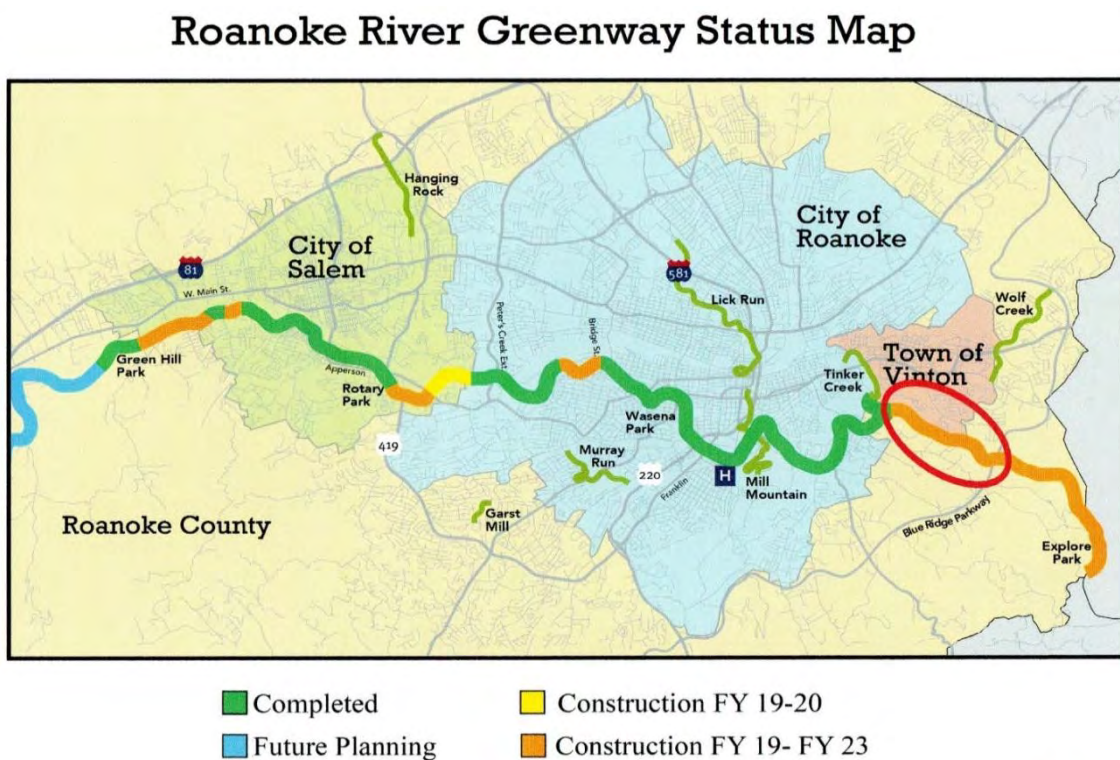
The Roanoke River Greenway is shown in the figure below including portions completed and those planned. Begun in 1995, construction of the Roanoke River Greenway has been continuous. Highlighted in red on Figure 5.1 below is an approximation of the Niagara Project Recreation Study Area.

The Roanoke River Greenway presently extends eastward to the upper limit of the Niagara Project boundary. At that point, it connects to a tributary greenway identified as the Tinker Creek Greenway which is a part of the overall system of greenways in the Roanoke Valley. The Tinker Creek Greenway begins at the intersection with the Roanoke Valley Greenway and extends northward over the Roanoke River at the upper limit of the Project boundary via a pedestrian bridge and then onward along the western banks of Tinker Creek. The Tinker Creek Greenway is

located across Tinker Creek from the ramp for the Tinker Creek Canoe Launch and is visible from that location.

As the greenway system has expanded, usage has increased as evidenced by the numbers presented in the charts below provided by Roanoke Valley Greenway Commission. Figure 5.2 presents overall growth in usage of the Roanoke River Greenway for the years 2013 through 2017 while Figure 5.3 presents average monthly usage for the Roanoke River Greenway over the same period as measured at the City of Roanoke's River Edge Park and for the Tinker Creek Greenway as measured at Underhill Avenue.

Figure 5.1: Roanoke River Greenway Status Map



Source: Roanoke Valley Greenway Commission

Figure 5.2: Roanoke Valley Greenway Utilization 2013-2017

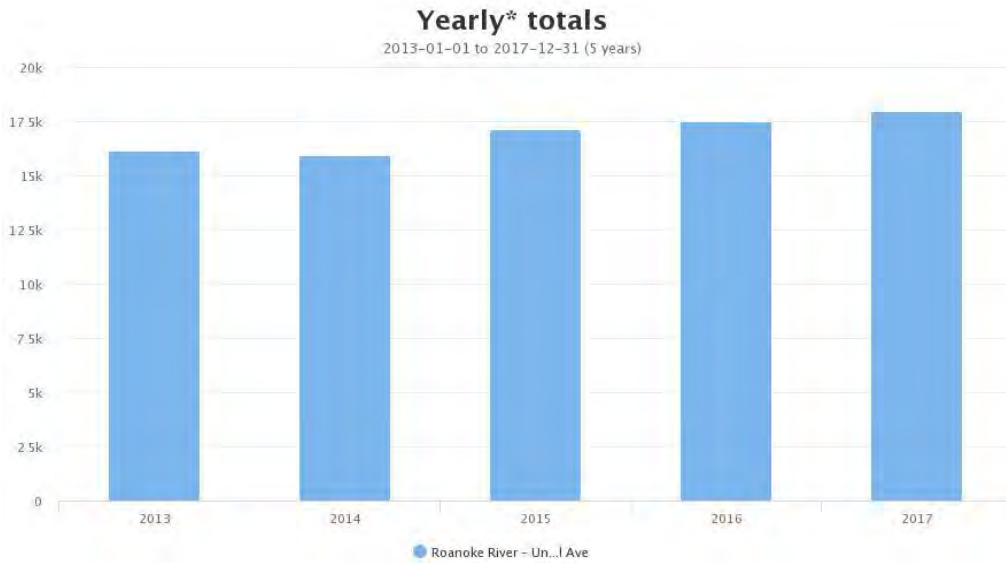
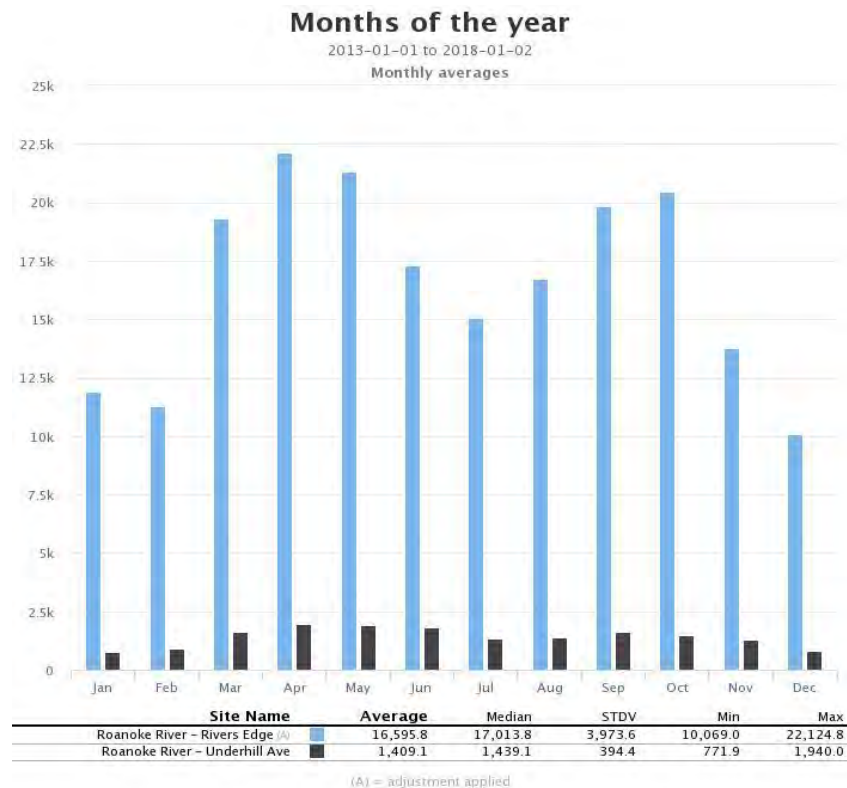
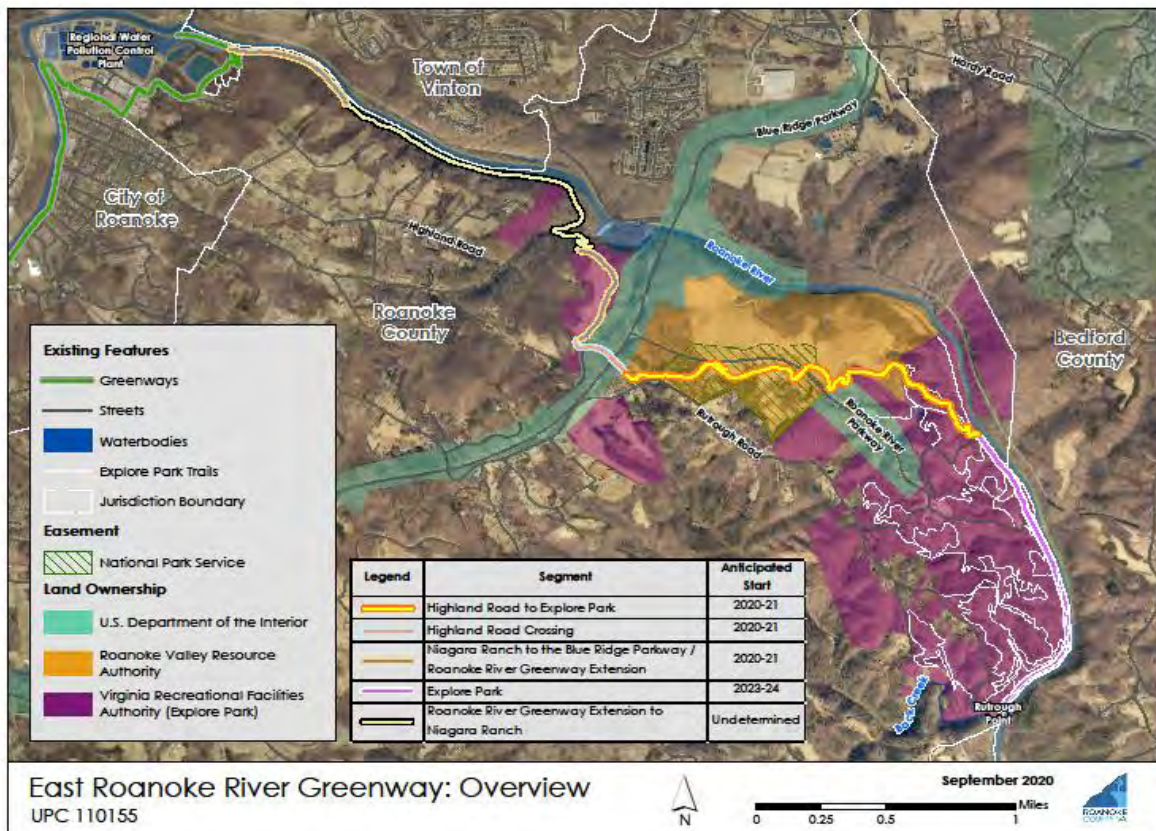


Figure 5.3: Roanoke Valley Greenway Utilization Monthly Averages 2013 - 2017



Relative to the Niagara Project, the plans for the Roanoke River Greenway are to extend the greenway eastward along the Project reservoir thence under the Blue Ridge Parkway and then onward through Explore Park. However, it is important to note that proposed greenway expansion is currently outside of the Niagara Project boundary. Figure 5.4 shows the plans including current expected construction periods.

Figure 5.4: Roanoke River Greenway Expansion Plans



Source: Roanoke County Parks and Recreation

5.1.2 Roanoke River Blueway

The Roanoke River Blueway encompasses the 45-mile stretch of the Roanoke River beginning in Montgomery County, Virginia and ending at the Hardy Ford Public Boat Access on Smith Mountain Lake. The described stretch of the Roanoke River passes through the heart of the cities of Salem and Roanoke before continuing to the scenic Roanoke River Gorge in Roanoke County. That segment of the Roanoke River begins immediately below the powerhouse for the Niagara Project and extends approximately three miles downstream to Rutrough Point. It is considered unique since it represents one of only two gap sections of river in Virginia. The referenced segment of the Roanoke River has been determined to be Qualified for Consideration as a Virginia Scenic River.

Within the Roanoke River Blueway are seventeen local, state, federal, and private access points having various amenities which can include parking, trash receptacles, information kiosks, canoe/kayak ramps, restrooms, picnic shelters, and multi-use trails. The following table provides a list of the access points and distances between each.

Table 5.1: Roanoke River Blueway Access Points Paddle Distances

Access Name	Owner	Distance (Miles)															
East Montgomery County Park	Montgomery County	0.0	4.1	11.1	13.8	15.9	16.8	18.5	19.4	24.0	25.4	30.4	31.5	33.6	33.9	37.0	41.3
Wayside Park	Roanoke County	0.0	7.0	9.7	11.8	12.7	14.4	15.3	19.9	21.3	26.3	27.4	29.5	29.8	32.9	37.2	
Green Hill Park	Roanoke County		0.0	2.7	4.8	5.7	7.4	8.3	12.9	14.3	19.3	20.4	22.5	22.8	25.9	30.2	
West Riverside Drive	City of Salem			0.0	2.1	3.0	4.7	5.6	10.2	11.6	16.6	17.7	19.8	20.1	23.2	27.5	
Cardinal Academy	City of Salem				0.0	0.9	2.6	3.5	8.1	9.5	14.5	15.6	17.7	18.0	21.1	25.4	
Eddy Avenue	City of Salem					0.0	1.7	2.6	7.2	8.6	13.6	14.7	15.8	16.1	19.2	23.5	
Salem Rotary Park	City of Salem						0.0	0.9	5.5	6.9	11.9	13.0	15.1	15.4	18.5	22.8	
Back Country Ski and Sport	City of Salem							0.0	4.6	6.0	11.0	12.1	14.2	14.5	17.6	21.9	
Wasena Park	City of Roanoke								0.0	1.4	6.4	7.5	9.6	9.9	13.0	17.3	
Smith Park	City of Roanoke									0.0	5.0	6.1	8.2	8.5	11.6	15.9	
13th Street/Bennington	City of Roanoke										0.0	1.1	3.2	3.5	6.6	10.9	
Tinker Creek 3rd Street	Town of Vinton											0.0	2.1	2.4	5.5	9.8	
Niagara Dam Portage	AEP												0.0	0.3	3.4	7.7	
Roanoke River Overlook	National Park Service													0.0	3.1	7.4	
Explore Park/Rutrough Point	Roanoke County														0.0	4.3	
DGIF Hardy Ford	DGIF																0.0
Most recreational paddlers average 2 - 3 miles per hour at normal streamflow.		East Montgomery County Park	Wayside Park	Green Hill Park	West Riverside Drive	Cardinal Academy	Eddy Avenue	Salem Rotary Park	Back Country Ski & Sport	Wasena Park	Smith Park	13th /Bennington Street	Tinker Creek 3rd Street	Niagara Dam Portage	Blue Ridge Parkway Roanoke River	Explore Park/Rutrough Point	DGIF Hardy Ford

Source: Roanoke River Blueway Committee

Information was obtained from Roanoke Mountain Adventures which rents kayaks and canoes for use on the Roanoke River along with providing shuttles to the various access points. In addition, guided trips are provided upon request. The numbers provided in Table 5.2 show the annual increases in water related activity for the Roanoke River Blueway.

It should be noted that the decrease in guided trips for the years 2018 and 2019 occurred based upon a business decision to focus more on rentals and providing shuttle services. The decreases shown for 2020 in all categories may have resulted from restrictions related to COVID-19.

**Table 5.2: Roanoke Mountain Adventures Water Rentals, Shuttles & Guided Trips
2015 Through 2020**

<u>Year</u>	<u>Rentals</u>	<u>Shuttles</u>	<u>Guided Trips</u>
2015	776	44	40
2016	887	111	37
2017	950	180	64
2018	1,530	362	47
2019	2,135	460	16
2020	2,023	372	0

5.1.3 Explore Park

Explore Park is a 1,100-acre passive recreation facility operated by the Roanoke County Department of Parks, Recreation and Tourism (Figure 5.5). The Park is located at milepost 115 on the Blue Ridge Parkway in Roanoke County, Virginia, with 700 acres of the park lying in Roanoke County and 400 acres in adjacent Bedford County. It is located on both sides of the Roanoke River downstream of the Niagara Project.

Key recreational opportunities afforded at Explore Park include camping, kayaking, tubing, hiking, zip-lining, and food and retail operations. Water activities that occur in the Roanoke River at Explore Park have resulted in the establishment of a privately-owned venture that provides tubing and kayak rentals. Tubes and kayaks are transported upstream of the take-out point at Journey's End Campsite approximately one mile to capture the rapids within the Roanoke River below the Project powerhouse. The kayaks and tubes exit the river at either the Journey's End Campsite or further downstream at Rutrough Point depending on the length of trip desired. In 2019, there were 231 tubing and kayak rentals that served 722 customers. Those numbers increased significantly in 2020 to 621 and 1,925 respectively. A map of Explore Park including features of the park is provided below.

The canoe and kayak ramp at Rutrough Point, which is a part of Explore Park, provides access to the Roanoke River at the upper end of Smith Mountain Lake. Kayakers utilize this location as a take-out point for floats beginning upstream below the Project powerhouse and continuing downstream through whitewater type flows. Kayakers and canoeists that launch at Rutrough Point do so to be able to fish the upper portion of Smith Mountain Lake without having to be concerned with significant boat traffic associated with recreation on the lake. Paddle boarders also launch

at Rutrough Point in order to enjoy the usually still waters from that location downstream. Monthly vehicle counts for the parking area at Rutrough Point as provided by Roanoke County for the years 2019 and 2020 are provided in Table 5.3 as are estimates of boat usage. Boats in this case primarily reflect canoes, kayaks, and paddleboards.

Table 5.3: Rutrough Point Vehicle Counts 2019 & 2020

Month	Vehicles 2019	Boats 2019	Vehicles 2020	Boats 2020
January	611	183	563	169
February	647	194	672	202
March	994	298	1,617	485
April	1,657	497	2,234	670
May	2,224	667	2,672	802
June	1,715	515	2,087	626
July	1,670	501	2,548	764
August	1,391	417	1,488	446
September	1,051	315	1,279	384
October	908	272	1,146	344
November	680	204	873	262
<u>December</u>	<u>619</u>	<u>186</u>	<u>597</u>	<u>179</u>
Total Year	13,272	4,249	17,776	5,333

The number of boats is based upon an approximation by the Roanoke Blueway Committee that thirty percent of the vehicles counted represent boaters to Rutrough Point. From the field monitoring accomplished for this study, the approximation appears reasonable.

Figure 5.5: Explore Park



5.2 Existing Recreation at the Project

Based upon the results of the Recreation Study, the primary recreation activities that take place at the Niagara Project include hiking, kayaking, canoeing, paddle boarding, boat fishing, shoreline fishing and viewing. Levels of in-water activities such as kayaking, canoeing, and paddle boarding are contingent upon the location in the Roanoke River within the Project boundary. The results indicate that the facilities in the vicinity of the Niagara Project are utilized each month of the year with the majority of the activities taking place from April through October. In addition, those utilizing the facilities at the Niagara Project appear to be quite satisfied with the facilities provided with the exception of the canoe portage as it currently exists.

The average age of those interviewed in the field was 40 years with the ages of those interviewed being from 19 to 80 demonstrating the variability in the groups enjoying the recreation facilities. The majority of those interviewed were male, approximately 17 percent of those interviewed being female. Individuals utilizing the facilities provided at the Niagara Project were primarily from the local area. Most visitors from outside the Roanoke area were counted for the Roanoke River Trail due to its proximity to the Blue Ridge Parkway.

5.2.1 Water Related Activities

In general, activities such as boat fishing, paddle boarding, and canoeing take place in the more tranquil waters above the Niagara Project spillway and powerhouse. In contrast, activities such as kayaking take place in the more rapid like portions of the Roanoke River that exist from downstream of the Project powerhouse to the kayak/canoe access at Rutrough Point.

Kayaks, canoes, paddleboards, and fishing boats that enter the Niagara Project reservoir from either the Tinker Creek Canoe Boat Launch or Bennington Canoe Launch located above the Project limits do so with the primary intent being to return to the point of access. For example, individuals putting in their fishing boat at the Tinker Creek Canoe Launch normally float down Tinker Creek to the Roanoke River and then continue either upstream toward the Bennington Canoe Launch or downstream to the Project spillway. Once reaching the Bennington Canoe Launch or the Project spillway, they turn around eventually returning to the Tinker Creek Canoe Launch. Paddling upstream on the Roanoke River or Tinker Creek is not considered difficult under normal flow conditions.

As a note, funding is currently being obtained by the City of Roanoke for improvements to the Bennington Canoe Launch. Design of those improvements has been completed with the intent to have those improvements constructed by 2022.

Stakeholders have noted that relatively few individuals accessing the Roanoke River from either the Tinker Creek Canoe Launch or Bennington Canoe Launch continue downstream past the Niagara Project powerhouse and spillway since doing so would require use of the existing canoe portage around the powerhouse which is deemed by the Roanoke River Blueway Committee and

recreationists as being difficult to use. Kayakers in particular forego floating the Roanoke River upstream of the Project spillway and elect to put-in down below the Project powerhouse in order to access the rapid flow conditions that begin at that point. This has resulted in a distinct separation of types of water recreation. Upstream of the Project spillway and powerhouse, water recreation is primarily for those desiring a tranquil flow while downstream is for those wanting to ride the turbulent portions of the river.

Based upon the information provided by the Roanoke River Blueway Committee, the estimated float time required by canoe or kayak from the Tinker Creek Canoe Launch to Rutrough Point (5.5 miles) is from 1.8 to 2.75 hours. The portage around the Project facilities is located approximately 2.1 miles downstream from the Tinker Creek Canoe Launch and 3.4 miles upstream of Rutrough Point. Canoeists and kayakers entering the Roanoke River at the end of the steps for the Roanoke River Trail travel approximately 3.1 miles which would take from 1 to 1.6 hours to reach Rutrough Point.

There are apparently no existing guidelines relative to locating access points along the Roanoke River including in the vicinity of the Niagara Project. The locations are established based upon sites becoming available to the public. Comments received as part of this study either from representatives for stakeholder groups or individuals participating in the in-person surveys indicate that canoeing or kayaking from Tinker Creek Canoe Launch to Rutrough Point represents an acceptable day trip along the river. A comparison to guidelines for canoeing and kayaking on another river system concurs with the assessments made regarding the Roanoke River through the Niagara Project.

Information from the Water Trail Master Plan developed in 2015 by Edgewater Resources for St. Joseph County, Michigan indicates that an ideal spacing for canoeing/kayaking access points to be every two hours along a paddling trip, or approximately five miles. Within the five-mile paddling trip, resting points spaced at one-hour intervals are considered ideal even for the casual canoeist or kayaker. The referenced Master Plan further notes that what paddlers find most useful are launches that are not too steep and having safe footing.

The spacing of access points through the Study area for the Niagara Project appears to meet the criteria referenced from the Water Trail Master Plan by Edgewater Resources. However, the take-out and put-in points for the Niagara Project canoe portage, as they currently exist, do not appear to meet criteria whereby users would feel safe.

In addition to the spacing of access locations for kayaking and canoeing along Tinker Creek and the Roanoke River, the time required to transport individuals and equipment between access sites is important. For the facilities studied, the one-way transport distances and times between each along existing roadways are presented in Table 5.4.

Table 5.4: Transport Distances and Times Between Access Locations

Locations	Distance (miles)	Time (minutes)
Tinker Creek Canoe Access to Rutrough Point	7.3	20
Tinker Creek Access to Roanoke River Trail	7.9	20
Rutrough Point to Roanoke River Trail	2.8	10

The times and distances presented above are based upon trips taken between them in the field and appear reasonable as part of a canoe or kayak venture.

In addition to kayaking and canoeing downstream of the Niagara Project powerhouse, tubing has become popular. As noted previously, tubing this portion of the river has seen an increase as evidenced by the tubing and kayak rentals at Explore Park. Further downstream, paddle boarding has become popular in the more tranquil waters near to and downstream of Rutrough Point. Launching paddle boards from Rutrough Point has become popular since those paddle boarding can launch from and return to the same location.

5.2.2 Other Activities

Fishing is popular both upstream and downstream of the Project powerhouse and spillway. Upstream, fisherman put-in at the Tinker Creek Canoe Launch and traverse either upstream along the Roanoke River to the Bennington Canoe Launch or downstream to the Project. Bank fishing also occurs along the Project reservoir although the availability to do so is somewhat restricted due to the steep slopes along the reservoir and the property along the shoreline being primarily privately owned. Downstream of the Project powerhouse, fishing along the banks of the Roanoke River is very popular as evidenced by the number of individuals descending the Roanoke River Trail to gain access to the river. Bank fishing was the most popular recreation activity as observed by the trail camera at the Niagara canoe put-in. Fishing at Rutrough Point and trails along the Roanoke River at Explore Park has also been observed and noted in the online survey.

Hiking in the Project vicinity is also a popular activity. Within the Project boundary, hiking opportunities are limited due to the terrain and the unavailability of public land upon which to hike. However, downstream of the Project boundary hiking opportunities are quite extensive at Explore Park. A number of the individuals parking at Rutrough Point hike the trails leading upstream to connect to the miles of trails provided at Explore Park.

5.3 Future Recreation - Recommendations

The 2018 Virginia Outdoors Plan identifies trails and water trails as two of the four most needed outdoor recreation opportunities for the Commonwealth. From information provided in the Virginia Outdoors Plan, for the years 2011 through 2017 participation in water-related activities increased significantly. In particular, freshwater fishing increased by 10 percent, canoeing/kayaking by 9 percent, tubing by 8 percent, and paddle boarding by 6 percent. Evidence of the importance of blueways to the Commonwealth of Virginia is highlighted by the opening in June 2021 of Clinch

River State Park in southwest Virginia. Clinch River State Park, consisting of 696 acres along with a number of access points along the Clinch River, is the first blueway state park in Virginia.

Featured projects for the Roanoke Valley-Alleghany Region identified in the 2018 Virginia Outdoors Plan include: (a) implementing the Roanoke River Greenway and Blueway Plan; (b) implementing the Tinker Creek, Glade Creek and Daleville Creek Greenways; and (c) promoting and implementing the 2016 Explore Park Adventure Plan. Within the Roanoke County Community Strategic Plan 2028 Annual Report, the importance of supporting the outdoors is also emphasized.

As described earlier in this report, recreation activities in the Roanoke Valley, including the Project area, have been increasing over the past years and are expected to continue to grow. According to the Weldon Cooper for Public Service, Demographics Research Group, January 29, 2021 report, population growth for the Roanoke Region from 2019 to 2020 almost quadrupled the average annual rate of growth over the last decade resulting in nearly an increase of 1,500 people. Growth in population is also documented by the results of the 2021 census as shown in the table below. Along with the growth in population, use of trails, parks, open spaces, and rivers reportedly increased significantly from 2019 to 2020.

Table 5.5: Roanoke Region Population Change 2010-2020

2010-2020 Population Change

Area	2010 Total Population	2020 Total Population	2010-2020 Percent Change
Alleghany County*	16,250	15,223	-6.3%
Botetourt County	33,148	33,596	1.4%
Covington City	5,961	5,737	-3.8%
Craig County	5,190	4,892	-5.7%
Franklin County*	56,159	54,477	-3.0%
Roanoke City	97,032	100,011	3.1%
Roanoke County*	92,376	96,929	4.9%
Salem City	24,802	25,346	2.2%
Roanoke MSA	308,707	315,251	2.1%
RVARC Region	330,918	336,211	1.6%

Source: US Bureau of the Census, 2021 (*includes towns)

The proposed extension of the Roanoke Greenway eastward along the south shoreline for the Niagara Project Reservoir should provide greater connectivity between the greenways and the

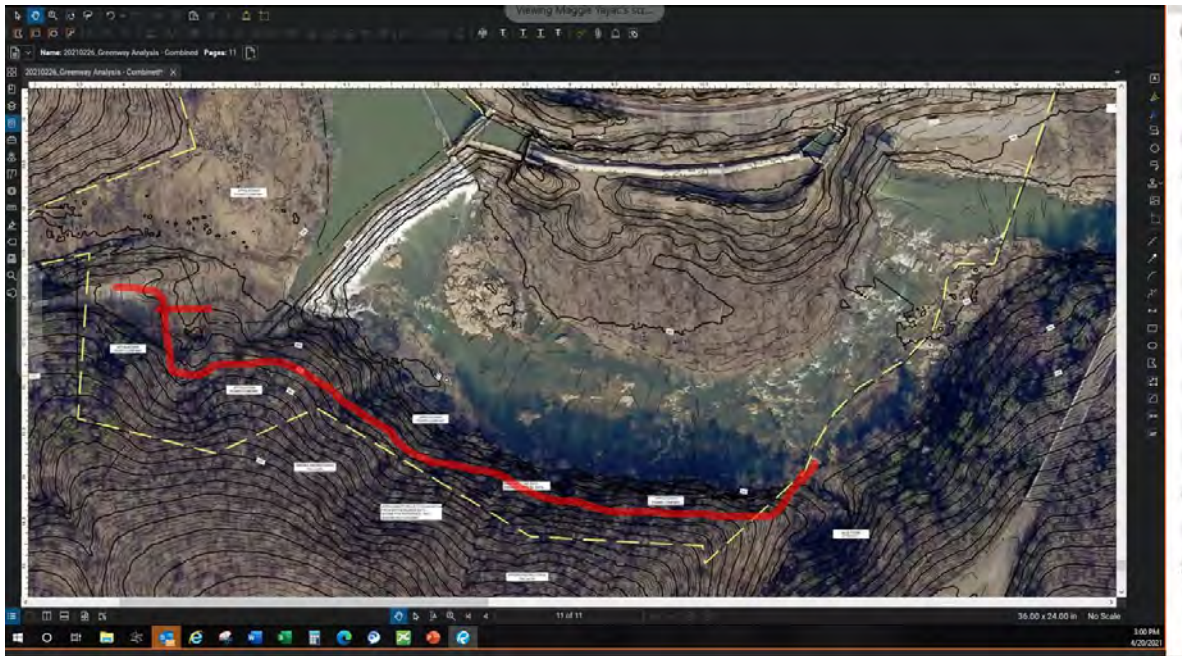
Roanoke River thus increasing recreation opportunities for individuals. Opportunities for connectivity is noted as an important feature in both the Roanoke River Greenway and Roanoke River Blueway plans. Appalachian continues to support Roanoke County and Roanoke Valley Greenway Commission to secure the necessary property rights and governmental approvals to allow for construction of the greenway extension.

As a part of the extension of the Roanoke Greenway along the Project shoreline, Roanoke County and the Greenway Commission are investigating locating a parking area near the south abutment for the Project spillway. Appalachian currently has a construction laydown area located adjacent to the abutment. Access to the laydown area for Appalachian personnel and contractors only exists through an easement across private property along an access road leading from the intersection of Eastland and Highland roads. To date, it has not been possible to reach agreement with the current landowners to extend the greenway along the shoreline near the spillway abutment, therefore restricting access to construct a parking area and public access to the Project reservoir. Public safety will have to be addressed by Roanoke County should the site ever be acquired due to its proximity to the spillway.

In general, recreationists in the Niagara Project area find the existing recreation amenities more than adequate when considering overall enjoyment, safety, available parking, condition of facilities, and accessibility. However, there are also identified needs for improvement especially when it comes to portaging around the Project facilities. As described earlier in this report, the take-out and put-in points for the existing portage are considered difficult to use by the public and the length of the portage long.

Comments recorded from the online and in-field survey results suggest that an alternative portage around the south abutment for the Project spillway should be investigated. Similar comments were received from representatives for the stakeholders including Roanoke County, the Roanoke Valley Greenway Commission, FORVA, and Roanoke River Blueway Committee. Potential routes for a trail around the south abutment were investigated as part of this study. That investigation included walking potential routes in the field. The lands adjacent to the south spillway abutment are very steep. Although it may be possible to construct a trail around the spillway abutment that could be utilized as a canoe/kayak portage, the resulting trail would ultimately likely be longer than the existing portage and more difficult to traverse while carrying a canoe or kayak. Any trail constructed would be more conducive to be utilized for hiking and connecting to other trails in the area (See Figure 5.4).

Figure 5.4: Potential Portage Trail Around Spillway South Abutment



Source: AEP Presentation to Stakeholders – April 20, 2021

It would appear to be more prudent to focus efforts regarding portaging around the Project facilities on the existing portage. Those efforts could include: (1) improvements to the existing take-out and put-in locations; (2) improved signage directing canoeists and kayakers to the take-out and put-in locations and along the portage trail itself; (3) a mechanism to assist those utilizing the portage with transporting canoes and kayaks or education on the helpfulness of a small cart; and (4) an education program informing the public of the availability of the portage and that the reservoir is open to use by all for recreation or coordination with applicable entities to include the portage on relevant maps and publications. Appalachian will consult with the stakeholders in the design of any proposed improvements.

Based upon comments received, it is apparent that Appalachian has a good working relationship with the local governments and organizations. This is evident by its contributions to the Town of Vinton for improvements at the Tinker Creek Canoe Launch and updating the website for the Roanoke Valley Greenway Commission. That working relationship should continue to the benefit of the local communities.

It is also apparent that educating the public as to the availability to access the Niagara Project reservoir by water and availability to portage the Project facilities needs to be improved. Through Appalachian's and stakeholder websites, there are opportunities to increase communications to the public regarding Project recreation facilities and opportunities. Appalachian plans to develop a draft Recreation Management Plan for the Project, in consultation with agencies and other

recreation stakeholders, to guide development and maintenance of recreation facilities and opportunities at the Project over the new license term.

6.0 VARIANCES FROM FERC-APPROVED STUDY PLAN

The following are variances from the FERC-Approved Revised Study Plan:

- The Existing and Future Recreational Opportunities task was postponed until 2021 due to concerns related to COVID-19.
- The stakeholder meeting was held virtually on April 20, 2021.
- The Recreation Visitor Use Online Survey was extended through October 2021 at the request of stakeholders during the ISR meeting.
- Closure of the Roanoke River Trail in May 2021 resulted in not being able to document usage of the Niagara Project Canoe Portage Trail from the Roanoke River Trail. In order to monitor usage of the Niagara Canoe Portage Trail, a trail camera was installed to capture usage at the portage put-in downstream of the Project powerhouse from the end of May through the end of October 2021.
- The Recreational Use Documentation survey was postponed and re-scheduled; the surveys were originally to take place during the May through October time period at each of the Project and Non-Project related recreation facilities in 2020. Construction activities by NPS for the Blue Ridge Parkway and the parking area for the Roanoke River Trail resulted in the trail and parking area being closed beginning May 24, 2021. The Recreational Use Documentation survey for the Roanoke River Trail was accomplished beginning March 20, 2021 and extending through May 23, 2021. The additional recreation facilities were surveyed from May through October 2021.

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NIAGARA HYDROELECTRIC PROJECT
(NO. 2466)
RECREATION STUDY

**Attachment 1: Recreation Facilities Inventories and
Condition Assessments**

Appalachian Power Company

Niagara Hydroelectric Project (P-2466)



Recreation Facilities Inventory and Condition Assessments

Prepared for:

Appalachian Power Company

Prepared by:



2112 Talmage Drive Leland, NC 28451-9340

youngenergyservices.com

January 2020

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1.0 Scope of Work

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner, and operator of the Niagara Hydroelectric Project (Project) located on the Roanoke River in Roanoke County, Virginia. Appalachian is conducting a Recreation Study as part of the relicensing of the Project. The goal of this study is to determine the need for enhancement to the existing recreation facility, or the need for additional recreation facilities, to support the current and future demand for public recreation in the study area. The Scope of Work for the Recreation Study is described in the Revised Study Plan (RSP) filed by Appalachian on November 6, 2019.

Under Task 1 of the Recreation Study, Appalachian is to perform a field inventory to document existing Project and non-Project recreation facilities located within or adjacent to the Project boundary including Tinker Creek Canoe Launch, Niagara Project Canoe Portage Trail, Roanoke River Trail, and Rutrough Road Canoe and Kayak Access, known as Rutrough Point. The information to be recorded includes:

- A description of the type and location of the existing facilities;
- The type of recreation provided (boat access, angler access, picnicking, etc.);
- Length and footing materials of any trails;
- Existing facilities, signage, and sanitation;
- Type of vehicle access and parking (if any);
- Suitability of facilities to provide recreational opportunities and access for persons with disabilities (i.e. compliance with current Americans with Disabilities Act (ADA) standards for accessible design); and
- Photographic documentation of the recreation facilities and GPS location.

In addition, a qualitative assessment of the condition of the recreation facilities is to be performed using the Facilities Inventory and Condition Form developed by Appalachian. A copy of the form is included in Section 3.0 of this Recreation Facility Inventory and Condition Assessments.

The existing formal Project recreation facilities described by the RSP to be inventoried and assessed include the following:

- Niagara Canoe Portage Trail.

The existing formal Non-Project recreation facilities described by RSP to be inventoried and assessed include the following:

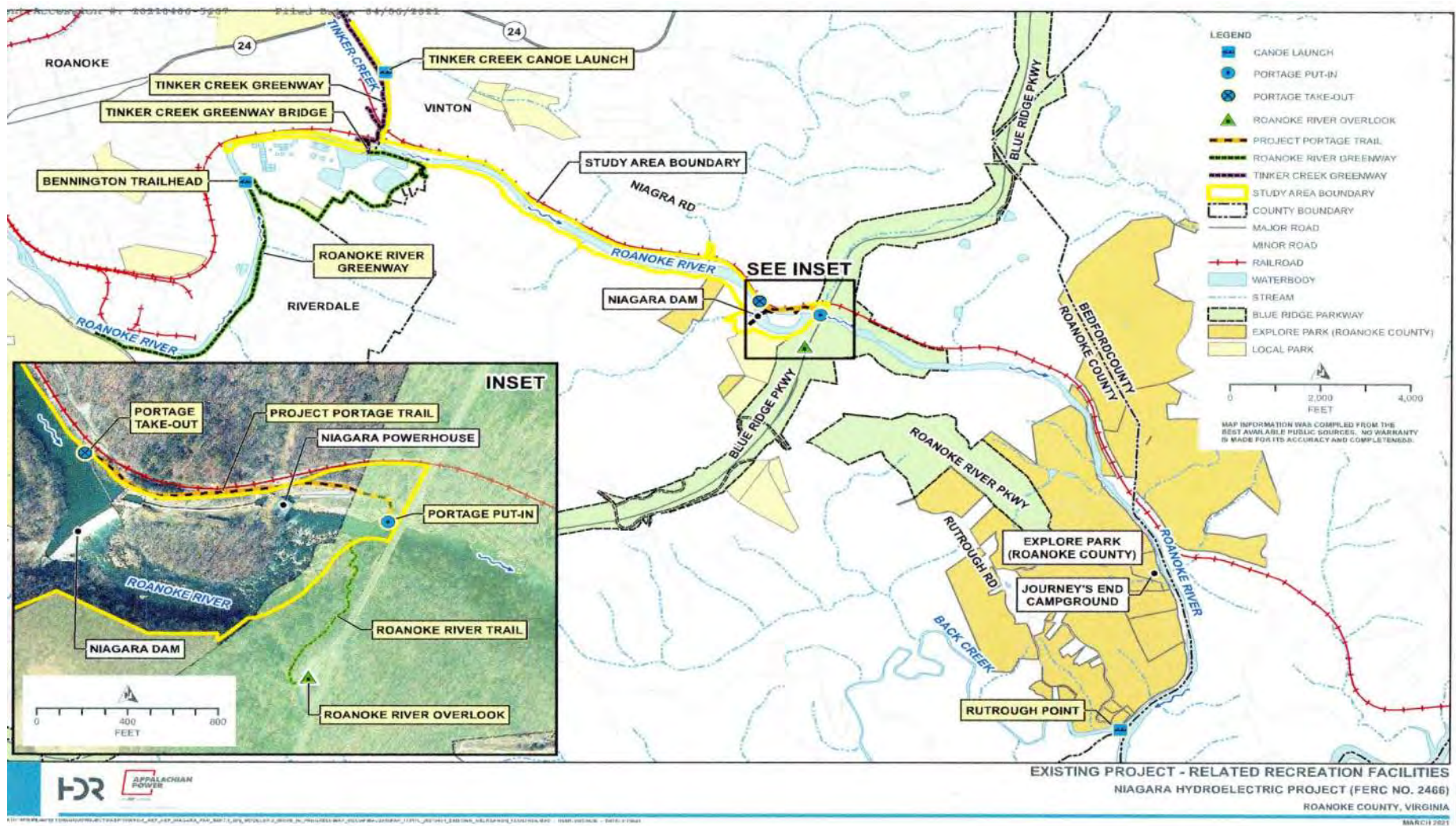
- Tinker Creek Canoe Launch located at The Town of Vinton, Virginia along Tinker Creek.
- Roanoke River Trail leading from the parking area along the National Park Service (NPS) Blue Ridge Parkway at Milepost 115 to the Roanoke River downstream of the powerhouse for the Niagara Project.

2.0 Inventories and Condition Assessments

The inventory and assessment information for the described locations is included as part of this report. This information for each facility includes the Inventory Assessment Forms, photographs, and notes from the field surveys. Coordinates noted for each site represent the connecting points to the Roanoke River and Tinker Creek as appropriate. The locations for which inventory and condition assessments were made are shown on the figure attached presenting recreational facilities within and adjacent to the Project Boundary.

The field inventory for the Tinker Creek Canoe Launch occurred on October 18, 2019 while those for the Niagara Project Canoe Portage Trail and the Roanoke River Trail took place on October 24 and October 28 respectively.

In addition to the formal Project and Non-Project recreation facilities listed above, the canoe/kayak take-out and put-in located at the terminus of Rutrough Road at the Roanoke River (Rutrough Point) was similarly inventoried and assessed. Rutrough Point is located approximately three miles downstream of the Project Powerhouse and provides a location for canoeists and kayakers to exit and enter the Roanoke River. The field inventory and condition assessment for that facility was performed on October 28, 2019.



Note: Figure from Niagara Hydroelectric Project Revised Study Plan dated November 6, 2019.

3.0 RECREATION FACILITY INVENTORY AND CONDITION ASSESSMENT BLANK FORM

RECREATION FACILITY INVENTORY AND CONDITION ASSESSMENT Niagara Hydroelectric Project (FERC No.2466)

Location:
Date:
Surveyor:
Photo Number(s):

Type of Amenity	#	ADA	Condition	Notes
Boat Launch Ramp/Lane			N / R / M / G	
Fishing Platform			N / R / M / G	
Portage (put-in/take-out)			N / R / M / G	
Portage Trail/Walking Trail (include length and footing materials)			N / R / M / G	
Picnic Table			N / R / M / G	
Restroom			N / R / M / G	
Trash Receptacles			N / R / M / G	
Other			N / R / M / G	

PARKING	Total Spaces: _____ Standard: _____ ADA: _____ Double (trailer): _____ Other: _____				Condition N / R / M / G
	Surface Type: Asphalt Concrete Gravel Other: _____				
Signs	#	Size	Material	Condition	Comments
FERC Project			wood / metal / other	N / R / M / G	
Facility ID			wood / metal / other	N / R / M / G	
Regulations			wood / metal / other	N / R / M / G	
Directional			wood / metal / other	N / R / M / G	
Interpretive			wood / metal / other	N / R / M / G	

Needs replacement (broken or missing components, or non-functional)
R - Needs repair (structural damage or otherwise in obvious disrepair)
M - Needs maintenance (ongoing maintenance issue, primarily cleaning)
G - Good condition (functional and well-maintained)
If a facility is given a rating of "N", "R", or "M", provide specific details.

ADDITIONAL COMMENTS/NOTES:

Note the age of the facilities (if known) as well as any signs of overuse.

4.0 RECREATION FACILITY INVENTORIES AND CONDITION ASSESSMENTS FORMS, NOTES, AND PHOTOGRAPHS

- **Niagara Project Canoe Portage Trail (Project Facility)**
- **Tinker Creek Canoe Launch – Vinton, Virginia (Non-Project Facility)**
- **Roanoke River Trail (Non-Project Facility)**
- **Rutrough Point (Non-Project Facility)**

RECREATION FACILITY INVENTORY AND CONDITION ASSESSMENT
Niagara Hydroelectric Project (FERC No. 2466)

Location:	Niagara Project Canoe Portage Trail (37.2677; -80.0263)
Date: 10/24/2019	Surveyor: F. Simms/K. Simms
Photo Number(s):	Photos Attached

Type of Amenity	#	ADA	Condition	Notes
Portage (put-in/take-out)	1 Ea.	No	N / R / M / G	Three timber with earth fill steps at Take-Out. Each Step 48"W x 20"D x 6"H. Take-Out at Roanoke River downstream of powerhouse very rocky. Difficult to access river
Portage Trail/Walking Trail (include length and footing materials)	1	No	N / R / M / G	Portage trail utilizes existing plant access road for most of its length. Surface is gravel. Width is 10 to 12 ft. Length of portage approximately 1,550 ft. Slopes along portage range from flat to 10 to 12 percent.
Trash Receptacles			N / R / M / G	
Other			N / R / M / G	
Other			N / R / M / G	
Other			N / R / M / G	

PARKING: (See Notes)	Total Spaces: _____ Standard: _____ ADA: _____ Double (trailer): _____ Other: _____				Condition N / R / M / G
	Surface Type: Asphalt Concrete Gravel Other: _____				
Signs	#	Size	Material	Condition	Comments
FERC Project	1		wood / metal / other	N / R / M / G	Provides Project No. No information on recreation
Facility ID	2	30" x 20"	wood / metal / other	N / R / M / G	Take-Out and Put-In location signs with plastic facing.
Regulations			wood / metal / other	N / R / M / G	
Directional	5	24"x 24"	wood / metal / other	N / R / M / G	Plastic facing coming loose.
Interpretive			wood / metal / other	N / R / M / G	

N – Needs replacement (broken or missing components, or non-functional)
R – Needs repair (structural damage or otherwise in obvious disrepair)
M – Needs maintenance (ongoing maintenance issue, primarily cleaning)
G – Good condition (functional and well-maintained)
If a facility is given a rating of "N", "R", or "M", provide specific details.

ADDITIONAL COMMENTS/NOTES:

Note the age of the facilities (if known) as well as any signs of overuse.

- Access to Roanoke River at Put-In difficult due to rocky conditions.
- Take-Out at reservoir very steep below first step. Water is very deep. Difficult to access steps.
- No public access to road to powerhouse. Parking is gravel but only for employees and individuals granted permission to access powerhouse area.
- No ADA accommodations.
- Estimated age of portage 20+ years. No sign of excessive use.
- No one was observed utilizing the facility during the field inventory.

Notes from Niagara Project Canoe Portage Trail
Inventory and Condition Assessment – October 24, 2019

- Entrance road to powerhouse and spillway is closed to public use by locked gate. Access can be obtained by contacting Appalachian and scheduling date and time.
- The canoe/kayak take-out at the reservoir is not well marked. Accessing the take-out steps is difficult. The depth of water at the end of the steps is very deep and the side slope is steep.
- The boat barrier adjacent to the portage take-out consists of barrels connected by cable. During the inventory, debris accumulation in excess of what could be contained in a dumpster along the barrier was noted.
- Directional signs for the portage need to be replaced due to plastic covering coming off.
- The portage trail shares the access road for employees and contractors.
- There is an active railroad track paralleling the portage trail. No barrier between the trail and track exists.
- Gravel surfaced parking for employees and contractors is provided near to the Project powerhouse. Access to the public is restricted.
- The last section of the portage trail (approximately 150' long) is not defined and traverses a grassed and muddy area. Some accumulated debris likely due to high water noticed in this area as well as at the put-in point.
- Although a sign designates the existence of the portage at the put-in, the put-in itself is not clearly delineated.
- The portage put-in area is very rocky and very difficult to cross to get to the Roanoke River. Due to the rocky nature of the put-in, placing a canoe or kayak in the water can be difficult.
- Bank fishing opportunities at take-out and put-in limited due to access limitations.
- There are no restroom facilities or trash receptacles provided.
- In general, the portions of the portage trail sharing the plant access road and surrounding plant grounds are well maintained and in good condition.
- There is a sign identifying the Project number. However, there is no information provided denoting other recreation opportunities in the area.
- Weather at time of field inventory: Sunny, mild breezes, temperature 65° F.

Steps at Portage Take-Out



Sign at Portage Take-Out



Portage Trail from Take-Out



Boat Barrier Adjacent to Take-Out



Portage/Access Road at Railroad Tracks



Portage/Access Road Near Powerhouse



View of Spillway Bypass Below Powerhouse from Portage Trail



Portage Trail/Access Road Near to Blue Ridge Parkway Bridge



Portage Trail at Put-In to Roanoke River



**View of Roanoke River Trail Steps and USGS Gage (No. 02056000)
Across Roanoke River from Put-In**



Portage Put-In at Roanoke River Downstream of Powerhouse



View of Powerhouse from Portage/Access Road



Signs at Put-In at Roanoke River



Roanoke River Downstream of Put-In



Roanoke River Upstream of Put-In



RECREATION FACILITY INVENTORY AND CONDITION ASSESSMENT
Niagara Hydroelectric Project (FERC No. 2466)

Location:	Tinker Creek Canoe Launch – Vinton, Virginia (37.2636; -79.9149)
Date: 10/18/2019	Surveyor: F. Simms/K. Simms
Photo Number(s):	Photos Attached

Type of Amenity	#	ADA	Condition	Notes
Portage (put-in/take-out)			N / R / M / G	
Portage Trail/Walking Trail (include length and footing materials)			N / R / M / G	
Trash Receptacles	1		N / R / M / G	
Other: Boat Launch	1	No	N / R / M / G	Curved Concrete Ramp. Width = 10 ft.; Length = 75 ft.; Slope = 20% (Avg.)
Other: Canoe/Kayak Storage Rack	1	No	N / R / M / G	Located at upper end of concrete ramp. Holds 6 canoes and/or kayaks.
Other			N / R / M / G	

PARKING	Total Spaces: <u>23</u> Standard: <u>22</u> ADA: <u>1</u> Double (trailer): _____ Other: _____				Condition
	Surface Type: <u>Asphalt</u> Concrete <u>Gravel</u> Other: _____				N / R / M / G
Signs	#	Size	Material	Condition	Comments
FERC Project	N/A		wood / metal / other	N / R / M / G	Non-Project Facility
Facility ID	1	48"x36"	<u>wood</u> / metal / other	N / R / M / G	Sign at Entrance.
Regulations	1	48"x48"	<u>wood</u> / metal / other	N / R / M / G	Board covered by glass.
Directional	3	24"x10"	wood / metal / <u>other</u>	N / R / M / G	Plastic entrance and exit directional signs with arrows.
Interpretive	4	Various	wood / metal / other	N / R / M / G	See notes and photos.

N - Needs replacement (broken or missing components, or non-functional)
R - Needs repair (structural damage or otherwise in obvious disrepair)
M - Needs maintenance (ongoing maintenance issue, primarily cleaning)
G - Good condition (functional and well-maintained)
If a facility is given a rating of "N", "R", or "M", provide specific details.

ADDITIONAL COMMENTS/NOTES:

Note the age of the facilities (if known) as well as any signs of overuse.

- Age of facility unknown. No signs of overuse.
- Five vehicle parking spots designated for boater use only. One of the five spots is designated for ADA use. Remaining 18 parking spots are for general public and use by Town of Vinton employees. The 18 spots are sized for vehicles but can be combined for use by vehicle with boat trailer.
- Information regarding signs provided in attached notes.
- Weather on day of inventory: Sunny with no clouds. Mild breeze. Temperature = 60°F.
- Overall, facilities well maintained and in good condition.
- No one was observed utilizing the site during the field inventory.

Notes from Town of Vinton, Va. – Tinker Creek Canoe Launch
Inventory and Condition Assessment – October 18, 2019

- Weather during the inventory and condition assessment was sunny with no clouds, a mild breeze, and temperatures near 60° F.
- The boat launch area is well maintained with little to no litter.
- Boat ramp is concrete for its entire length and in good condition. Depth of water at end of ramp at Tinker Creek is shallow and has a rocky bottom.
- There is a total of 23 vehicle parking spaces. Five of the spaces are designated for use by boaters only with one of the five being identified for handicap use. The remaining eighteen spaces are for use by those utilizing the boat launch as well as for uses unrelated to the boat launch including parking for employees for the Town of Vinton.
- Directional signs are provided along Virginia Ave. which is the nearest major road. The signs are visible from both directions.
- There are numerous signs at the boat launch area including the following:
 1. Entrance sign (48" W x 36" H) having a wood frame surrounding a composite sign board.
 2. Information sign (48" W x 36" H) describing contributors to the facility.
 3. One entrance and three exit direction signs (24" W x 10" H) made of plastic.
 4. Information sign (36" W x 24" H) describing the Virginia Treasure program. The sign is metal.
 5. Information sign (48" W x 48" H) containing regulations for the boat launch and providing information regarding local activities. The sign has a glass facing and is held on a wood frame.
 6. Handicap parking sign (12" W x 18" H) made of metal.
 7. Metal sign (24" W x 18" H) denoting parking spaces for boaters only.
- A timber canoe/kayak rack is located at the top of the boat ramp and provides the ability to stack up to six canoes/kayaks for temporary storage.
- A wood privacy fence is provided along the entire length of the north border of the boat launch area.
- Limited opportunities for bank fishing.
- There are neither restroom facilities nor trash receptacles provided.

Entrance Sign at 3rd Street



Boat Ramp Looking Uphill



Boater Only Parking



Boater Only Parking Sign



ADA Parking Sign



Information Sign at Fence Along North Property Line



Information Sign Along North Boundary Fence



Canoe/Kayak Temporary Storage Rack at Boat Ramp



Erosion at Base of Boat Ramp



View of Tinker Creek Downstream of Boat Ramp



View of Tinker Creek Upstream of Boat Ramp



Information Sign at Boat Launch Containing Rules and General Information



Boat Launch Common Parking



RECREATION FACILITY INVENTORY AND CONDITION ASSESSMENT
Niagara Hydroelectric Project (FERC No. 2466)

Location:	Roanoke River Trail (37.2531; -79.8716)
Date: 10/28/2019	Surveyor: F. Simms/K. Simms
Photo Number(s): (Photos Attached)	

Type of Amenity	#	ADA	Condition	Notes
Portage (put-in/take-out)			N / R / M / G	
Portage Trail/Walking Trail (include length and footing materials)	1	No	N / R / M / G	Upper Tail: 200 LF (Asphalt: 3 ft. wide). Mid-Portion: 280 LF (Gravel 4 ft. wide). At end of gravel trail, steps begin. Number of steps = 200 (Each step timber with gravel fill; 48" wide; 6" high; 20" avg. depth). See notes for more detail.
Trash Receptacles	1	No	N / R / M / G	Located in parking lot at beginning of trail.
Other			N / R / M / G	
Other			N / R / M / G	
Other			N / R / M / G	

PARKING	Total Spaces: <u>35</u> Standard: <u>35</u> ADA: <u> </u> Double (trailer): <u> </u> Other: <u> </u>					Condition
	Surface Type: <u>Asphalt</u> Concrete Gravel Other: <u> </u>					N / R / M / G
Signs	#	Size	Material	Condition	Comments	
FERC Project			wood / metal / other	N / R / M / G		
Facility ID			wood / metal / other	N / R / M / G		
Regulations			wood / metal / other	N / R / M / G		
Directional	1	56" x 24"	wood / metal / other	N / R / M / G	In parking lot at trail start. See notes for other directional	
Interpretive	1	48"x 20"	wood / metal / other	N / R / M / G	In parking lot at trail start. See notes for other interpretive	

N – Needs replacement (broken or missing components, or non-functional)
R – Needs repair (structural damage or otherwise in obvious disrepair)
M – Needs maintenance (ongoing maintenance issue, primarily cleaning)
G – Good condition (functional and well-maintained)
If a facility is given a rating of "N", "R", or "M", provide specific details.

ADDITIONAL COMMENTS/NOTES:

Note the age of the facilities (if known) as well as any signs of overuse.

- Age of upper portions of trail unknown. Steps constructed in 2015.
- No signs of overuse.
- Safety sign at end of asphalt portion of trail. Composite material (24" x 30"). Poor condition thus difficult to read. Needs replacement.
- Two wood trail direction signs at top of steps (20" x 8" and 25" x 6"). Good condition.
- Information sign about Niagara Project. Metal (36" x 24"). Good condition.
- No litter was noticed. Site appears to be well-maintained.
- No ADA accommodations.
- Weather during inventory and condition assessment: Sunny with mild wind, temperature 65°F.

Notes from Roanoke River Trail
Inventory and Condition Assessment – October 28, 2019

- The trail consists of three segments. The upper portion of the trail is 200 ft. long, has a slope of 16%, a width of 36", and an asphalt surface. The asphalt is cracking and in need of repair.
- The middle portion of the trail is 150 ft. long and 48 in. wide. It is dirt with a gravel surface in some areas. Portions of the middle portion need maintenance including the addition of gravel at some locations.
- The lower portion of the trail is steep consisting of 200 timber steps with gravel fill. Each step is 48 in. wide, 6 in. high, and has an average depth of 20 in. The gravel fill has settled in certain locations and should be replenished. There are short landings of various lengths that provide an area to rest. A wood bench is located at one landing providing a place to sit and view the Project bypass and powerhouse. There also is a bench at another landing that has a seating area carved out of a segment of a tree trunk. The vertical distance from the top of the steps to the end at the Roanoke River is estimated at approximately 100 ft.
- The fishing access at the end of the steps is rocky but provides a good area for bank fishing. One individual was observed fishing during the inventory.
- The powerhouse for the Niagara Project is visible from the fishing access. Along the fence adjacent to the powerhouse is a sign that provides information regarding flow releases from the powerhouse. The lettering on the sign is difficult to read from the fishing access due to the lettering being too small. A larger sign should be considered.
- During the inventory which lasted for 2.5 hours beginning at 12:30 p.m., eight individuals were observed walking the trail. Based upon the license plates for the vehicles in the parking lot, those utilizing the trail and fishing access were from the local area as well as various states outside of Virginia including Minnesota, North Carolina, and Florida. The apparent primary activity for those utilizing the trail was to view the Niagara Project facilities and surrounding terrain.
- No restroom facilities are provided along the trail or at the parking lot.
- The trail and steps provide access to the USGS Gage (02056000) located near the end of the steps.
- The Niagara Project Canoe Portage Trail put-in at the Roanoke River can be observed from the trail fishing access. During the field inventory, no one was observed utilizing the portage.
- The bridge carrying the Blue Ridge Parkway over the Roanoke River downstream of the Niagara Project powerhouse is adjacent to the parking lot for the Roanoke River Trail. The Project spillway bypass and powerhouse can be viewed from the bridge.

Entrance from Blue Ridge Parkway to Roanoke River Trail Parking Lot



Roanoke River Trail Parking Lot



Overlook Sign at Roanoke River Trail Parking Lot



Trash Receptacle and Information Sign at Parking Lot



View of Project Spillway from Parking Lot



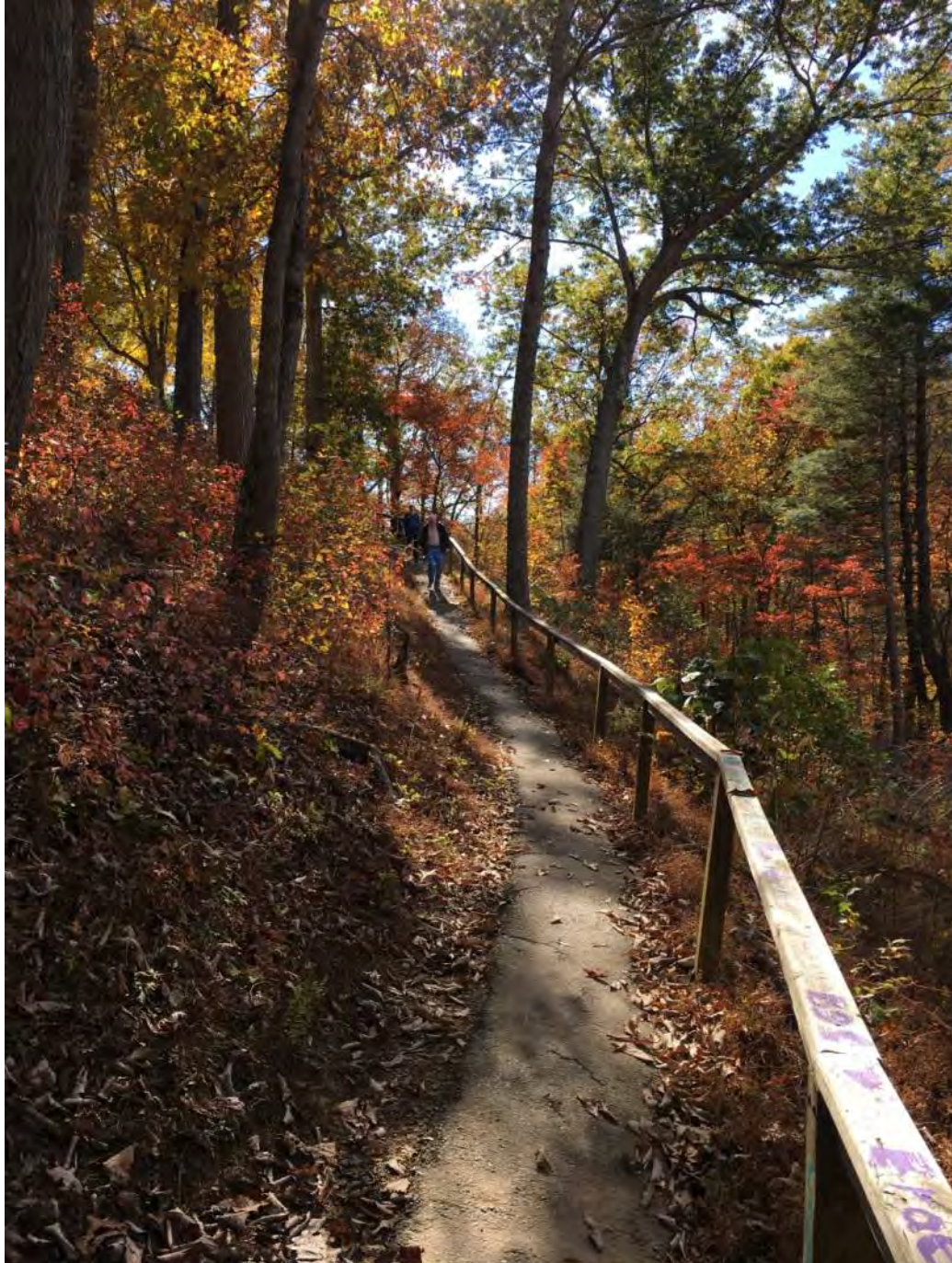
Seating at Parking Lot



Project Information Sign at Overlook Along Steps



Asphalt Portion of Roanoke River Trail



Roanoke River Trail Gravel Segment



Roanoke River Trail Directional Sign at Top of Steps



Roanoke River Trail Steps



Bench at Steps Landing



View of Project Bypass from Bench at Roanoke River Trail Steps



Log Bench at Landing Along Steps



View of Powerhouse from Steps



Roanoke River Trail Steps



End of Steps at Roanoke River Fishing Area



Fishing Area at End of Steps Looking Upstream at Niagara Project Powerhouse



USGS Gage (02056000) located at End of Steps



Fishing Area at End of Steps Looking Downstream Along Roanoke River



View of Spillway Bypass from Fishing Area



View of Niagara Project Canoe/Kayak Portage Put-In Across Roanoke River from Roanoke River Trail



Warning Sign at Face of Niagara Project Powerhouse



View of Project Spillway Bypass from Blue Ridge Parkway Bridge



RECREATION FACILITY INVENTORY AND CONDITION ASSESSMENT
Niagara Hydroelectric Project (FERC No. 2466)

Location:	Rutrough Point (37.2259; -79.8474)
Date: 10/18/2019	Surveyor: F. Simms/K. Simms
Photo Number(s): Photos Attached	

Type of Amenity	#	ADA	Condition	Notes
Portage (put-in/take-out)	1	No	N / R / M / G	Timber steps. W=8 ft.; D=15 in.; H=6"; No. = 12. Accumulated debris and soil should be removed.
Portage Trail/Walking Trail (include length and footing materials)	1	No	N / R / M / G	Dirt trail with some gravel. W=30 in.; L=75 ft. Trail leads from parking area to put-in.
Trash Receptacles	1	No	N / R / M / G	
Other: Picnic table	1	No	N / R / M / G	
Other			N / R / M / G	
Other			N / R / M / G	

PARKING	Total Spaces: <u>12</u> Standard: <u>12</u> ADA: <u> </u> Double (trailer): <u> </u> Other: <u> </u>				Condition
	Surface Type: <u>Asphalt</u> <u>Concrete</u> <u>Gravel</u> Other: <u> </u>				N / R / M /
Signs	#	Size	Material	Condition	Comments
FERC Project	N/A		wood / metal / other	N / R / M / G	Non-Project Facility
Facility ID			wood / metal / other	N / R / M / G	
Regulations			wood / metal / other	N / R / M / G	
Directional			wood / metal / other	N / R / M / G	
Interpretive			wood / metal / other	N / R / M / G	

N - Needs replacement (broken or missing components, or non-functional)
R - Needs repair (structural damage or otherwise in obvious disrepair)
M - Needs maintenance (ongoing maintenance issue, primarily cleaning)
G - Good condition (functional and well-maintained)
If a facility is given a rating of "N", "R", or "M", provide specific details.

ADDITIONAL COMMENTS/NOTES:

Note the age of the facilities (if known) as well as any signs of overuse.

- Numerous signs at site. Information regarding signs provided on attached notes.
- Age of facilities unknown.
- No signs of overuse.
- Weather during inventory: Sunny, mild breezes, 70° F.

Notes from Rutrough Point Canoe and Kayak Access
Inventory and Condition Assessment – October 18, 2019

- In general, the area is well kept and in good condition.
- Parking is available for an estimated twelve vehicles. There is no designated handicap parking space.
- The steps leading to the edge of the water to allow for launching of canoes and/or kayaks have been covered by silt and grasses which can cause the steps to be slippery to use. There are twelve timber with earth fill steps each being 8' wide, 15" deep, and 6" high.
- The trail leading from the parking area to the canoe/kayak put-in could use some resurfacing. It is primarily a 30" wide dirt path with some portions having a gravel surface.
- The picnic table provided at the put-in is in poor condition and requires either maintenance or replacement.
- Trails for Explore Park are accessible from the Rutrough Road Canoe/Kayak Put-In with the trails having directional signs at the point they connect to the parking area.
- Bank fishing occurs in vicinity of put-in and along banks near trails.
- There are no directional signs from Rutrough Road to the parking area.
- Numerous signs are provided at the parking area including the following:
 1. Recreation site identification sign (38" W x 58" H) constructed of wood. Eight gunshot holes were noticed through the sign.
 2. One high water warning sign (18" W x 12"H) made of metal.
 3. Metal "Virginia Treasures" informational sign (18" W x 12" H).
 4. Metal directional sign (24"H x 18"H ea.) stating that gate is not to be blocked.
 5. Information sign at the entrance to the parking area (72" W x 48" H) having a wood frame and glass cover. Current information includes rules to follow while utilizing the site along with maps of the adjoining Explore Park.
 6. Adventure plan and map metal sign (12" W x 12" H).
- No restroom facilities are provided.
- A trash receptacle along with "mutt-mitts" and trash bags are provided. The "mutt-mitts" and trash bags are stored on-site in metal containers.
- During the field inventory, two fisherman and four individuals hiking were observed.

Parking Entrance from Rutrough Road



Rutrough Point Kayak & Canoe Access Entrance Sign



Parking Area



High Water Warning Sign at Put-In



Trail from Parking Area to Put-In



Put-In at Roanoke River



Picnic Table at Put-In



Steps at Put-In



View of Roanoke River Upstream of Put-In



View of Roanoke River Downstream of Put-In



View Along Back Creek from Put-In



Information Sign at Parking Area



Planning Information at Parking Area



Explore Park Trail Connection to Parking Area Including Information Signs



**NIAGARA HYDROELECTRIC PROJECT
(FERC NO. 2466)
RECREATION STUDY**

**Attachment 2: Recreation Site Survey Questionnaire and
Field Monitoring Results**

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Recreation Survey – Blank Questionnaire

RECREATION STUDY SURVEY
Niagara Hydroelectric Project (FERC No. 2466)
Recreation Survey Questionnaire

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the Niagara Hydroelectric Project (Project or Niagara Project) which is licensed by the Federal Energy Regulatory Commission (FERC). The current operating license for the Project expires on February 29, 2024. As part of the relicensing process, Appalachian is conducting studies on environmental resources to enable FERC to prepare an environmental document. The purpose of this survey is to collect information about use of the Project's recreation facilities. There is one FERC-approved recreation facility, the canoe portage trail, associated with the Project, owned and operated by Appalachian. There are three non-project recreation facilities that are of interest to Project stakeholders, the Tinker Creek Canoe Launch, Roanoke River Trail, and the Rutrough Road Canoe/Kayak Ramp. A map of the Project area is provided in Attachment 1 of this Questionnaire.

Recreation Location (check one):	<input type="checkbox"/> Niagara Portage Trail
	<input type="checkbox"/> Tinker Creek Canoe Launch
	<input type="checkbox"/> Roanoke River Trail/Outlook
	<input type="checkbox"/> Rutrough Road Canoe/Kayak Ramp
Home Zip Code: _____ Date: _____	
Age: _____	
Are you: Male <input type="checkbox"/> Female <input type="checkbox"/> Prefer not to answer <input type="checkbox"/>	

Q-1. Regarding the Niagara Project area, do you consider yourself: **(Please circle one)**

1. A regular visitor to this area (*3 or more times per year*)
2. An occasional visitor (*1-2 times per year*)
3. An infrequent visitor (*Less than 1 time per year*)
4. This is my first visit

Q-2. On this trip to the Niagara Study Area, when did you arrive?

Arrival Date

Arrival Time

____/____/____ ____AM/PM

When did you leave the Niagara Study area?

Departure Date

Departure Time

____/____/____ ____AM/PM

Q-3. During the last 12 months (including this trip), which month(s) did you visit the Niagara Study area?
(Please select all that apply)

Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐

Q-4. About how many miles did you travel to get to the Niagara Study area?

A. _____miles

Q-5. Did you stay overnight in the Niagara Study area (not including at your own home) on this trip?

1. Yes 2. No

Q-6. If you answered yes to **Q-5**, at what type of accommodations did you stay? **(Please select one)**

1. RV/Auto/Tent Campground
2. Motel/hotel
3. Bed and Breakfast
4. Vacation or rental home
5. Other (Please specify: _____)

Q-7. On this trip to the Niagara Study area, in which of the following activities did you participate in? **(Please select all that apply)**

- | | | |
|----------------------|-----------------|-----------------------------|
| 1. Bank fishing | 5. Picnicking | 8. Hunting |
| 2. Boat fishing | 6. Swimming | 9. Wildlife viewing |
| 3. Pleasure boating | 7. Sight-seeing | 10. Other (please describe) |
| 4. Canoeing/kayaking | | _____ |

Q-8. Of the activities you circled in Q-7 above, what is the primary activity that you participated in on this visit?
(Please write in the corresponding number from above)

A. Primary activity # _____

Q-9. Regarding the primary activity you participated in on this visit listed in Q-8, please rate the following at the Project:

	Totally Unacceptable	Unacceptable	Neutral	Acceptable	Totally Acceptable
Safety	1	2	3	4	5
Enjoyment	1	2	3	4	5
Crowding	1	2	3	4	5
Overall Experience	1	2	3	4	5

Q-10. If you participated in recreational activities in the Niagara Study area today or in the past, rate the following on a 1-5 scale as listed in Q-9:

	Rating
Accessibility	
Parking	
Crowding	
Safety	
Condition of Recreation Facilities	
Available Facilities	
Overall Experience	

Q-11. Please tell us what type(s) of recreation enhancements you believe are needed at the Niagara Project.

Description of recreation enhancement and location:

Q-12. Please share any other comments that you have regarding recreation near the Niagara Project:

Thank you for completing the Recreation Survey!

Recreation Study Online Survey – Windshield Flyer

NIAGARA HYDROELECTRIC PROJECT (P-2466) **RECREATION STUDY** **ONLINE SURVEY**

Appalachian Power Company (Appalachian) is conducting a Recreation Study as part of the relicensing of the Niagara Hydroelectric Project (Project). The purpose of the Recreation Study is to assess the use of public recreational facilities in the immediate vicinity of the Project Dam, Powerhouse and Reservoir. As part of that assessment, Appalachian is requesting your participation by visiting the website referenced below to take a brief online survey intended to gather information about recreation use at the Project.

Please use the following web address to find the survey and click on the Recreation Survey link:

www.aephydro.com/HydroPlant/Niagara

Appalachian thanks you for your cooperation.

On-Site/In-Person Recreation Survey Results – Tinker Creek Canoe Launch

NIAGARA HYDROELECTRIC PROJECT (FERC No. 2466)
ON-SITE/IN-PERSON RECREATION SURVEY RESULTS
TINKER CREEK CANOE LAUNCH

Q-1: Regarding the Niagara Project area, do you consider yourself: (1) a regular visitor to the area; (2) an occasional visitor; (3) an infrequent visitor; or (4) is this your first visit?

Visitor Type	Regular	Occasional	Infrequent	First Visit
Number	7	0	0	0
Percentage	100%	0%	0%	0%

Q-2: On this trip to the Niagara Project area, when did you arrive? When do you expect to leave the Niagara Project area? (See interview results summaries)

Q-3: During the last 12 months (including this trip), which month(s) did you visit the Niagara Study area?

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number	3	3	3	5	7	7	7	7	7	7	5	3
Percentage	43%	43%	43%	71%	100%	100%	100%	100%	100%	100%	71%	43%

Q-4: About how many miles did you travel to get to the Niagara Study area?

Miles	0-10	10-25	25-50	50-100	100-200	>200
Number	6	1	0	0	0	0
Percentage	86%	14%	0%	0%	0%	0%

Q-5: Did you stay overnight in the Niagara Study area (not including at your own home) on this trip?

Answer	Yes	No
Number	0	7
Percentage	0%	100%

Q-6: If you answered yes to Q-5, at what type of accommodations did you be staying?

Accommodation	RV/Auto/Tent	Motel/Hotel	B&B	Vac. or Rental Home	Other
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Number	0	0	0	0	0
Percentage	0%	0%	0%	0%	0%

Q-7: On this trip to the Study area, in which of the following activities did you participate in?

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/ Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	0	4	0	3	0	0	0	0	0	0
Percent	0%	57%	0%	43%	0%	0%	0%	0%	0%	0%

Q-8: Of the activities you circled in Q-7 above, what is the primary activity that you participated in, on this visit?

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/ Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	0	4	0	3	0	0	0	0	0	0
Percent	0%	57%	0%	43%	0%	0%	0%	0%	0%	0%

Q-9: Regarding the primary activity you participated in on this visit listed in Q-8, please rate the following at the Project:

Number (Percent)	Totally Unacceptable	Unacceptable	Neutral	Acceptable	Totally Acceptable
Safety	0	0	0	0	7 (100%)
Enjoyment	0	0	0	0	7 (100%)
Crowding	0	0	0	2 (29%)	5 (71%)
Overall Experience	0	0	0	0	7 (100%)

Q-10: If you participated in recreational activities in the Niagara Study area today or in the past, rate the following on a 1-5 scale as listed in Q-9. .

Number (Percent)	Accessibility	Parking	Crowding	Safety	Condition of Facilities	Available Facilities	Overall Experience
Totally Unacceptable	0	0	0	0	0	0	0
Unacceptable	0	0	0	0	0	0	0
Neutral	0	0	0	0	0	0	0

Acceptable			2 (29%)				
Totally Acceptable	7 (100%)	7 (100%)	5 (71%)	7 (100%)	7 (100%)	7 (100%)	7 (100%)

Q-11: Please tell us what type(s) of recreation enhancements you believe are needed and at the Niagara Project. (See interview results summaries)

Q-12: Please share any other comments that you have regarding recreation near the Niagara Project. (See interview results summaries)

Field Monitoring Results – Tinker Creek Canoe Launch

Questions 1 thru 3

<u>Survey No.</u>	<u>Date</u>	<u>Home Zip Code</u>	<u>M/F</u>	<u>Age</u>	<u>Regular</u>	<u>Q-1 Visits Occasional</u>	<u>Infrequent</u>	<u>First</u>	<u>Q-2 Arrive Time</u>
1	5/1/2021	Unknown	M	50	1				10:00 AM
2	5/1/2021	24016	M	50	1				1:15 PM
3	7/23/2021	24012	M	27	1				12:00 PM
4	10/2/2021	24153	M	50	1				10:45 AM
5	10/2/2021	24013	M	50	1				10:45 AM
6	10/2/2021	24179	M	64	1				11:00 AM
7	10/4/2021	24179	M	41	1				7:15 AM
Total					7	0	0	0	
Percentage					100.00%	0.00%	0.00%	0.00%	
Average					47.43				

Survey No.	Q-3 Month											
	Jan	Feb	Mar	April	May	June	July	Aug	Sept.	Oct	Nov	Dec
1				1	1	1	1	1	1	1		
2	1	1	1	1	1	1	1	1	1	1	1	1
3				1	1	1	1	1	1	1		
4					1	1	1	1	1	1	1	
5					1	1	1	1	1	1	1	
6	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1
Total	3	3	3	5	7	7	7	7	7	7	5	3
Percent	42.86%	42.86%	42.86%	71.43%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	71.43%	42.86%

Questions 4 thru 7

<u>Survey No.</u>	<u>Q-4 Miles</u>	<u>Q-5: Overnight Stay</u>		<u>RV</u>	<u>Motel</u>	<u>Q-6: Location</u>			
		<u>Yes</u>	<u>No</u>			<u>B&B</u>	<u>Rental</u>	<u>Other</u>	
1	5		1						
2	5		1						
3	12		1						
4	10		1						
5	10		1						
6	5		1						
7	10		1						
Total		0	7	0	0	0	0	0	0
Percentage		0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Average	8.14								

<u>Survey No.</u>	Q-7: Activities										<u>Other Descrip.</u>
	<u>Bank Fish.</u>	<u>Boat Fish</u>	<u>Boating</u>	<u>Canoe/Kayak</u>	<u>Picnicking</u>	<u>Swimming</u>	<u>Hike/Sight-See</u>	<u>Hunting</u>	<u>Wildlife View</u>	<u>Other</u>	
1		1									
2		1									
3				1							
4		1									
5		1									
6				1							
7	1			1							
Total	1	4	0	3	0	0	0	0	0	0	0
Percent	14.29%	57.14%	0.00%	42.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

<u>Survey No.</u>	Q-8: Primary Activities									
	<u>Bank Fish.</u>	<u>Boat Fish</u>	<u>Boating</u>	<u>Canoe/Kayak</u>	<u>Picnicking</u>	<u>Swimming</u>	<u>Hike/Sight-See</u>	<u>Hunting</u>	<u>Wildlife View</u>	<u>Other</u>
1		1								
2		1								
3				1						
4		1								
5		1								
6				1						
7				1						
Total	0	4	0	3	0	0	0	0	0	0
Percent	0.00%	57.14%	0.00%	42.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

<u>Survey No.</u>	<u>Q-9: Primary Activity Rating*</u>				<u>Q-10: General Rating of Niagara Area Facilities</u>						
	<u>Safety</u>	<u>Enjoyment</u>	<u>Crowding</u>	<u>Overall Exp.</u>	<u>Accessibility</u>	<u>Parking</u>	<u>Crowding</u>	<u>Safety</u>	<u>Condition</u>	<u>Available Fac.</u>	<u>Overall Exp.</u>
1	5	5	5	5	5	5	5	5	5	5	5
2	5	5	5	5	5	5	5	5	5	5	5
3	5	5	5	5	5	5	5	5	5	5	5
4	5	5	4	5	5	5	4	5	5	5	5
5	5	5	4	5	5	5	4	5	5	5	5
6	5	5	5	5	5	5	5	5	5	5	5
7	5	5	5	5	5	5	5	5	5	5	5
Average	5.00	5.00	4.71	5.00	5.00	5.00	4.71	5.00	5.00	5.00	5.00

Questions 11 and 12

Survey No.

Q-11 & Q-12: Comments

- 1 Normal fishing trip is down Tinker Creek to Roanoke River then upstream to Bennington Launch followed by Downstream to Tinker Creek and then back to Tinker Creek Canoe Launch. No enhancements recommended.
- 2 Normal fishing trip is down Tinker Creek to Roanoke River then upstream to Bennington Launch followed by Downstream to Tinker Creek and then back to Tinker Creek Canoe Launch. Sometimes ramp closed too long. Another boat launch on Roanoke River would be nice. Lights at portage take-out and at boat barrier would be good. Primary users kayakers and paddleboarders.
- 3 Need better signage to recreation sites. Connectivity to Greenways should be improved.
- 4 Kayak slide to assist carrying kayaks. Provide porta-johns. No knowledge of portage at Niagara Dam. Primarily fish river upstream of dam to Bennington launch.
- 5 Trash an issue. Provide porta-johns. Kayak slide to assist carrying kayaks. No knowledge of portage at Niagara Dam. Primarily fish river upstream of dam to Bennington launch.
- 6 Primarily kayak river to Niagara Dam and Bennington launch.
- 7 Rutrough Point steps at launch more difficult to use than Tinker Creek ramp. Parking fee at Rutrough Point appears to help keep amount of trash at site and number of homeless down. Do not use portage at dam as result of receiving ticket from Game Warden for using it. Steps at Roanoke River Trail to difficult to use for launching kayaks.

Tinker Creek Canoe Access: Information Regarding Individuals Surveyed

<u>ZIP CODE</u>	<u>LOCATION</u>	<u>NUMBER</u>	<u>MALE</u>	<u>FEMALE</u>	<u>LOCAL</u>	<u>NOT LOCAL</u>
24012	Roanoke, Va.	1	1	0	1	0
24013	Roanoke, Va.	1	1	0	1	0
24016	Roanoke, Va.	1	1	0	1	0
24153	Salem, Va.	1	1	0	1	0
24179	Vinton, Va.	2	2	0	2	0
<u>Unknown</u>	<u>Unknown</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>
TOTAL		7	7	0	7	0
PERCENTAGE			100.00%	0.00%	100.00%	0.00%

TINKER CREEK CANOE ACCESS LICENSE PLATES		
STATE	COUNT RECORDED	% OF TOTAL
Virginia	109	98.20%
Louisiana	2	1.80%
TOTAL	111	100.00%

Niagara Hydroelectric Project P-2466
Updated Recreation Study Report Attachment 2

2021 TINKER CREEK CANOE LAUNCH RECREATION MONITORING DAILY SUMMARY REPORT: Niagara Project (P-2466)														
DATE	ORDER	ARRIVAL TIME	LEAVE TIME	SURVEYS DONE	VEHICLES PARKED W/TRAILERS	VEHICLES PARKED W/O TRAILERS	# OF VEHICLES IN NON-DESIG. AREA	# OF INDIVIDUALS OBSERVED	BOATS LOADING/ UNLOADING AT RAMP	TYPES OF BOATS	PRIMARY ACTIVITIES	TOTAL VEHICLES	PARKING SPACES PERCENTAGES	
1-May-21	3	10:30 AM		0	0	2	0	4	0	0	Bank fishing. All plates Va.	2	40.00%	
			11:00 AM	0	0	2	0	4	0	0	Bank fishing. All plates Va.	2	40.00%	
	6	1:15 PM		2	0	1	0	1	1	Fishing	All plates Va.	1	20.00%	
			1:45 PM	0	0	1	0	1	1	Fishing	All plates Va.	1	20.00%	
11-May-21	3	11:30 AM		0	0	0	0	0	0	N/A		0	0.00%	
			12:00 PM	0	0	0	0	0	0	N/A		0	0.00%	
	4	2:40 PM		0	0	2	0	0	0	N/A	All Va. plates.	2	40.00%	
			3:10 PM	0	0	2	0	0	0	N/A	All Va. plates.	2	40.00%	
31-May-21	1	9:10 AM		0	0	0	0	0	0	0	01- Trash receptacle placed at site.	0	0.00%	
			9:40 AM	0	0	0	0	0	0	0	01- Trash receptacle placed at site.	0	0.00%	
	3	11:10 AM		0	0	1	0	0	0	0		1	20.00%	
			11:45 AM	0	0	1	0	0	0	0		1	20.00%	
7-Jun-21	4	10:50 AM		0	0	1	0	2	0	0	Kayaking.	1	20.00%	
			11:20 AM	0	0	1	0	2	0	0	Kayaking.	1	20.00%	
	2	9:12 AM		0	0	1	1	0	0	0		2	40.00%	
			9:42 AM	0	0	1	1	0	0	0		2	40.00%	
19-Jun-21	1	9:51 AM		0	0	0	0	0	0	0		0	0.00%	
			10:21 AM	0	0	0	0	0	0	0		0	0.00%	
	3	11:33 AM		0	0	1	0	2	1	kayak	Kayaking.	1	20.00%	
			12:03 PM	0	0	1	0	2	1	kayak	Kayaking.	1	20.00%	
3-Jul-21	2	11:48 AM		0	0	0	0	0	0	0		0	0.00%	
			12:30 PM	0	0	0	0	0	0	0		0	0.00%	
	4	1:45 PM		0	0	0	0	0	0	0		0	0.00%	
			2:30 PM	0	0	0	0	0	0	0		0	0.00%	
23-Jul-21	1	11:05 AM		0	0	2	0	0	0	0	Two vehicles in boat only area. Six vehicles in shared parking area. All plates Va.	2	40.00%	
			11:40 AM	0	0	2	0	0	0	0	Two vehicles in boat only area. Six vehicles in shared parking area. All plates Va.	2	40.00%	
	3	1:15 PM		1	0	1	0	2	1	Canoe	All plates Va. Individuals observed taking canoe out of water. One vehicle in boat only area. Six vehicles in shared parking area.	1	20.00%	
			2:00 PM	0	0	1	0	0	0	0	All plates Va. Vehicle with canoe left site.	1	20.00%	
14-Aug-21	1	8:47 AM		0	1	11	2	16	2	Canoes	River Clean-up. All plates Va.	14	280.00%	
			9:47 PM	0	1	11	2	16	2	Canoes	River Clean-up. All plates Va.	14	280.00%	
	3	10:50 AM		0	1	12	2	4	1	Canoes	Canoeing. All plates Va.	15	300.00%	
			11:23 AM	0	1	12	2	4	1	Canoes	Canoeing. All plates Va.	15	300.00%	
19-Aug-21	2	10:42 AM		0	0	0	0	0	0	0	None	0	0.00%	
			11:25 AM	0	0	0	0	0	0	0	None	0	0.00%	
	4	12:37 PM		0	0	0	0	0	0	0	None	0	0.00%	
			1:15 PM	0	0	0	0	0	0	0	None	0	0.00%	

Niagara Hydroelectric Project P-2466
Updated Recreation Study Report Attachment 2

2021 TINKER CREEK CANOE LAUNCH RECREATION MONITORING DAILY SUMMARY REPORT: Niagara Project (P-2466) - Cont'd													
DATE	ORDER	ARRIVAL TIME	LEAVE TIME	SURVEYS DONE	VEHICLES PARKED W/TRAILERS	VEHICLES PARKED W/O TRAILERS	# OF VEHICLES IN NON-DESIG. AREA	# OF INDIVIDUALS OBSERVED	BOATS LOADING/ UNLOADING AT RAMP	TYPES OF BOATS	PRIMARY ACTIVITIES	TOTAL VEHICLES	PARKING SPACES PERCENTAGES
5-Sep-21	1	9:37 AM		0	0	3	0	3	0	Kayaks	Kayaking, Plates: All Va.	3	60.00%
			10:07 AM	0	0	3	0	3	0	Kayaks	Kayaking, Plates: All Va.	3	60.00%
	3	11:16 AM		0	0	4	0	7	1	Kayaks	Kayaking, Plates: 1-La.; 3-Va.	4	80.00%
			11:46 AM	0	0	4	0	7	1	Kayaks	Kayaking, Plates: 1-La.; 3-Va.	4	80.00%
24-Sep-21	1	1:39 PM		0	0	0	0	0	0	N/A		0	0.00%
			2:23 PM	0	0	0	0	0	0	N/A		0	0.00%
	3	3:39 PM		0	0	0	0	1	0		0 1-person on motorcycle riding through site.	0	0.00%
			4:25 PM	0	0	0	0	0	0	N/A		0	0.00%
2-Oct-21	2	10:45 AM		3	0	2	0	3	3	Kayaks	Boat Fishing, Plates: All Va.	2	40.00%
			11:30 AM		0	3	0	1	1	Kayaks	Boat Fishing, Plates: All Va.	3	60.00%
	4	12:57 PM		0	0	3	0	0	0		Plates: All Va.	3	60.00%
			1:45 PM		0	3	0	0	0		Plates: All Va.	3	60.00%
4-Oct-21	1	7:06 AM		1	0	1	0	1	0		0 1-person bank fishing, Plates: All Va.	1	20.00%
			7:50 AM	0	0	1	0	1	0		0 1-person bank fishing, Plates: All Va.	1	20.00%
	3	9:00 AM		0	0	0	0	0	0			0	0.00%
			9:45 AM	0	0	0	0	0	0			0	0.00%
TOTAL				7	4	97	10	87	17		Total Vehicles Parked		111
AVERAGE						0	2	2	0		Avg. Number of Vehicles Parked		2
PERCENTAGE											Avg. Percentage of Parking Spaces Occupied		42.69%
PARKING SPACES OCCUPIED	TOTAL	AVG. VEHICLES/DAY	AVG. PERCENT/DAY	MAX. VEHICLES/DAY	MAX. PERCENT/DAY								
HOLIDAY	16	1	26.67%	4	80.00%								
WEEKEND DAY	77	5	96.25%	15	300.00%								
WEEKDAY	18	1	15.00%	2	40.00%								

On-Site/In-Person Recreation Survey Results – Roanoke River Trail

NIAGARA HYDROELECTRIC PROJECT (FERC No. 2466)

ON-SITE/IN-PERSON RECREATION SURVEY RESULTS

ROANOKE RIVER TRAIL

Q-1: Regarding the Niagara Project area, do you consider yourself: (1) a regular visitor to the area; (2) an occasional visitor; (3) an infrequent visitor; or (4) is this your first visit?

Visitor Type	Regular	Occasional	Infrequent	First Visit
Number	7	3	2	7
Percentage	17%	16%	11%	37%

Q-2: On this trip to the Niagara Project area, when did you arrive? When do you expect to leave the Niagara Project area? (See interview results summaries)

Q-3: During the last 12 months (including this trip), which month(s) did you visit the Niagara Study area?

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number	5	5	10	13	11	9	8	9	9	7	5	5
Percent	26%	26%	53%	68%	58%	47%	42%	47%	47%	37%	36%	26%

Q-4: About how many miles did you travel to get to the Niagara Study area?

Miles	0-10	10-25	25-50	50-100	100-200	>200
Number	10	2	1	0	1	5
Percentage	53%	11%	5%	0%	5%	26%

Q-5: Did you stay overnight in the Niagara Study area (not including at you own home) on this trip?

Answer	Yes	No
Number	5	14
Percentage	26%	74%

Q-6: If you answered yes to Q-5, at what type of accommodations did you be staying?

Accommodation	RV/Auto/Tent	Motel/Hotel	B&B	Vac. or Rental Home	Other
Number	1	2	0	0	2
Percentage	20%	40%	0%	0%	40%

Q-7: On this trip to the Study area, in which of the following activities did you participate in?

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/ Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	4	0	0	0	2	0	14	0	2	3
Percent	21%	0%	0%	0%	11%	0%	74%	0%	11%	16%

Q-8: Of the activities you circled in Q-7 above, what is the primary activity that you participated in, on this visit?

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/ Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	4	0	0	0	0	0	12	0	0	3
Percent	21%	0%	0%	0%	0%	0%	63%	0%	0%	16%

Q-9: Regarding the primary activity you participated in on this visit listed in Q-8, please rate the following at the Project:

Number (Percent)	Totally Unacceptable	Unacceptable	Neutral	Acceptable	Totally Acceptable
Safety	0	0	0	3 (16%)	16 (84%)
Enjoyment	0	0	0	2 (11%)	17 (89%)
Crowding	0	1 (5%)	1 (5%)	3 (16%)	14 (74%)
Overall Experience	0	0	0	3 (16%)	16 (84%)

Q-10: If you participated in recreational activities in the Niagara Study area today or in the past, rate the following on a 1-5 scale as listed in Q-9. .

Number (Percent)	Accessibility	Parking	Crowding	Safety	Condition of Facilities	Available Facilities	Overall Experience
Totally Unacceptable	0	0	0	0	0	0	0

Unacceptable	0	0	1 (5%)	0	0	0	0
Neutral	0	1 (5%)	2 (11%)	0	0	0	0
Acceptable	4 (21%)	1 (5%)	3 (16%)	3 (16%)	7 (37%)	6 (32%)	4 (21%)
Totally Acceptable	15 (79%)	17 (89%)	13 (68%)	16 (84%)	12 (63%)	13 (68%)	15 (79%)

Q-11: Please tell us what type(s) of recreation enhancements you believe are needed and at the Niagara Project. (See interview results summaries).

Q-12: Please share any other comments that you have regarding recreation near the Niagara Project. (See interview results summaries).

ROANOKE RIVER TRAIL – SURVEY RESPONSES

<u>Survey Number</u>	<u>Date</u>	<u>Home Zip Code</u>	<u>M/F</u>	<u>Age</u>	<u>QUESTION NO. 1</u>				<u>QUESTION NO.2</u>
					<u>Regular</u>	<u>Occasional</u>	<u>Infrequent</u>	<u>First</u>	<u>Arrive Time</u>
1	3/20/2021	24179	M	72	1				12:40 PM
2	3/20/2021	24014	M	42				1	Unknown
3	3/20/2021	24015	M	31	1				12:00 PM
4	3/29/2021	23336	M	67				1	1:00 PM
5	3/29/2021	24019	F	22				1	12:15 PM
6	3/29/2021	24018	M	23		1			12:15 PM
7	3/29/2021	21061	M	40				1	11:30 AM
8	4/10/2021	24014	M	28	1				9:30 AM
9	4/10/2021	24179	M	23	1				8:00 AM
10	4/10/2021	20740	M	41				1	11:30 AM
11	4/12/2021	24121	M	19				1	4:00 PM
12	4/12/2021	24012	M	34	1				12:30 PM
13	4/12/2021	74948	F	51		1			3:00 PM
14	4/24/2021	24179	M	26	1				9:00 AM
15	4/24/2021	24174	M	40			1		8:00 AM
16	5/1/2021	80222	M	25	1				11:30 AM
17	5/1/2021	24018	M	28				1	11:30 AM
18	5/11/2021	25443	F	70			1		10:45 AM
19	5/11/2021	24018	M	80		1			2:40 PM
Total					7	3	2	7	
Percentage					36.84%	15.79%	10.53%	36.84%	

Average

40.11 |

Survey Number	<u>QUESTION - 3</u>											
	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept.</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
1	1	1	1	1	1	1	1	1	1	1	1	1
2			1									
3	1	1	1	1	1	1	1	1	1	1	1	1
4			1									
5			1									
6			1	1	1	1	1	1	1	1		
7			1									
8	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1
10				1								
11				1								
12				1	1	1	1	1	1			
13				1		1						
14				1	1	1	1	1	1			
15				1								
16	1	1	1	1	1	1	1	1	1	1	1	1
17					1							
18					1							
19				1	1			1	1	1		
Total	5	5	10	13	11	9	8	9	9	7	5	5
Percent	26.32%	26.32%	52.63%	68.42%	57.89%	47.37%	42.11%	47.37%	47.37%	36.84%	26.32%	26.32%

<u>Survey Number</u>	<u>Q-4</u>	<u>QUESTION - 5</u>		<u>QUESTION - 6</u>			
	<u>Miles</u>	<u>Yes</u>	<u>No</u>	<u>RV</u>	<u>Motel</u>	<u>Rental</u>	<u>Other</u>
1	4		1				
2	5		1				
3	10		1				
4	200	1			1		
5	3		1				
6	10		1				
7	250	1			1		
8	5		1				
9	5		1				
10	300	1					1
11	25		1				
12	10		1				
13	550	1					1
14	5		1				
15	30		1				
16	1,500	1					1
17	10		1				
18	300		1				
19	15		1				
Total		5	14	0	2	0	3
Percentage		26.32%	73.68%	0.00%	10.53%	0.00%	15.79%
Average	170.37						

<u>QUESTION - 7</u>										
<u>Survey Number</u>	<u>Boat Fish</u>	<u>Boating</u>	<u>Kayak</u>	<u>Picnic</u>	<u>Swim</u>	<u>Hiking</u>	<u>Hunting</u>	<u>Viewing</u>	<u>Other</u>	<u>Descrip.</u>
1						1				Trash
2						1				
3						1			1	PhotoS
4						1				
5									1	Photos
6						1				
7						1				
8										
9										
10				1		1		1		
11						1		1		
12				1		1				
13						1				
14										
15									1	Photos
16						1				
17						1				
18						1				
19						1				
Total	0	0	0	2	0	14	0	2	3	
Percentage	0.00%	0.00%	0.00%	10.53%	0.00%	73.68%	0.00%	10.53%	15.79%	

QUESTION - 8

<u>Survey Number</u>	<u>Bank Fish.</u>	<u>Boat Fish</u>	<u>Boating</u>	<u>Canoe /Kayak</u>	<u>Picnicking</u>	<u>Hiking</u>	<u>Hunting</u>	<u>Other</u>	<u>Other Description</u>
1						1			
2						1			
3								1	Photos
4						1			
5								1	Photos
6						1			
7						1			
8	1								
9	1								
10						1			
11						1			
12	1								
13						1			
14	1								
15								1	Photos
16						1			
17						1			
18						1			
19						1			
Total	4	0	0	0	0	12	0	3	
Percentage	21.05%	0.00%	0.00%	0.00%	0.00%	63.16%	0.00%	15.79%	

QUESTION - 9

QUESTION - 10

<u>Survey Number</u>	<u>Safety</u>	<u>Enjoyment</u>	<u>Crowding</u>	<u>Overall Experience</u>	<u>Access</u>	<u>Parking</u>	<u>Crowding</u>	<u>Safety</u>	<u>Condition</u>	<u>Available</u>	<u>Overall Experience</u>
1	5	5	5	5	5	5	5	5	5	5	5
2	5	5	5	5	5	5	5	5	5	5	5
3	5	5	5	5	5	5	5	5	5	5	5
4	5	5	5	5	5	5	5	5	5	5	5
5	5	5	5	5	4	5	5	5	4	5	5
6	5	5	4	5	4	3	3	5	4	4	4
7	5	5	5	5	5	5	5	5	5	5	5
8	4	5	3	4	5	5	3	4	4	4	4
9	5	5	4	5	5	5	4	5	4	4	5
10	4	4	4	4	4	4	4	4	4	4	4
11	5	5	5	5	5	5	5	5	5	5	5
12	5	5	5	5	5	5	4	5	5	5	5
13	5	5	5	5	5	5	5	5	5	5	5
14	4	4	2	4	4	5	2	4	4	4	4
15	5	5	5	5	5	5	5	5	4	4	5
16	5	5	5	5	5	5	5	5	5	5	5
17	5	5	5	5	5	5	5	5	5	5	5
18	5	5	5	5	5	5	5	5	5	5	5
19	5	5	5	5	5	5	5	5	5	5	5
Total Percent Average	4.84	4.89	4.58	4.84	4.79	4.84	4.47	4.84	4.63	4.68	4.79

QUESTIONS 11 & 12

**Survey
Number**

Comments

- 1 Water over dam or not does not affect aesthetics. Appreciates view of rocks and woods. No improvements necessary.
- 2 Water over dam or not does not affect aesthetics.
- 3 Prefers water over dam due to sound. Trail to bypass and parking near spillway recommended.
- 4 No comments.
- 5 Improvements to handrails along trail recommended.
- 6 Trail steps need repair. Parking can get crowded at times but not overly.
- 7 No comments. Looking to relocate to Roanoke from Maryland.
- 8 Enjoys site as-is. Canoe portage needs improvements to access. Tinker Creek Canoe Access great place. improve parking. Enjoys water over dam. Rutrough Point needs improved access like Tinker Creek Canoe Launch
- 9 Porta-jon at trail needed. Has not launched kayak at trail but has seen others. Flow over dam preferred. Launches kayak at Tinker Creek to fish reservoir.
- 10 No comments.
- 11 No preference to flow over or not over spillway.
- 12 No preference to flow over or not over spillway.
- 13 Would like to see activity areas along Parkway open longer hours. No preference to flow over or not over spillway. Does like sound of water at higher flows.
- 14 Trail great place to fish.
- 15 Improve sight lines. Vegetation blocks views of bypass.
- 16 No comments.
- 17 No comments.
- 18 Need bathroom.
- 19 Identification signs of types of trees and flora would be nice. Has put canoe in water at Rutrough Point to float and fish at Smith Mountain reservoir.

Roanoke River Trail: Information Regarding Individuals Surveyed

<u>ZIP CODE</u>	<u>LOCATION</u>	<u>NUMBER</u>	<u>MALE</u>	<u>FEMALE</u>	<u>LOCAL</u>	<u>NOT LOCAL</u>
24179	Vinton, Va.	3	3	0	3	0
24014	Roanoke, Va.	2	2	0	2	0
24015	Roanoke, Va.	1	1	0	1	0
23336	Chincoteague, Va.	1	1	0	0	1
24019	Ronaoke, Va.	1	0	1	1	0
24018	Ronaoke, Va.	3	3	0	3	0
21061	Glen Burnie, MD.	1	1	0	0	1
20740	College Park, MD.	1	1	0	0	1
24121	Moneta, Va.	1	1	0	1	0
24012	Roanoke, Va.	1	1	0	1	0
74948	Muldrow, OK.	1	0	1	0	1
24174	Thaxton, Va.	1	1	0	0	1
80222	Denver, CO.	1	1	0	0	1
<u>25443</u>	<u>Shepherdstown, WV.</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>
	TOTAL	19	16	3	12	7
	PERCENT		84.21%	15.79%	63.16%	36.84%

Field Monitoring Results – Roanoke River Trail

ROANOKE RIVER TRAIL FIELD MONITORING SUMMARY REPORT-2021						
DATE	WEATHER	TIME	VEHICLES	% OF SPACES	ACTIVITIES OBSERVED	LICENSE PLATES
3/20/2021	50°F. Sunny	12:40 PM	15	43%	2-Individuals hiking.	1-Maryland; 1-Fla.; 1-Penn.; 12-Va.
3/29/2021	55°F. Sunny	11:30 AM	5	14%	2-Individuals in cars viewing and eating.	1- Maryland; 4-Va.
4/10/2021	60°F. Cloudy	9:30 AM	6	17%	4-Individuals bank fishing.	1-Maryland; 1-Tenn.; 4-Va.
4/12/2021	72°F. Sunny	3:00 PM	3	9%	No activity.	1-Ky.; 2-Va.
4/24/2021	45°F. Cloudy	9:00 AM	5	14%	4-Bank fishing/1-Photographer.	1-Ala.; 4-Va.
5/1/2021	55°F. Sunny	9:00 AM	3	9%	No activity.	1-Wash.; 2-Va.
5/1/2021	61°F. Sunny	11:15 AM	4	11%	5-Individuals hiking.	1-Ohio; 1-NH.; 2-Va.
5/11/2021	61°F. Sunny	10:30 AM	4	11%	1-Individual hiking; 3-Individuals viewing dam.	1-Wash.; 3-Va.
5/11/2021	72°F. Sunny	3:25 PM	2	6%	4-Individuals hiking.	1-Ohio; 1-NH.; 2-Va.

NOTE: Total number of parking spaces for vehicles = 35.

ROANOKE RIVER TRAIL LICENSE PLATES		
STATE	COUNT RECORDED	% OF TOTAL
Virginia	59	75.64%
Maryland	5	6.41%
New York	2	2.56%
Washington	2	2.56%
New Hampshire	2	2.56%
Ohio	2	2.56%
Georgia	1	1.28%
Florida	1	1.28%
Pennsylvania	1	1.28%
Tennessee	1	1.28%
Kentucky	1	1.28%
Alabama	1	1.28%
TOTAL	78	100.00%

On-Site/In-Person Recreation Survey Results – Rutrough Point

NIAGARA HYDROELECTRIC PROJECT (FERC No. 2466)
ON-SITE/IN-PERSON RECREATION SURVEY RESULTS
RUTROUGH POINT

Q-1: Regarding the Niagara Project area, do you consider yourself: (1) a regular visitor to the area; (2) an occasional visitor; (3) an infrequent visitor; or (4) is this your first visit?

Visitor Type	Regular	Occasional	Infrequent	First Visit
Number	9	6	1	4
Percentage	45%	30%	5%	20%

Q-2: On this trip to the Niagara Project area, when did you arrive? When do you expect to leave the Niagara Project area? (See interview results summaries)

Q-3: During the last 12 months (including this trip), which month(s) did you visit the Niagara Study area?

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number	5	5	6	7	15	16	15	14	10	8	5	5
Percentage	25%	25%	30%	35%	75%	80%	75%	70%	50%	40%	25%	25%

Q-4: About how many miles did you travel to get to the Niagara Study area?

Miles	0-10	10-25	25-50	50-100	100-200	>200
Number	13	6	0	0	1	0
Percentage	65%	30%	0%	0%	5%	0%

Q-5: Did you stay overnight in the Niagara Study area (not including at you own home) on this trip?

Answer	Yes	No
Number	1	19
Percentage	5%	95%

Q-6: If you answered yes to Q-5, at what type of accommodations did you be staying?

Accommodation	RV/Auto/Tent	Motel/Hotel	B&B	Vac. or Rental Home	Other
Number	1	0	0	0	0
Percentage	100%	0%	0%	0%	0%

Q-7: On this trip to the Study area, in which of the following activities did you participate in?

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/ Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	16	3	1	10	1	3	5	0	1	1
Percent	80%	15%	5%	50%	5%	15%	25%	0%	5%	5%

Q-8: Of the activities you circled in Q-7 above, what is the primary activity that you participated in, on this visit?

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/ Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	12	0	0	5	0	1	2	0	0	0
Percent	60%	0%	0%	25%	0%	5%	10%	0%	0%	0%

Q-9: Regarding the primary activity you participated in on this visit listed in Q-8, please rate the following at the Project:

Number (Percent)	Totally Unacceptable	Unacceptable	Neutral	Acceptable	Totally Acceptable
Safety	0	0	0	5 (25%)	15 (75%)
Enjoyment	0	0	0	5 (25%)	15 (75%)
Crowding	0	0	6 (30%)	5 (25%)	9 (45%)
Overall Experience	0	0	0	6 (30%)	14 (70%)

Q-10: If you participated in recreational activities in the Niagara Study area today or in the past, rate the following on a 1-5 scale as listed in Q-9. .

Number (Percent)	Accessibility	Parking	Crowding	Safety	Condition of	Available Facilities	Overall Experience
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					Facilities		
Totally Unacceptable	0	0	0	0	0	0	0
Unacceptable	0	0	1 (5%)	0	0	0	0
Neutral	0	0	4 (20%)	0	1 (5%)	1 (5%)	0
Acceptable	2 (10%)	4 (20%)	7 (35%)	2 (10%)	8 (40%)	7 (35%)	5 (25%)
Totally Acceptable	18 (90%)	16 (80%)	8 (40%)	18 (90%)	11 (55%)	12 (60%)	15 (75%)

Q-11: Please tell us what type(s) of recreation enhancements you believe are needed and at the Niagara Project. (See interview results summaries).

Q-12: Please share any other comments that you have regarding recreation near the Niagara Project. (See interview results summaries).

Field Monitoring Results – Rutrough Point

Questions 1 thru 3

<u>Survey No.</u>	<u>Date</u>	<u>Home Zip Code</u>	<u>M/F</u>	<u>Age</u>	<u>Regular</u>	<u>Q-1 Visits Occasional</u>	<u>Infrequent</u>	<u>First</u>	<u>Q-2 Arrive Time</u>
1	5/1/2021	Unknown	M	31				1	Unk.
2	5/1/2021	24101	F	31				1	Unk.
3	5/11/2021	24017	M	51	1				7:40 AM
4	5/31/2021	24016	M	30	1				9:31 AM
5	5/31/2021	24090	M	28	1				9:00 AM
6	5/31/2021	24017	M	50		1			8:00 AM
7	5/31/2021	24013	M	34	1				Unk.
8	5/31/2021	24065	M	21		1			Unk.
9	6/7/2021	24014	M	35	1				7:30 AM
10	6/7/2021	24095	M	34	1				9:30 AM
11	6/19/2021	23114	F	22				1	5:00 PM
12	6/19/2021	24015	F	36	1				10:00 AM
13	7/3/2021	24012	F	50				1	Unk.
14	7/3/2021	24017	M	31		1			1:00 PM
15	7/23/2021	24012	M	67	1				11:30 AM
16	7/23/2021	24017	M	29	1				2:30 PM
17	7/23/2021	24014	F	34		1			12:30 PM
18	9/24/2021	24018	M	22		1			4:30 PM
19	10/2/2021	24018	M	42		1			9:40 AM
20	10/4/2021	24014	M	43				1	9:00 AM
Total					9	6	1	4	
Percentage					45.00%	30.00%	5.00%	20.00%	
Average					36.05				

<u>Survey No.</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>April</u>	<u>May</u>	<u>Q-3 Month</u> <u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept.</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
1					1	1	1	1	1	1		
2					1							
3	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1
5					1	1	1	1	1	1		
6	1	1	1	1	1	1	1	1	1	1	1	1
7				1	1	1	1	1	1	1		
8					1	1	1	1	1			
9	1	1	1	1	1	1	1	1	1	1	1	1
10			1	1	1	1						
11						1						
12						1						
13							1					
14					1	1	1	1	1			
15	1	1	1	1	1	1	1	1	1	1	1	1
16					1	1	1	1				
17					1	1	1	1				
18					1	1	1	1				
19							1	1	1	1		
20										1		
Total	5	5	6	7	15	16	15	14	10	8	5	5
Percentage	25.00%	26.32%	30.00%	35.00%	75.00%	80.00%	75.00%	70.00%	50.00%	40.00%	25.00%	25.00%

<u>Survey No.</u>	<u>Q-4 Miles</u>	<u>Q-5: Overnight Stay</u>		<u>Q-6: Location</u>				
		<u>Yes</u>	<u>No</u>	<u>RV</u>	<u>Motel</u>	<u>B&B</u>	<u>Rental</u>	<u>Other</u>
1	5		1					
2	5		1					
3	5		1					
4	5		1					
5	15		1					
6	10		1					
7	3		1					
8	20		1					
9	2		1					
10	15		1					
11	150	1		1				
12	10		1					
13	10		1					
14	10		1					
15	12		1					
16	20		1					
17	19		1					
18	10		1					
19	10		1					
20	5		1					
Total		1	19	1	0	0	0	0
Percentage		5.00%	95.00%	5.00%	0.00%	0.00%	0.00%	0.00%
Average	16.80							

<u>Survey No.</u>	<u>Q-7: Activities</u>										<u>Other Descrip.</u>
	<u>Bank Fish.</u>	<u>Boat Fish</u>	<u>Boating</u>	<u>Canoe/Kayak</u>	<u>Picnicking</u>	<u>Swimming</u>	<u>Hike/Sight-See</u>	<u>Hunting</u>	<u>Wildlife View</u>	<u>Other</u>	
1	1			1							
2	1										
3	1										
4	1										
5	1							1			
6	1										
7	1			1			1	1			
8	1	1		1							
9	1			1							
10	1	1									
11	1	1	1	1	1		1		1		
12				1				1			
13				1							1 Tubing
14	1										
15	1							1			
16				1			1				
17	1										
18	1			1							
19	1										
20				1							
Total	16	3	1	10	1	3	5	0	1	1	
Percent	80.00%	15.00%	5.00%	50.00%	5.00%	15.00%	25.00%	0.00%	5.00%	5.00%	

Questions 8 thru 10

<u>Survey No.</u>	Q-8: Primary Activities										
	<u>Bank Fish.</u>	<u>Boat Fish</u>	<u>Boating</u>	<u>Canoe/Kayak</u>	<u>Picnicking</u>	<u>Swimming</u>	<u>Hike/Sight-See</u>	<u>Hunting</u>	<u>Wildlife View</u>	<u>Other</u>	<u>Other Descrip.</u>
1	1										
2	1										
3	1										
4	1										
5	1										
6	1										
7	1										
8				1							
9				1							
10	1										
11				1							
12							1				
13				1							
14	1										
15							1				
16						1					
17	1										
18	1										
19	1										
20				1							
Total	12	0	0	5	0	1	2	0	0	0	0
Percentage	60.00%	0.00%	0.00%	25.00%	0.00%	5.00%	10.00%	0.00%	0.00%	0.00%	0.00%

Questions 11 and 12

<u>Survey No.</u>	<u>Q-11 & Q-12: Comments</u>
1	Lot of people on water at times. Need more plain definition of rules. Website with clear fishing regulations. Restroom at Rutrough Point would be nice but not necessary.
2	Restroom would be nice.
3	Avoids weekends due to number of people. Trash and issue. Provide trash cans. Provide bank protection at put-in.
4	No comments.
5	Site crowded on hot days and weekend days.
6	Good as is.
7	Trash an issue. Need trash containers. Kayaking mostly in calm waters near put-in.
8	Normally launches kayak at Roanoke River Trail Steps. Difficult going down steps. Runners at steps would be helpful. Trash an issue on river.
9	Additional boat launch. Trash an issue. Provide porta-john. Driving access to area above spillway needed. Allow everyone to spread out more.
10	No tourist area needed. Provide porta-john. Trash and issue. Provide access near dam.
11	Provide porta-john at Rutrough Point. Love the area and the recreation areas. Overall great trip.
12	No comments.
13	OK as is. Trash and issue. Family picnic with a total group size of 20+ with both adults and children.
14	Fishing dock would be nice at Rutrough Point. Also playground for children.
15	Need easier trail accessibility for those with special needs. Everything is great as is.
16	No comments.
17	Site is peaceful. No comments.
18	Normally launches kayak at Black Dog Salvage and takes out at Wasena Park.
19	Open up more areas for bank fishing. Trash an issue.
20	Porta-John would be nice. Steps at launch difficult to use. Suggest earlier time to allow individuals to utilize facilities.

Rutrough Point: Information Regarding Individuals Surveyed

<u>ZIP CODE</u>	<u>LOCATION</u>	<u>NUMBER</u>	<u>MALE</u>	<u>FEMALE</u>	<u>LOCAL</u>	<u>NOT LOCAL</u>
23114	Chesterfield, Va.	1	0	1	1	0
24012	Roanoke, Va.	2	1	1	2	0
24013	Roanoke, Va.	1	1	0	1	0
24014	Roanoke, Va.	3	2	1	3	0
24015	Roanoke, Va.	1	0	1	1	0
24016	Roanoke, Va.	1	1	0	1	0
24017	Roanoke, Va.	4	4	0	4	0
24065	Boones Mill, Va.	1	1	0	1	0
24090	Fincastle, Va.	1	1	0	1	0
24095	Goodview, Va.	1	1	0	1	0
24101	Hardy, Va.	1	0	1	1	0
24018	Roanoke, Va.	2	2	0	2	0
<u>Unknown</u>	<u>Unknown</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>
TOTAL		20	15	5	20	0
PERCENTAGE			75.00%	25.00%	100.00%	0.00%

RUTROUGH POINT LICENSE PLATES		
STATE	COUNT RECORDED	% OF TOTAL
Virginia	229	90.87%
New Jersey	8	3.17%
N. Carolina	4	1.59%
Florida	3	1.19%
Pennsylvania	3	1.19%
Tennessee	3	1.19%
Kansas	2	0.79%
TOTAL	252	100.00%

Niagara Hydroelectric Project P-2466
Updated Recreation Study Report Attachment 2

2021 RUTROUGH POINT RECREATION MONITORING DAILY SUMMARY REPORT: Niagara Project (P-2466)													
DATE	ORDER	ARRIVAL TIME	LEAVE TIME	SURVEYS DONE	VEHICLES PARKED W/TRAILERS	VEHICLES PARKED W/O TRAILERS	# OF VEHICLES IN NON-DESIG. AREA	# OF INDIVIDUALS OBSERVED	BOATS LOADING/ UNLOADING AT RAMP	TYPES OF BOATS	PRIMARY ACTIVITIES	TOTAL VEHICLES	PARKING SPACES PERCENTAGES
1-May-21	2	9:45 AM		0	0	3	0	0	0	0	0 All plates Va.	3	25.00%
			10:15 AM	0	0	3	0	0	0	0	0 All plates Va.	3	25.00%
	5	12:30 PM		2	0	2	0	2	0	0	0 Bank fishing, All plates Va.	2	16.67%
			1:00 PM	0	0	2	0	2	0	0	0 Bank fishing, All plates Va.	2	16.67%
11-May-21	1	9:45 AM		1	0	1	0	1	0	N/A	Bank Fishing, All Va. plates.	1	8.33%
			10:15 AM	0	0	1	0	1	0	N/A	Bank Fishing, All Va. plates.	1	8.33%
	6	4:15 PM		0	0	2	0	4	2	Kayaks	Two kayakers, two bank fishing, All Va. plates.	2	16.67%
			4:45 PM	0	0	2	0	4	2	Kayaks	Two kayakers, two bank fishing, All Va. plates.	2	16.67%
31-May-21	2	10:00 AM		3	0	5	0	7	0	0	Family of 5 and 3 other individuals bank fishing, All plates Va.	5	41.67%
			10:45 AM	0	0	5	0	7	0	0	Family of 5 and 3 other individuals bank fishing, All plates Va.	5	41.67%
	4	12:00 PM		2	1	9	3	6	3	Kayaks	3 Individuals bank fishing, 3-kayaks floating downstream to Hardy Ford. License Plates: 1-Penn.; 1-Tenn.; 11-Va.	13	108.33%
			1:00 PM	0	1	9	3	6	3	Kayaks	3 Individuals bank fishing, 3-kayaks floating downstream to Hardy Ford. License Plates: 1-Penn.; 1-Tenn.; 11-Va.	13	108.33%
7-Jun-21	1	8:20 AM		1	0	3	1	1	0	0	0 Bank fishing, All plates Va.	4	33.33%
			8:51 AM	0	0	3	1	1	0	0	0 Bank fishing, All plates Va.	4	33.33%
	3	9:58 AM		1	0	4	1	4	0	0	0 Bank fishing, All plates Va.	5	41.67%
			10:32 AM	0	0	4	1	4	0	0	0 Bank fishing, All plates Va.	5	41.67%
19-Jun-21	2	10:37 AM		1	2	2	3	9	1	kayak	Kayaking, fishing, paddle boarding, All plates Va.	7	58.33%
			11:16 AM	0	2	2	3	9	1	kayak	Kayaking, fishing, paddle boarding, All plates Va.	7	58.33%
	4	12:20 PM		1	1	8	2	2	1	kayak	Biking, kayaking, All plates Va.	11	91.67%
			12:57 PM	0	1	8	2	2	1	kayak	Biking, kayaking, All plates Va.	11	91.67%
3-Jul-21	1	10:38 AM		1	2	13	2,20+	12+		Kayaks, tubes.	Family gathering, Kayaking, picnicing, tubing. Plates: 2-NJ; 1-NC; 14-Va.	17	141.67%
			11:30 AM	0	2	13	2,20+	12+		Kayaks, tubes.	Family gathering, Kayaking, picnicing, tubing. Plates: 2-NJ; 1-NC; 14-Va.	17	141.67%
	3	12:51 PM		1	2	16	3,20+	12+		Kayaks, tubes.	Family gathering, Kayaking, picnicing, tubing. Plates: 2-NJ; 1-NC; 18-Va.	21	175.00%
			1:35 PM	0	2	16	3,20+	12+		Kayaks, tubes.	Family gathering, Kayaking, picnicing, tubing. Plates: 2-NJ; 1-NC; 18-Va.	21	175.00%
23-Jul-21	2	12:05 PM		1	0	1	0	2	0	0	0 All plates Va. Individuals resting in vehicle.	1	8.33%
			12:50 PM	0	0	3	0	4	0	0	0 All plates Va. Individuals observed: 2-hiking, 0 2 - bank fishing.	3	25.00%
	4	2:13 PM		2	0	2	0	0			All plates Va. Individuals observed family of six swimming.	2	16.67%
			3:00 PM	0	0	1	0	0	0	0	0 Tubes and kayaks picked up by vendor.	1	8.33%
14-Aug-21	2	9:33 AM		0	1	2	1	6	1	Kayak	Fishing, kayaking, All plates Va.	4	33.33%
			10:03 AM	0	1	2	1	6	1	Kayak	Fishing, kayaking, All plates Va.	4	33.33%
	4	12:03 PM		0	1	4	1	1	1	Canoe	Dog walking, All plates Va.	6	50.00%
			12:33 PM	0	1	4	1	1	1	Canoe	Dog walking, All plates Va.	6	50.00%
19-Aug-21	1	9:35 AM		0	0	1	0	0	0	0	0 Plates: 1-Fla.	1	8.33%
			10:20 AM	0	0	1	0	0	0	0	0 Plates: 1-Fla.	1	8.33%
	3	11:40 AM		0	0	2	0	1	0	0	0 Trail running, Plates: 1-Fla., 1-Va.	2	16.67%
			12:25 PM	0	0	1	0	0	0	0	0 None	1	8.33%

Niagara Hydroelectric Project P-2466
Updated Recreation Study Report Attachment 2

2021 RUTROUGH POINT RECREATION MONITORING DAILY SUMMARY REPORT: Niagara Project (P-2466) - Cont'd													
		ARRIVAL	LEAVE	SURVEYS	VEHICLES PARKED	VEHICLES PARKED	# OF VEHICLES IN	# OF INDIVIDUALS	BOATS LOADING/	TYPES OF	PRIMARY	TOTAL	PARKING SPACES
DATE	ORDER	TIME	TIME	DONE	W/TRAILERS	W/O TRAILERS	NON-DESIG. AREA	OBSERVED	UNLOADING AT RAMP	BOATS	ACTIVITIES	VEHICLES	PERCENTAGES
5-Sep-21	2	10:26 AM		0	0	4	0	11	0	Kayaks	Bank fishing and kayaking. Plates: All Va.	4	33.33%
			10:56 AM	0	0	4	0	11	0	Kayaks	Bank fishing and kayaking. Plates: All Va.	4	33.33%
	4	12:04 PM		0	0	3	0	5	0	N/A	Bank fishing.	3	25.00%
			12:34 PM	0	0	3	0	5	0	N/A	Bank fishing.	3	25.00%
24-Sep-21	2	2:39 PM		0	0	0	0	0	0		N/A	0	0.00%
			3:25 PM	0	0	0	0	0	0		N/A	0	0.00%
	4	4:40 PM		1	0	3	0	5	0		1-person bank fishing; 1-hiker; 1-trail biker; 2-viewing from vehicle. Plates: 2-Va.; 1-Kansas.	3	25.00%
			5:25 PM	0	0	2	0	2	0		1-person bank fishing; 1-hiker; Plates: 1-Va.; 0 1-Kansas.	2	16.67%
2-Oct-21	1	9:32 AM		1	0	1	0	2	0		2- persons bank fishing. Plates: All Va.	1	8.33%
			10:15 AM	0	0	1	0	2	0		2- persons bank fishing. Plates: All Va.	1	8.33%
	3	11:42 AM		0	0	6	0	1	0		1-person bank fishing. Plates: All Va.	6	50.00%
			12:25 PM	0	0	5	0	4	0		3-trail bikers. Plates: All Va.	5	41.67%
4-Oct-21	2	8:05 AM		0	0	1	0	0			0 Plates: All Va.	1	8.33%
			8:50 AM	0	0	1	0	0	0		0 Plates: All Va.	1	8.33%
	4	10:00 AM		1	0	2	0	0	0		0 1-person fishing from kayak. Plates: All Va.	2	16.67%
			10:45 AM	0	0	2	0	2	0		1-person fishing from kayak. One person 0 retrieving kayak. Plates: All Va.	2	16.67%
TOTAL				20	20	198	34	143	18		Total Vehicles Parked		252
AVERAGE					0	4	1	3	0		Avg. Number of Vehicles Parked		5
PERCENTAGE											Avg. Percentage of Parking Spaces Occupied		40.38%
PARKING SPACES OCCUPIED	TOTAL	AVG. VEHICLES/DAY	AVG. PERCENT/DAY	MAX. VEHICLES/DAY	MAX. PERCENT/DAY								
HOLIDAY	126	11	87.50%	21	175.00%								
WEEKEND DAY	79	5	41.15%	11	91.67%								
WEEKDAY	47	2	16.32%	5	41.67%								
TOTAL	252	5	40.38%										

On-Site/In-Person Recreation Survey Results – Niagara Project

NIAGARA HYDROELECTRIC PROJECT (FERC No. 2466)
ON-SITE/IN-PERSON RECREATION SURVEY RESULTS
NIAGARA PROJECT

Q-1: Regarding the Niagara Project area, do you consider yourself: (1) a regular visitor to the area; (2) an occasional visitor; (3) an infrequent visitor; or (4) is this your first visit?

Visitor Type	Regular	Occasional	Infrequent	First Visit
Number	23	9	3	11
Percentage	50%	19%	7%	24%

Q-2: On this trip to the Niagara Project area, when did you arrive? When do you expect to leave the Niagara Project area? (See interview results summaries)

Q-3: During the last 12 months (including this trip), which month(s) did you visit the Niagara Study area?

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number	13	13	19	25	33	32	30	30	26	22	15	13
Percentage	28%	28%	41%	54%	72%	70%	65%	65%	56%	48%	33%	28%

Q-4: About how many miles did you travel to get to the Niagara Study area?

Miles	0-10	10-25	25-50	50-100	100-200	>200
Number	29	9	1	0	2	5
Percentage	63%	19%	2%	0%	4%	11%

Q-5: Did you stay overnight in the Niagara Study area (not including at you own home) on this trip?

Answer	Yes	No
Number	6	40
Percentage	13%	87%

Q-6: If you answered yes to Q-5, at what type of accommodations did you be staying?

Accommodation	RV/Auto/Tent	Motel/Hotel	B&B	Vac. or Rental Home	Other
Number	2	2	0	0	2
Percentage	33%	33%	0%	0%	33%

Q-7: On this trip to the Study area, in which of the following activities did you participate in?

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/ Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	21	7	1	13	3	3	19	0	3	4
Percent	46%	15%	2%	28%	6%	6%	41%	0%	6%	9%

Q-8: Of the activities you circled in Q-7 above, what is the primary activity that you participated in, on this visit?

Activity	Bank Fishing	Boat Fishing	Pleasure Boating	Canoe/ Kayak	Picnic	Swim	Sight-Seeing	Hunt	View Wildlife	Other
Number	16	4	0	8	0	1	14	0	0	3
Percent	35%	9%	0%	17%	0%	2%	30%	0%	0%	6%

Q-9: Regarding the primary activity you participated in on this visit listed in Q-8, please rate the following at the Project:

Number (Percent)	Totally Unacceptable	Unacceptable	Neutral	Acceptable	Totally Acceptable
Safety	0	0	0	8 (17%)	38 (83%)
Enjoyment	0	0	0	7 (15%)	39 (85%)
Crowding	0	1 (2%)	7 (15%)	10 (22%)	28 (61%)
Overall Experience	0	0	0	9 (19%)	37 (80%)

Q-10: If you participated in recreational activities in the Niagara Study area today or in the past, rate the following on a 1-5 scale as listed in Q-9. .

Number (Percent)	Accessibility	Parking	Crowding	Safety	Condition of Facilities	Available Facilities	Overall Experience
Totally	0	0	0	0	0	0	0

Unacceptable							
Unacceptable	0	0	2 (4%)	0	0	0	0
Neutral	0	1 (2%)	6 (13%)	0	1 (2%)	1 (2%)	0
Acceptable	6 (13%)	5 (11%)	12 (26%)	5 (11%)	15 (33%)	13 (28%)	9 (19%)
Totally Acceptable	40 (87%)	40 (87%)	26 (56%)	41 (89%)	30 (65%)	32 (69%)	37 (81%)

**NIAGARA HYDROELECTRIC PROJECT
(FERC NO. 2466)
RECREATION STUDY**

Attachment 3: Aesthetic Flow Documentation Photos

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KEY OBSERVATION POINTS (KOP) LOCATIONS



Photos of Spillway from KOP-1, Bypass from KOP-2, and Bypass from KOP-3



**November 15, 2019 – View of Spillway and Bypass from KOP-1
(Q=24 cfs)**



November 15, 2019 – View of Bypass from KOP-2 (Q=24 cfs)



November 15, 2019 – View of Bypass from KOP-3 (Q=24 cfs)



January 1, 2020 – View of Spillway and Bypass from KOP-1 (Q=332 cfs)



January 1, 2021 – View of Bypass from KOP-2 (Q=332 cfs)



January 1, 2020 – View of Bypass from KOP-3 (Q=332 cfs)



January 30, 2020 – View of Spillway and Bypass from KOP-1 (Q=31 cfs)



January 30, 2020 – View of Bypass from KOP-2 (Q=31 cfs)



January 30, 2020 – View of Bypass from KOP-3 (Q=31 cfs)



February 7, 2020 – View of Spillway and Bypass from KOP-1 (Q=11,716 cfs)



February 7, 2020 – View of Bypass from KOP-2 (Q=11,716 cfs)



February 7, 2020 – View of Bypass from KOP-3 (Q=11,716 cfs)



March 2, 2020 – View of Spillway and Bypass from KOP-1 (Q=28 cfs)



March 2, 2020 – View of Bypass from KOP-2 (Q=28 cfs)



March 2, 2020 – View of Bypass from KOP-3 (Q=28 cfs)



March 25, 2020 – View of Spillway and Bypass from KOP-1 (Q=2,638 cfs)



March 25, 2020 – View of Bypass from KOP-2 (Q=2,638 cfs)



March 25, 2020 – View of Bypass from KOP-3 (Q=2,638 cfs)



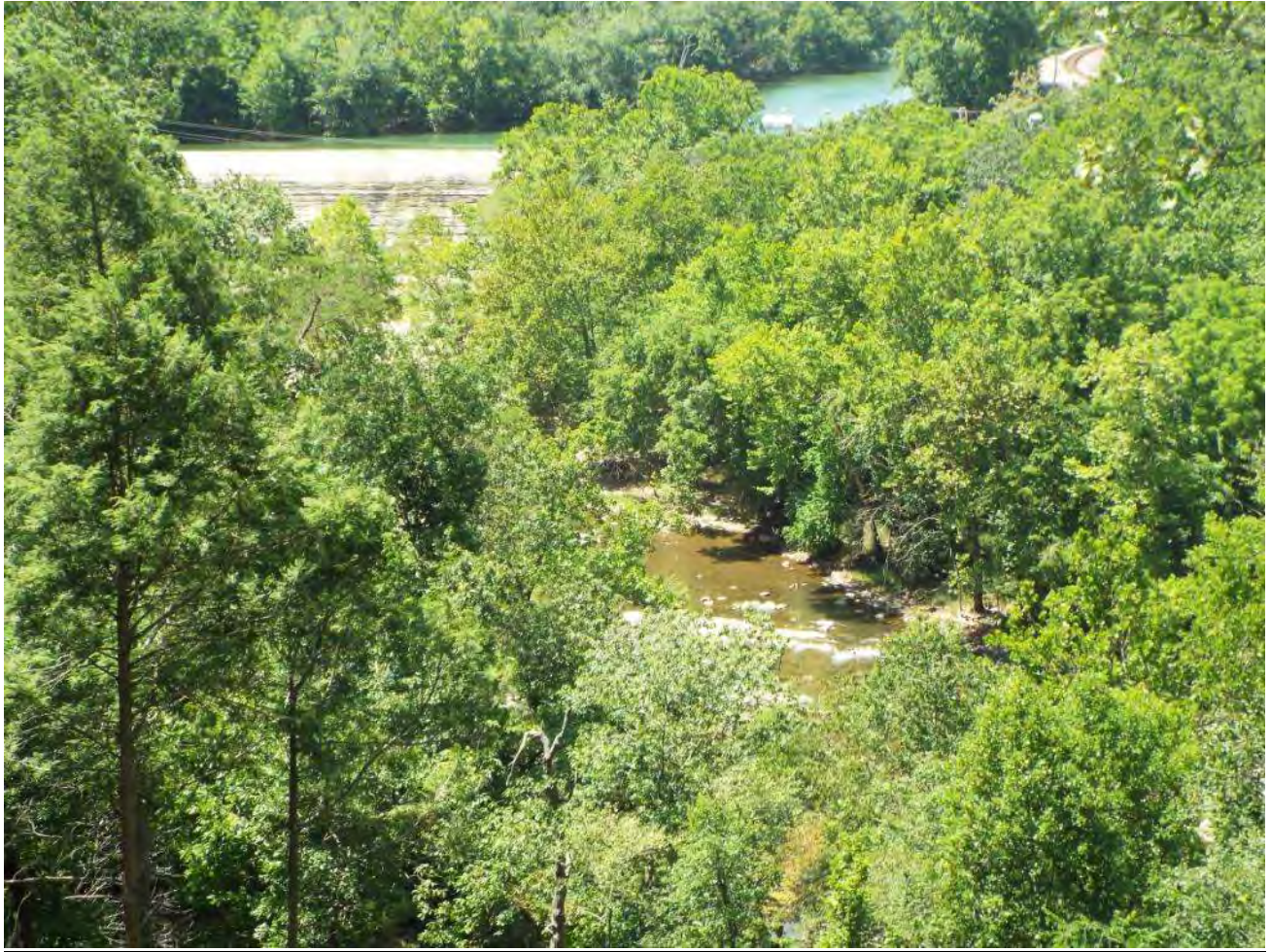
May 1, 2020 – View of Spillway and Bypass from KOP-1 (Q=3,317 cfs)



May 1, 2020 – View of Bypass from KOP-2 (Q=3,337 cfs)



May 1, 2020 – View of Bypass from KOP-3 (Q=3,337 cfs)



July 11, 2020 – view of Spillway and Bypass from KOP-1 (Q=32 cfs)



July 11, 2020 – View of Bypass from KOP-2 (Q=32 cfs)



July 11, 2020 – View of Bypass from KOP-3 (Q=32 cfs)



September 5, 2020 – View of Spillway and Bypass from KOP-1 (Q=30 cfs)



September 5, 2020 – View of Bypass from KOP-2 (Q=30 cfs)



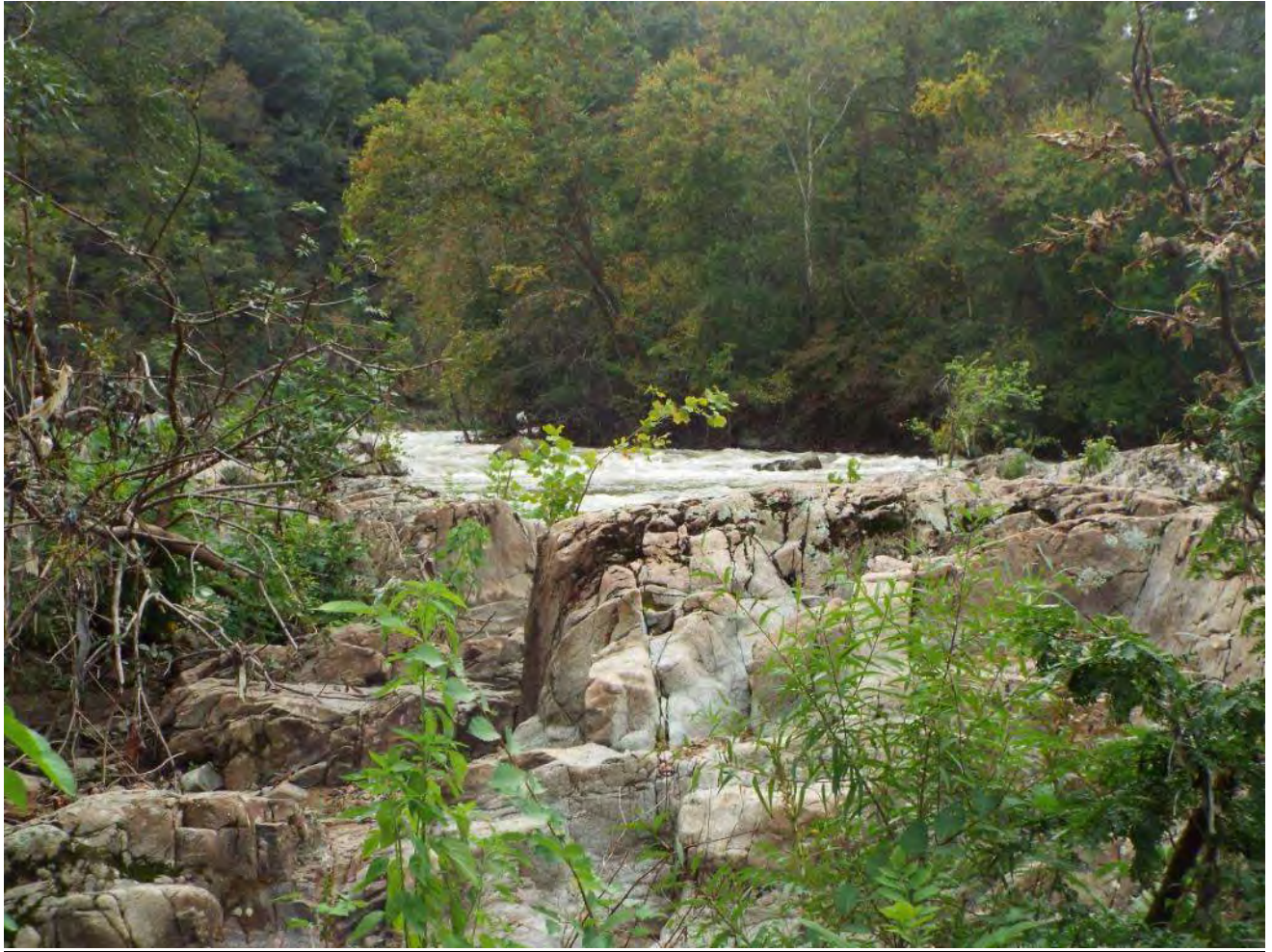
September 5, 2020 – View of Bypass from KOP-3 (Q=30 cfs)



September 26, 2020 – View of Spillway and Bypass from KOP-1 (Q=765 cfs)



September 26, 2020 – View of Bypass from KOP-2 (Q=765 cfs)



September 26, 2020 – View of Bypass from KOP-3 (Q=765 cfs)



April 24, 2021 – View of Spillway and Bypass from KOP-1 (Q=24 cfs)



April 24, 2021 – View of Bypass from KOP-3 (Q=24 cfs)

**NIAGARA HYDROELECTRIC PROJECT
(FERC NO. 2466)
RECREATION STUDY**

Attachment 4: Summary

April 20, 2021 Stakeholder Meeting

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<u>5. ROANOKE RIVER BLUEWAY COMMITTEE PRESENTATION</u>	<u>25</u>

1. Meeting Summary

Project:	Niagara Hydroelectric Project (FERC No. 2466)	
Subject:	Recreation Stakeholder Meeting	
Date:	Tuesday, April 20, 2021	
Location:	WebEx	
Attendees:	<div><div>Amanda McGee (Blueway Committee) Anita McMillan (Town of Vinton) Bill Tanger (FORVA) Lindsay Webb (Roanoke County) Liz Belcher (Roanoke Valley Greenways) Roberta Rhur (VDCR) Nathaniel McClung (Town of Vinton) Pete Eshelman (Roanoke Regional Partnership) Richard Caywood (Roanoke County) Doug Blount (Roanoke County)</div><div>Jonathan Magalski (Appalachian) Elizabeth Parcell (Appalachian) Sarah Kulpa (HDR) Maggie Yayac (HDR) Kerry McCarney-Caste (HDR) Frank Simms (YES)</div></div>	

Appalachian and HDR Introduction

J. Magalski – Opening remarks, housekeeping items, and introductions

M. Yayac – Safety moment - distracted driving

S. Kulpa briefly discussed the relationship of recreation facilities and the FERC relicensing process, the difference between Project and Non-project Facilities and how they are included or not included in the FERC Project Boundary, and what is “required” under the license. Facilities that are required to be maintained during the term of the license are termed “Project” facilities. Non-Project facilities are near the Project Boundary but are not under FERC’s jurisdiction or typically maintained or operated by the licensee.

M. Yayac gave a high level overview of the Recreation Study presented in the Initial Study Report (ISR) and stated that there is one Project Facility and three Non-Project facilities as described in the Revised Study Plan for the Recreation Study. She showed the updated Existing Recreation Facilities Project Map and asked for comments.

B. Tanger voiced two concerns:

- 1) Roanoke River Trail – there is an informal trail off of the Roanoke River Trail that goes straight down to an area where boaters can put boats in closer to the dam.
- 2) In FORVA’S 2019 comments, they asked if there is a way to coordinate special releases from the Spring Hollow reservoir upstream.

- J. Magalski asked where this reservoir is located. B. Tanger noted it would need to be a multijurisdictional effort. S. Kulpa mentioned that neither Appalachian nor FERC has the ability to require actions by another dam owner, but that Appalachian has the ability to coordinate operation of the Niagara Project (within the limits authorized by the license) with upstream releases that can be arranged or provided by others.

L. Webb asked HDR/ Appalachian to change the two yellow parcels (Virginia Recreation Facility Authority [VRFA] owned) just south of the bypass to orange because they are leased and considered Explore Park parcels (**Action Item**). M. Yayac agreed. **Update:** this edit has been made to the map.

A. McGee asked about whether this map would cover proposed recreation facilities. M. Yayac noted that this map is specific to existing amenities to get a baseline of the recreation facilities/opportunities in the Project area. S. Kulpa mentioned that the USR will take into account proposed recreation facilities, as applicable, and this meeting's intent is to understand what recreational opportunities stakeholders are pursuing or interested in.

M. Yayac went over the Recreation Study tasks status. She mentioned that YES has been on-site at the Roanoke River Overlook and Trail gathering survey data ahead of the Blue Ridge Parkway closure.

L. Belcher asked how users are supposed to find out about the online survey. E. Parcell mentioned that there are signs posted around the area; however, L. Belcher mentioned that people aren't likely to fill this out in the woods and will forget by the time they leave. P. Eshelman agreed. B. Tanger added that stakeholders could consider running advertisements in local newspapers. F. Simms noted that when interviewing people at the facilities – if people aren't interested in doing the survey at that time, he provides a handout with the information. A. McGee stated that it would be good to have the information in several places to remind people multiple times. L. Webb mentioned that Roanoke County currently has the link up on their social media page and includes it in their public newsletters. S. Kulpa stated that any help would be greatly appreciated in getting the word out for the recreation online surveys. E. Parcell will look into posting about the online survey on the Smith Mountain Facebook page.

Action Item: Appalachian to send an email to the core team with instructions and a link to the survey to help push that out to internal teams and stakeholder groups.

R. Rhur asked how much use the Project dam portage received and noted it's her understanding it is not very user-friendly. S. Kulpa stated the portage is useable but the location for the takeout may be the problem and asked the stakeholders for feasible alternatives or improvements for the portage. B. Tanger interjected that the way one gets into the river could be improved – as it is now, it's very steep and rocky – and mentioned that perhaps installing a cable at the take-out of the dam extending down to the downstream put-in (with a boat clip to slide the boats along) might be a solution on river-left. S. Kulpa noted that HDR/ Appalachian

have no direct experience in installation of this type of system at portage sites; however, HDR/Appalachian would be interested in learning about others' experiences/efforts at other facilities.

S. Kulpa went over upcoming ILP Milestones.

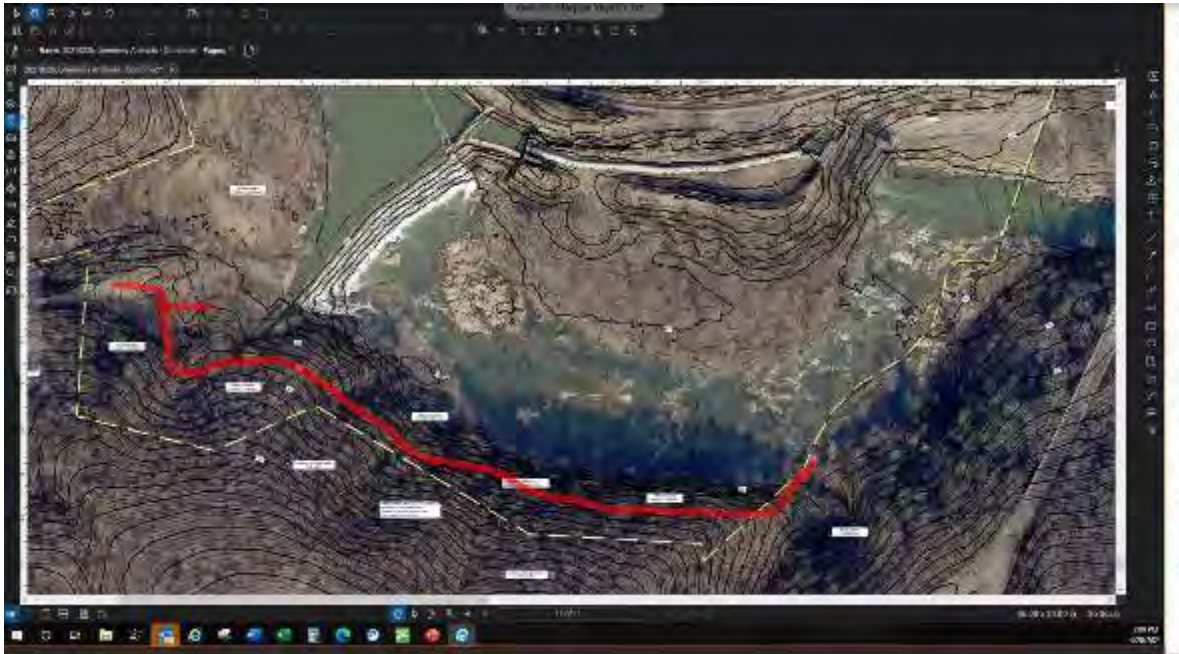
E. Parcell briefly discussed the April 2021 Site Visit with F. Simms.

M. Yayac showed a figure of the Project Boundary that included property owners (Roanoke Co. publicly available data) and topographic lines. L. Webb stated Dawn Leonard is a good contact for Blue Ridge/National Park Service (M. Yayac confirmed she was invited to this meeting). L. Webb also noted that Roanoke County has a 99-year lease on the VRFA parcels.

L. Belcher and B. Tanger talked about public access / roadblocks as far as access on river-right, including the biggest barrier to access the Holland Heirs property (3124 highland Road – 46 acres).

B. Tanger noted that on river-right with improvements, boaters could take-out near the right abutment above the dam, follow a portage trail and put-in below the dam in the bypass, which could be constructed without access to Holland Heirs property. However, if a parking lot was constructed by the right abutment (which is one idea the stakeholders have) access to the Holland Heirs property would be necessary. J. Magalski stated that Appalachian would be interested to understand more details on this proposal and wondered if the trail would be possible because of the steep terrain.

L. Belcher drew on the map a proposed portage trail that may be possible on river-right and would not access National Park Service land (screenshot below). B. Tanger stated he wasn't so much talking about a trail but more of a short portage path to a put-in directly below the dam. F. Simms stated that during low flows, portaging on river-right into the bypass would be incredibly challenging due to the terrain. J. Magalski noted safety concerns with portaging directly below the dam.



Stakeholder Presentations (see attached slides for additional details)

L. Webb – Roanoke County

- Virginia Outdoors Plan 2018
- Roanoke Valley-Alleghany Recreational Planning Region
- Overview of Explore Park
- Future Riverside Village – Adventure Plan
- Recreational Use of the Roanoke River, including documented vehicle counts
- Proposed East Roanoke River Greenway traverses from Roanoke City to Explore Park
- Extend Greenway on south side of river (note there is a railroad on the northside) however, lots of residential properties to cross and rely on Appalachian for support to stay within their property as much as possible.
 - S. Kulpa noted that if the Greenway were to be brought into the Project license (and boundary, and FERC jurisdiction) as a required development/enhancement, this would subject future expansion to FERC approvals and would place the burden of Greenway expansion and maintenance on Appalachian if the County were to no longer be able to pursue. Keeping the Greenway as a non-Project facility gives Appalachian and the County more flexibility and streamlines development process.
- Roanoke County Recreation Requests:
 - Support Explore Park
 - Support Roanoke River Greenway
 - Support Roanoke River Blueway
 - Support Trash and Debris Clean-up efforts

A. McGee – Roanoke River Blueway Committee

- Roanoke River Blueway – extends 45 miles and crosses many jurisdictions
- Water access ranked as third greatest need for recreation sources in the Roanoke region
- Economic development
- 13th Street Bennington – parking lot provides connection to Tinker Creek Greenway and is the last take-out on the Roanoke River above the dam. Planned improvements to portage.
- Tinker Creek improvements – Blueway is working on signage improvements at this location and across all access points.
- Downstream Blue Ridge Parkway Roanoke River Overlook
- Connectivity to Explore Park/Blueway disrupted by Niagara dam especially since the portage is not very easy to use. Also talked about poor signage and historical cart that may have move boats around.
 - Liz Parcell noted she helped with signage of the boat cart donated by FORVA, but unfortunately it was quickly stolen.
- Blueway request updates to existing portage – important to the region and water resources
- Greenway users should be considered recreation stakeholders

B. Tanger – FORVA Requests:

1. River-left – engineering solutions; perhaps a zip line/cable concept to transport boats from above to below the dam.
2. River-right – try to get access to Holland Heirs property but if not, engineering design to get a short switchback trail around river-right and portage into bypass.
3. River access off Roanoke River informal trail – people have been dragging boats and there is sloughing/erosion of the banks (informal trail). Would be helpful to formalize trail, with steps or switchbacks.
4. Coordinate additional flow releases from Spring Hollow (originally owned by Roanoke County, now managed by Western Virginia Water Authority) to then release at Niagara. Spring Hollow was built as a back-up for drinking water. (As follow-up to this discussion, Appalachian’s consultant located the Clifford D. Craig Dam at Spring Hollow Reservoir, which is operated by the Western Virginia Water Authority – geographic coordinates are 37.231224196 N, 80.1728163958 W. At full pond Spring Hollow Reservoir holds 3.2 billion gallons of water and has a surface area of 158 acres.

S. Kulpa asked Bill for his thoughts regarding tradeoffs/benefits between portage improvements on river-right or river-left, in terms of which may be more feasible and used by the public. B. Tanger noted that if measures (e.g., cable) could be installed at river-left to make that an easier

portage, it may be the more cost-effective solution and receive more use because use of the put-in below the tailrace is not dependent on bypass reach flows. S. Kulpa confirmed that the existing portage trail does not require crossing the railroad tracks during portage on river-left.

Liz Belcher – Roanoke County

- Regional Perspectives of why Roanoke River Greenway is important. Concerned that Appalachian did not consider adding the greenway to the Recreation Inventory study.
 - S. Kulpa stated that Appalachian does not discount the importance of the Greenway and appreciates its value to the community, visitors to the area, and the County. However, the aim of the inventory was to address and understand use of the facilities more directly related to Project operations and amenities. As previously discussed, Appalachian does not believe it is in any entities' best interest to tie Greenway development to the license, which would at a minimum delay activities for the next phase to 2024. Appalachian will support development of the Greenway where it is not incompatible with uses of or present unacceptable public safety risk on lands owned by Appalachian.
- Progress on Roanoke River Greenway since 2018 – working with Appalachian on right-of-way for the Greenway along Appalachian's property has not produced results.
 - L. Parcell clarified she has been working with L. Webb to move along the process and it is her understanding Roanoke County is working on environmental permitting. The next phase of the Greenway expansion may require a conveyance (easement) of minor amounts of land within the Niagara Boundary. Appalachian is able to request approval of this conveyance from FERC in advance of the new license issuance, but that request does require detailed information about what is proposed in terms of construction activities/disturbance and protection measures.
- L. Belcher stressed that more users are coming to the region and use is going to increase in the next few years. We need to be planning for it.
- Trash management – can't get trash out of the water and carry it away plus cannot get a vehicle down there. This is a good opportunity to improve Appalachian's reputation.

S. Kulpa – Next Steps

J. Magalski requested slides of the presentations.

A. McMillian added that help from Appalachian with the trash would be appreciated. Also asked E. Parcell regarding improvements to the Niagara access road. E. Parcell noted there are no

plans to open it up to the public. A. McMillan's concern was more for EMS to be able to get through. E. Parcell said she would follow up with emergency services to ask about their current access. **Update:** Emergency personnel have access/ a key to the Project.

B. Tanger asked that the online survey instructions are provided as one-page PDF that he could hand out at meetings.

L. Belcher requested that Appalachian schedule a meeting with the County regarding the Greenway "Non-Project" status. E. Parcell said that she and L. Webb will continue to work together.

2. AEP PRESENTATION



Niagara Hydroelectric Project

Recreation Stakeholder Meeting
April 20, 2021



BOUNDLESS ENERGY



Meeting Agenda

Topic	Schedule
Welcome and Introduction	2:00 PM – 2:10 PM
Safety Moment	2:10 PM – 2:15 PM
ISR Recap and upcoming milestones, Recreation map updates and April site visit	2:15 PM – 2:45 PM
Roanoke County Presentation	2:45 PM – 3:00 PM
Blueway Presentation	3:00 PM – 3:15 PM
FORVA Presentation	3:15 PM – 3:30 PM
Greenway Presentation	3:30 PM – 3:45 PM
Discussion and Q&A	3:45 PM – 4:00 PM

BOUNDLESS ENERGY



Safety Moment – Distracted Driving Month



42,060 people are estimated to have died in motor vehicle crashes in 2020.

- The preliminary estimated rate of death on the roads last year spiked 24% over the previous 12-month period, despite miles driven dropping 13%.
- An estimated 4.8 million additional roadway users were seriously injured in crashes in 2020, with an estimated cost to society of \$474 billion.
- Here are some immediate life-saving measures that would put us on a road to zero deaths:

What action can you take?

Never drink and drive! Always have a designated driver or utilize a ride share option (such as Uber) if you will be drinking.

Never exceed the speed limit and follow all signage.

Silence your phone or stow it out of sight. Don't text and drive. Nothing is more important than your safety.

Click it or ticket! Always wear a seatbelt, no exceptions.

A helmet should always be worn when riding a motorcycle, regardless of whether it is a law or not.



Recreation Facilities – Relationship to FERC License

- FERC's **policy** is to seek the ultimate development of the recreational resources of all projects, consistent with the needs of the project area and the primary purposes of the project and taking into account, among other things, Project economics.
- Licenses are issued with standard conditions **reserving FERC authority** to require the licensee to undertake additional recreational development, should circumstances warrant.
- The Commission requires licensees of most projects to submit for approval a **plan** for ensuring the development and maintenance of adequate public recreational facilities.

BOUNDLESS ENERGY™



Recreation Facilities – Relationship to FERC License

- **Recreation facilities**, is a comprehensive term which includes both infrastructure (i.e., parking, restrooms, access paths, docks, etc.) and amenities (i.e., boat launches, picnic areas, campgrounds, trails, etc.).
- While a variety of recreation facilities may exist within the project boundary, only those required by the license (or Recreation Plan) are considered Commission-approved (or "**Project Facilities**").
- Typically, **Project Facilities** are incorporated into the **project boundary** and the licensee is ultimately responsible for the construction, operation, and maintenance of the recreation facilities.
- Other recreation facilities at or in the vicinity of the project which are not necessarily required by FERC may include state parks, municipal and/or county agencies, and/or non-project uses at the project ("**Non-Project Facilities**"). The licensee is not responsible for operation and maintenance of such facilities.

BOUNDLESS ENERGY™



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 Overlook and Trail (Non-Project Facility) includes a short-inclined trail and access to fishing in the bypass reach.
- Rutrough Point (Non-Project Facility) is 3RM downstream from the Niagara dam.

BOUNDLESS ENERGY™



BOUNDLESS ENERGY



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	Stakeholder meeting - April 20, 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. Continue to evaluate in 2021.

BOUNDLESS ENERGY



Upcoming ILP Milestones

Date	Milestones
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 8, 2021	FERC Provide Determination on Disputes (18 CFR § 5.16(c)(8)) (if necessary)
Spring – Fall 2021	Appalachian Conduct Second Year of Studies
October 1, 2021	Appalachian File Draft License Application (DLA) (18 CFR § 5.16(e))
December 5, 2021	Appalachian File USR (18 CFR § 5.15(f))
December 20, 2021	Appalachian Host USR Meeting (18 CFR § 5.16(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)

BOUNDLESS ENERGY



April Portage Site Visit



Former Laydown Area, Facing South Dam Abutment

Facing Away From South Dam Abutment – Towards Hill

BOUNDLESS ENERGY

Niagara Hydroelectric Project P-2466
Updated Recreation Study Report Attachment 4



3. ROANOKE COUNTY PRESENTATION

**Niagara Dam Hydroelectric
Project Relicensing (FERC No. 2466-034)**




 **Recreation Stakeholder Meeting**
April 20, 2021




Overview

- Virginia Outdoors Plan
- Roanoke County Strategic Plan
- Explore Park Adventure Plan
- Roanoke River Greenway
- Roanoke River Blueway
- Recommended Recreation Improvements



Virginia Outdoors Plan 2018



Regional Focus

Table 5.1 Most-Needed Outdoor Recreation Opportunities

Roanoke Valley-Allegheny Recreational Planning Region

activity	% of households in region	% of households in state
Natural areas	58	54
Trails	49	43
Water access	45	41
Parks	30	49
Historic areas	17	39
Scenic drives adjoining farmland	9	29
Floating, fishing, sports and golf facilities	12	22

Source: 2017 Virginia Outdoors Demand Survey
2018 Virginia Outdoors Plan

Regional Featured Projects

To be considered a regional featured project, a project must meet at least one of the following criteria:

- Has statewide or regional significance.
- Addresses top statewide or regional needs identified by the Virginia Outdoors Demand Survey.
- Has involvement and support from multiple jurisdictions in the region.
- Able to be initiated within the next five years.

Featured projects for the Roanoke Valley-Allegheny region:

- Preserve and implement the James River Heritage Trail including the Upper James River Water Trail and the Allegheny Highlands Blueways.
- Implement the Roanoke River Greenway and Blueways Plan.**
- Implement the Tinker Creek, Glade Creek and Galen Creek Greenways.
- Implement the Allegheny Highlands Trails system.
- Implement the Appalachian Trail Priority Landscape at Catawba Valley and Mullins Knob.
- Preserve and implement the 2016 Explora Park Adventure Plan.**
- Preserve Virginia's Blue Ridge Ride Center, an International Mountain Biking Association Silver Level Ride Center.
- Design and implement in-river kayak parks.**
- Develop the Anasazi Initiative as a multi-jurisdictional effort to preserve large landscapes for the protection of wildlife migration and forest ecology.

Roanoke County Community Strategic Plan (2016)



COMMUNITY STRATEGIC PLAN
2016

Vision Statement
Roanoke County is a vibrant, innovative, and inclusive community that values its citizens, heritage, and quality of life.

Keep Roanoke County Healthy, Clean and Beautiful

Outdoor Recreation and Natural Resources

Roanoke County's abundant outdoor recreational opportunities are seen as a means to market the County's high quality of life to young professionals and increasingly important part of the equation in attracting entrepreneurial businesses to the region. Outdoor recreation that capitalizes on increasing the number of visitors to the area while providing healthy alternatives for citizens is a high priority. Roanoke County will continue to expand and promote the County's outdoor recreational advantages, especially amenities such as Scenic Byways, assessments, and businesses.

Environmental Stewardship

Environmental stewardship and protecting natural resources is important to keeping Roanoke County healthy, clean and beautiful. The scenic beauty of the Blue Ridge Mountains, along with the regional streams and rivers of this region, are what set Roanoke County apart from other communities. The County will continue to preserve and improve these irreplaceable features that are so vital to ensuring an attractive and healthy community for future generations.







Roanoke County Community Strategic Plan Annual Reports

Maintaining and Improving Outdoor Spaces

Explore Park held two river clean-ups last year with more than 170 volunteers and staff removing over five tons of garbage from the along the park's waterways.

Explore Park also partnered with the **Pathfinders for Greenways** to repair over 10 miles of equestrian trails from Explore Park to Mill Mountain. This project is another example of partnering to increase the outdoor experience for a variety of recreation users across the Roanoke Valley.



Explore Park Succeeds as a Center for Outdoor Recreation

In 2016, Roanoke County received National Award of Excellence for Explore Park. The new award recognizes Explore Park's efforts to provide a variety of recreational opportunities for all ages and abilities, while maintaining the park's historic and scenic values.

Explore Park's success is due to the many volunteers and staff who work to maintain the park's facilities and provide a safe and enjoyable experience for all visitors. In 2016, Explore Park was awarded the National Award of Excellence for its efforts to provide a variety of recreational opportunities for all ages and abilities, while maintaining the park's historic and scenic values.

Explore Park's Success as a Center for Outdoor Recreation

Explore Park's success is due to the many volunteers and staff who work to maintain the park's facilities and provide a safe and enjoyable experience for all visitors. In 2016, Explore Park was awarded the National Award of Excellence for its efforts to provide a variety of recreational opportunities for all ages and abilities, while maintaining the park's historic and scenic values.

POSITION ROANOKE COUNTY FOR ECONOMIC GROWTH

Explore Park Adventure Plan Development

Roanoke County has achieved a major milestone in the development of the Explore Park Adventure Plan. The plan, which was developed by the Roanoke County Board of Supervisors, outlines the future development of the park and its facilities. The plan includes a variety of recreational opportunities for all ages and abilities, while maintaining the park's historic and scenic values.



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KEEP ROANOKE COUNTY HEALTHY, CLEAN AND BEAUTIFUL

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Brief History of Explore Park

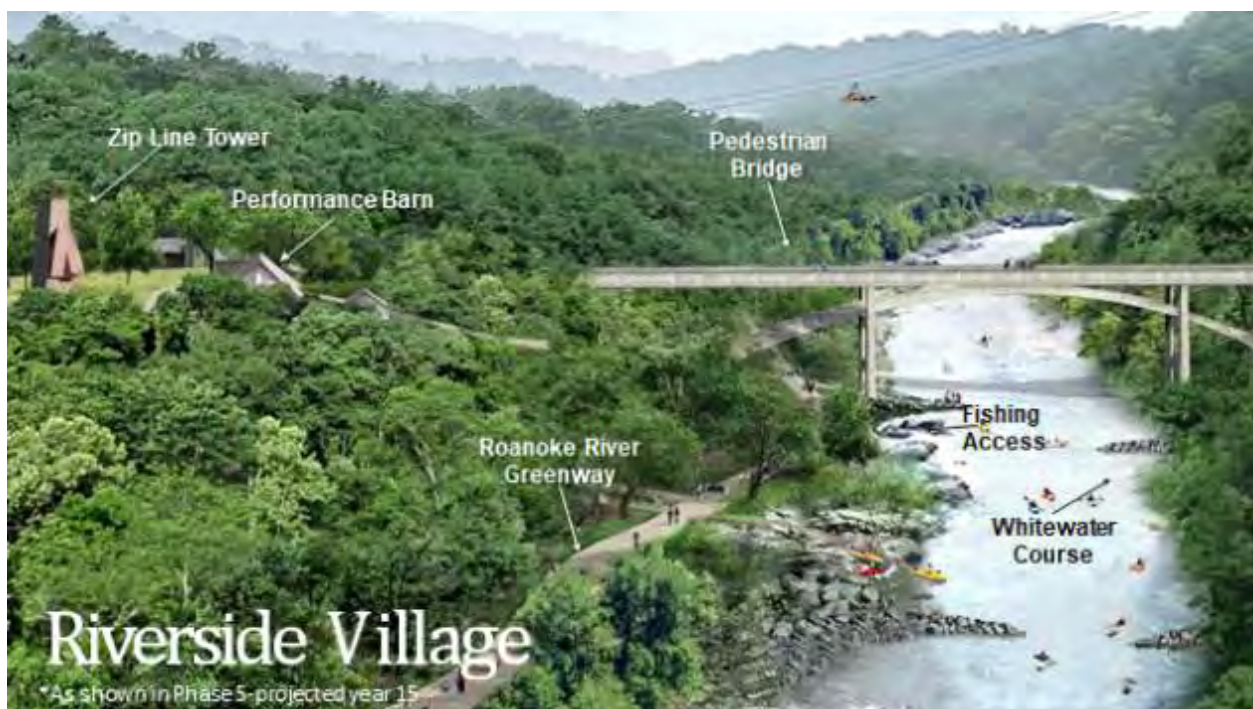
- Originally opened in 1994 by the Virginia Recreational Facilities Authority (VRFA) as a living history museum
- Closed in 2007 due to recession and declining State funds
- 99-year lease executed between Roanoke County and VRFA in 2013
- Roanoke County reopened the park in 2014
- Explore Park Adventure Plan adopted by the Roanoke County Board of Supervisors in 2016



Explore Park Adventure Plan Fulfilling the Community's Vision

Key Amenities:

- In-River Kayak Park
- Roanoke River Greenway
- River Access/Blueway Improvements
- Bike Skills Park
- Disc Golf Course
- Aerial Park/Zipline
- Overnight Accommodations
- Food/Retail Operations



The map displays various watersheds across Roanoke County, each color-coded according to its project status:

- Completed:** Green
- Construction FY 19-20:** Yellow
- Future Planning:** Light Blue
- Construction FY 19- FY 23:** Orange

Key locations labeled include City of Salem, City of Roanoke, Town of Vinton, Green Hill Park, Rotary Park, Hanging Rock, Lick Run, Tinker Creek, Wolf Creek, Explore Park, Mill Mountain, Murray Run, Wasena Park, Garst Mill, and Blue Ridge Parkway. Major roads like I-81, US-421, VA-619, and VA-220 are also shown.



East Roanoke River Greenway (UPC 91191) Roanoke City to Highland Road

- Design/Engineering Plans are Complete
- Project Impacts proposed within Niagara Dam Hydroelectric Project Boundary and Appalachian Power Company owned land
- Phasing Construction:
 - Reducing scope on western and eastern termini due to right-of-way acquisition issues with private land owners
 - Construction anticipated 2021-2022
- Roanoke County will continue negotiating with property owners along Roanoke River





Summary of Recreation Requests

- **Support Implementation of the Explore Park Adventure Plan**
 - Recreation Flow Controlled Releases (i.e., summer and fall)
 - In-River Kayak Park proposed downstream of the Niagara Dam
- **Support Roanoke River Greenway**
 - Right of Way, Environmental, and FERC approvals needed
- **Support Roanoke River Blueway**
 - River-Left: improvements needed to existing portage put-in needed (i.e., floating dock) and portage take-out (i.e., with ramp or stairs) of the Niagara Dam
 - River-Right: Potential property acquisition could provide for development of a new public access facility with vehicular parking adjacent to the Niagara Dam
- **Support Trash and Debris Clean-Up Efforts**



15

Questions or Comments?

Thank you for the opportunity to provide input!

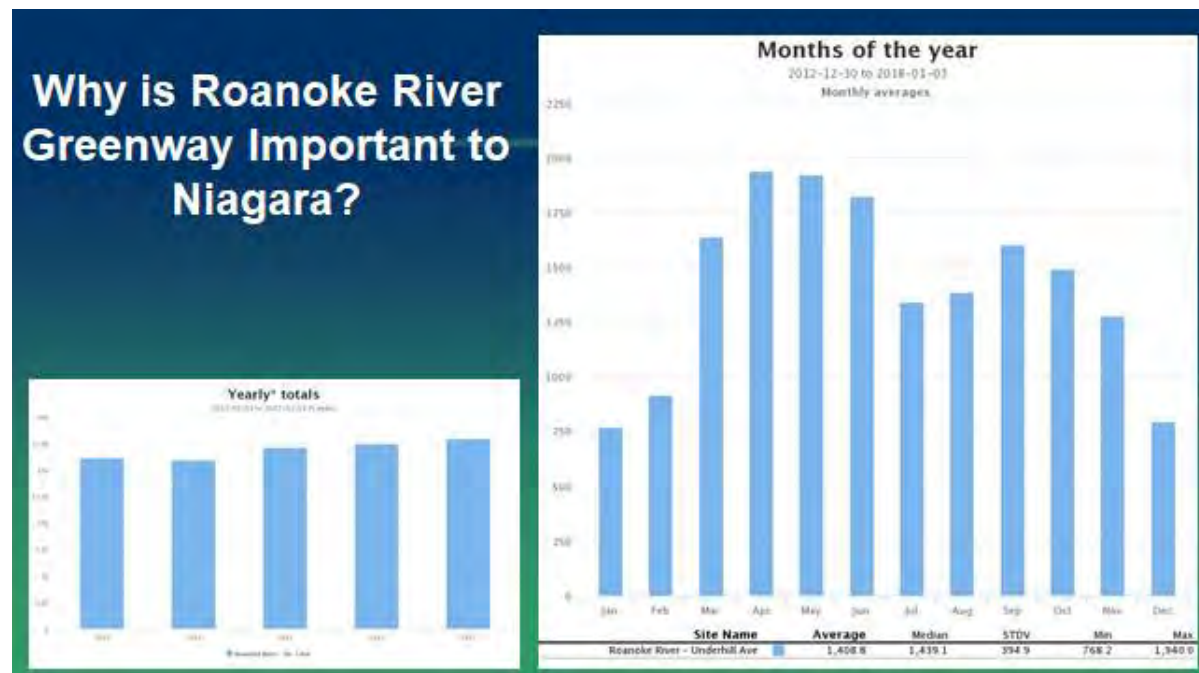


Lindsay B. Webb, MPA
Parks Planning and Development Manager
1206 Kessler Mill Road | Salem, VA 24153
(540) 777-6328 | (540) 521-9907 (cell)

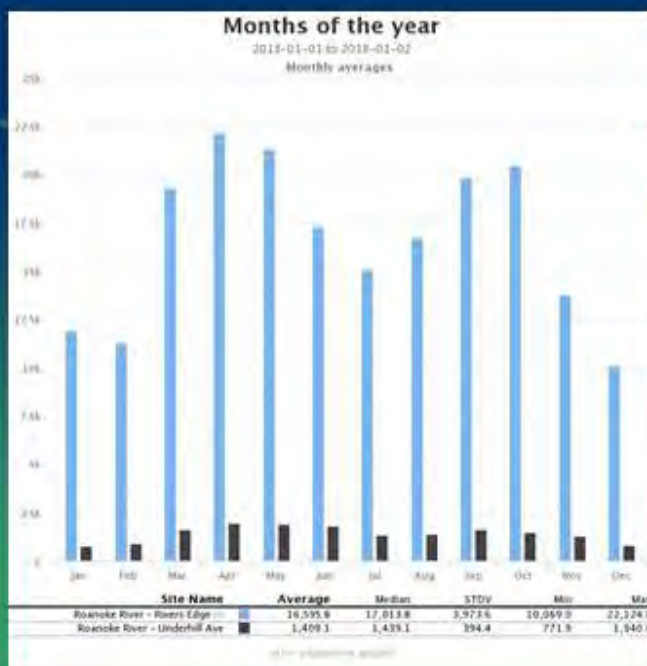
16



4. ROANOKE VALLEY GREENWAY COMMISSION PRESENTATION



**This increased use is
coming your way.**



Why Does the Trash Matter?



Why Does the Trash Matter?

**It makes AEP look bad.
It makes Roanoke look
bad.**

**Addressing this
problem would improve
AEP's image.**

Take the opportunity!



5. ROANOKE RIVER BLUEWAY COMMITTEE PRESENTATION



April 20, 2021

Presentation to AEP
and Consultants for
the Recreation
Stakeholder Meeting

Niagara Dam Relicensing: Project 2466-034





What is the Roanoke River Blueway?

A 45-mile stretch of the Roanoke River which begins in Montgomery County. Stretching through the heart of the Cities of Salem and Roanoke before continuing on to the scenic Roanoke River Gorge in Roanoke County, the Roanoke River Blueway is a unique outdoor recreation opportunity in Virginia's Blue Ridge Mountains.

[RoanokeRiverBlueWay.org]

6/28/2011



Filling a Regional Need

- In the Roanoke Region water access was ranked as the third greatest need for recreation resources
- Virginia Tourism Corporation 2014 Virginia Mountain Region Travel Profile for Roanoke shows a strong interest in nature-based tourism and recreational tourism offerings.
- Outdoor recreation supports health and wellness, economic development, and conservation goals.



Program Achievements

- Governor's Award for Environmental Excellence for Implementing the Virginia Outdoors Plan
- Virginia Treasures Designation for all access points
- Virginia Tourism Corporation Grant to leverage funding for promotion efforts
- ACA Designated Water Trail

Source: Shenandoah Valley

6/28/2011



Blueways as Economic Development

- USA Today's 3rd Best Urban Kayaking Spot!
- Outdoor Recreation key draw for tourism in our region
- Promoting blueways supports outfitters and other local businesses
- Blueway connection to greenway a unique asset

Source: Shenandoah Valley

6/28/2011

Usage Numbers

Roanoke Mountain Adventures

- Tube Rentals Trips: 1482 = \$21,794.00
- Kayak Rental Trips: 534 = \$16,577.00
- Paddleboard Rental Trips: 126 = \$7,550.00
- Shuttles: 373 = \$6,965.00
- Total water rentals: \$45,721.00

Blue Ridge Parkway/Fisherman's Trail Counter



Access Points

Roanoke River:

- | | |
|--------------------------------|---|
| • East Montgomery County | • Tinker Creek |
| • Wayside Park | • Blue Ridge Parkway – Roanoke River Overlook |
| • Green Hill Park | • Explore Park – Journey's End* |
| • West Riverside Drive | • Explore Park – Rutrough Point |
| • Cardinal Justice Academy | • Hardy Road |
| • Eddy Avenue | |
| • Salem Rotary Park | |
| • Wasena Park | |
| • Smith Park Low Water Bridge | |
| • Launch at Reserve | |
| • 13 th /Bennington | |

Tributary Access:

- Jae Valley Park
- Mason Creek



13th/Bennington

- Connected directly to the Roanoke River Greenway
- Funding allocated by the Blueway Committee for improvements at this location
- 13th Street/Bennington parking lot provides connection to Tinker Creek Greenway (Underhill counting site)
- Last takeout on the Roanoke River above the dam

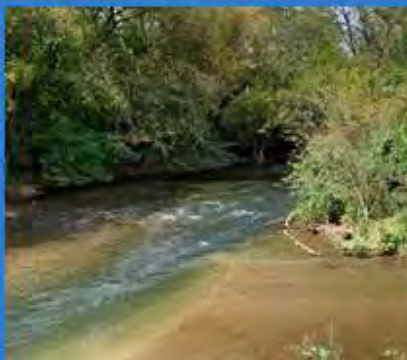
RoanokeRiverBlueway.org



Tinker Creek

- Improvements funded in part by AEP, DWR, and the Town of Vinton
- Managed and operated by the Town of Vinton
- Last takeout before the dam
- Signage improvements in progress here and other sites

RoanokeRiverBlueway.org



Blue Ridge Parkway, Roanoke River Overlook

- Rehabilitation in 2015 by FORVA and Pathfinders for Greenways
- Ribbon cutting held February 2016
- Put in below the dam – best views of the dam

RoanokeRiverBlumway.org



Explore Park— Journey's End and Rutrough Point



Journey's End

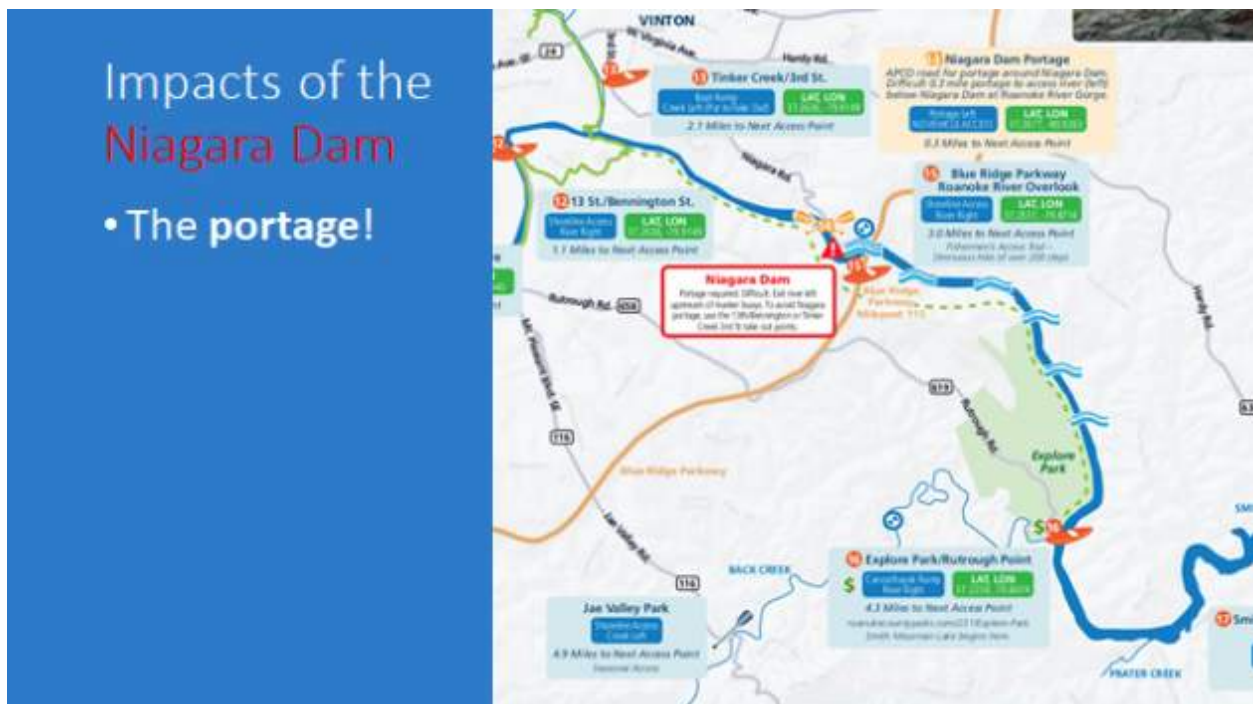
- Popular for tubing
- Needs to be incorporated into our mapping/website

Rutrough Point

- Last takeout in Explore Park
- Confluence of Back Creek (Jae Valley Park)
- Popular paddleboarding location

RoanokeRiverBlumway.org







Takeaways

The Blueway Committee supports:

- Improvements to the Portage
- Study Access Above the Dam
- Include Greenway Users Amongst Recreation Stakeholders
- Access to the Bypass Reach/Recreational Releases



For more information please contact Amanda McGee at amcgee@rvarc.org or visit

RoanokeRiverBlueway.org

Roanoke River
BLUEWAY

**NIAGARA HYDROELECTRIC PROJECT
(FERC NO. 2466)
RECREATION STUDY**

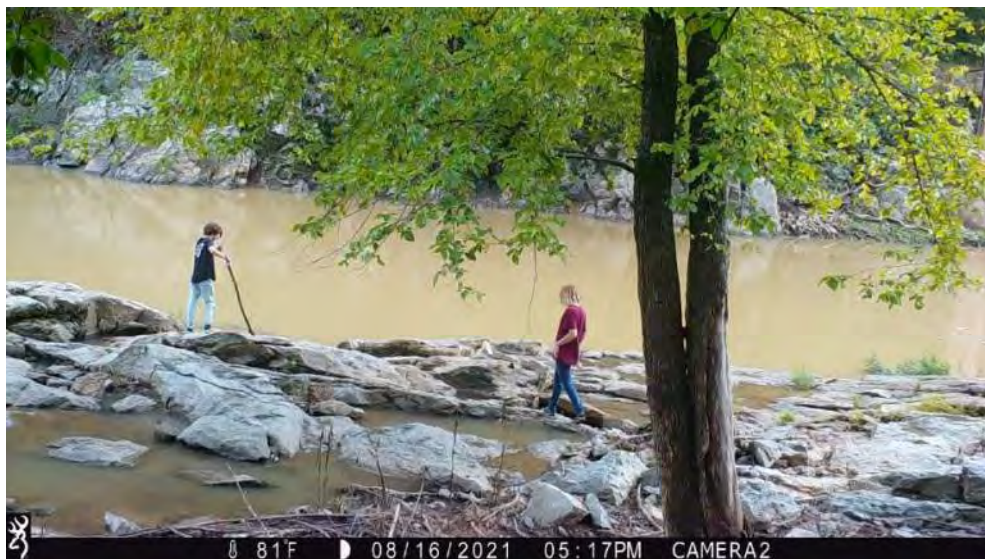
**Attachment 5:
Niagara Project Canoe Portage Trail
Trail Camera Photos**

Trail Camera Documentation - Representative Photos

Observing the Project Facility and Roanoke River

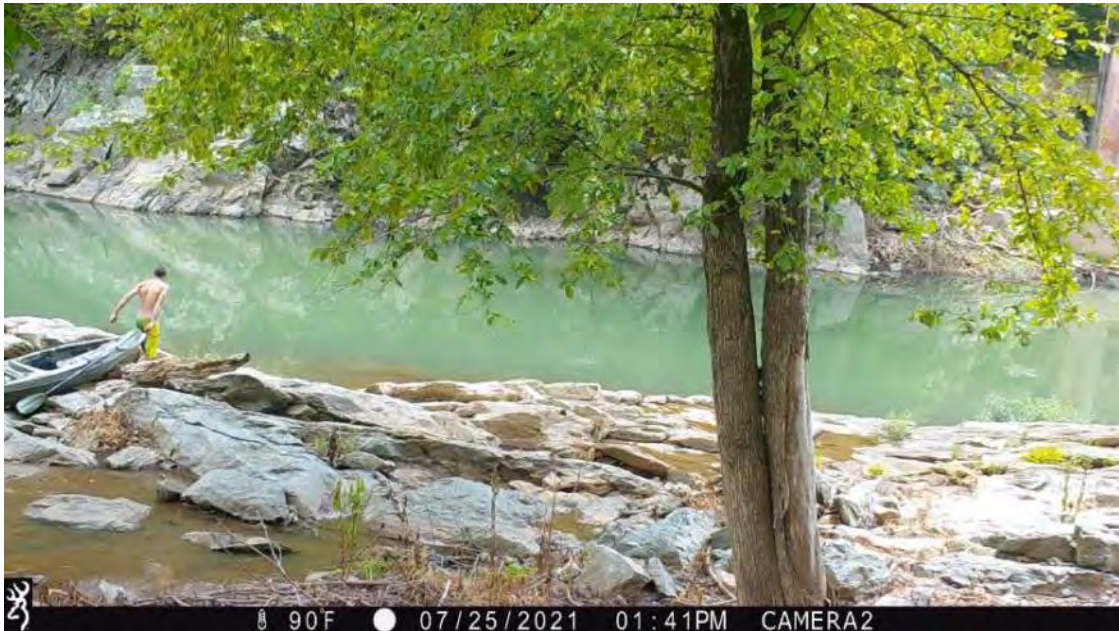


Friday, June 25, 2021



Monday, August 16, 2021

Canoe/Kayaking

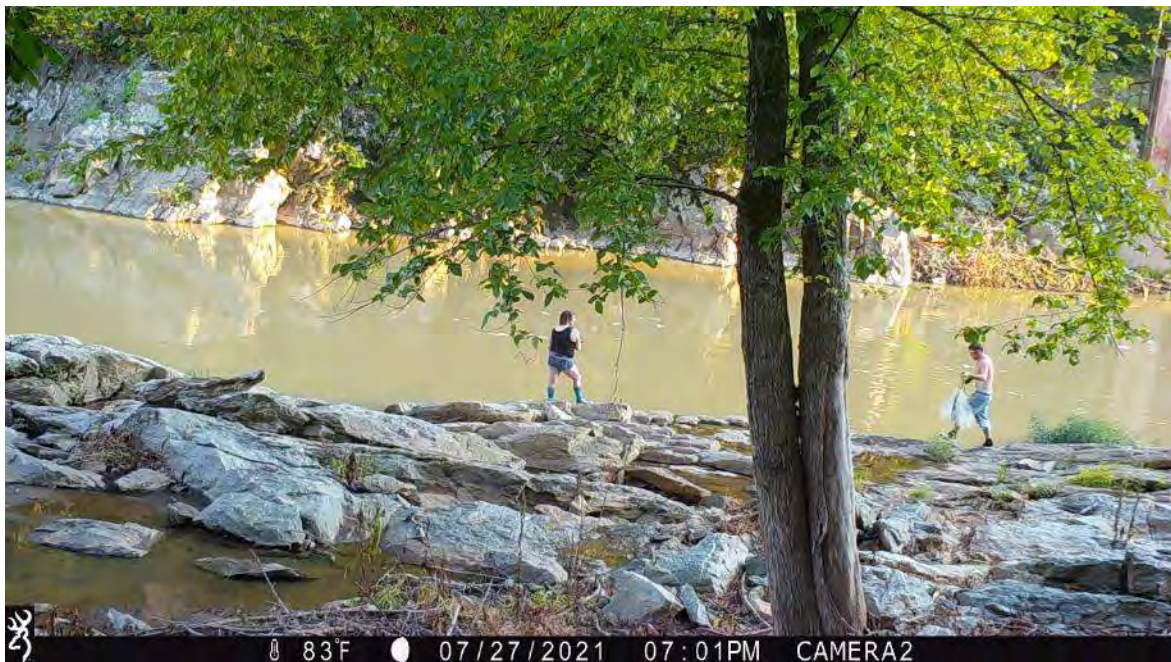


Sunday, July 25, 2021

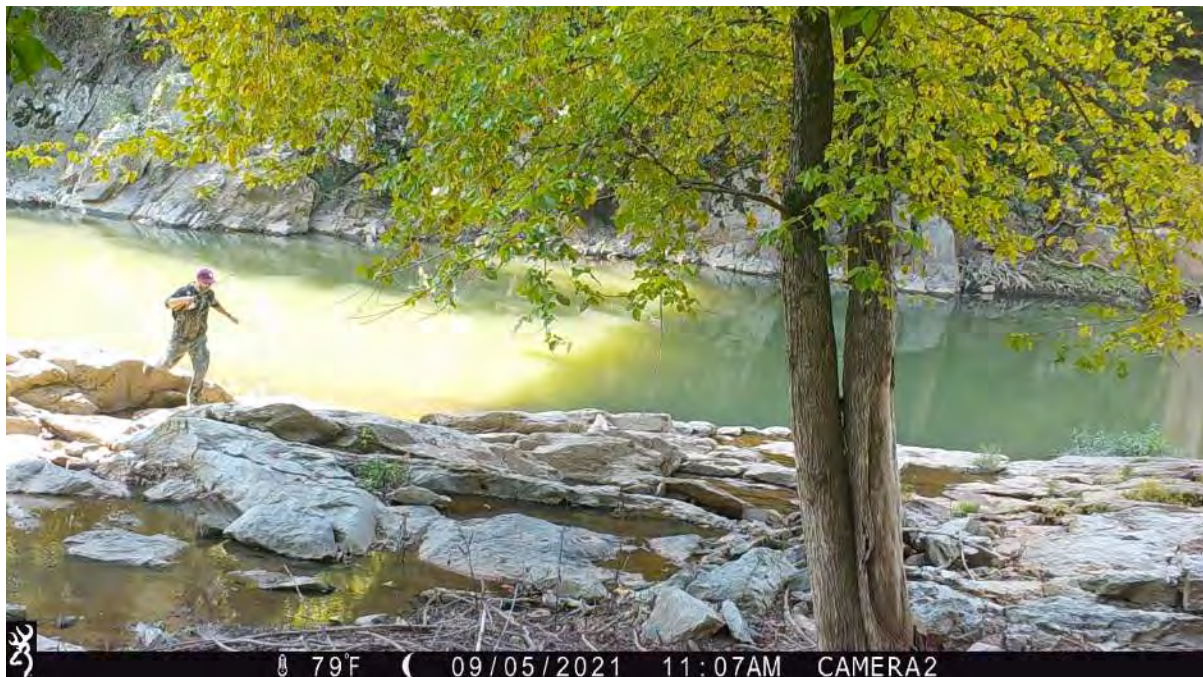


Tuesday, October 5, 2021

Bank Fishing



Tuesday, July 27, 2021



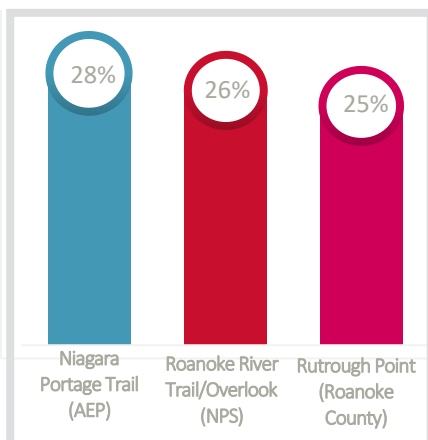
Sunday, September 5, 2021

**NIAGARA HYDROELECTRIC PROJECT
(FERC NO. 2466)
RECREATION STUDY**

**Attachment 6:
Results from Online Surveys**

Niagara Recreation – Overall Online Summary Results

Survey Locations:



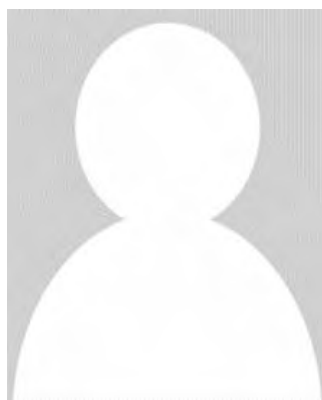
From **April 2020** to **October 2021** there were **119** respondents that visited various locations within Niagara Recreation Project Area who completed this survey. **79%** of the responses primarily came from three locations: Niagara Portage Trail (AEP), Roanoke River Trail/Overlook (National Park Service), and Rutrough Point (Roanoke County).

Respondents answered questions about their use of the recreation facilities. This data is collected to support the Federal Energy Regulatory Commission (FERC) relicensing process and is an on-going study.

55% of the survey respondents come from four zip code locations, which are on average **9** miles away from the Project. **83%** consider themselves to be regular visitors to the area with at least 3 or more visits per year and an average length of stay of **4** hours.

Males comprised **73%** of the respondents. **48%** of respondents were between the ages of 40 and 59.

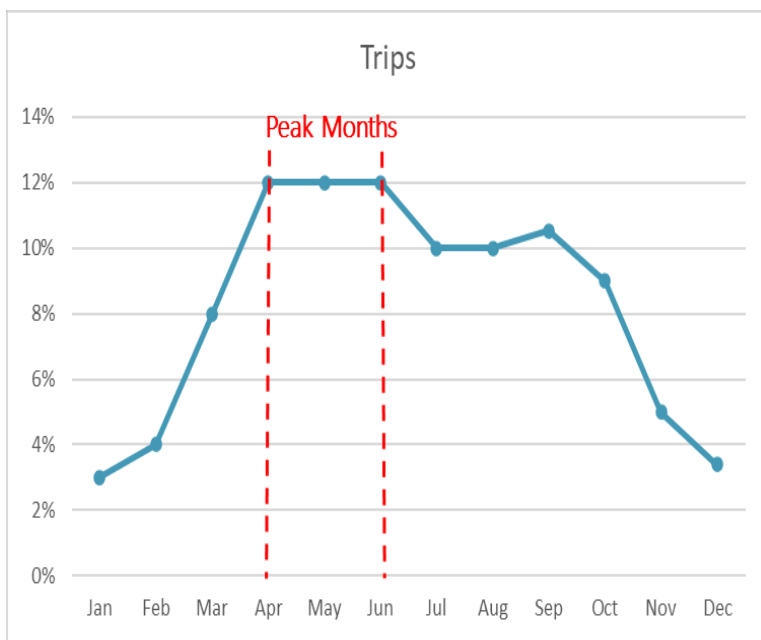
The most frequent months visited are from April to September, and April and June are the peak months.



- Zip codes of most frequent visitors; **24014, 24015, 24018 & 24179**

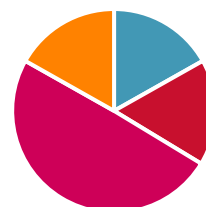
- Average # of visits per year are **11**

- Average miles traveled **22**



95% of respondents were *not* staying overnight in the Project area. The chart below provides a breakdown of overnight accommodations for the remaining **5%** who were staying overnight.

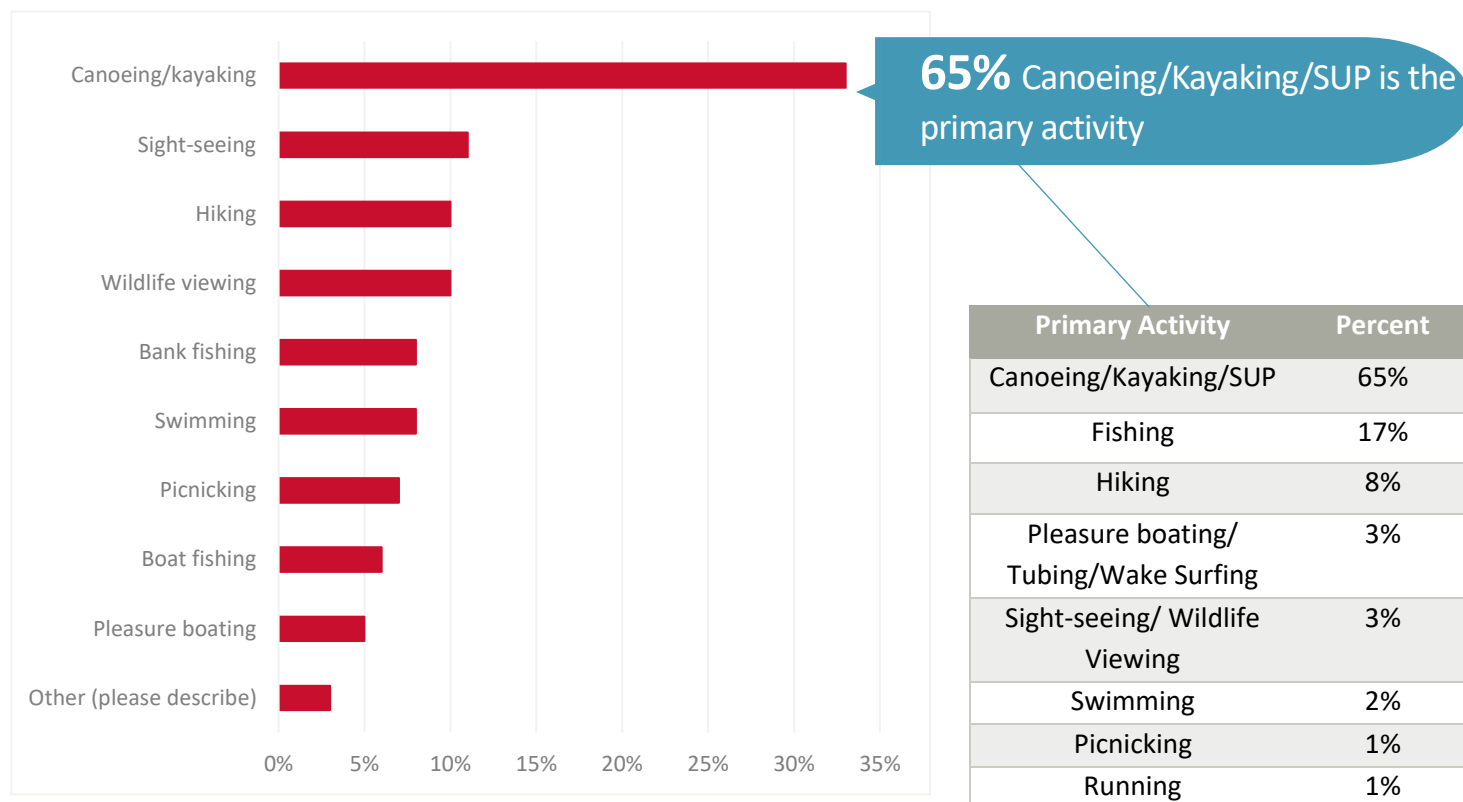
Overnight Accommodations



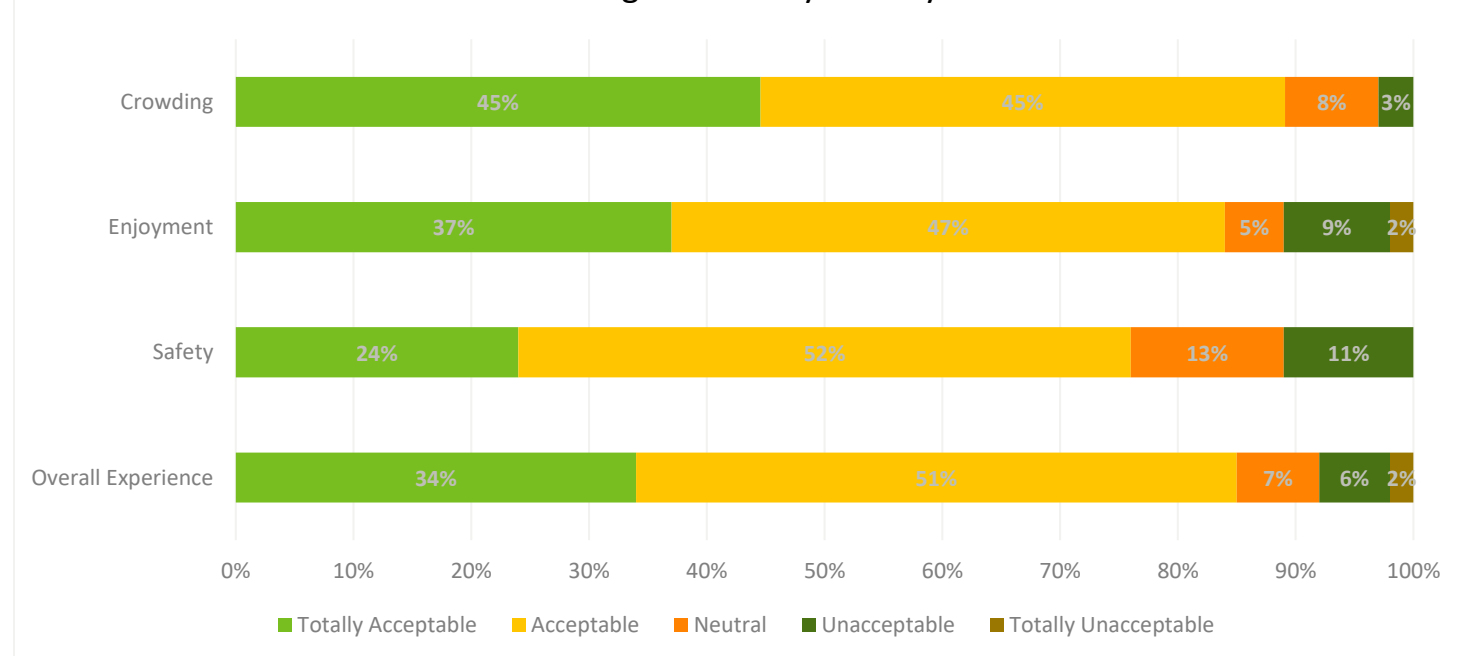
■ RV/Auto/Tent Campground ■ Motel/hotel
■ Vacation or rental home ■ Tent

Niagara Recreation – Overall Online Summary Results

Activities Participated on Trip:

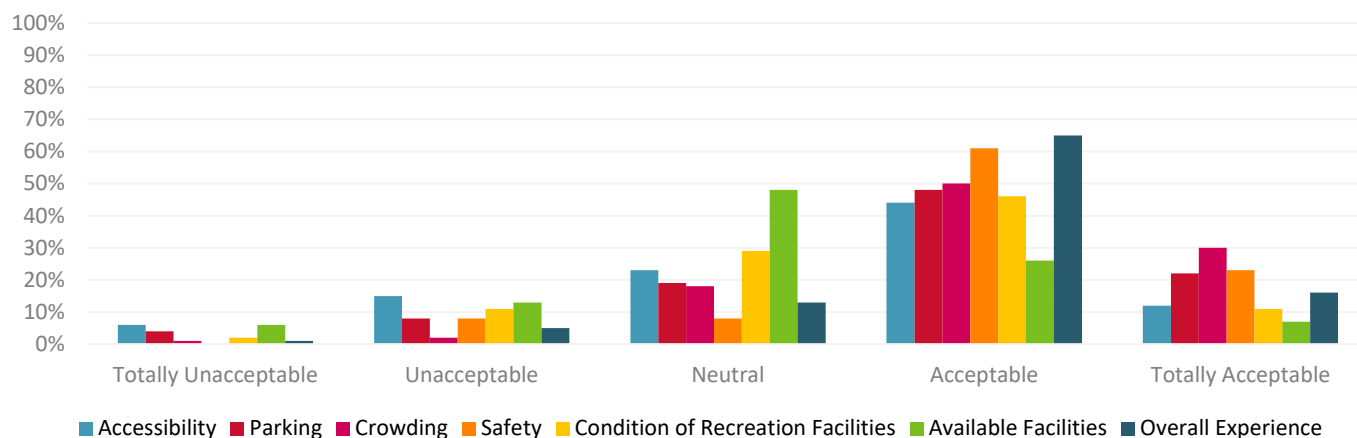


Rating for Primary Activity



Niagara Recreation – Overall Online Summary Results

Overall Ratings on All Visits



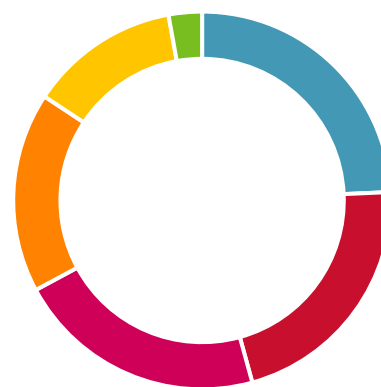
Improvement Suggestions

Count

Improvements to boat launches / take-outs	27
Better and more public access	24
Release more water (summer) / poor water quality	18
Restrooms / changing rooms	14
Trash	13
Parking (more, better, lighting)	10
Add / Remove (trails, dam, etc.)	9
More attractions	8
Access to water release schedule	8
Trail work / road improvements	4
Signage & wayfinding	3

Overall Comments

- Beautiful area, love having it
- Regular release of water with schedule / improve water quality
- Trash / lack of management
- Portage difficulties
- More activities/ additional signage
- Removal of dam

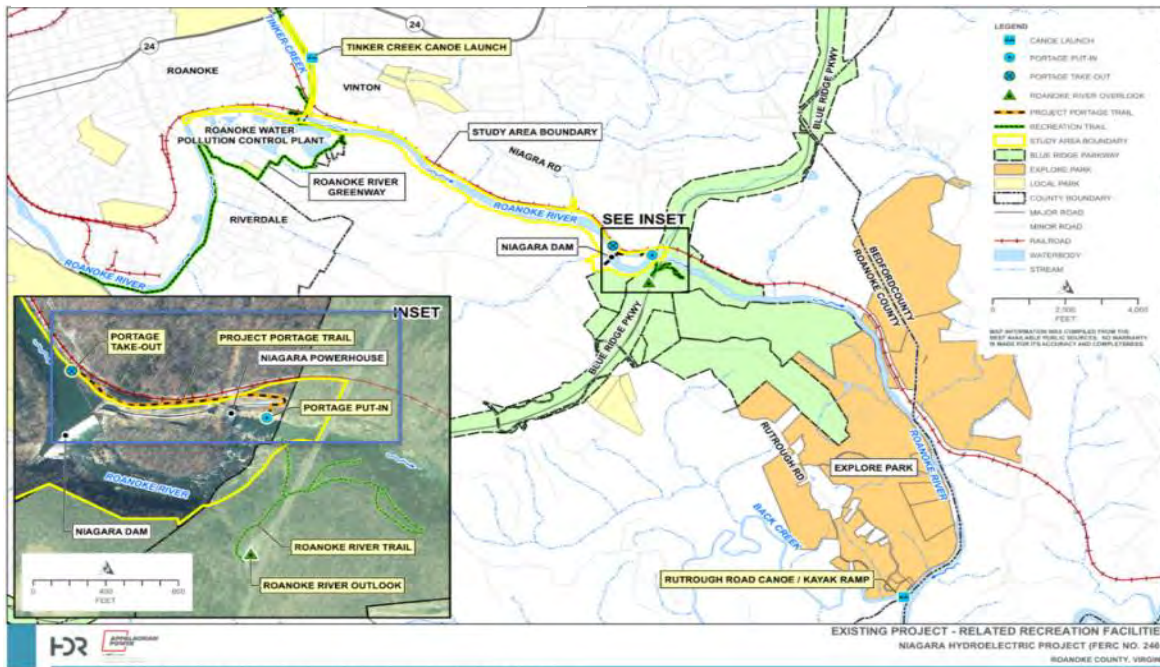


Overall the comments from the respondents show that **24%** “love” having the Niagara recreation site(s) and would like to see a regular release of water for boating and to improve overall water quality. They would also like to see the trash picked-up.

The top **2** suggestions for improvement include better and more public access with improvements to portages.

Niagara – cumulative results by Niagara Portage Trail

Survey Location:



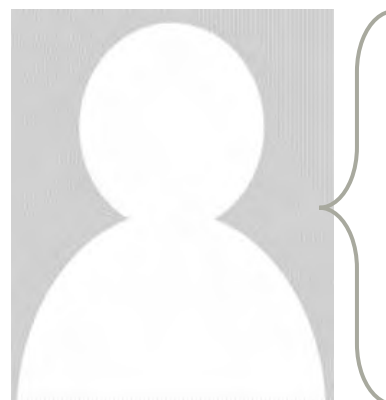
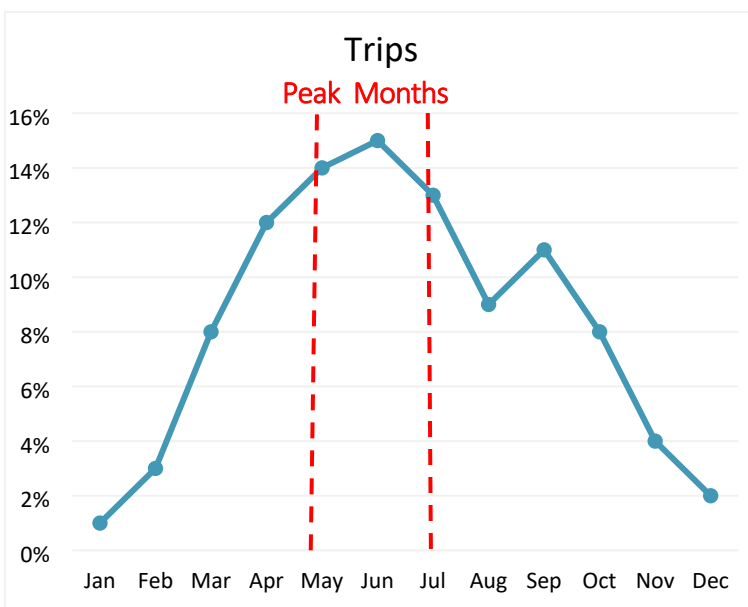
From the time period of **May 2020 to October 2021** there were **39** visitors from **Niagara Portage Trail** that responded to this survey. During this timeframe **28%** of the responses came from this location.

These respondents answered questions about their use of the recreation facilities. This data is collected to support the Federal Energy Regulatory Commission (FERC) relicensing process.

Predominately **67%** of the survey respondents come from four zip code locations, which average about **11** miles away from Niagara Recreation. **88%** consider themselves to be regular visitors to the area, visiting at least 3 or more times a year with an average length of stay being **4** hours.

The highest percentage of individuals visiting the locations consists of males (**84%**), with **56%** greater than the age of 50.

The most frequent months visited are April through July, with May to July being the highest visited months.

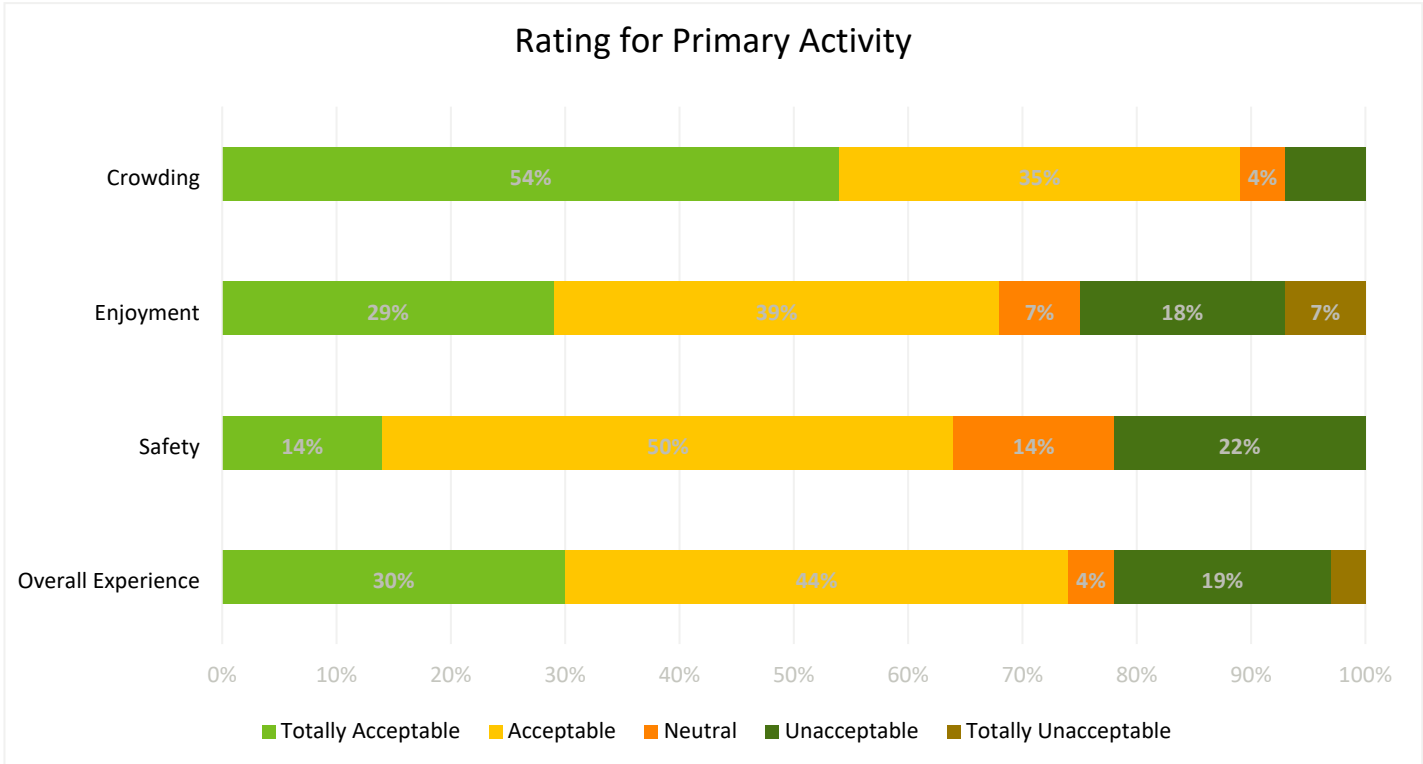
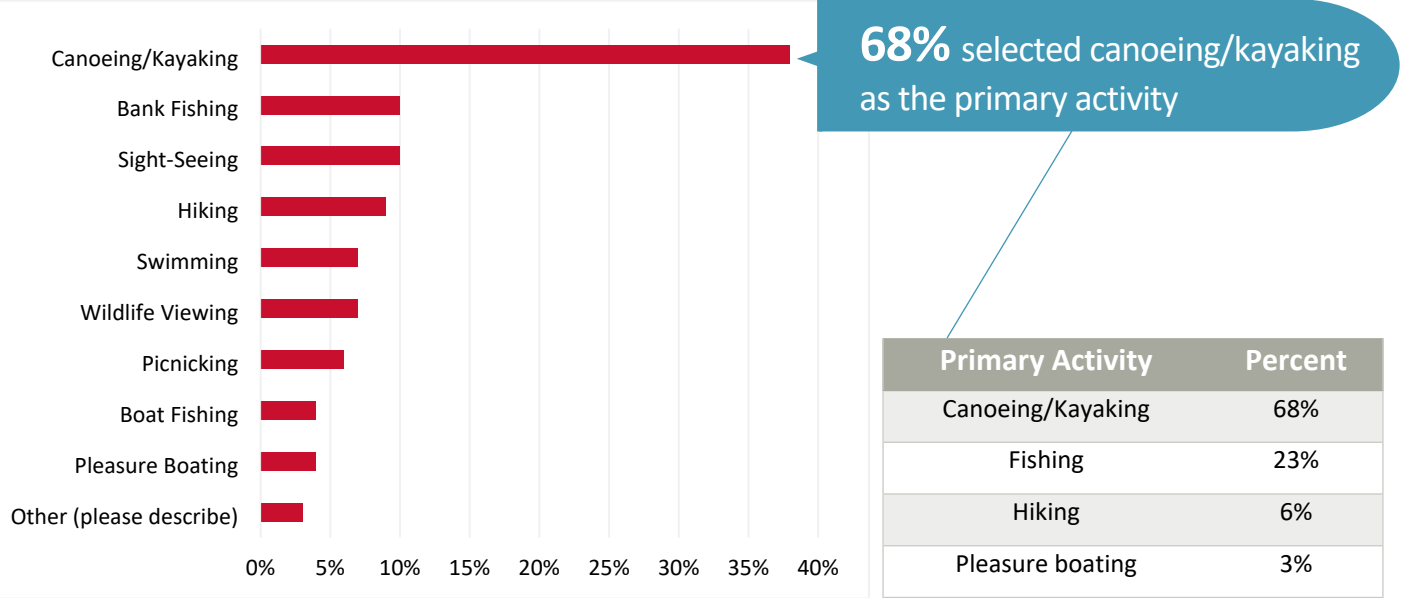


- zip codes of most frequent visitors; **24014, 24015, 24018 & 24019**
- Average # of visits per year are **8**
- Average miles traveled **15**

From the visitors who responded, **97%** were *not* staying overnight in the Niagara Project area. The remaining 3% were staying at RV/tent camping accommodations.

Niagara – cumulative results by Niagara Portage Trail

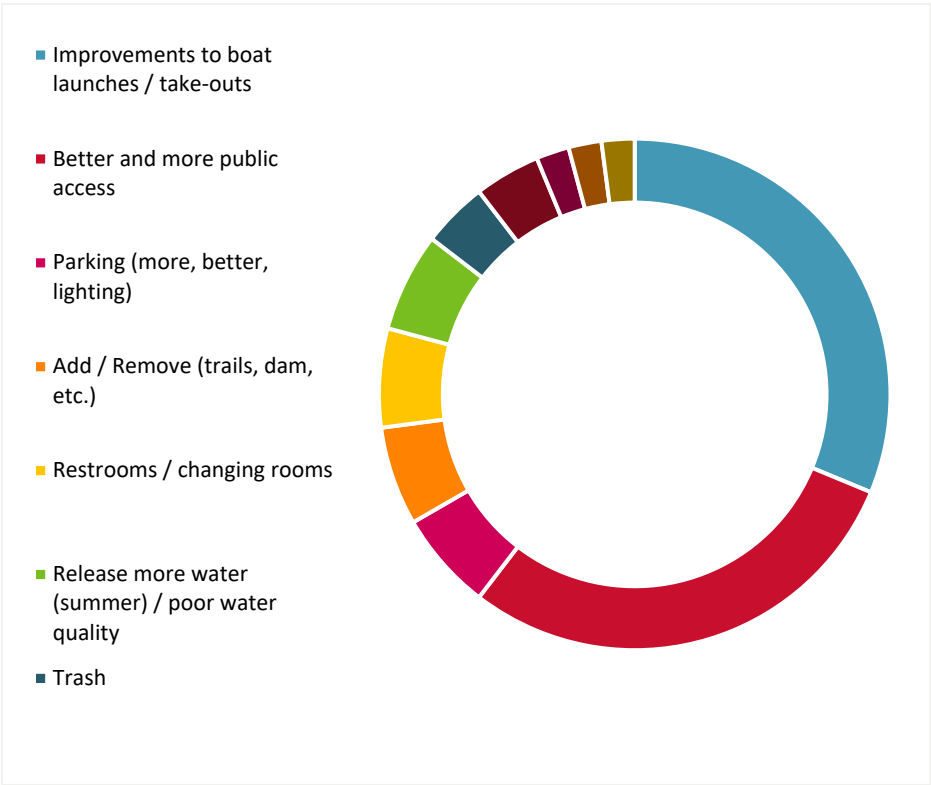
Activities Participated on Trip:



Niagara Recreation – cumulative results by Niagara Portage Trail



Suggested Improvement Responses from Niagara Portage Trail:



Improvement Suggestions	#
Improvements to boat launches / take-outs	15
Better and more public access	14
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
Trail work / road improvements	2
Signage & wayfinding	1
Access to water release schedule	1
More attractions	1

Niagara Recreation – *cumulative results by Niagara Portage Trail*

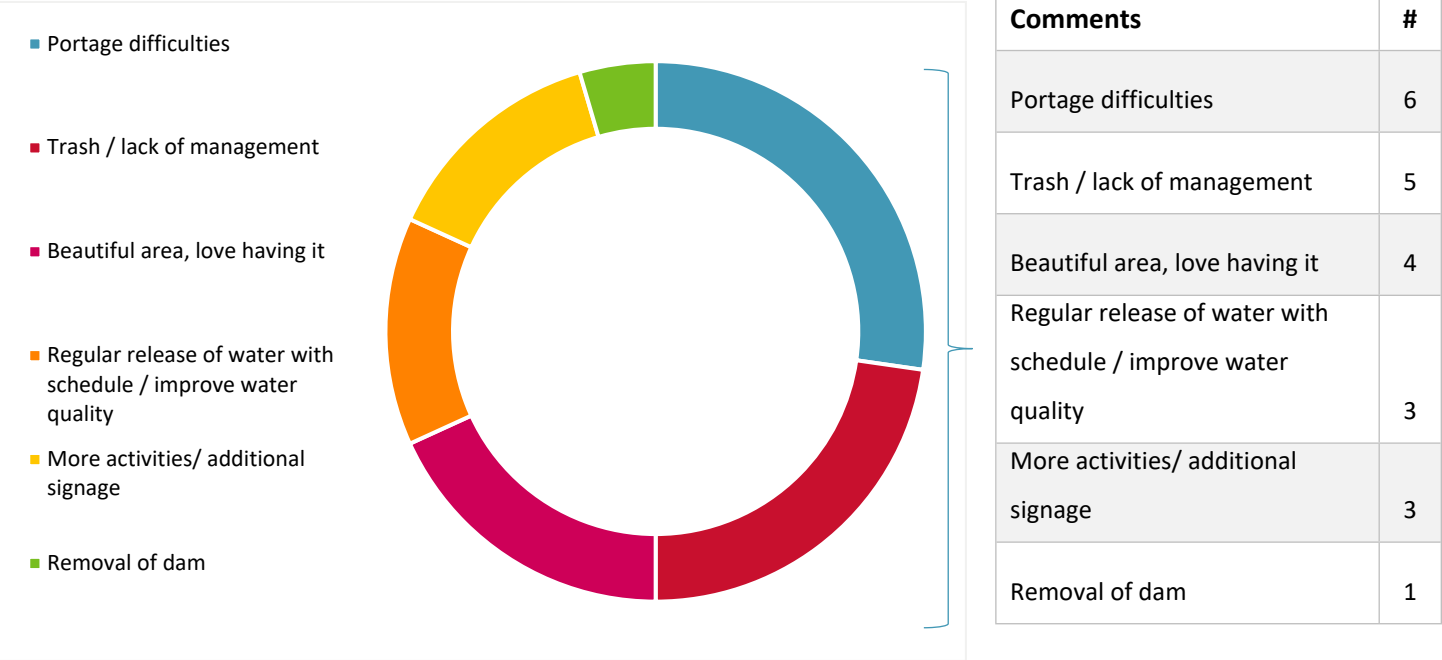
Type(s) of recreation facilities or improvements respondents believe are needed and at what specific location(s) at the Niagara Project: (*verbatim responses*)

- A boat rail to assist with getting your boat to water. Improved portage.
- Access by automobile to the reservoir in front of the dam area. Niagara Rd. dead ends so no driving to the reservoir area.
- Access trail(s) from north side of Roanoke River bridge.
- At the parking there could be bathrooms and an easier way to access the river. Also, in the bathrooms maybe some lock boxes for people to put their keys in while they float the river. Also, the trash through here is high and some of the areas that could be nice stop offs need to be cleared. I understand not destroying habitats, however small beaches, etc. in case of storms or to enjoy your time would be nice.
- Better access and parking. Safer access to both sides of the river.
- Boat launch is cracking and needs to be widened - accessibility is challenging. The blue way here is incredibly polluted with garbage. We feel lucky to have access to this boat launch despite its challenges. It's a great 4 mile paddle with lots of wildlife, I just wish it were easier to put in (the grade and width of the launch are really challenging when you're carrying a 40lb boat) and cleaner.
- Construct the greenway
- Continued work on trail to River, request for a dam release conversation/schedule.
- Extend Greenway
- I would like public access to both sides of the river from the Gorge overlook area. Currently if you are on the opposite/other bank, this is considered trespassing. I also think a Swinging bridge, located under the Parkway Bridge would be an awesome addition, and attract many more people to the Explorer Park/ Niagra dam area.
- Improve the portage entrance from the Roanoke River above the dam.
- Improved access in general would be phenomenal. The portage trail is in better condition than it used to be in for sure thanks to the work of volunteers... but it is still a tough portage.
- Improved access/portage around Niagara dam
Removal of Niagara dam
- It would be a blessing if there were an easier way to get my kayak down to the river .I't not that easy for a 68 year old .
- More access for fishing and walking above and below dam that dies not interfere with aep operations. Thank you.
- Need a better portage around the dam, getting boats up the bank is tough, its over grown, steep , getting them back in the water below the dam is also tuff

- Need for improved portage around dam. 1/4 mile gravel with no assistance device was rough. This is a really significant barrier to joining the blueway in the Roanoke City/Salem area to the Explore Park and county blueway areas. Its like a dead zone right now due to the challenging portage. With easier, nicer portage, there could be more fluid connection between usage of the river upstream and downstream
- Paddler take-out on river right above dam. Parking on river right above dam. Trail from take-out to parkway fisherman's trail.
- Parking lot lighting, water access trail needs improved, more accessible fishing areas
- Porta Potti at Tinker Creek launch during summer. The trash along the River and in the water is unacceptable. For Blueway use, boaters need a site for overnight stays. Portage sat Niagra needs a way to get loaded boats lifted up the steps. Add a pull-up system to move boats around the dam. Better yet, REMOVE THE DAM, and promote fly fishing and urban whitewater paddling. Tinker remains shaded and a positive experience. Wish I would start closer to Monterey. Or connect to Carvins Cove. The waterways in Va need to be connected.
- Possibly add controlled releases to enhance kayak and canoe experience as well as regulate water temperature below dam.
- Recreational water releases from the dam over the summer months
- Remove the dam
- Restrooms at put ins and take outs for the two runs involved, namely Vinton canoe launch to the damn and from the damn to Rutrough point
- scheduled flow releases
- Shorter portage around the Dam
- Take out is often trashy at the steps and difficult to get out. Portage is very hot and dusty. Put in is often very slick and dangerous.
- The canoe/kayak launch could be a bit more developed. It still seemed a bit rough. Wayfinding is not great -- especially if I was coming from out of town. Are restrooms a possibility -- maybe like we have at Carvins Cove Bennett Springs lot?
- The signage and put-in for the Niagara dam portage is not ideal. It is not clearly marked on both ends (and along the route). We would benefit from a graded put-in below the dam.
- There needs to be better access for Paddlers on the river. It is a long hike down from the parkway or a long portage at the dam. A put in down stream would be a great improvement to a beautiful part of the river. Older paddlers as myself have a hard time with the hike
- Whitewater park

Niagara Recreation – cumulative results by Niagara Portage Trail

Additional Comment Responses from Niagara Portage Trail:



Niagara Recreation – *cumulative results by Niagara Portage Trail*

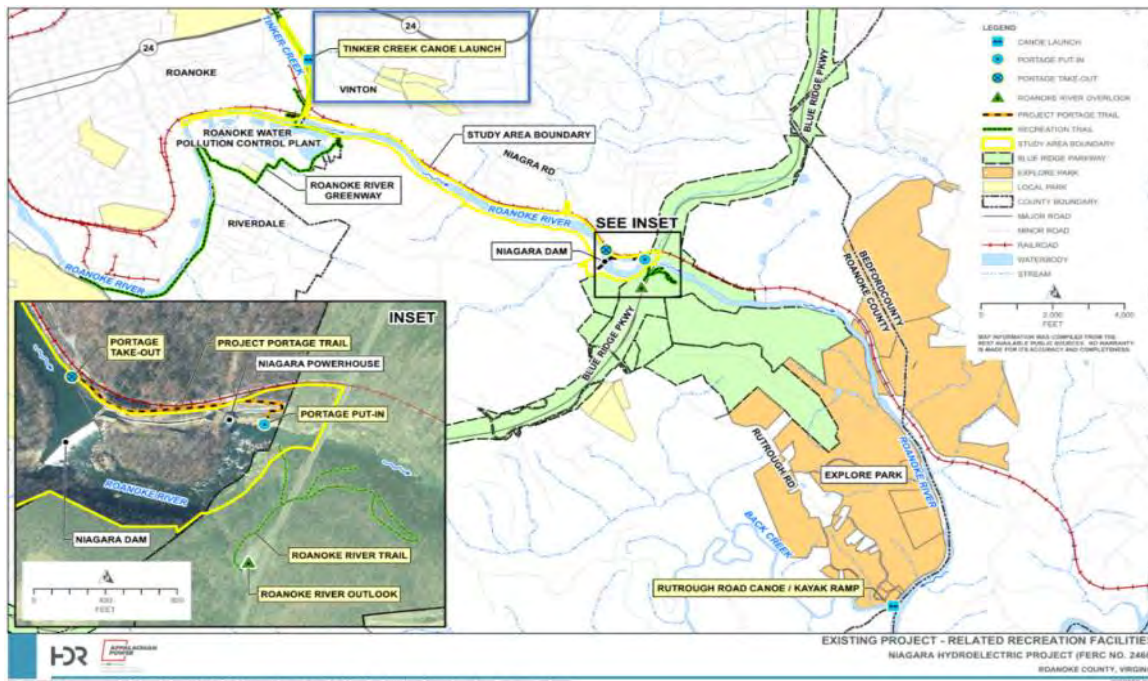
Additional comments: (*verbatim responses*)

- A better portage around the dam is needed.
- A dream scenario would be to REMOVE THE DAM altogether so that the roanoke river gorge could be accessed via the tinker creek put in which is far more convenient. There is also the potential that the river beneath the lake created by the dam would offer additional whitewater/recreational opportunities!
- Amazing scenery in the gorge below the dam but too low of flow for boaters to enjoy in the summer months.
- better access below dam to carry canoes , yaks down the hill, its tuff
- Clean up the Rutrough area Host a community clean up day. Give us access to the reservoir area by foot or vehicle
- Easier access please. Thank you
- Hampered by the railroad right of way, lack of bank management, and poor portage options
- I would prefer fly fishing and more challenging white water paddling. The portage should be Accessible. Could a hoist be added to pull boats out of the water? Something to transport the canoes/kayaks at the portage. The gravel is hard to walk on. It would be even harder to push/pull wheels for a boat.

Remove the trash. Remove the Dam to allow upstream travel for ells and fish. Thank you for allowing input.
- More accessible fishing areas
- Recreation is pretty clearly discouraged.
- scheduled flow releases
- Scheduled water releases on weekend during agreed upon months, to increase CFS to a level for consistent recreational paddling.
- That is a long portage around the Dam
- The gorge is so pretty and has such potential. I'd hate to see it filled with people, which would detract from its beauty, but the experience could be more purposeful and the area around Explore Park could be a bit more refined.
- The portage around the damn IS difficult and the water is often to low. The portage around the damn would be better on the other side of the river. Putting in below the rapids
- This area is great, other than some maintenance and safer walk ways to the water it is always a fun spot to float and enjoy a day on the river.
- This has always been an adventure, though as I get older it becomes more challenging. Always a fun time.
- This survey is dysfunctional. The instructions are not clear. It is confusing, asking a question and then not providing proper options.
- Way too much trash
- While the capture of debris above the dam at the booms is great, there needs to be regular clean-out to prevent it from being washed downstream during high water events, and better high-water capture. I have property along the river below the dam (edge of SML) so I see what all floats by during high water events.

Niagara Recreation – Cumulative Results for Tinker Creek Canoe Launch

Survey Location:



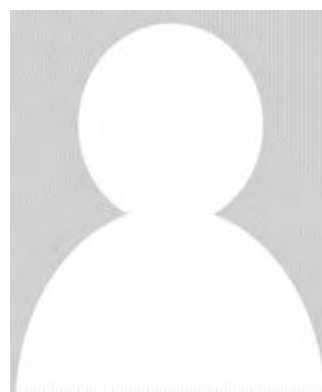
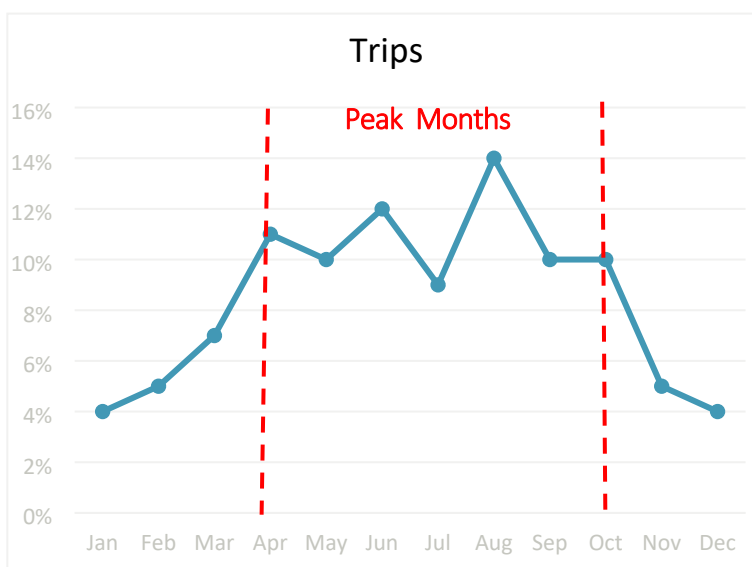
From **April 2020 to October 2021** there were **13** respondents from **Tinker Creek Canoe Launch**. Overall, **13%** of the responses came from this location.

These respondents answered questions about their use of the recreation facilities. This data is collected to support the Federal Energy Regulatory Commission (FERC) relicensing process and is on-going.

Predominately **74%** of the survey respondents come from three zip code locations, which are about **5** miles away from the Project. **93%** consider themselves to be regular visitors to the area, with at least 3 or more visits per year and an average length of stay of **4** hours.

54% of the respondents were male, and **46%** were female. **73%** of the respondents were between the ages 40 and 59.

The most frequent months visited are April through October with August being the highest visited months.

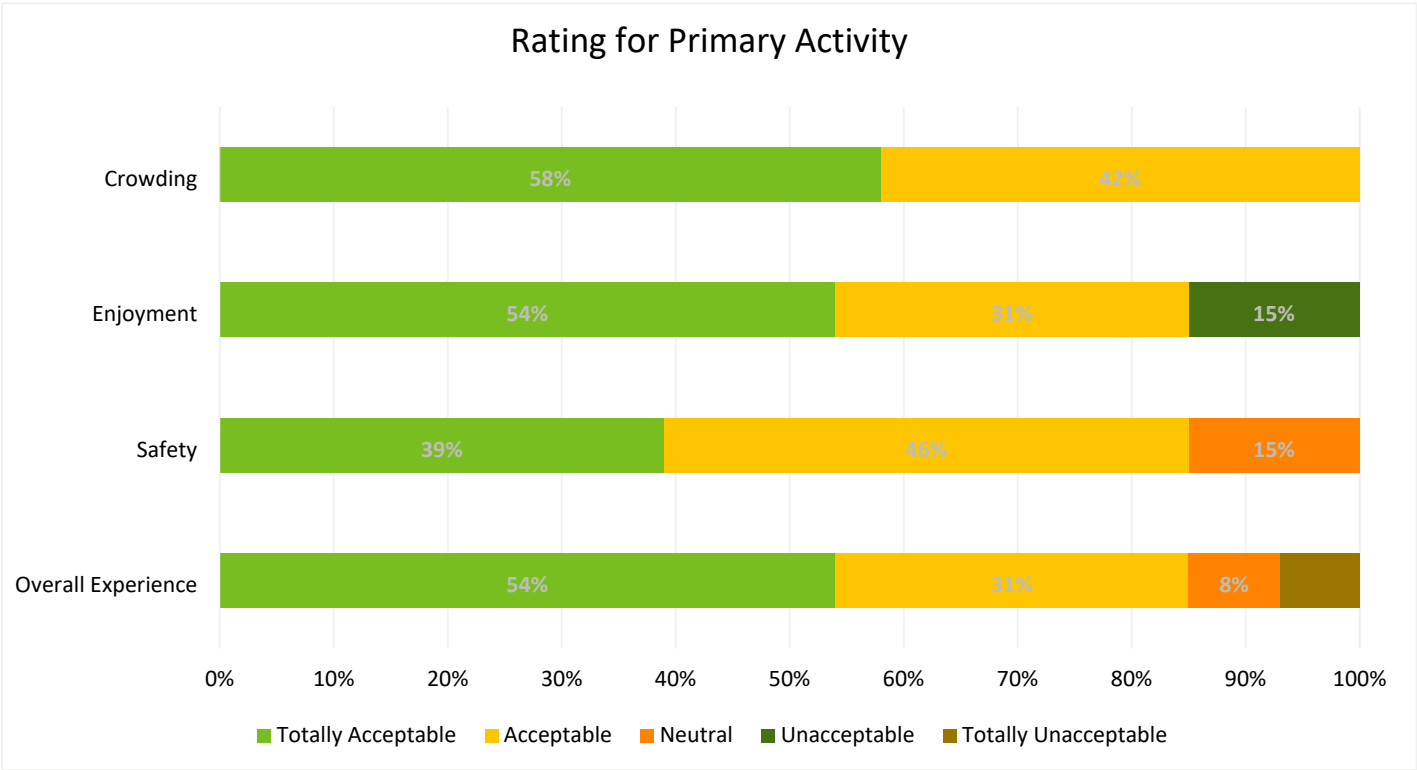
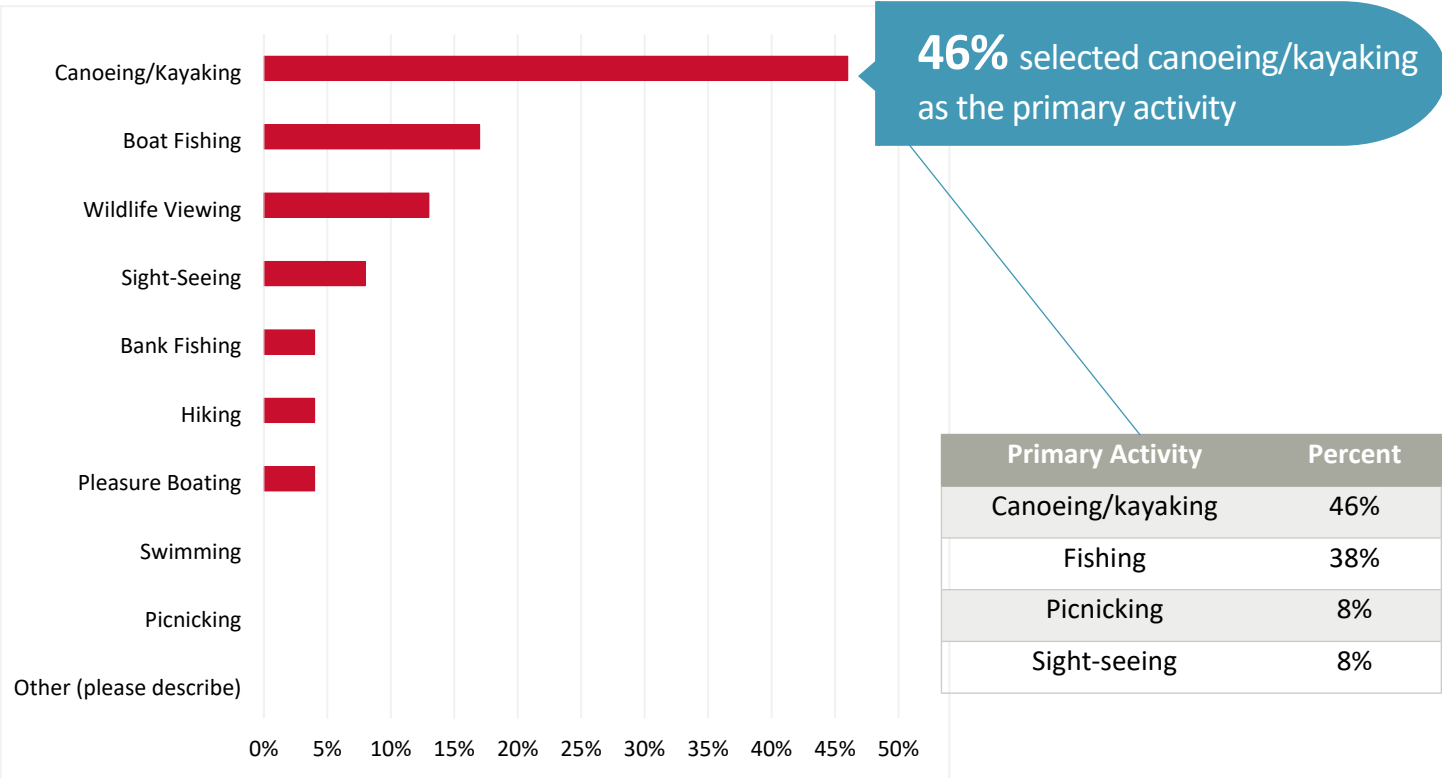


- Zip code of most frequent visitors: **24012, 24014 & 24179**
- Average # of visits per year are **19**
- Average miles traveled: **5**

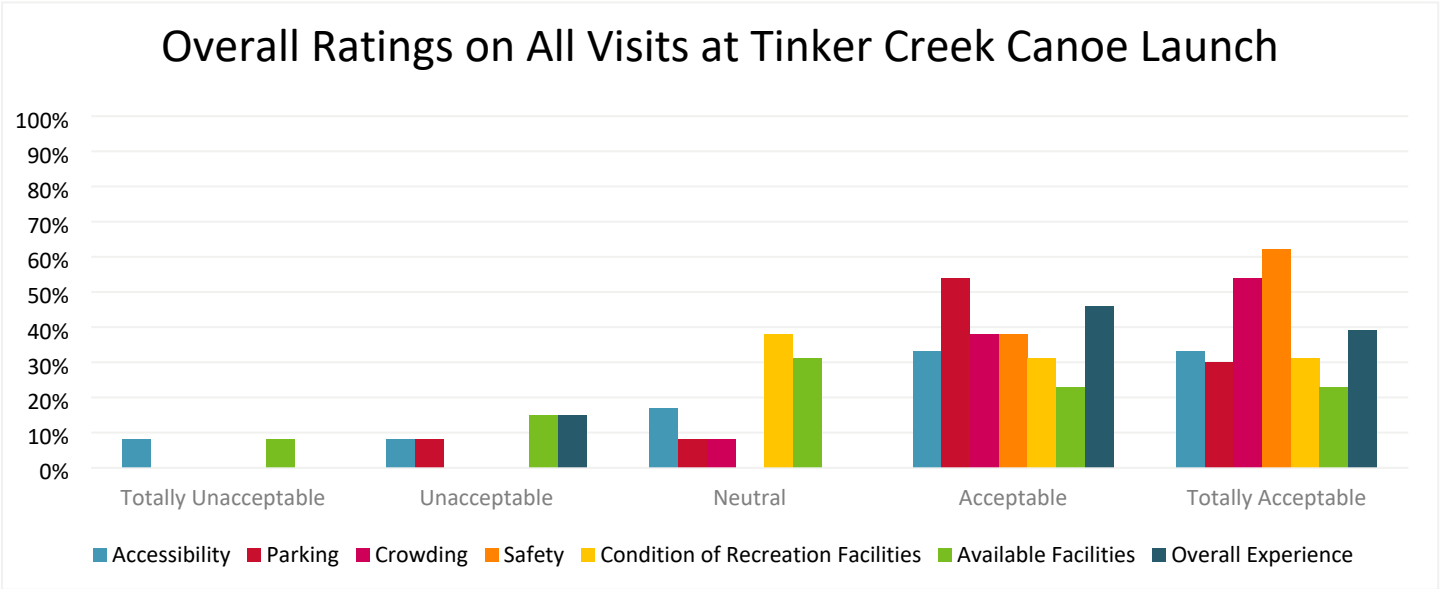
100% of respondents were *not* staying overnight in the Niagara Project area.

Niagara Recreation – Cumulative Results for Tinker Creek Canoe Launch

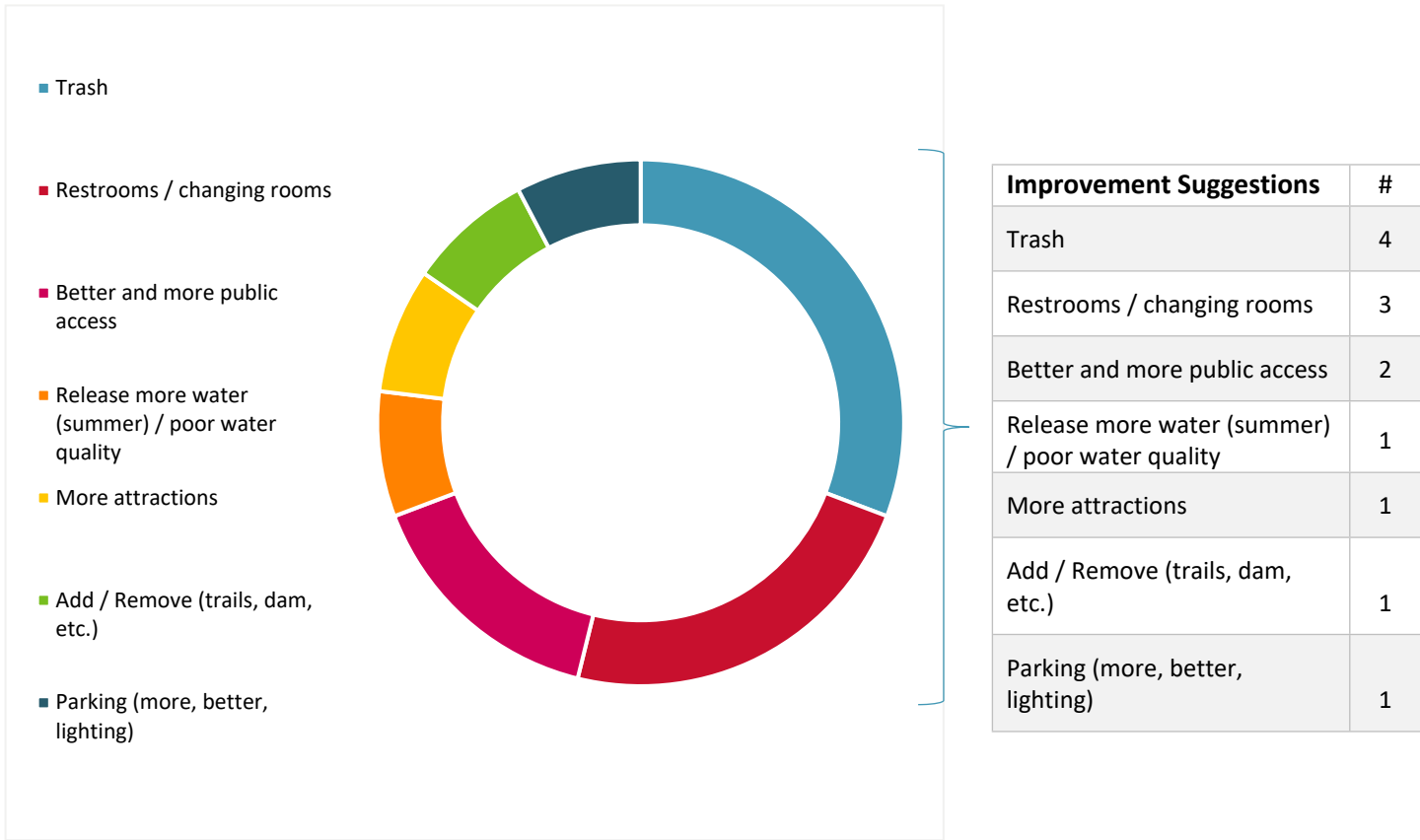
Activities Participated on Trip:



Niagara Recreation – Cumulative Results for Tinker Creek Canoe Launch



Suggested Improvement Responses from Tinker Creek Canoe Launch:



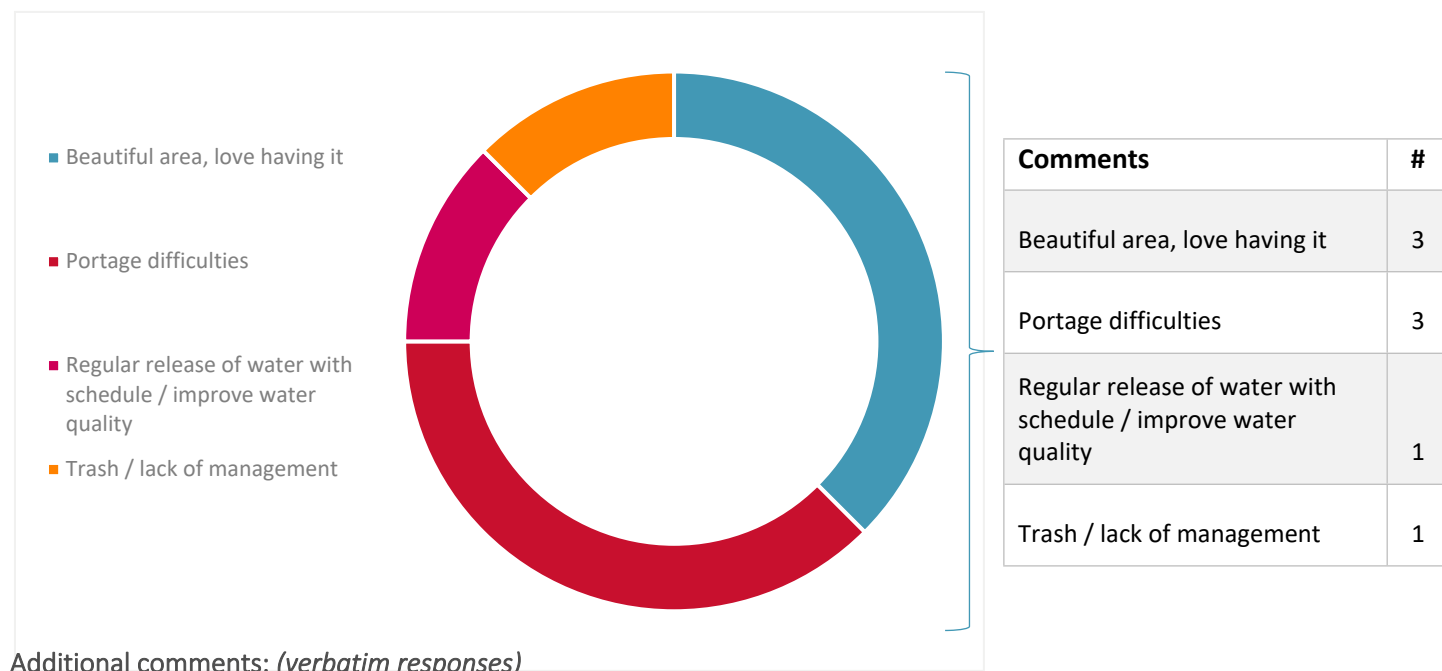
Niagara Recreation – *Cumulative Results for Tinker Creek Canoe Launch*

Type(s) of recreation facilities or improvements respondents believe are needed and at what specific location(s) at the Niagara Project: *(verbatim responses)*

<ul style="list-style-type: none"> Anything to attract more visitors!! I live about a mile up above the dam!
<ul style="list-style-type: none"> Better access for fisherman.
<ul style="list-style-type: none"> Not allowed to get in the water
<ul style="list-style-type: none"> Portajohn
<ul style="list-style-type: none"> Removal of Niagara Dam
<ul style="list-style-type: none"> Water quality and/or trash improvements; Removal of the large number of tires that are falling in from the closed landfill just downstream of the Blue Ridge Parkway on river right; Removal of trash in the gorge
<ul style="list-style-type: none"> I'd love to see trash maintenance volunteer days. We noticed lots of litter caught in the trees along the river after rising waters from a storm.
<ul style="list-style-type: none"> Regular controlled releases of water would be awesome. A better portage option.
<ul style="list-style-type: none"> Bathroom... picnic tables
<ul style="list-style-type: none"> Improve Parking
<ul style="list-style-type: none"> Portable toilet at Vinton canoe launch

Niagara Recreation – Cumulative Results for Tinker Creek Canoe Launch

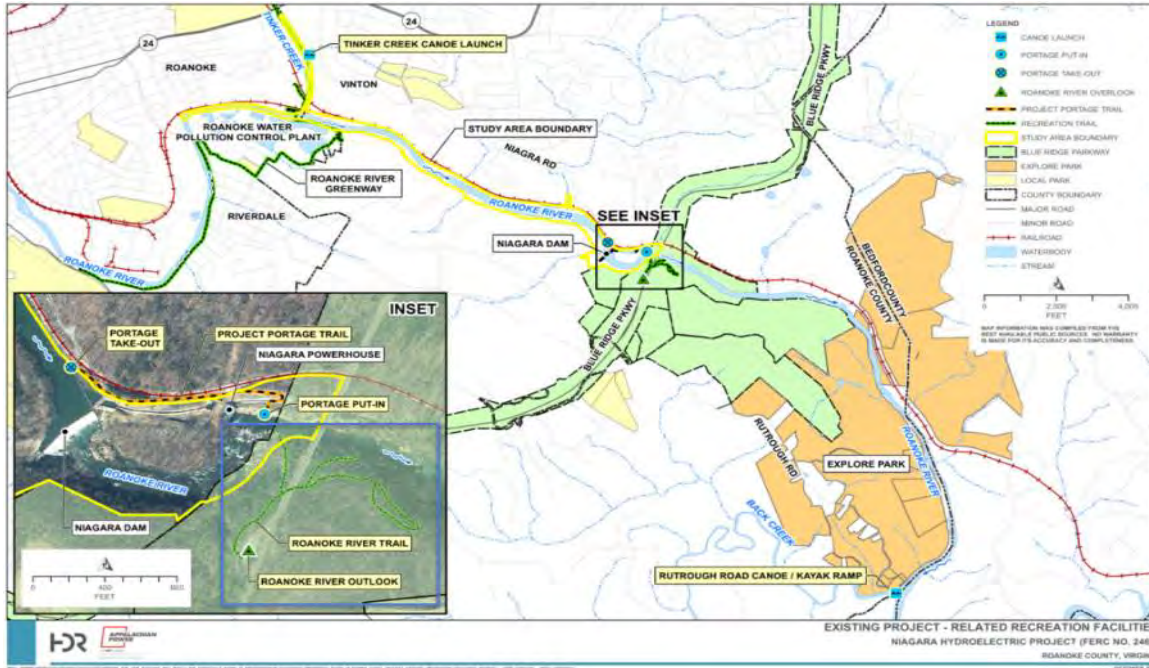
Additional Comment Responses from Tinker Creek Canoe Launch:



<ul style="list-style-type: none"> Great asset for the valley
<ul style="list-style-type: none"> I go to either Tinker Creek and paddle flatwater to the dam and back or go to the Blue Ridge Parkway access and paddle to Explore Park. I go many times a year between these two locations. Each is a jewel. Water quality is the biggest problem. Also, the portage at Niagara Dam is rough - the takeout often has deep floating garbage and the walk is not short. It would be helpful to have a portage on River Right also for whitewater boaters to more easily access the good rapids between the dam and the powerhouse.
<ul style="list-style-type: none"> Looks nice
<ul style="list-style-type: none"> Very beautiful place!! A lot of people do not know about it!!
<ul style="list-style-type: none"> I hope this kayak launch will remain! It's such a great location for us!
<ul style="list-style-type: none"> A trash collecting mechanism would be great too.

Niagara Recreation – Cumulative Results for Roanoke River Trail / Overlook

Survey Location:



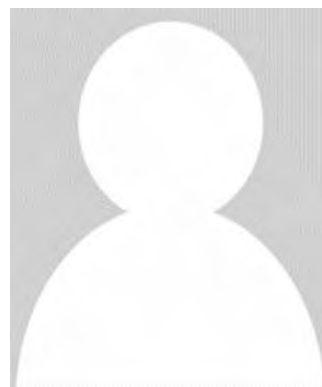
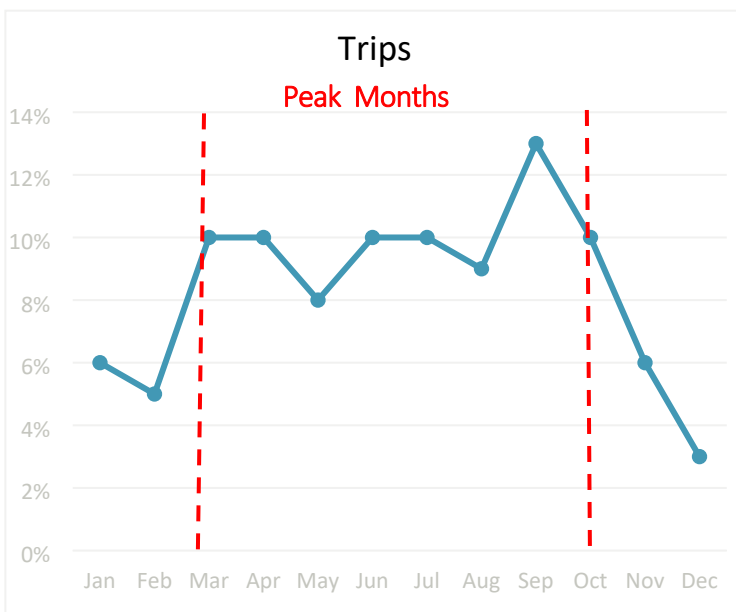
From **April 2020 to October 2021** there were **28** respondents from **Roanoke River Trail / Overlook**. Overall, **26%** of the responses came from this location.

These respondents answered questions about their use of the recreation facilities. This data is collected to support the Federal Energy Regulatory Commission (FERC) relicensing process and is on-going.

50% of the survey respondents come from four zip code locations, which average about **15** miles away from the Project. **82%** consider themselves to be regular visitors to the area, with at least 3 or more visits per year and an average length of stay being **2** hours.

Males made up **71%** of the respondents. **88%** of respondents were between the ages of 40 and 69.

The most frequent months visited are March through October, with September being the highest visited month.



- Zip codes of most frequent visitors:

24014, 24018, 24065 & 24153

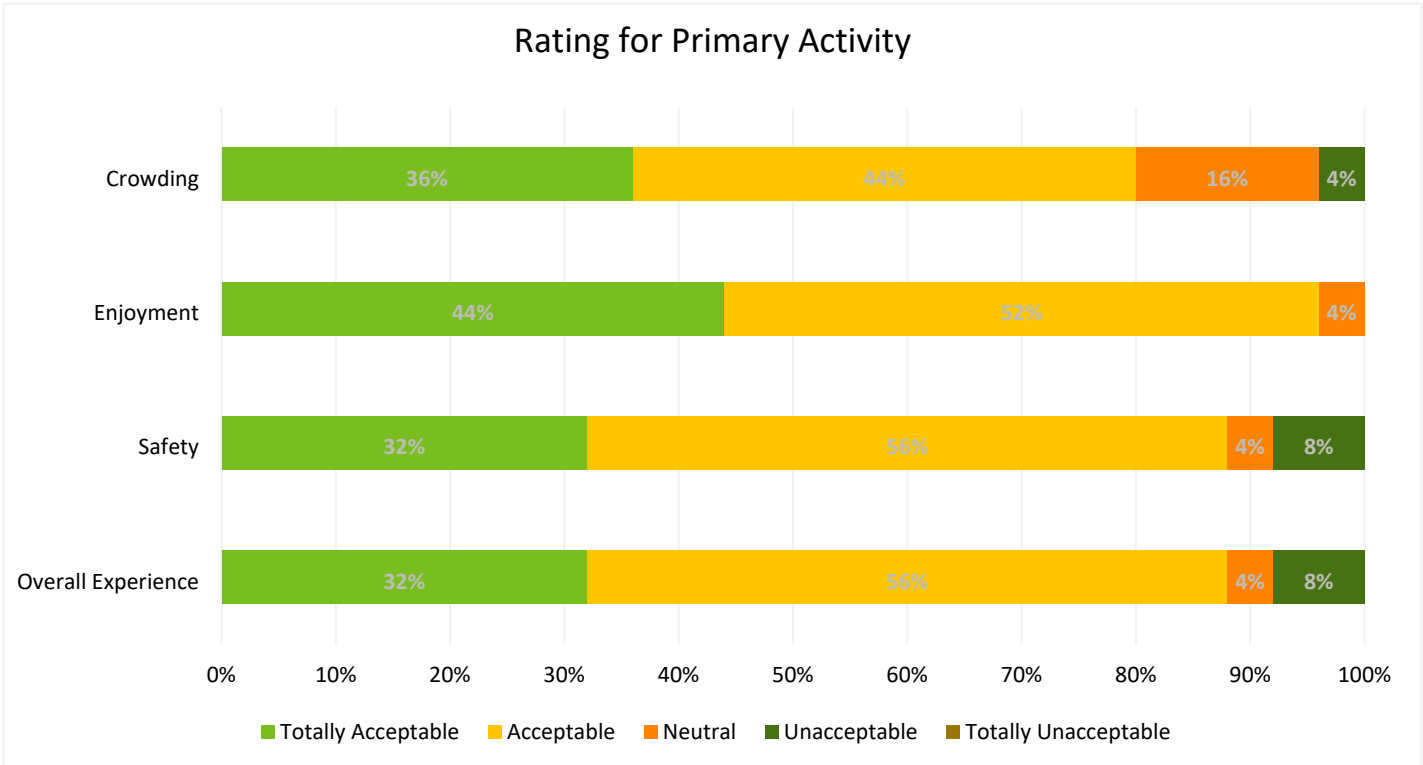
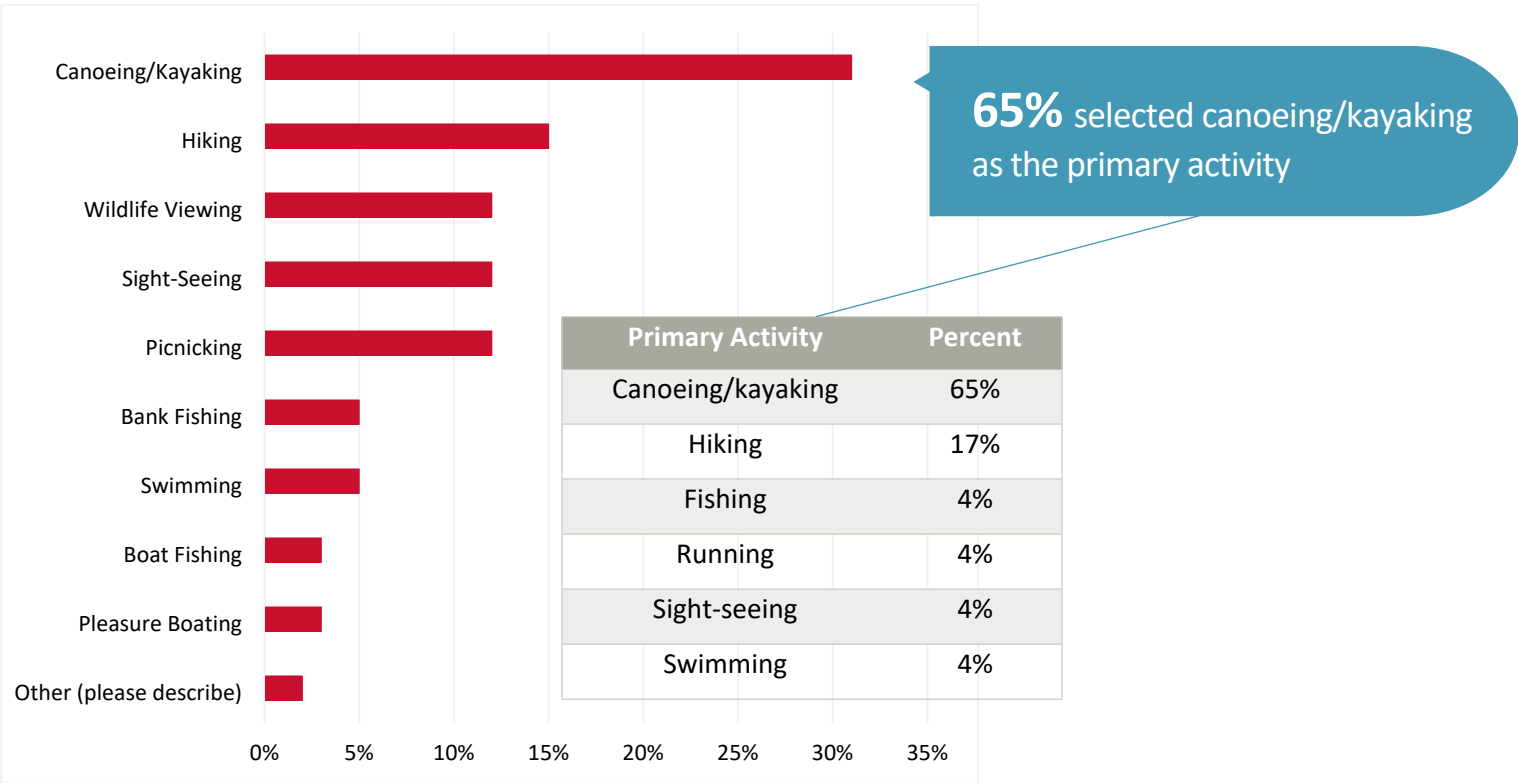
- Average # of visits per year are **9**

- Average miles traveled: **33**

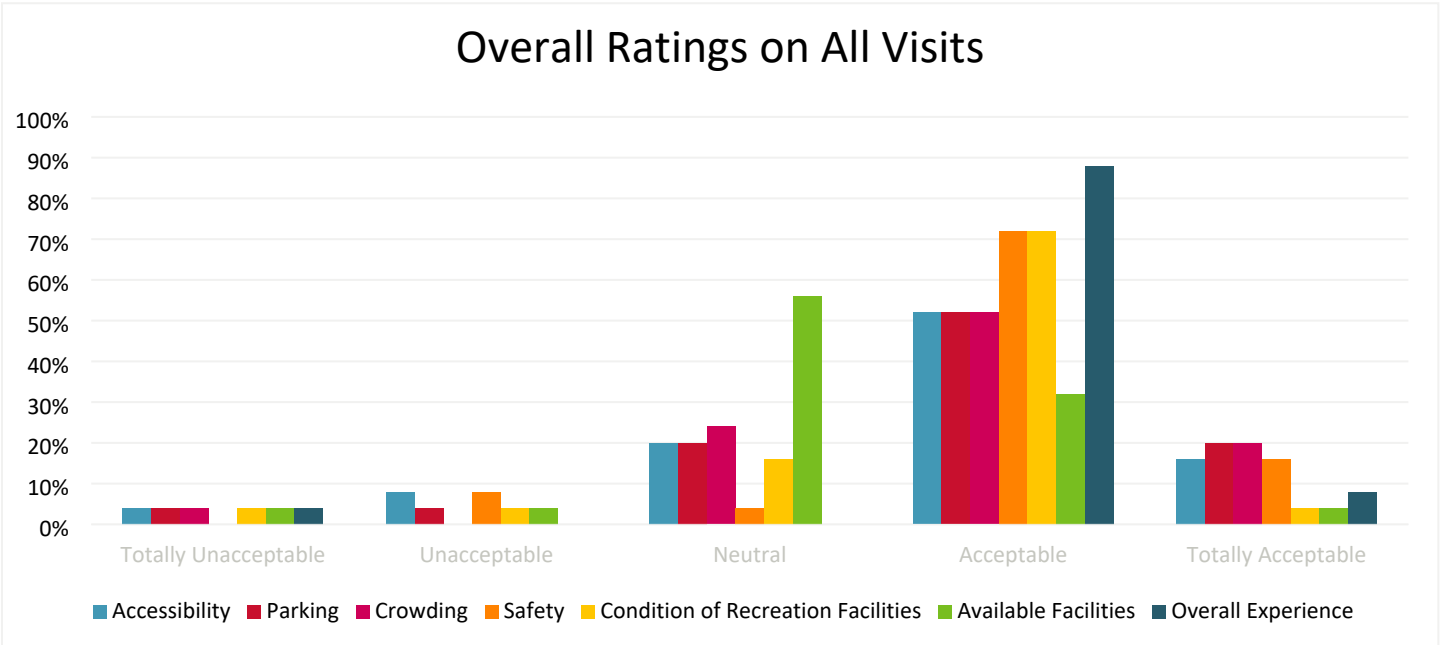
92% of respondents were not staying overnight in the Niagara Project area. Of those staying overnight, **50%** were staying at a vacation or rental home and **50%** were a guest at a private home.

Niagara Recreation – Cumulative Results for Roanoke River Trail / Overlook

Activities Participated on Trip:



Niagara Recreation – Cumulative Results for Roanoke River Trail / Overlook



Suggested Improvement Responses from Roanoke River Trail / Overlook:



Niagara Recreation – Cumulative Results for Roanoke River Trail / Overlook

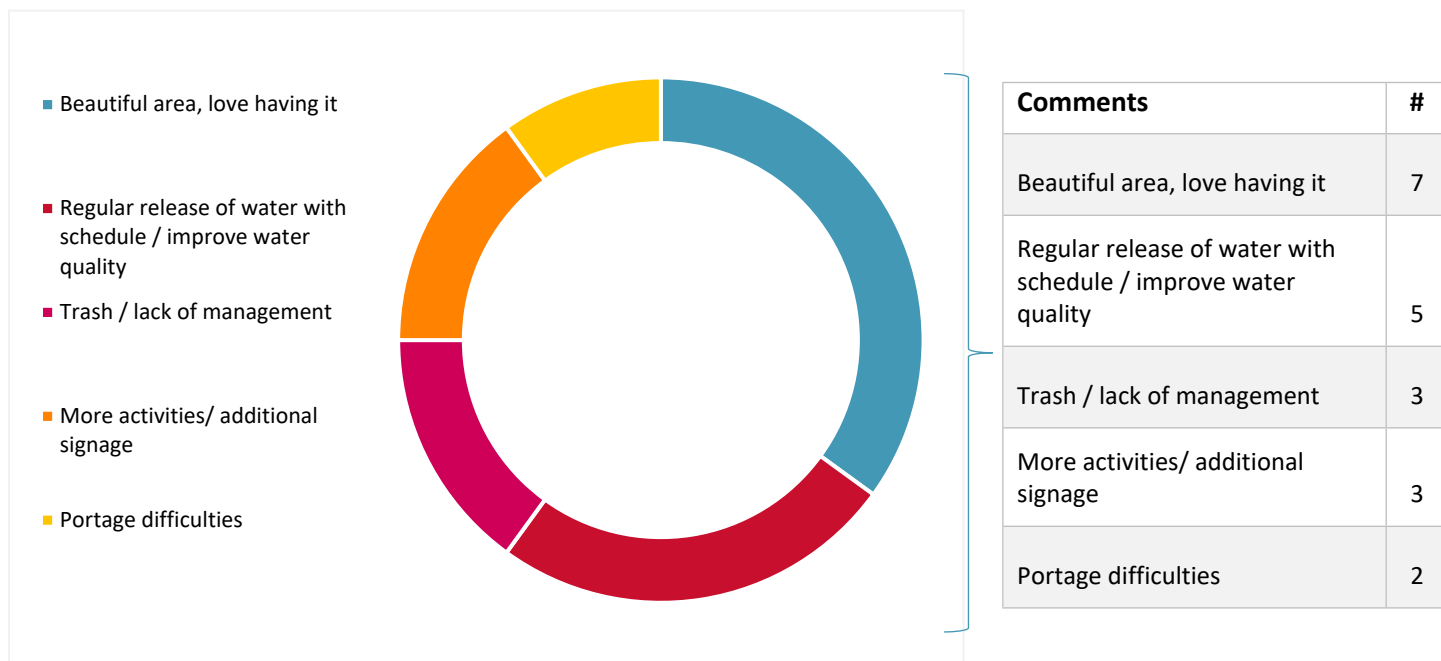
Type(s) of recreation facilities or improvements respondents believe are needed and at what specific location(s) at the Niagara Project: *(verbatim responses)*

<ul style="list-style-type: none"> Any chance we can clean the water up?
<ul style="list-style-type: none"> Better boating access at Niagara Dam
<ul style="list-style-type: none"> Better canoe/kayak access from the Blue Ridge Parkway, especially a route to the base of the dam so the rapids above the powerhouse can be run. Also I may have missed it, but if there is a way to access the portage route from the parkway that would be desirable, as that put-in may be less steep than the one from the other side of the bridge.
<ul style="list-style-type: none"> Bike trail would be nice.
<ul style="list-style-type: none"> Dam releases during low water summer months
<ul style="list-style-type: none"> General litter pick up along the river banks should be systemically addressed.
<ul style="list-style-type: none"> Good for me!
<ul style="list-style-type: none"> More access points, ? Open up to put in take out vendors
<ul style="list-style-type: none"> more parking
<ul style="list-style-type: none"> Need scheduled water releases for paddling in the summer. Need a trail to access the rapids in river between the powerhouse and the dam.
<ul style="list-style-type: none"> Notice of any intentional water releases, and doing them during commonly usable freetime (e.g., weekends, or later afternoons) would be nice
<ul style="list-style-type: none"> On line accessible hydro release schedule for the power house.
<ul style="list-style-type: none"> Parking at both the put-in (Roanoke River Overlook) and take-out (Explore Park) is limited. Extreme wish list: an easily accessible whitewater park on this stretch
<ul style="list-style-type: none"> Parking other than the Blue Ridge Parkway lot
<ul style="list-style-type: none"> Recreational dam release dates would be a large driving factor in bringing folks out who tend to take care of and respect the areas in which they play. Restrooms and / or changing room facilities would also better accommodate for various recreational opportunities. The topography of the area also beckons for additional trails to allow for mountain biking travel in addition to the current hiking trails. This could, again, bring yet another crowd in that seems to care for areas that they recreate in.
<ul style="list-style-type: none"> Scheduled releases for the Roanoke river gorge for kayaking
<ul style="list-style-type: none"> show Tinker Creek Greenway trail on your map. ADA facilities are non-existent. Lack of public restroom facilities. Poor NPS type informational and wayfinding signs. Lack of bank fishing opportunities.
<ul style="list-style-type: none"> Summer time release of Niagara dam
<ul style="list-style-type: none"> Toilet facility at NPS put-in and Rutrough take out. More parking at Rutrough if use increases. There's a lot of trash on this River run, which was the primary reason I scored the experience as less enjoyable. LOVE having the RRG as a local kayaking resource.

Niagara Recreation – Cumulative Results for Roanoke River Trail / Overlook

- Trash clean-up/removal at Rutrough Point - along banks.
- -Regular releases sufficient to kayak, especially on weekends
-Trail needed to the base of the dam area in order to put in a boat upstream of one of the best rapids. If you put in at the parkway bridge you miss this rapid.
-better parking, possibly a separate area for boaters, possibly on the other side of the parkway bridge from the current overlook area.

Additional Comment Responses from Roanoke River Trail / Overlook:



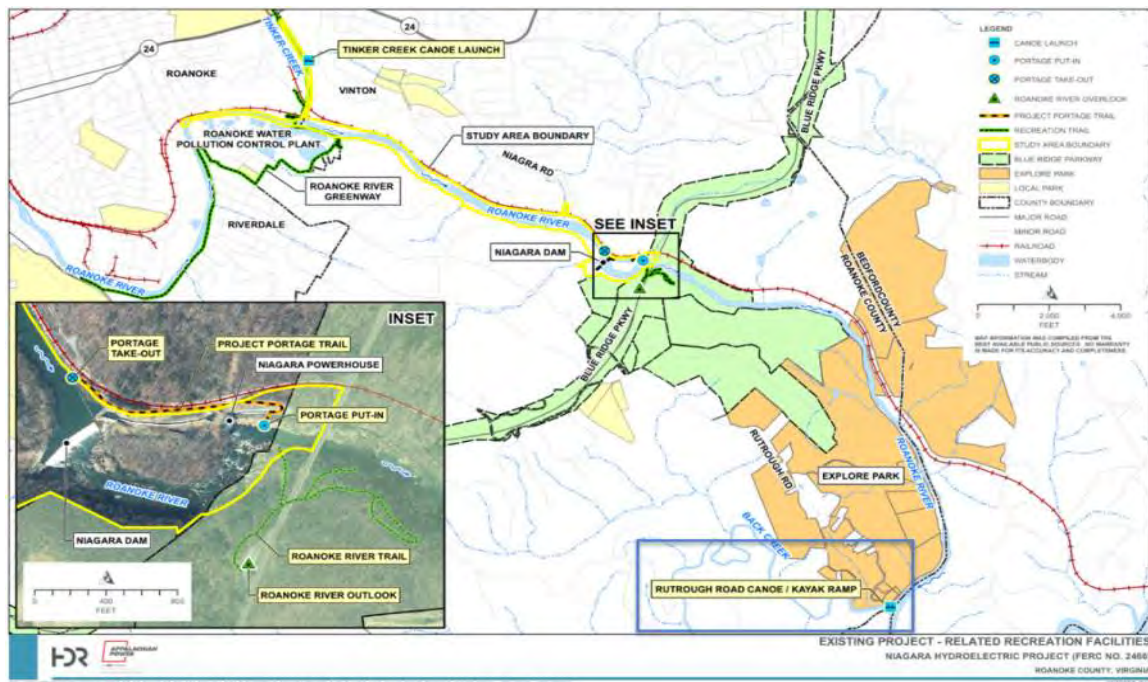
Additional comments: (*verbatim responses*)

- Great place to have in Roanoke. Would love to see releases more often.
- Its a cool area and the locals would love there to be an investment but the water needs to get cleaned up first.
- Like to stop the litter bugs!
- Such a beautiful area should have a host of activities to be enjoyed by all! Fishing and biking is great but the opportunities are ample! Especially with explore park in such close proximity, the two provide great terrain for boating, zip lining, mountain biking, hiking, and much more. The trails already in place could also use some more interpretive features such as signage at unique species and vistas to explain the importance of each and educate the public on caring for them.

<ul style="list-style-type: none"> • The lack of any release schedule, makes it very difficult to plan canoe and Kayaking outings at the project.
<ul style="list-style-type: none"> • The river rapids between the dam and powerhouse are much underutilized for recreation. Some regular water releases in this bypass section and access trail would greatly improve utilization.
<ul style="list-style-type: none"> • There's a lot of trash on this River run, which was the primary reason I scored the experience as less enjoyable. I LOVE having the RRG as a local kayaking resource and would love to see some summer releases.
<ul style="list-style-type: none"> • This is a nice stretch of whitewater and an asset to the community. Every effort should be taken to preserve it and maintain access for the community.
<ul style="list-style-type: none"> • This is the best in-town run for boaters who want a lap after work and is underutilized by the community due to conditions/trash and accessibility
<ul style="list-style-type: none"> • Wonderful urban whitewater asset accessible most of the year. With additional signage, programming, and engagement from the region, this could be a more publicly enjoyed amenity and thus help the region address public health and economic development weaknesses.
<ul style="list-style-type: none"> • Would love to see a recreational focus on portage improvements to promote connectivity between the city blueway, and the river, Explore park, and SML below the dam. What about portage river-right an option? That would be shorter, and put users at the "bypass reach" (?) for smoother continuous use of water by kayakers, tubers, canoeists, etc., and improve a trail for times when the reach is too shallow. Apco owns land around the SW edge of the dam, and appears to be ample room. I would think some public money could be made available to assist with it. Looks like some safety measures would have to be implemented to prevent inadvertent drifting over the dam and spillway in the SW corner. I leave the technical discussion for later, but perhaps a safety-buffered 'raceway' that is usable other than during high water to get safely near the dam prior to exit, but which would be submerged during flooding, protected from floating debris, etc., at times when access would be deemed closed due to high water anyway. A short trail then winding down to the bypass reach? A 'flume' for canoes and kayaks, to get them down to the waterway below, would be cool, but I imagine that would be too involved and present too many liability issues, especially if there were any chance of them being ridden by people. In the alternative, keeping the old portage, then a better system for use of boat toting rigs, including some sort of return system so that borrowing one doesn't mean walking another 1/2 mile to return it, then go back to the river below the dam. Or perhaps some sort of narrow boat-dragging lane with fake grass or some other non-damaging surface, with minimal friction, to drag a boat along the 1/4 mile route? The lake was once an active social area with row boats, etc. Would be nice to see it revived as a well-functioning part of the Roanoke River Blueway.
<ul style="list-style-type: none"> • I fully enjoy the recreation of this area - please don't take any action to alter any part of it or remove any part of it in any way.

Niagara Recreation – Cumulative Results for Rutrough Point

Survey Location:



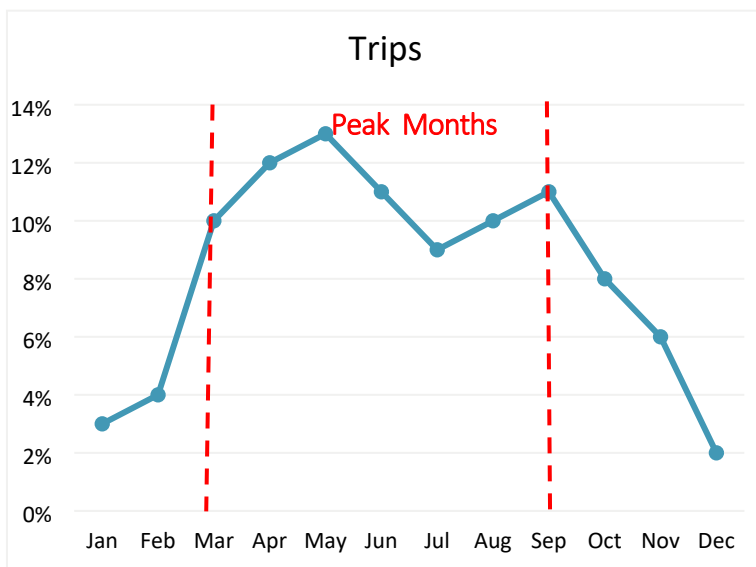
From **April 2020 to October 2021** there were **26** respondents from **Rutrough Point**. Overall, **25%** of the responses came from this location.

These respondents answered questions about their use of the recreation facilities. This data is collected to support the Federal Energy Regulatory Commission (FERC) relicensing process and is on-going.

31% of the survey respondents come from two zip code locations, which average about **8** miles away from the Project. **85%** consider themselves to be regular visitors to the area, with at least 3 or more visits per year and an average length of stay of **3** hours.

Males made up **73%** of the respondents. **93%** of respondents were between ages 30 and 69.

The most frequent months visited are March through September with May being the highest visited month.



- Zip codes of most frequent visitors: **24014 & 24015**

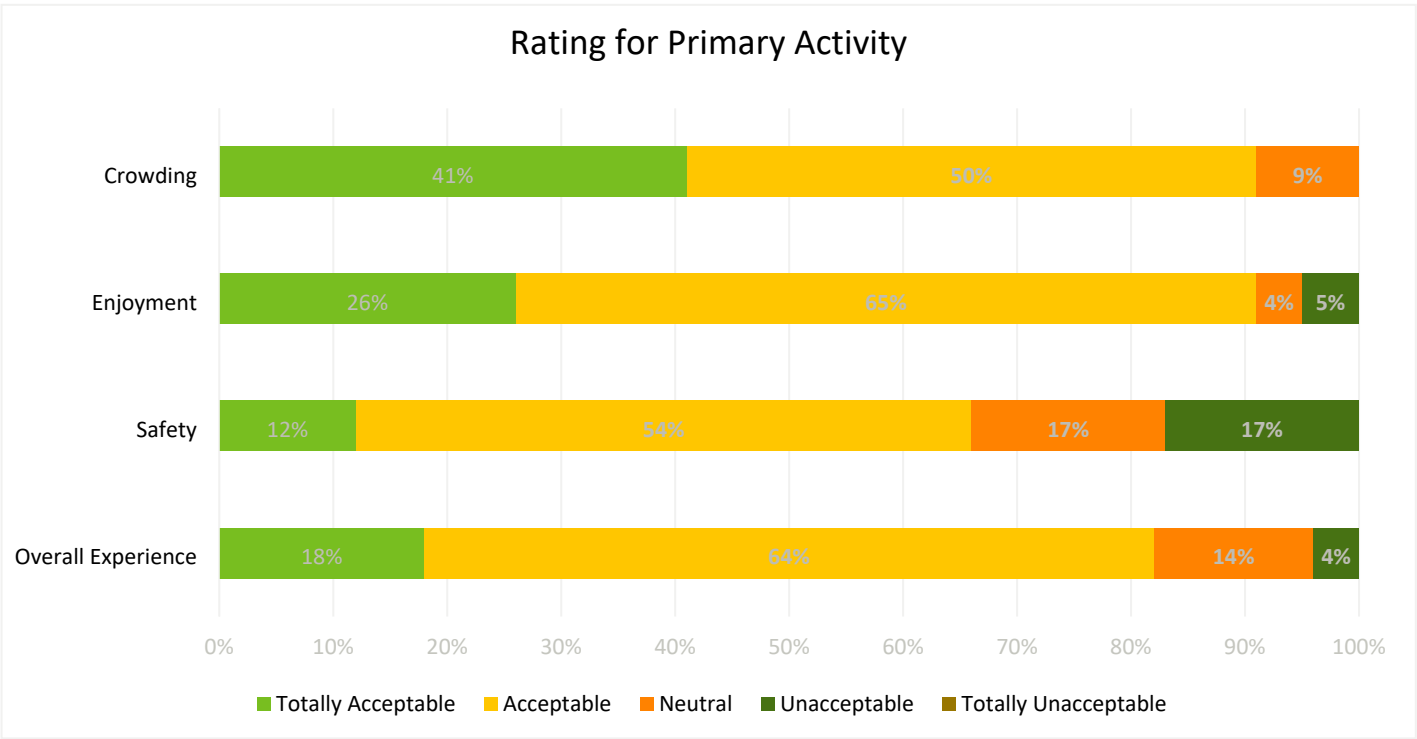
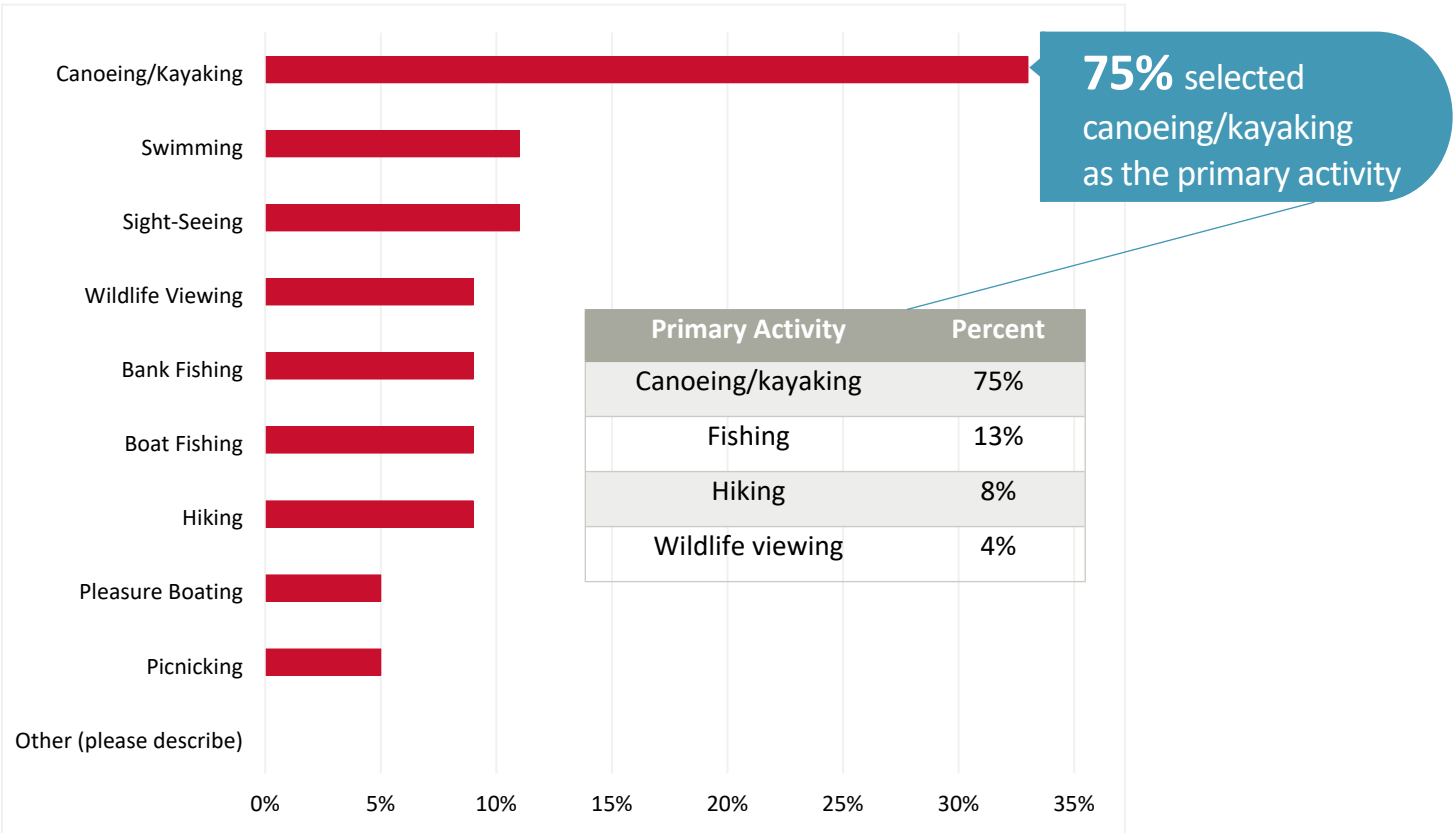
- Average # of visits per year are **10**

- Average miles traveled: **22**

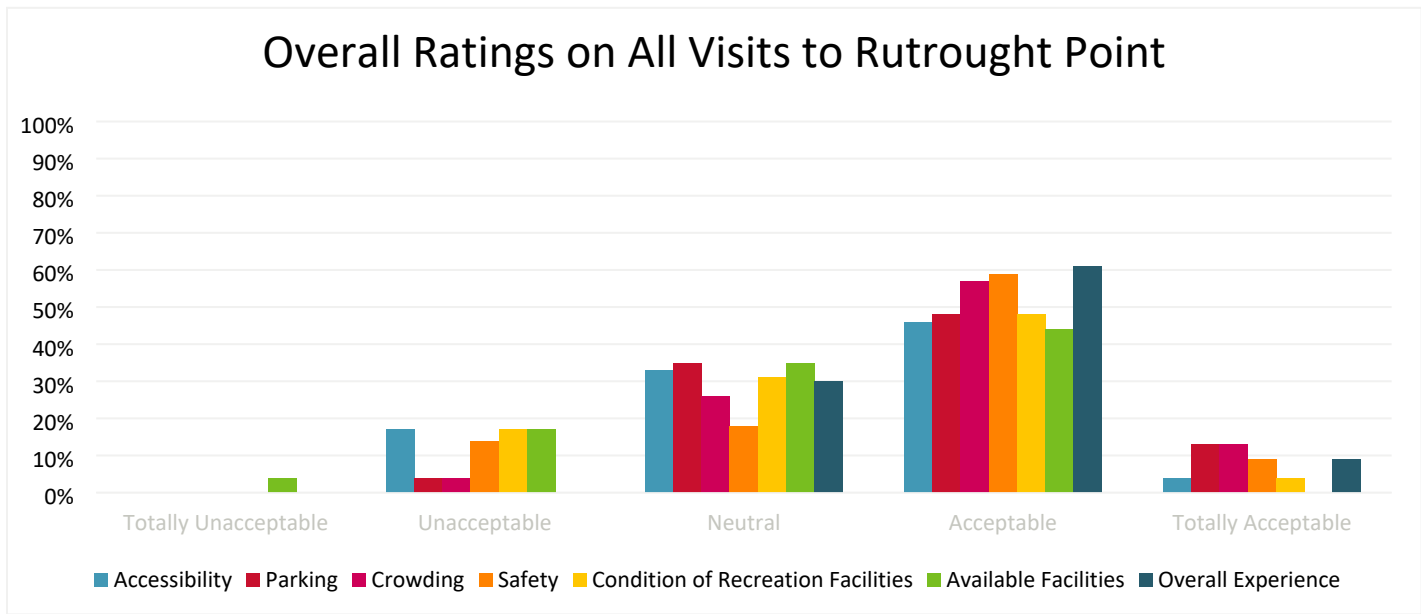
92% of respondents were not staying overnight in the Niagara Project area. Of those staying overnight, **50%** were staying at a vacation or rental home and **50%** were a guest in a private home.

Niagara Recreation – Cumulative Results for Rutrough Point

Activities Participated on Trip:



Niagara Recreation – Cumulative Results for Rutrough Point



Suggested Improvement Responses from Rutrough Point:



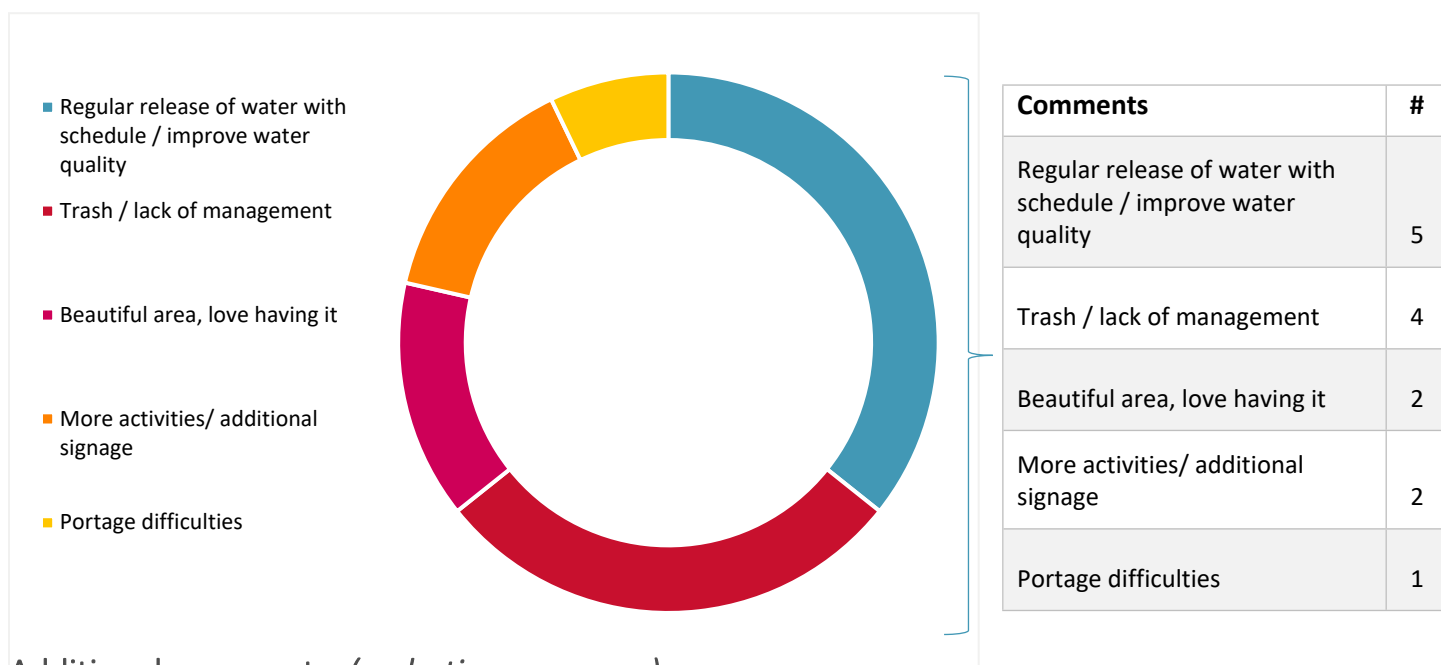
Niagara Recreation – *Cumulative Results for Rutrough Point*

Type(s) of recreation facilities or improvements respondents believe are needed and at what specific location(s) at the Niagara Project: *(verbatim responses)*

<ul style="list-style-type: none"> Online accessible hydro release schedule. The lack of any hydro release schedule, and recreational releases on weekends and other times during the summer, makes it very difficult to plan canoe and Kayaking outings at the project.
<ul style="list-style-type: none"> A quality boat ramp would be nice, especially for people my age & older as well as disabled persons so we can access a unique fishery that is pretty much inaccessible to those other than the young and physically fit individuals.
<ul style="list-style-type: none"> Alter the site to create a whitewater park
<ul style="list-style-type: none"> Boat ramp improvements. The banks are difficult.
<ul style="list-style-type: none"> It would be nice to have some type of system that would make it easier to get kayaks from the parkway parking lot to the river. The stairs are pretty difficult.
<ul style="list-style-type: none"> More parking area at Rutrough rd. and more acco for fishing.
<ul style="list-style-type: none"> more public access throughout the entire Project area
<ul style="list-style-type: none"> Planned river releases are needed to ensure the river is at an acceptable level for recreational whitewater kayaking
<ul style="list-style-type: none"> Play wave
<ul style="list-style-type: none"> Release water! Its a great paddling resource but is only usable after rains. Release water, get more people on the river
<ul style="list-style-type: none"> Rutrough Boat Launch needs major improvement. It is a mud hole and difficult for a lot of people who are not familiar with it.
<ul style="list-style-type: none"> Rutrough Point: Park benches. No parking in the culdesac. Remove the old house.
<ul style="list-style-type: none"> Safer entry into water for boating. Toilets. Road improvement near the end.
<ul style="list-style-type: none"> Scheduled water releases, or at least 1 or 2 days notice; and some kind of trash collection at the dam- perhaps a boom. Being downstream from Roanoke means lots of trash along the river.
<ul style="list-style-type: none"> The installation of a surf wave or two on the Roanoke River between the dam and Rutrough Point is needed. Also, a bathroom or vault toilet is needed at Rutrough Point. Changing facilities at Rutrough Point would also be welcomed.
<ul style="list-style-type: none"> Water quality is poor through the river in this area. We could use more regular flow (release from the dam) in the summer and better water quality (clean up the wastewater treatment plant).
<ul style="list-style-type: none"> kayak ramp that is separate from fishing area parking
<ul style="list-style-type: none"> Stop flooding the river below it creates a safety issue.
<ul style="list-style-type: none"> Rutrough needs portajohns and brew pub needs a pavilion

Niagara Recreation – Cumulative Results for Rutrough Point

Additional Comment Responses from Rutrough Point:

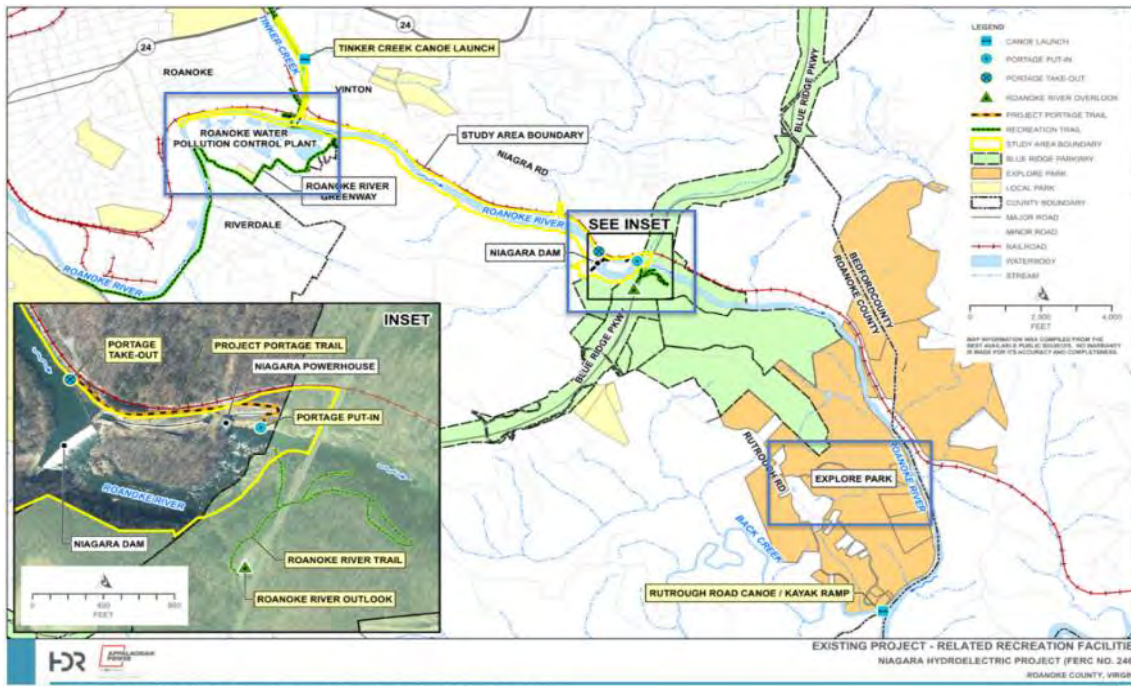


Additional comments: *(verbatim responses)*

<ul style="list-style-type: none"> It is a beautiful area for a picnic also.
<ul style="list-style-type: none"> My only complaint is the amount of trash on the banks and hanging in the trees.
<ul style="list-style-type: none"> Needs more water
<ul style="list-style-type: none"> On line accessible hydro release schedule for the power house. The lack of any release schedule, and recreational releases on weekends and other times during the summer, makes it very difficult to plan canoe and Kayaking outings at the project.
<ul style="list-style-type: none"> Recreation is a popular and important draw for this area and lots of people enjoy the Roanoke River through this area. Continued recreation and opportunity for portage should be a priority.
<ul style="list-style-type: none"> Regular summer releases would be key here. Work with the WVWA to clean up the wastewater treatment plant so the water quality is better.
<ul style="list-style-type: none"> The recent improvements are very nice and hope to see more in the future. Thanks
<ul style="list-style-type: none"> Trash clean up efforts need to be in the forefront. Also heavy fines for those caught littering. Too much trash on the banks. Also, we need more facilities. Fish cleaning station. Picnic areas etc.
<ul style="list-style-type: none"> At many visits we have had conflicts with people who are fishing that are blocking entry and exit to the water. Getting in and out can be slippery and would be dangerous for some people that are not physically fit.

Niagara Recreation – Cumulative Results for “Other” Locations

Survey Location:



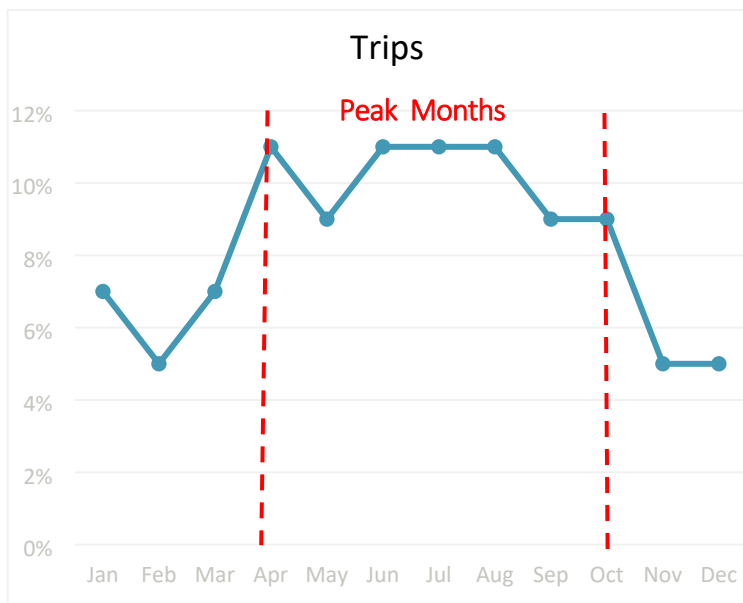
From **April 2020 to October 2021** there were been **9** respondents from **“Other” locations (not assessed by the Recreation Study)**. Overall, **8%** of the responses came from other locations.

These respondents answered questions about their use of recreation facilities outside of the Project area or not assessed by the Recreation Study. This data is collected to support the Federal Energy Regulatory Commission (FERC) relicensing process.

There was no predominate zip code location for the survey respondents. **90%** consider themselves to be regular visitors to the area with at least 3 or more visits per year and an average length of stay of **3** hours.

56% of the respondents were male, and **44%** were female. **77%** of the respondents were in their between the ages of 30 and 49.

The most frequent months visited are April through October with April, June, July and August being the highest visited months.



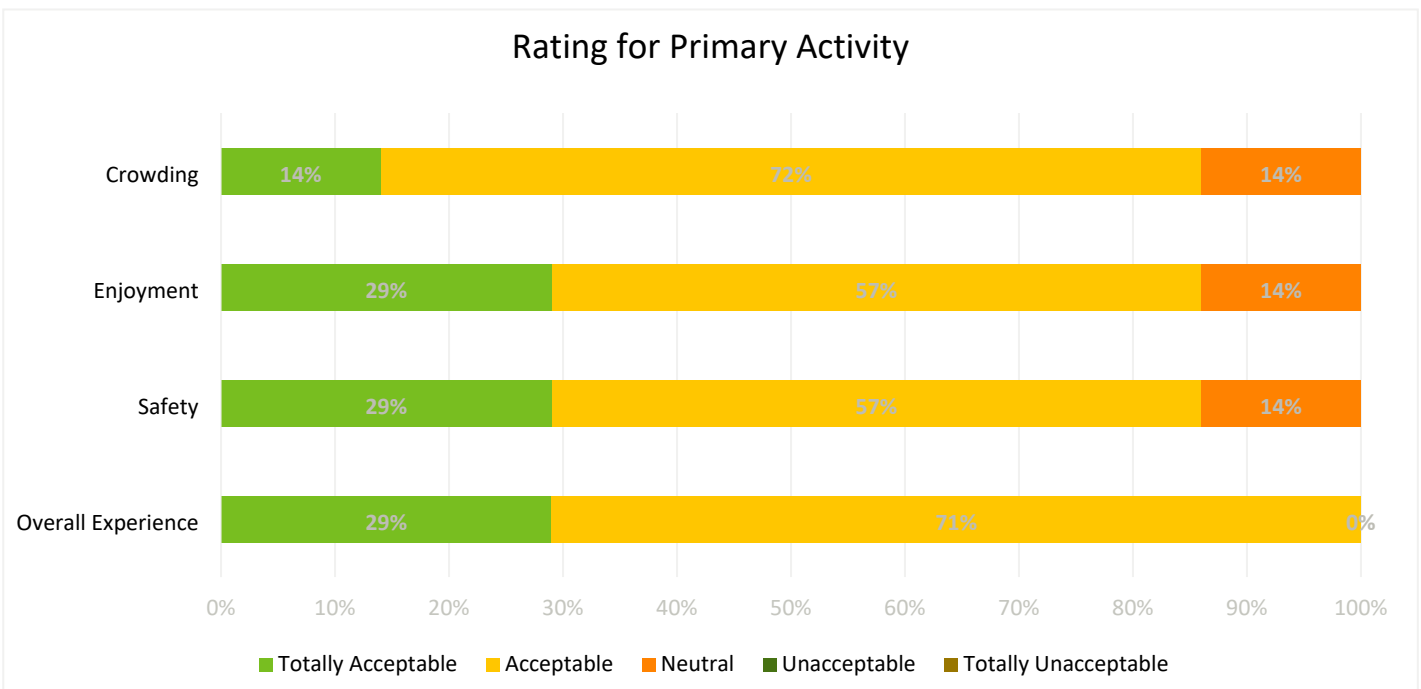
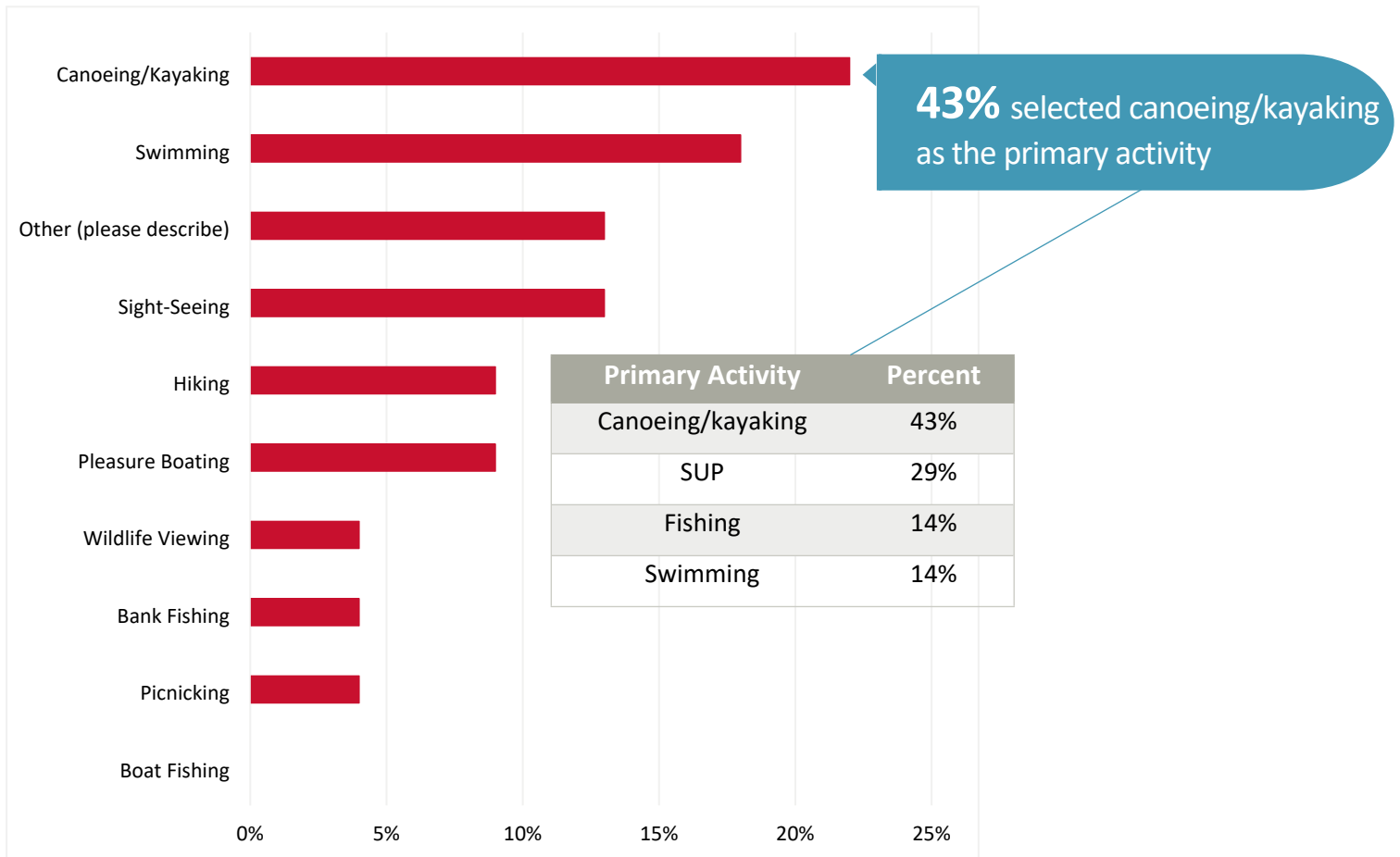
- Average # of visits per year are **20**

- Average miles traveled: **52**

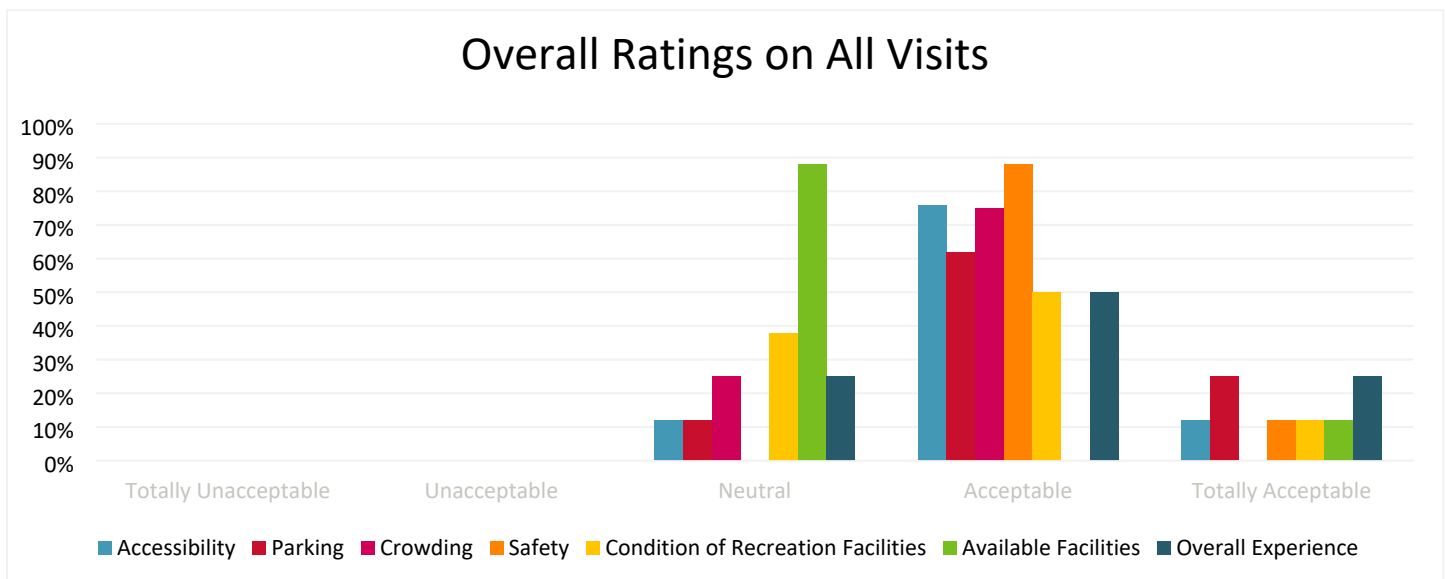
87% of respondents were not staying overnight in the Niagara Project area. Of those staying overnight, all were staying at a vacation or rental home.

Niagara Recreation — Cumulative Results for “Other” Locations

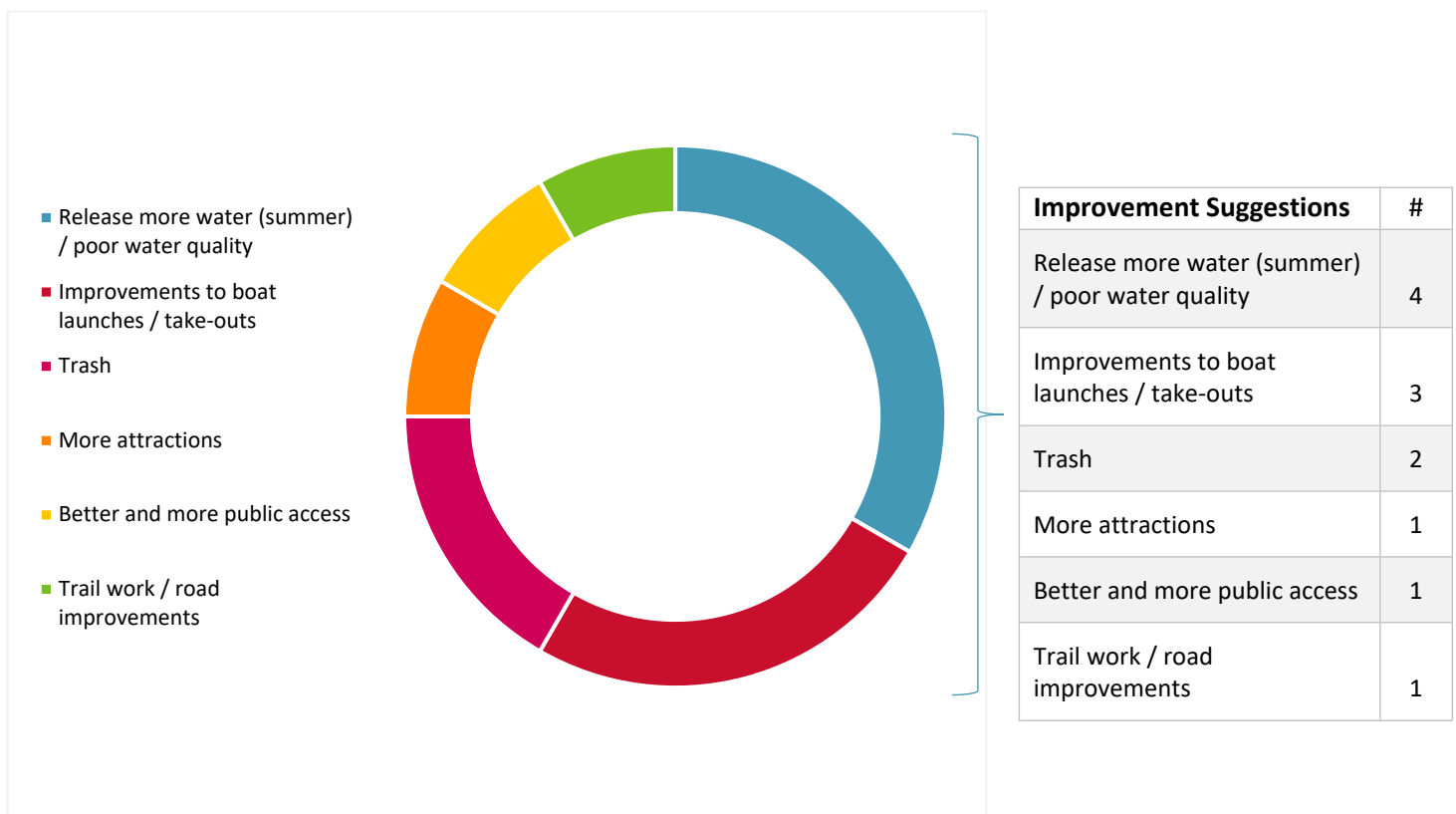
Activities Participated on Trip:



Niagara Recreation – Cumulative Results for “Other” Locations



Suggested Improvement Responses from Other locations:

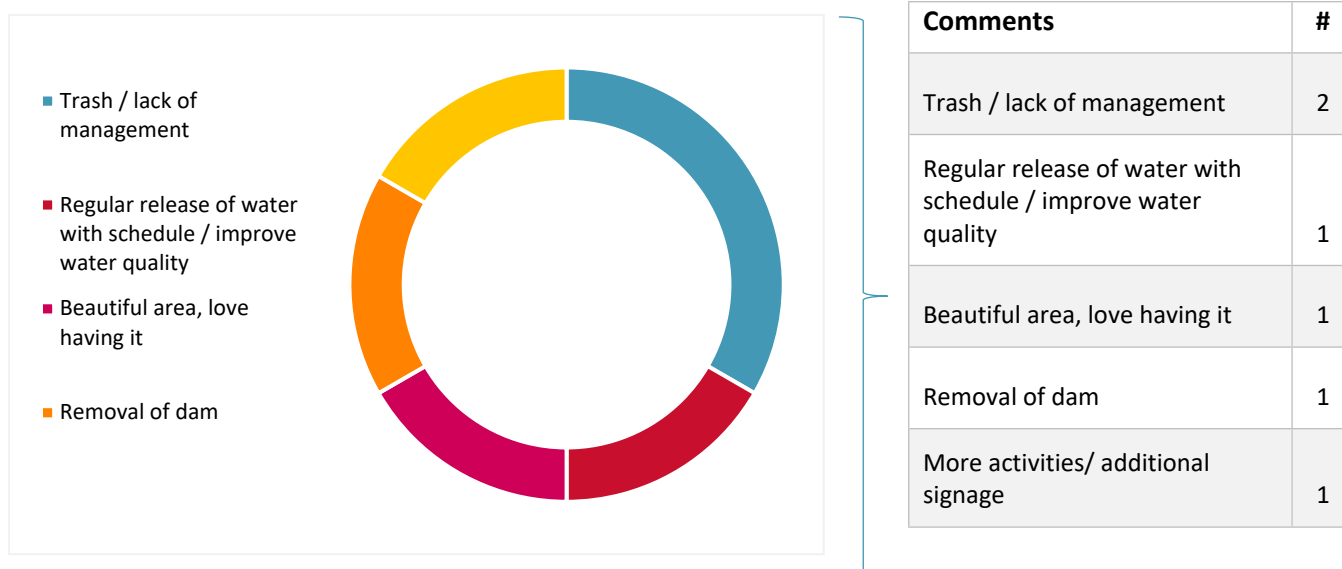


Niagara Recreation — Cumulative Results for “Other” Locations

Type(s) of recreation facilities or improvements respondents believe are needed and at what specific location(s) at the Niagara Project: *(verbatim responses)*

<ul style="list-style-type: none"> Cell signal at blue mountain adventures
<ul style="list-style-type: none"> Enhanced access at various locations. Thanks
<ul style="list-style-type: none"> Recreational releases of water during weekends in the summer are would dramatically improve paddling through the Roanoke Gorge.
<ul style="list-style-type: none"> Separate boat launch and fishing areas. Trash receptacles near fishing areas. Scheduled water releases for recreation. Water clean up projects/ shore cleanup projects.
<ul style="list-style-type: none"> Summer dam releases!!
<ul style="list-style-type: none"> There should at minimum be a safe portage trail around the dam. It may also be out of the scope of the project, but a riverside trail that goes from Rutrough rd all the way up to the Blue Ridge Parkway would be a wonderful way to access the river gorge below. There is already a lot of trail that goes about halfway up the gorge in Explore Park, so it would be a simple extension.

Additional Comment Responses from Other locations:



Additional comments: *(verbatim responses)*

<ul style="list-style-type: none"> I think there would be great interest in having a calendar of recreational releases in the gorge for the whitewater community. It could be as simple as one weekend a month from June-August, depending on water levels behind the dam. It could do a lot for aquatic life downstream and improve fish habitat as well. Also, as a side note, the gorge below the dam is FULL of trash. I realize its downstream of Roanoke, but every tree along the banks is full of junk from highwater events and there is a lot of larger trash that has been discarded from behind the landfill like tires and appliances.
<ul style="list-style-type: none"> Ideally, the dam should be removed to improve paddling and fishing throughout the entire Roanoke River corridor.
<ul style="list-style-type: none"> Really appreciate the work that is going into the area and hope to see continued improvements.

**NIAGARA HYDROELECTRIC PROJECT
(FERC NO. 2466)
RECREATION STUDY**

**Attachment 7:
Notes from Meetings with Various Stakeholders**

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<u>AMANDA MCGEE, ROANOKE VALLEY ALLEGHANY REGIONAL COMMISSION (RVARC) - REGIONAL PLANNER III - FEBRUARY 26, 2020</u>	<u>3</u>
<u>JAMES REVERCOMB, ROANOKE MOUNTAIN ADVENTURES, OWNER - MARCH 5, 2020 .</u>	<u>4</u>
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Renee Powers, City of Roanoke Parks and Recreation - Trails and Greenways Coordinator - February 19, 2020

- Existing portage needs upgrades at take-out and put-in.
- Porta-john at portage would be a plus.
- Kayakers prefer segment of Roanoke River from powerhouse downstream to Rutrough Road access as compared to reservoir above Project Dam.
- Parking area above Project dam would allow for “Family Friendly” paddling while also benefitting those paddling downstream of powerhouse since better and shorter road access than to Rutrough Road.
- Kayakers currently access Roanoke River from NPS Fishing Trail although difficult. Canoeists rarely utilize the trail for access due to the difficulties encountered.
- Alternate portage route would be nice but current portage trail is adequate except for the take-out and put-in conditions.
- Distance from Tinker Creek access to Rutrough Road access is good for day trips by kayakers and canoeists.

Liz Belcher, Roanoke Valley Greenways Coordinator - February 21, 2020

- Along with discussions, Liz Belcher and Frank Simms walked potential pathways for a canoe portage along south side of Project reservoir, spillway, and bypass channel. From the field survey made, it appears that it would be possible to construct an alternative canoe portage to that which exists. However, the resulting route would likely be longer than the existing portage and require significant amounts of work. The alternative portage could be part of any loop trail to be built by Roanoke County in conjunction with NPS.
- Existing trail, although long, considered good except for condition of take-out and put-in.
- Roanoke County has usage numbers for scheduled floats putting in from the existing canoe portage to the Roanoke River downstream of the Project powerhouse.
- Paddling distance from Tinker Creek access to Rutrough Road access considered good for day trip.
- NPS Blueway Planning Document may be good resource of general information.
- Option of paddling from parking area at south abutment of Project spillway to existing canoe portage take-out and then proceeding along portage to put-in at Roanoke River downstream of powerhouse is feasible but not preferable to existing situation.
- Kayakers definitely prefer river segment downstream of Project powerhouse. Slack water portion of Roanoke River created by Project reservoir is not preferred.
- Porta-john at existing portage would be a welcome improvement.
- Status of existing agreement between Roanoke County and APCO regarding access to canoe portage for scheduled floats unknown.

**Amanda McGee, Roanoke Valley Alleghany Regional Commission
(RVARC) - Regional Planner III - February 26, 2020**

- There are no governing plans or documents followed for the development of the Roanoke River Blueway. One reference utilized is the American Canoe Association (ACA) Guidelines. VDGIF may have some requirements.
- The Blueway Committee has a list of goals. James Revercomb may have access to that list.
- Information resources regarding the recreation activities along the Roanoke River include: (1) James Revercomb – Roanoke Mountain Adventures; (2) Bill Tanger – Friends of the Roanoke River; (3) Scott Smith – VDGIF; and (4) Back Country Outfitters in Roanoke.

James Revercomb, Roanoke Mountain Adventures, Owner - March 5, 2020

- There are no guidelines or directives being followed for the development of the Roanoke River Blueway. Mr. Revercomb is a member of the Roanoke River Blueway Committee. Development of access points is based upon properties being made available. The primary goals and objectives of the Blueway Committee are: (1) continue to promote recreation on the Roanoke River; (2) improve signage; and (3) improve access points. The Blueway Committee is in the process of updating its website.
- Roanoke Mountain Adventures rents kayaks and paddleboards to the public. They also provide transport to Rotary Park in Salem, Va. for half-day trips from the park to Roanoke Mountain Adventures located in the Wasena neighborhood in Roanoke. Individuals also launch at 13th Street access, Tinker Creek access in Vinton, and the bridges access near Carilion Hospital.
- Launching from the Tinker Creek access is done by a small percentage of equipment renters who paddleboard and kayak on the Niagara Project reservoir since it provides a tranquil water surface. In general, the individuals launching from the Tinker Creek access return to that location. Very few individuals utilize the canoe portage at Niagara Dam to continue downstream of the dam and powerhouse. Tinker Creek access is utilized somewhat as a take-out point for those launching at the launch sites upstream of Tinker Creek.
- Roanoke Mountain Adventures has data for at least the past five years for paddleboard and kayak rentals. That information according to Mr. Revercomb will provide information on how recreation on the Roanoke River has increased but will not reflect usage of the Project reservoir and canoe portage. In general, equipment renters are young couples, families, and groups of friends. He believes that approximately 50% of the in-water equipment renters are from outside the Roanoke area.
- Mr. Revercomb believes that the biggest challenge to canoeing/kayaking on the Roanoke River is debris, both upstream and downstream of the Project dam and powerhouse.
- Regarding the canoe portage around the Project facilities, the condition of the take-out and put-in needs to be improved. In addition, the length of the portage is an issue. Provision of a restroom facility would be a benefit.

- Mr. Revercomb believes that there should be improvements to the interface between the Greenways and the Blueway.
- Mr. Revercomb believes that although there is canoeing on the Roanoke River, the river is more conducive to kayaking.
- In his own opinion, Mr. Revercomb believes that a take-out above the Project spillway is not a key need. He believes that removal of debris in that area is needed more than the providing of a take-out at that location.
- Mr. Revercomb stated that efforts to improve in-water recreation in the vicinity of the Niagara Project should focus on the segment of the Roanoke River from the end of the Roanoke Trail at the Blue Ridge Parkway to the Rutrough Road Canoe/Kayak Access. That 3-mile segment of the Roanoke River is considered unique since it represents one of only two gap sections of river in Virginia. As part of those efforts, improvements to the Rutrough Road Access are needed. The take-out has a muck bottom which should be hardened. In addition, individuals fishing at the take-out impede use of the launch. Fishing should be restricted from that area.
- Mr. Revercomb stated that the Rutrough Road access receives significant usage. He has witnessed numerous individuals with kayaks descending the stairs at the Roanoke Trail to launch just below the Project powerhouse in order to enjoy paddling the 3 mile stretch of the Roanoke River to the Rutrough Road Access. Most of those descending the steps do not believe that the descent is too difficult.

Pete Peters, Town of Vinton, VA (Manager) - January 6, 2021

- The Roanoke River Blueway Committee was formed approximately eight years ago to promote and coordinate recreation on the Roanoke River. The Blueway Committee is currently working on informational kiosks to be placed at access points, installing mileage signs along the river, and identifying additional access sites. Typically, they look for available public property.
- The primary recreational activities on the Roanoke River within and near the Project Boundary for the Niagara Project consist of paddling, fishing on the river, bank fishing, and hiking.
- The development of Explore Park downstream of the powerhouse for the Project has had a considerable impact on recreation activities along the Roanoke River. As an example, tubers accessing the river from Explore Park and floating downstream to the Rutrough Road access. Tubes are available to the public from a vendor at Explore Park.
- The Roanoke River downstream of the Project powerhouse is very popular particularly for kayakers. At higher flows, usage increases since the higher flows provide a whitewater type experience. Kayakers put-in at the end of the Fisherman's Trail from the Blue Ridge Parkway. The stretch of the Roanoke River from the described put-in to where tubes are launched at Explore Park can be difficult for inexperienced kayakers. The remaining portion down to the Rutrough Road take-out generally has less turbulent flow and thus is popular with tubers.
- Numerous individuals fish from the rocks at the end of the NPS Trail. Sunbathing is also popular in the same area.
- The reservoir for the Project powerhouse is not as popular for paddling as the section below the powerhouse. However, there is a significant amount of boat fishing and bank fishing.
- Individuals who launch from the Tinker Creek access typically paddle on Tinker Creek and the Project Reservoir and then return to the Tinker Creek launch. Paddling upstream is minimally difficult but does present some obstacles.
- The take-out and put-in at the existing canoe portage need to be improved as does signage. In addition, the public needs to be better informed regarding boating on the Project Reservoir. There apparently is confusion as to the reservoir being available to use by the public. Improvements to the existing portage along with educating the public about use of the reservoir and portage

could result in increased activities on the reservoir thus increasing use of the Tinker Creek and Rutrough Road accesses.

- Having a porta-john provided at the canoe portage is not considered necessary since the portage is not a destination point. A porta-john at the Rutrough Road access would make more sense since it is a take-out/put-in site having an associated parking facility.
- Providing trash receptacles generally result in more trash at a site than if none provided. Having individuals take-out whatever they carry-in has proven to be a better approach to controlling trash.
- Due to the focus on water related activities, one project being investigated by Roanoke County is an in-river whitewater park located on the Roanoke River at Explore Park.
- Numerous individuals stop at the parking area for the NPS Fisherman's Trail to view the spillway and bypass channel for the Niagara Project. Flow over the spillway does provide a more aesthetically pleasant experience than when there is no flow over the spillway.

Bill Tanger, Chair, Friends of the Rivers of Virginia (FORVA) - January 12, 2021

- Mr. Tanger is aware that the pandemic could skew numbers for both 2020 and 2021 in either a positive or negative direction. He stated that Twin Rivers Rentals in Buchanan, Virginia may be a good resource regarding impacts on river recreation of COVID-19.
- The section of the Roanoke River from the Tinker Creek access to the Niagara Project dam has very limited recreation activity. Activities in that section are primarily bank fishing and some paddling by kayak, canoe, or paddle-board. Mr. Tanger believes that a take-out with parking above the south dam abutment would lead to more recreation in the described area. His belief is that individuals could take their canoes/kayaks out of the water at that location, load them onto their vehicles, and convey them to the Roanoke River Trail at the NPS Blue Ridge Parkway in order to paddle further downstream of the Niagara Project powerhouse.
- Mr. Tanger believes that the existing portage is too long. He suggests that some sort of way of conveying canoes/kayaks from the existing take-out to the existing put-in would be a benefit.
- According to Mr. Tanger, trails from the south dam abutment to the existing Roanoke River Trail would be a benefit as would a trail downstream of the Project powerhouse from the end of the Roanoke River Trail to Explore Park.
- Mr. Tanger believes that carrying canoes/kayaks down the stairs for the Roanoke River Trail is not difficult and that the stairs as currently exists is adequate.
- Signs are needed directing individuals to the Rutrough Road Access.
- Tubes are placed in the water at Journeys End at Explore Park. Those floating the Roanoke River from that location travel approximately three miles to the Rutrough Road Access.
- Mr. Tanger believes that the proposed fees to be mandated for boaters, kayakers, and canoeists utilizing VWR sites will cause increases to usage of other sites such as the Tinker Creek and Rutrough Road accesses.

Pete Eshelman, Roanoke Regional Partnership (Director) - January 15, 2021

- Tubers who access the Roanoke River at Explore Park typically take out at Journey's End in Explore Park upstream of the Rutrough Road access. The tubers park at Journey's End and are shuttled upstream to a put-in point.
- The canoe portage around Niagara Dam needs improvements to the take-out and put-in. Not having a road access to the portage available to the public is an issue to the users. At one time there was a cart that individuals could utilize to assist in hauling canoes and kayaks. To his knowledge, Mr. Eshelman believes that the portage is seldom used. One reason is that the general public appears to not readily know that the portage is available for their use.
- Canoeists and kayakers generally put-in at the end of the Roanoke River Trail and travel downstream to Journey's End at Explore Park. The take-out at Journey's end has become popular with the opening of the Brue Tavern nearby. Road access from the take-out at Journey's End to the parking area at the Roanoke River Trail is also shorter and more direct than if one takes their canoe or kayak out of the water at the Rutrough Road access.
- Most canoeists and kayakers enjoy the stretch of the Roanoke River downstream of the Niagara Project Powerhouse due to its having somewhat of a whitewater effect. The stretch of the Roanoke River upstream of the Project spillway has flat water which is utilized more by paddle boarders who put in at the Tinker Creek access. Those putting in at the Tinker Creek access then return to that location when done paddling. Canoeists and kayakers putting in at the access located upstream of the Project Reservoir near Carilion Clinic normally paddle the Roanoke River from that location and take out at 13th Street. They typically do not proceed onward to take out at the Tinker Creek access.
- Mr. Eshelman was aware of the plans by the National Park Service (NPS) to close the Blue Ridge Parkway including the parking area for the Roanoke River Trail in 2021 for approximately one year to allow for maintenance work to take place on the bridge over the Roanoke River. He did not know the exact dates for the closures. He also was not sure if NPS would attempt to preclude anyone from paddling below the work area. One way that could be accomplished would be to close the portage around the Niagara Project Powerhouse which could effectively close all boating activity through the stretch of the river from the powerhouse to Explore Park.
- Mr. Eshelman believes that providing a take-out on river-right above the Project spillway that included a parking area would be a benefit to river related activities.

The parking area could be accessible from local roads. If a trail were provided from the parking area to the existing Roanoke River Trail, that trail could then replace the existing portage and provide more recreation opportunity.

- Hauling canoes and kayaks down the steps at the Roanoke River Trail is difficult but is done quite often due to the popularity of that location being utilized for access to the river. Any kind of assistance such as a slide adjacent to the steps could be helpful.
- Trash in the river is a concern to those recreating on the river. However, the practice of “carry-it-in/take-it-out” is preferred to having trash receptacles at the access sites. Toilet facilities are not necessary at any of the access sites including the portage.
- Mr. Eshelman believes that there is significant support for controlled releases from the Niagara Project especially during the lower flow summer months. The releases would enhance the experience during prime recreation periods through the river below the Project powerhouse to Explore Park which is the closest and only whitewater type experience in the Roanoke area. The releases could also be a benefit to the waterpark being considered for Explore Park. Mr. Eshelman indicated that he would provide information to me for the waterpark feasibility study.
- Regarding aesthetics when comparing flow over the Project spillway to not having flow over the spillway, Mr. Eshelman believes that both situations are fine. The view of the spillway with its having a concrete face is as pleasing to him as having flow over the surface.

Holy Hart, Blue Mountain Adventures- February 23, 2021

- Meeting was held 10:00 am at Explore Park. The purpose of the meeting was to discuss the operations for Blue Mountain Adventures at Explore Park. Of particular interest was activities along the Roanoke River downstream of the Niagara Hydro Project.
- Blue Mountain Adventures primarily rents equipment for tubing and kayaking (inflatable kayaks) for a one-mile float starting one mile upstream of the take-out at Journey's End. There are future plans to extend the float downstream to Rutrough Point. Blue Mountain Adventures transports the tubers and kayakers to the upstream put-in.
- Some canoeists/kayakers that put in upstream of Explore Park do take out at Journey's End. However, the majority continue on downstream to Rutrough Point.
- Parking at Journey's End is currently free. However, Roanoke County is considering collecting money as done at Rutrough Point. The parking area is extensive. It is gravel and in good condition. According to Ms. Hart, parking by canoeists/kayakers not renting equipment from Blue Mountain Adventures is minor.
- The porta-john at Journey's End is available for use by the general public. There is consideration for adding another porta-john.
- Shuttle services can be provided to individuals not renting equipment from Blue Mountain Adventures at a cost. Consideration is being given to extending shuttle services to the parking area for the Roanoke River Trail adjacent to the Blue Ridge Parkway.
- Blue Mountain Adventures would find an established flow release from the Niagara Project a benefit during low flow months. It would be best if the releases were accomplished on a regular schedule or significant notice of releases given in order to be prepared.
- The bridge work over the Roanoke River by the NPS is expected to impact operations for Blue Ridge Mountain Adventures since it will likely reduce the number of people accessing Explore Park from the Blue Ridge Parkway. The planned work has also delayed Blue Mountain Adventures from applying for a permit from NPS to extend the shuttle service to the Roanoke River Trail put-in.
- COVID-19 impacted operations in 2020 primarily due to having to minimize the number of individuals that could be safely accommodated by the shuttles. The greatest impact was felt early in the year with numbers increasing towards the Labor Day holiday.

- Ms. Hart had not comment regarding the possible provision of a parking area and access upstream of the Niagara Project dam at its south abutment. She indicated that most activity upstream of the dam is limited to paddleboarders in the reservoir and fishing along the reservoir banks. Essentially, activities upstream of the dam are totally different than those downstream which take advantage of the rapids. There has been a noted increase in paddleboard use downstream of Journey's End to Rutrough Point where flows are more tranquil.
- Ms. Hart noted that an improvement that she would recommend is some sort of rail along the steps for the Roanoke River Trail that would assist canoeists/kayakers in accessing the put-in at the end of the steps.
- Regarding flyers being placed on windshields regarding the available on-line survey, Blue Ridge Mountain Adventures would prefer that not be done. The major concern is trash that may result. Ms. Hart did state that Blue Ridge Mountain Adventures would post information regarding the availability of the online survey on their web site and at their office. In addition, she agreed to allow on site surveys during the study period.
- Ms. Hart stated she would assemble information regarding equipment rentals and use of their facilities for the past five years to YES for the study.