FINAL LICENSE APPLICATION

Volume II of V

Part 4 - Consultation Appendix
Book 3 of 3

Byllesby-Buck Hydroelectric Project
(FERC No. 2514)

February 28, 2022

Prepared by:

Prepared for:
Appalachian Power Company

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Appendix I

Consultation Summary
Book 3 of 3

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February 12, 2021

Via Electronic Filing

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

Subject: Byllesby-Buck Hydroelectric Project (FERC No. 2514-186)
Filing of Initial Study Report Meeting Summary

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the two-development Byllesby-Buck Hydroelectric Project (Project) (Project No. 2514), located on the upper New River in Carroll County, Virginia.

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

Pursuant to 18 CFR § 5.15(c), Appalachian filed the Initial Study Report (ISR) with the Commission on January 18, 2021. The ISR filing also included notification of the ISR Meeting date, time, and proposed agenda. As required by the ILP schedule within 15 days of the ISR filing, Appalachian held a virtual ISR Meeting via Webex from 9:30am to 3pm on Thursday, January 28, 2021.

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

If there are any questions regarding this filing, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,

Elizabeth Parcell
Process Supervisor
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cc: Distribution List
Jonathan Magalski (AEP)

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Meeting Summary

Project:	Byllesby-Buck Hydroelectric Project (P-2514)
Subject:	Initial Study Report Meeting
Date:	Thursday, January 28, 2021
Location:	WebEx Virtual Meeting
Attendees:	Jonathan Magalski (AEP) Elizabeth Parcell (AEP) David Bailey (AEP) Fred Colburn (AEP) Sarah Kulpa (HDR) Maggie Yayac (HDR) Misty Huddleston (HDR) Ty Ziegler (HDR) Erin Settevendemio (HDR) Kerry McCarney-Castle (HDR) Joe Dvorak (HDR) Jon Studio (EDGE) John Spaeth (EDGE) Dan Symonds (Stantec) Allyson Conner (FERC) Jeremy Feinberg (FERC) Jody Callihan (FERC) Laurie Bauer (FERC) Woohee Choi (FERC) Jeff Williams (VDWR) John Copeland (VDWR) Toby McClanahan (VDWR) Brian Watson (VDWR) Janet Norman (USFWS) Jessica Pica (USFWS) Joe Grist (VDEQ) Sam Sweeney (VDCR) Jennifer Wampler (VDCR) Angie Grooms (Landowner) David and Beth Taylor (Landowner/Mayor of Wytheville) Rick Roth (Friends of the Rivers of Virginia) Zach Slate (New River Water Authority, Austinville)

Overview

This document provides the meeting summary for Appalachian Power Company's (Appalachian) Byllesby-Buck Hydroelectric Project Initial Study Report (ISR) Meeting. The meeting was held via WebEx to review with stakeholders the progress and results reported in the ISR, which was filed with the Federal Energy Regulatory Commission (FERC) on January 18, 2021. The ISR can be accessed from either FERC's website or from AEP's website: www.aephydro.com/HydroPlant/ByllesbyBuck. A copy of the meeting presentation is included with this meeting summary as Attachment A.

Welcome and Introductions (Slides 1-7)

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

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

Questions/Comments

Janet Norman asked for a reminder about the schedule for the 2021 wetland and shoreline study. Wetland study field work is planned late July - August 2021 (previously determined to be appropriate study season for botanical species of interest) and the shoreline study field work is planned April - July 2021. Maggie Yayac noted the schedule in the ISR provides the timeline for each task of the individual studies.

Joe Grist asked when Appalachian will apply for a Virginia Water Permit (VWP) Surface Water Withdrawal Permit/401 Certification with the Virginia Department of Environmental Quality (VDEQ). J. Magalski noted that Appalachian and their consultants would be giving this further consideration and plan to follow-up with VDEQ in 2021 to confirm the schedule and pre-application meeting requirements. Sarah Kulpa noted that the VWP application would benefit from completion of the relicensing studies and is not required by the FERC licensing process to be filed until after the Final License Application, but added that Appalachian understands VDEQ's interests in an earlier filing. J. Grist noted that the sooner Appalachian plans ahead, the better it will be for VDEQ and Appalachian since the process can take a while.

Aquatic Resources Study (Slides 8-48)

Misty Huddleston (Aquatic Resources Study Lead) introduced herself and her study team including Erin Settevendemio and HDR's sub-consultants, Jon Studio and John Spaeth with EDGE Engineering & Science (EDGE) and Dan Symonds with Stantec Inc. (Stantec).

Study Results

<u>Fish Community Survey</u>
M. Huddleston reviewed the goal, objectives, and status of the fish community survey. J. Studio reviewed the survey methods (i.e., boat electrofishing and gillnets) and results. J. Studio noted that in general there were frequent precipitation events in the watershed in 2020 resulting in relative high base flows on the New River throughout the 2020 field season. He also explained the challenges encountered with river access in the Study Area. The Byllesby Virginia Department of Wildlife Resources (VDWR) boat launch was used as an access point to survey upstream of Byllesby Dam; however, in the riverine reach below Byllesby Dam and upstream of the Buck reservoir, EDGE could not put a boat in due to the bedrock and boulders in the riverbed.

Fall 2020 sampling efforts included boat electrofishing and gill net sets, with gill net deployment delayed to later in the index period specifically to target Walleye, and the sampling schedule and methods were done in consultation with VDWR. EDGE stated that the 2021 field effort will include backpack electrofishing samples in wadeable, riffle habitats. EDGE made clear that the backpack electrofishing methodology would be appropriate for sampling the Candy Darter in spring 2021 if they are present within the Study Area.

J. Studio provided a high-level overview of the survey results but noted that analyses are ongoing and are pending awaiting additional data to be collected during the 2021 field season. J. Studio noted the consistency in species diversity between the Byllesby and Buck pools, with 15 fish species collected in samples from each pool.

Desktop Impingement/Entrainment Study

E. Settevendemio introduced the methodology and results for the desktop impingement and entrainment study. The Byllesby intake approach velocity was determined, using desktop calculation methods, to be 2.0 feet per second (fps) and the Buck intake approach velocity is 1.6 fps.

A list of target species was identified based on species recently collected within the study area, collected in prior relicensing studies within the study area, or from VDWR records of historical presence. Swim burst speeds for target species (or their surrogates) indicate that most juvenile and adult species can avoid the velocities at the intakes. Entrainment rates were estimated using historical entrainment study data compiled by the Electric Power Research Institute (EPRI). Entrainment rates were highest in April, July and October, and species that are over 8 inches in length as juveniles or adults were infrequently entrained (less than 5%). M. Huddleston clarified that the difference observed in entrainment rates between the Byllesby and Buck intakes is based on the flow capacity of the individual intakes (i.e., the four-unit Byllesby powerhouse has a higher hydraulic capacity than the three-unit Buck powerhouse).

Macroinvertebrate and Crayfish Survey

M. Huddleston provided an overview of the goal, objectives, and status of the macroinvertebrate and crayfish study. J. Studio covered the methods and results of the first field survey, which was completed between October 6 and October 8, 2020, and noted that the quantitative sites have good quality habitat at 7 of 8 of the sites, while the qualitative sites exhibited lower quality or poor habitat at all sites. Field teams identified two native species of crayfish. Crayfish were collected at six of the sixteen sites. No invasive species were collected. No crayfish were collected from upstream of the Byllesby dam; however, J. Studio emphasized that there are potentially many reasons for this and noted that crayfish may be collected from above Byllesby Dam during the planned spring 2021 sampling.

Freshwater Mussel Survey

Dan Symonds reviewed the methods and results of the mussel survey. The survey effort was concentrated in potential habitat identified downstream of Byllesby Dam and upstream of Buck Dam and additional sites downstream of Buck Dam. Dan described how reservoir areas upstream of Byllesby and Buck Dams, and the river reach downstream of Buck Dam have been subject to recent or ongoing surveys that inform our understanding of mussel populations in other parts of the study area – including the notable shift in mussel communities (increase in species richness and abundance) downstream of Buck Dam. Nine live mussels (Purple Wartyback) were found in two of the ten survey areas. Species richness was greater downstream of Buck versus in the reservoir.

Questions/Comments

Fish Community Survey

Angie Grooms asked about the location of backpack shocking location below Buck Dam (J. Studio pointed it out on the map in the PowerPoint).

Janet Norman asked whether the turbidity of the water or the effects of high flows had any impact on the efficacy of the electrofishing? J. Studio noted that sampling was during what was considered "baseflow" for 2020, and turbidity was not an issue. J. Studio further clarified that Secchi disk readings (light penetrating through water) were also recorded at sampling sites prior to initiating electrofishing and results did not indicate concerns for turbidity. EDGE conducted boat electrofishing and gillnets in pool areas, which do not change much under slightly higher flows. Riffle habitats may change with higher flows, therefore J. Studio noted there is a hydrograph provided in the ISR that demonstrates after precipitation events, water levels recede quite rapidly—thus field surveys were completed after the peak in the hydrograph occurred and water levels had receded to near [2020] baseflow levels.

John Copeland asked if there is a map of where the backpack electrofishing will be located for the 2021 field season? J. Studio noted there is a map in the Revised Study Plan (RSP) and clarified where the sampling will be on the map shown in the PowerPoint (backpack shocking upstream of BFB1). There were two locations noted as boat electrofishing sites, but J. Studio clarified that they will be sampled using backpack electrofishing methods due to onsite observations and terrain restrictions (i.e. boulder habitat). There will also be four backpack electrofishing sites located downstream of Buck Dam.

Jody Callihan asked if EDGE could include the raw catch data in the Preliminary Fish Community Study Report. He explained it would be helpful to have the raw fish length data to support FERC staff's impingement/entrainment analysis for the Environmental Analysis. J. Callihan noted that total length data would be sufficient. J. Studio agreed. The preferred format for the data is to present by "site", "gear type", and "species". (Action item: HDR/Edge to include data in this format in the Updated Study Report [USR].)

J. Copeland asked about the four redhorse (*Moxostoma* spp.) fish that were caught in the gill nets and offered to share a paper that was published about New River species introductions (i.e., related to V-lip Redhorse and Silver Redhorse). (J. Copeland shared the paper with Jon Studio and HDR immediately after the meeting ended.)

J. Norman noted that in the table on page 6 (of the Preliminary Fish Community Study Report), Appalachian identifies hydrograph vs. sampling period (which is helpful to U.S. Fish and Wildlife Service [USFWS]). It shows the fall period is much higher than median daily flow over the 98-year period. J. Norman asked if there were any flow related challenges and if turbidity was measured. S. Kulpa noted that turbidity will not be measured as part of the Fish Community Study. J. Studio confirmed that EDGE did not take turbidity measurements but took Secchi depth measurements and could provide if necessary. J. Studio clarified the Secchi depths indicated that turbidity was not a concern for proceeding with sampling activities.

J. Callihan asked about the velocity measurements and how they were taken. J. Studio noted velocity measurements were taken via handheld flow measurement instruments during the fish community survey.

A. Grooms asked about the spring backpack electroshocking and wondered whether Appalachian would consider adding turbidity as a parameter since it is such an interest to the locals. J. Studio noted that it would require grab samples as EDGE surveyed different locations, but it is possible. S. Kulpa said it would be taken into consideration. A. Grooms asked whether surveys used or would use any of the continuous in-situ parameters? S. Kulpa confirmed the approved study plan for the Projects does not include continuous turbidity monitors or conduct of a broad turbidity study.

Impingement and Entrainment

J. Callihan asked about calculation of approach velocity (i.e., multiplying by 1.5) and if HDR could explain the calculation methodology. Ty Ziegler explained that the approach velocity calculation is based on the maximum design turbine capacity divided by the area of the intake structure opening. However, because the headgate opening is at the bottom of the intake structure, most of the flow entering the powerhouse will be pulled from the bottom 2/3 (approximate) of the water column. For example, at the Buck development, the maximum design turbine capacity is 3,540 cubic feet per second (cfs). The width of the intake opening is 104 feet (ft) and the height of the headgate opening is 14 ft. Therefore, the calculated approach velocity = 3,540 cfs / (104 ft x 14 ft x 1.5) = 1.6 fps. The 1.5 factor assumes that flow entering the headgate will be pulled from the bottom portion of the water column equal to approximately 150 percent of the headgate height. For Buck, this equates to 14 ft x 1.5 = 21 ft which is approximately 60 percent of the total depth (approximately 35 ft) in front of the intake structure. This calculation methodology results in a conservative approach velocity because if the full depth in front of the intake structure was assumed to enter the headgate, the resulting calculated approach velocity would be approximately 1.0 fps (i.e., 3,540 cfs / [104 ft x 35 ft]).

For the Byllesby development, the design of the intake structure and location of the headgate is similar to Buck, so the same calculation methodology was used. The maximum design turbine capacity is 5,868 cfs, the width of the intake structure is 143 ft, and the height of the headgate opening is 14 ft. This results in a calculated approach velocity = 5,868 cfs / (143 ft x 14 ft x 1.5) = 2.0 fps. Again, a conservative value as the depth of water column in front of the intake structure is approximately 39 ft; using this depth would result in a calculated approach velocity = 1.0 fps (i.e., 3,540 cfs / [104 ft x 35 ft]).

T. Ziegler pointed J. Callihan to the intake structure drawings for both developments which provide the dimensions used to calculate approach velocities.

J. Callihan asked whether taking acoustic doppler current profiler (ADCP) measurements in the field to calculate approach velocity is still planned. S. Kulpa noted that originally field measurements were proposed, but after additional time in the field and understanding the trash rack design and orientation further, HDR is proposing to forgo the field work and depend on the calculated approach velocities described above. Measuring approach velocities in the field is not as straightforward as originally anticipated. T. Ziegler noted that the trash racks are angled at 15 degrees, so the bottom of the rack extends approximately 10 ft upstream of the top of the rack, which complicates ADCP measurements because the ADCP also measures velocity at an angle of approximately 25 degrees from vertical. As a result, approach velocities would have to be measured over an area across the face of each intake structure and extending approximately 25 ft upstream. Therefore, HDR recommends using the conservative approach velocity calculation methodology described above in lieu of measured approach velocities given the complexities associated with field measurements at the Byllesby and Buck developments. There was no concern noted from stakeholders on the call about forgoing field measurements to determine approach velocities.

Jessica Pica asked about the intake structure drawings and where they are available. S. Kulpa noted that we did not include them in the ISR, but can provide them in the USR and in the interim directly to USFWS if needed (Action Item: HDR to include detailed historical intake drawings in as an appendix or attachment to the final Fish Community Study Report that will be filed with the USR, after confirming the drawing or excerpted sections do not require treatment as CEII by FERC).

J. Grist asked if the literature or reference information used to determine swim speeds for assessing intake avoidance was available in the report. M. Huddleston noted that the resource used to determine swim speeds is cited in the report. S. Kulpa asked the group to please contact Appalachian or HDR if anybody has trouble finding a reference cited in the preliminary study reports.

J. Copeland questioned the species included in the study, specifically White Bass, which have become extremely rare and wondered why it was considered. E. Settevendemio explained that species were included based on both historical range data (VDWR), species of management interest, species of recreational or commercial value, and species recently collected from the New River. E. Settevendemio clarified that the list was meant to be conservative and inclusive of more species (rather than less). M. Huddleston explained that this data is preliminary and after the field sampling at the end of the second study season (2021) HDR will update the species list to include any new species and information identified (including potential removal of White Bass), which will also be used to perform the Turbine Blade Strike Analysis.

J. Norman asked about the entrainment results figure in the report (and presentation) regarding the White Bass percentage and asked if it was not a representative species, then why include in the graph, and recommended that the graphic would be more effective if representative of species that are actually occurring in the study area. Relative abundance of fish by species collected in the 2020 and 2021 surveys will be provided in the USR. E. Settevendemio added that in the USR there will be a qualitative assessment of impingement and entrainment susceptibility of target species and clarified that the assessment is based on best professional judgement and interpretation of the impingement and entrainment assessment results. Results may change with additional fish community data, and there will be added discussion in the USR comparing the results of the fish community study versus what is provided in the EPRI entrainment database with regard to relative abundances.

M. Huddleston also added that susceptibility to impingement and entrainment is not necessarily correlated with relative abundance in of a species within the study area. Based on HDRs experience with impingement and entrainment assessments (including thermal generation cooling water intakes, as well as hydroelectric powerhouse intakes), susceptibility to entrainment and impingement at intakes is species-specific and influenced more by the type of spawning behavior (broadcast of demersal adhesive eggs, nest builders, or broadcast of buoyant eggs), life stage, body size, and seasonality (related to spawning and recruitment) when an organism encounters the intake structure. The dominant species encountered in entrainment and impingement studies rarely corresponds to the species that are most abundant in the waterbody. This point will be clarified in the USR.

<u>Macroinvertebrate and Crayfish Study</u>

No questions or comments. J. Studio clarified that all sampling and laboratory processing is being conducted in conformance with VDEQ guidelines.

<u>Freshwater Mussel Survey</u>

J. Norman asked about the sampling site where the green floater was found. D. Symonds noted that it was found during the 2018 drawdown (survey of exposed bank areas) and not the recent relicensing mussel survey. J. Copeland noted that the location is mentioned on page 19 of the Freshwater Mussel Survey Study Report. Appalachian is able to provide the report of the 2018 survey upon request.

A. Grooms asked whether there was any indication that mussel populations are changing below Buck Dam. D. Symonds noted that Stantec is evaluating mussel populations in that vicinity as part of the Claytor Project (AEP-owned dam downstream from Buck). D. Symonds noted that trends do not suggest the population is changing. A. Grooms noted that as a landowner (approximately 2 miles downstream of Buck Dam), visually she sees less shells on the shoreline than she did five years ago. D. Symonds agreed he has also heard this anecdotally from fisherman in the area. Brian Watson noted that pistolgrip is still in higher numbers in this area, although habitat is focused in the river and since it’s a larger area, it’s easy to be ‘off’ by just a small amount when sampling. Brian noted this observation is derived from VDWR’s experiences collecting pistolgrip from this area for propagation.

J. Magalski noted that as part of the ongoing mussel monitoring plan for the Claytor Project AEP and VDWR are looking into deploying a mussel silo downstream of Buck and below Claytor Dam. J. Magalski noted mussel abundance and diversity is generally low throughout the watershed.

Variances from FERC-approved Study Plan

- Forgo approach velocity field measurements and rely on calculated approach velocities for the impingement/entrainment study.
- Replace boat electrofishing with backpacking shocking where necessary to ensure adequate covered of the available habitat at the predefined sampling location.

Second Field Season (2021)

- Spring Fishery Survey (Boat, Backpack, and Gillnetting): April – May 2021
- Turbine Blade Strike Analysis: July 2021

Bypass Reach Flow and Aquatic Habitat Study (Slides 50-77)

Study Results

T. Ziegler (Study Lead) introduced the study, methodology, and results for the bypass reach flow and aquatic habitat study. He explained that the Buck development study is further along than the Byllesby development (due to gate and unit operational issues that resulted in high flows in the Byllesby bypass reach during the 2020 field season).

The desktop mesohabitat and substrate mapping, determination of model calibration target flows, and assembly of habitat suitability index (HSI) criteria have been completed for both developments. T. Ziegler summarized the results of this effort at a high level and explained that additional details are provided in the Preliminary Bypass Reach Flow and Aquatic Habitat Study Report.

Field data (i.e., depths, water surface elevations, point velocities, flow measurements, and pebble counts) were collected in the Buck bypass reach during September 2020 under four model calibration target flows (i.e., leakage [17.1 cfs], low [210 cfs], middle [354 cfs], and high [714 cfs]). This data is provided in the Buck Bypass Reach ICM Model Development report (Attachment 1 of the Preliminary Bypass Reach Flow and Aquatic Habitat Study Report) and was used to calibrate the 2-D hydraulic model. Modeled water surface elevations closely matched the measured water surface elevations at the four target flows (R^2=0.99). T. Ziegler also summarized the bypass reach level logger data and explained how it was used to determine flow travel times and changes in water surface elevation under various flow regimes (note the level loggers recorded depths during a two month period which included the four model calibration target flows and higher flows during rainfall runoff events).

For the Buck bypass reach study, an initial set of habitat suitability model runs have been completed at the four model calibration target flows. Results are provided in Attachment 3 of the Preliminary Bypass Reach Flow and Aquatic Habitat Study Report. T. Ziegler reviewed results for one of the guild categories (i.e., Deep-Fast) as an example and explained how the results can be used to evaluate potential available habitat under different bypass reach flow regimes.

Questions/Comments

J. Norman asked how cover is determined. T. Ziegler explained that cover is comprised of both instream cover (e.g., large rock outcrops, aquatic vegetation, undercut banks) and overhead cover (e.g., overhanging tree limbs, shrubs). J. Norman asked if velocity is a factor in determining whether or not vegetation is considered to be cover. T. Ziegler explained that the model determines the presence of available habitat based on a combination of depth, velocity, substrate, and cover; and this can vary by species and life stage. J. Norman asked if the habitat mapping assumes there is fish habitat, even if there is no water. T. Ziegler clarified that substrate and cover mapping is independent of depth. The model will determine if habitat is available based on a combination depth, velocity, substrate and cover. If a particular area has suitable substrate and cover, but zero depth and velocity, the model results would indicate that no habitat is available in that area at that flow.

J. Norman asked if all four model calibration target flows were released from Tainter Gate #1. T. Ziegler confirmed that no gates were open during the leakage target flow field measurements, but Tainter Gate #1 was used for the other three target flow releases.

J. Callihan asked if T. Ziegler knew the maximum flow that could be passed through Tainter Gate #1. Joe Dvorak noted it depends on pond level, but the capacity of each tainter gate is approximately 3,000 cfs at pond elevation 2003.4 (i.e., top of operating pool).

J. Callihan asked J. Copeland about the state management goal for the Buck bypass reach. J. Copeland noted that discussions to date have focused on historical stranding issues and the need to maintain connectivity to minimize fish stranding, especially for Walleye.

J. Norman asked about flow characteristics under higher flow conditions, specifically referring to Figure 6.6. T. Ziegler explained that the substrate and cover mapping provided in Figure 6.6 (of the Preliminary Bypass Reach Flow and Aquatic Habitat Study Report) does not change based on modeled flow conditions. However, as simulated flows increase, depths and velocities will also increase (generally speaking), so the amount of available habitat will change. Changes in available habitat are specific to each species/life stage modeled at each modeled flow.

J. Norman asked about the guild HSI curves and T. Ziegler clarified that absent a specific recommendation from resource agencies as to individual species of interest (in this case only Walleye was specifically requested), guild curves are typically used as they cover the vast majority of species present in the study area (i.e., species/life stages that prefer Deep-Fast, Deep-Slow, Shallow-Fast, and Shallow-Slow habitats).

J. Copeland asked about the species (example: Silver Redhorse) and whether these are specific to the New River or representative of other species. T. Ziegler confirmed that species/life stages used to represent a certain guild are considered to be surrogates with preferences matching the specific guild criteria. In this example, Silver Redhorse adult is representative of the Deep-Fast guild with a slight preference for finer substrate sizes and cover. The HSI curves are not specific to the New River but were developed from and/or used in other studies in the mid-Atlantic region (including the New and Roanoke Rivers). T. Ziegler noted that development of HSI curves is a significant undertaking, typically performed by universities or USFWS. J. Copeland confirmed VDWR’s understanding of the origins of the HSI curves and noted that they are okay with the guild approach and walleye-specific (but not New River walleye-specific) curves used in this study.

J. Norman noted that USFWS asked early on about the possibility of releasing flows from gates other than Tainter Gate #1 (which was used during the target flow field measurements). J. Callihan noted that the operational gates (i.e., Tainter gates and Obermeyer gates) are on the right side of the dam (looking downstream) and the area of interest from a fish stranding perspective is downstream of the left side of the dam. T. Ziegler showed a photograph of the dam depicting the location of the Tainter and Obermeyer gates and explained that, due to a break in the topography approximately mid-channel of the upper bypass reach, flow releases from any of the gates would likely not affect the area of interest unless the flows were greater than 6,500 cfs. J. Callihan clarified that 6,500 cfs was the total flow (including powerhouse flows in the tailrace) and if you assumed the powerhouse was operating at maximum design capacity (i.e., 3,540 cfs), this would equate to approximately 3,000 cfs in the bypass reach. T. Ziegler agreed with this assessment. J. Callihan asked at what flow (in the bypass reach) does the high area located in the center of the channel immediately downstream of the dam (i.e., center channel of the upper bypass reach) start to become inundated with water and how frequent do those types of flows occurs/and when? J. Magalski noted that Appalachian can work with AEP operations to obtain Buck powerhouse operations data. T. Ziegler noted we already have flow data from the Ivanhoe USGS gage (downstream of the bypass reach and tailrace confluence) and could use Buck generation data and/or flow releases to the tailrace to estimate flows in the bypass reach (by subtracting tailrace flows from the Ivanhoe USGS gage flows). Action Items: (1) Include definition or clarification of bypass versus total New River flows in characterization of dam release operating scenarios in the USR, (2) Correct cfs label on figures (for inclusion in USR) – 354 cfs not 654 cfs.

J. Norman asked if the 17 cfs leakage flow is what is keeping the side channel (i.e., river left immediately downstream of the dam) watered. T. Ziegler noted that 17 cfs was the total leakage flow measured in September 2020; approximately 5 cfs of the total leakage flow is routed to the side channel area.

A. Grooms noted she has observed flashboard failures at the Buck dam during high rainfall runoff flow events which result in large amounts of sediment released into the bypass reach.

Woohee Choi asked about the mesh size used in the 2-D hydraulic model. J. Dvorak explained that HDR is using Innovyze Infoworks Integrated Catchment Model (ICM) software which uses terrain sensitive meshing to develop an unstructured grid. Terrain sensitive meshing allows for a maximum height variation between cells to be selected; for the Buck model, this was set at 0.25 ft. The average element area (i.e., mesh size) in the model is approximately 0.2 square meters. W. Choi recommended showing the mesh on the model results figures, but J. Dvorak explained that the mesh size is so small it would show up as a solid mass and you would not see anything else on the figures. J. Dvorak also pointed out that more information on the ICM model (i.e., configuration, assumptions, etc.) is provided in the Buck Bypass Reach ICM Model Development report (Attachment 1 of the Preliminary Bypass Reach Flow and Aquatic Habitat Study Report).

J. Callihan asked about the information provided on Slide 64 showing the 2-D hydraulic model calibration results. J. Dvorak confirmed that the data shown is a comparison of modeled to measured water surface elevations for the four model calibration target flows.

J. Norman asked about the level logger travel time information presented on Slides 68 and 69; in particular, the location of the level logger shown as a red line. T. Ziegler replied that the level logger depicted by the red line was located immediately downstream from Tainter Gate #1 and was placed there to record gate operations during the model calibration target flow fieldwork.

J. Callihan asked if the minimum flow requirement (360 cfs) is specific to the bypass reach, or just downstream from the Buck development. S. Kulpa clarified the minimum flow requirement is downstream from the Buck development and is a combination of tailrace and bypass reach flows. In response to J. Callihan's question as to whether it's possible to pass the minimum flow requirement though the powerhouse, Appalachian confirmed the powerhouse is capable of providing the minimum flow requirement through unit generation.

J. Norman asked if habitat model runs are correlated with seasonality (e.g., specific to spawning periods). T. Ziegler explained that the habitat model runs to date are specific to the four model calibration target flow scenarios. A next step in the modeling process is to incorporate hydrology over time (i.e., seasons) to determine if there are particular flows of interest from a habitat modeling perspective. HDR could also use the model to evaluate different flow release points along the Buck Dam and spillway structure. S. Kulpa reminded the group that while we can model hypothetical flows and release points, we also need to keep in mind the real-world challenges of water management at these projects, including run-of-river operations, aging structures and a variety of release mechanisms, and flashy river conditions, such that there are practical limits to how precisely flows and wetted areas can be managed by Project operation.

J. Norman noted the management goal for the Buck bypass reach was to not isolate or strand species that get into the side channel area at higher flows. She asked if the model had the capability of excluding a habitat 'cell' if the adjacent cell had zero habitat. T. Ziegler replied that the model is not excluding isolated habitat cells. Rather, it is up to the end user to determine if isolated habitat cells are considered to provide meaningful habitat. J. Callihan commented the focus should be on flow connectivity as opposed to habitat.

J. Norman asked if HDR could determine the amount of flow in the bypass reach over time, and in particular, on a day-to-day basis to help evaluate flow connectivity. M. Huddleston noted this would vary from year-to-year. J. Copeland noted that Walleye spawning is triggered by a combination of flow and water temperature which typically occurs in March with the highest activity during in the 2nd week of March. Action Item: T. Ziegler noted HDR has the information necessary to provide a chart (or figure) showing estimated flows in the Buck bypass reach during March (on a daily basis) over the hydrology period of record (i.e., 1996 – 2020). This would help the group evaluate the potential for Project inflows that are high enough and long enough to promote Walleye spawning.

J. Copeland asked if the model considers diurnal conditions (i.e. changes in sunlight and temperature over the course of a 24-hr day). T. Ziegler noted that the model simulations are based on changing flow conditions and do not consider diurnal effects.

2021 Byllesby Study Activities

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

Water Quality Study (Slides 79-96)

T. Ziegler (Study lead) introduced the water quality study, methods and results.

Study Results

T. Ziegler explained that at the Byllesby development, instrumentation was only installed at the tailrace monitoring location due to a Tainter gate open during the study period and a damaged flashboard section which made installation at other monitoring locations unsafe. Instrumentation at all of the Buck development monitoring locations identified in the RSP and Study Plan Determination was installed. Instrumentation captured continuous temperature and dissolved oxygen (DO) data (15-min intervals) and HDR also collected discrete data (i.e., water temperature, DO, pH, and specific conductivity) during installation, monthly data downloads, and removal of the equipment. Vertical profiles were also collected at the Buck forebay monitoring location during discrete data collection events. The monitoring locations at Byllesby that were not captured during the 2020 study period will be captured during July – September 2021.

Water temperature, DO, and pH measurement results meet Virginia Class IV (New River) water quality standards. While there isn't a state standard for specific conductivity, measurement results are suitable for aquatic species and typical for this reach of the New River. T. Ziegler explained there was little to no thermal or DO stratification at the Byllesby or Buck forebay.

Questions/Comments

General

J. Callihan asked how deep the two DO instruments were in the Buck bypass reach. T. Ziegler answered 3 to 5 feet deep, depending on flow conditions. J. Callihan noted that it would be beneficial to have information on Project operations during the study period to determine if the data collected is typical of normal operations. Action Item: Appalachian/HDR to determine Project operations during the Water Quality Study to determine if operations were typical and include additional notations in the USR.

Turbidity

A. Grooms stated that turbidity is a parameter of interest to the residents living downstream of the Buck development, including the consideration of flow coming into and out of the Project, trash rake operation and looking at flashboard failure (scoured out sediment). She is interested in fine sediment downstream of the confluence of the tailrace and bypass and asked that evaluating turbidity be considered. T. Ziegler stated that one of the tasks in 2021 is to collect turbidity data specific to trash rake operations to determine if this affects turbidity levels in the Project's forebay and tailrace areas. This study will be performed during a low flow period to better isolate the effect of trash rake operations. S. Kulpa noted that based on sediment modeling conducted for Appalachian for the Claytor relicensing, our understanding of sediment transport in the New River is that the river carries a significant sediment load during high flows, and this sediment load passes through the Projects and riverine reaches downstream of Buck, with much of the sediment carried by high river flows settling in Claytor Lake. HDR observed turbid river conditions throughout the study area (including inflows to the Byllesby reservoir) during or following high flows in 2020, which supports this understanding. The limited turbidity study to be conducted in 2021 focuses on the issue where there is a potential nexus to Project operations. A. Grooms noted that data on sedimentation coming into the Project from upstream would be helpful to understand potential impacts on water quality downstream. She noted that information for the local governments on turbidity (even if unrelated to Project effects) would help identify mitigation needs like sediment erosion control measures or tighter buffers in the watershed to help the water quality downstream.

J. Callihan asked if flashboard ruptures/breaks might be less frequent with the newly installed Obermeyer gates. J. Magalski responded that is the intent.

2021 Field Season

- Continuous and Monthly Water Quality Monitoring at Byllesby (July – September 2021)
- Conduct monthly chlorophyll a grab samples at 1-meter depth in the forebay of each development during July, August, and September 2021
- Conduct ~1-week turbidity study in the forebay and tailrace of each development during a low flow period (July – September 2021).

Recreation Study (Slides 97-131)

Maggie Yayac (Study lead) introduced the Recreation Study goals and results and provided an overview of the Project and non-Project Recreation Facilities.

Study Results

M. Yayac explained HDR found consistent recreation usage at most of the Project and non-Project facilities with usage peaking on weekends, holidays, and warmer months. The New River Trail provides a unique opportunity to access most of the recreation facilities in otherwise remote locations. The trail camera and online survey results indicated that fishing and canoe/kayaking were the primary recreation activities. The Buck Dam Canoe Portage was the only Project recreation facility that saw very little recreation usage, likely because it is inaccessible except by boat.

Questions/Comments

J. Copeland asked if Byllesby Dam – Fishing Access (adjacent to the New River Trail) was considered a Project Facility. M. Yayac responded that it was included in the Recreation Inventory Assessment after the RSP since it was determined to be a Project facility.

A. Grooms noted that VDWR Loafer's Rest access is used a lot by the people who live in that area for a kayak and canoe launch. Residents' and visitors' abilities to shuttle for kayaking and canoeing was impeded by COVID-19 restrictions and precautions in 2020. M. Yayac responded that Loafer's Rest access area was not part of the Recreation Study, but stakeholder interest in the Buck tailrace for fishing access was evaluated. J. Copeland noted the VDWR's original intent of Loafer's Rest access was to provide a way for people to get closer (and safer) access to tailrace fishing.

J. Copeland stated that there is interest from anglers to fish from the New River Canoe Launch. There is a no fishing sign upstream of that area and VDWR is seeking to make sure fishing isn't restricted in that area. M. Yayac and S. Kulpa confirmed that the no fishing sign restricted access to the powerhouse, but not the sandy beach before the access road. Elizabeth Parcell acknowledged that signage will be replaced and potentially increased in conjunction with the relicensing effort.

Sam Sweeney stated there is no signage across the New River below the spillways, such that a canoer or kayaker would not have visible signage. S. Sweeney recommends adding signage letting the user know they are not allowed in areas close to the dams.

M. Yayac asked if the group wanted to add anything to the discussion from the recreation site visit or virtual call (October 2020). Allyson Conner asked if Fowler's Ferry was owned by Appalachian. S. Kulpa explained the land is owned by Appalachian, but it is not entirely within the Project Boundary. E. Parcell noted Appalachian would be interested in leasing this land to VDWR, as she understands there is a grant that may make this feasible for VDWR. J. Copeland noted that the grant is operational. Toby McClanahan did not know about the grant at that time, but stated he could find out more.

Jennifer Wampler stated that people are interested in improvements on the Thompson Campground based on her studies. M. Yayac explained the Virginia Department of Conservation and Recreation (VDCR) has not been successful in leasing the land from the U.S. Forest Service. M. Yayac noted that interest in this area was noted throughout many of the Recreation Study communications, especially responses to the online survey. S. Kulpa asked if anybody uses the area right now. S. Sweeney stated people use it anyway (especially during COVID restrictions), as camping is allowed on U.S. Forest Service land. A. Grooms wondered if that land needs to be transferred to the state and asked how to drive interest in this process at the regional level. S. Sweeney stated that they have participated in meetings and stated that U.S. Forest Service might consider a lease. A. Grooms stated it would help the local economy and the city of Wytheville. The group agreed that transfer of federal land to the state (i.e., in lieu of a long-term lease) is unlikely as a it does take an act of congress to move land from federal to state. Sam noted that a long-term lease (e.g., 99 years) is needed for the VDCR to justify investments needed to re-open the campground.

David Taylor noted that regarding the VDWR Loafer's Rest access, he would love to see better access for people to use and put in their boats. He wondered whether there is a put-in between Buck Dam and Austinville Bridge owned by the state? S. Sweeney noted that VDWR has a portage on river left only. D. Taylor explained that river rescue does not have a place to get in along that stretch and has on occasion asked to use his property.. D. Taylor noted there is a long walk from the parking area to the river, making it very difficult to use. S. Sweeney agreed it would be advantageous to put a larger road/put in at Loafer's Rest. This area is currently considered "fishing access" by VDWR and does not include a formal hand-launch area, though the area is commonly used for that purpose. J. Wampler agreed.

John Copeland commented he does not think the No Trespassing signs in the Buck Dam tailrace were posted by VDWR and will follow-up with Appalachian.

A. Grooms noted that she believes high turbidity levels kept users off of the river throughout much of 2020.

A. Conner asked about signs near the Buck Dam Canoe Portage. S. Kulpa acknowledged more signage a certain distance from each dam should be provided for boaters to make it clear where access is prohibited. E. Parcell followed up to note the Public Safety Plan on file with FERC which says boats must stay 500 feet away from the dam.

A. Conner asked about the Buck Dam Fishing Access and M. Yayac clarified that this area is not a Project facility, but an informal access point that was of study interest to the VDWR for tailrace fishing.

A. Conner asked if there would be any additional surveys in 2021 for the Recreation Study. M Yayac and S. Kulpa stated that the Recreation Study had been completed, and that 2021 activities would focus on evaluation of the feasibility of potential enhancements to be included as part of Appalachian's licensing proposal.

A. Grooms asked if Loafer's Rest would be looked at for expansion and improvement. J. Copeland stated that overall, more background and clarification on Loafer's Rest is needed and who owns what, where the trespassing signs are and come from. Sarah K. said Appalachian would consider an addendum to the study report regarding to the Loafer's Rest area and existing agreement.

Beth Taylor (Mayor of Wytheville) used the Webex chat feature to provide her interests which included: 1) as Mayor she is interested in the possibility to increase economic development, 2) New River Water Authority where turbidity and velocity are important 3) noted that property owners below Buck have observed over past four years have seen a marked decrease in catching fish, swimming and boating due to increase turbidity. She added she also appreciates any evaluation and improvements that may come out of this study of Loafers Rest "fishing input" and invite all to take a walk or better yet a boat down there.

Cultural Resources Study (Slides 133-138)

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

Study Results

Terracon received four responses to the Area of Potential Effects (APE) consultation with no objections. Phase I and geomorphological assessment tasks were completed in 2020. No historic properties are adversely affected by the Project. New construction or modifications of the Project structures (historical features) would require consultation with the State Historic Preservation Office (SHPO).

Questions/Comments

A. Conner asked about definition of historic alluvium as used in this report. S. Kulpa explained it included soils deposited in the river valley by river flows.

J. Grist wanted to make sure that all Virginia recognized tribes were included in communications. A. Conner read off the list of tribes FERC included in initial tribal consultation. Joe listed a few more that should be included (seven state and federally recognized). A. Conner requested a full list of tribes to ensure the Project ILP consultation by FERC includes them all. J. Grist agreed to provide her with the list. J.Wampler provided a website for the list of tribes: https://www.ncsl.org/research/state-tribal-institute/list-of-federal-and-state-recognized-tribes.aspx#Virginia.

J. Norman asked if there are copies of all correspondence from tribes in the ISR. However, tribal responses are privileged.

Next Steps and Discussion

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

Questions/Comments

A. Grooms asked when exactly stakeholders should expect Appalachian to file the ISR Meeting notes since follow-up dates are dependent. J. Magalski said it would probably be right on the 12th of February.

Attachment 1

Attachment 1 – ISR Meeting Presentation

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Byllesby-Buck Hydroelectric Project

Initial Study Report Meeting
January 28, 2021

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Initial Study Report

- Appalachian is pursuing a subsequent license for the Project pursuant to the Commission’s Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5.
- The Initial Study Report (ISR) filed on January 18, 2021 describes the Licensee’s overall progress in implementing the study plan and schedule, the data collected, and any variances from the study plan and schedule.
- The Commission’s regulations at 18 CFR § 5.15(c) requires Appalachian to hold an ISR Meeting within 15 days of filing the ISR.
- The purpose of the ISR Meeting is to discuss available study results and any proposals to modify the study plans in light of the data collected.

Meeting Agenda

Topic	Schedule
Welcome and Introduction	9:30 AM – 9:45 AM
Aquatic Resources Study: • Fish Community Survey • Fish Impingement and Entrainment Study • Macroinvertebrate and Crayfish Survey • Freshwater Mussel Survey	9:45 AM – 11:00 AM
Morning Break	11:00 AM – 11:10 AM
Bypass Reach Flow and Aquatic Habitat Study	11:10 AM – 12:30 PM
Lunch Break	12:30 PM – 1:00 PM
Water Quality Study	1:00 PM – 1:40 PM
Recreation Study	1:40 PM – 2:40 PM
Afternoon Break	2:40 PM – 2:45 PM
Cultural Resources Study	2:45 PM – 2:55 PM
Discussion, Questions and Next Steps	2:55 PM – 3:00 PM

Completed ILP Milestones

Date	Milestone
January 7, 2019	Appalachian Filed NOI and PAD (18 CFR §5.5, 5.6)
March 8, 2019	FERC Issued Notice of PAD/NOI and Scoping Document 1 (SD1) (18 CFR §5.8(a))
April 10-11, 2019	FERC Conducted Scoping Meetings and Site Visit (18 CFR §5.8(b) (viii))
May 7, 2019	Stakeholders Submitted Comments on the PAD, SD1, and Study Requests (18 CFR §5.9)
June 21, 2019	FERC Issued Scoping Document 2 (SD2) (18 CFR §5.10)
June 21, 2019	Appalachian Filed Proposed Study Plan (PSP) (18 CFR §5.11(a))
July 21, 2019	Appalachian Held Study Plan Meeting (18 CFR §5.11(e))
September 9, 2019	Stakeholders Submitted Comments on the PSP (18 CFR §5.12)
October 19, 2019	Appalachian Filed RSP (18 CFR §5.13(a))
November 3, 2019	Stakeholders Submitted Comments on the RSP (18 CFR §5.13(b))
November 18, 2019	FERC Issued the SPD (18 CFR §5.13(c))
July 27, 2020	Appalachian Submitted First Quarterly Report, ILP Study Update, and Request for Extension of Time File ISR
August 10, 2020	FERC Issued Order Granting Appalachian Extension of Time and Filing of ISR
August – November 2020	Appalachian Conducted First Season of Field Studies (18 CFR §5.15(a))
October 27, 2020	Appalachian Submitted Second Quarterly Progress Report (18 CFR §5.15(b))
December 23, 2020	FERC Issued Scoping Document 3 (SD3)
January 18, 2021	Appalachian Submitted ISR (18 CFR §5.15(c)(1))

Studies Approved in the SPD

FERC's November 18, 2019 Study Plan Determination (SPD) for the Byllesby-Buck Hydroelectric Project (Project) directed Appalachian to conduct eight studies:

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

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Proposals to Modify Studies or for New Studies

At this time, Appalachian is not proposing any modifications to the studies approved and modified in the Commission's November 18, 2019 SPD or any new studies.

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

Upcoming ILP Milestones

Date	Milestone
January 28, 2021	**Appalachian Host ISR Meeting (18 CFR §5.15(c)(2))**
February 12, 2021	Appalachian File ISR Meeting Summary (18 CFR §5.15(c)(3))
March 14, 2021	Stakeholders File Disagreements with ISR Meeting Summary (18 CFR §5.15(c)(3)) (if necessary)
April 13, 2021	Appalachian File Response to ISR Meeting Summary Disagreements (18 CFR §5.15(c)(5)) (if necessary)
May 13, 2021	FERC Provide Determination on Disputes (18 CFR §5.15(c)(6)) (if necessary)
Spring – Fall 2021	Appalachian Conducts Second Year of Studies
October 1, 2021	Appalachian File Draft License Application (DLA) (18 CFR §5.16(a))
November 17, 2021	Appalachian File Updated USR (18 CFR §5.15(f))
December 2, 2021	Appalachian Host USR Meeting (18 CFR §5.15(f))
December 17, 2021	Appalachian File USR Meeting Summary (18 CFR §5.15(f))
December 30, 2021	Stakeholders File Comments on DLA (18 CFR §5.16(e))
January 16, 2022	Stakeholders File Disagreements with USR Meeting Summary (18 CFR §5.15(f)(4)) (if necessary)
February 15, 2022	Appalachian File Response to USR Meeting Summary Disagreements (18 CFR §5.15(f)(5)) (if necessary)
February 28, 2022	Appalachian File Final License Application (18 CFR §5.17)

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Aquatic Resources Study: Fish Community Survey

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Fish Community Survey

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

Fish Community Survey

Study Status

- Appalachian initiated the Fish Community Survey in accordance with the methods described in the RSP and SPD.
  - General fish community survey utilizing boat electrofishing and gill net sets was completed fall 2020
  - Confirmed intake velocities desktop calculations
  - Preliminary assessment of impingement and entrainment at the intake structures

Fish Community Survey Methods

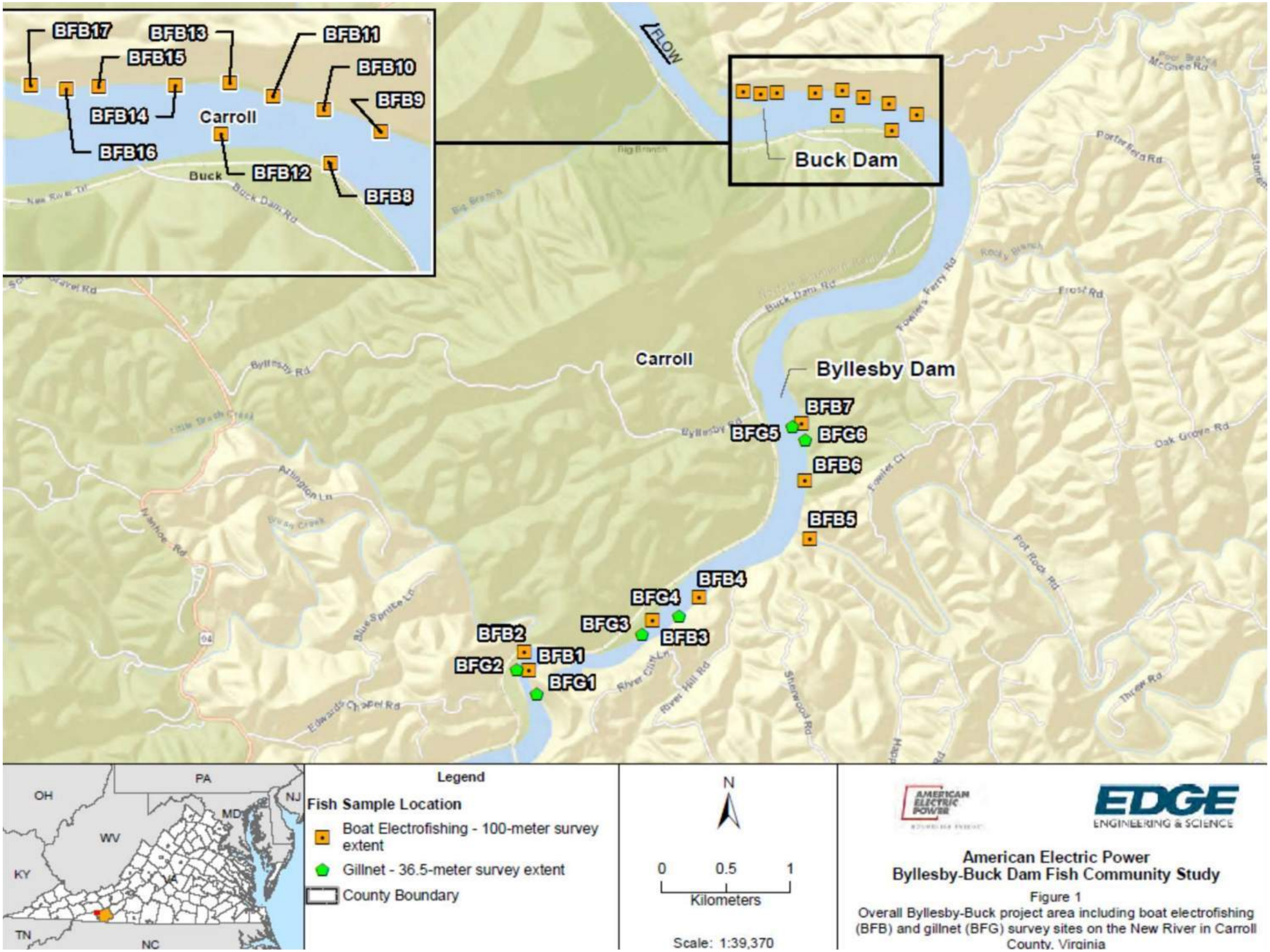
Byllesby – Boat Electrofishing

- October 22, 24 – 25 of 2020

- Seven sites in Byllesby impoundment electrofished by boat, a minimum of 5 minutes each site

- Fish ID to species, enumerated, and examined for anomalies; up to 30 individuals per taxon measured and weighed

- Calculated catch per unit effort (CPUE) as number of fish per minute and H'; Shannon index and compared preliminary results to those from historical studies



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Byllesby-Buck Dam Fish Community Study

Figure 1
Overall Byllesby-Buck project area including boat electrofishing (BFB) and gillnet (BFG) survey sites on the New River in Carroll County, Virginia

Fish Community Survey Methods

Byllesby - Gillnets

- November 9 -11, 18 – 20 of 2020

- Six sites in Byllesby impoundment sampled with 36.5-meter[m]-long by 2.4-m-deep gillnets
  - Each gillnet consisted of eight 4.6-m-long panels with mesh sizes of 1.9, 2.5, 3.2, 3.8, 5.1, 6.4, 7.6, and 10.2 centimeters
  - Fished for 24-hours and then checked, redeployed
  - Fished additional 24-hours and then retrieved, total of 48 hours

- Fish ID to species, enumerated, and examined for anomalies; up to 30 individuals per taxon measured and weighed

- Calculated CPUE (# fish/min) and H'; Shannon index and compared preliminary results to those from historical studies

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Fish Community Survey Methods

Buck – Boat Electrofishing

- October 22, 24 – 25 of 2020
- Ten sites in Buck impoundment electrofished by boat, a minimum of 5 minutes each site
- Fish ID to species, enumerated, and examined for anomalies; up to 30 individuals per taxon measured and weighed
- Calculated CPUE (# fish/min) and H'; Shannon index and compared preliminary results to those from historical studies

Fish Community Survey Results

- 207 fish representing 23 species
  - 107 fish (20 species) by boat electrofishing
  - 37 fish (7 species) from 4 of 6 gill net sites
- Boat electrofishing sites
  - Average CPUE of 1.5 (2.0 in Byllesby pool; 1.2 in Buck pool)
  - Average diversity of 1.25 (1.3 in Byllesby pool; 1.1 in Buck pool)
- Gill net sites
  - Average CPUE of 3.8 (4.6 for 4 sites with fish collected)
  - Average diversity of 0.91

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Aquatic Resources: Fish Impingement and Entrainment Study

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Fish Impingement and Entrainment Study

Assessment Methods

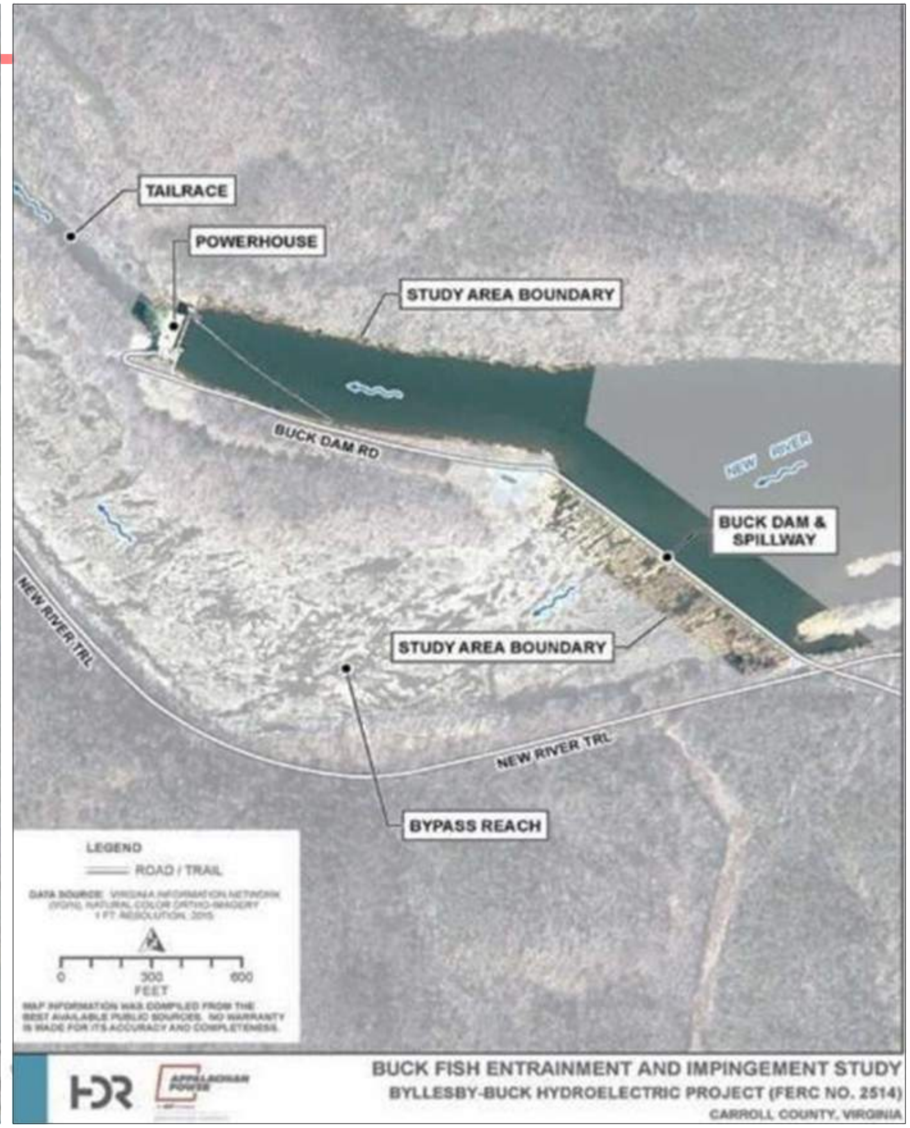
- Compiled intake specifications, flow characteristics, and calculated approach velocity
- Identified target species/groups
- Assessed potential of impingement or entrainment
  - Intake avoidance (swim burst speed comparison)
  - Size exclusion (max length: width scaling)
  - Early life stage entrainment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

Fish Impingement and Entrainment Study

Assessment Methods

- Evaluated entrainment rate based on EPRI entrainment database
  - 43 facilities
  - 5 were eliminated due to no collection efficiency data
  - 5 were eliminated based on trash rack spacing
  - **33 facilities** used for this analysis

Fish Impingement and Entrainment Study



Fish Impingement and Entrainment Study

- Target species/groups

Common Name	Scientific Name
Black Crappie	*Pomoxis nigromaculatus*
Bullheads and Madtoms	*Ameiurus* spp. and *Noturus* spp.
Catfishes	*Ictalurus* spp.
Common Carp	*Cyprinus carpio*
Darters and Logperch	*Etheostoma* and *Percina* spp.
Largemouth Bass	*Micropterus salmoides*
Lepomis Sunfishes	*Lepomis* spp.
Muskellunge	*Esox masquinongy*
Rock Bass	*Ambloplites rupestris*
Shiners, Chubs, and Minnows	Leuciscinae
Smallmouth Bass	*Micropterus dolomieu*
Spotted Bass	*Micropterus punctulatus*
Suckers and Redhorse	Catostomidae and *Moxostoma* spp.
Walleye	*Sander vitreus*
White Bass	*Morone chrysops*

Fish Impingement and Entrainment Study

Assessment Results

- Intake avoidance
  - Byllesby approach velocity – 2.0 feet per second (fps)
  - Buck approach velocity – 1.6 fps
  - Swim burst speeds indicate that most juvenile and adult species occurring near the intake can avoid the velocities at the intake.
- Size exclusion (impingement assessment)
  - Several species including Channel Catfish*, Common Carp*, and Largemouth Bass*, Walleye, and White Sucker would be excluded. The remaining target and surrogate species would pass through the trash racks (and be entrained).
- Early life stage entrainment susceptibility
  - Spawning April-June, subsequent egg and larvae development May-August
  - Many species spawning habitats are not found near the intake structure; therefore, entrainment potential is considered low for most early life stages.

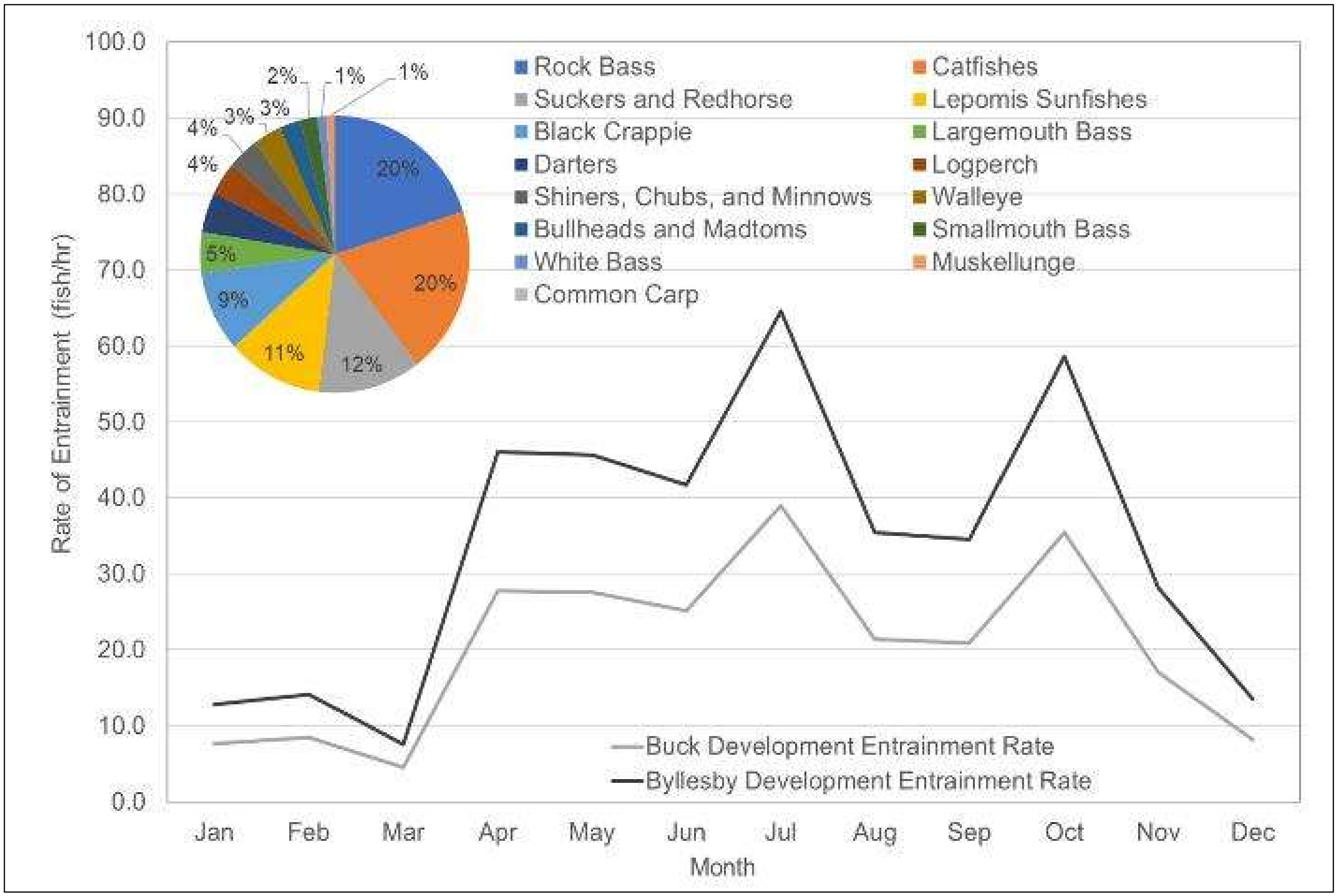
Fish Impingement and Entrainment Study

Assessment Results

- 88% of entrainment consisted of fish less than six inches in length
- Average seasonal rates of entrainment were highest in April, July, and October
- Fish over 8 inches in length were infrequently entrained (less than 5% of entrainment)
- Entrainment susceptibility varied temporally and by species
- Most target species/groups had low entrainment potential throughout the year

Fish Impingement and Entrainment Study

- **Dominant species entrained**



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Fish Impingement and Entrainment Study

- Seasonal patterns in entrainment rates are likely driven by spawning activity/movement (spring/summer), juvenile recruitment (summer/fall), or in response to cooling water temperatures (fall)

- Most species not expected to spawn in the vicinity of the intake due to a lack of required spawning habitat

Fish Impingement and Entrainment Study

- **Walleye and Muskellunge**
  - Older life stages are considered low risk for impingement at the Project as their burst speeds are sufficient to overcome intake approach velocities.
  - Early life stages are considered low risk for entrainment at the Project based on the absence of preferred spawning habitat near the intake structures.

Variances from FERC-approved Study Plan

Variances from FERC-approved Study Plan:

- Intake velocity
  - Unable to evaluate with ADCP due to high flow events and station operation
  - Determined using desktop calculation
  - Angled trashracks would require ADCP measurement some distance upstream

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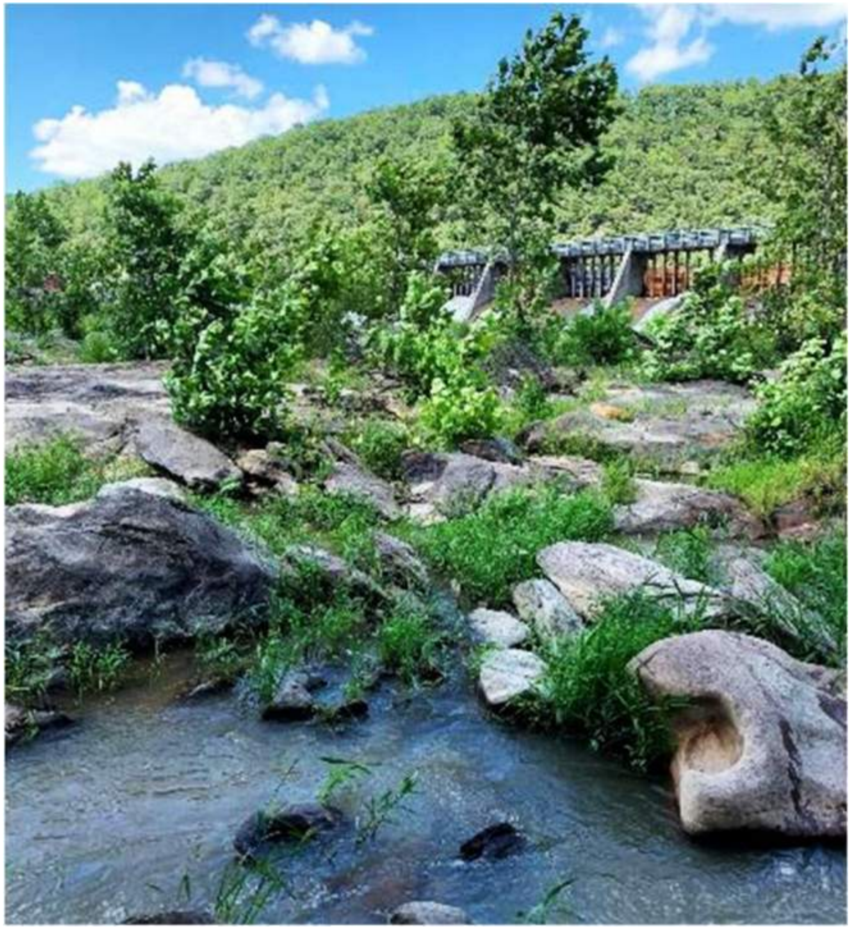
Aquatic Resources: Macroinvertebrate and Crayfish Survey



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Macroinvertebrate and Crayfish Survey

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

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Macroinvertebrate and Crayfish Survey

Study Status

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

Macroinvertebrate and Crayfish Survey

Summary of Study Methods

- Sampling performed October 6, 7, and 8, 2020
- Visual habitat assessment
- Qualitative and quantitative sampling

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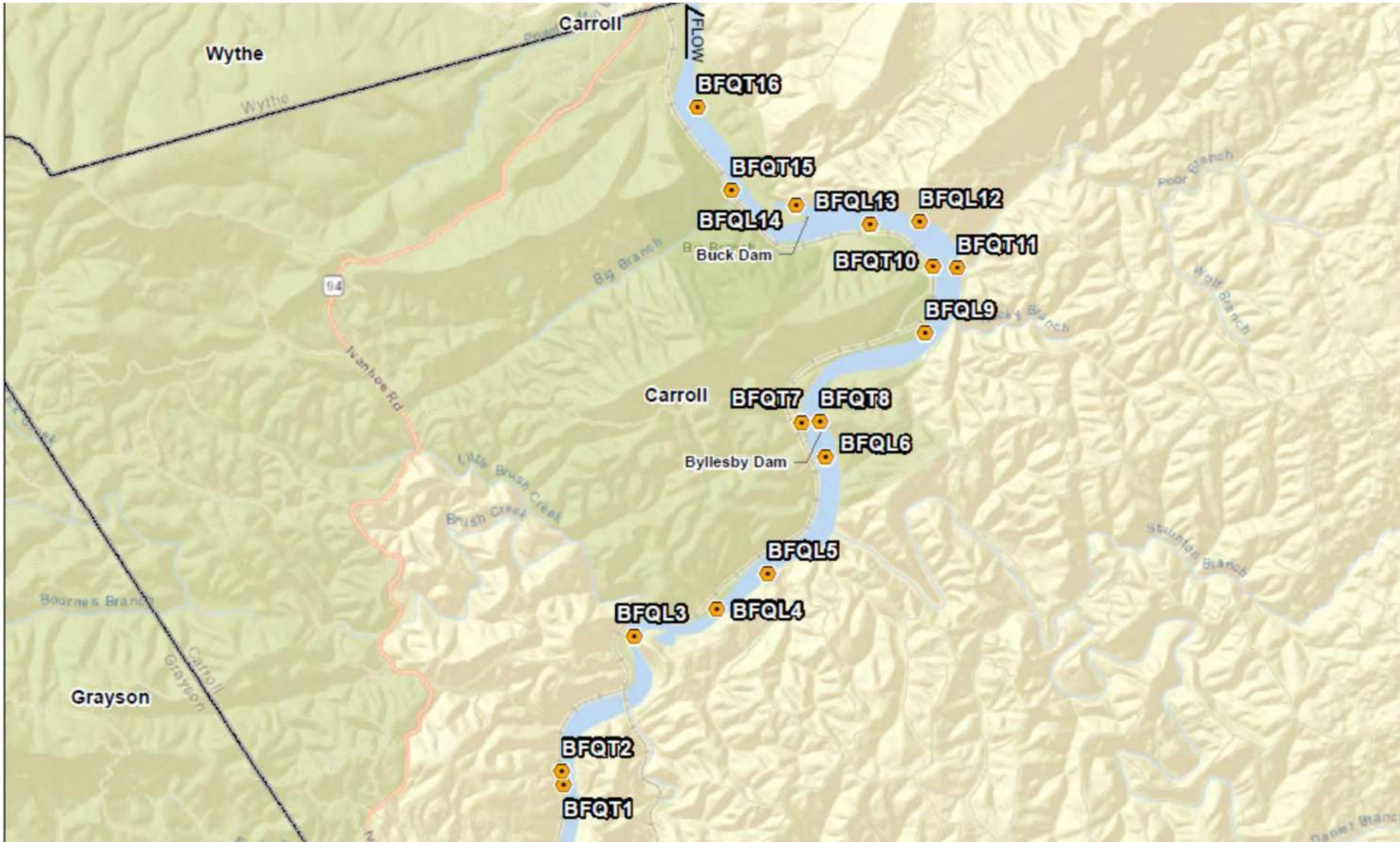
Macroinvertebrate and Crayfish Survey

Summary of Study Methods

- Quantitative Samples
  - 8 riffle/run sites along 100-m transects, two sites upstream of Byllesby Dam, four sites between Byllesby and Buck Dam, and two sites downstream of Buck Dam
  - Each site consists of 6 kick net sets composited into one sample
  - Each sample equals approximately 2 square meters
  - Crayfish data supplemented with seine hauls

- Qualitative Samples
  - 8 pool sites, four sites upstream of Byllesby Dam and four sites between Byllesby and Buck Dam
  - 20 dip-net grabs of representative habitats in proportion to their availability
  - Each sample covers approximately 1 linear meter of habitat



Legend

Macroinvertebrate Sample Location

County Boundary

N

0 0.75 1.5

Kilometers

Scale: 1:59,055

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Byllesby-Buck Benthic Aquatic Resource

Figure 1
Overall Byllesby-Buck project area including quantitative (BFQT) and qualitative (BFQL) macroinvertebrate survey sites on the New River in Carroll County, Virginia.

Macroinvertebrate and Crayfish Survey

Summary of Study Results

- Quantitative Sites
  - Good quality habitat at seven of the eight sites; one site heavily embedded (BFQT2)
  - Habitats consisted primarily of bedrock, boulder, cobble, and gravel substrates

- Qualitative Sites
  - Relatively poor habitat at all sites
  - Habitat consisted primarily of sand, silt, and bedrock substrates

Macroinvertebrate and Crayfish Survey

Summary of Study Results

- Taxonomic identification of macroinvertebrates in process
- Two native species of crayfish collected and identified in the field during survey efforts at 6 of 16 sites
  - Conhaway Crayfish (*Cambarus appalachiensis*)
  - Spiny Stream Crayfish (*Faxonius cristavarius*)
- No invasive species collected

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Aquatic Resources: Freshwater Mussel Survey

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Freshwater Mussel Survey

- **Study Goal:** Obtain current information on the mussel community in the New River in the vicinity of the Project to support an analysis of Project effects

- **Specific Objectives:**
  - Collect a comprehensive baseline of the existing mussel community in the Project vicinity.
  - Compare current mussel data to historical data to determine any significant changes to species composition, abundance, or distribution.

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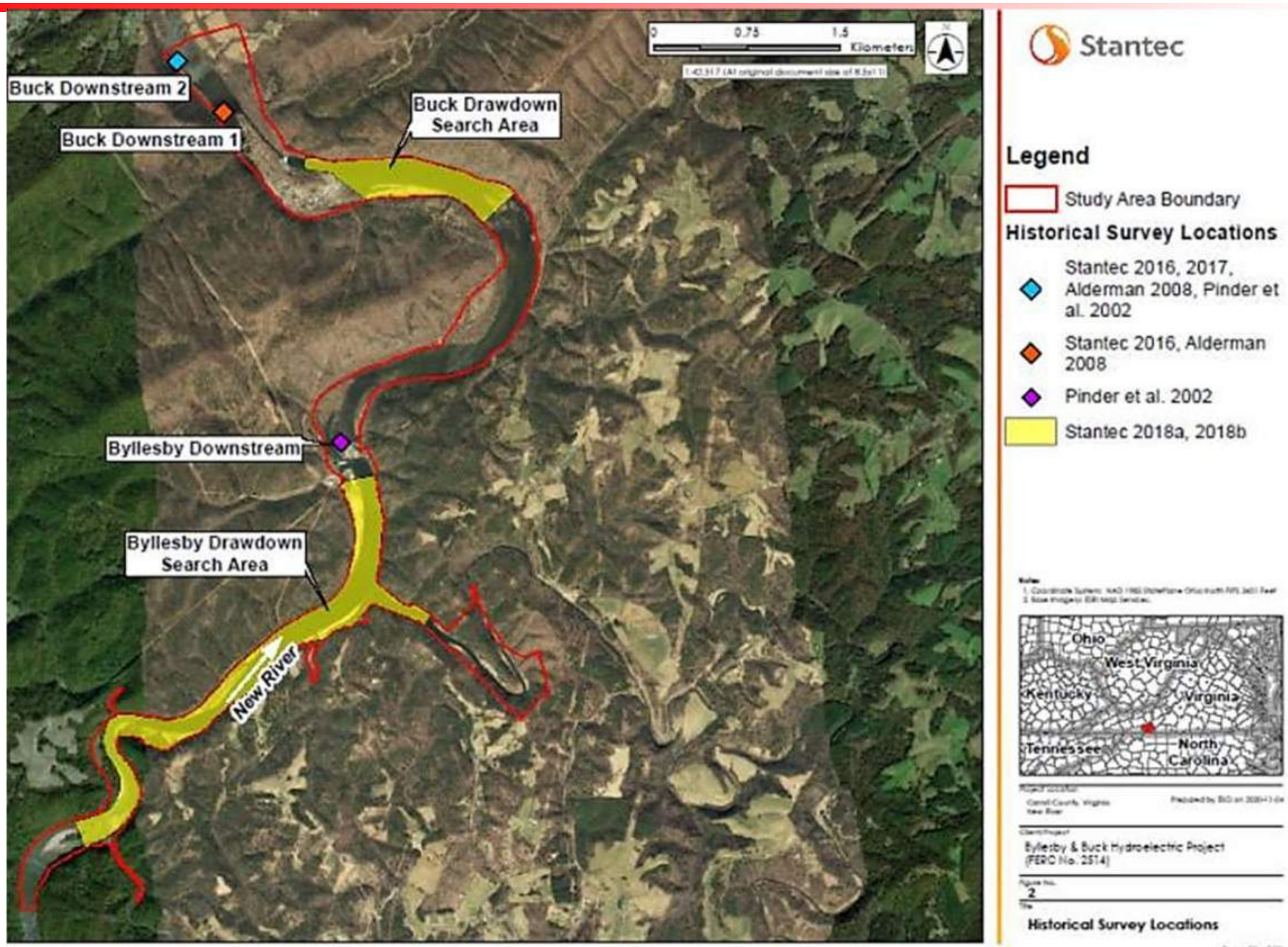
Freshwater Mussel Survey

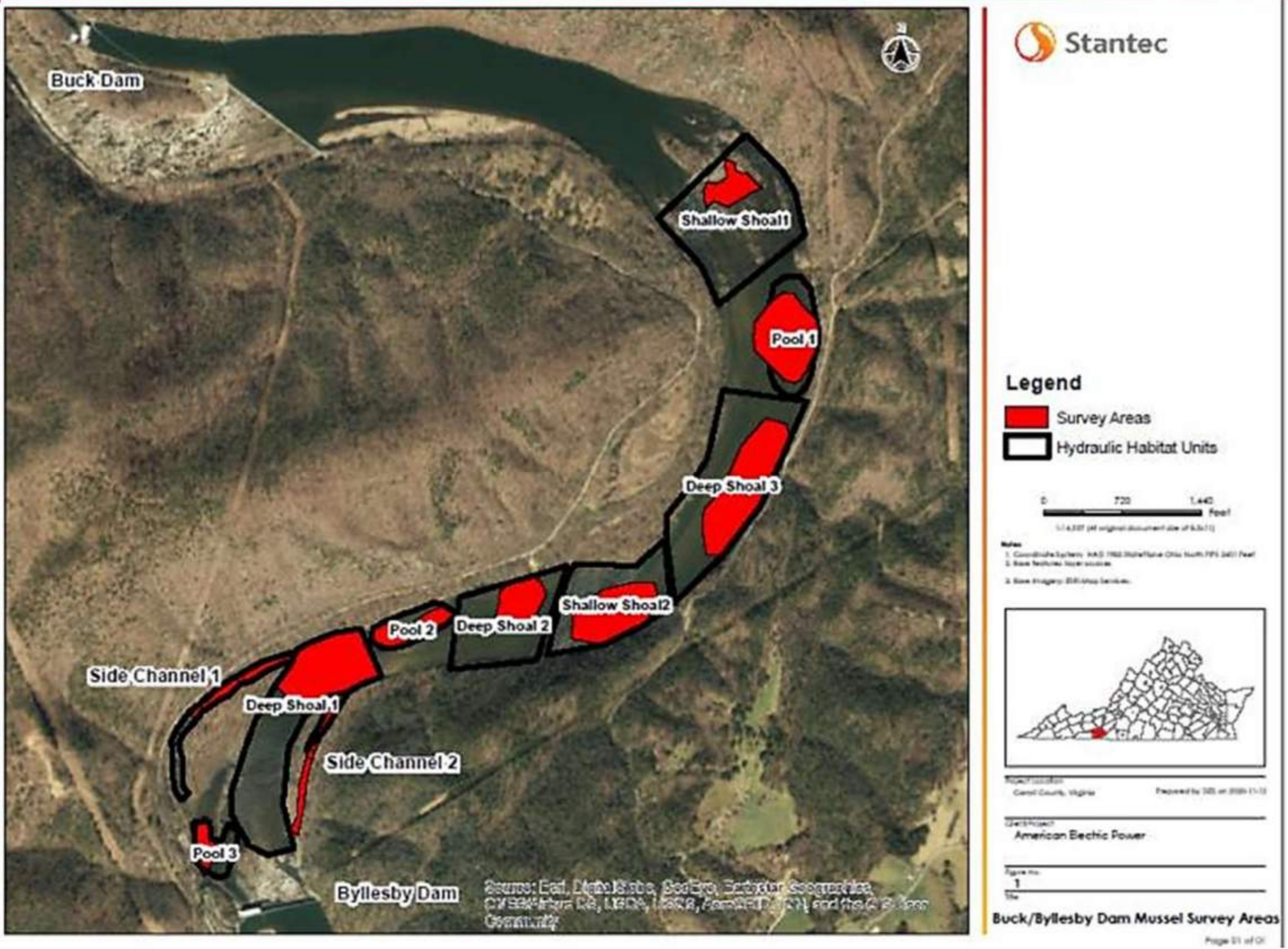
Study Status

- Appalachian initiated and completed the Freshwater Mussel Survey in accordance with the schedule and methods described in the RSP and SPD.
  - Completed fall 2020
  - No further sampling required

Freshwater Mussel Survey Methods



Freshwater Mussel Survey Methods



Freshwater Mussel Survey Methods

- Reconnaissance level habitat assessment
- 500 m
- Visual searches of exposed river-banks for spent valves or evidence of suitable mussel habitat

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Freshwater Mussel Survey Results

Mussels Found In Survey Area (2020)

Area	Species	Length (mm)	Condition
Shallow Shoal 1	*C. tuberculata*	48	Live
Shallow Shoal 1	*C. tuberculata*	87	Live
Shallow Shoal 1	*C. tuberculata*	-	Weathered
Deep Shoal 2	*C. tuberculata*	85	Live
Deep Shoal 2	*C. tuberculata*	84	Live
Deep Shoal 2	*C. tuberculata*	95	Live
Deep Shoal 2	*C. tuberculata*	85	Live
Deep Shoal 2	*C. tuberculata*	78	Live
Deep Shoal 2	*C. tuberculata*	91	Live
Deep Shoal 2	*C. tuberculata*	64	Live
Pool 1	*E. dilatata*	-	Weathered

Freshwater Mussel Survey Results

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Previous Studies

Study	Location	Methods	Total Search Time (person-hours)
Pinder et al. 2002	Buck 2 Below Byllesby	Wandering search - snorkel and/or viewscopes	5
Alderman 2008	Buck 2 Buck 1	Wandering search – snorkel, SCUBA and/or viewscopes	9.25
Stantec 2016	Buck 2 Buck 1	Transects – snorkel SCUBA Quadrat excavation	13.4
Stantec 2017	Buck 2	Transects – snorkel SCUBA Quadrat excavation	6.7
Stantec 2018a	Byllesby Drawdown Area	Wandering search – walking dewatered substrates	27.2
Stantec 2018b	Buck Drawdown Area	Wandering search – walking dewatered substrates	15.5
Stantec 2020	Un-impounded Reach	Wandering search – snorkel SCUBA	33.3

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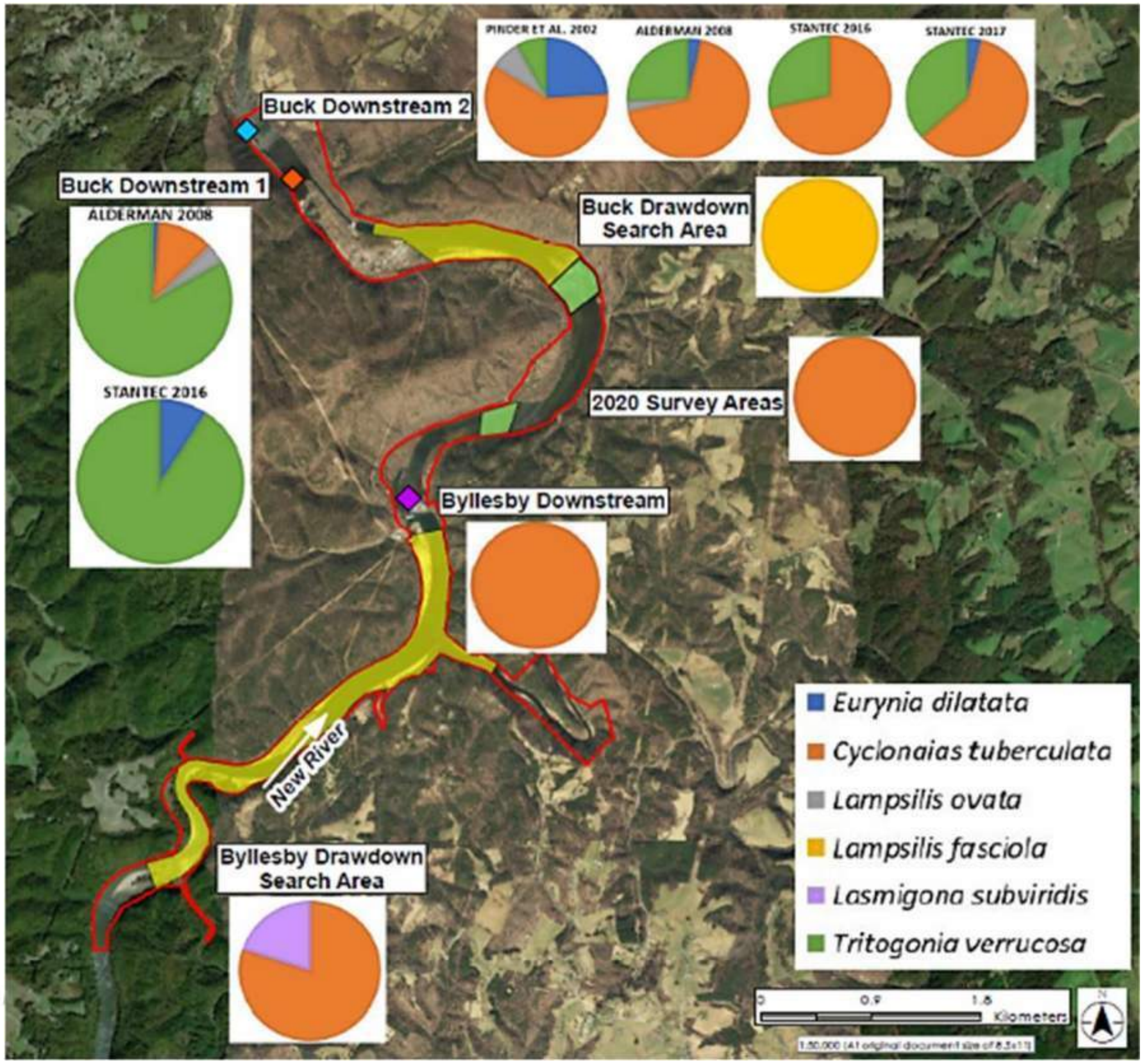
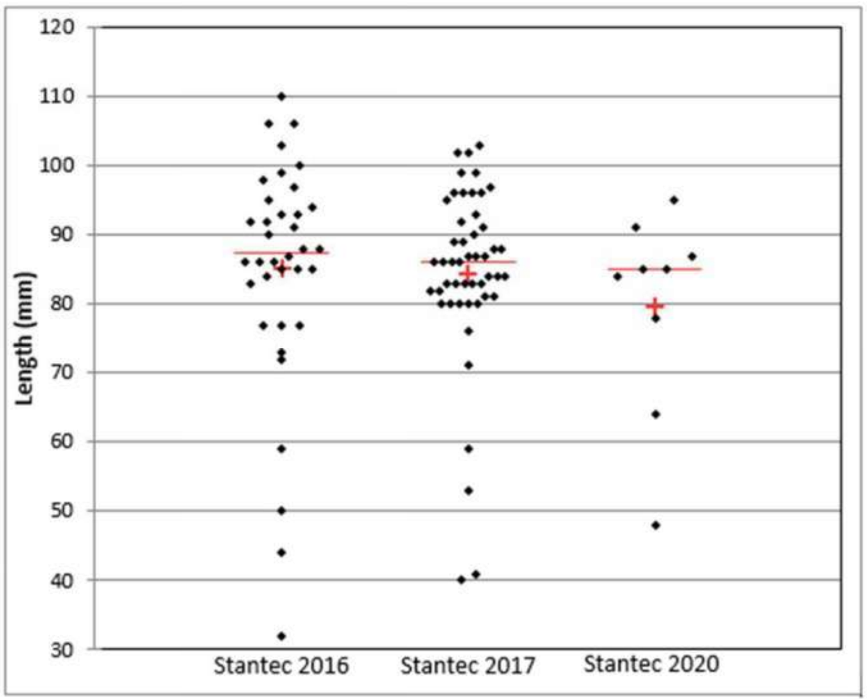
Freshwater Mussel Survey Results



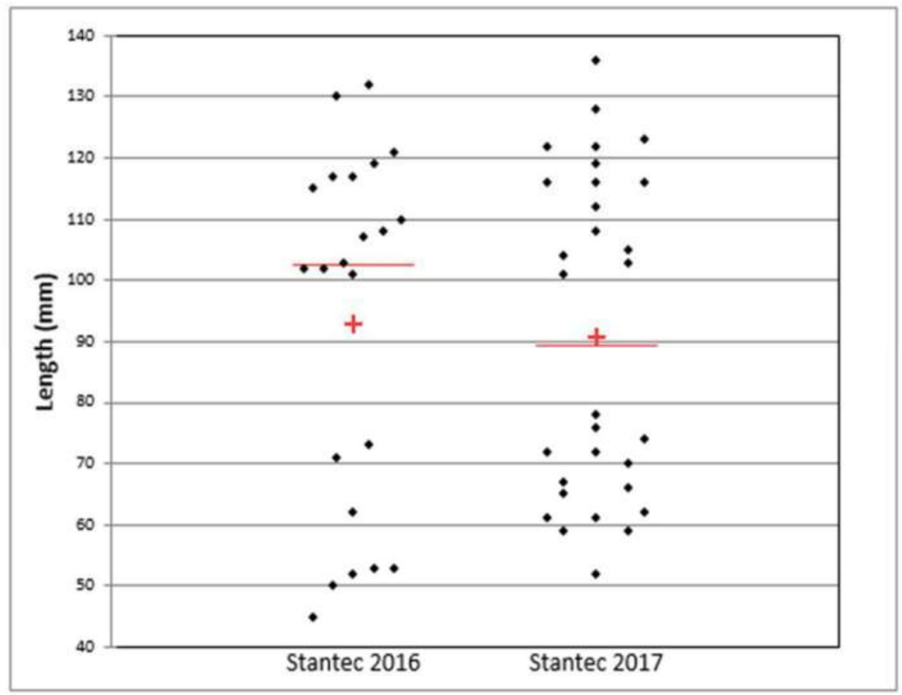
Freshwater Mussel Survey Results

	Pinder et al. 2002	Alderman 2008	Stantec 2016	Stantec 2017	Stantec 2018a	Stantec 2018b	Stantec 2020
Location	Downstream of Buck				Byllesby Pool	Buck Pool	B/N Buck/Byllesby
Species Richness	4	4	3	3	2	1	1
Abundance	26	275	53	82	5	1	9
Search effort (hours)	5	9.25	6.7	6.7	27.2	15.5	33.3
CPUE	5.2	29.7	3.9	11.0	0.18	0.13	0.27
Density (mussels/m^2)	-	-	0.24	0.32	-	-	-

Freshwater Mussel Survey Results



Shell Lengths of *Cyclonaias tuberculata* Stantec (2016, 2017, 2020)



Shell Lengths of *Tritogonia verrucose* Stantec (2016, 2017)

Freshwater Mussel Survey Results

- Buck Tailrace: no evidence of mussels
- Velocity visually estimated at 3fps
- Could not safely evaluate substrate

Freshwater Mussel Survey Conclusion

- Overall abundance and density are low
- Densities are the lowest in reach between the two dams
- Better substrate did not correspond to higher abundance in impoundment area
  - Perceived higher quality substrate in side-channels, but sparse invertebrate life observed
  - Side channels may be intermittent during summer (no data on this)

Variances from FERC-Approved Study Plan

Proposed Scheduling Changes to the 2020-2021 Study Plan Schedule for the Byllesby/Buck Project (FERC No. 2514)		
Study	**Activities**	**Proposed Timeframe for Completion (January 2021 update)**
Aquatic Resources Study	Desktop Literature Review	Completed (August 2020)
	Macroinvertebrate and Crayfish Survey	Completed (October 2020) April – May 2021
	Fish Community Survey	Boat Electrofishing (October) and Gill Netting (November) Completed in 2020 Boat and Backpack Electrofishing and Gill Netting Scheduled for Spring 2021 (April – May)
	Freshwater Mussel Survey	Completed (September - October 2020)
	Fish Impingement and Entrainment Evaluation and Turbine Blade Strike Analysis	Preliminary Impingement and Entrainment Evaluation Completed (December 2020) Final Impingement and Entrainment Evaluation and Turbine Blade Strike Analysis (July 2021)
	Distribute Draft Aquatic Resources Study Report with the ISR/USR	ISR Completed (January 2021) USR December 2021

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Morning Break

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Bypass Reach Flow and Aquatic Habitat Study

Buck Bypass Reach 9.16.2020 714 cfs

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Bypass Reach Flow and Aquatic Habitat Study

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

Specific Objectives

- Delineate and quantify aquatic habitats and substrate types within the bypass reaches
- Identify and characterize locations of habitat management interest within the bypass reaches
- Determine surface water travel times and water surface elevation responses at various gate openings to:
  - Evaluate the existing ramping rates required by the existing license
  - Evaluate potential available habitat under the existing 360 cfs minimum downstream flow requirement
  - Evaluate potential seasonal minimum flow releases in the bypass reach

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Bypass Reach Flow and Aquatic Habitat Study

Study Status

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

Preliminary Summary of Study Methods and Results

- Completed desktop habitat mapping and evaluation of Project inflows
- Assembled Habitat Suitability Index (HSI) criteria
- Developed a model calibration target flow recommendation
- Collected field data during target flow releases into the Buck bypass reach
- Developed and calibrated 2-D hydraulic model of the Buck bypass reach
- Used model to simulate potential available habit in the Buck study area at target flows

Byllesby Study Area

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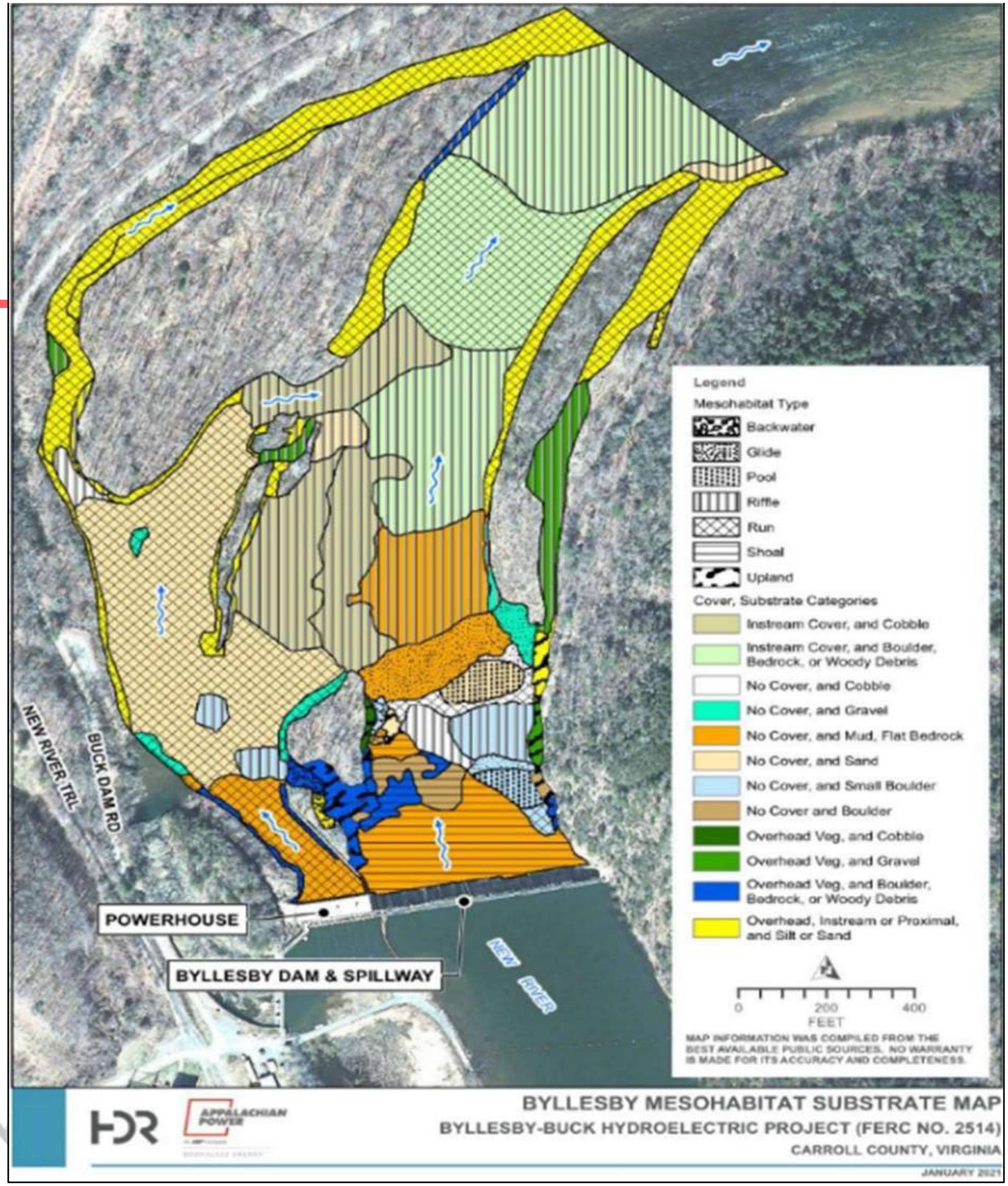
Byllesby Mesohabitat Substrate Map



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Byllesby Aquatic Habitat Characteristics

Habitat Characteristic	Area (acres)	Percent (%)
Cover		
No Cover	16.0	39.9
Instream Cover	15.0	37.4
Overhead Vegetation	9.1	22.7
Substrate		
Boulder, Bedrock, or Woody Debris	11.6	28.9
Sand	6.9	17.2
Silt or Sand	6.8	16.9
Mud or Flat Bedrock	5.8	14.6
Cobble	5.5	13.6
Boulder	1.9	4.6
Gravel	1.7	4.2
Mesohabitat		
Run	17.7	44.2
Riffle	16.4	41.0
Shoal	2.9	7.2
Glide	1.3	3.3
Upland	0.9	2.2
Pool	0.6	1.4
Backwater	0.5	0.7

Byllesby Bypass Reach 7.31.2019 Leakage Flow

Byllesby Downstream Reach 8.29.2019

Buck Study Area

Figure 1 of 3
Buck Mesohabitat Substrate Map (Upper Bypass Reach)

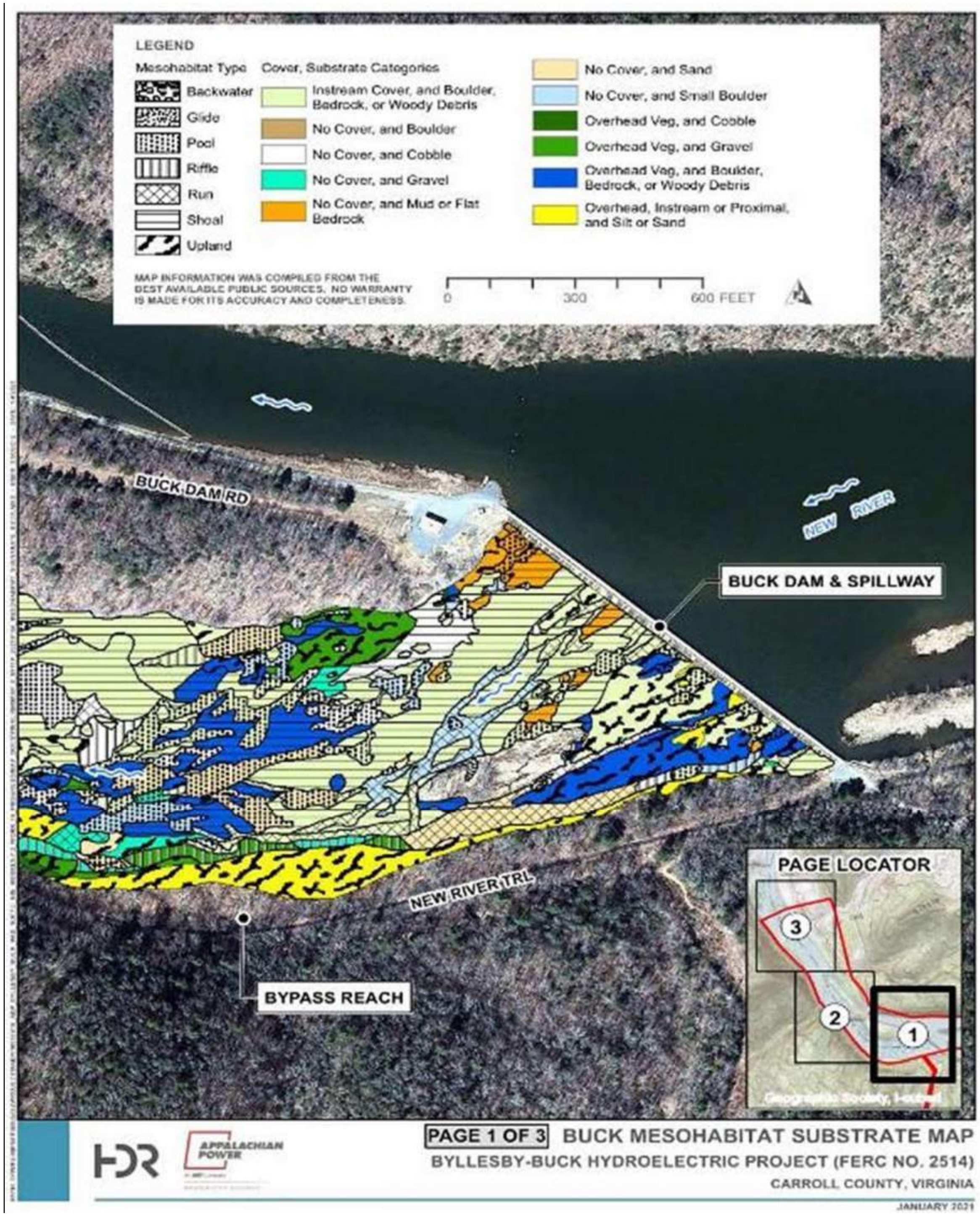


Figure 2 of 3
Buck Mesohabitat Substrate Map (Lower Bypass Reach)

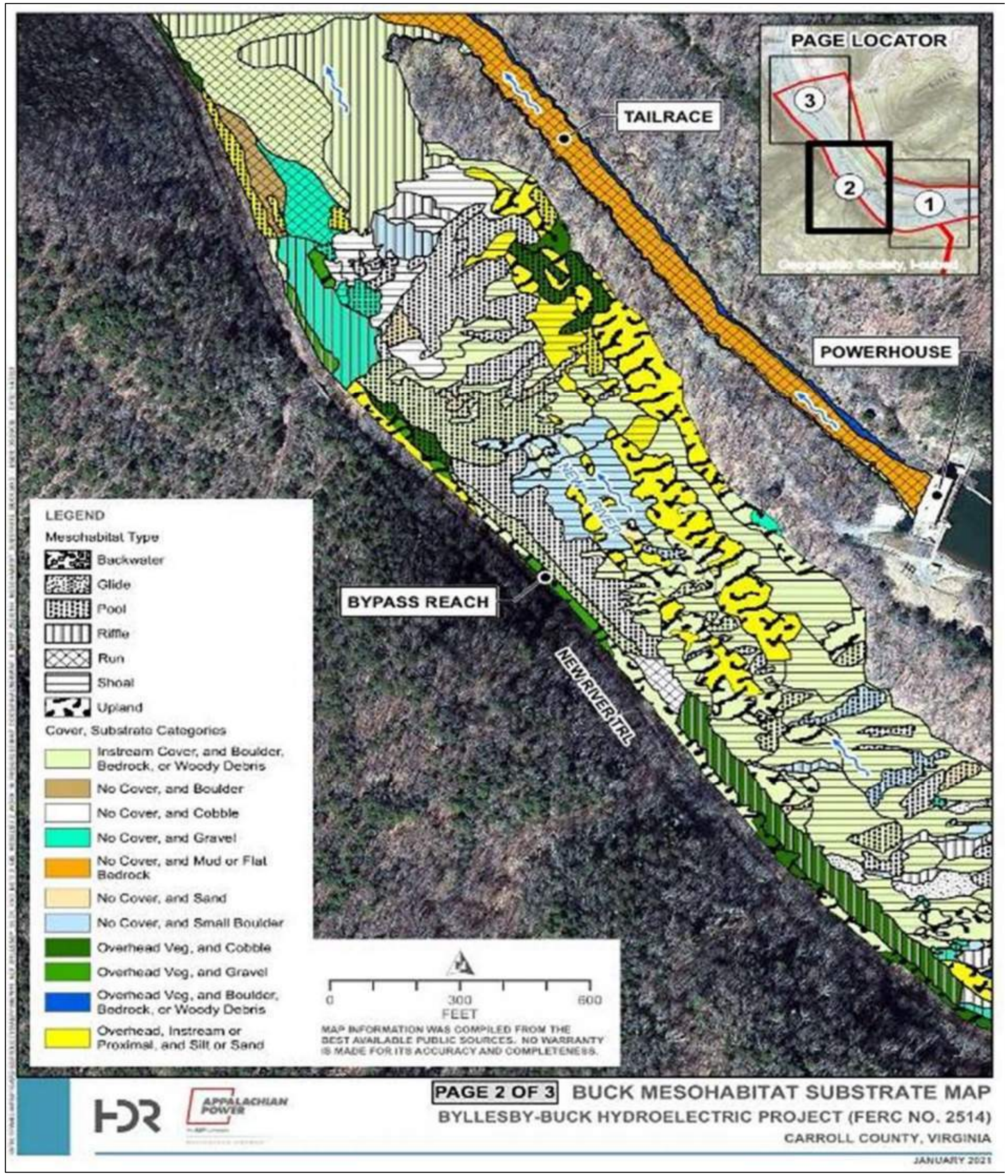
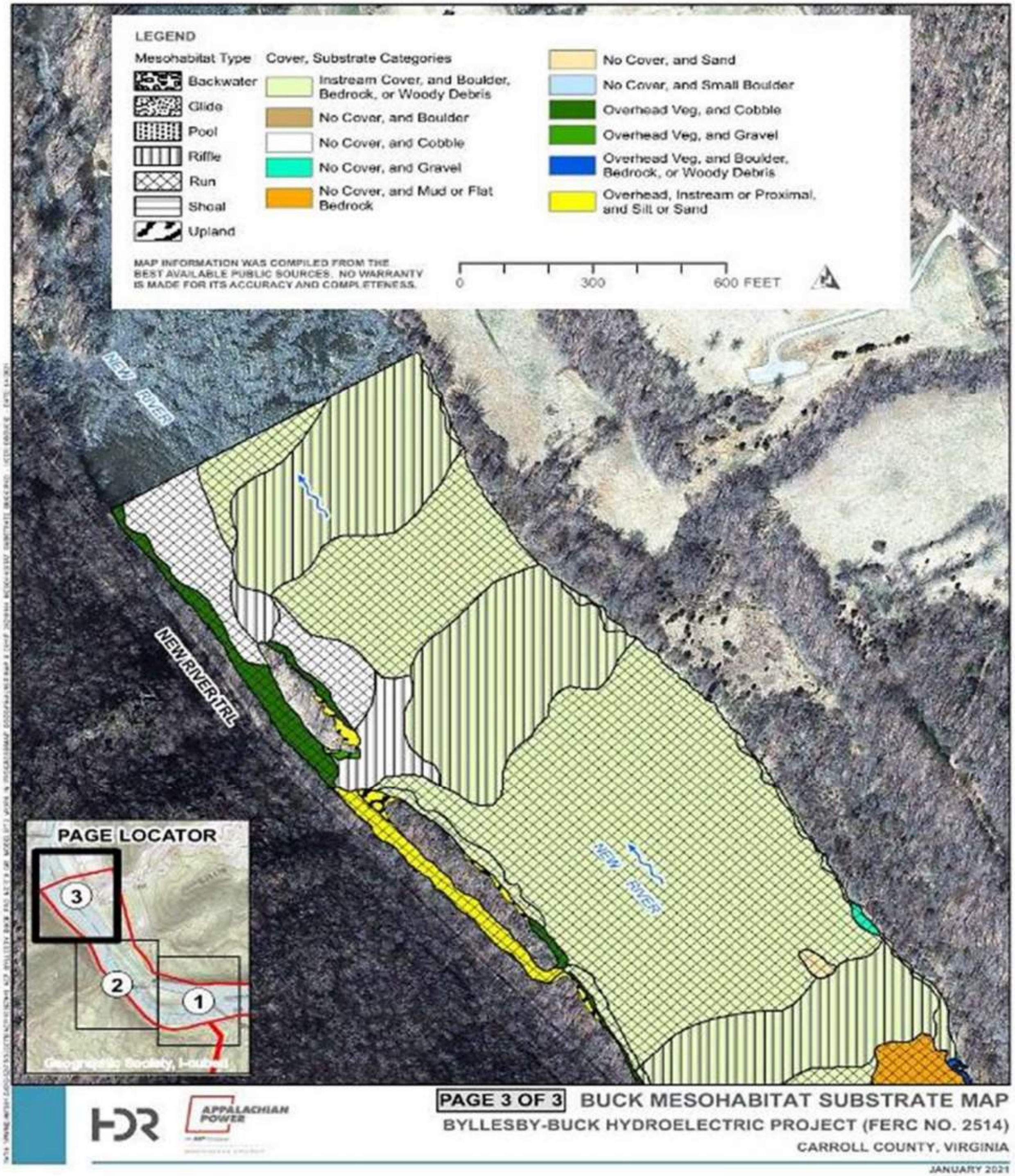


Figure 3 of 3
Buck Mesohabitat Substrate Map (Lower Study Area Boundary)



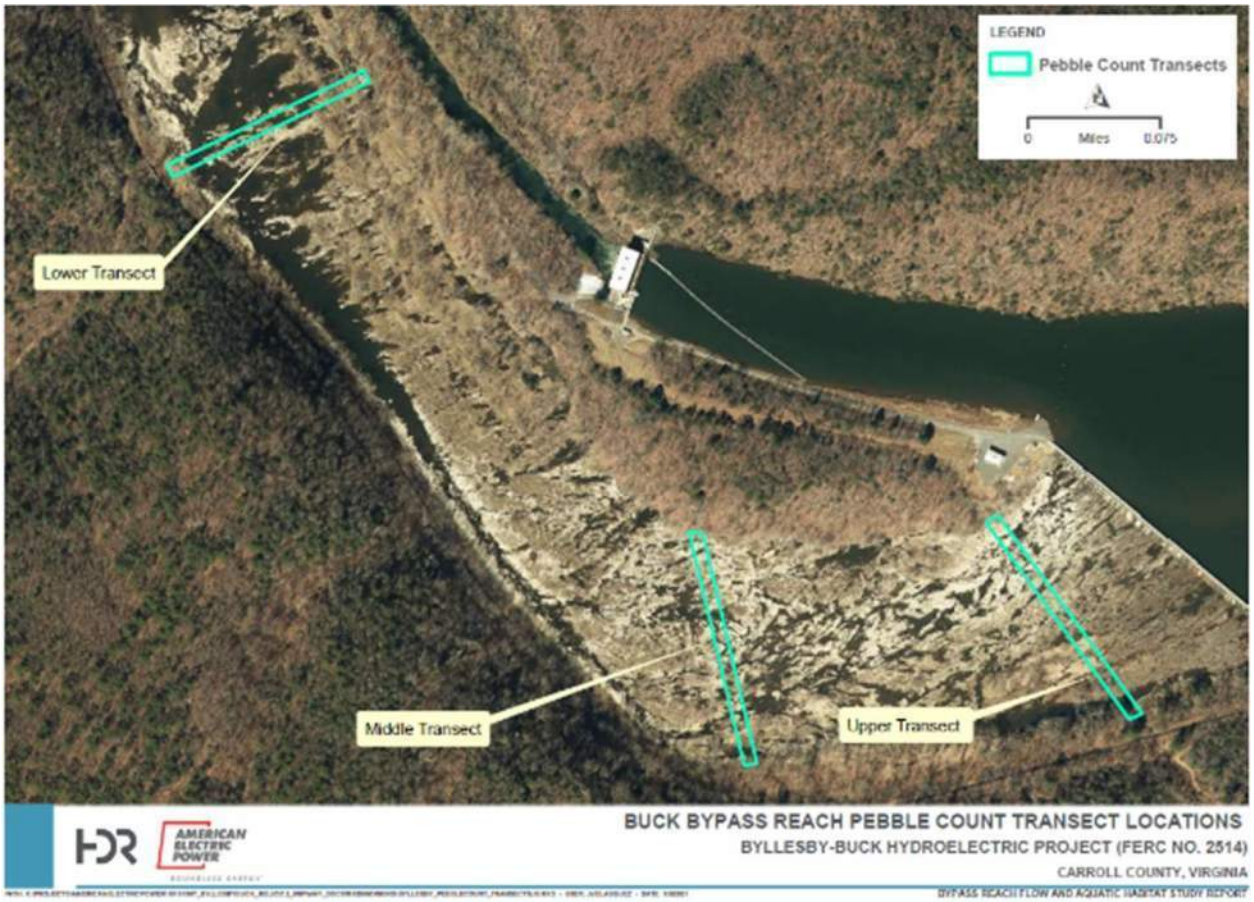
Buck Aquatic Habitat Characteristics

Habitat Characteristic	Area (acres)	Percent (%)
Cover		
Instream Cover	65.8	66.2
No Cover	24.5	24.7
Overhead Vegetation	9.1	9.1
Substrate		
Boulder, Bedrock, or Woody Debris	61.6	61.9
Cobble	15.0	15.1
Silt or Sand	8.0	8.1
Gravel	4.3	4.3
Small Boulder	3.8	3.8
Mud or Flat Bedrock	3.8	3.8
Sand	2.6	2.7
Boulder	0.4	0.4
Mesohabitat		
Run	31.1	31.2
Shoal	20.6	20.7
Riffle	20.2	20.4
Upland	14.5	14.6
Pool	12.6	12.7
Glide	0.4	0.4
Backwater	0.0	0.0

Buck Upper Bypass Reach
7.31.2019 Leakage Flow

Buck Lower Bypass Reach
8.17.2020 Tainter Gates #1 & #4 Partially Open

Particle Size Distribution Results – Buck Bypass



<u>Percent Bedrock</u>

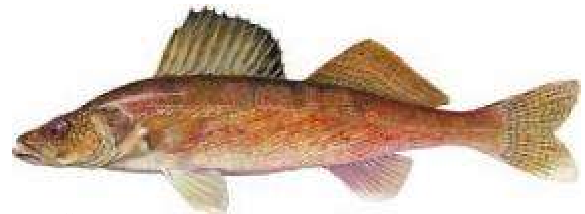
Upper Transect 52%

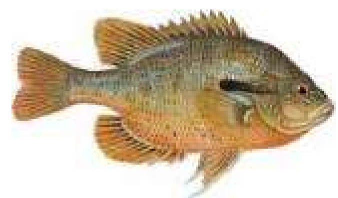
Middle Transect 27%

Lower Transect 22%

Species of Interest
Walleye and Guilds

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


Walleye
Courtesy: Virginia DWR


Redbreast Sunfish
Courtesy: Virginia DWR


Silver Redhorse
Courtesy: USGS


Shorthead Redhorse
Courtesy: Iowa DNR

2-D Hydraulic Model Calibration Flows

Measured Flows:

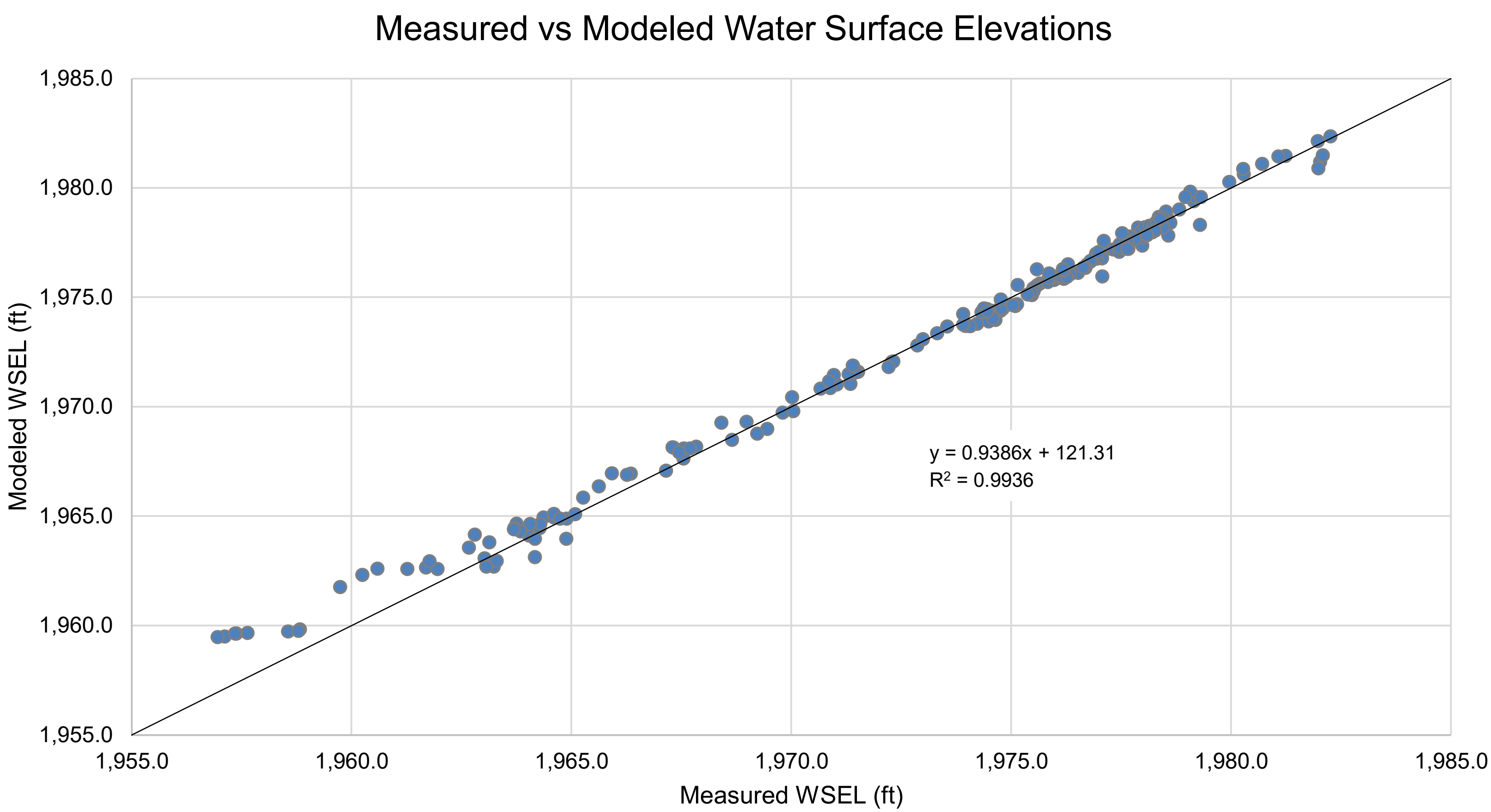
- Leakage: 17.1 cfs
- Low: 210.7 cfs (shown)
- Middle: 354 cfs
- High: 714 cfs

- Level loggers also recorded water surface elevations during higher bypass flow events

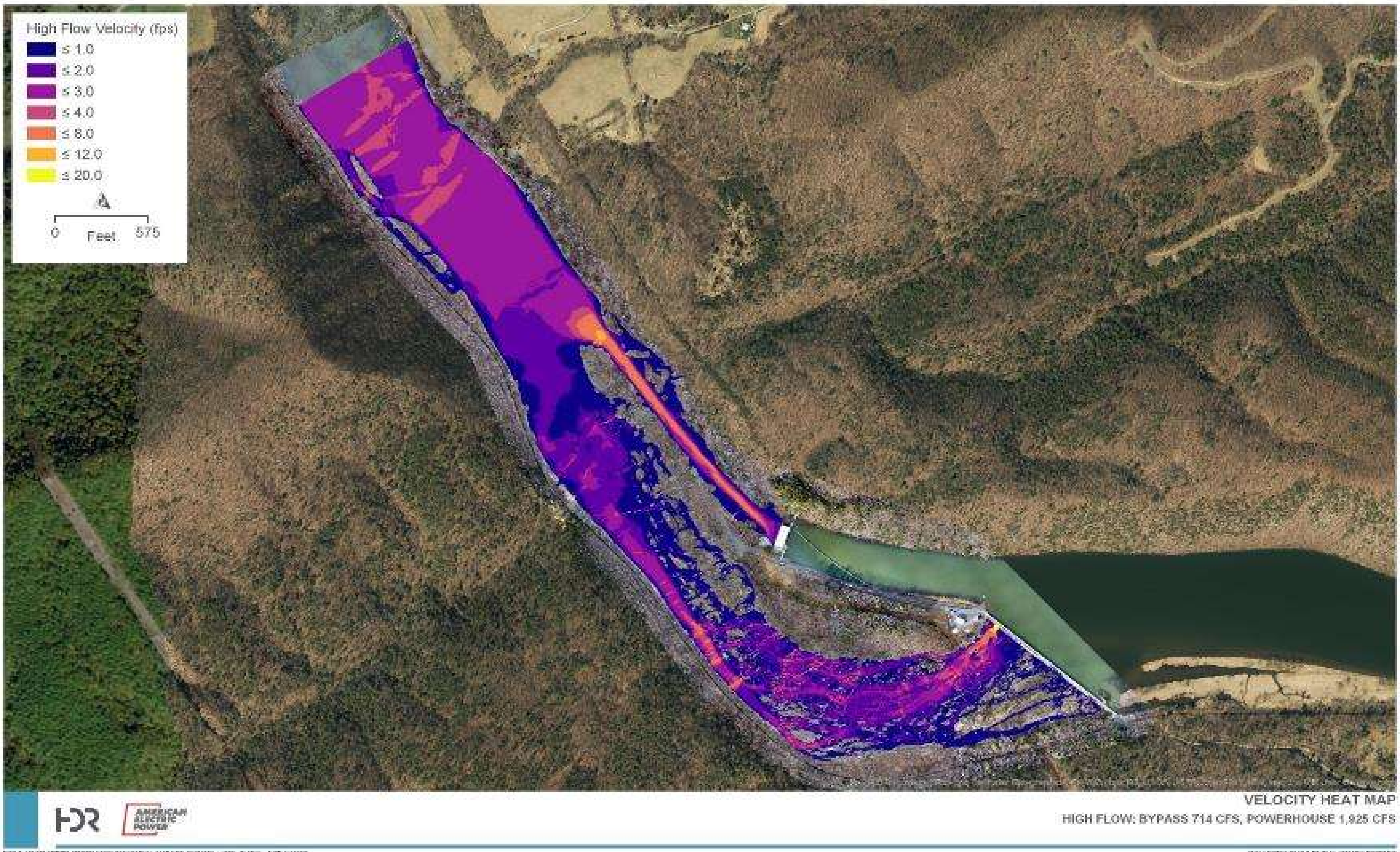
Buck Upper Bypass Reach 9.10.2020 210.7 cfs

Buck Upper Bypass Reach 9.10.2020 210.7 cfs

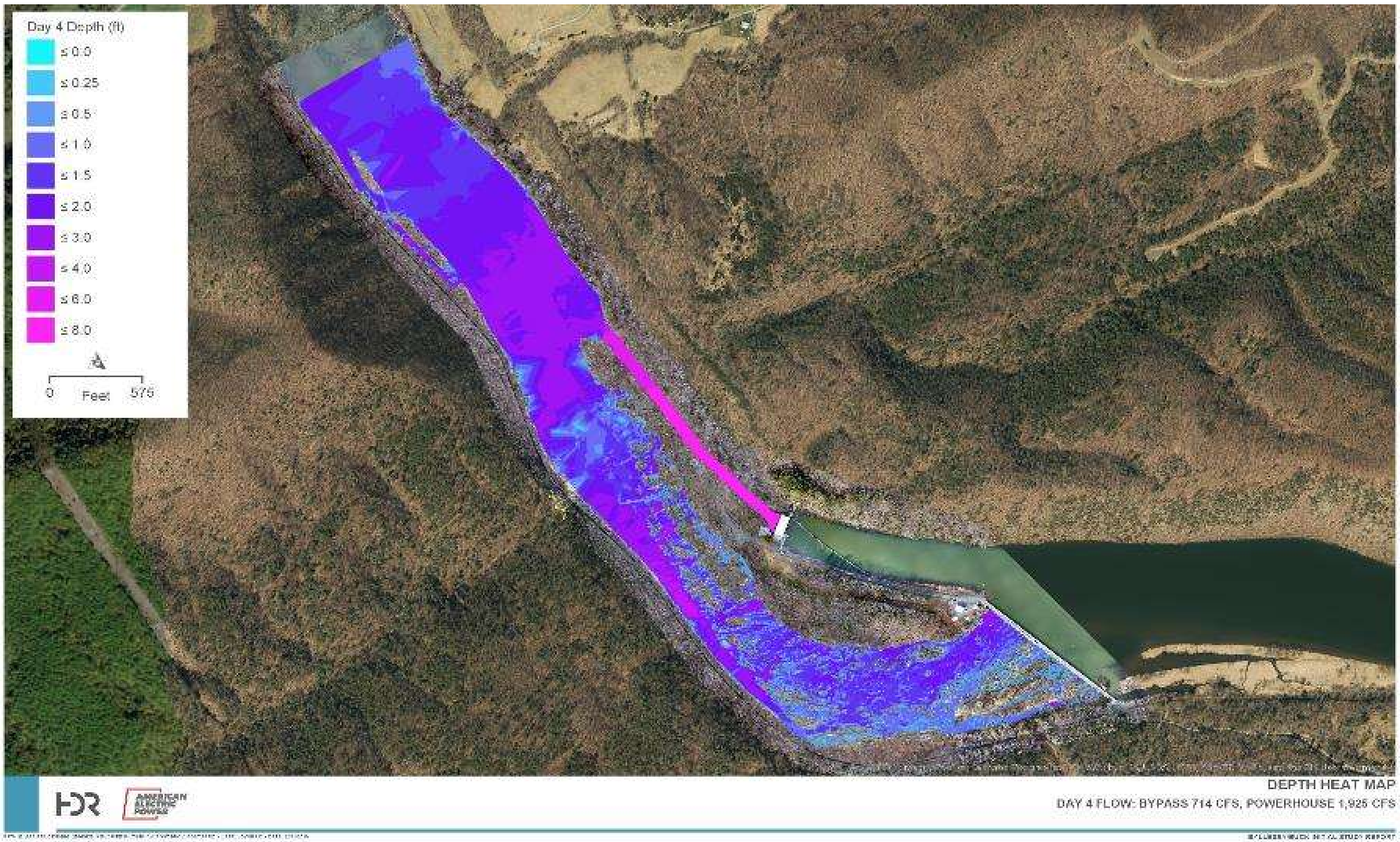
2-D Hydraulic Model Calibration Results: WSEL



2-D Hydraulic Model Calibration Results: Velocity



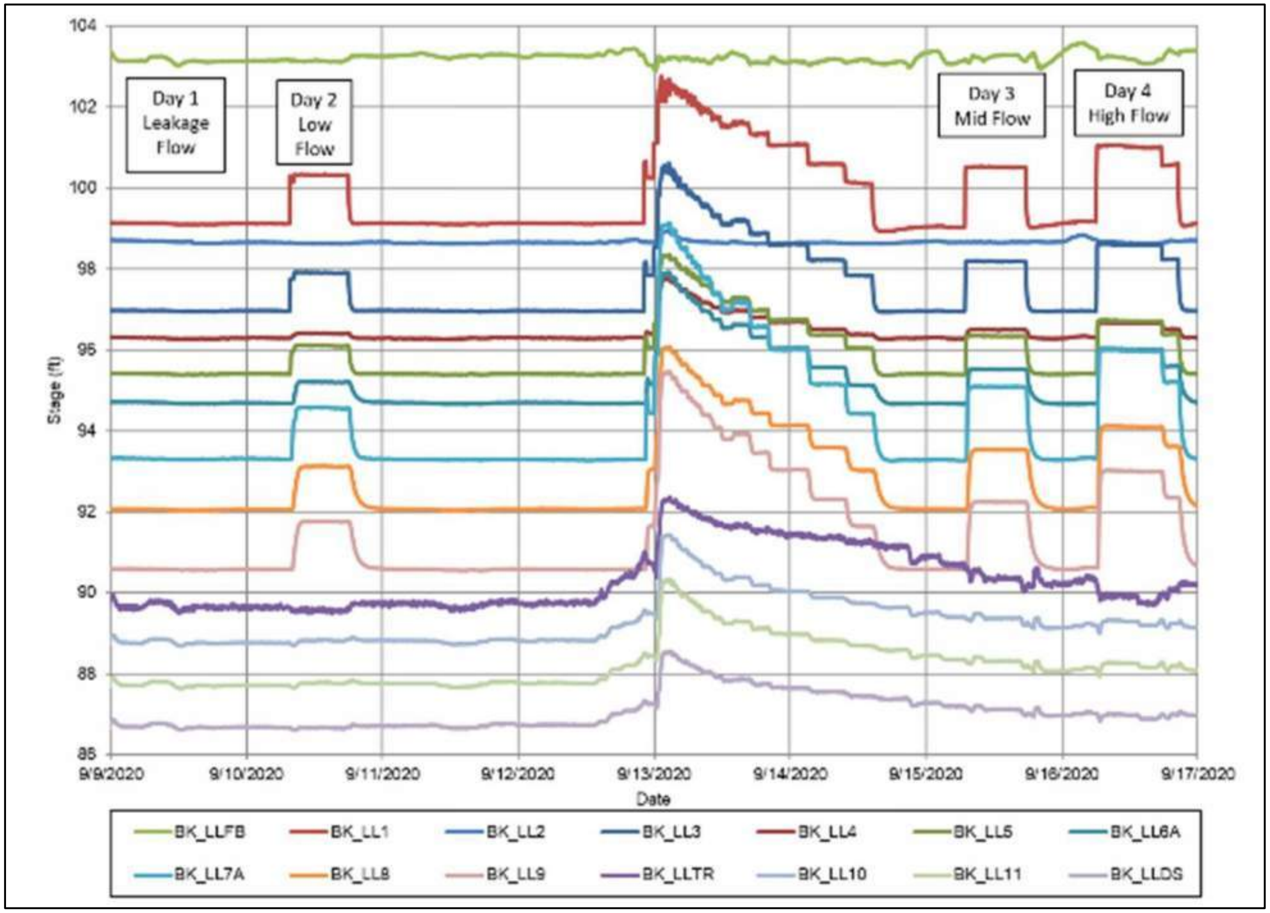
2-D Hydraulic Model Calibration Results: Depth



2-D Hydraulic Model Calibration Results: Travel Time

Bypass Reach Flow	Level Logger Time (hr:min)	Model Time (hr:min)	Delta (hr:min)
Day 1 (Leakage)	N/A	N/A	N/A
Day 2 (Low)	2:30	2:25	-0:05
Day 3 (Mid)	1:40	1:50	+0:10
Day 4 (High)	1:00	1:15	+0:15

Buck Bypass Reach: Travel Time and Water Surface Elevations



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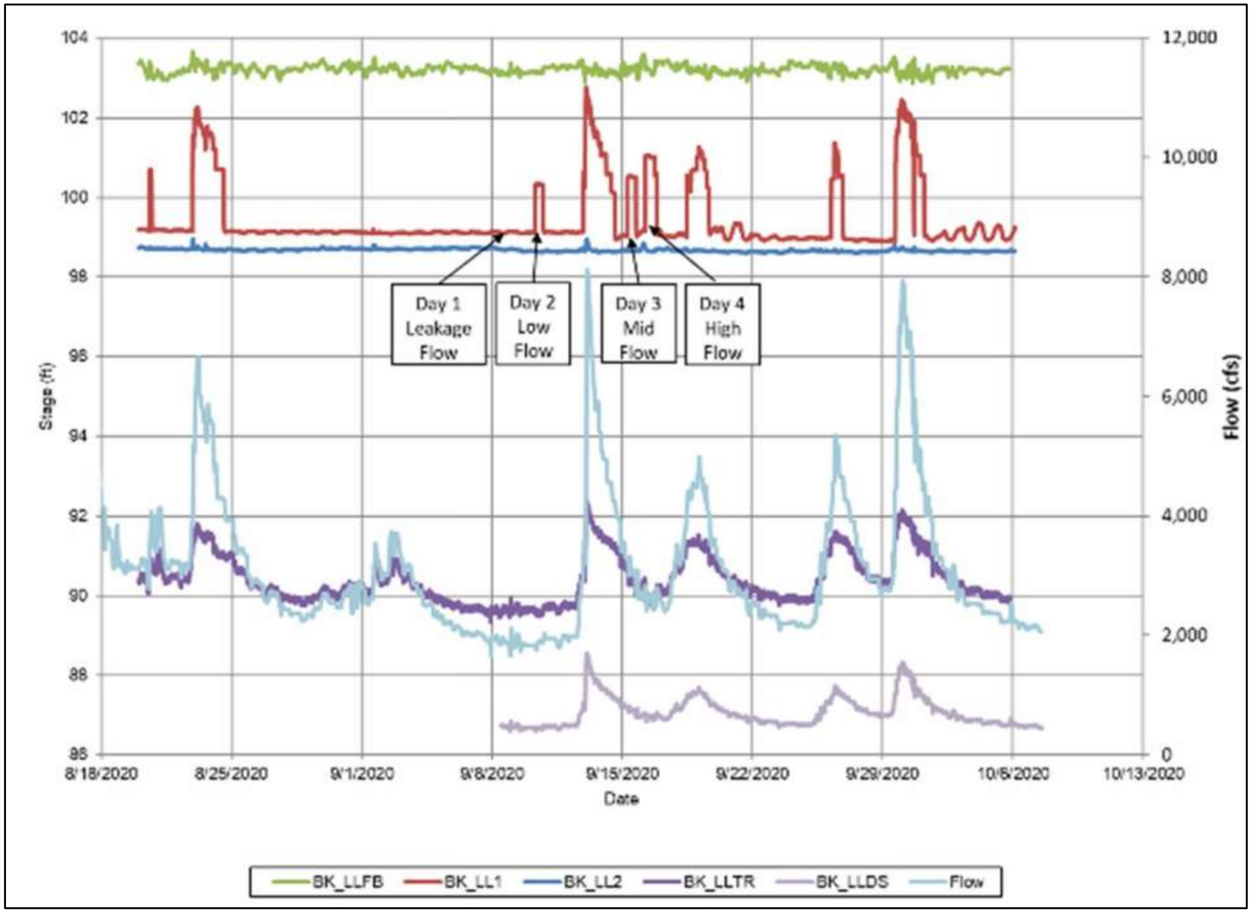
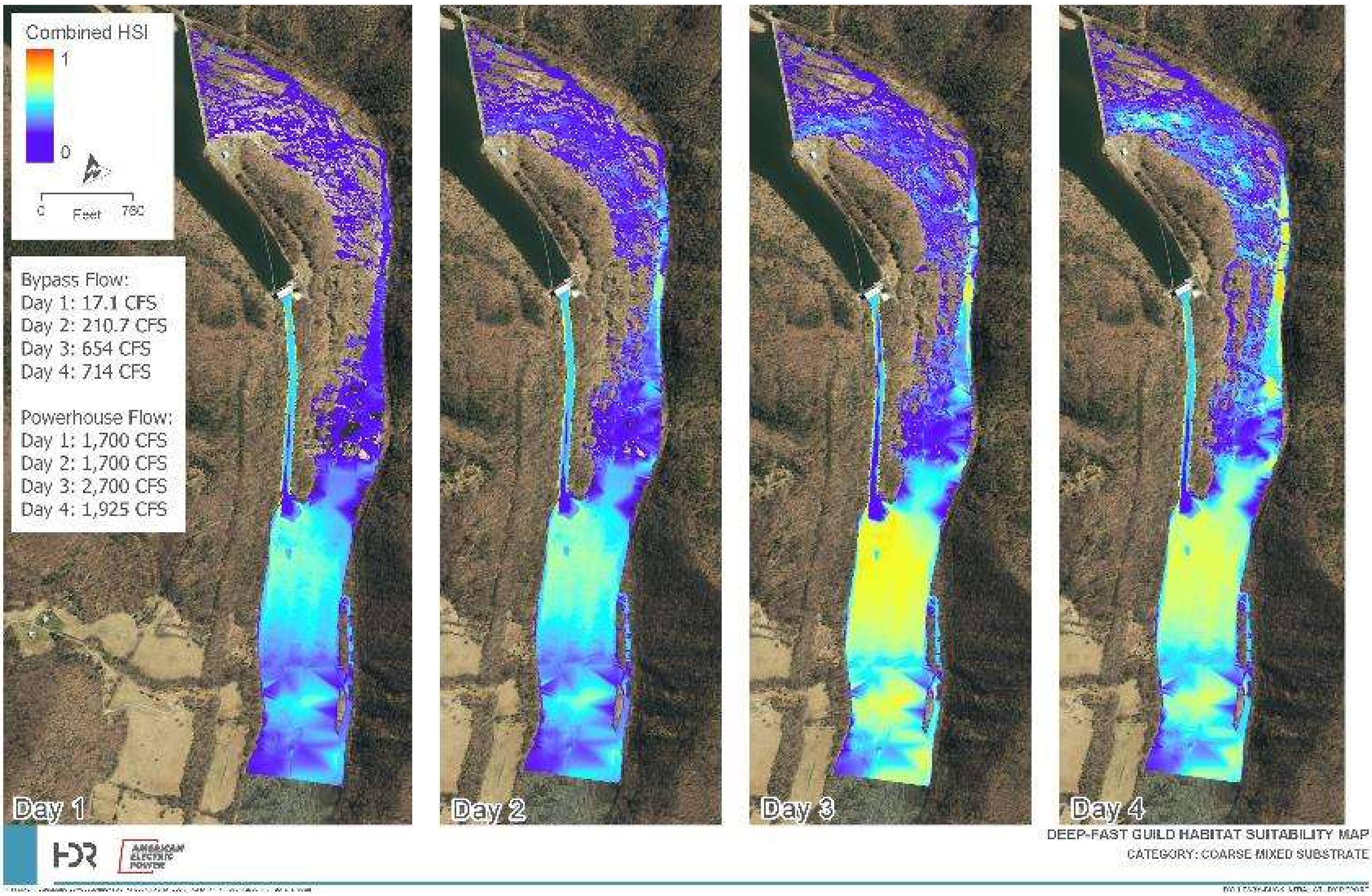
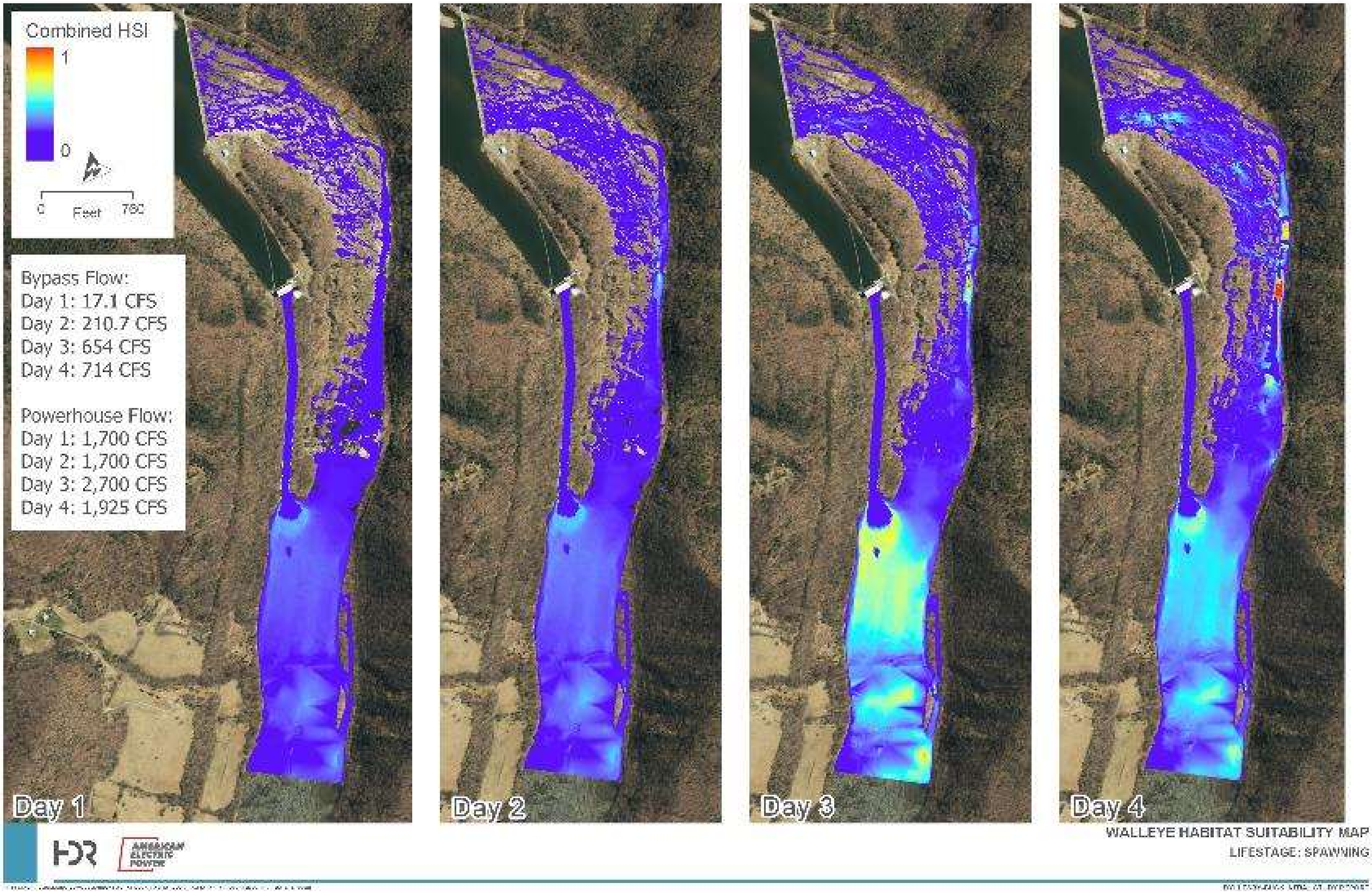
Buck Bypass Reach: Travel Time and Water Surface Elevations



Habitat Results



Habitat Results



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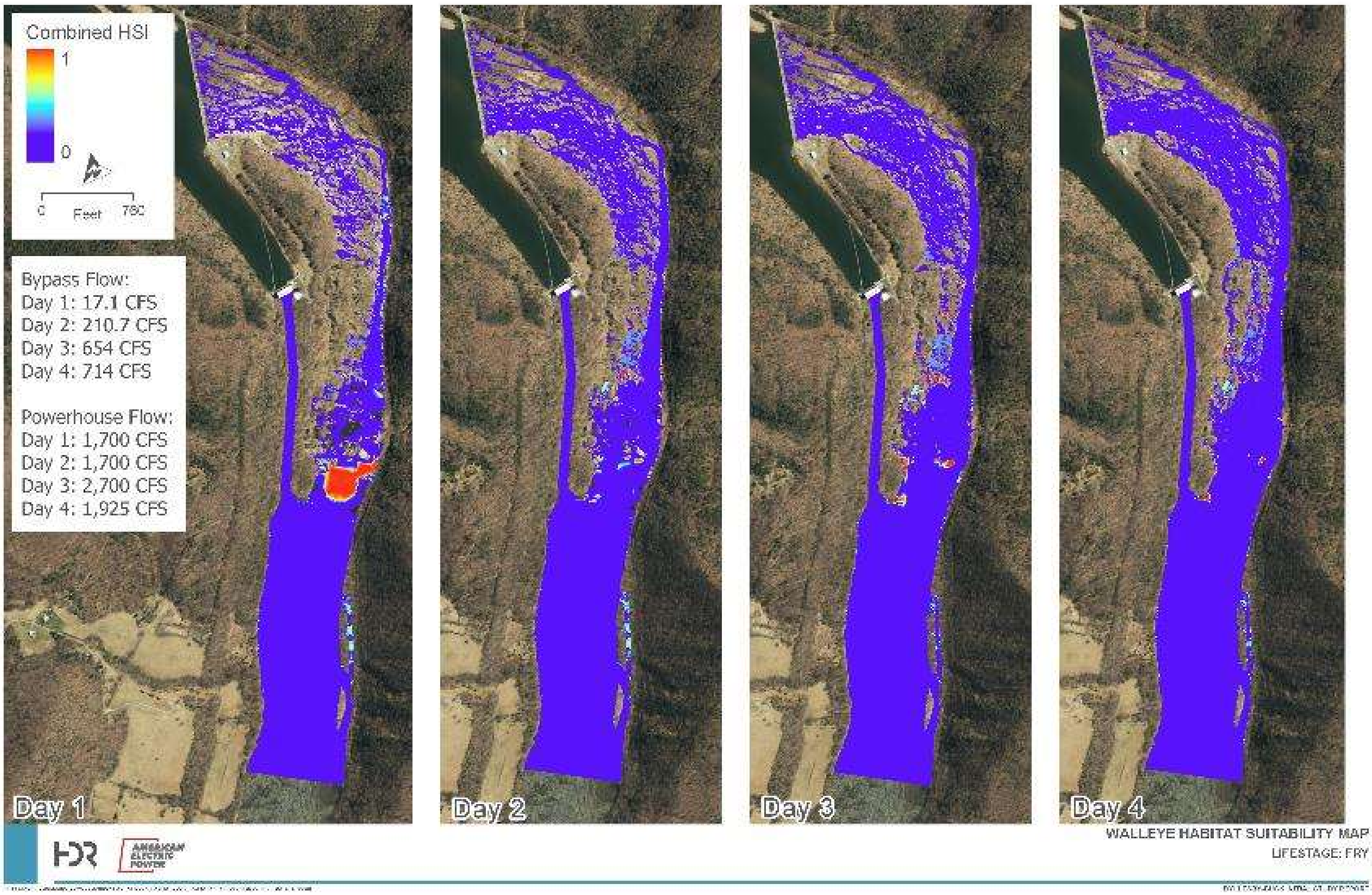
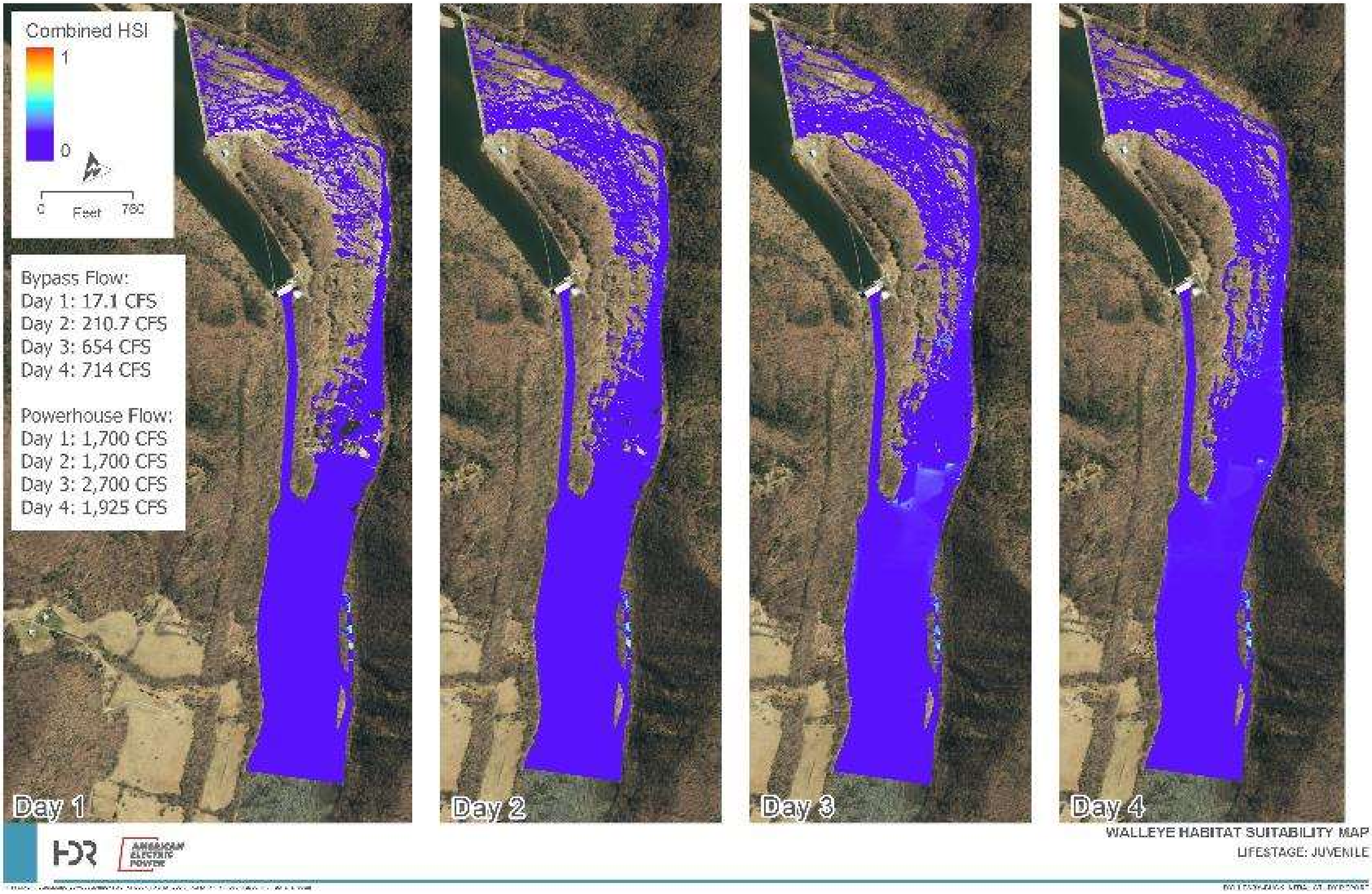
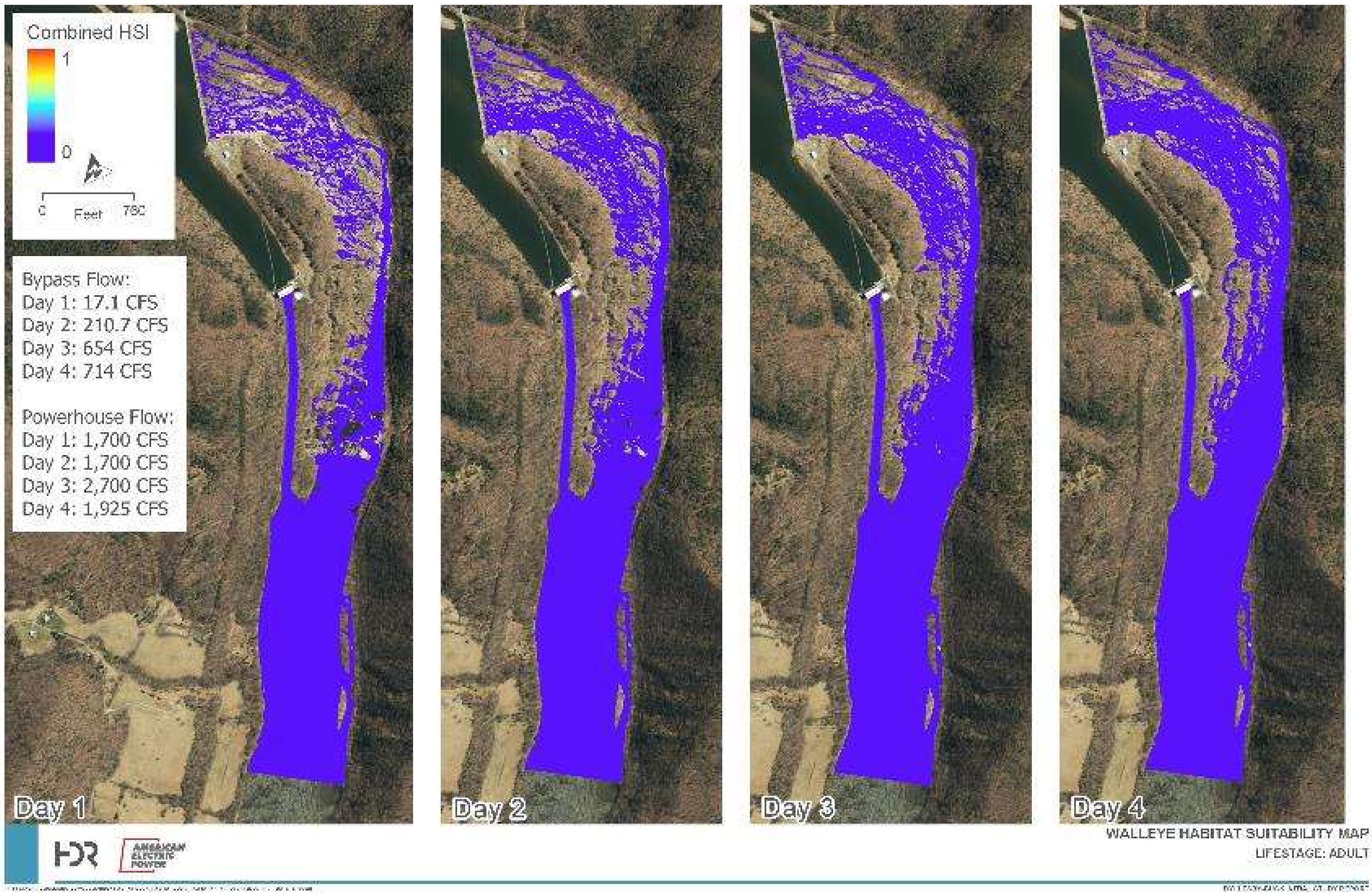
Habitat Results



Habitat Results



Habitat Results



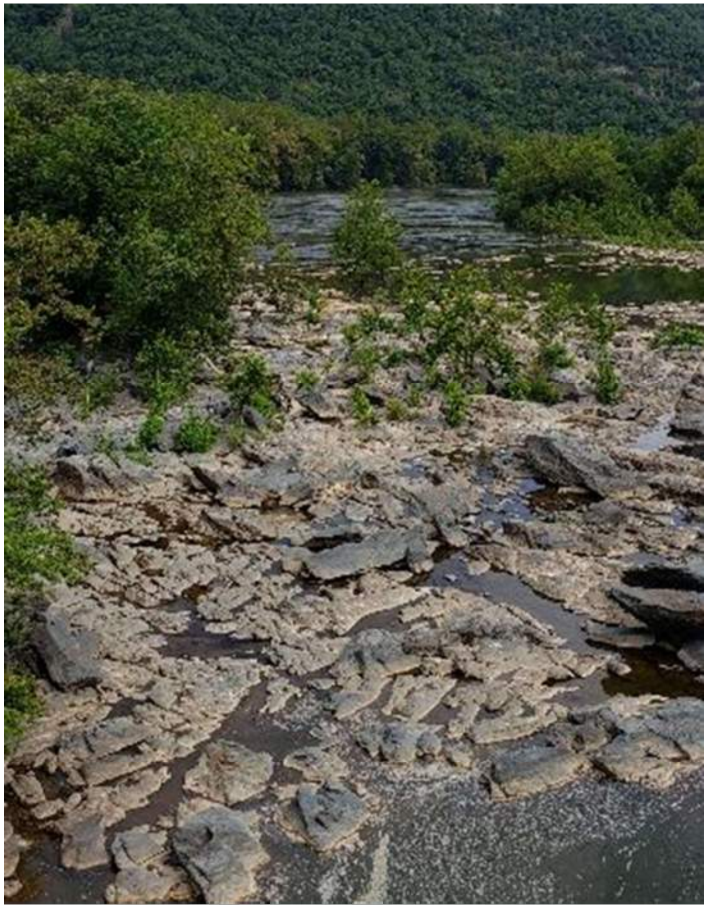
Planned (2021) Study Activities at Buck

- Ability to simulate potential aquatic habitat under various bypass flow scenarios
- Evaluate existing 360 cfs minimum downstream flow requirement
- Evaluate potential seasonal minimum flow releases in the bypass reach

Buck Bypass Reach 9.9.2020 Leakage Flow

Planned (2021) Study Activities at Byllesby

- Collect model calibration data at steady-state target flows
- Develop 2-D hydraulic model (Innovyze Infoworks Integrated Catchment Model)
- Simulate potential aquatic habitat under various bypass flow scenarios
- Evaluate existing 360 cfs minimum downstream flow requirement
- Evaluate potential seasonal minimum flow releases in the bypass reach



Byllesby Bypass
Reach 7.31.2019
Leakage Flow

Variances from FERC-approved Study Plan

Proposed Scheduling Changes to the 2020-2021 Study Plan Schedule for the Byllesby/Buck Project (FERC No. 2514)		
Study	**Activities**	**Proposed Timeframe for Completion (January 2021 update)**
Bypass Reach Flow and Aquatic Habitat Study	Topographic Mapping and Photogrammetry Data Collection	Completed (January 2020)
	Desktop Habitat Assessment	Completed (August 2020)
	Mesohabitat Mapping and Substrate Characterization Field Data Collection	Buck Completed (September 2020) Byllesby June – August 2021
	Distribute Proposed Flow Test Scenario Framework to Interested Parties for Review	Completed (August 2020)
	Conduct Flow and Water Level Assessment and Hydraulic Modeling	Buck Completed (December 2020) Byllesby June – December 2021
	Distribute Draft Study Report with the ISR/USR	ISR Completed (January 2021) USR December 2021

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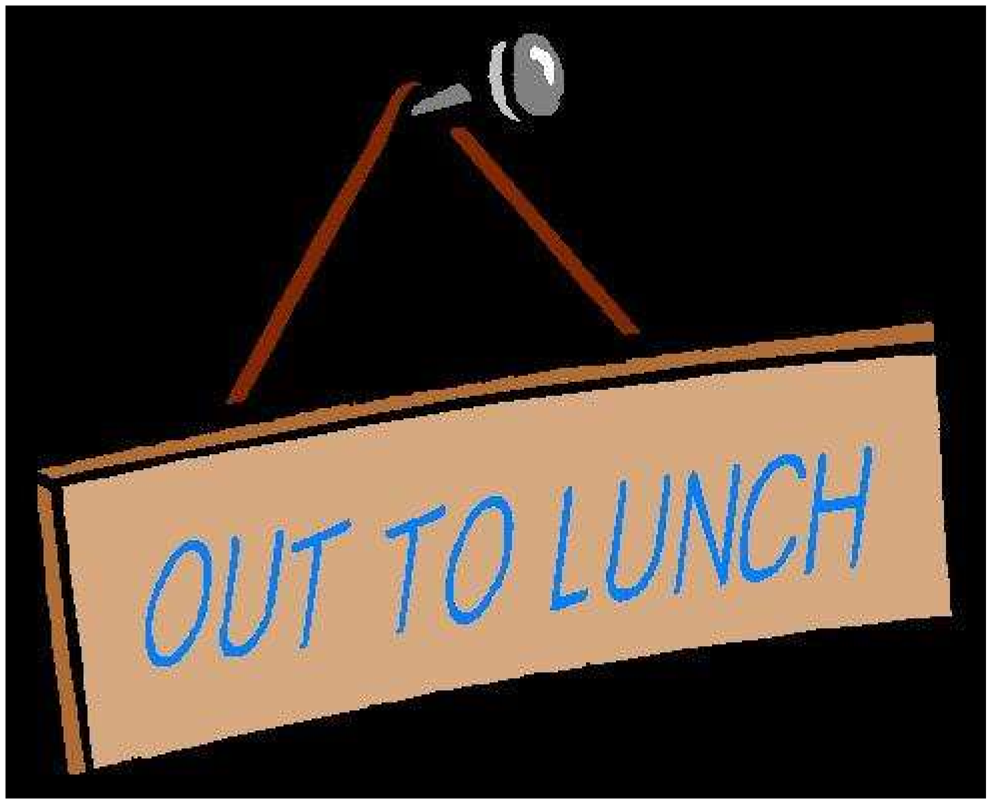
30-Minute Lunch Break



Water Quality Study

Byllesby Forebay 7.31.2019

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Water Quality Study

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

Specific Objectives:

- Gather baseline water quality data sufficient to determine consistency of existing Project operations with applicable Virginia state water quality standards and designated uses

- Provide data to determine the presence and extent, if any, of temperature or dissolved oxygen (DO) stratification in the Byllesby and Buck impoundments

- Provide data to support a Virginia Water Protection Permit application (CWA Section 401 Certification)

- Provide information to support evaluation of whether additional or modified protection, mitigation, and enhancement (PM&E) measures may be appropriate for the protection of water quality at the Project

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Water Quality Study

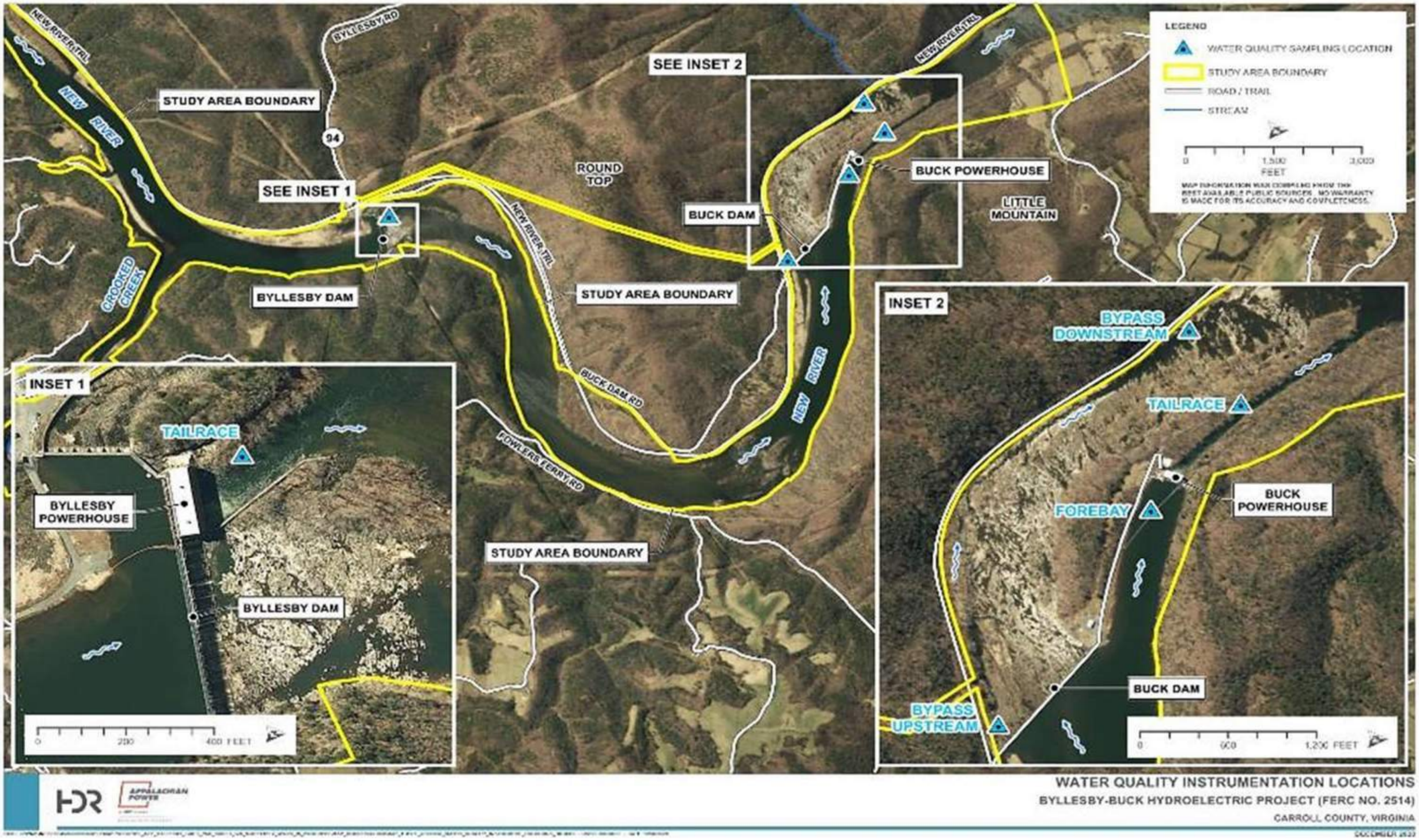
Study Status

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

Summary of Study Methods and Results

- Study period: August 17 – October 8, 2020
- Monitoring locations:
  - Byllesby tailrace location
  - Buck forebay, tailrace, and bypass reach locations
- Temperature and DO data collected at 15-minute intervals
- Discrete data collected during equipment installation, download events, and demobilization (temperature, DO, pH, and specific conductivity)
- Vertical profile data collected during discrete data collection events

Water Quality Study Area



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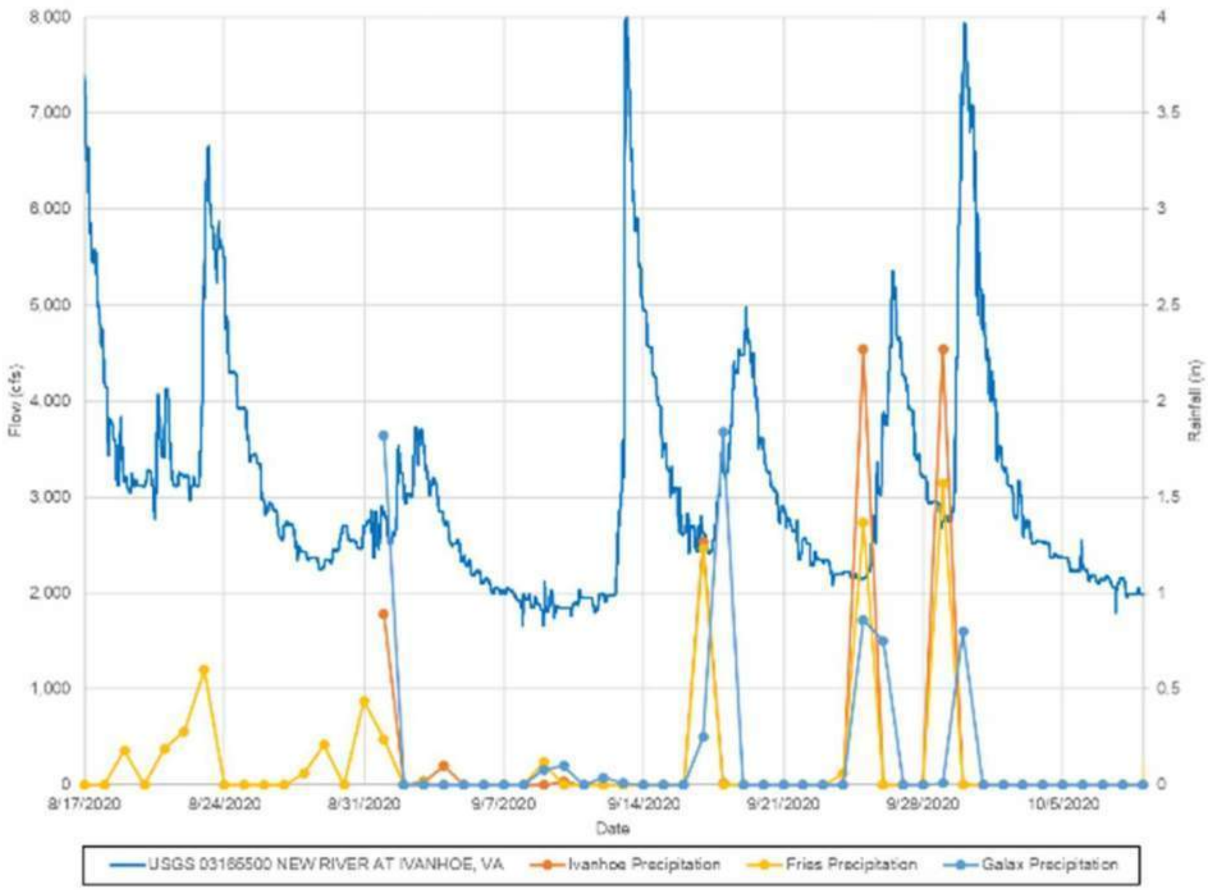
Project Hydrology



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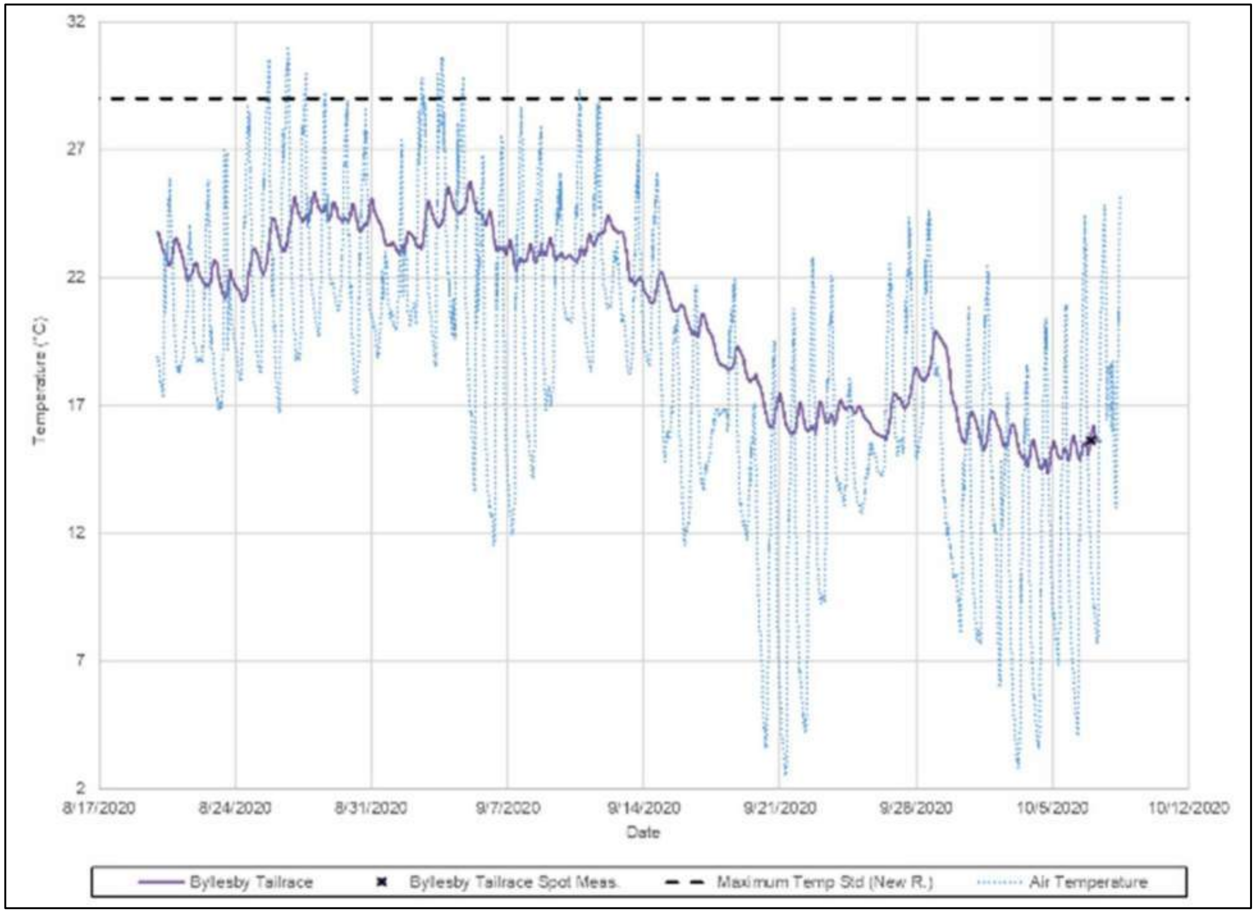
Air & Water Temperatures Byllesby Tailrace



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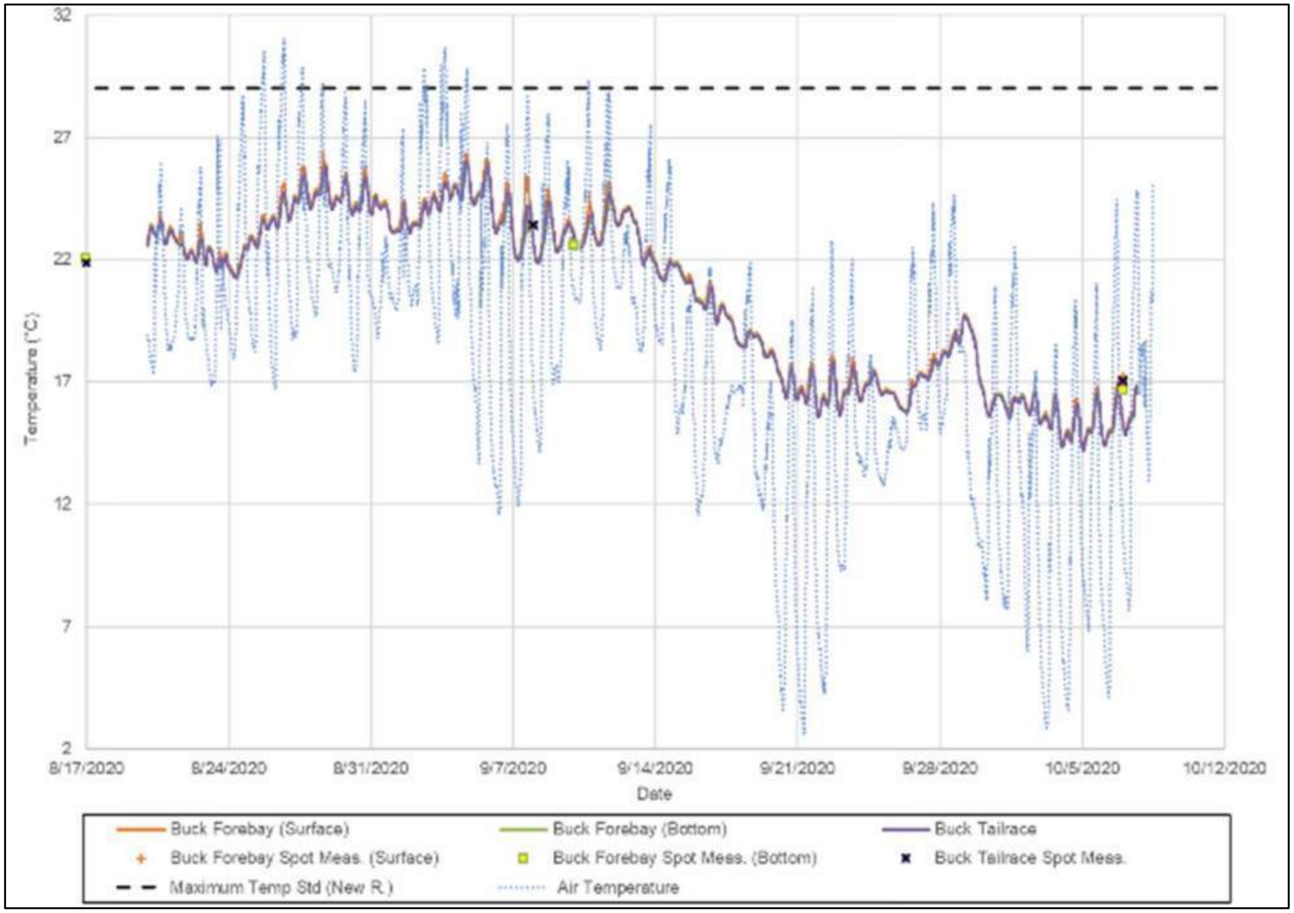
Air & Water Temperatures Buck Forebay and Tailrace



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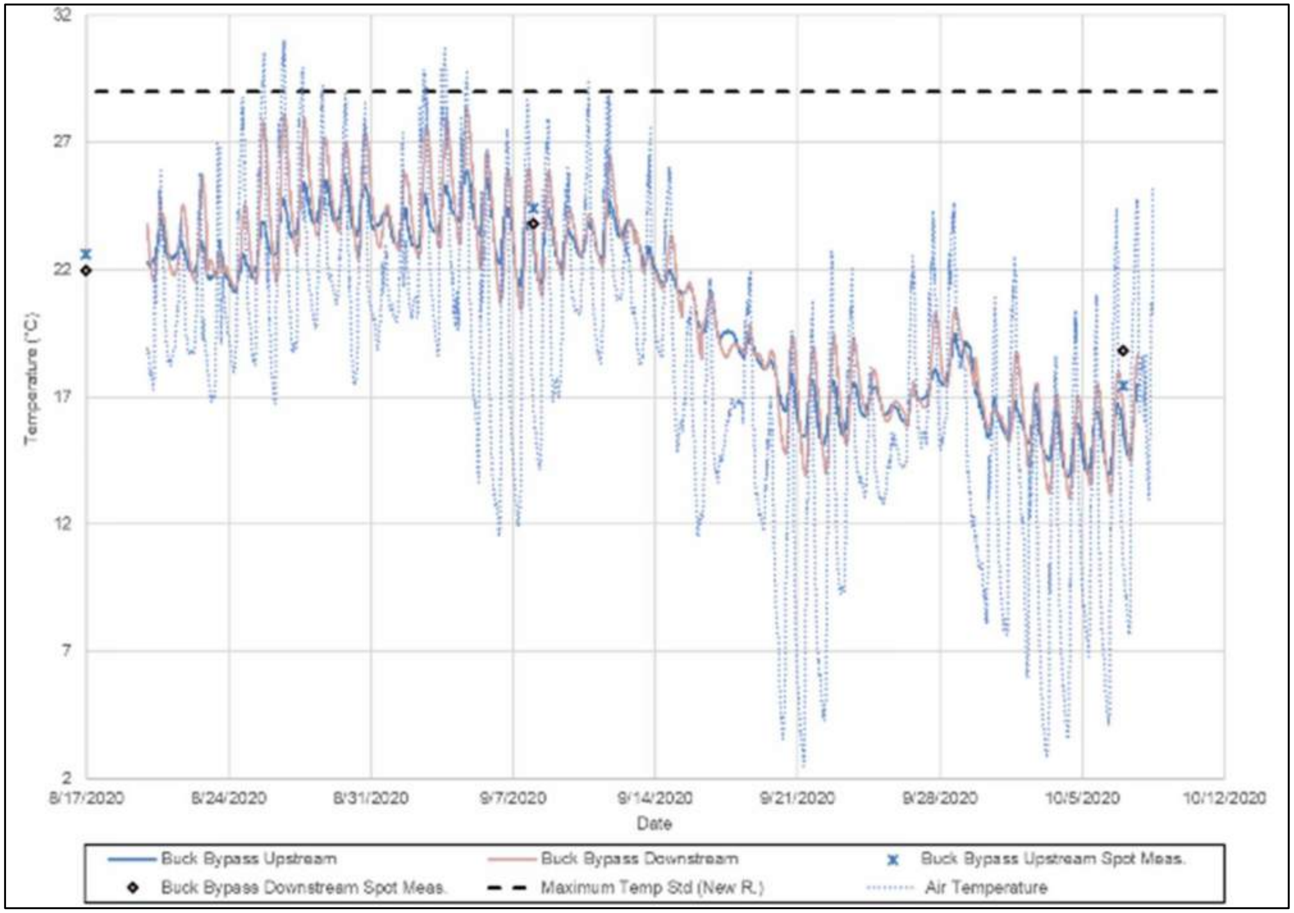
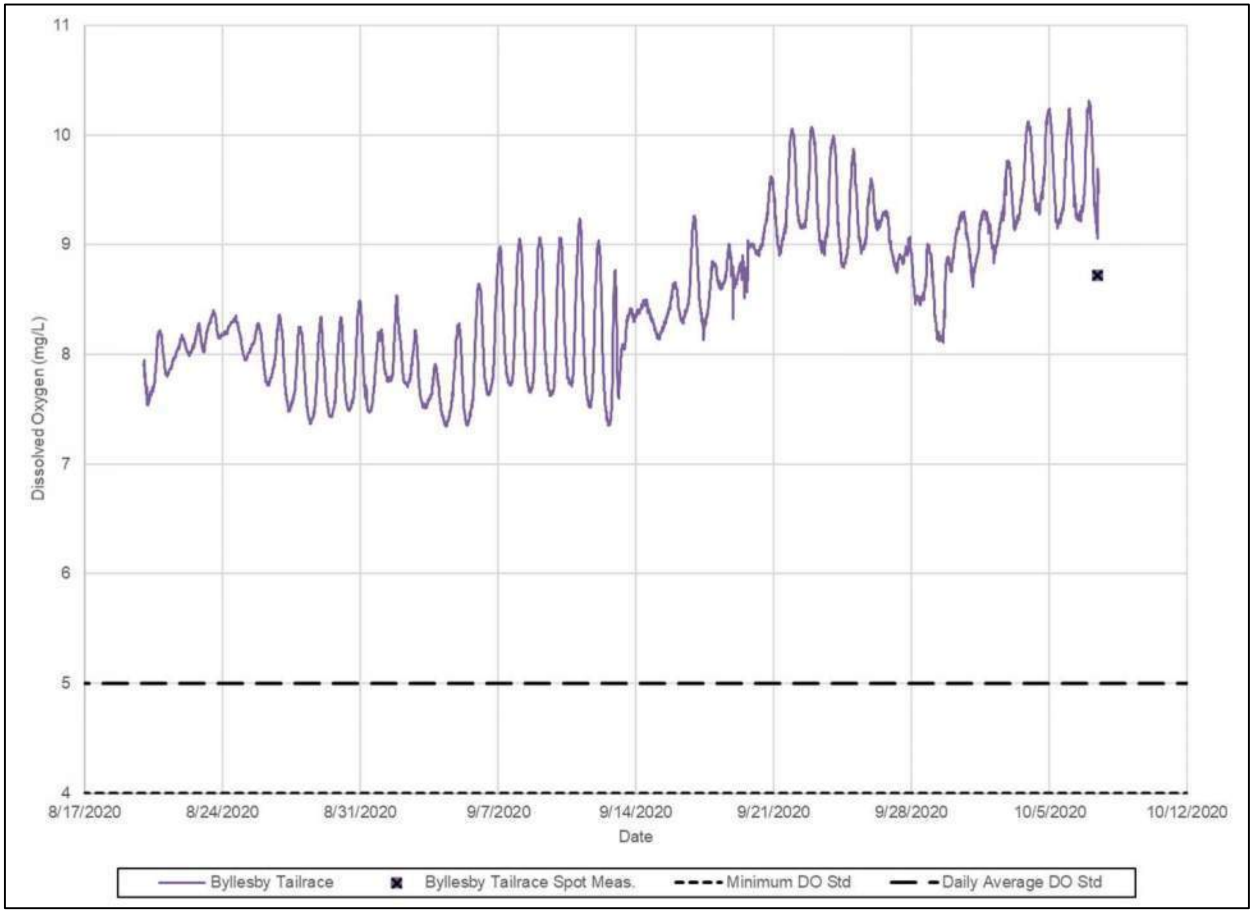
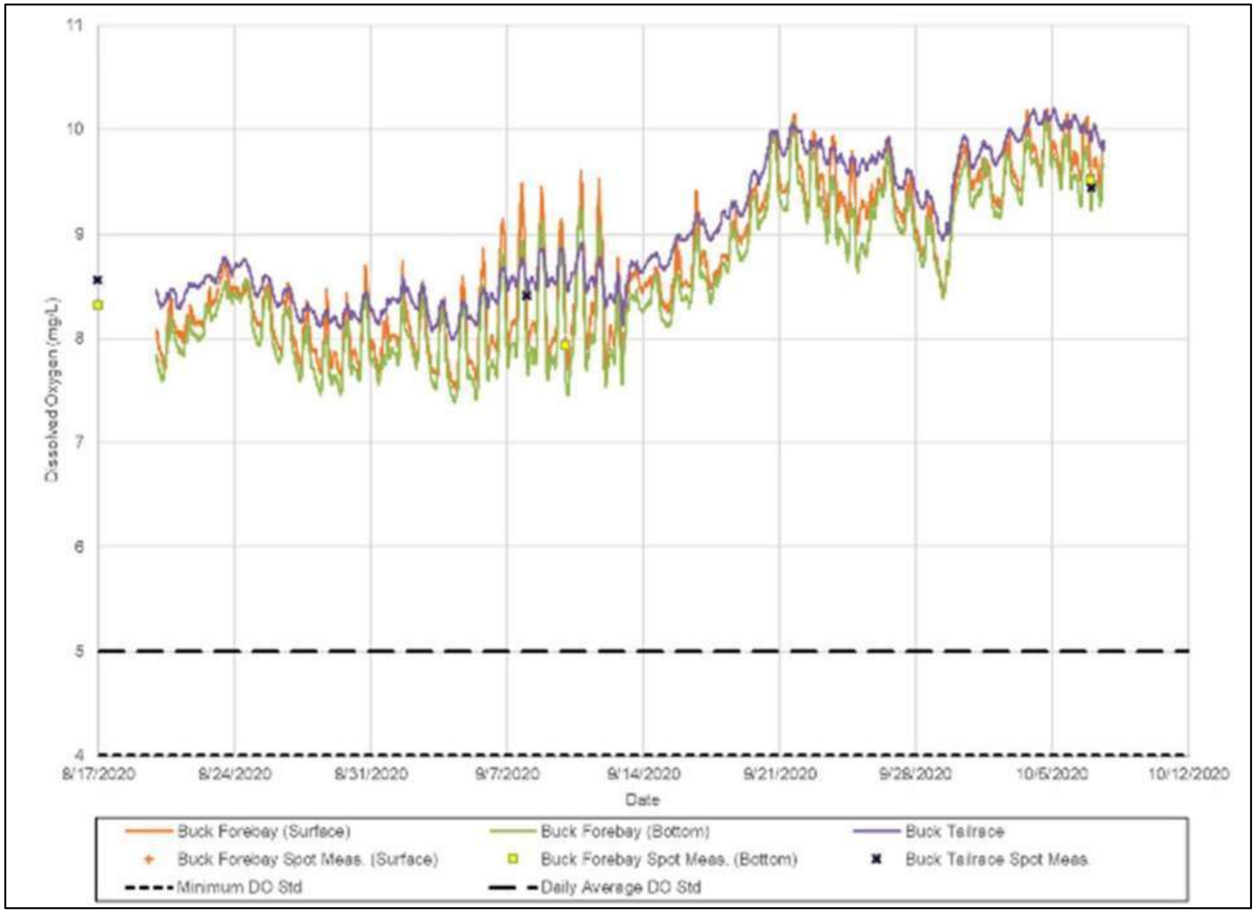
Air & Water Temperatures
Buck Bypass Reach



Dissolved Oxygen
Byllesby Tailrace



Dissolved Oxygen
Buck Forebay and Tailrace



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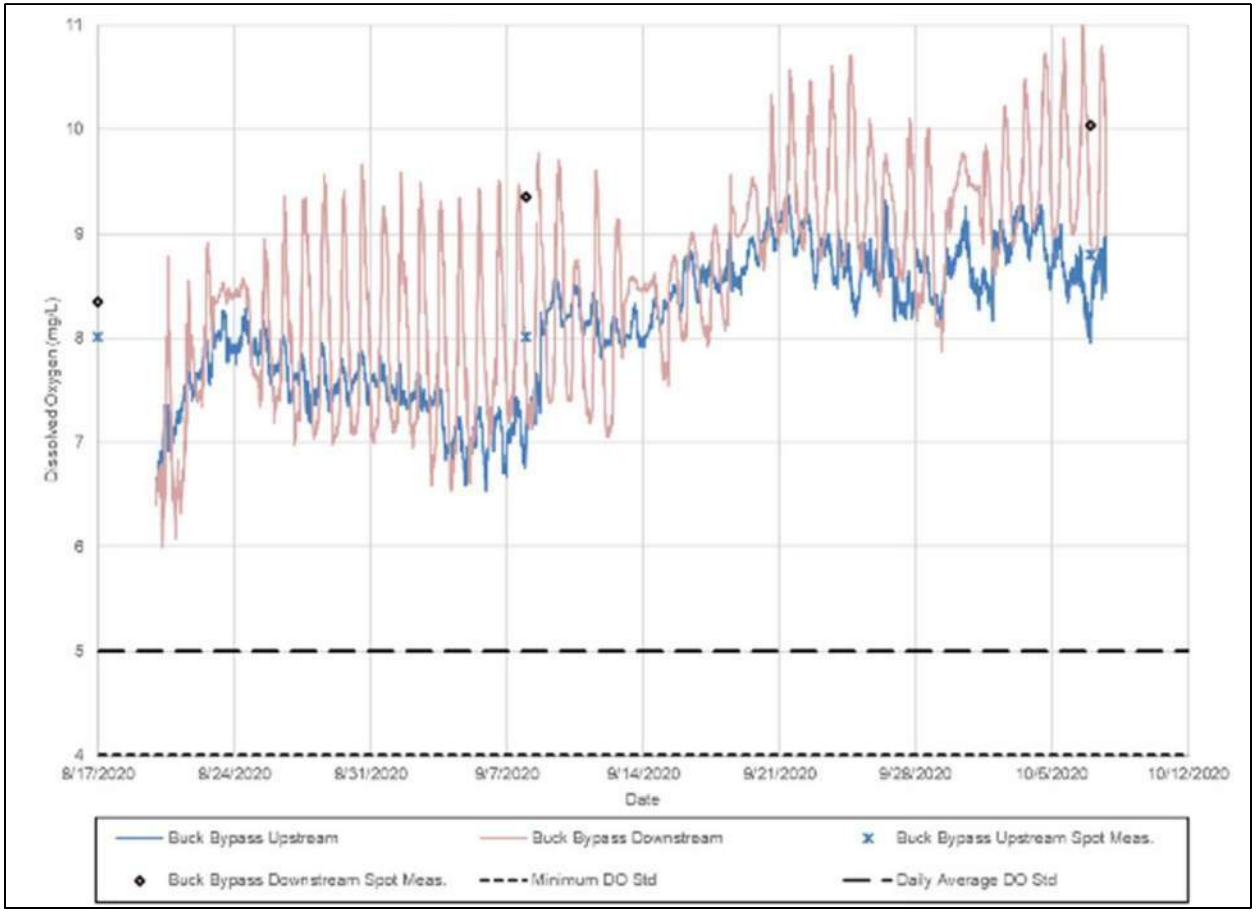
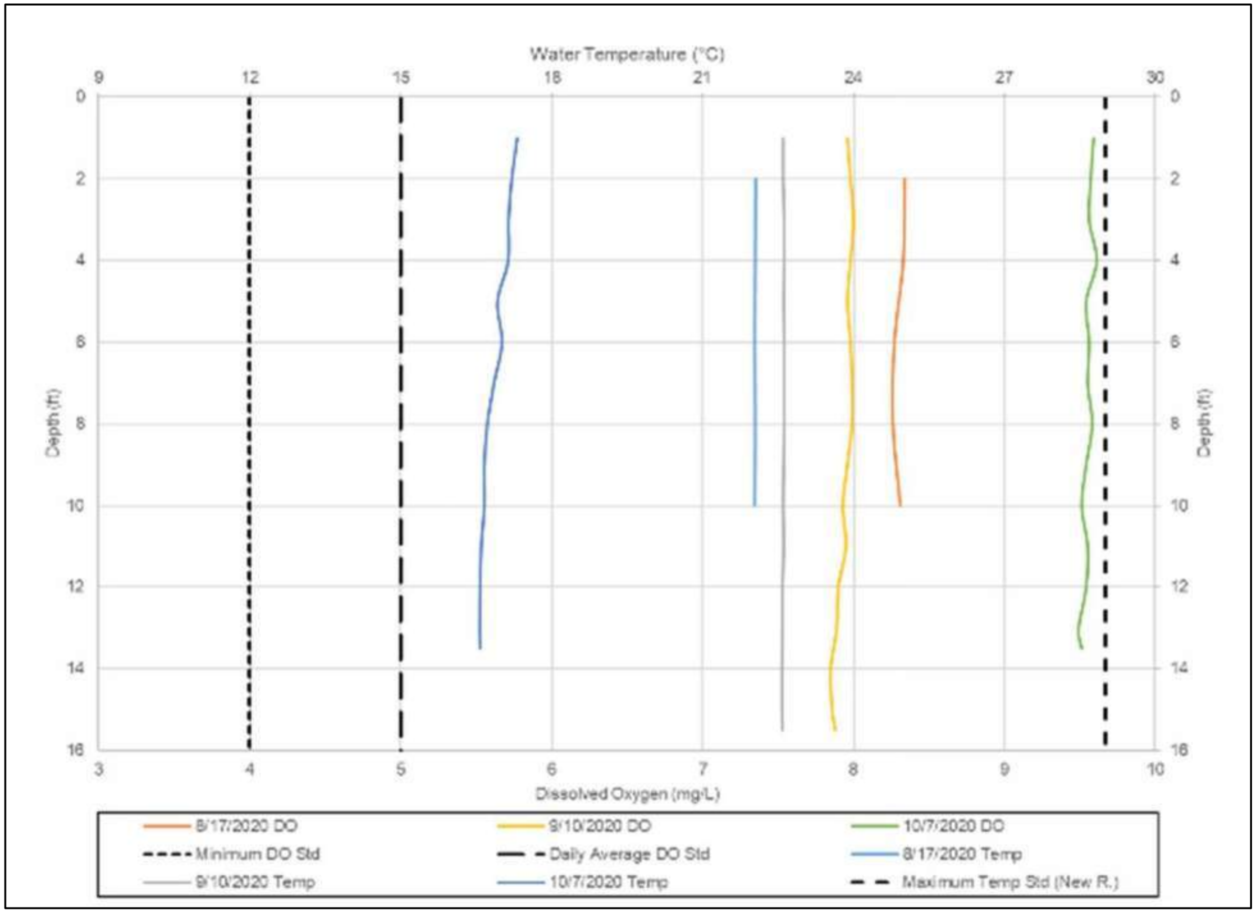
Dissolved Oxygen
Buck Bypass Reach

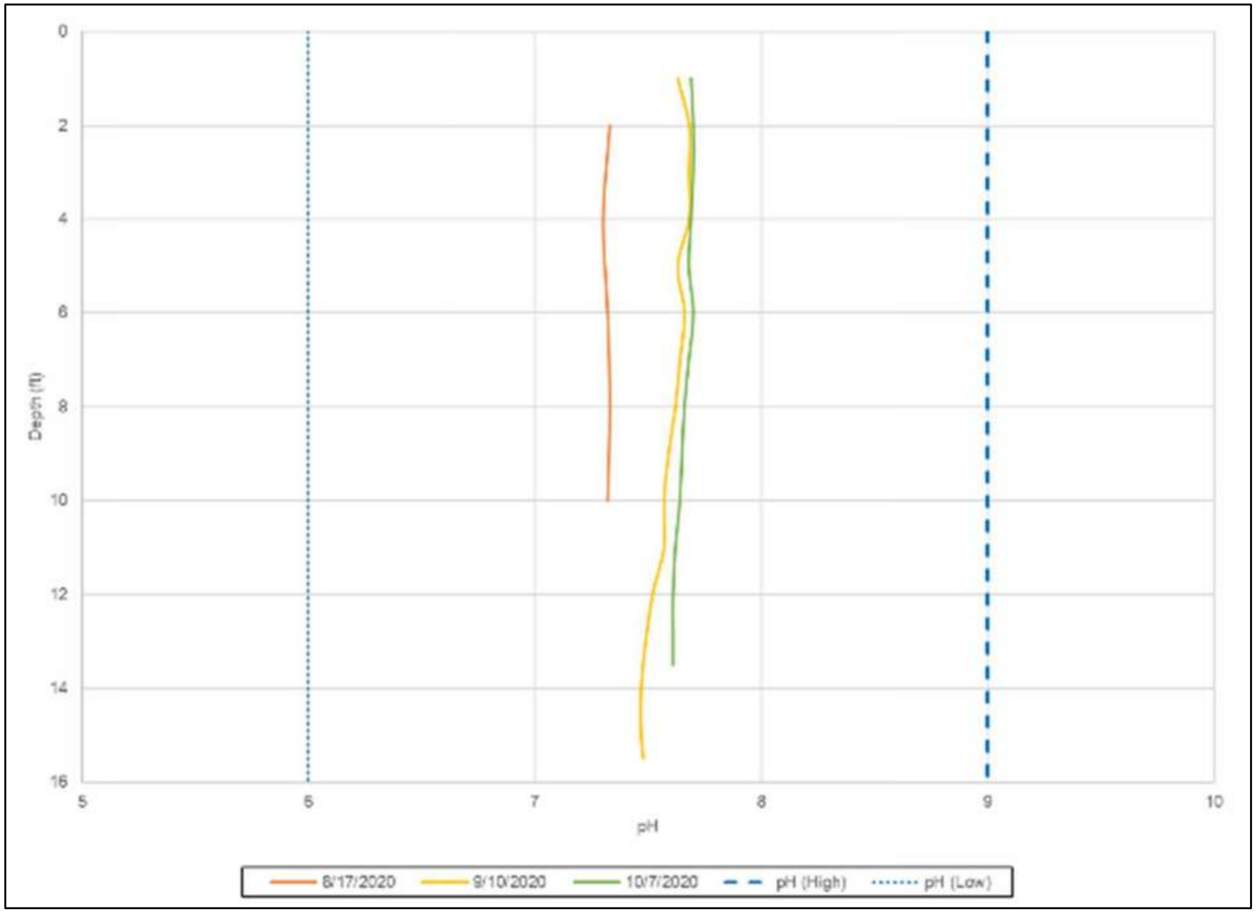


BOUNDLESS ENERGY

Buck Forebay Vertical Profiles Temperature and DO



Buck Forebay Vertical Profiles pH



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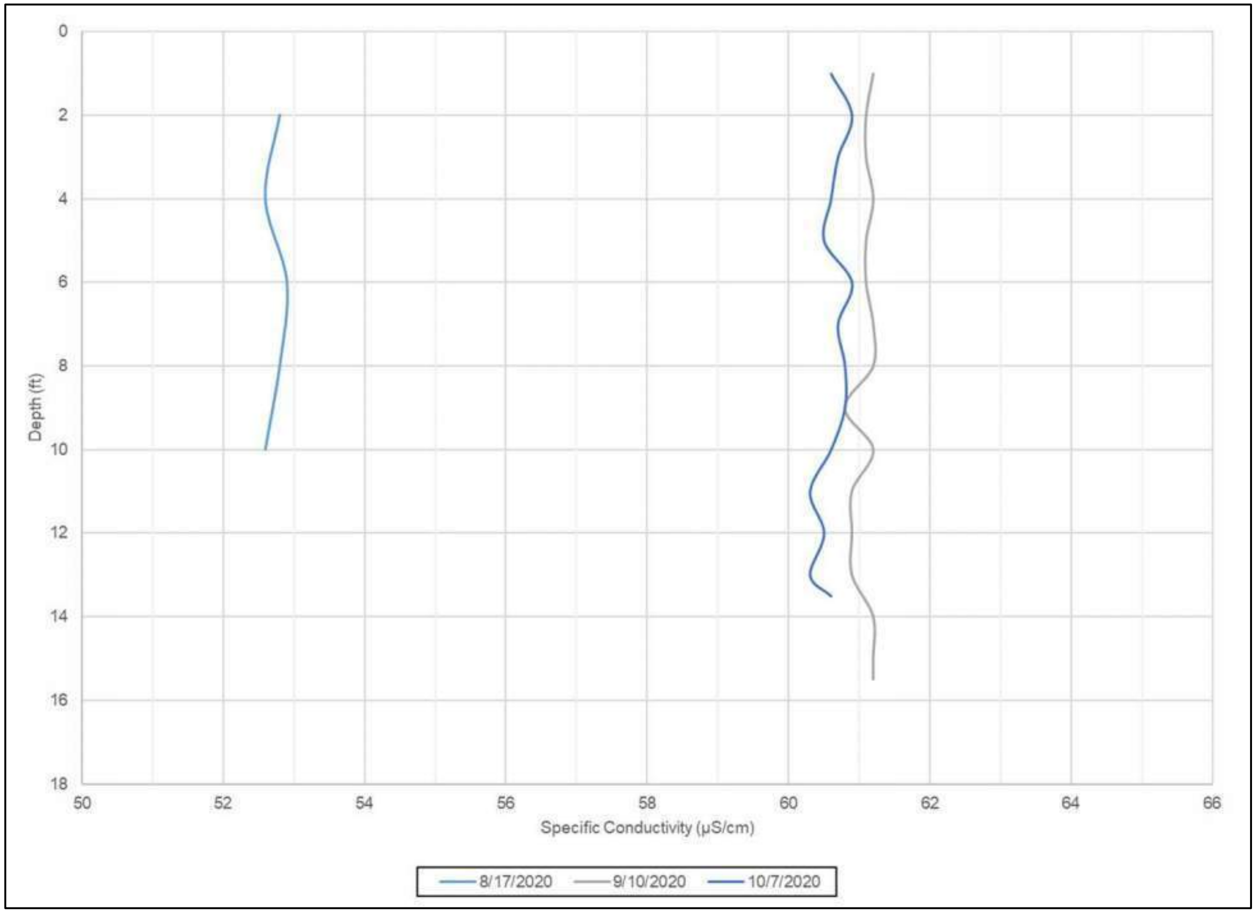
Buck Forebay Vertical Profiles Specific Conductivity



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Water Quality Study Summary and Conclusions

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

Buck Bypass Reach Side Channel Area 9.9.2020 Leakage Flow

Additional Water Quality Data Needs (Byllesby)

Byllesby Forebay
7.31.2019

- Water quality measurements in the Byllesby tailrace met Virginia Class IV standards
- Project inflows were higher than normal during the 2020 data collection period preventing installation of the Byllesby upstream, forebay, and bypass reach water quality monitoring locations
- Recommend installing monitoring equipment at these three monitoring locations during July-September 2021 to capture the warmer, typically lower flow, summer months

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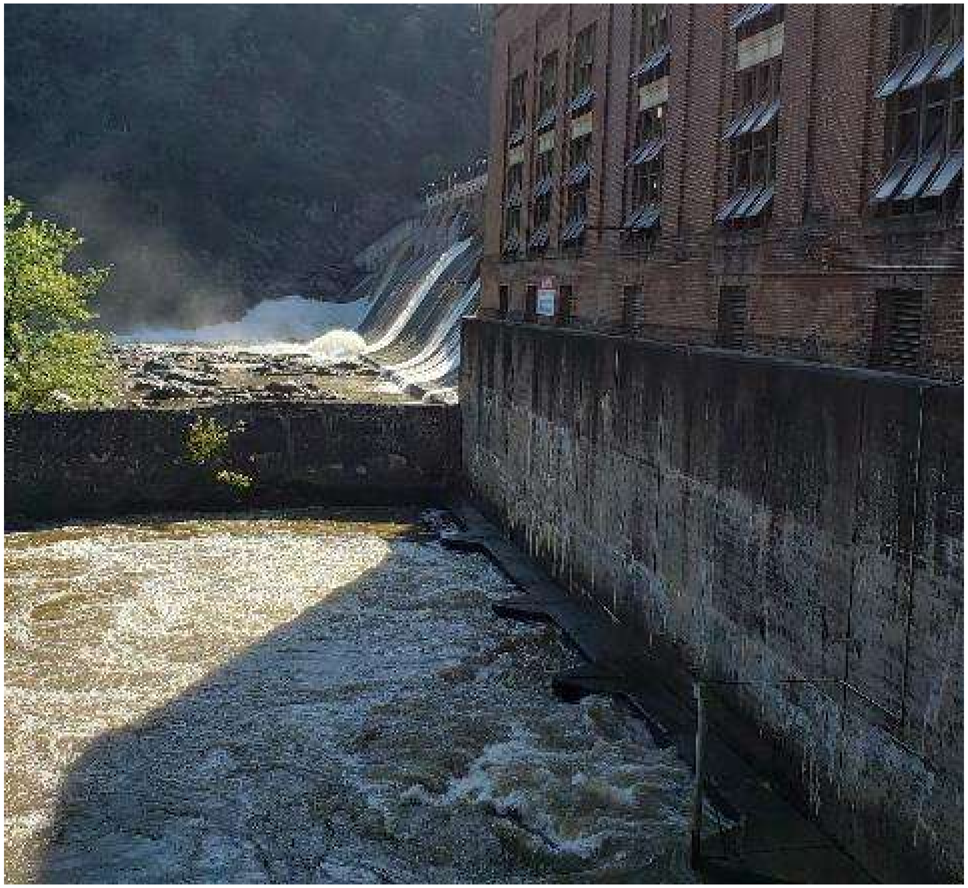
Additional Water Quality Data Needs (Buck & Byllesby)



- Conduct monthly chlorophyll a grab samples at 1-meter depth in the forebay of each development during July, August, and September 2021
- Conduct 1-week turbidity study (as described in the RSP) in the forebay and tailrace of each development during a low flow period in Q2 or Q3 2021

Byllesby Powerhouse and Tailrace (foreground); Main Spillway (background) 8.18.2020

Variances from FERC-approved Study Plan

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

Proposed Scheduling Changes to the 2020-2021 Study Plan Schedule for the Byllesby/Buck Project (FERC No. 2514)		
Study	**Activities**	**Proposed Timeframe for Completion (January 2021 update)**
Water Quality Study	Study Planning and Existing Data Review	Completed (July 2020)
	Continuous and Monthly Water Quality Monitoring (Dissolved Oxygen and Temperature)	Buck Completed (August – October 2020) Byllesby July – September 2021
	Turbidity Monitoring Study	July – September 2021
	Distribute Draft Study Report with the ISR/USR	ISR Completed (January 2021) USR December 2021

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Recreation Study

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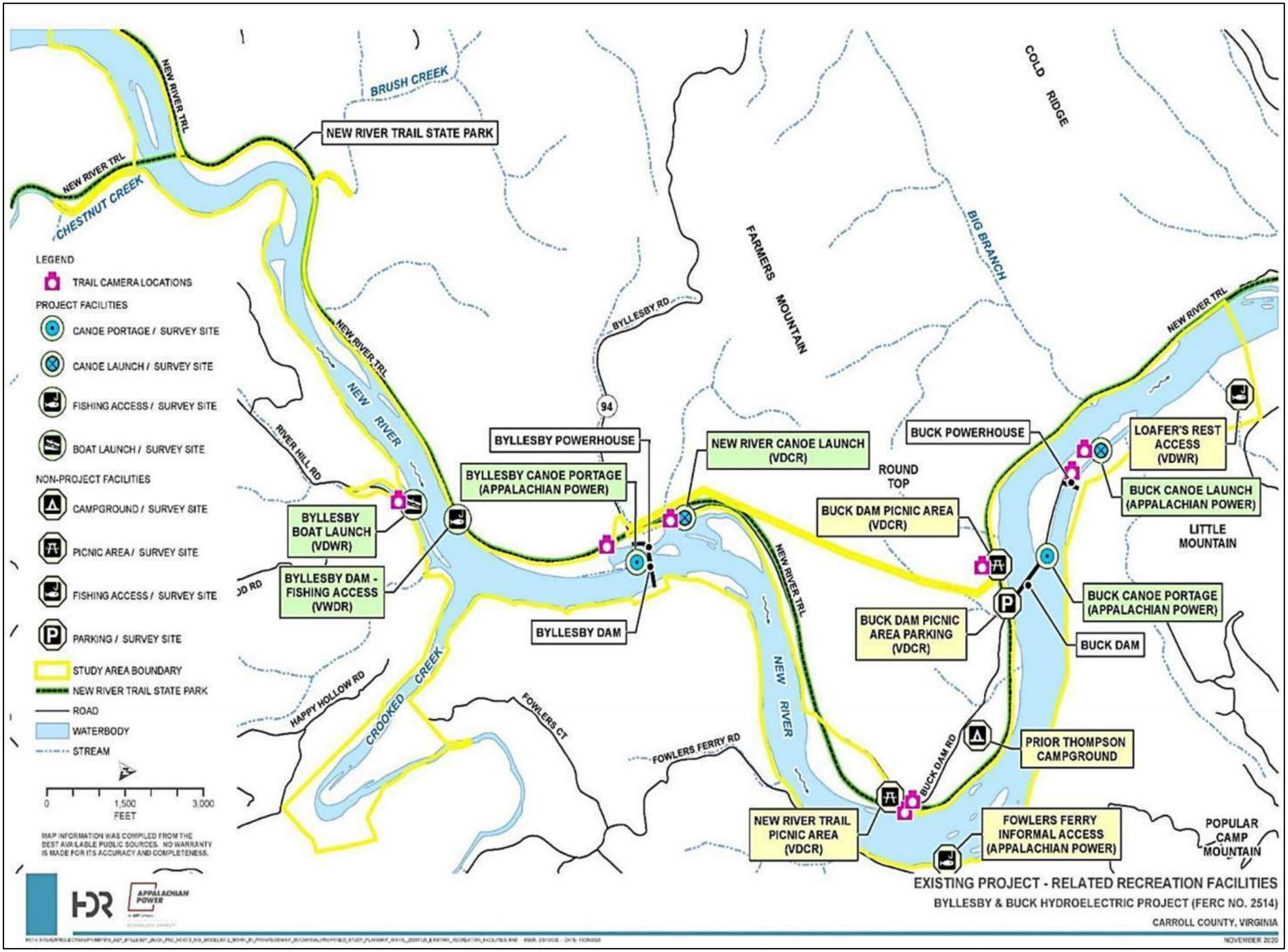
Recreation Study

Study Status

Appalachian completed the Recreation Study in accordance with the methods described in the RSP and SPD.

The approved Study Plan defines four primary tasks for the Recreation Study:

- Recreation Facility Inventory and Condition Assessment
- Site Visit with Stakeholders
- Recreation Use Visitor Online Survey
- Recreation Use Documentation



EXISTING PROJECT - RELATED RECREATION FACILITIES

BYLLESBY & BUCK HYDROELECTRIC PROJECT (FERC NO. 2514)

CARROLL COUNTY, VIRGINIA

NOVEMBER 2020

Project and Non-Project Recreation Facilities Studied

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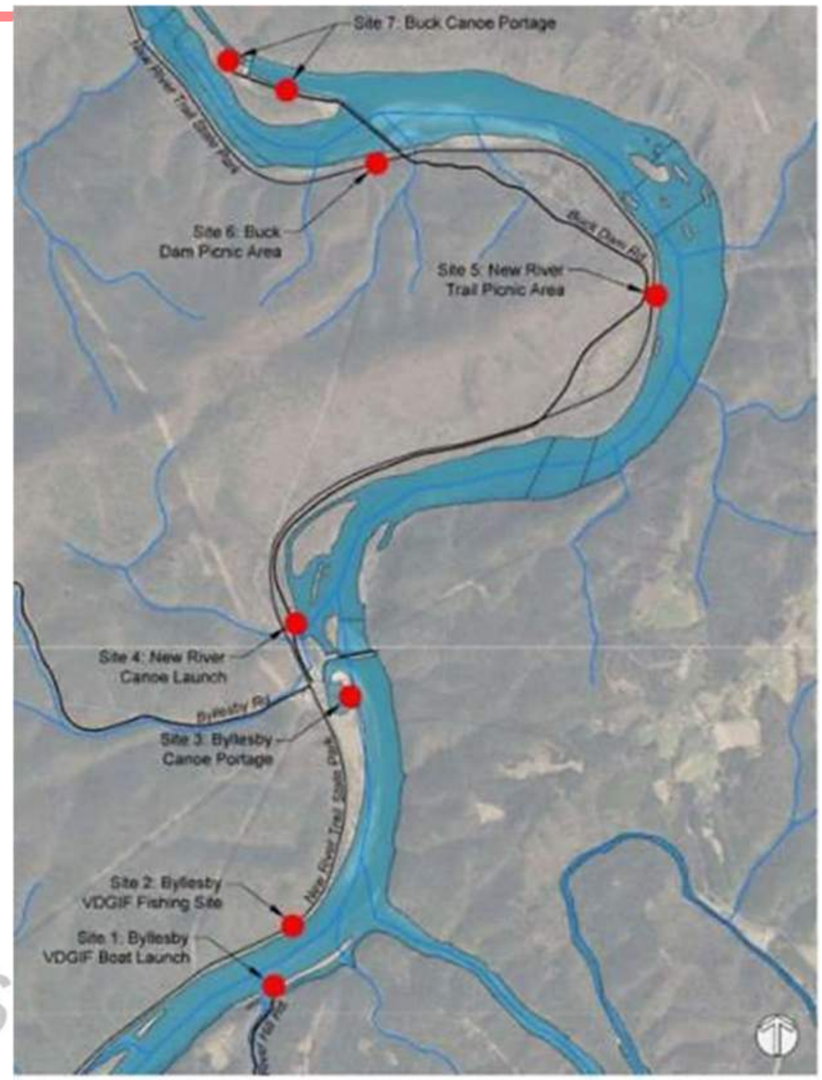
Recreation Facility	Recreation Facility Inventory and Condition Assessment	Site Visit with Stakeholders	Recreation Visitor Use Online Survey	Recreational Use Documentation - Trail Camera
Byllesby Development				
Byllesby VDWR Boat Launch	x	x	x	x
Byllesby Canoe Portage	x	x	x	x
New River Canoe Launch	x	x	x	x
VWDR Fishing Site	x			
Buck Development				
Buck Dam Picnic Area	x	x	x	x
New River Trail Picnic Area	x	x	x	x (Upper and Lower)
Buck Dam Canoe Portage	x	x	x	x
Loafer's Rest			x	x (Buck tailrace)

Recreation Study: Recreation Facility Inventory and Condition Assessment

Study Methods:

Land Planning Design Associates (LPDA), conducted a Recreation Facility Inventory and Condition Assessment of seven Project and Non-Project recreation facilities.

LPDA recorded specific criteria for each facility and completed a qualitative assessment of the condition of the facilities.



Byllesby VDWR Boat Launch (Project Facility)

Includes a 16-ft wide concrete boat ramp with a gentle slope, concrete walkway, crushed gravel parking area, and signage. Amenities are in good condition.

Potential enhancements:

- Update and replace signage.

Photo 1-1: Entrance into parking lot

Photo 1-2: Boat Ramp

VDWR Fishing Site (Project Facility)

Includes a fire pit and grill, bench, lantern hook, and trash can (aged). Access to the water is difficult with a steep slope. Accessed by the New River Trail which is 0.6 miles upstream from the Byllesby Canoe Launch parking lot.

Potential enhancements:

- Maintenance or replacement of amenities.
- Add signage.

Photo 2-1: Fishing site with fire ring/grill, bench and lantern hook.

Photo 2-4: Rough wood bench and lantern hook with chipping paint.

Byllesby Canoe Portage (Project Facility)

Includes a 0.2-mile portage path, 12-space gravel parking area, a put-in, a large wetland, and multiple signs. The portage take-out is poorly defined with limited amenities. The trash can is older but is being serviced and is lined. Signage is faded.

Potential enhancements identified for this site were as follows:

- Update and replace signage.


Photo 3-8: Trail leading from gate toward the river and portage


Photo 3-1: Parking Lot and portage sign

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New River Canoe Launch (Project Facility)

Includes a 10-space gravel parking area, portage/no-fishing signs, a gate, and a canoe portage in a relatively flat, sandy area. The signage at this facility is in good condition with adequate directional information.

No potential enhancements identified for this site.

Photo 4-3: Canoe portage put-in and maintenance road accessing it from the parking area

Photo 4-4: Canoe portage put-in

New River Trail Picnic Area (Non-Project Facility)

Upper area includes a picnic table shelter, bike rack and hitching trail. An informal car pull-off and trail accessing the picnic area. The bike rack, hitching rail, and shelter (ADA accessible) is in good condition.

Lower area includes trash can, barbeque grill (severely corroded), picnic table, bird nesting box, two lantern hooks, two fire rings, and three benches. The trash can is in good condition and is regularly serviced. One bench is missing a slat and the lantern hook is older but usable.

Potential enhancements:

- Maintenance or replacement of amenities at lower area.


Photo 5-2: Picnic shelter, bike rack and hitching rail


Photo 5-4: Lower picnic area

Buck Dam Picnic Area (Non-Project Facility)

Includes a parking area with a trash can, kiosk with regulation signs and old machinery. The trash can is dented and aged, but usable/regularly serviced.

Stone trail to a separate area that includes a picnic table shelter, bike rack, an accessible Porta Potty, and hitching rail.

- The picnic shelter is in good condition while the table is older but usable.
- Paint on the hitching rail and bike rack is chipped but the amenities are usable.

Potential enhancements:

- Improved signage for educational and safety purposes.

Photo 6-3: Kiosk at parking area displays New River Trail State Park map and posted regulations

Photo 6-8: Picnic shelter with bike rack and hitching post

Buck Dam Canoe Portage (Project Facility)

Includes a take-out above and a put-in below Buck Dam. Portage route via an asphalt maintenance road, gravel access road, and a gravel walking trail (0.27 miles). There is an unlined trash can at the put-in. The signage is in good condition.

Potential enhancements :

- Improved safety and regulatory signage are recommended at this site.

Photo 7-1: Upper canoe portage take-out. Note that water elevation was low when picture was taken, so the put-out length is not usually this long.

Photo 7-9: Water access at put-in location facing downstream. Note the steep access, deep water, and narrow land strip.

Recreation Study: Site Visit with Stakeholders to Discuss Existing and Future Recreational Opportunities

- Documentation of the virtual meeting (October 21, 2020) and site visit (October 28, 2020) are included in Attachment 2 of the ISR.
- An informal area known locally as Fowler's Ferry was identified as an area that agencies are potentially interested in developing for future recreational use.

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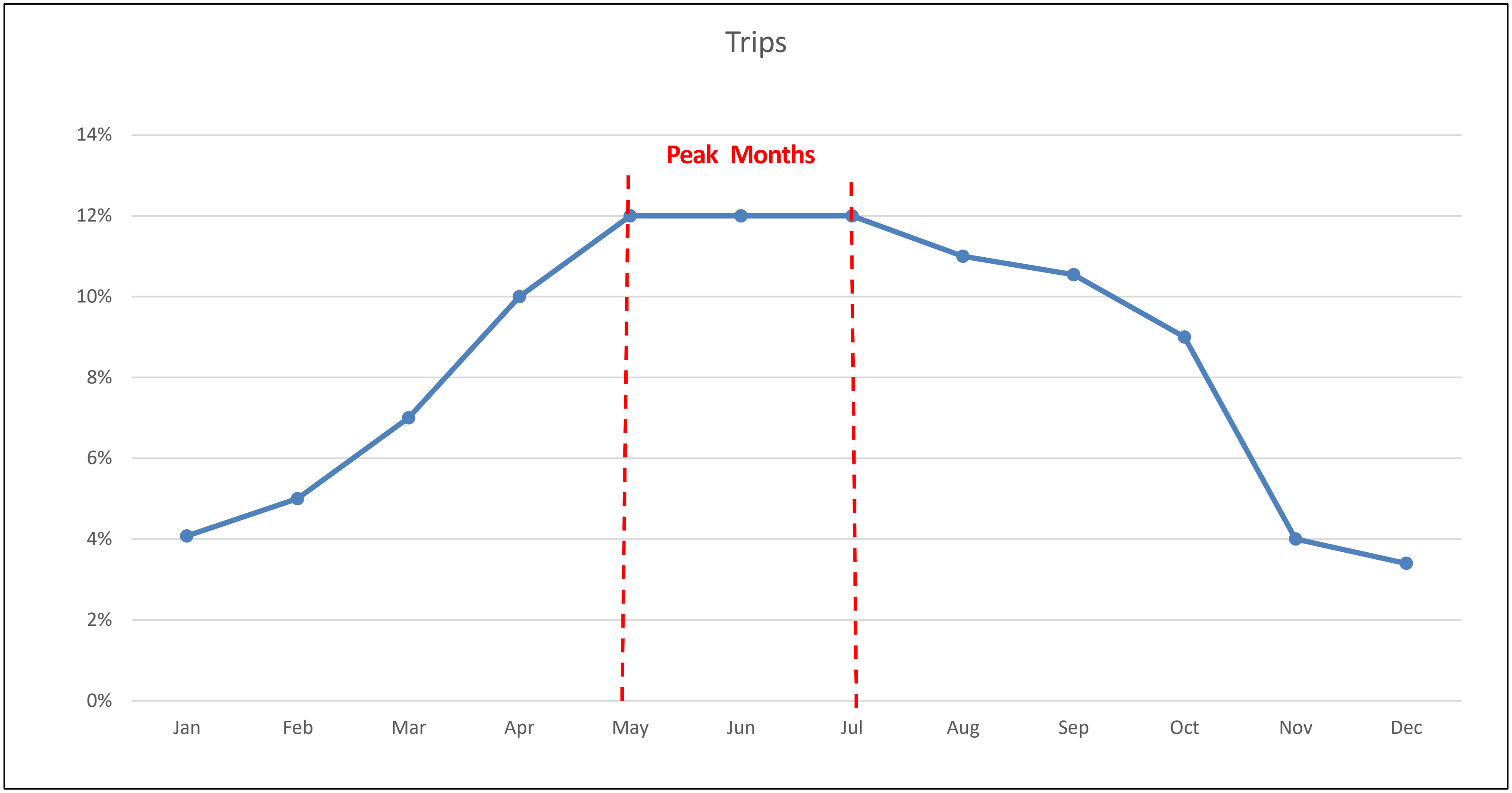
Recreation Study: Recreation Visitor Use Online Survey

Summary of Study Methods

- Provides a method for existing and potential recreation visitors to the Study Area to respond and provide feedback on recreation opportunities and Project and Non-Project facilities.
- Outreach methods included: posted signs, coordinated with stakeholders, included in ILP Progress Report, and social media.
- From April 21, 2020 to December 1, 2020, Appalachian received 142 responses to the online survey.

Monthly Recreation Activity for Project and Non-Project Facilities



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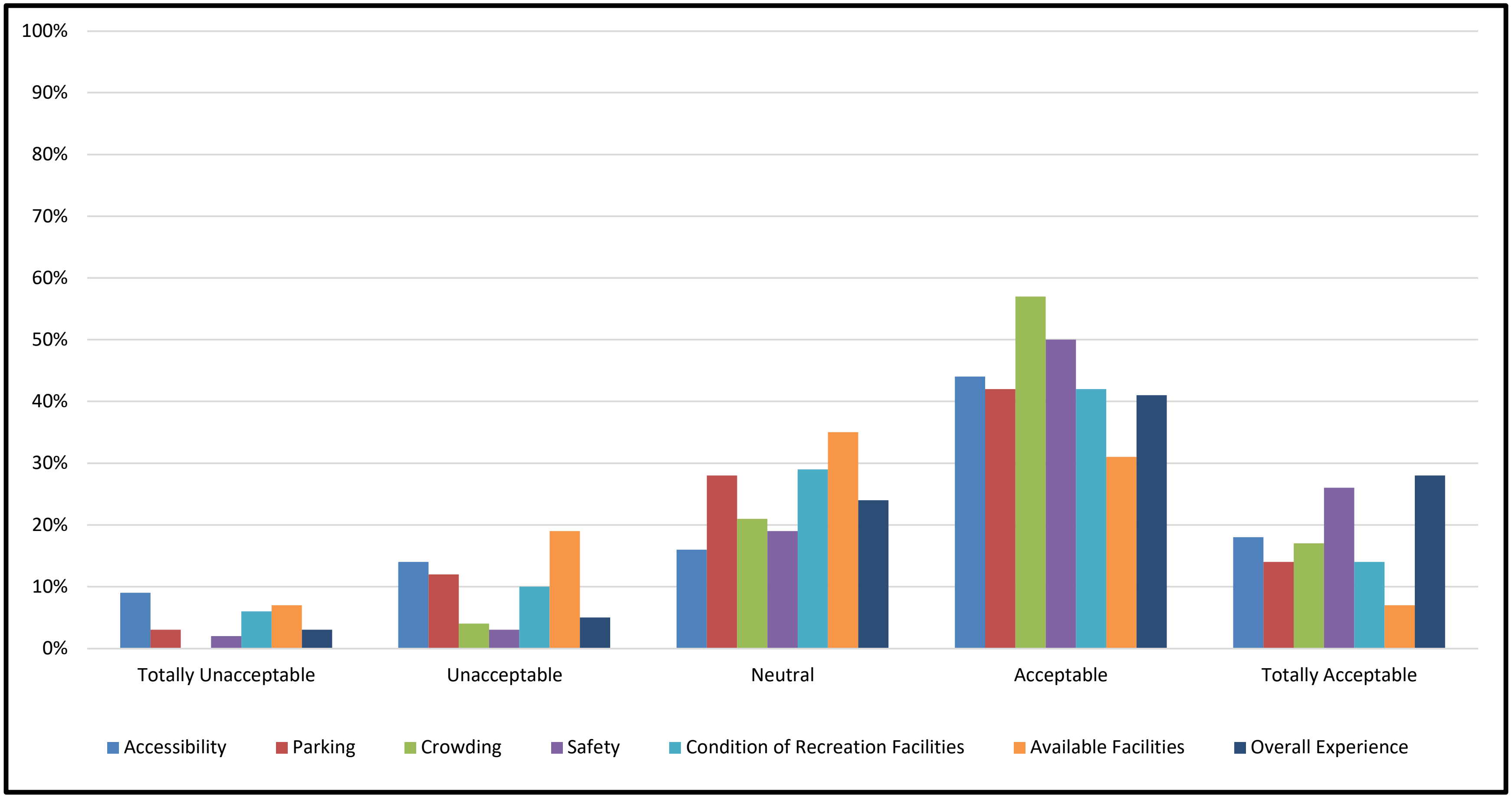
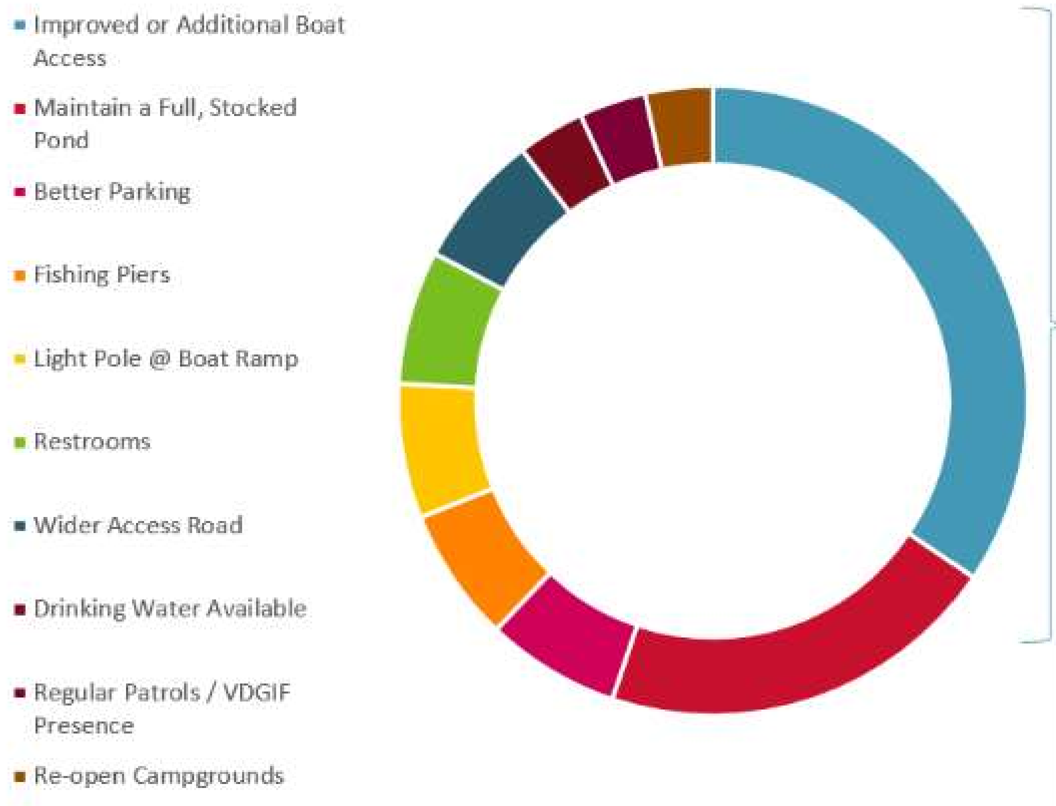
Summary for Primary Recreation Activities at all Project and Non-Project Facilities

Primary Activity	Use (%)
Fishing	48
Canoeing/kayaking	20
Sight-seeing	11
Biking	9
Picnicking	4
Hiking	2
Hunting	2
Wildlife Viewing	2
Swimming	1

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



Byllesby Boat Launch: Suggested Improvement Online Responses



Improvement Suggestions	#
Improved or Additional Boat Access	10
Maintain a Full, Stocked Pond	6
Fishing Piers	2
Light Pole @ Boat Ramp	2
Better Parking	2
Restrooms	2
Drinking Water Available	1
Regular Patrols / VDGIF Presence	1
Re-open Campgrounds	1
Wider Access Road	1

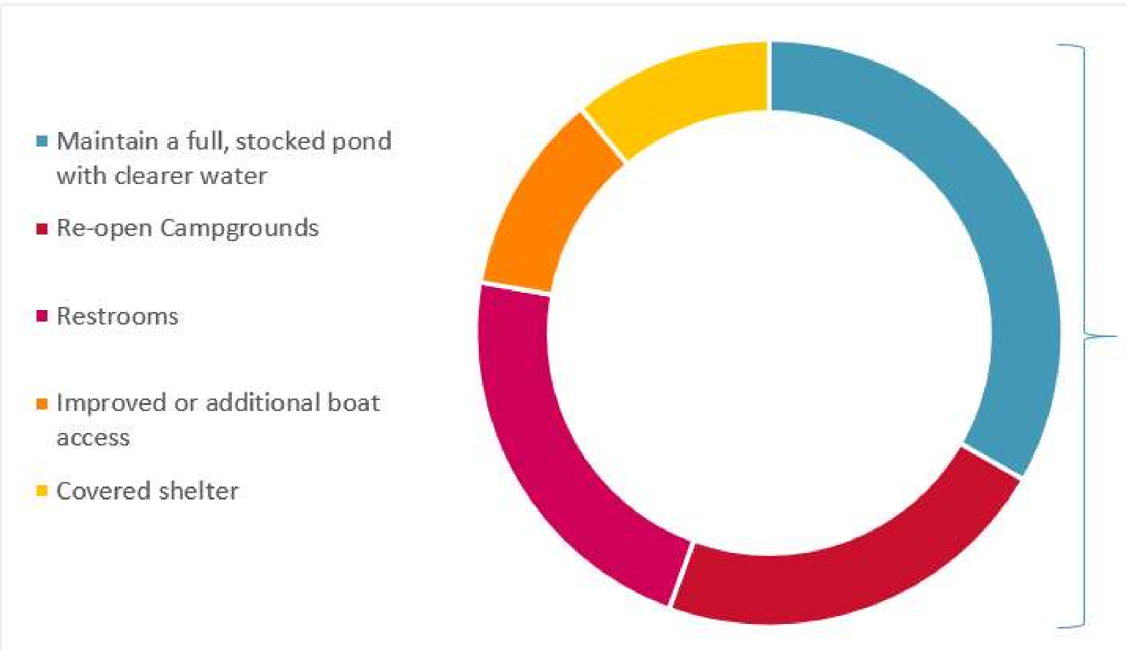
Byllesby Canoe Portage: Suggested Improvement Online Responses

There were only four online survey overall respondents for the Byllesby Canoe Portage.

Type(s) of recreation facilities or improvements respondents believe are needed and at what specific location(s) at the Byllesby-Buck Project: *(verbatim responses)*

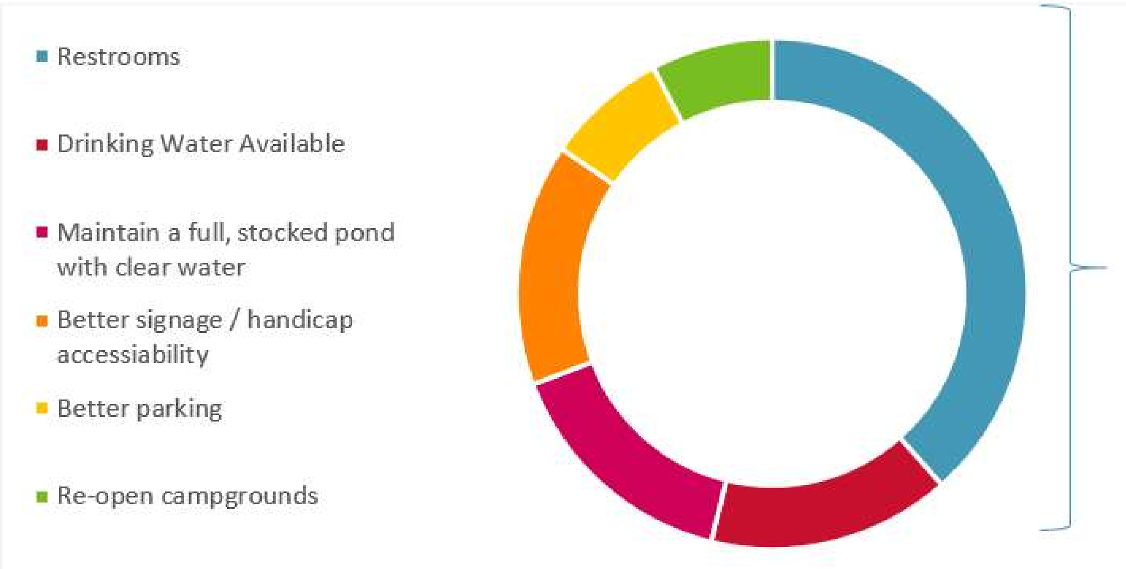
• Easier public access and Portage options for kayak/canoe around both dams.
• A good boat launch on the power plant side of the river would be awesome.

New River Canoe Launch: Suggested Improvement Online Responses



Improvement Suggestions	#
Maintain a full, stocked pond w/ clearer water	3
Re-open Campgrounds	2
Restrooms	2
Improved or additional boat access	1
Covered shelter	1

New River Trail Picnic Area: Suggested Improvement Online Responses



Improvement Suggestions	#
Restrooms	5
Drinking Water Available	2
Maintain a full, stocked pond with clear water	2
Better signage / handicap accessibility	2
Better parking	1
Re-open campgrounds	1

Buck Dam Picnic Area: Suggested Improvement Online Responses

There were 10 online survey respondents from the Buck Dam Picnic Area.

Type(s) of recreation facilities or improvements respondents believe are needed and at what specific location(s) at the Byllesby-Buck Project: *(verbatim responses)*

- more public parking at the Byllesby dam canoe portage
- We need to be able to float from below Byllesby dam to above buck without having to go below buck dam Need to be a Portage above buck so you dont have go below
- Campgrounds need mowed and maintained. we used to camp there weeks at a time
- More bathrooms always plus no matter location in state of Virginia.

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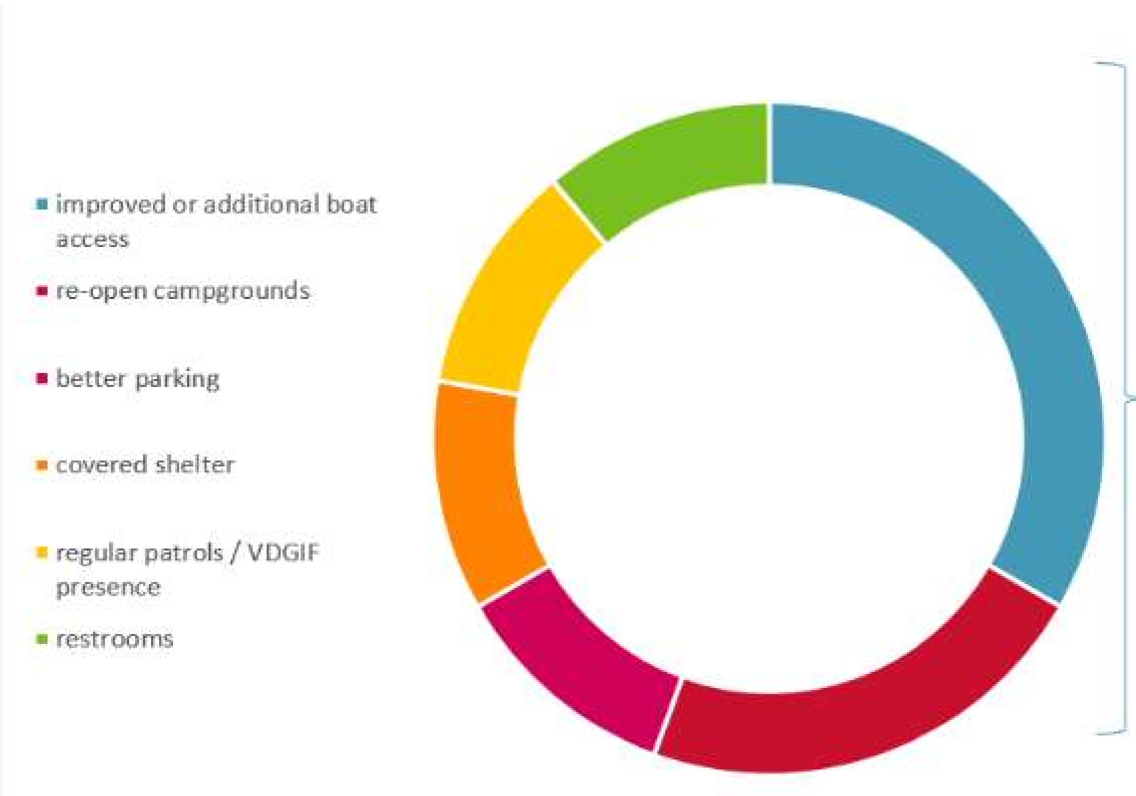
Buck Dam Canoe Portage: Suggested Improvement Online Responses



Improvement Suggestions	#
improved or additional boat access	3
re-open campgrounds drinking water available	2
better parking	1
covered shelter	1
regular patrols / VDGIF presence	1
restrooms	1

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Recreation Study: Recreation Use Documentation

Summary of Study Methods

- Full year of Project and Non-Project recreation facility usage with motion-activation trail cameras.
- Eight trail cameras were installed from October 2019 - November 2020.
- Recorded time, temperature, date, and vehicle usage.

Recreation Study: Recreation Use Documentation

Recreation Facility	Project or Non-Project Facility	Purpose	Number of Cameras
Byllesby VDWR Boat Launch (Camera 1)	Project Facility	Collect data on vehicles entering and exiting the parking area	1
Byllesby Canoe Portage (Camera 2)	Project Facility	Collect data on visitors utilizing New River Trail parking area and canoe portages	1
New River Canoe Launch (Camera 3)	Project Facility	Collect data on visitors utilizing canoe portage	1
Buck Dam Picnic Area (Camera 6)	Non-Project Facility	Collect data on visitors utilizing the picnic area, bike rack, and hitching post	1
New River Trail Picnic Area (Cameras 4 and 5)	Non-Project Facility	Collect data on visitors utilizing the picnic area, grill, informal angler location, and addition recreation features	2
Buck Dam Canoe Portage (Camera 8)	Project Facility	Collect data on visitors utilizing portage and tailrace	1
Buck Tailrace – Fishing Access (Camera 7)	Non-Project Facility	Collect data on visitors utilizing Buck tailrace area for fishing; camera faces river-right to capture all types of recreation (of specific interest is fishing from Loafer's Rest)	1

Byllesby VDWR Boat Launch and the Byllesby Canoe Portage (Project Facilities)

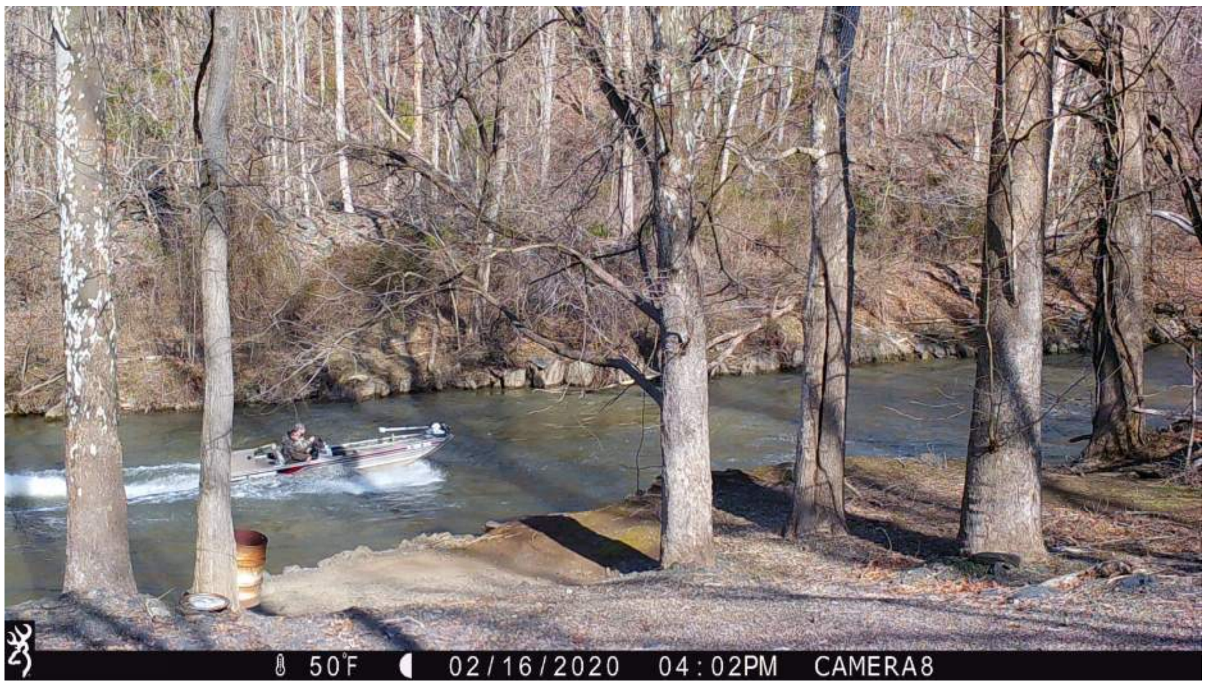
- Most frequented by users: Byllesby VDWR Boat Launch and Byllesby Canoe Portage parking lot.
- Provide a range of recreation opportunities including boating, canoeing, fishing, walking, biking, and hiking.
- The Byllesby VWDR Boat Launch has the easiest boat access to the New River within the Study Area. Fishing is also popular along the shoreline.

New River Canoe Launch (Project-Facility)

- Used as intended (canoe/kayak put-in), but more frequently used for bank fishing or relaxing along the sandy shore.
- Had a consistent amount of foot traffic, especially during the warmer days.

Buck Dam – Canoe Portage (Project Facility)

- Generally not used and the trail camera did not capture a high use.
- Stakeholders noted during the site visit that users cross the Buck bypass to Mountain Island to gain angler access further downstream.



Buck Dam – Fishing Access (Non-Project Facility)

- Accessed from VDWR's Loafer's rest facility.
- Only camera that was set to time-lapse.
- Interest to stakeholders during the development of the RSP; however, the camera only recorded approximately two days of use during the survey year.

New River Trail Picnic Area (Non-Project Facility)

- Upper and lower access provides a wide range of recreational opportunities including picnicking, horseback riding, biking, walking (and dog walking), relaxing, grilling, fishing, observing wildlife and more.
- Accessed directly from the New River Trail, recorded consistent usage throughout the survey window, especially from spring to fall.

Buck Dam Picnic Area (Non-Project Facility)

- Just downstream of the New River Trail Picnic Area and is also on the New River Trail, so use was similar.
- This area has direct access from the New River Trail and saw consistent usage throughout the survey window especially from spring to fall.

Recreation Facility	Project or Non-Project Facility	Primary Recreation Activity(s) Observed	Representative Spring Count Sunday, May 10, 2020	Representative Summer Count Friday, July 24, 2020	Representative Fall Count Saturday, October 24, 2020	Additional Notes
Camera 1: Byllesby VWDR Boat Launch	Project Facility	Bank Fishing and Boating.	14 vehicles	16 vehicles	12 vehicles	Highest recreational usage noted at this facility over the trail camera study period.
Camera 2: Byllesby Canoe Portage	Project Facility	Parking lot used to walk, bike, or hike.	9 vehicles	6 vehicles	15 vehicles	No canoe portaging from the parking area was observed.
Camera 3: New River Canoe Launch	Project Facility	Bank Fishing.	10 people	2 people	4 people	Bank fishing was commonly seen, whereas the portage was seldom used.
Camera 4: New River Trail Picnic Area (Upper)	Non-Project Facility	Facilities (picnicking, bike rack, informal walking trail, and hitching post) enjoyed by New River trail users.	5 people	13 people	23 people	Usage Counts was calculated based on individual's using the recreation facilities, not only the New River Trail.
Camera 5: New River Trail Picnic Area (Lower)	Non-Project Facility	Bank Fishing and Observing/Relaxing.	6 people	7 people[1]	18 people	Frequently used to appreciate the New River from the New River Trail.
Camera 6: Buck Dam Picnic Area	Non-Project Facility	Facilities (picnicking, bike rack and hitching post) enjoyed by New River trail users.	6 people	7 people[1]	22 people	Usage Counts was calculated based on individual's using the recreation facilities, not only the New River Trail.
Camera 7: Buck Dam – Fishing Access (informal recreation facility)	Non-Project Facility	Bank Fishing and Canoe/Kayaking.	0 people	0 people	0 people	Two observed uses (fishing and observing) during the study, but overall, no primary recreation noted. High water from the trash gate restricts access to this area often.
Camera 8: Buck Dam Canoe Portage (Put-In)	Project Facility	None	0 people	0 people	0 people	Low overall usage of the recreation site.

Capacity

- There were approximately ten to fifteen days during peak weekends (e.g., holidays) or when weekend weather was optimal where the parking lot at the Byllesby VDWR Boat Launch and Byllesby Canoe Portage parking lot appeared to reach capacity.
- On non-peak weekends or a typical recreation day these two facilities did not appear to reach parking capacity.
- Project is sufficient to meet the current demand during a typical peak recreation day.

Recreation Study Summary

- Consistent recreation usage at most of the Project and Non-Project facilities, with usage peaking on the weekends, holidays, and warmer months, as anticipated.
- The New River Trail provides a unique opportunity to access most of the recreation facilities in otherwise remote locations.
- The trail camera and online survey results indicated that fishing and canoe/kayaking were the primary recreation activities.
- The Buck Dam Canoe Portage was the only Project recreation facility that saw very little recreation usage, likely because it is inaccessible except by canoe/kayak.

Variances from FERC-approved Study Plan

The Recreation Study was conducted in conformance with the Commission's SPD.

5-minute break

Cultural Resources Study

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Cultural Resources Study

Study Status

- Initiated the Study in accordance with the schedule and methods described in the RSP and SPD.

Methods

- Task completed (late summer – November 2020):
  - Consultation for the APE Determination (Task 1),
  - Background Research and Archival Review of the Study Area (Task 2),
  - Phase I Reconnaissance Survey of the Area of Potential Effects (APE) (Task 3).
- Task to be completed in 2021:
  - Inventory of Traditional Cultural Properties (Task 4)
  - Update to the Cultural Resources Management Plan (Task 5)

Cultural Resources Study

APE Consultation

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

APE responses were received from:

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

Cultural Resources Study

Background Research

- Terracon reviewed the Virginia Cultural Resource Information System (V-CRIS) to identify previously recorded cultural resources within a 0.5-mile radius of the Study Area.
- On September 10, 2020, Terracon staff traveled to the Virginia Department of Historic Resources (VDHR) office in Richmond, VA to gather additional information.

Cultural Resources Study: Background Research and On-Site Fieldwork

- Terracon conducted an archaeological assessment of the Project APE (October 2020)
  - Most of the APE is either steeply sloped or deeply buried in historic alluvium.
  - Very little erosion or other Project related effects in any portions of the APE.
- The three above-ground historic resources are eligible for inclusion in the National Register of Historic Places (NRHP) and were revisited during the field work. All three remain eligible for listing in the NRHP.
  - It is Terracon's opinion that no historic properties are currently being affected by continued Project operations.
- None of the resources identified through Terracon's research, either within the APE and those within a 0.5-mile radius, will be affected by the Project.

Variances from FERC-approved Study Plan

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

Proposed Scheduling Changes to the 2020-2021 Study Plan Schedule for the Byllesby/Buck Project (FERC No. 2514)		
	Activity	**Proposed Timeframe for Completion (January 2021 update)**
Cultural Resources Study	Determination of Area of Potential Effect (APE)	Completed (September 2020)
	Background Research and Archival Review	Completed (September 2020)
	Phase I Reconnaissance Survey of APE	Completed (October 2020)
	Inventory of Traditional Cultural Properties	August 2020 – August 2021
	Review and Updates to the Existing CRMP	November 2021
	Distribute Draft Study Report with the ISR/USR	ISR Completed (January 2021) USR December 2021

ISR Meeting: Stakeholder Participation

- Appalachian will file the Initial Study Report Meeting Summary with FERC by February 12, 2021.
- Meeting summary disagreements, requests for modifications to studies, or requests for new studies should be filed with FERC by March 14, 2021.
  - If requesting modifications to studies, stakeholders must take into account FERC's Criteria for Modification of Approved Studies (18 CFR § 5.15(d)).
  - If requesting new studies, stakeholders must take into account FERC's 7 Criteria for New Study (18 CFR § 5.15(e)).
- Appalachian will file responses to meeting summary disagreements by April 13, 2021.
- FERC will make a determination on any disputes/amendments to the approved study plan by May 13, 2020.
- Stakeholders can contact Appalachian with questions or comments:

Elizabeth Parcell
(540) 985-2441
ebparcell@aep.com

Jonathan Magalski
(614) 716-2240
jmmagalski@aep.com

Closing

BOUNDLESS ENERGY℠

Subject: FW: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Initial Study Report Meeting Summary
Attachments: AEP to FERC BB ISR Mtg Summary Transmittal_02.12.2021.pdf

From: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>
Sent: Monday, February 15, 2021 9:39 AM
To: ACHP - John Eddins <jeddins@achp.gov>; American Whitewater - Kevin Colburn <kevin@americanwhitewater.org>; Angie Grooms <angie.grooms750@gmail.com>; Appalachian Trail Conservancy - Andrew Downs <adowns@appalachiantrail.org>; Carroll County - Rex Hill <rex.hill@carrollcountyva.gov>; Carroll County Administrator - Steve Truitt <steve.truitt@carrollcountyva.gov>; Catawba Indian Nation - Caitlin Rogers <caitlin.rogers@catawba.com>; Cherokee Nation - Elizabeth Toombs <elizabeth-toombs@cherokee.org>; David Taylor <jklfloat@embarqmail.com>; Delaware Nation - Erin Paden <epaden@delawarenation-nsn.gov>; Fish and Wildlife Conservation - Caitlin Carey <cscarey@vt.edu>; Fish and Wildlife Conservation - Donald J. Orth <dorth@vt.edu>; Friends of the Rivers of Virginia - Richard Roth <rroth@radford.edu>; Friends of the Roanoke - Bill Tanger <bill.tanger@verizon.net>; Harold Peterson <harold.peterson@bia.gov>; New River Conservancy - George Santucci <george@newriverconservancy.org>; New River Conservancy - Laura Walters <claytorlakegirl@gmail.com>; New River Outdoor Adventures - Tim Dixon <newriveroutdooradventures@yahoo.com>; New River Regional Water Authority - Zachary Slate <newriverwater@gmail.com>; New River Trail State Park - Sam Sweeney <Sam.Sweeney@dcr.virginia.gov>; Pamunkey Indian Tribe - Terry Clouthier <terry.clouthier@pamunkey.org>; Town of Fries - Scott McCoy <townoffries@friesva.com>; Town of Wytheville - Dr. Beth Taylor, Mayor <beth.taylor@wytheville.org>; USFWS Chesapeake Bay Field Office - Janet Norman <janet_norman@fws.gov>; USGS - Mark Bennett <mrbennet@USGS.gov>; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov) <emma.williams@governor.virginia.gov>; VADCR - Jennifer Wampler <jennifer.wampler@dcr.virginia.gov>; VADCR - Jimmy Elliott <james.elliott@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADCR - Sharon Ewing <sharon.ewing@dcr.virginia.gov>; VADEQ <eir@deq.virginia.gov>; VADEQ - Bettina Rayfield <Bettina.rayfield@deq.virginia.gov>; VADEQ - Joe Grist <joseph.grist@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; VADEQ - Scott Kudlas <scott.kudlas@deq.virginia.gov>; VADEQ - Tony Cario <anthony.cario@deq.virginia.gov>; VADHR - Timothy Roberts <tim.roberts@dhr.virginia.gov>; VADWR - Jeff Williams <jeff.williams@dwr.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; Virginia Department of Game and Inland Fisheries - John Copeland <John.Copeland@dgif.virginia.gov>; Virginia Department of Game and Inland Fisheries - William Kittrell <bill.kittrell@dgif.virginia.gov>; Wythe County Admin - Stephen Bear <sdbear@wytheco.org>
Cc: 'ebparcell@aep.com' <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>
Subject: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Initial Study Report Meeting Summary

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP). Pursuant to the ILP, Appalachian filed the Initial Study Report (ISR) for the Project on January 18, 2021. The ISR describes the Licensee's overall progress in implementing the study plan and schedule, summarizes available data, and describes any variances from the study plan and schedule approved by the Commission.

Pursuant to the ILP, Appalachian conducted the Initial Study Report (ISR) Meeting on January 28, 2021 and filed the ISR Meeting Summary for the Project on February 12, 2021. The ISR Meeting Summary is now available for stakeholder review. For your convenience, a copy of the cover letter filed with the ISR Meeting Summary is attached. Appalachian encourages stakeholders to view the complete filing online at FERC's eLibrary at https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20210212-5176. Appalachian will also be adding the ISR to the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck) in the coming days.

As established by FERC's regulations at 18 C.F.R. § 5.15, the deadline for filing meeting summary disagreements, requests for modifications to studies, or requests for new studies is March 14, 2021.

Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com. On behalf of AEP and the Byllesby-Buck Project relicensing team, thank you for your participation in this process.

Sarah Kulpa
Project Manager

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COMMONWEALTH of VIRGINIA

Matthew J. Strickler
Secretary of Natural Resources

Department of Wildlife Resources

Ryan J. Brown
Executive Director

March 12, 2021

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

Re: *Comments on the Initial Study Meeting Report Summary, Byllesby-Buck Hydroelectric Project Federal Energy Regulatory Commission (FERC) Project Number 2514-186.*

Dear Secretary Bose:

Virginia Department of Wildlife Resources aquatic biologists attended the Initial Study Report Meeting on January 28, 2021 and reviewed the Initial Study Report Meeting Summary dated February 12, 2021 for the Byllesby-Buck Hydroelectric Project FERC Number 2514-186 on the New River in Carroll County, Virginia. We are satisfied with progress on the relicensing studies performed to date. The meeting summary captured our concerns and needs for clarification on completed and continuing studies for this relicensing.

Thank you for the opportunity to provide comments on the *Initial Study Report Meeting Summary* for the Byllesby-Buck Hydroelectric Project. If you need further information about our comments, please contact me at John.Copeland@dwr.virginia.gov or (540) 871-6064.

Sincerely,

John R Copeland

John R. Copeland
Fisheries Biologist
Blacksburg District

Cc: E. Aschenbach
M. Bednarski
R. Fernald
T. Hampton
J. Trollinger
B. Watson
J. Williams

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Equal Opportunity Employment, Programs and Facilities

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426
March 15, 2021

OFFICE OF ENERGY PROJECTS

Project No. 2514-185 – Virginia
Byllesby-Buck Hydroelectric Project
Appalachian Power Company

VIA Electronic Mail

Ms. Elizabeth Parcell
Process Supervisor
American Electric Power
ebparcell@aep.com

Reference: Comments on the Initial Study Report and Meeting Summary

Dear Ms. Parcell,

On January 19, 2021, Appalachian Power Company (Appalachian) filed the Initial Study Report (ISR) for the Byllesby-Buck Hydroelectric Project (Byllesby-Buck Project) describing Appalachian's overall progress in implementing the approved study plans. On January 28, 2021, Appalachian held a virtual meeting to discuss the ISR. On February 12, 2021, Appalachian filed its ISR Meeting Summary (Meeting Summary). We have reviewed the ISR and the Meeting Summary and provide our comments in Appendix A, pursuant to 18 C.F.R. § 5.15(c)(4).

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

Sincerely,

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

APPENDIX A
Comments on the Initial Study Report and Meeting Summary

1. The approved study plan requires that fish lengths be measured;[1] however, no length data were provided in the Preliminary Aquatic Resources Study Report of the Initial Study Report (ISR). Therefore, when filing the Updated Study Report (USR) please provide this raw length data, preferably in Microsoft Excel format. The Excel file should include species and sampling information (i.e., sampling date/location/gear) for each measured individual. Information on the size distribution of fish in the vicinity of the project will aid staff's analysis of the susceptibility of resident fishes to impingement and entrainment.

2. Figure 6-9 of the Preliminary Bypassed Reach Flow and Aquatic Habitat Study Report shows continuously recorded water levels from water level loggers deployed in the Buck bypassed reach in 2020. While total project inflows are plotted on these figures, there is no indication of what portion of the total inflow is being released (spilled) into the bypassed reach and how much flow is being passed through the powerhouse. Adding this information on the flows in the bypassed reach and through the powerhouse would improve the interpretability of the figure and allow Commission staff to more easily discern how water levels in the bypassed reach change under varying amounts of spill, which would in turn aid our analysis of the potential for fish stranding in the bypassed reach following high-flow (spill) events. Therefore, in the USR, we recommend adding bypassed reach and powerhouse flows to figure 6-9 (2020 field season) and any similar figures generated from data collected during the upcoming 2021 field season.

3. The preliminary Water Quality Study Report provides no confirmation as to whether the project was operating normally during the 2020 water quality monitoring period from August 17, 2020 through October 8, 2020. Therefore, in the USR, please indicate for both the previous (2020) and upcoming (2021) monitoring periods, if the project was operating normally and identify any periods during which there were any unit outages, flashboard failures, or station trips that may have increased spill into the bypassed reaches relative to normal project operation. Providing this operational data will assist Commission staff's analysis of the potential effects of project operation on water quality.

---

[1] *See* section 6.6.1.2 of the Revised Study Plan.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
http://www.fws.gov/chesapeakebay

March 12, 2021

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

RE: Filing of Initial Study Report, Byllesby-Buck Hydroelectric Project, FERC No. 2514-186 on the New River, Carroll County, Virginia.

Dear Secretary Bose:

This letter provides the U.S. Fish and Wildlife Service's (Service) comments on the Initial Study Report for the Byllesby-Buck Hydroelectric Project (Project, FERC No. 2514), located on the New River in Carroll County, Virginia. Appalachian Power Company (Licensee), a unit of American Electric Power, is the licensee, owner, and operator of the two-development Byllesby-Buck Project.

The Initial Study Report was filed with FERC on January 18, 2021 by the project applicant, Appalachian Power Company. The Service reviewed that report and participated in the virtual Initial Study Report meeting on January 28, 2021 with the applicant and their consultants, FERC, state resource agencies, and local interest parties. A transcript summary of the Initial Study Report meeting was filed and distributed on February 12, 2021.

The Service agrees that the filed transcript summary notes captured our concerns and identified action items needed to be addressed. We look forward to seeing the information associated with those action items and discussion to ensue based upon the detailed notes of the 14-page transcript summary.

The Service is satisfied with the impingement/entrainment study plan. In the meeting notes there is an action item for the consultant to provide intake structure drawings so the Service can review how they calculate approach velocity and, in turn, impingement/entrainment issues. The Service will want the opportunity to review the screen approach velocity calculations when the study results are published.

The detailed questions and discussion outlined on pages 7 through 10 of the IRS meeting summary regarding the Bypass Reach Flow and Aquatic Habitat Study will continue to be of interest to the Service. We expect to learn more as the applicant moves into subsequent study years and as habitat modeling is refined with consideration of seasonality of hydrology and impacts to stranding, and to walleye (*Sander vitreus*) spawning habitat.

The Service acknowledges that the mussel sampling portion identified for the Study Plan is completed for now. If green floater mussel (*Lasmigona subviridis*) becomes federally listed, the Service will request a new survey.

The Service appreciates the opportunity to provide comments on the Byllesby-Buck Initial Study Report. If you have any questions regarding our comments, please contact Janet Norman of my staff at Janet_Norman@fws.gov or 410/320-5519.

Sincerely,

Genevieve LaRouche
Field Supervisor

Appalachian Power Company
P. O. Box 2021
Roanoke, VA 24022-2121
aep.com

Via Electronic Filing April 13, 2021

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

**Subject: Byllesby Buck Hydroelectric Project (FERC No. 2514-186)
Response to Comments on the Initial Study Report**

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the two-development Byllesby-Buck Hydroelectric Project (Project) (Project No. 2514) located on the upper New River in Carroll County, Virginia. The Project is currently licensed by the Federal Energy Regulatory Commission (FERC or Commission). The Project underwent relicensing in the early 1990s and the current operating license for the Project expires on February 29, 2024. Accordingly, Appalachian is pursuing a subsequent license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5.

Pursuant to 18 CFR § 5.15(c), Appalachian filed the Initial Study Report (ISR) with the Commission on January 18, 2021. The ISR filing also included notification of the ISR Meeting date, time, and proposed agenda. As required by the ILP schedule, within 15 days of the ISR filing Appalachian held a virtual ISR Meeting via WebEx from 9:30am to 3pm on Thursday, January 28, 2021. The ISR meeting summary was filed with FERC on February 12, 2021. Stakeholders comments on the ISR meeting summary were due by March 14, 2021.

The United States Fish and Wildlife Service (USFWS or the Service) and FERC provided written comments in response to Appalachian's filing of the ISR meeting summary. A letter from the Virginia Department of Wildlife Resources (VDWR) was also received; however, they stated that the meeting summary captured all concerns and needs for clarification on completed and continuing studies for the relicensing and they had no further concerns or comments.

Appalachian is hereby providing responses to stakeholder comments received on the ISR.

Aquatic Resources Study

Stakeholder Comment:

FERC requests that when filing the Updated Study Report (USR), Appalachian provide the raw length data (as approved in the Revised Study Plan [RSP]), preferably in Microsoft Excel format. The file should include species and sampling information (i.e., sampling date/location/gear) for each measured individual. Information on the size distribution of fish in the vicinity of the projects will aid FERC staff's analysis of the susceptibility of resident fishes to impingement and entrainment.

Appalachian's Response:

Appalachian will provide the raw catch length data as available in the USR, which will include the date, site, species, and gear type used.

Stakeholder Comment:

The USFWS notes that the ISR meeting summary captured all concerns and identified appropriate action items. The Service confirms they are satisfied with the impingement / entrainment study plan; however, they would like to review the intake structure drawings and screen approach velocity calculations when the study results are published.

Appalachian's Response:

Appalachian greatly appreciates the Service's participation at the ISR meeting and concurrence on the ISR meeting summary and action items. Appalachian will provide detailed historical intake structure drawings as an appendix or attachment to the final Fish Community Study Report that will be filed with the USR. (Appalachian has done a preliminary review of relevant drawings and believes they can be filed publicly; if the drawings are determined to contain sensitive information that would require filing as CEII, Appalachian will coordinate with the Service to directly provide the requested information.) The intake structure approach velocity calculations were provided in the ISR meeting summary and will also be included in the final Fish Community Study Report.

Stakeholder Comment:

The USFWS also notes that the protected status of the Green Floater (*Lasmigona subviridis*) is currently under review, and that should the review lead to federal protection as a listed species, a new mussel survey will be requested.

Appalachian's Response:

Appalachian appreciates the Service's comment about the Green Floater and will continue to track the federal listing status of this species.

Bypass Reach Flow and Aquatic Habitat Study

Stakeholder Comment:
The Commission notes that Figure 6-9 of the Preliminary Bypass Reach Flow and Aquatic Habitat Study Report shows continuously recorded water levels from water level loggers deployed in the Buck bypass reach in 2020. While total Project inflows are plotted on these figures, there is no indication of what portion of the total inflow is released (spilled) into the bypass reach and how much flow is being passed through the powerhouse. Adding this information on the flows in the bypass reach and through the powerhouse would improve the interpretability of the figure and allow FERC staff to more easily discern how water levels in the bypass reach change under varying amounts of spill, which would in turn aid the analysis of the potential for fish stranding in the bypass reach following high-flow (spill) events. Therefore, in the USR, FERC recommends adding bypass reach and powerhouse flows to Figure 6-9 (2020 field season) and any similar figures generated from data collected during the upcoming 2021 field season.

Appalachian's Response:
Appalachian agrees that adding powerhouse flow and bypass reach flow (in addition to total flow) would be of benefit to more easily discern how water levels in the bypass reach change under varying amounts of spill into the bypass reach. This information will be included in the USR for the figure referenced above (i.e., Figure 6-9 of the Preliminary Bypass Reach Flow and Aquatic Habitat Study Report for the Buck bypass reach) as well as any similar figures generated from the upcoming 2021 field season for the Byllesby bypass reach.

Stakeholder Comment:
The USFWS states that they have continued interest in the Bypass Reach Flow and Aquatic Habitat Study (reference pages 7-10 of the ISR meeting summary). The USFWS expects to learn more as Appalachian moves into the 2021 study year as habitat modeling is refined with respect to seasonal hydrology and potential impacts related to fish stranding and to Walleye (*Sander vitreus)* spawning habitat.

Appalachian's Response:
Appalachian appreciates the USFWS's continued interest in the Bypass Reach Flow and Aquatic Habitat Study and plans to host a virtual meeting in May or June 2021 with stakeholders to review seasonal hydrology (in particular as it relates to the potential for Walleye spawning in March; the peak month identified by the VDWR during the ISR meeting) and discuss other flow scenarios of interest at the Buck development from a fish habitat modeling perspective.

Water Quality Study

Stakeholder Comment:
FERC notes that the preliminary Water Quality Study Report provides no confirmation as to whether the Project was operating normally during the 2020 water quality monitoring period from August 17, 2020 through October 8, 2020. Therefore, in the USR, FERC requests that the License indicate for the previous (2020) and upcoming (2021) monitoring periods whether the Project was operating normally and identify any periods during which there were unit outages, flashboard failures, or station trips that may have increased spill into the bypass reaches relative to normal Project operation. Providing this operational data will assist FERC staff's analysis of the potential effects of Project operation on water quality.

Appalachian's Response:
Appalachian will provide information related to Project operations in the USR for the 2020 and 2021 water quality monitoring periods. This information will include identification of any periods during which there were unit outages, flashboard failures, or station trips that may have increased spill into the bypass reaches relative to normal Project operations.

Appalachian sincerely appreciates the detailed comments provided by relicensing stakeholders and has put careful consideration into the proposals and commitments presented in this response. If there are any questions regarding this filing, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,

Elizabeth Parcell
Process Supervisor
American Electric Power Services Corporation

cc: Distribution List
Jonathan Magalski (AEP)

Byllesby/Buck Hydroelectric Project (FERC No. 2514)
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Yayac, Maggie

Subject: FW: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Response to Comments on the Initial Study Report
Attachments: Responses to Byllesby Buck ISR Comments_04.13.21.pdf

From: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>
Sent: Tuesday, April 13, 2021 6:04 PM
To: ACHP - John Eddins <jeddins@achp.gov>; American Whitewater - Kevin Colburn <kevin@americanwhitewater.org>; Angie Grooms <angie.grooms750@gmail.com>; Appalachian Trail Conservancy - Andrew Downs <adowns@appalachiantrail.org>; Carroll County - Rex Hill <rex.hill@carrollcountyva.gov>; Carroll County Administrator - Steve Truitt <steve.truitt@carrollcountyva.gov>; Catawba Indian Nation - Caitlin Rogers <caitlin.rogers@catawba.com>; Cherokee Nation - Elizabeth Toombs <elizabeth-toombs@cherokee.org>; David Taylor <jklfloat@embarqmail.com>; Delaware Nation - Erin Paden <epaden@delawarenation-nsn.gov>; Fish and Wildlife Conservation - Caitlin Carey <cscarey@vt.edu>; Fish and Wildlife Conservation - Donald J. Orth <dorth@vt.edu>; Friends of the Rivers of Virginia - Richard Roth <rroth@radford.edu>; Friends of the Roanoke - Bill Tanger <bill.tanger@verizon.net>; Harold Peterson <harold.peterson@bia.gov>; New River Conservancy - George Santucci <george@newriverconservancy.org>; New River Conservancy - Laura Walters <claytorlakegirl@gmail.com>; New River Outdoor Adventures - Tim Dixon <newriveroutdooradventures@yahoo.com>; New River Regional Water Authority - Zachary Slate <newriverwater@gmail.com>; New River Trail State Park - Sam Sweeney <Sam.Sweeney@dcr.virginia.gov>; Town of Fries - Scott McCoy <townoffries@friesva.com>; Town of Wytheville - Dr. Beth Taylor, Mayor <beth.taylor@wytheville.org>; USFWS Chesapeake Bay Field Office - Janet Norman <janet_norman@fws.gov>; USGS - Mark Bennett <mrbennet@USGS.gov>; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov) <emma.williams@governor.virginia.gov>; VADCR - Jennifer Wampler <jennifer.wampler@dcr.virginia.gov>; VADCR - Jimmy Elliott <james.elliott@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADCR - Sharon Ewing <sharon.ewing@dcr.virginia.gov>; VADEQ <eir@deq.virginia.gov>; VADEQ - Bettina Rayfield <Bettina.rayfield@deq.virginia.gov>; VADEQ - Joe Grist <joseph.grist@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; VADEQ - Scott Kudlas <scott.kudlas@deq.virginia.gov>; VADEQ - Tony Cario <anthony.cario@deq.virginia.gov>; VADHR - Timothy Roberts <tim.roberts@dhr.virginia.gov>; VADWR - Jeff Williams <jeff.williams@dwr.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; Virginia Department of Game and Inland Fisheries - John Copeland <John.Copeland@dgif.virginia.gov>; Virginia Department of Game and Inland Fisheries - William Kittrell <bill.kittrell@dgif.virginia.gov>; Wythe County Admin - Stephen Bear <sdbear@wytheco.org>
Cc: 'ebparcell@aep.com' <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>
Subject: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Response to Comments on the Initial Study Report

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Pursuant to the ILP, Appalachian filed the Initial Study Report (ISR) for the Project on January 18, 2021, held a virtual ISR Meeting on January 28, 2021, and filed a summary of the ISR meeting with FERC on February 12, 2021. Several relicensing stakeholders provided written comments in response to the meeting summary. In accordance with 18 CFR 5.15(c), Appalachian has filed responses to stakeholder comments.

On behalf of Appalachian, on behalf of Appalachian, we are notifying stakeholders of this response to comments filing. A copy is attached for your convenience. Appalachian will also be adding the ISR to the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck) in the coming days.

On behalf of AEP and the Byllesby-Buck Project relicensing team, thank you for your participation in this process. Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com.

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Project Manager

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Appalachian Power Company
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April 30, 2021

VIA ELECTRONIC FILING

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

**Subject: Byllesby-Buck Hydroelectric Project (FERC No. 2514-186)
Third Quarterly Study Progress Report – Spring 2021**

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Applicant), a unit of American Electric Power (AEP) is the Licensee, owner, and operator of the 30.1 megawatt (MW) Byllesby-Buck Hydroelectric Project (Project No. 2514 (Project or Byllesby-Buck Project), located on the New River in Carroll County, Virginia. The two-development Project comprises the upstream Byllesby development and the downstream Buck development. The Project is currently undergoing relicensing following the Federal Energy Regulatory Commission's (FERC or Commission) Integrated Licensing Process (ILP).

Pursuant to 18 Code of Federal Regulations (CFR) § 5.15(c), Appalachian filed the Initial Study Report (ISR) with the Commission on January 18, 2021, which summarized study activities performed in 2020, as well as ILP activities expected to be completed in 2021.

This Third Quarterly Study Progress Report describes the activities performed since the ISR was filed, including activities that occurred in quarter 1 (Q1) of 2021 and activities expected to be conducted in quarter 2 (Q2) of 2021. Unless otherwise described, all relicensing studies are being conducted in conformance with the approved Revised Study Plan (RSP) and the Commission's Study Plan Determination (SPD), as subsequently modified by Order on Rehearing dated February 20, 2020, and the ISR study schedule.

General Updates – ILP Process and Milestones

- As required by the ILP schedule, within 15 days of the ISR filing, Appalachian held a virtual ISR meeting via WebEx on Thursday, January 28, 2021 which included participation by agencies and stakeholders with interest in the Project.
- The ISR meeting summary was filed with FERC on February 12, 2021. Stakeholders comments on the ISR meeting summary were due by March 14, 2021. Appalachian's responses to the stakeholder meeting comments were filed on April 13, 2021.

Bypass Reach Flow and Aquatic Habitat Study

Buck Bypass Reach

- Field data collection for the Buck Bypass Reach Flow and Aquatic Habitat Study was completed in 2020 and summarized in the ISR. Appalachian plans to host a virtual meeting (via WebEx) in May or June 2021 with interested stakeholders to review seasonal hydrology (in particular as it relates to the potential for Walleye spawning in March; the peak month identified by the Virginia Department of Wildlife Resources [VDWR] during the ISR meeting) and discuss other flow scenarios of interest at the Buck development from a fish habitat modeling perspective.
- Additional aquatic habitat modeling, based on stakeholder consultation, will be performed in 2021 and the results, summary, and recommendations will be provided in the Updated Study Report (USR).

Byllesby Bypass Reach

- The GIS-based desktop aquatic habitat assessment and Habitat Suitability Index curves for the aquatic species that will be modeled in the Byllesby bypass reach, as well as the proposed test flow scenarios that will be used to support model calibration and validation activities, were summarized in the Bypass Reach Flow and Aquatic Habitat Study provided in the ISR submitted on January 18, 2021.
- Field data collection is planned for the 2021 field season (likely in quarter 3 [Q3]) to allow time for spillway flashboard repairs once higher inflows, which typically occur over the winter and early spring months, recede. Once the field data has been collected, a two-dimensional (2D) aquatic habitat model will be developed. Appalachian plans to host a virtual meeting (via WebEx) with agency representatives after the model has been developed to discuss flow scenarios of interest. Modeling results, conclusions, and recommendations will be provided in the USR in the fourth quarter (Q4) of 2021.

Water Quality Study

Buck Development

- Field data collection for the Buck development was completed in 2020 and summarized in the ISR.
- Based on stakeholder comments on the ISR, Appalachian will provide additional information related to Project operations in the USR for the 2021 water quality monitoring periods. This information will include identification of any periods during which there were unit outages, flashboard failures, or station trips that may have increased spill into the bypass reaches relative to normal Project operations.

Byllesby Development

- Due to high baseflow conditions and continuous flow releases at the dam through the damaged flashboard section throughout Q3 and Q4 2020, water quality instrumentation was deployed solely at the Byllesby tailrace location during the 2020 water quality monitoring period. This data was summarized in the ISR.
- As proposed in the ISR and Appalachian's subsequent response to comments filed by stakeholders on the ISR meeting summary, water quality data collection efforts will be repeated at Byllesby in 2021 with the full deployment of data sondes as proposed in the RSP (including the tailrace monitoring location which was sampled during the 2020 study period). The deployment is planned for July through September 2021 to capture the warmer, typically lower flow, summer months.

Byllesby and Buck Developments

- The RSP included the collection of chlorophyll a grab samples in the forebay of each development during the monthly discrete water quality sampling events. Since forebay water quality monitoring was not conducted at the Byllesby development in 2020, chlorophyll a sampling in the Buck forebay was also delayed so that samples from both forebay monitoring locations would be collected during the same year. As proposed in the ISR and Appalachian's subsequent response to comments filed by stakeholders on the ISR meeting summary, monthly chlorophyll a grab samples will be collected during the monthly discrete water quality sampling events as described in the RSP at both the Buck forebay and Byllesby forebay monitoring locations during the same months (i.e., July, August, and September) in 2021.
- Due to higher than normal Project inflows from the New River in Q3 2020, the turbidity study was also rescheduled for Q3 2021 at the Byllesby and Buck developments, which

will allow data collection efforts to target conditions that are more representative of typical station operations during lower flows.

Aquatic Resources Study

Fish Community Study

- Field data collection for the fall season of the general fish community study was completed in 2020 and summarized in the ISR.
- Additional spring 2021 fish community sampling was performed April 1926, 2021. Electrofishing samples were completed at all sites for Byllesby and for two of ten sample sites located upstream and downstream of Buck Dam. Sampling had to be halted due to an issue with the electrofishing boat motor. An additional field deployment is planned for early May 2021 to complete the remaining sampling sites for Buck Dam. Results of the 2020 and 2021 sampling efforts will be used to support completion of the Fish Impingement and Entrainment Study and will be summarized in the USR.

Impingement, Entrainment, and Bladestrike Analysis Study

- Data compilation is underway for the desktop impingement and entrainment evaluation.
- Appalachian will initiate the Turbine Blade Strike Evaluation for Buck and Byllesby using the most recent version of the USFWS Turbine Blade Strike Analysis Model[1] and will also incorporate available historical information. A tentative list of fish species collected at the site to be used in the analysis was presented in the ISR. The analysis and reporting will be performed in Q2 2021 and results will be included in the USR.

Macroinvertebrate and Crayfish Community Study

- The ISR did not include results of the 2020 macroinvertebrate field data collection efforts because laboratory identification had not been completed yet. Laboratory identification to the lowest practicable taxonomic level was completed in Q1 2021. Detailed results and data analyses will be presented in the USR. Preliminary results are summarized below:
    - Crayfish
        i. Two specimens of Cambaridae in the genus *Faxonius* were collected at Site BFQT7. Additional crayfish observation data were recorded in the field and previously summarized in the ISR.

[1] U.S. Fish and Wildlife Service (USFWS). 2020. TBSA Model: A Desktop Tool for Estimating Mortality of Fish Entrained in Hydroelectric Turbines. Excel file dated December 9, 2020.

- Macroinvertebrates
    i. The total number of taxa collected at study sites was between 8 and 28, with an average of 18 total taxa per sample site.
    ii. The diversity of the EPTs (Ephemeroptera, Plecoptera, Trichoptera) varied between 3 and 17 species, depending on sampling methodology (quantitative versus qualitative) and habitat sampled. The largest diversity of EPT taxa occurred at riffle sites (BFQT7 and BFQT8) just downstream of Byllesby Dam. The density of EPT organisms per site varied between 3 and 94, with an average of 43 organisms per sample site.
    iii. Specimens from five families of gastropods and two families of clams (Asian and Fingernail clams) were collected in low numbers across the study area.
- Additional spring 2021 macroinvertebrate community sampling was completed April 19-26. Results of the field efforts and taxonomic identification will be presented in the USR.

Recreation Study

- Field data collection for the Recreation Study was completed in 2020 and summarized in the ISR submitted on January 18, 2021.
- Appalachian, HDR, Land Planning Design & Associates (HDR's sub-consultant), and the VDWR met at the Loafer's Rest recreation facility for a site visit on March 24, 2021 to evaluate and discuss applicable stakeholder comments at the ISR meeting.
- Appalachian is presently evaluating recreation facility enhancements to be included in Appalachian's licensing proposal and plans to conduct additional agency consultation related to potential enhancements in Q3 2021.

Cultural Resources Study

- Data collection for the Cultural Resources Study was completed in 2020 and summarized in the ISR. Appalachian completed the final additional day in the field for the geomorphology survey during the week of April 19th, 2021, which was interrupted last year due to high flows and weather. Complete results of the Cultural Resources Study will be filed with the USR.

If there are any questions regarding this progress report, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,

Elizabeth Parcell
Process Supervisor
American Electric Power Services Corporation

Yayac, Maggie

Subject: FW: Byllesby-Buck Hydroelectric Project (VA) -- Filing of ILP Study Progress Report
Attachments: ByllesbyBuck Third Quarterly Progress Report April 2021.pdf

From: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>
Sent: Monday, May 3, 2021 5:06 PM
To: ACHP - John Eddins <jeddins@achp.gov>; American Whitewater - Kevin Colburn <kevin@americanwhitewater.org>; Angie Grooms <angie.grooms750@gmail.com>; Appalachian Trail Conservancy - Andrew Downs <adowns@appalachiantrail.org>; Carroll County - Rex Hill <rex.hill@carrollcountyva.gov>; Carroll County Administrator - Steve Truitt <steve.truitt@carrollcountyva.gov>; Catawba Indian Nation - Caitlin Rogers <caitlin.rogers@catawba.com>; Cherokee Nation - Elizabeth Toombs <elizabeth-toombs@cherokee.org>; David Taylor <jklfloat@embarqmail.com>; Delaware Nation - Erin Paden <epaden@delawarenation-nsn.gov>; Fish and Wildlife Conservation - Caitlin Carey <cscarey@vt.edu>; Fish and Wildlife Conservation - Donald J. Orth <dorth@vt.edu>; Friends of the Rivers of Virginia - Richard Roth <rroth@radford.edu>; Friends of the Roanoke - Bill Tanger <bill.tanger@verizon.net>; Harold Peterson <harold.peterson@bia.gov>; New River Conservancy - George Santucci <george@newriverconservancy.org>; New River Conservancy - Laura Walters <claytorlakegirl@gmail.com>; New River Outdoor Adventures - Tim Dixon <newriveroutdooradventures@yahoo.com>; New River Regional Water Authority - Zachary Slate <newriverwater@gmail.com>; New River Trail State Park - Sam Sweeney <Sam.Sweeney@dcr.virginia.gov>; Town of Fries - Scott McCoy <townoffries@friesva.com>; Town of Wytheville - Dr. Beth Taylor, Mayor <beth.taylor@wytheville.org>; USFWS Chesapeake Bay Field Office - Janet Norman <janet_norman@fws.gov>; USGS - Mark Bennett <mrbennet@USGS.gov>; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov) <emma.williams@governor.virginia.gov>; VADCR - Jennifer Wampler <jennifer.wampler@dcr.virginia.gov>; VADCR - Jimmy Elliott <james.elliott@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADCR - Sharon Ewing <sharon.ewing@dcr.virginia.gov>; VADEQ <eir@deq.virginia.gov>; VADEQ - Bettina Rayfield <Bettina.rayfield@deq.virginia.gov>; VADEQ - Joe Grist <joseph.grist@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; VADEQ - Scott Kudlas <scott.kudlas@deq.virginia.gov>; VADEQ - Tony Cario <anthony.cario@deq.virginia.gov>; VADHR - Timothy Roberts <tim.roberts@dhr.virginia.gov>; VADWR - Jeff Williams <jeff.williams@dwr.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; Virginia Department of Game and Inland Fisheries - John Copeland <John.Copeland@dgif.virginia.gov>; Virginia Department of Game and Inland Fisheries - William Kittrell <bill.kittrell@dgif.virginia.gov>; Wythe County Admin - Stephen Bear <sdbear@wytheco.org>
Cc: 'ebparcell@aep.com' <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>; Yayac, Maggie <Maggie.Yayac@hdrinc.com>
Subject: Byllesby-Buck Hydroelectric Project (VA) -- Filing of ILP Study Progress Report

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Pursuant to the ILP, Appalachian filed the third ILP Study Progress Report with the Commission on Friday, April 30. We are notifying stakeholders and distributing an electronic copy of this submittal (attached). The filing can also be viewed online at FERC's eLibrary and will be added to the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck) in the coming days.

Thank you for your continued interest in this Project. Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com.

Thank you,

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Project Manager

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From: Kulpa, Sarah
Sent: Wednesday, July 21, 2021 9:24 AM
To: Hanson, Danielle
Subject: FW: Byllesby-Buck Loafer's Rest Recreation Meeting Summary
Attachments: Byllesby Buck Recreation Meeting Summary_06.29.21.pdf

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From: Salazar, Maggie <Maggie.Salazar@hdrinc.com>
Sent: Tuesday, July 20, 2021 4:46 PM
To: jeff.williams@dwr.virginia.gov; tom.hampton@dwr.virginia.gov; Copeland, John <john.copeland@dwr.virginia.gov>
Cc: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>; McCarney-Castle, Kerry <Kerry.McCarney-Castle@hdrinc.com>; Jonathan M Magalski <jmmagalski@aep.com>; ebparcell@aep.com; Tristan Cleveland <tristan@lpda.net>
Subject: Byllesby-Buck Loafer's Rest Recreation Meeting Summary

Jeff, Tom, and John,

Please find the attached meeting notes from our WebEx call on June 29th. Let me know if you have any questions or comments.

I hope you all are having a nice week!

Maggie Salazar
Regulatory Specialist

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Please note my last name has changed

Meeting Summary

Project:	Byllesby-Buck Relicensing
Subject:	Potential Recreation Improvements
Date:	Tuesday, June 29, 2021
Location:	WebEx
Attendees:	Elizabeth Parcell (AEP) Tom Hampton (VDWR) John Copeland (VDWR) Jeff Williams (VDWR) Sarah Kulpa (HDR) Maggie Yayac (HDR) Kerry McCarney-Castle (HDR) Tristan Cleveland (LPDA)

Opening Remarks

S. Kulpa opened the call and provided introductions, opening remarks, and objectives of call:

> The Byllesby-Buck Hydroelectric Project (Project) Draft License Application (DLA) will be submitted by or on Oct 1, 2021 to the Federal Energy Regulatory Commission (FERC) and relicensing participants. The objective of this call was to introduce the recreation enhancements Appalachian Power Company (Appalachian) is considering proposing in the DLA, in collaboration with the Virginia Department of Wildlife Resources (VDWR), and seek preliminary VDWR feedback.

Loafers Rest

M. Yayac screen shared to display trail maps and design options developed by LPDA for potential Project recreation enhancements at Loafers Rest and talked about progress since the site visit in March 2021. **M. Yayac** noted that all potential enhancements are on property owned by Appalachian leased to the VDWR.

T. Cleveland explained the proposed fishing trail (majority follows an existing trail bed and farm track) and pointed out where new/updated signage would be required. The trail would require a newly constructed portion (0.09 miles) to join the upgraded existing trail to the proposed fishing access in the tailrace. Improvements are outside of current FERC Project Boundary. See Figure 1 (attached).

J. Copeland agreed the fishing trail location and layout makes sense and was in line with discussions in the field. On behalf of VDWR, J. Copeland expressed interest in enhancements at Loafers Rest beyond the trail access. HDR/LPDA confirmed there are no additional proposed enhancements for the fishing access and provided an overview of potential enhancements (based on field discussions) at Loafers Rest to facilitate water access.

T. Cleveland presented enhancement options as follows:

Option A

In an effort to improve public access to water and carrying boats down to the water, a proposed 12-foot entry drive to connect to existing Farm Lane, bollard and cables would be constructed, leading to a proposed primary (gravel) parking area with 12 spaces with staging area for drop-off/unloading boats and an improved 10-foot river access trail. Water access would be hardened and/or have canoe/kayak slide. Banks would be stabilized. Additionally, LPDA proposed new signage, loading bars (t bars) for kayaks and pullover spots for larger vehicles (trailers). See Figure 2 (attached).

Option B

Similar to Option A, however, lower costs associated with a smaller turnaround with only 4 parking spaces for loading and unloading and no additional parking spaces (same proposed entrance drive, improved surface conditions for put-in, water access, and kayak slide as Option A). See Figure 3 (attached).

J. Copeland stated he thought the options were appropriate and asked for T. Hampton's opinion.

T. Hampton stated he prefers Option A over Option B to facilitate parking and therefore usage for a broad range of recreation visitors, including older adults. He indicated that VDWR has moved away from kayak slides and requested a concrete hardened access. He explained with a hardened access, emergency response personnel could launch a boat (which they could not do on a kayak slide). He asked about the surface of the parking area and **T. Cleveland** responded that it would be gravel. **T. Hampton** said gravel would be advantageous for maintenance.

T. Cleveland asked for clarification regarding emergency/administrative access and if the conceptual design should include straightening out the curb of the parking area; this design change would result in increased construction cost including additional clearing.

Action Item: LPDA to develop an "Option C" that would allow Emergency Vehicles to access and turn in the parking lot and revise kayak slide to hardened water access.

E. Parcell asked if the Loafers Rest improvement could potentially benefit from funding through U.S. Fish and Wildlife Service (USFWS) or other grants. **T. Hampton** did not have definitive answer. **E. Parcell** suggested a follow-up with contact at VDWR to see if there is potential for funding. **E. Parcell** had dealt with James Adams at VDWR in the past; however, he is no longer with the agency and has not been replaced. **E. Parcell** asked if T. Hampton could track down the person to start a conversation regarding federal funding. T. Hampton noted they would not have the opportunity to get a proposed project in front of USFWS until December.

Action Item: T. Hampton and E. Parcell to coordinate and reach out about funding assistance from the USFWS.

S. Kulpa asked if the additions to Loafers Rest would continue to be maintained by VDWR. **T. Hampton** believed that they could get it added to their list to fall under VDWR maintenance and asked if Loafers Rest would be included in the license. Currently it is not part of the license either as a Project or Non-Project facility. **S. Kulpa** said it would be beneficial to include as a licensing proposal so that FERC can reference and recognize the Project's efforts for recreation enhancement and mitigation. Appalachian currently proposes to designate this as a Non-Project facility since it falls outside of the FERC Project Boundary. The benefit of keeping outside of the Project Boundary is the ease of process (i.e., not under FERC jurisdiction).

J. Copeland asked to clarify the fishing trail is only to provide public access to the Buck tailrace. **S. Kulpa** agreed. **T. Cleveland** noted a portion of the proposed fishing trail would be completely new trail, but the rest would not require much improvements (on existing trail bed). **E. Parcell** agreed and noted that she revisited the site with a general contractor who confirmed that the existing base trail is in decent shape and wouldn't need much work. **J. Copeland** asked about the existing farm bridge along the trail. **E Parcell** mentioned installing handrails could improve the bridge and culverts/bridge may be grandfathered in and not require a permit. However, replacing the bridge would increase the cost significantly due to the large culverts required.

T. Hampton mentioned there is an existing dove hunting field that is popular and asked if there a need to make notation that it's a recreation opportunity provided to the public. **E. Parcell** said continue to use as dove hunting area as-is. **T. Cleveland** said any improvements would not affect dove hunting field.

T. Cleveland referred back to the earlier discussion regarding the proposed parking area in Option A and asked about the size of the proposed parking lot and if 12 spaces would be adequate. **T. Hampton** said 12 spaces would be adequate and asked about the vegetated "islands" in the parking area – acknowledged they help prevent people from doing "donuts" with vehicles but was concerned about maintenance of green space on the islands. **T. Cleveland** said they could possibly make it gravel-topped instead of green, but ultimately group decided to leave as currently proposed and believed that since the site will already require mowing this should not be a significant maintenance issue.

Fowler's Ferry

S. Kulpa asked if VDWR would be interested in leasing the area from Appalachian or had any more thoughts about this area. See Figure 4 (attached).

T. Hampton stated that if Bill Kittrell (VDWR) had started a conversation about leasing this property he did not hear about it, however, he reiterated that the grant program through NRCS is available to lease private land for public access. Therefore, VDWR would be interested in leasing this land from Appalachian and would be interested in continuing the conversation.

S. Kulpa asked if the grant would cover necessary improvements to the site. **T. Hampton** confirmed the grant would cover improvements and asked about next steps. E. Parcell said she would bring in somebody from AEP real estate to start that conversation.

Action Item: E. Parcell to connect with AEP real estate and set-up call with VDWR regarding leasing the area associated with Fowler's Ferry.

S. Kulpa mentioned the potential to keep leasing of this land/development of this area outside of the relicensing process since the location is completely outside of the FERC Project Boundary.

J. Copeland stated that, as background, the interest in this area came from their conservation officer and his difficulties in enforcing access and safety from a law enforcement standpoint.

T. Cleveland stated there is evidence of heavy use and trash, camping (informal), and the access road is rutted and undergoing erosion. Improvements to the site would address erosion and prevent vehicles from accessing the site (trail only would be provided). T. Cleveland pointed out where barriers would need to be placed along Fowler's Ferry Road to help enforcement and also would install usage signage. Additionally, parking and vehicular access would be provided along the road by slightly widening Fowler's Ferry road.

Portages

S. Kulpa – The Buck take-out is upstream of the dam and forebay. Other than debris accumulation, it's a well-established trail to the put-in; however, some additional signage would be a useful enhancement. Perhaps improving the area of the put-in, which is currently very steep into the bottom of the tailrace channel would be beneficial. **VDWR** agreed being able to safely hand-launch there would be a useful improvement.

T. Cleveland noted that the step downs are by tree-roots, therefore, enhancement may include hardening up the banks and providing a wider spot or downstream location for people to access.

S. Kulpa confirmed the Buck put-in enhancement under discussion is the only portage location proposed for improvement as part of Appalachian's licensing proposal and asked VDWR if they had any suggestion regarding prioritization or any other portage locations, or any other improvements to note. **J. Copeland** acknowledged challenges (i.e., length) and constraints of the Byllesby take-out above the dam but lack of feasible alternatives and satisfactory conditions of the put-in below and confirmed nothing additional is being requested from them at this time.

Byllesby Boat Launch

This improvement presently involves resurfacing the parking lot at the VDWR Byllesby boat launch. **E. Parcell** is waiting for a response from AEP contractor regarding resurfacing and costs.

S. Kulpa asked VDWR if they have other priorities regarding Byllesby Boat Launch. **J. Copeland** remarked he did not recall anything, but Toby and Ben (also VDWR) may have had concerns/suggestions during the last meeting. **M. Yayac** pulled up the previous site visit notes which indicated fishing extension and wildlife viewing enhancements.

J. Copeland stated bank fishing in this location occurs daily and stated perhaps some sort of extension of parking area (concrete) would facilitate shoreline use. **T. Hampton** mentioned that facilities to promote wildlife viewing would be beneficial to the area. **J. Copeland** mentioned the new Wildlife Viewing Plan was approved in early June and will share with E. Parcell.

Action Item: VDWR will share Wildlife Viewing Plan with E. Parcell (Complete)

S. Kulpa confirmed the following three items are the correct priorities (and in the correct order) for the Project recreational improvements:

1. Loafers Rest
2. Buck Portage
3. Byllesby Boat launch

Other Items

J. Copeland mentioned the campground near the area and stated the need to bring in Sam Sweeney with VDCR, to which **S. Kulpa** replied AEP understands there was very strong interest in Forest Service leasing land for campground, but there's really no nexus to the Project and this is out of Appalachian's control to improve. **T. Copeland** recommended involving Rex Hill regarding campground area.

S. Kulpa asked if VDWR would lead the effort for construction/modification to existing site with funding from Appalachian or is VDWR looking for Appalachian to handle capital improvements (all sites). **T. Hampton** stated VDWR was happy to partner but thought it may be easier for modifications to be done outside of the state processes.

S. Kulpa asked if there were any other areas or interests to discuss. **T. Cleveland** mentioned consistent signage would be a useful improvement at all of the sites. **S. Kulpa** asked if there are VDWR signage guidelines. **T. Hampton** replied there are many kinds of signs with different color schemes, for different uses and will send a guidelines document. The group discussed potential benefits and feasibility of the addition of more interpretive signage at recreation areas.

Action Item: VDWR to provide standard signage guidelines document and/or POC for standard guidelines (Complete)

Figures

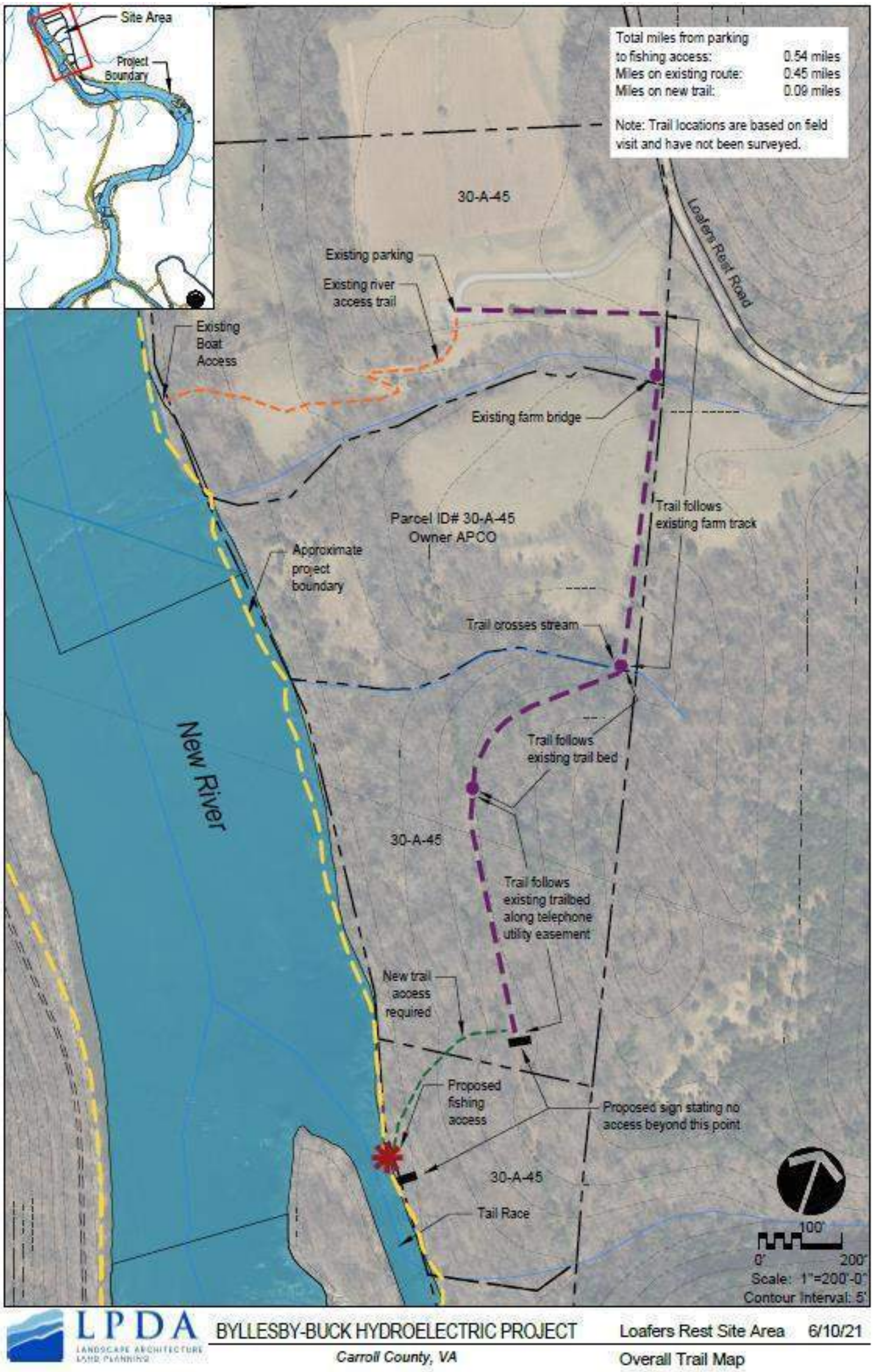

Figure 1. Preliminary Overall Trail Map at Loafers Rest

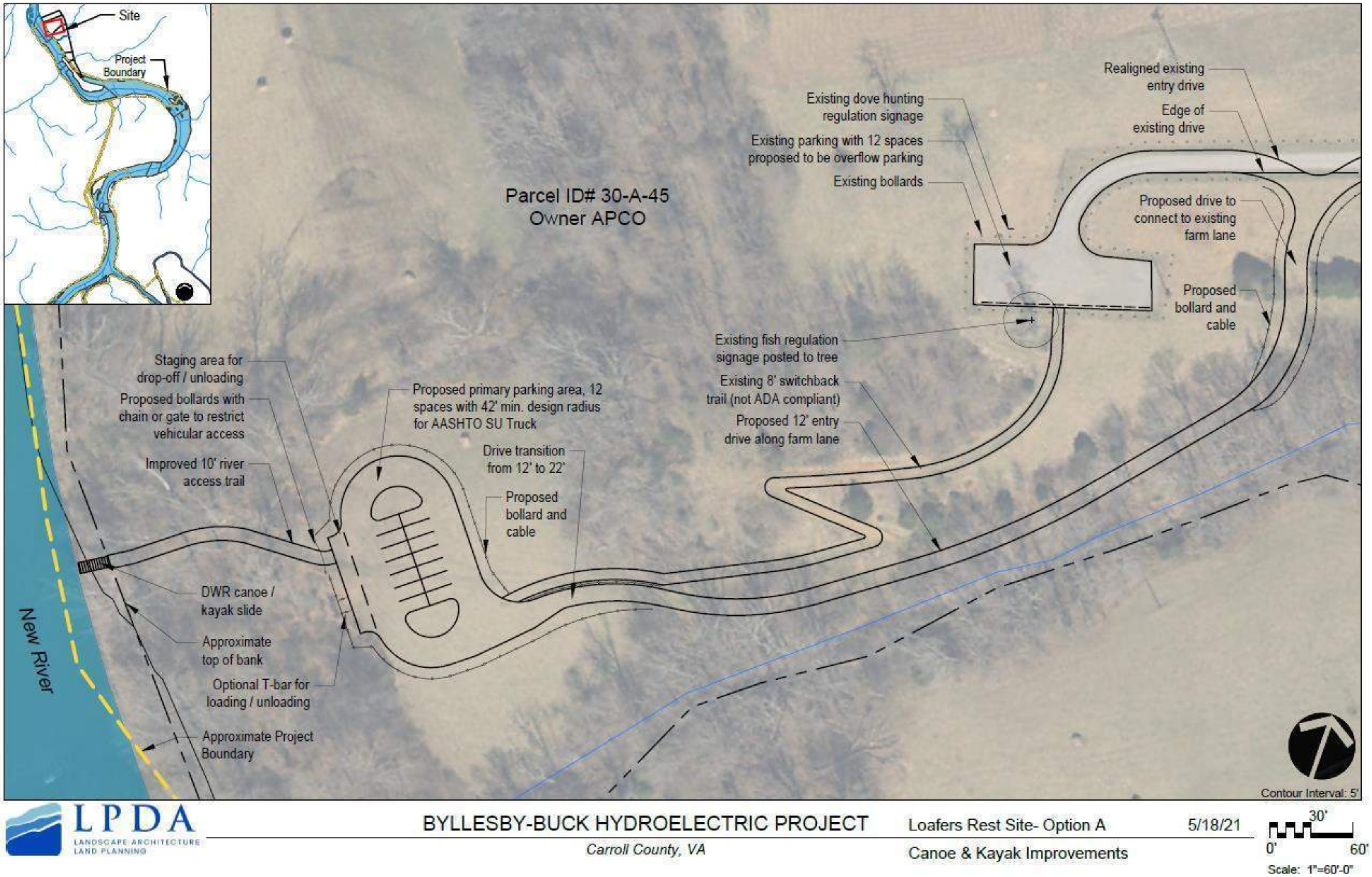

Figure 2. Proposed Canoe & Kayak Improvements – Loafers Rest Site Option A

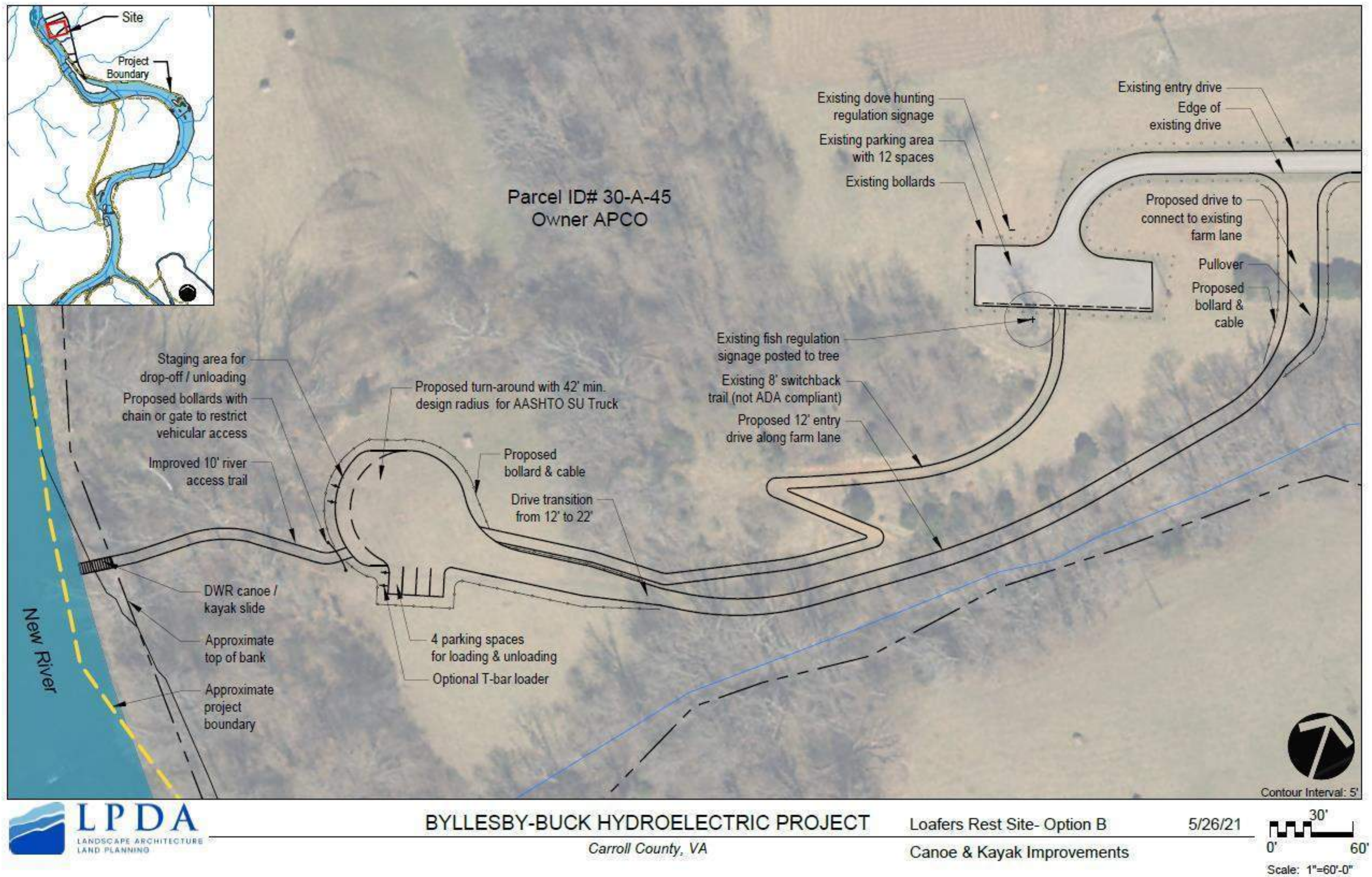

Figure 3. Proposed Canoe & Kayak Improvements – Loafers Rest Site Option B

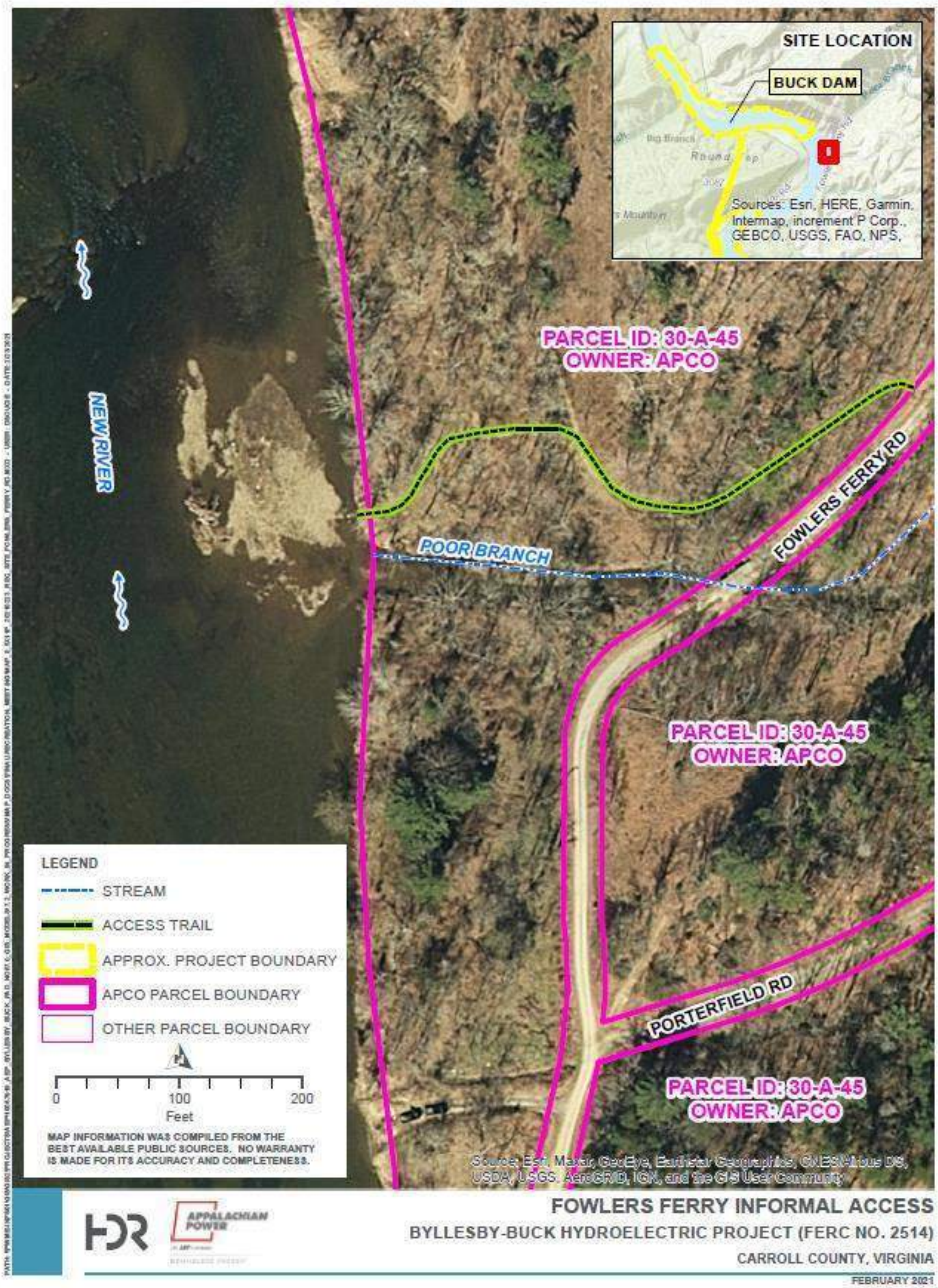

Figure 4. Fowlers Ferry Proposed Informal Access

Appalachian Power Company
P. O. Box 2021
Roanoke, VA 24022-2121
aep.com

July 22, 2021

VIA ELECTRONIC FILING

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

Subject: **Byllesby-Buck Hydroelectric Project (FERC No. 2514-186)**
Fourth Quarterly Study Progress Report – Summer 2021

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Applicant), a unit of American Electric Power (AEP) is the Licensee, owner, and operator of the 30.1 megawatt (MW) Byllesby-Buck Hydroelectric Project (Project No. 2514 (Project or Byllesby-Buck Project), located on the New River in Carroll County, Virginia. The two-development Project comprises the upstream Byllesby development and the downstream Buck development. The Project is currently undergoing relicensing following the Federal Energy Regulatory Commission's (FERC or Commission) Integrated Licensing Process (ILP).

This Fourth Quarterly Study Progress Report describes the activities performed since the Third Quarterly Study Progress Report which was filed on April 30, 2021 and includes activities expected to be conducted in quarter 3 (Q3) of 2021. Unless otherwise described, all relicensing studies are being conducted in conformance with the approved Revised Study Plan (RSP) and the Commission's Study Plan Determination (SPD), as subsequently modified by Order on Rehearing dated February 20, 2020, and the ISR study schedule.

Bypass Reach Flow and Aquatic Habitat Study

Buck Bypass Reach

- Appalachian plans to host a virtual meeting (via WebEx) later this summer with interested stakeholders to review seasonal hydrology (in particular as it relates to the potential for Walleye spawning in March; the peak month identified by the Virginia Department of Wildlife Resources [VDWR] during the ISR meeting) and discuss other flow scenarios of interest at the Buck development from a fish habitat modeling perspective.

- Additional aquatic habitat modeling, based on stakeholder consultation, will be performed in the fall of 2021 and the results, summary, and recommendations will be provided in the Updated Study Report (USR).

Byllesby Bypass Reach

- Field data collection is presently scheduled for August, subject to project operating and inflow and other conditions. Habitat mapping and data collection under leakage flow will not be feasible until the damaged flashboard bay is repaired. Appalachian is presently working to schedule a brief reservoir drawdown to allow for this maintenance in early August.
- Once all field data has been collected, a two-dimensional (2D) aquatic habitat model will be developed. Appalachian plans to host a virtual meeting (via WebEx) with agency representatives after the model has been developed to discuss flow scenarios of interest. Modeling results, conclusions, and recommendations will be provided in the USR.

Water Quality Study

Buck Development

- As noted in the previous progress report, Appalachian will provide additional information related to Project operations in the USR for the 2020 water quality monitoring periods at the Buck Development. This information will include identification of any periods during which there were unit outages, flashboard failures, or station trips that may have increased spill into the bypass reach relative to normal Project operations.

Byllesby Development

- As discussed in the previous progress report, water quality data collection efforts are being repeated at Byllesby in 2021 with the full deployment of data sondes as proposed in the RSP (including the tailrace monitoring location which was sampled during the 2020 study period). Water quality equipment was successfully installed at these four locations on June 15 and 16, 2021 and were downloaded on June 28 and July 14. The data will continue to be downloaded through September to capture warmer, typically lower flow, summer months.

Byllesby and Buck Developments

- Monthly chlorophyll a and turbidity grab samples will be collected during the monthly discrete water quality sampling events as described in the RSP at both the Buck forebay and Byllesby forebay monitoring locations during the same months (i.e., July, August, and September) in 2021. The first monthly grab sample was completed on July 14.

- The turbidity Water Quality Study task could not be completed in 2020 due to higher than normal Project inflows from the New River. This task is presently rescheduled for the fall of 2021 at the Byllesby and Buck developments, which will allow data collection efforts to target conditions that are more representative of typical station operations during lower flows, and is also intended to accommodate scheduled repairs to the Byllesby trashracks and return to normal operation of the trashrake at the Byllesby Development.

Aquatic Resources Study

Fish Community Study

- Additional spring 2021 fish community sampling was performed April 19-26, 2021 and completed on May 27, 2021. Electrofishing samples were completed at all sites for Byllesby and for the ten sample sites located upstream and downstream of Buck Dam. Results of the 2020 and 2021 sampling efforts will be used to support completion of the Fish Impingement and Entrainment Study and will be summarized in the USR.

Impingement, Entrainment, and Bladestrike Analysis Study

- Data compilation is underway for the desktop impingement and entrainment evaluation.
- Appalachian will initiate the Turbine Blade Strike Evaluation for Buck and Byllesby using the most recent version of the USFWS Turbine Blade Strike Analysis Model[1] and will also incorporate available historical information. A tentative list of fish species collected at the site to be used in the analysis was presented in the ISR. The analysis and reporting will be continued to be performed in Q3 2021 and results will be included in the USR.
- Appalachian is evaluating the potential for turbine upgrades to extend the Project's operating life. If turbine upgrades, which would result in a significant increase in hydraulic capacities' of the units, are proposed by Appalachian in the draft or final license application, the Turbine Blade Strike Evaluation will be further run to account for potential proposed changes to the turbines.

Recreation Study

- Appalachian, HDR, Land Planning Design & Associates (HDR's sub-consultant), and the VDWR participated in a conference call on June 29, 2021 to discuss potential Project and

[1] U.S. Fish and Wildlife Service (USFWS). 2020. TBSA Model: A Desktop Tool for Estimating Mortality of Fish Entrained in Hydroelectric Turbines. Excel file dated December 9, 2020.

Non-Project improvements. Appalachian plans on further consulting with the larger recreation stakeholder group in advance of the filing of the Draft License Application.

- Appalachian continues to evaluate recreation facility enhancements to be included in Appalachian’s licensing proposal.

Terrestrial Resources Study

- The field work in support of the Terrestrial Resources Study was completed on May 26-27, 2021 and results will be provided in the USR.

Wetlands, Riparian, and Littoral Habitat Characterization Study and Shoreline Stability Assessment

- The field work in support of the Wetlands, Riparian, and Littoral Habitat Characterization Study and the Shoreline Stability Assessment is scheduled to be completed during the week of July 19th and results will be provided in the USR.

Cultural Resources Study

- All field investigations for this study have been completed. Final results of the Cultural Resources Study will be filed with the USR.

If there are any questions regarding this progress report, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,

Elizabeth Parcell
Process Supervisor
American Electric Power Services Corporation

From: Wampler, Jennifer <jennifer.wampler@dcr.virginia.gov>
Sent: Tuesday, July 27, 2021 10:57 AM
To: Kulpa, Sarah
Cc: ACHP - John Eddins; American Whitewater - Kevin Colburn; Angie Grooms; Appalachian Trail Conservancy - Andrew Downs; Carroll County - Rex Hill; Carroll County Administrator - Steve Truitt; Catawba Indian Nation - Caitlin Rogers; David Taylor; Delaware Nation - Erin Paden; Fish and Wildlife Conservation - Caitlin Carey; Fish and Wildlife Conservation - Donald J. Orth; Cherokee Nation - Elizabeth Toombs; Friends of the Rivers of Virginia - Richard Roth; Friends of the Roanoke - Bill Tanger; Harold Peterson; New River Conservancy - George Santucci; New River Conservancy - Laura Walters; New River Outdoor Adventures - Tim Dixon; New River Regional Water Authority - Zachary Slate; New River Trail State Park - Sam Sweeney; Town of Fries - Scott McCoy; Town of Wytheville - Dr. Beth Taylor, Mayor; USFWS Chesapeake Bay Field Office - Janet Norman; USGS - Mark Bennett; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov); VADCR - Jimmy Elliott; VADCR - Robbie Ruhr; VADCR - Sharon Ewing; VADEQ; VADEQ - Bettina Rayfield; VADEQ - Joe Grist; VADEQ - Matthew Link; VADEQ - Scott Kudlas; VADEQ - Tony Cario; VADHR - Timothy Roberts; VADWR - Jeff Williams; Virginia Department of Conservation and Recreation - Rene Hypes; Virginia Department of Game and Inland Fisheries - John Copeland; Virginia Department of Game and Inland Fisheries - William Kittrell; Wythe County Admin - Stephen Bear; ebparcell@aep.com; Jonathan M Magalski; Salazar, Maggie; Hanson, Danielle
Subject: Re: Byllesby-Buck Hydroelectric Project (VA) -- Filing of ILP Study Progress Report

Sarah,
Please check your email list for any contacts with dgif and change to dwr. For example, John.copeland@dwr.virginia.gov
DGIF is now the Department of Wildlife Resources.
Thanks,
Jennifer

On Tue, Jul 27, 2021 at 9:27 AM Kulpa, Sarah <Sarah.Kulpa@hdrinc.com> wrote:

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Pursuant to the ILP, Appalachian filed the third ILP Study Progress Report with the Commission on Thursday, July 22. We are notifying stakeholders and distributing an electronic copy of this submittal (attached). The filing can also be viewed online at FERC's eLibrary and will be added to the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck) in the coming days.

Thank you for your continued interest in this Project. Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com.

Thank you,

Sarah Kulpa

Project Manager

HDR

440 S. Church Street, Suite 900
Charlotte, NC 28202-2075
D 704.248.3620 **M** 315.415.8703
sarah.kulpa@hdrinc.com

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Jennifer Wampler
Virginia Dept. of Conservation and Recreation
600 E Main Street, 24th floor
Richmond, VA 23219
jennifer.wampler@dcr.virginia.gov
804-786-9240

From: Kulpa, Sarah
Sent: Tuesday, July 27, 2021 6:27 AM
To: ACHP - John Eddins; American Whitewater - Kevin Colburn; Angie Grooms; Appalachian Trail Conservancy - Andrew Downs; Carroll County - Rex Hill; Carroll County Administrator - Steve Truitt; Catawba Indian Nation - Caitlin Rogers; David Taylor; Delaware Nation - Erin Paden; Fish and Wildlife Conservation - Caitlin Carey; Fish and Wildlife Conservation - Donald J. Orth; Cherokee Nation - Elizabeth Toombs; Friends of the Rivers of Virginia - Richard Roth; Friends of the Roanoke - Bill Tanger; Harold Peterson; New River Conservancy - George Santucci; New River Conservancy - Laura Walters; New River Outdoor Adventures - Tim Dixon; New River Regional Water Authority - Zachary Slate; New River Trail State Park - Sam Sweeney; Town of Fries - Scott McCoy; Town of Wytheville - Dr. Beth Taylor, Mayor; USFWS Chesapeake Bay Field Office - Janet Norman; USGS - Mark Bennett; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov); VADCR - Jennifer Wampler; VADCR - Jimmy Elliott; VADCR - Robbie Ruhr; VADCR - Sharon Ewing; VADEQ; VADEQ - Bettina Rayfield; VADEQ - Joe Grist; VADEQ - Matthew Link; VADEQ - Scott Kudlas; VADEQ - Tony Cario; VADHR - Timothy Roberts; VADWR - Jeff Williams; Virginia Department of Conservation and Recreation - Rene Hypes; Virginia Department of Game and Inland Fisheries - John Copeland; Virginia Department of Game and Inland Fisheries - William Kittrell; Wythe County Admin - Stephen Bear
Cc: 'ebparcell@aep.com'; Jonathan M Magalski; Salazar, Maggie; Hanson, Danielle
Subject: Byllesby-Buck Hydroelectric Project (VA) -- Filing of ILP Study Progress Report
Attachments: ByllesbyBuck Fourth Quarterly Progress Report_July 2021.pdf

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

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Thank you,

Sarah Kulpa
Project Manager

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Appalachian Power Company
P.O. Box 2021
Roanoke, VA 24022-2121
aep.com

September 8, 2021

To: Attached Section 106 Consultation Distribution List

Subject: **Byllesby-Buck Hydroelectric Project (FERC No. 2514)**
Cultural Resource Study Report
Consultation Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended

Dear Consulting Parties:

This letter represents consultation with the Virginia State Historic Preservation Officer (SHPO) and federally recognized Indian tribes (collectively "Consulting Parties") regarding the enclosed cultural resource study report. The report has been prepared in support of the ongoing Federal Energy Regulatory Commission (FERC or Commission) relicensing of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) located in Carroll County, Virginia.

Appalachian Power Company (Appalachian or Applicant), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the 30.1-megawatt (MW) Byllesby-Buck Hydroelectric Project (Project No. 2514) (Project or Byllesby-Buck Project), located on the New River in Carroll County, Virginia. The Byllesby development is located about nine miles north of the City of Galax, and the Buck development is located approximately three river miles (RM) downstream of Byllesby and 43.5 RM upstream of Claytor Dam.

The existing license for the Project was issued by the Federal Energy Regulatory Commission (FERC or Commission) for a 30-year term, with an effective date of March 28, 1994, and expires February 29, 2024. Accordingly, Appalachian is pursuing a new license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5. Section 106 of the National Historic Preservation Act (Section 106) requires the Commission to take into account the effects of issuing a new license for the continued operation of the Project on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment[1]. This consultation, including the enclosed cultural resources study report, represents part of Appalachian's ongoing Section 106 consultation efforts for the Project.

BACKGROUND

Pursuant to the regulations implementing Section 106[2], the Commission has determined that issuing a new license for the Byllesby-Buck Project is considered an undertaking with the

[1] 54 United States Code § 306108
[2] 36 C.F.R. Part 800

potential to effect historic properties listed in or eligible for inclusion in the National Register of Historic Places.

Appalachian filed a Pre-Application Document (PAD) and associated Notice of Intent (NOI) with the Commission on January 7, 2019, to initiate the ILP. The Commission issued Scoping Document 1 (SD1) for the Project on March 8, 2019. SD1 was intended to advise resource agencies, Indian tribes, non-governmental organizations, and other stakeholders as to the proposed scope of FERC's Environmental Assessment (EA) for the Project and to seek additional information pertinent to the Commission's analysis.

On April 10 and 11, 2019, the Commission held public scoping meetings in Galax, Virginia. During these meetings, FERC staff presented information regarding the ILP and details regarding the study scoping process and how to request a relicensing study, including the Commission's study criteria. In addition, FERC staff solicited comments regarding the scope of issues and analyses for the EA. Pursuant to 18 CFR §5.8(d), a public site visit of the Project was conducted on April 10, 2019.

Concurrent with the January 7, 2019, PAD and NOI required by the ILP, Appalachian requested designation as the Commission's non-federal representative for carrying out informal consultation pursuant to Section 106. The Commission granted Appalachian's request by notice dated March 8, 2019. While Appalachian is authorized to consult in an informal capacity, the Commission remains legally responsible for all agency findings and determinations under Section 106.

On October 18, 2019, Appalachian filed a Revised Study Plan (RSP) with the Commission describing the studies that the Licensee is proposing to conduct in support of relicensing the Project, including a Cultural Resources Study. As described in the RSP, Appalachian preliminarily proposed to define the Study Area/Area of Potential Effects (APE) to include lands within the FERC-approved Project boundary, and lands outside of the Project boundary where Project operations, Project-related recreation activities or other enhancements, and routine maintenance activities associated with implementation of the license by the Commission could cause changes in the character or use of historic properties, if any such properties exist.

On September 1, 2020, Appalachian submitted a letter to the Virginia SHPO, federally recognized Indian Tribes, the Advisory Council on Historic Preservation (ACHP), and other interested parties requesting concurrence on the definition of the APE and to ascertain whether properties of cultural significance (e.g., Traditional Cultural Properties [TCPs]) might exist within the APE. If no response was received from Indian Tribes, follow-up emails were sent in September and October 2021. Responses were received from the Virginia Department of Historic Resources (Virginia SHPO), Catawba Indian Nation, Delaware Nation, and Pamunkey Indian Tribe. There was no response from the National Park Service, Bureau of Indian Affairs, Cherokee Nation, Eastern Band of Cherokee Indians, or the Archaeological Society of Virginia. As a result of the consultation, no TCPs were indicated as being within the APE.

ARCHAEOLOGICAL AND GEOMORPHOLOGICAL INVESTIGATIONS

Archaeological fieldwork was conducted from October 19–22, 2020, by Terracon Consultants, Inc (Terracon). Nine different portions of the Project area considered to have the highest potential for containing archaeological resources were examined using shovel testing. In addition, Terracon attempted to relocate three previously recorded sites that were reported to be within the APE, 44CA3, 44CA33, and 44CA121. Sites 44CA3 and 44CA121 are late nineteenth century Army Corps of Engineers sluices, whereas site 44CA33 is a temporally non-diagnostic lithic scatter. Site 44CA33 was relocated and is recommended as being ineligible for inclusion in the National Register of Historic Places (NRHP). Sites 44CA3 and 44CA121 could not be relocated, possibly because the water level was too high. In addition to the archaeological investigations, geomorphological investigations were conducted by Seramur & Associates from October 26–28, 2020, and again on April 20, 2021. Twenty hand auger borings were placed in the same nine areas where archaeological investigations took place. Based on the geomorphological analysis, only the area near site 44CA33 had the potential to contain buried archaeological deposits. Currently, this area is not being affected by Project operations, including erosion. The other eight areas did not have suitable landforms for containing undisturbed archaeological resources. Based on these results, Terracon recommended the Project would have no effect on historic properties and that no additional cultural resource investigations were warranted for the proposed undertaking.

Although no significant archaeological resources are being affected by the Project, the investigations did identify one area within the APE that has the potential for containing intact archaeological sites. This approximately 47.5-acre area includes a terrace located on the east bank of the river at the north end of the Project where archaeological site 44CA33 was found. Based on the archaeological and geomorphological studies, this is the only area within the Project that has the potential to contain intact archaeological resources. Although the area is not currently being affected by the Project, nor will continued operations of the Project affect the area through erosion or other mechanisms, Terracon recommended that a Phase I intensive archaeological survey take place if any ground disturbing activities were to occur in this area. Terracon also recommended updating the existing Cultural Resources Management Plan (CRMP) for the Project (Berger 1995) to include the results and recommendations contained in their report.

ARCHITECTURAL SURVEY

There are three previously recorded aboveground historic-age resources identified within the Project boundary—the Buck Hydroelectric Facility (017-0022); the Byllesby Dam (017-5154); and the Norfolk and Western Railway Cripple Creek Extension (077-5068). The Byllesby and

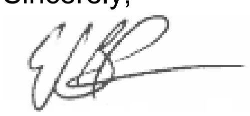
Buck facilities were determined to be eligible for the NRHP (Berger 1990), as was the Norfolk and Western Railway. None of these historic resources are currently being affected by Project operations.

REQUEST FOR CONCURRENCE

At this time, Appalachian is seeking concurrence from the Consulting Parties on the recommendations contained in the enclosed cultural resources study report, including the recommendation to prepare a revised Historic Properties Management Plan.

Appalachian respectfully requests that the consulting parties provide written concurrence within 30 days of the date of this letter (e.g., on or before October 8, 2021). If there are any questions regarding the enclosed study or the relicensing process, please do not hesitate to contact me at (540) 985-2241 or via email at ebparcell@aep.com.

Sincerely,



Elizabeth Parcell
Process Supervisor
American Electric Power Services Corporation

Attachment: Byllesby-Buck Hydroelectric Project Section 106 Consultation Distribution List

Byllesby/Buck Hydroelectric Project (FERC No. 2514)
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From: Elizabeth B Parcell <ebparcell@aep.com>
Sent: Wednesday, September 22, 2021 11:20 AM
To: Jeff Williams; John Copeland (John.Copeland@dgif.virginia.gov); Grist, Joseph; Norman, Janet
Cc: Ziegler, Ty; Kulpa, Sarah; Jonathan M Magalski; Frederick A Colburn
Subject: Byllesby-Buck Turbidity Study Consultation

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

Good morning. I hope that you are well and enjoying the much needed rain.

As required by the Revised Study Plan, Appalachian is planning to conduct a study to evaluate the potential impact that Project operations, in particular drag rake operations, have on turbidity concentrations in the Byllesby and Buck tailraces. We are targeting a one-week, relatively low flow period during the last week of September/first week of October 2021 after this week's rainfall runoff works its way through the upper New River. During the study period, a Hydrolab data sonde equipped with a turbidity sensor will be installed at each of the locations listed below (which coincide with the continuous water quality monitoring locations) to continuously record turbidity concentrations (in Nephelometric turbidity units) at 5-minute intervals.

- One location in the upstream extent of the Byllesby reservoir (to characterize background turbidity levels)
- One location in the Byllesby forebay (approximate mid-depth)
- One location in the Byllesby tailrace below the powerhouse
- One location in the Buck forebay (approximate mid-depth)
- One location in the Buck tailrace below the powerhouse

During the study period, the drag rakes at Byllesby and Buck will be operated on a 2-hour cycle (24/7) which is normal for this time of year. Turbidity data collected will be evaluated against drag rake operation and powerhouse generation in an effort to help determine any differences in downstream turbidity concentrations resulting from station operations versus naturally occurring background conditions. Results from the turbidity study will be provided in the Final License Application (to be filed with FERC by February 28, 2022).

Please let us know if you have any questions and thank you for your continued involvement in the Byllesby-Buck relicensing process.

Liz

ELIZABETH B PARCELL | **PROCESS SUPV**
EBPARCELL@AEP.COM | D:540.985.2441 | C:540.529.4191
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Via Electronic Filing October 1, 2021

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

Subject: Byllesby-Buck Hydroelectric Project (FERC No. 2514-186)
Filing of Draft License Application

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the 30.1-megawatt, two-development Byllesby-Buck Hydroelectric Project (Project) (Project No. 2514), located on the upper New River in Carroll 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 new license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5. In accordance with 18 CFR § 5.16(a), Appalachian is hereby filing the Draft License Application (DLA) for the Project.

As described in the DLA, Appalachian is proposing to continue the existing run-of-river mode of operation of the Project and proposes to modernize the Project in the new license term to include replacement of three of four turbine-generator units at the Byllesby Development and replacement of two of three turbine-generator units at the Buck Development. The upgrades will not result in a significant increase in the Project's authorized installed capacity or the maximum hydraulic capacities of the powerhouses, but due to efficiencies of the replacement units and modern components, the upgrades are expected to increase average annual generation at the Project by approximately 25,927 MWh.

The DLA also includes proposals for some preliminary protection, mitigation, and enhancement (PM&E) measures related to operations and resources associated with the Project. The proposed PM&E measures described in the DLA reflect careful consideration of available information, preliminary results of studies conducted or in-process, and issues specific to the Project. Appalachian notes that these proposals are preliminary and expects them to be refined within the Final License Application (to be filed with FERC by February 28, 2022), based on the completion of ongoing relicensing studies and study reporting, interests of Project stakeholders, and further evaluation of Project power and non-Power values.

The DLA is composed of five volumes, as described below:

Volume I of V (Public)

Volume I contains Public information and exhibits as listed below.

- Table of Contents
- Initial Statement and Additional Information Required by 18 CFR §5.18(a)
- Exhibit A – Project Description
- Exhibit B – Project Operations and Resource Utilization
- Exhibit C – Construction History and Proposed Construction Schedule
- Exhibit D – Costs and Financing

Volume II of V (Public)

Volume II contains Exhibit E – Environmental Report and Appendices (including consultation). Final Study Reports are not included as they are still under preparation and will be filed under with the Updated Study Report (to be filed with FERC by November 17, 2021).

Volume III of V (Public)

Volume III contains Public information and exhibits as listed below.

- Exhibit F – List of General Design Drawings
- Exhibit G – Project Boundary Maps
- Exhibit H – Ability to Operate

Volume IV of V (CRITICAL ENERGY/ELECTRIC INFRASTRUCTURE INFORMATION [CUI//CEII])

Volume IV contains CUI/CEII materials not intended for public release, and includes the following:

- Exhibit F – General Design Drawings
- Exhibit H – Single Line Diagrams of the Transmission Systems

Volume V of V (PRIVILEGED [CUI//PRIV])

Volume V contains CUI/PRIV materials not intended for public release, and includes the following:

- Cultural Resources Study Report

Appalachian is filing the DLA with the Commission electronically and is distributing this letter electronically to the parties listed on the attached distribution list. All parties interested in the relicensing process may obtain a copy of the DLA electronically through FERC's eLibrary system at https://elibrary.ferc.gov/idmws/search/fercgensearch.asp under docket number P-2514-186, or on Appalachian's website at http://www.aephydro.com/HydroPlant/ByllesbyBuck.

In accordance with 18 CFR § 5.16(e), interested parties may file comments regarding the DLA within 90 days of the date of this letter, by December 30, 2021. All comments must be filed with FERC electronically or via the following address:

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

If there are any questions regarding this filing, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,

Elizabeth Parcell
Process Supervisor
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cc: Distribution List
Jonathan Magalski (AEP)

Byllesby/Buck Hydroelectric Project (FERC No. 2514)
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November 2, 2021

VIA ELECTRONIC FILING

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

**Subject: Byllesby-Buck Hydroelectric Project (FERC No. 2514-186)
Fifth Quarterly (Final) Study Progress Report – Fall 2021**

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Applicant), a unit of American Electric Power (AEP) is the Licensee, owner, and operator of the 30.1-megawatt (MW) Byllesby-Buck Hydroelectric Project (Project No. 2514 (Project or Byllesby-Buck Project), located on the New River in Carroll County, Virginia. The two-Development Project comprises the upstream Byllesby Development and the downstream Buck Development. The Project is currently undergoing relicensing following the Federal Energy Regulatory Commission's (FERC or Commission) Integrated Licensing Process (ILP).

This Fifth Quarterly Study Progress Report describes the activities performed since the Fourth Quarterly Study Progress Report which was filed on July 22, 2021 and includes the final study plan activities expected to be conducted in quarter 4 (Q4) of 2021. Unless otherwise described, all relicensing studies are being conducted in conformance with the approved Revised Study Plan (RSP) and the Commission's Study Plan Determination (SPD), as subsequently modified by Order on Rehearing dated February 20, 2020, and the ISR study schedule.

Bypass Reach Flow and Aquatic Habitat Study

- Field data collection was completed at the Byllesby Development from July 27, 2021 – September 9, 2021 in accordance with the methods proposed in the RSP.
- Appalachian's consultant was unable to complete the field data collection and model development activities early enough to allow for a meeting with stakeholders in advance of the USR. As such, Appalachian plans to review seasonal hydrology [in particular as it relates to the potential for Walleye spawning in March, the peak month identified by the Virginia Department of Wildlife Resources (VDWR) during the ISR meeting] and discuss other flow scenarios of interest at the Buck and Byllesby Developments from a fish habitat

modeling perspective during the presentation at the USR meeting. Appalachian will consult with stakeholders at that time to determine if a follow-up call is needed in advance of the filing of the Final License Application.

- HDR is developing a two-dimensional (2D) aquatic habitat model for the Byllesby bypass reach. Modeling results, conclusions, and recommendations will be provided in the USR.

Water Quality Study

- As noted in the previous progress reports, Appalachian will provide additional information related to Project operations in the USR for the 2020 and 2021 water quality monitoring periods at the Buck Development. This information will include identification of any periods during which there were unit outages, flashboard failures, or station trips that may have increased spill into the bypass reach relative to normal Project operations.
- Also as previously reported, the water quality data collection effort was repeated at Byllesby in 2021 with the full deployment of data sondes as proposed in the RSP (including the tailrace monitoring location which was sampled during the 2020 study period). Water quality equipment was successfully installed at these four locations on June 15 and 16, 2021; were downloaded on June 28, July 14, July 27-29, August 25, September 7-9, September 15, and September 28; and were removed on October 5.
- Monthly chlorophyll a and turbidity grab samples were collected during the monthly discrete water quality sampling events as described in the RSP at both the Buck forebay and Byllesby forebay monitoring locations during the same months (i.e., July, August, and September) in 2021. Monthly grab samples were completed on July 14, August 25 (turbidity only), September 10 (chlorophyll a only), and September 29 (both turbidity and chlorophyll a).
    - The chlorophyll a grab samples were shipped to an off-site laboratory for analysis. The shipping provider utilized for the August samples did not deliver them to the laboratory within the required sample hold period, therefore, the samples were not analyzed. As a result, HDR collected additional chlorophyll a grab samples in early September to substitute the August samples.
- As previously reported, the Water Quality Study turbidity task could not be completed in 2020 due to higher than normal Project inflows from the New River. This task was shifted to a low inflow period in 2021 and was conducted from September 28 – October 5 with a one-day follow-up data collection event on October 14. During the initial continuous turbidity data sonde deployment from September 28 – October 5, several data sondes failed on the first day of deployment. During the follow-up data collection event on October 14, additional turbidity measurements were focused on the Buck Development as the Byllesby

Development was in an outage condition for scheduled intake screen repair. Observations from and results of this data collection will be reported in the USR.

Aquatic Resources Studies

- All field data collection activities were completed by the end of May 2021 and results will be provided in the USR.
- An evaluation of fish passage and turbine blade strike mortality for Byllesby and Buck was completed in October 2021 using the current version of the USFWS Turbine Blade Strike Analysis Model. The results will be reported in the USR.

Recreation Study

- Appalachian is in the process of preparing a draft Recreation Management Plan for stakeholder review.

Terrestrial Resources; Wetlands, Riparian, and Littoral Habitat Characterization; and Shoreline Stability Assessment Studies

- All field data and desktop mapping activities for these studies were completed as of the end of July 2021. Results will be reported in the USR.

Cultural Resources Study

- As noted in the Draft License Application, the Cultural Resources Study was completed by Terracon in 2020-2021. The final study report was distributed to SHPO and Tribes on September 8, 2021 for a 30-day review period. No reply comments have yet been received. The study report was also filed with FERC as a CUI/Privileged volume of the Draft License Application.

If there are any questions regarding this progress report, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,

Elizabeth Parcell
Process Supervisor
American Electric Power Services Corporation

From: Salazar, Maggie
Sent: Thursday, November 18, 2021 6:30 AM
To: Hanson, Danielle
Subject: FW: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Updated Study Report
Attachments: AEP to FERC BB USR Transmittal Letter_Nov 17 2021.pdf

---

From: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>
Sent: Thursday, November 18, 2021 7:27 AM
To: ACHP - John Eddins <jeddins@achp.gov>; American Whitewater - Kevin Colburn <kevin@americanwhitewater.org>; Angie Grooms <angie.grooms750@gmail.com>; Appalachian Trail Conservancy - Andrew Downs <adowns@appalachiantrail.org>; Carroll County - Rex Hill <rex.hill@carrollcountyva.gov>; Carroll County Administrator - Steve Truitt <steve.truitt@carrollcountyva.gov>; Catawba Indian Nation - Caitlin Rogers <caitlin.rogers@catawba.com>; Cherokee Nation - Elizabeth Toombs <elizabeth-toombs@cherokee.org>; David Taylor <jklfloat@embarqmail.com>; Delaware Nation - Erin Paden <epaden@delawarenation-nsn.gov>; Fish and Wildlife Conservation - Caitlin Carey <cscarey@vt.edu>; Fish and Wildlife Conservation - Donald J. Orth <dorth@vt.edu>; Friends of the Rivers of Virginia - Bill Tanger <riverdancer1943@gmail.com>; Friends of the Rivers of Virginia - Richard Roth <rroth@radford.edu>; Harold Peterson <harold.peterson@bia.gov>; New River Conservancy - George Santucci <george@newriverconservancy.org>; New River Conservancy - Laura Walters <claytorlakegirl@gmail.com>; New River Outdoor Adventures - Tim Dixon <newriveroutdooradventures@yahoo.com>; New River Regional Water Authority - Zachary Slate <newriverwater@gmail.com>; New River Trail State Park - Sam Sweeney <Sam.Sweeney@dcr.virginia.gov>; Terry Clouthier Pamunkey THPO <terry.clouthier@pamunkey.org>; Town of Fries - Scott McCoy <townoffries@friesva.com>; Town of Wytheville - Dr. Beth Taylor, Mayor <beth.taylor@wytheville.org>; USFWS Chesapeake Bay Field Office - Janet Norman <janet_norman@fws.gov>; USGS - Mark Bennett <mrbennet@USGS.gov>; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov) <emma.williams@governor.virginia.gov>; VADCR - Jennifer Wampler <jennifer.wampler@dcr.virginia.gov>; VADCR - Jimmy Elliott <james.elliott@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADCR - Sharon Ewing <sharon.ewing@dcr.virginia.gov>; VADEQ <eir@deq.virginia.gov>; VADEQ - Bettina Rayfield <Bettina.rayfield@deq.virginia.gov>; VADEQ - Joe Grist <joseph.grist@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; VADEQ - Scott Kudlas <scott.kudlas@deq.virginia.gov>; VADEQ - Tony Cario <anthony.cario@deq.virginia.gov>; VADHR - Timothy Roberts <tim.roberts@dhr.virginia.gov>; VADWR - Jeff Williams <jeff.williams@dwr.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; WADWR - John Copeland <John.Copeland@dwr.virginia.gov>; Wythe County Admin - Stephen Bear <sdbear@wytheco.org>
Cc: 'ebparcell@aep.com' <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>; Salazar, Maggie <Maggie.Salazar@hdrinc.com>
Subject: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Updated Study Report

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP). Pursuant to the ILP, Appalachian filed the Updated Study Report (USR) for the Project on November 17, 2021. The USR describes the Licensee's overall progress in implementing the study plan and schedule, summarizes study results, and describes any variances from the study plan and schedule approved by the Commission.

On behalf of Appalachian, we are notifying stakeholders of the availability of the USR. For your convenience, a copy of the cover letter filed with the USR is attached. Appalachian encourages stakeholders to view the complete filing online at FERC's eLibrary at eLibrary | File List (ferc.gov). Appalachian will also be adding the USR to the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck) in the coming days.

The Commission's regulations require Appalachian to hold a meeting with participants and FERC staff within 15 days of filing the USR. **Accordingly, Appalachian will hold a virtual USR Meeting via Webex from 9 AM to approximately 4 PM on Wednesday, December 1, 2021.** Appalachian requests that the stakeholders interested in participating in the Virtual USR Meeting contact Maggie Salazar at maggie.salazar@hdrinc.com on or before close of business Monday, November 29, 2021 to obtain instructions to join the virtual meeting.

Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com.

On behalf of AEP and the Byllesby-Buck Project relicensing team, thank you for your participation in this process, and we hope you and your families have a healthy, safe, and happy Thanksgiving.

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From: Kulpa, Sarah
Sent: Monday, October 4, 2021 8:57 AM
To: ACHP - John Eddins; American Whitewater - Kevin Colburn; Angie Grooms; Appalachian Trail Conservancy - Andrew Downs; Carroll County - Rex Hill; Carroll County Administrator - Steve Truitt; Catawba Indian Nation - Caitlin Rogers; Cherokee Nation - Elizabeth Toombs; David Taylor; Delaware Nation - Erin Paden; Fish and Wildlife Conservation - Caitlin Carey; Fish and Wildlife Conservation - Donald J. Orth; Friends of the Rivers of Virginia - Bill Tanger; Friends of the Rivers of Virginia - Richard Roth; Harold Peterson; New River Conservancy - George Santucci; New River Conservancy - Laura Walters; New River Outdoor Adventures - Tim Dixon; New River Regional Water Authority - Zachary Slate; New River Trail State Park - Sam Sweeney; Terry Clouthier Pamunkey THPO; Town of Fries - Scott McCoy; Town of Wytheville - Dr. Beth Taylor, Mayor; USFWS Chesapeake Bay Field Office - Janet Norman; USGS - Mark Bennett; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov); VADCR - Jennifer Wampler; VADCR - Jimmy Elliott; VADCR - Robbie Ruhr; VADCR - Sharon Ewing; VADEQ; VADEQ - Bettina Rayfield; VADEQ - Joe Grist; VADEQ - Matthew Link; VADEQ - Scott Kudlas; VADEQ - Tony Cario; VADHR - Timothy Roberts; VADWR - Jeff Williams; Virginia Department of Conservation and Recreation - Rene Hypes; WADWR - John Copeland; Wythe County Admin - Stephen Bear
Cc: 'ebparcell@aep.com'; Jonathan M Magalski; Hanson, Danielle
Subject: Byllesby-Buck Hydroelectric Project (VA) - Filing of Draft License Application
Attachments: AEP ByllesbyBuck_FERC 2514_DLA Transmittal_20211001.pdf

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Pursuant to the ILP, Appalachian filed the Draft License Application (DLA) for the Project on October 1, 2021. The DLA describes measures proposed by Appalachian for the new license term. Appalachian notes that these proposals are preliminary and expects they will be refined within the Final License Application (to be filed with FERC by February 28, 2022), based on the completion of ongoing relicensing studies and study reporting, interests of Project stakeholders, and further evaluation of Project power and non-Power values.

We are notifying stakeholders of this DLA filing (see attached for transmittal letter). The public files that compose this filing can be viewed online at FERC's eLibrary (https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20211001-5258) and on the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck).

Interested parties may file comments regarding the DLA within 90 days of the date of the DLA filing, by **December 30, 2021**. All comments must be filed with FERC electronically or via the mailing address provided in the attached letter.

Thank you for your continued interest in this Project. Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com.

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From: Kulpa, Sarah
Sent: Wednesday, November 3, 2021 10:01 AM
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Cc: 'ebparcell@aep.com'; Jonathan M Magalski; Hanson, Danielle; Salazar, Maggie
Subject: Byllesby-Buck Hydroelectric Project (VA) -- Filing of ILP Study Progress Report
Attachments: Byllesby-Buck Fifth Quarterly Progress Report Nov 2021.pdf

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Pursuant to the ILP, Appalachian filed the fifth (and final) ILP Study Progress Report with the Commission on Tuesday, November 2. We are notifying stakeholders and distributing an electronic copy of this submittal (attached). The filing can also be viewed online at FERC's eLibrary (eLibrary | File List (ferc.gov)) and will be added to the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck) in the coming days.

Thank you for your continued interest in this Project. Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com.

Thank you,

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Via Electronic Filing November 17, 2021

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

Subject: Byllesby-Buck Hydroelectric Project (FERC No. 2514-186)
Filing of Updated Study Report and Schedule for Virtual USR Meeting

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the two-development Byllesby-Buck Hydroelectric Project (Project) (Project No. 2514), located on the upper New River in Carroll 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.

By way of background, Appalachian developed a Revised Study Plan (RSP) for the Project that was filed with the Commission and made available to stakeholders on October 18, 2019. On November 18, 2019 FERC issued the Study Plan Determination (SPD). On December 18, 2019, Appalachian filed a request for rehearing of the SPD. The SPD was subsequently modified by FERC by an Order on Rehearing dated February 20, 2020. On July 27, 2020, Appalachian filed an updated ILP study schedule and a request for extension of time to file the Initial Study Report (ISR) to account for Project delays resulting from the COVID-19 pandemic. These delays pushed the start of the 2020 field season into early August 2020 and resulted in some of the spring and summer 2020 field work being rescheduled for 2021. The request was approved by FERC on August 10, 2020, and the filing deadline for the ISR for the Project was extended from November 17, 2020 to January 18, 2021. The ISR was filed on January 18, 2021 and the ISR meeting was held on January 28, 2021. No modifications to the study plan were required by FERC following the ISR meeting and subsequent comments.

Appalachian has conducted studies in accordance with 18 CFR §5.15, as provided in the RSP and as subsequently modified by FERC's SPD. In accordance with 18 CFR §5.15, Appalachian is hereby filing the Updated Study Report (USR) with the Commission. The USR describes the Licensee's overall progress in implementing the study plan and schedule, summarizes available data, and describes any variances from the study plan and schedule approved by the Commission.

The Commission's regulations at 18 CFR §5.15(c) require Appalachian to hold a meeting with participants and FERC staff within 15 days of filing the ISR. **Accordingly, Appalachian will hold a USR Meeting via Webex from 9 AM to approximately 4 PM on Wednesday, December 1, 2021.** An agenda for the USR Meeting is provided in Attachment 1. Participants are free to join the meeting in part based on interests or availability, but please note that the agenda is intended as an approximation and more or less time may be spent on individual studies, as needed.

Appalachian respectfully requests that the stakeholders interested in participating in the Virtual USR Meeting contact Maggie Salazar at maggie.salazar@hdrinc.com on or before close of business Monday, November 29, 2021 to obtain instructions for joining the virtual meeting.

If there are any questions regarding this progress report, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,

Elizabeth Parcell
Process Supervisor
American Electric Power Services Corporation

cc: Distribution List
Jonathan Magalski (AEP)

Byllesby/Buck Hydroelectric Project (FERC No. 2514)
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Byllesby/Buck Hydroelectric Project (FERC No. 2514)
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Sample Date	Site #	Gear	Common Name	Species	Length (mm)	Weight (g)
10/22/2020	BFB11	Boat Electrofishing	Bigmouth Chub	Nocomis platyrhynchus	182	67.93
4/20/2021	BSBP1	Backpack Electrofishing	Bigmouth Chub	Nocomis platyrhynchus	157	44.6
4/20/2021	BSBP1	Backpack Electrofishing	Bigmouth Chub	Nocomis platyrhynchus	175	64.8
4/21/2021	BSBP5	Backpack Electrofishing	Bigmouth Chub	Nocomis platyrhynchus	71	3.8
4/21/2021	BSBP5	Backpack Electrofishing	Bigmouth Chub	Nocomis platyrhynchus	72	4.3
4/21/2021	BSBP9	Backpack Electrofishing	Bigmouth Chub	Nocomis platyrhynchus	59	2.3
4/21/2021	BSBP9	Backpack Electrofishing	Bigmouth Chub	Nocomis platyrhynchus	61	2.8
4/21/2021	BSBP9	Backpack Electrofishing	Bigmouth Chub	Nocomis platyrhynchus	67	3.4
10/25/2020	BFB5	Boat Electrofishing	Black Crappie	Pomoxis nigromaculatus	115	16.19
4/22/2021	BSG5	Gillnet	Black Crappie	Pomoxis nigromaculatus	173	70
4/25/2021	BSB1	Boat Electrofishing	Black Crappie	Pomoxis nigromaculatus	152	39.6
10/22/2020	BFB10	Boat Electrofishing	Bluegill	Lepomis macrochirus	42	1
10/22/2020	BFB13	Boat Electrofishing	Bluegill	Lepomis macrochirus	36	0.7
10/22/2020	BFB9	Boat Electrofishing	Bluegill	Lepomis macrochirus	39	1.01
10/24/2020	BFB4	Boat Electrofishing	Bluegill	Lepomis macrochirus	115	21.58
10/24/2020	BFB4	Boat Electrofishing	Bluegill	Lepomis macrochirus	96	12.9
10/24/2020	BFB7	Boat Electrofishing	Bluegill	Lepomis macrochirus	37	0.6
10/25/2020	BFB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	67	5.18
10/25/2020	BFB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	39	2.8
10/25/2020	BFB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	38	1.53
10/25/2020	BFB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	36	1.17
10/25/2020	BFB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	31	0.53
10/25/2020	BFB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	81	8.7
10/25/2020	BFB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	41	1.37
10/25/2020	BFB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	31	1.2
10/25/2020	BFB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	41	1.71
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	59	2.73
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	46	1.55
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	49	1.54
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	85	8.4
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	136	44.1
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	47	0.76
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	54	1.44
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	41	0.54
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	33	0.5
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	53	2.25
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	48	1.65
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	43	0.78
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	40	0.69
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	41	0.76
10/25/2020	BFB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	45	1.27
11/19/2020	BFG3	Gillnet	Bluegill	Lepomis macrochirus	170	120
4/25/2021	BSB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	87	8.4
4/25/2021	BSB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	87	10.6
4/25/2021	BSB1	Boat Electrofishing	Bluegill	Lepomis macrochirus	45	1.5
4/25/2021	BSB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	46	1.7
4/25/2021	BSB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	57	2.4
4/25/2021	BSB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	41	1.2
4/25/2021	BSB2	Boat Electrofishing	Bluegill	Lepomis macrochirus	50	2.2
4/25/2021	BSB6	Boat Electrofishing	Bluegill	Lepomis macrochirus	61	2.4
4/25/2021	BSB7	Boat Electrofishing	Bluegill	Lepomis macrochirus	47	1.4
4/25/2021	BSB7	Boat Electrofishing	Bluegill	Lepomis macrochirus	40	0.51
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	45	0.5
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	54	1.2
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	39	0.3

4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	51	1.4
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	48	1.5
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	57	0.8
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	35	0.2
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	38	0.3
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	53	0.8
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	75	6.5
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	51	0.6
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	26	0.1
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	53	0.6
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	51	1.2
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	39	0.4
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	38	0.4
4/26/2021	BSB16	Boat Electrofishing	Bluegill	Lepomis macrochirus	38	0.3
4/26/2021	BSB17	Boat Electrofishing	Bluegill	Lepomis macrochirus	56	0.6
4/26/2021	BSB17	Boat Electrofishing	Bluegill	Lepomis macrochirus	51	0.7
5/27/2021	BSB12	Boat Electrofishing	Bluegill	Lepomis macrochirus	130	37
5/27/2021	BSB12	Boat Electrofishing	Bluegill	Lepomis macrochirus	100	25
5/27/2021	BSB13	Boat Electrofishing	Bluegill	Lepomis macrochirus	130	47
5/27/2021	BSB14	Boat Electrofishing	Bluegill	Lepomis macrochirus	80	7
5/27/2021	BSB14	Boat Electrofishing	Bluegill	Lepomis macrochirus	100	30
5/27/2021	BSB14	Boat Electrofishing	Bluegill	Lepomis macrochirus	30	1
5/27/2021	BSB8	Boat Electrofishing	Bluegill	Lepomis macrochirus	110	28
5/27/2021	BSB9	Boat Electrofishing	Bluegill	Lepomis macrochirus	150	74
5/27/2021	BSB9	Boat Electrofishing	Bluegill	Lepomis macrochirus	120	53
5/27/2021	BSB8	Boat Electrofishing	Bluntnose Minnow	Pimephales notatus	50	4
5/27/2021	BSB8	Boat Electrofishing	Bluntnose Minnow	Pimephales notatus	50	4
5/27/2021	BSB8	Boat Electrofishing	Bluntnose Minnow	Pimephales notatus	60	5
5/27/2021	BSB8	Boat Electrofishing	Bluntnose Minnow	Pimephales notatus	60	3
5/27/2021	BSB8	Boat Electrofishing	Bluntnose Minnow	Pimephales notatus	50	2
4/20/2021	BSBP3	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	66	2.2
4/21/2021	BSBP5	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	73	3.9
4/21/2021	BSBP5	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	69	4.2
4/21/2021	BSBP8	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	69	3.7
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	91	8.3
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	82	5.5
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	104	12.5
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	110	14.3
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	94	8.1
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	103	11.5
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	146	37.2
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	116	17.4
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	131	23.8
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	141	31.5
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	138	30.2
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	89	6.5
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	101	10.6
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	74	4.5
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	79	4.9
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	86	5.7
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	102	10.6
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	103	10.6
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	97	10.5
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	98	7.8
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	109	12.5
4/22/2021	BSBP10	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	75	4.4

4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	137	33.1
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	80	9.2
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	63	3.6
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	88	9.1
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	73	4.9
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	118	20.1
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	92	8.8
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	67	1.8
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	93	9.5
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	93	9.5
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	97	7.5
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	79	6.9
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	64	4.2
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	76	3.8
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	93	9.2
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	72	3.9
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	62	2.2
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	92	7.1
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	105	10.6
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	85	8.5
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	72	3.8
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	90	7.2
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	79	5.9
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	90	5.9
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	77	5.6
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	80	4.8
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	73	5.6
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	85	7.4
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	68	6.6
4/22/2021	BSBP11	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	83	5.8
4/23/2021	BSBP6	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	111	13.9
4/23/2021	BSBP13	Backpack Electrofishing	Central Stoneroller	Campostoma anomalum	140	24.9
11/10/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	240	89.32
11/10/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	460	820
11/10/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	455	860
11/10/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	415	550
11/10/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	395	420
11/10/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	410	610
11/10/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	335	250
11/10/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	325	220
11/11/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	450	930
11/11/2020	BFG6	Gillnet	Channel Catfish	Ictalurus punctatus	390	420
11/19/2020	BFG3	Gillnet	Channel Catfish	Ictalurus punctatus	451	770
4/20/2021	BSG2	Gillnet	Channel Catfish	Ictalurus punctatus	490	1160
4/20/2021	BSG6	Gillnet	Channel Catfish	Ictalurus punctatus	560	2210
4/20/2021	BSG6	Gillnet	Channel Catfish	Ictalurus punctatus	339	620
4/20/2021	BSG6	Gillnet	Channel Catfish	Ictalurus punctatus	359	320
4/20/2021	BSG6	Gillnet	Channel Catfish	Ictalurus punctatus	372	400
4/20/2021	BSG6	Gillnet	Channel Catfish	Ictalurus punctatus	355	360
4/20/2021	BSG6	Gillnet	Channel Catfish	Ictalurus punctatus	462	670
4/20/2021	BSG6	Gillnet	Channel Catfish	Ictalurus punctatus	386	440
4/20/2021	BSG6	Gillnet	Channel Catfish	Ictalurus punctatus	551	1760
4/22/2021	BSG3	Gillnet	Channel Catfish	Ictalurus punctatus	310	230
4/22/2021	BSG3	Gillnet	Channel Catfish	Ictalurus punctatus	480	1140
4/22/2021	BSG5	Gillnet	Channel Catfish	Ictalurus punctatus	270	150
4/22/2021	BSG5	Gillnet	Channel Catfish	Ictalurus punctatus	315	260

4/22/2021	BSG5	Gillnet	Channel Catfish	Ictalurus punctatus	328	300
4/22/2021	BSG5	Gillnet	Channel Catfish	Ictalurus punctatus	307	220
4/22/2021	BSG5	Gillnet	Channel Catfish	Ictalurus punctatus	205	60
4/26/2021	BSB17	Boat Electrofishing	Channel Catfish	Ictalurus punctatus	82	2.6
10/22/2020	BFB9	Boat Electrofishing	Chub	Nocomis sp.	71	3.48
10/22/2020	BFB9	Boat Electrofishing	Chub	Nocomis sp.	44	0.72
4/20/2021	BSBP3	Backpack Electrofishing	Chub	Nocomis sp.	68	3.7
4/20/2021	BSBP3	Backpack Electrofishing	Chub	Nocomis sp.	64	3.5
4/23/2021	BSBP6	Backpack Electrofishing	Chub	Nocomis sp.	60	2.4
4/23/2021	BSBP6	Backpack Electrofishing	Chub	Nocomis sp.	58	1.9
4/23/2021	BSBP6	Backpack Electrofishing	Chub	Nocomis sp.	52	1.5
4/23/2021	BSBP7	Backpack Electrofishing	Chub	Nocomis sp.	74	4
10/25/2020	BFB2	Boat Electrofishing	Common Carp	Cyprinus carpio	390	780
10/25/2020	BFB5	Boat Electrofishing	Common Carp	Cyprinus carpio	775	5330
10/25/2020	BFB5	Boat Electrofishing	Common Carp	Cyprinus carpio	617	2700
10/25/2020	BFB5	Boat Electrofishing	Common Carp	Cyprinus carpio	358	610
10/25/2020	BFB5	Boat Electrofishing	Common Carp	Cyprinus carpio	342	520
10/25/2020	BFB5	Boat Electrofishing	Common Carp	Cyprinus carpio	379	580
10/25/2020	BFB5	Boat Electrofishing	Common Carp	Cyprinus carpio	332	500
11/10/2020	BFG2	Gillnet	Common Carp	Cyprinus carpio	320	410
11/10/2020	BFG2	Gillnet	Common Carp	Cyprinus carpio	345	500
11/19/2020	BFG3	Gillnet	Common Carp	Cyprinus carpio	532	2570
11/19/2020	BFG3	Gillnet	Common Carp	Cyprinus carpio	494	1550
11/19/2020	BFG3	Gillnet	Common Carp	Cyprinus carpio	571	2700
11/19/2020	BFG3	Gillnet	Common Carp	Cyprinus carpio	590	2440
11/19/2020	BFG3	Gillnet	Common Carp	Cyprinus carpio	555	2090
11/19/2020	BFG3	Gillnet	Common Carp	Cyprinus carpio	600	3240
11/19/2020	BFG3	Gillnet	Common Carp	Cyprinus carpio	601	2910
11/19/2020	BFG3	Gillnet	Common Carp	Cyprinus carpio	589	2920
11/19/2020	BFG3	Gillnet	Common Carp	Cyprinus carpio	536	2470
11/19/2020	BFG5	Gillnet	Common Carp	Cyprinus carpio	410	840
11/20/2020	BFG5	Gillnet	Common Carp	Cyprinus carpio	350	360
11/20/2020	BFG5	Gillnet	Common Carp	Cyprinus carpio	350	510
4/20/2021	BSG4	Gillnet	Common Carp	Cyprinus carpio	340	470
4/20/2021	BSG4	Gillnet	Common Carp	Cyprinus carpio	380	640
4/20/2021	BSG4	Gillnet	Common Carp	Cyprinus carpio	560	2240
4/20/2021	BSG4	Gillnet	Common Carp	Cyprinus carpio	329	460
4/20/2021	BSG4	Gillnet	Common Carp	Cyprinus carpio	345	540
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	279	260
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	332	470
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	347	510
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	357	500
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	310	420
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	303	370
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	334	460
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	310	390
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	323	430
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	320	400
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	260	230
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	321	400
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	351	500
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	362	510
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	327	500
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	333	520
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	393	680
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	337	530

4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	362	610
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	337	450
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	331	490
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	341	530
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	413	890
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	382	700
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	362	660
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	332	410
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	342	540
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	650	3270
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	540	2050
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	650	3070
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	609	2760
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	655	3230
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	385	790
4/22/2021	BSG3	Gillnet	Common Carp	Cyprinus carpio	430	1000
4/22/2021	BSG5	Gillnet	Common Carp	Cyprinus carpio	280	340
4/22/2021	BSG5	Gillnet	Common Carp	Cyprinus carpio	317	470
4/22/2021	BSG5	Gillnet	Common Carp	Cyprinus carpio	340	540
4/22/2021	BSG5	Gillnet	Common Carp	Cyprinus carpio	278	320
4/22/2021	BSG5	Gillnet	Common Carp	Cyprinus carpio	310	570
4/25/2021	BSB7	Boat Electrofishing	Common Carp	Cyprinus carpio	709	4650
4/26/2021	BSB16	Boat Electrofishing	Common Carp	Cyprinus carpio	89	12.8
4/26/2021	BSB16	Boat Electrofishing	Common Carp	Cyprinus carpio	83	8.1
5/27/2021	BSB13	Boat Electrofishing	Common Carp	Cyprinus carpio	610	2580
4/21/2021	BSBP5	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	44	0.6
4/21/2021	BSBP8	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	45	1.2
4/23/2021	BSBP6	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	63	2.7
4/23/2021	BSBP6	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	47	1
4/23/2021	BSBP6	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	44	0.9
4/23/2021	BSBP6	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	45	1
4/23/2021	BSBP6	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	61	2
4/23/2021	BSBP6	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	63	2.2
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	71	3.6
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	75	3.1
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	60	2
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	40	0.8
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	42	0.8
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	39	0.6
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	41	0.8
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	43	0.85
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	47	1.1
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	52	1.5
4/23/2021	BSBP7	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	52	1.4
4/23/2021	BSBP12	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	74	3.8
4/23/2021	BSBP12	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	78	3.8
4/23/2021	BSBP12	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	54	1.85
4/23/2021	BSBP12	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	52	1.5
4/23/2021	BSBP12	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	58	2.5
4/23/2021	BSBP12	Backpack Electrofishing	Fantail Darter	Etheostoma flabellare	43	0.95
5/27/2021	BSB9	Boat Electrofishing	Fantail Darter	Etheostoma flabellare	50	2
10/24/2020	BFB4	Boat Electrofishing	Flathead Catfish	Pylodictis olivaris	205	65.43
11/11/2020	BFG6	Gillnet	Flathead Catfish	Pylodictis olivaris	690	3160
4/20/2021	BSBP1	Backpack Electrofishing	Flathead Catfish	Pylodictis olivaris	72	7.4
4/22/2021	BSG5	Gillnet	Flathead Catfish	Pylodictis olivaris	540	1890
4/25/2021	BSB6	Boat Electrofishing	Flathead Catfish	Pylodictis olivaris	85	4.1

5/27/2021	BSB11	Boat Electrofishing	Flathead Catfish	Pylodictis olivaris	190	80
5/27/2021	BSB9	Boat Electrofishing	Flathead Catfish	Pylodictis olivaris	200	74
10/22/2020	BFB10	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	135	43.29
10/25/2020	BFB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	89	15.78
10/25/2020	BFB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	72	6.97
4/25/2021	BSB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	115	21.5
4/25/2021	BSB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	119	22.7
4/25/2021	BSB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	95	13.3
4/25/2021	BSB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	111	17.9
4/25/2021	BSB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	113	20.8
4/25/2021	BSB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	35	0.7
4/25/2021	BSB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	45	2
4/25/2021	BSB1	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	75	9.1
4/25/2021	BSB2	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	63	5.4
4/25/2021	BSB4	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	160	84.7
4/26/2021	BSB16	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	170	87.5
4/26/2021	BSB17	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	51	0.7
5/27/2021	BSB10	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	100	21
5/27/2021	BSB10	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	120	32
5/27/2021	BSB15	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	90	14
5/27/2021	BSB15	Boat Electrofishing	Green Sunfish	Lepomis cyanellus	90	13
4/20/2021	BSBP1	Backpack Electrofishing	Greenside Darter	Etheostoma blennioides	71	4.5
4/20/2021	BSBP1	Backpack Electrofishing	Greenside Darter	Etheostoma blennioides	64	2.9
4/20/2021	BSBP1	Backpack Electrofishing	Greenside Darter	Etheostoma blennioides	72	3.4
4/21/2021	BSBP5	Backpack Electrofishing	Greenside Darter	Etheostoma blennioides	56	1.5
4/22/2021	BSBP11	Backpack Electrofishing	Greenside Darter	Etheostoma blennioides	73	5.2
4/22/2021	BSBP11	Backpack Electrofishing	Greenside Darter	Etheostoma blennioides	52	1.3
4/22/2021	BSBP11	Backpack Electrofishing	Greenside Darter	Etheostoma blennioides	60	2.9
4/23/2021	BSBP12	Backpack Electrofishing	Greenside Darter	Etheostoma blennioides	55	1.6
4/23/2021	BSBP13	Backpack Electrofishing	Greenside Darter	Etheostoma blennioides	60	2
5/27/2021	BSB9	Boat Electrofishing	Greenside Darter	Etheostoma blennioides	50	1
4/21/2021	BSBP4	Backpack Electrofishing	Kanawha Darter	Etheostoma kanawhae	41	1.4
4/22/2021	BSBP10	Backpack Electrofishing	Kanawha Sculpin	Cottus kanawhae	85	7.5
4/23/2021	BSBP12	Backpack Electrofishing	Kanawha Sculpin	Cottus kanawhae	95	10.8
4/23/2021	BSBP13	Backpack Electrofishing	Kanawha Sculpin	Cottus kanawhae	91	11
4/23/2021	BSBP13	Backpack Electrofishing	Kanawha Sculpin	Cottus kanawhae	84	8.3
4/23/2021	BSBP13	Backpack Electrofishing	Kanawha Sculpin	Cottus kanawhae	78	7.5
4/23/2021	BSBP13	Backpack Electrofishing	Kanawha Sculpin	Cottus kanawhae	86	9.7
4/23/2021	BSBP13	Backpack Electrofishing	Kanawha Sculpin	Cottus kanawhae	96	10.3
4/23/2021	BSBP13	Backpack Electrofishing	Kanawha Sculpin	Cottus kanawhae	80	7.7
10/22/2020	BFB10	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	74	3.66
10/22/2020	BFB16	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	76	4.75
10/24/2020	BFB6	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	340	440
10/24/2020	BFB7	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	445	1230
10/25/2020	BFB2	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	395	820
4/25/2021	BSB2	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	59	2.7
4/25/2021	BSB5	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	353	630
4/25/2021	BSB6	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	266	240
4/25/2021	BSB7	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	394	860
4/25/2021	BSB7	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	162	44.1
4/25/2021	BSB7	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	58	2.46
4/26/2021	BSB16	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	85	5.4
4/26/2021	BSB16	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	80	6.3
4/26/2021	BSB17	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	64	2.4
4/26/2021	BSB17	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	59	1.7
5/27/2021	BSB12	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	120	20

5/27/2021	BSB13	Boat Electrofishing	Largemouth Bass	Micropterus salmoides	130	25
4/22/2021	BSBP10	Backpack Electrofishing	Logperch	Percina caprodes	137	18.5
5/27/2021	BSB9	Boat Electrofishing	Logperch	Percina caprodes	91	6.5
4/21/2021	BSBP4	Backpack Electrofishing	Margined Madtom	Noturus insignis	78	6.3
4/21/2021	BSBP5	Backpack Electrofishing	Margined Madtom	Noturus insignis	81	5.1
4/22/2021	BSBP10	Backpack Electrofishing	Margined Madtom	Noturus insignis	94	6.3
4/22/2021	BSBP10	Backpack Electrofishing	Margined Madtom	Noturus insignis	129	17.9
4/22/2021	BSBP11	Backpack Electrofishing	Margined Madtom	Noturus insignis	91	6.2
4/22/2021	BSBP11	Backpack Electrofishing	Margined Madtom	Noturus insignis	78	5.1
4/22/2021	BSBP11	Backpack Electrofishing	Margined Madtom	Noturus insignis	77	5
4/22/2021	BSBP11	Backpack Electrofishing	Margined Madtom	Noturus insignis	55	2.2
4/22/2021	BSBP11	Backpack Electrofishing	Margined Madtom	Noturus insignis	64	2.5
4/22/2021	BSBP11	Backpack Electrofishing	Margined Madtom	Noturus insignis	68	3.6
4/22/2021	BSBP11	Backpack Electrofishing	Margined Madtom	Noturus insignis	53	2.1
4/22/2021	BSBP11	Backpack Electrofishing	Margined Madtom	Noturus insignis	70	3.4
4/23/2021	BSBP6	Backpack Electrofishing	Margined Madtom	Noturus insignis	69	3.9
4/23/2021	BSBP7	Backpack Electrofishing	Margined Madtom	Noturus insignis	71	3.9
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	58	2.2
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	52	1.1
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	81	5.7
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	66	3.2
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	64	2.3
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	58	1.8
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	59	2
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	67	3.2
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	43	0.6
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	69	3.3
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	57	1.5
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	69	3.1
4/23/2021	BSBP12	Backpack Electrofishing	Margined Madtom	Noturus insignis	56	1.5
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	106	10
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	76	2.8
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	78	3.6
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	77	4
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	56	1.8
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	96	7.3
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	45	0.9
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	51	1.2
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	86	4.5
4/23/2021	BSBP13	Backpack Electrofishing	Margined Madtom	Noturus insignis	57	1.5
4/20/2021	BSBP3	Backpack Electrofishing	Mimic Shiner	Notropis volucellus	51	1.3
4/20/2021	BSBP3	Backpack Electrofishing	Mimic Shiner	Notropis volucellus	48	1.2
4/23/2021	BSBP6	Backpack Electrofishing	Mimic Shiner	Notropis volucellus	55	1.8
4/23/2021	BSBP6	Backpack Electrofishing	Mimic Shiner	Notropis volucellus	43	0.65
4/25/2021	BSB3	Boat Electrofishing	Mimic Shiner	Notropis volucellus	62	2.1
4/25/2021	BSB3	Boat Electrofishing	Mimic Shiner	Notropis volucellus	60	2
4/25/2021	BSB3	Boat Electrofishing	Mimic Shiner	Notropis volucellus	52	1.3
4/25/2021	BSB3	Boat Electrofishing	Mimic Shiner	Notropis volucellus	53	1.3
4/25/2021	BSB3	Boat Electrofishing	Mimic Shiner	Notropis volucellus	47	0.8
4/25/2021	BSB3	Boat Electrofishing	Mimic Shiner	Notropis volucellus	54	1.2
4/25/2021	BSB3	Boat Electrofishing	Mimic Shiner	Notropis volucellus	46	0.7
4/25/2021	BSB3	Boat Electrofishing	Mimic Shiner	Notropis volucellus	38	0.5
4/25/2021	BSB3	Boat Electrofishing	Mimic Shiner	Notropis volucellus	33	0.3
4/25/2021	BSB4	Boat Electrofishing	Mimic Shiner	Notropis volucellus	50	1.1
4/25/2021	BSB4	Boat Electrofishing	Mimic Shiner	Notropis volucellus	47	0.9
4/25/2021	BSB4	Boat Electrofishing	Mimic Shiner	Notropis volucellus	47	0.9

4/25/2021	BSB4	Boat Electrofishing	Mimic Shiner	Notropis volucellus	42	0.7
4/25/2021	BSB4	Boat Electrofishing	Mimic Shiner	Notropis volucellus	32	0.3
4/22/2021	BSG3	Gillnet	Muskellunge	Esox masquinongy	569	1090
4/25/2021	BSB3	Boat Electrofishing	Muskellunge	Esox masquinongy	505	620
4/25/2021	BSB4	Boat Electrofishing	Muskellunge	Esox masquinongy	542	750
10/22/2020	BFB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	66	2.4
4/22/2021	BSBP11	Backpack Electrofishing	New River Shiner	Notropis scabriceps	51	1.1
4/23/2021	BSBP6	Backpack Electrofishing	New River Shiner	Notropis scabriceps	51	1.2
4/25/2021	BSB4	Boat Electrofishing	New River Shiner	Notropis scabriceps	63	2.1
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	60	1.65
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	40	0.5
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	44	0.7
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	43	0.6
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	41	0.6
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	35	0.4
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	36	0.3
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	35	0.35
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	34	0.3
5/27/2021	BSB8	Boat Electrofishing	New River Shiner	Notropis scabriceps	30	0.25
4/21/2021	BSBP8	Backpack Electrofishing	Northern Hog Sucker	Hypentelium nigricans	95	10.5
4/23/2021	BSBP6	Backpack Electrofishing	Northern Hog Sucker	Hypentelium nigricans	65	2.9
4/23/2021	BSBP6	Backpack Electrofishing	Northern Hog Sucker	Hypentelium nigricans	55	1.1
4/23/2021	BSBP12	Backpack Electrofishing	Northern Hog Sucker	Hypentelium nigricans	72	3.9
4/23/2021	BSBP12	Backpack Electrofishing	Northern Hog Sucker	Hypentelium nigricans	88	6.9
4/23/2021	BSBP13	Backpack Electrofishing	Northern Hog Sucker	Hypentelium nigricans	86	5.8
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	130	25
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	150	32
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	130	24
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	120	17
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	150	32
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	140	28
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	150	34
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	120	19
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	100	12
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	150	33
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	130	26
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	130	26
5/27/2021	BSB8	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	150	35
5/27/2021	BSB9	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	140	28
5/27/2021	BSB9	Boat Electrofishing	Northern Hog Sucker	Hypentelium nigricans	110	14
10/22/2020	BFB10	Boat Electrofishing	Northern Hogsucker	Hypentelium nigricans	73	4.67
10/22/2020	BFB12	Boat Electrofishing	Northern Hogsucker	Hypentelium nigricans	95	6.79
10/22/2020	BFB9	Boat Electrofishing	Northern Hogsucker	Hypentelium nigricans	112	11.65
10/22/2020	BFB9	Boat Electrofishing	Northern Hogsucker	Hypentelium nigricans	74	4.61
10/22/2020	BFB9	Boat Electrofishing	Northern Hogsucker	Hypentelium nigricans	81	5.4
4/26/2021	BSB16	Boat Electrofishing	Pumpkinseed	Lepomis gibbosus	112	21.1
4/25/2021	BSB3	Boat Electrofishing	Rainbow Trout	Oncorhynchus mykiss	490	1250
10/22/2020	BFB10	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	110	22.78
10/22/2020	BFB11	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	47	1
10/22/2020	BFB13	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	121	32.52
10/22/2020	BFB13	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	53	1.2
10/22/2020	BFB13	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	59	2.54
10/22/2020	BFB13	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	54	1.4
10/22/2020	BFB13	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	66	4.2
10/22/2020	BFB13	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	53	1.4
10/22/2020	BFB14	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	116	29.52

10/22/2020	BFB16	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	66	4.84
10/24/2020	BFB4	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	111	24.89
10/24/2020	BFB4	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	175	97.01
10/24/2020	BFB4	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	83	8.51
10/24/2020	BFB6	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	156	67.4
10/24/2020	BFB6	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	71	4.42
10/24/2020	BFB6	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	190	122.46
10/24/2020	BFB6	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	91	11.35
10/24/2020	BFB6	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	86	10.38
10/24/2020	BFB7	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	91	10.58
10/24/2020	BFB7	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	105	16.34
10/24/2020	BFB7	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	81	8.18
10/24/2020	BFB7	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	61	1.72
10/24/2020	BFB7	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	46	0.62
10/24/2020	BFB7	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	46	1.43
10/25/2020	BFB1	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	97	18.9
10/25/2020	BFB1	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	43	1.59
10/25/2020	BFB1	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	38	1.21
10/25/2020	BFB2	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	47	0.82
10/25/2020	BFB2	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	150	56.85
4/20/2021	BSBP3	Backpack Electrofishing	Redbreast Sunfish	Lepomis auritus	55	4.6
4/23/2021	BSBP13	Backpack Electrofishing	Redbreast Sunfish	Lepomis auritus	67	4.1
4/25/2021	BSB1	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	81	7.5
4/25/2021	BSB4	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	142	40.4
4/25/2021	BSB4	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	79	9.3
4/25/2021	BSB7	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	56	2.1
4/25/2021	BSB7	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	43	0.78
4/26/2021	BSB16	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	75	6.8
4/26/2021	BSB16	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	51	0.7
4/26/2021	BSB17	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	63	5.5
4/26/2021	BSB17	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	54	2.4
4/26/2021	BSB17	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	56	2.3
4/26/2021	BSB17	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	57	2.5
4/26/2021	BSB17	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	61	2.7
4/26/2021	BSB17	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	50	0.6
5/27/2021	BSB14	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	110	25
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	80	12
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	80	10
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	70	8
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	100	17
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	120	30
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	130	46
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	70	10
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	80	13
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	90	14
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	80	11
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	60	4
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	60	5
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	70	6
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	60	5
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	70	6
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	100	18
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	90	13
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	80	10
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	60	3
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	70	5

5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	60	5
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	90	12
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	100	15
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	80	8
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	70	6
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	60	3
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	80	12
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	40	2
5/27/2021	BSB15	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	60	5
5/27/2021	BSB9	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	220	220
5/27/2021	BSB9	Boat Electrofishing	Redbreast Sunfish	Lepomis auritus	210	209
10/22/2020	BFB10	Boat Electrofishing	Rock Bass	Ambloplites rupestris	47	1.6
10/22/2020	BFB14	Boat Electrofishing	Rock Bass	Ambloplites rupestris	49	0.9
10/22/2020	BFB9	Boat Electrofishing	Rock Bass	Ambloplites rupestris	42	0.77
10/24/2020	BFB6	Boat Electrofishing	Rock Bass	Ambloplites rupestris	81	8.26
10/25/2020	BFB1	Boat Electrofishing	Rock Bass	Ambloplites rupestris	111	29.5
4/20/2021	BSBP1	Backpack Electrofishing	Rock Bass	Ambloplites rupestris	105	23.7
4/20/2021	BSBP3	Backpack Electrofishing	Rock Bass	Ambloplites rupestris	53	3.6
4/20/2021	BSBP3	Backpack Electrofishing	Rock Bass	Ambloplites rupestris	42	1.3
4/20/2021	BSBP3	Backpack Electrofishing	Rock Bass	Ambloplites rupestris	52	3.1
4/21/2021	BSBP5	Backpack Electrofishing	Rock Bass	Ambloplites rupestris	110	29.1
4/22/2021	BSG3	Gillnet	Rock Bass	Ambloplites rupestris	215	210
4/22/2021	BSG3	Gillnet	Rock Bass	Ambloplites rupestris	190	130
4/22/2021	BSG3	Gillnet	Rock Bass	Ambloplites rupestris	194	170
4/23/2021	BSBP7	Backpack Electrofishing	Rock Bass	Ambloplites rupestris	49	1.9
4/25/2021	BSB1	Boat Electrofishing	Rock Bass	Ambloplites rupestris	112	20.9
5/27/2021	BSB10	Boat Electrofishing	Rock Bass	Ambloplites rupestris	140	68
5/27/2021	BSB10	Boat Electrofishing	Rock Bass	Ambloplites rupestris	80	10
5/27/2021	BSB11	Boat Electrofishing	Rock Bass	Ambloplites rupestris	150	9
5/27/2021	BSB11	Boat Electrofishing	Rock Bass	Ambloplites rupestris	70	6
5/27/2021	BSB13	Boat Electrofishing	Rock Bass	Ambloplites rupestris	80	8
5/27/2021	BSB13	Boat Electrofishing	Rock Bass	Ambloplites rupestris	60	6
5/27/2021	BSB14	Boat Electrofishing	Rock Bass	Ambloplites rupestris	210	185
5/27/2021	BSB14	Boat Electrofishing	Rock Bass	Ambloplites rupestris	110	28
5/27/2021	BSB14	Boat Electrofishing	Rock Bass	Ambloplites rupestris	100	15
5/27/2021	BSB15	Boat Electrofishing	Rock Bass	Ambloplites rupestris	80	10
5/27/2021	BSB15	Boat Electrofishing	Rock Bass	Ambloplites rupestris	70	8
5/27/2021	BSB15	Boat Electrofishing	Rock Bass	Ambloplites rupestris	60	5
5/27/2021	BSB15	Boat Electrofishing	Rock Bass	Ambloplites rupestris	70	7
5/27/2021	BSB15	Boat Electrofishing	Rock Bass	Ambloplites rupestris	60	4
5/27/2021	BSB8	Boat Electrofishing	Rock Bass	Ambloplites rupestris	70	10
5/27/2021	BSB8	Boat Electrofishing	Rock Bass	Ambloplites rupestris	130	47
5/27/2021	BSB8	Boat Electrofishing	Rock Bass	Ambloplites rupestris	80	10
5/27/2021	BSB9	Boat Electrofishing	Rock Bass	Ambloplites rupestris	140	64
10/22/2020	BFB12	Boat Electrofishing	Rosefin Shiner	Lythrurus ardens	32	0.29
10/22/2020	BFB12	Boat Electrofishing	Rosefin Shiner	Lythrurus ardens	37	0.39
10/22/2020	BFB12	Boat Electrofishing	Rosefin Shiner	Lythrurus ardens	33	0.3
10/22/2020	BFB8	Boat Electrofishing	Rosefin Shiner	Lythrurus ardens	43	0.6
4/20/2021	BSBP3	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	50	1
4/20/2021	BSBP3	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	51	1.15
4/20/2021	BSBP3	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	51	1.2
4/20/2021	BSBP3	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	51	1.25
4/20/2021	BSBP3	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	45	0.75
4/20/2021	BSBP3	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	43	0.65
4/20/2021	BSBP3	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	47	0.8
4/20/2021	BSBP3	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	38	0.45

4/21/2021	BSBP8	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	65	2.2
4/21/2021	BSBP8	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	55	1.3
4/21/2021	BSBP8	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	50	1
4/21/2021	BSBP8	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	43	0.7
4/23/2021	BSBP6	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	62	2.15
4/23/2021	BSBP12	Backpack Electrofishing	Rosyface Shiner	Notropis rubellus	62	2.1
4/25/2021	BSB4	Boat Electrofishing	Rosyface Shiner	Notropis rubellus	60	1.8
4/23/2021	BSBP7	Backpack Electrofishing	Saffron Shiner	Notropis rubricroceus	66	2.7
4/21/2021	BSBP5	Backpack Electrofishing	Sharpnose Darter	Percina oxyrhynchus	81	4.2
4/22/2021	BSBP10	Backpack Electrofishing	Sharpnose Darter	Percina oxyrhynchus	110	8.5
4/22/2021	BSBP11	Backpack Electrofishing	Sharpnose Darter	Percina oxyrhynchus	81	4.8
10/22/2020	BFB11	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	83	5.98
10/22/2020	BFB11	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	68	3.08
10/22/2020	BFB11	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	71	3.72
10/22/2020	BFB11	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	91	6.41
10/22/2020	BFB11	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	78	5.42
10/22/2020	BFB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	66	4.12
10/22/2020	BFB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	89	8.18
10/22/2020	BFB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	74	5.32
10/22/2020	BFB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	171	57.3
10/22/2020	BFB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	66	1.98
10/22/2020	BFB16	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	74	4.42
10/22/2020	BFB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	79	4.95
10/24/2020	BFB4	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	135	34.02
10/24/2020	BFB6	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	330	670
10/24/2020	BFB6	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	139	29.7
10/24/2020	BFB6	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	57	2.1
10/24/2020	BFB7	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	300	340
10/24/2020	BFB7	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	61	2.19
10/25/2020	BFB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	151	43.6
10/25/2020	BFB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	71	5.34
10/25/2020	BFB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	78	4.45
10/25/2020	BFB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	121	25.14
10/25/2020	BFB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	91	8.35
10/25/2020	BFB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	71	4.34
10/25/2020	BFB2	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	127	20.72
11/11/2020	BFG2	Gillnet	Smallmouth Bass	Micropterus dolomieu	250	160
4/20/2021	BSBP1	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	79	5.8
4/20/2021	BSBP1	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	71	4.2
4/20/2021	BSBP3	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	78	4.8
4/20/2021	BSBP3	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	68	3.1
4/20/2021	BSBP3	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	54	1.6
4/21/2021	BSBP4	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	160	48.7
4/21/2021	BSBP4	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	71	5.7
4/21/2021	BSBP5	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	166	56.6
4/21/2021	BSBP8	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	101	10.3
4/21/2021	BSBP8	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	84	6.9
4/21/2021	BSBP9	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	66	3.5
4/21/2021	BSBP9	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	63	3.7
4/21/2021	BSBP9	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	70	5.1
4/21/2021	BSBP9	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	80	6.2
4/22/2021	BSBP11	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	69	9.1
4/23/2021	BSBP7	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	88	6.7
4/23/2021	BSBP7	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	63	2.5
4/23/2021	BSBP12	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	83	6.5
4/23/2021	BSBP12	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	6.5

4/23/2021	BSBP13	Backpack Electrofishing	Smallmouth Bass	Micropterus dolomieu	88	5.5
4/25/2021	BSB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	126	21.3
4/25/2021	BSB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	80	6.3
4/25/2021	BSB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	78	4.1
4/25/2021	BSB1	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	76	2.7
4/25/2021	BSB4	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	139	46.7
4/25/2021	BSB6	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	138	27.6
4/26/2021	BSB16	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	86	4.8
4/26/2021	BSB16	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	80	4.7
5/27/2021	BSB10	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	210	140
5/27/2021	BSB10	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	7
5/27/2021	BSB10	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	8
5/27/2021	BSB10	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	9
5/27/2021	BSB10	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	16
5/27/2021	BSB10	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	10
5/27/2021	BSB11	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	110	22
5/27/2021	BSB11	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	200	110
5/27/2021	BSB12	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	80	8
5/27/2021	BSB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	11
5/27/2021	BSB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	12
5/27/2021	BSB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	12
5/27/2021	BSB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	80	6
5/27/2021	BSB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	170	65
5/27/2021	BSB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	9
5/27/2021	BSB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	10
5/27/2021	BSB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	200	28
5/27/2021	BSB13	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	190	30
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	180	86
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	110	13
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	8
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	80	6
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	10
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	180	77
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	13
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	80	6
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	80	6
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	12
5/27/2021	BSB14	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	110	15
5/27/2021	BSB15	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	210	132
5/27/2021	BSB15	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	110	11
5/27/2021	BSB15	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	7
5/27/2021	BSB15	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	8
5/27/2021	BSB15	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	8
5/27/2021	BSB15	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	11
5/27/2021	BSB15	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	14
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	230	164
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	190	80
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	240	184
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	130	27
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	110	22
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	110	15
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	12
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	70	8
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	75	9
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	13
5/27/2021	BSB8	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	70	7

5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	220	140
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	14
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	160	70
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	80	9
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	210	140
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	200	105
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	105	13
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	12
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	12
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	90	11
5/27/2021	BSB9	Boat Electrofishing	Smallmouth Bass	Micropterus dolomieu	100	13
10/22/2020	BFB8	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	63	1.66
10/22/2020	BFB9	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	69	2.71
10/22/2020	BFB9	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	43	0.68
10/22/2020	BFB9	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	37	0.44
4/23/2021	BSBP12	Backpack Electrofishing	Spotfin Shiner	Cyprinella spiloptera	62	2.1
4/25/2021	BSB4	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	89	6.9
4/25/2021	BSB4	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	69	2.6
4/25/2021	BSB4	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	57	1.6
5/27/2021	BSB12	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	80	5.1
5/27/2021	BSB8	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	44	0.8
5/27/2021	BSB8	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	42	0.8
5/27/2021	BSB8	Boat Electrofishing	Spotfin Shiner	Cyprinella spiloptera	41	0.65
10/22/2020	BFB8	Boat Electrofishing	Spottail Shiner	Notropis hudsonius	83	4.33
10/24/2020	BFB7	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	59	2.26
10/25/2020	BFB2	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	68	3.47
4/26/2021	BSB16	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	86	5.7
4/26/2021	BSB16	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	62	0.8
4/26/2021	BSB16	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	72	4.6
5/27/2021	BSB14	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	70	3
5/27/2021	BSB14	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	80	5
5/27/2021	BSB9	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	100	14
5/27/2021	BSB9	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	100	12
5/27/2021	BSB9	Boat Electrofishing	Spotted Bass	Micropterus punctulatus	110	17
10/24/2020	BFB4	Boat Electrofishing	Sunfish	Lepomis sp.	47	1.67
10/24/2020	BFB7	Boat Electrofishing	Sunfish	Lepomis sp.	42	1.11
10/24/2020	BFB7	Boat Electrofishing	Sunfish	Lepomis sp.	55	1.42
10/24/2020	BFB7	Boat Electrofishing	Sunfish	Lepomis sp.	101	16.41
10/25/2020	BFB1	Boat Electrofishing	Sunfish	Lepomis sp.	95	14.68
10/25/2020	BFB1	Boat Electrofishing	Sunfish	Lepomis sp.	133	44.2
10/25/2020	BFB1	Boat Electrofishing	Sunfish	Lepomis sp.	79	9.22
10/25/2020	BFB1	Boat Electrofishing	Sunfish	Lepomis sp.	92	9.71
4/21/2021	BSBP9	Backpack Electrofishing	Sunfish	Lepomis sp.	44	1.5
4/23/2021	BSBP13	Backpack Electrofishing	Sunfish	Lepomis sp.	45	1.4
4/23/2021	BSBP13	Backpack Electrofishing	Sunfish	Lepomis sp.	46	1.7
4/23/2021	BSBP13	Backpack Electrofishing	Sunfish	Lepomis sp.	55	2.8
4/25/2021	BSB1	Boat Electrofishing	Sunfish	Lepomis sp.	83	9.3
4/25/2021	BSB1	Boat Electrofishing	Sunfish	Lepomis sp.	53	3.1
4/25/2021	BSB1	Boat Electrofishing	Sunfish	Lepomis sp.	50	2.8
4/25/2021	BSB1	Boat Electrofishing	Sunfish	Lepomis sp.	31	0.7
4/25/2021	BSB1	Boat Electrofishing	Sunfish	Lepomis sp.	39	1.1
4/25/2021	BSB1	Boat Electrofishing	Sunfish	Lepomis sp.	39	1.1
4/25/2021	BSB1	Boat Electrofishing	Sunfish	Lepomis sp.	47	2.2
4/25/2021	BSB2	Boat Electrofishing	Sunfish	Lepomis sp.	32	0.6
4/25/2021	BSB2	Boat Electrofishing	Sunfish	Lepomis sp.	34	0.7
4/25/2021	BSB2	Boat Electrofishing	Sunfish	Lepomis sp.	42	1.3

4/25/2021	BSB2	Boat Electrofishing	Sunfish	Lepomis sp.	48	2.1
4/25/2021	BSB3	Boat Electrofishing	Sunfish	Lepomis sp.	47	0.9
4/25/2021	BSB4	Boat Electrofishing	Sunfish	Lepomis sp.	74	7.6
10/22/2020	BFB8	Boat Electrofishing	Swallowtail Shiner	Notropis procne	62	1.76
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	78	4.65
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	58	1.95
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	59	2
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	48	1.05
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	1.75
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	58	1.9
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	53	1.6
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	59	2.15
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	2
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	50	1.3
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.7
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	60	2.3
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	53	1.45
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	53	1.45
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	1.95
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	54	1.75
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	53	1.8
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	52	1.55
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	55	1.75
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	54	1.05
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.8
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.8
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	2
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	2.05
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	54	1.55
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.8
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	62	2.55
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	55	1.7
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	55	1.6
4/21/2021	BSBP8	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	64	2.4
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	1.75
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	58	2.1
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	52	1.05
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	60	2.1
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.75
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	1.85
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	1.65
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	1.7
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	59	1.8
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	52	1.2
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.7
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.7
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	58	2.1
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	1.7
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	54	1.3
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.85
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	54	1.4
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	58	1.9
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	58	1.95
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	58	1.9
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	58	1.85
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	50	1.25

4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.95
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	59	2
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	1.75
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	2
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	56	1.65
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	61	2.1
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	59	1.75
4/22/2021	BSBP10	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	50	1.3
4/22/2021	BSBP11	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	55	1.85
4/22/2021	BSBP11	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	60	2.1
4/22/2021	BSBP11	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	59	1.8
4/23/2021	BSBP6	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	62	2.2
4/23/2021	BSBP6	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	2
4/23/2021	BSBP6	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	54	1.8
4/23/2021	BSBP6	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	53	1.55
4/23/2021	BSBP6	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	52	1.35
4/23/2021	BSBP6	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	50	1.3
4/23/2021	BSBP6	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	52	1.4
4/23/2021	BSBP6	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	49	1.3
4/23/2021	BSBP12	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	55	1.6
4/23/2021	BSBP12	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	52	1.25
4/23/2021	BSBP12	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	50	1.3
4/23/2021	BSBP12	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	51	0.95
4/23/2021	BSBP12	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	55	1.55
4/23/2021	BSBP12	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	53	1.4
4/23/2021	BSBP12	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	57	1.95
4/23/2021	BSBP12	Backpack Electrofishing	Telescope Shiner	Notropis telescopus	75	4.6
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	41	0.5
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	42	0.5
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	58	1.5
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	44	0.6
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	60	1.8
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	50	0.9
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	40	0.5
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	52	1.1
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	52	1.1
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	42	0.75
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	46	0.7
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	56	1.1
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	46	0.7
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	46	0.7
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	50	1
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	46	0.7
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	40	0.45
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	48	0.8
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	50	0.9
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	49	0.9
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	46	0.8
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	57	1
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	46	0.6
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	48	0.9
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	53	1.2
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	54	1.1
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	53	1.2
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	53	1.1
4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	39	0.45

4/25/2021	BSB4	Boat Electrofishing	Telescope Shiner	Notropis telescopus	60	1.5
11/11/2020	BFG2	Gillnet	Walleye	Sander vitreus	350	320
11/19/2020	BFG3	Gillnet	Walleye	Sander vitreus	390	480
11/20/2020	BFG5	Gillnet	Walleye	Sander vitreus	390	520
11/20/2020	BFG5	Gillnet	Walleye	Sander vitreus	319	260
11/20/2020	BFG5	Gillnet	Walleye	Sander vitreus	331	360
11/20/2020	BFG5	Gillnet	Walleye	Sander vitreus	340	400
4/22/2021	BSG3	Gillnet	Walleye	Sander vitreus	323	270
4/22/2021	BSG5	Gillnet	Walleye	Sander vitreus	330	320
4/22/2021	BSG5	Gillnet	Walleye	Sander vitreus	309	280
4/22/2021	BSBP10	Backpack Electrofishing	White Shiner	Luxilus albeolus	77	5.7
4/23/2021	BSBP12	Backpack Electrofishing	White Shiner	Luxilus albeolus	100	10.95
11/10/2020	BFG6	Gillnet	White Sucker	Catostomus commersonii	455	1040
11/19/2020	BFG3	Gillnet	White Sucker	Catostomus commersonii	355	490
11/19/2020	BFG5	Gillnet	White Sucker	Catostomus commersonii	350	570
4/20/2021	BSG4	Gillnet	White Sucker	Catostomus commersonii	332	500
4/22/2021	BSG3	Gillnet	White Sucker	Catostomus commersonii	330	410
4/22/2021	BSG3	Gillnet	White Sucker	Catostomus commersonii	460	1080
4/22/2021	BSG3	Gillnet	White Sucker	Catostomus commersonii	435	1050
4/22/2021	BSG5	Gillnet	White Sucker	Catostomus commersonii	470	1240
4/22/2021	BSG5	Gillnet	White Sucker	Catostomus commersonii	365	600
4/25/2021	BSB5	Boat Electrofishing	White Sucker	Catostomus commersonii	493	1270
10/22/2020	BFB13	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	71	2.44
10/22/2020	BFB13	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	49	0.87
10/22/2020	BFB13	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	43	0.63
10/22/2020	BFB13	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	38	0.38
10/22/2020	BFB13	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	39	0.46
10/22/2020	BFB13	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	33	0.23
10/22/2020	BFB14	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	90	5.85
10/22/2020	BFB14	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	56	1.48
10/22/2020	BFB14	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	44	0.67
10/22/2020	BFB14	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	46	0.75
10/22/2020	BFB14	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	45	0.69
10/22/2020	BFB15	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	44	0.72
10/22/2020	BFB15	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	43	0.59
10/22/2020	BFB15	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	41	0.55
10/22/2020	BFB15	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	39	0.46
10/22/2020	BFB15	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	38	0.46
10/22/2020	BFB15	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	37	0.35
10/22/2020	BFB15	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	36	0.36
10/22/2020	BFB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	59	1.72
10/22/2020	BFB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	55	1.46
10/22/2020	BFB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	56	1.32
10/22/2020	BFB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	54	1.29
10/22/2020	BFB9	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	74	3.51
10/22/2020	BFB9	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	55	1.33
10/22/2020	BFB9	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	50	1.04
10/22/2020	BFB9	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	61	1.78
10/22/2020	BFB9	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	83	4.76
10/22/2020	BFB9	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	59	1.7
10/22/2020	BFB9	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	41	0.57
10/24/2020	BFB7	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	63	1.41
10/24/2020	BFB7	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	43	0.59
10/24/2020	BFB7	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	45	0.72
10/24/2020	BFB7	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	40	0.51
10/25/2020	BFB1	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	54	1.24

10/25/2020	BFB2	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	56	1.23
4/20/2021	BSBP2	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	32	0.3
4/20/2021	BSBP1	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	76	3.6
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	50	1
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	56	1.35
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	45	0.75
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	56	1.5
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	64	2.3
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	44	0.7
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	41	0.6
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	38	0.45
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	51	1.1
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	64	2.15
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	38	0.45
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	37	0.4
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	65	2.55
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	48	1.05
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	46	1
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	47	0.75
4/20/2021	BSBP3	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	43	0.65
4/21/2021	BSBP8	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	85	5.3
4/21/2021	BSBP8	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	62	2.1
4/21/2021	BSBP8	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	54	1.5
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	64	2.3
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	65	2.4
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	76	3.6
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	64	2
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	61	1.8
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	53	1.1
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	65	2.3
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	72	3.2
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	50	1.05
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	65	2.25
4/22/2021	BSBP10	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	57	1.6
4/22/2021	BSBP11	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	35	0.45
4/22/2021	BSBP11	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	39	0.55
4/22/2021	BSBP11	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	52	1.15
4/22/2021	BSBP11	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	46	0.75
4/22/2021	BSBP11	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	56	1.5
4/22/2021	BSBP11	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	46	0.9
4/22/2021	BSBP11	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	48	1.1
4/22/2021	BSBP11	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	50	1
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	55	1.3
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	70	2.7
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	71	3.1
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	50	1.1
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	66	2.3
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	67	2.5
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	63	2
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	55	1.4
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	68	2.5
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	78	4.25
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	70	2.9
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	78	4.2
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	75	3.4
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	71	3.2

4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	78	3.85
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	62	2.1
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	86	6.1
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	45	0.8
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	43	0.75
4/23/2021	BSBP6	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	35	0.4
4/23/2021	BSBP12	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	57	1.5
4/23/2021	BSBP12	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	46	0.7
4/23/2021	BSBP12	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	46	0.7
4/23/2021	BSBP12	Backpack Electrofishing	Whitetail Shiner	Cyprinella galactura	57	1.4
4/25/2021	BSB7	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	49	0.95
4/25/2021	BSB7	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	45	0.7
4/25/2021	BSB7	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	38	0.5
4/25/2021	BSB7	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	35	0.35
5/27/2021	BSB12	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	122	21
5/27/2021	BSB12	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	110	19
5/27/2021	BSB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	90	10
5/27/2021	BSB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	90	11
5/27/2021	BSB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	70	6
5/27/2021	BSB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	50	4
5/27/2021	BSB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	50	4
5/27/2021	BSB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	70	5
5/27/2021	BSB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	90	7
5/27/2021	BSB8	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	45	0.65
5/27/2021	BSB9	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	80	4
5/27/2021	BSB9	Boat Electrofishing	Whitetail Shiner	Cyprinella galactura	80	6

Subject: FW: Byllesby-Buck Project Boundary

From: Wampler, Jennifer <jennifer.wampler@dcr.virginia.gov>
Sent: Thursday, December 9, 2021 12:44 PM
To: Salazar, Maggie <Maggie.Salazar@hdrinc.com>
Subject: Re: Byllesby-Buck Project Boundary

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

Thanks Maggie.

On Thu, Dec 9, 2021 at 12:01 PM Salazar, Maggie <Maggie.Salazar@hdrinc.com> wrote:

> Hi Jennifer,
>
> As requested last week at the Byllesby-Buck USR meeting, attached is a zip file containing the FERC Project Boundary. Please let me know if you have any issues accessing or need a different format.
>
> Thanks,
>
> **Maggie Salazar**
>
> *Regulatory Specialist*
>
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>
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--

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December 16, 2021

Via Electronic Filing

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

Subject: Byllesby-Buck Hydroelectric Project (FERC No. 2514-186)
Filing of Updated Study Report Meeting Summary

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the two-development Byllesby-Buck Hydroelectric Project (Project) (Project No. 2514), located on the upper New River in Carroll County, Virginia.

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

Pursuant to 18 CFR § 5.15(c), Appalachian filed the Updated Study Report (USR) with the Commission on November 17, 2021. The USR filing also included notification of the USR Meeting date, time, and proposed agenda. As required by the ILP schedule, within 15 days of the USR filing, Appalachian held a virtual USR Meeting via WebEx from 9:00 am to 4:30 pm on Wednesday, December 4, 2021.

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

If there are any questions regarding this filing, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,

Elizabeth Parcell
Process Supervisor
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Enclosure

cc: Distribution List
Jonathan Magalski (AEP)

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Meeting Summary

Project:	Byllesby-Buck Hydroelectric Project (P-2514)
Subject:	Updated Study Report Meeting Summary
Date:	Wednesday, December 01, 2021
Location:	WebEx Virtual Meeting
Attendees:	Jonathan Magalski (AEP) Elizabeth Parcell (AEP) Fred Colburn (AEP) Sarah Kulpa (HDR) Maggie Salazar (HDR) Misty Huddleston (HDR) Ty Ziegler (HDR) Erin Settevendemio (HDR) Kerry McCarney-Castle (HDR) Joe Dvorak (HDR) Eric Mularski (HDR) Jon Studio (EDGE) Bill Green (Terracon) Jeremy Feinberg (FERC) Jody Callihan (FERC) Samantha Pollack (FERC) Laurie Bauer (FERC) Woohee Choi (FERC) Jeff Williams (VDWR) John Copeland (VDWR) Janet Norman (USFWS) Jessica Pica (USFWS) Rick McCorkle (USFWS) Joe Grist (VDEQ) Jennifer Wampler (VDCR) Angie Grooms (Landowner) David Taylor (Landowner)

Overview

This document provides the meeting summary for Appalachian Power Company's (Appalachian) Byllesby-Buck Hydroelectric Project (Project) Updated Study Report (USR) Meeting. The meeting was held via WebEx to review with stakeholders the progress and results reported in the USR, which was filed with the Federal Energy Regulatory Commission (FERC) on November 17, 2021. The USR can be accessed from either FERC's website or from AEP's website: www.aephydro.com/HydroPlant/ByllesbyBuck. A copy of the meeting presentation is included with this meeting summary as Attachment 4.

Safety Moment

Sarah Kulpa presented a safety moment on road safety and to be aware of black ice road hazards and winter driving conditions.

Welcome and Introductions (Slides 1-6)

Elizabeth Parcell introduced the Byllesby-Buck Project and the USR meeting goals and objectives, and encouraged participation and feedback. She provided an overview of the agenda and the completed and upcoming Integrated Licensing Process (ILP) schedule milestones. The studies presented in the USR were completed in the first (2020) and/or second (2021) ILP study seasons:

- Bypass Reach Flow and Aquatic Habitat Study
- Water Quality Study
- Aquatic Resources Study
- Wetlands, Riparian, and Littoral Habitat Study
- Terrestrial Resources Study
- Shoreline Stability Assessment
- Recreation Study
- Cultural Resources Study

Final study reports were filed with the USR. If revisions are made to any of the study reports based on today's discussion or comments on the USR, revised study plans will be filed with the final license application (FLA) (due to FERC February 28, 2022). The focus of today's presentation and discussion is studies or study progress not covered by the Initial Study Report (ISR) filed earlier this year or the ISR meeting held on January 28, 2021.

General Questions/Comments

Janet Norman asked for clarification regarding the deadlines for stakeholder comments. Jody Callihan confirmed that the official ILP schedule presented in FERC's Scoping Documents state December 30th as the deadline for filing comments on the Draft License Application and January 16, 2022 to file disputes on the USR meeting summary and/or comments on the USR (if any).

Water Quality Study (Slides 7-28)

Ty Ziegler (study lead) introduced the objectives, methods, and results of the Byllesby Development water quality study. He clarified that results from the Buck Development were included in the ISR, therefore, the discussion is primarily focused on the 2021 field results for the Byllesby Development.

Study Results

T. Ziegler provided a brief overview of study activities completed in 2020 and explained that at the Byllesby Development, instrumentation was only installed at the tailrace monitoring location in 2020 due to a Tainter gate open during the study period and a damaged flashboard section, which made installation at other monitoring locations unsafe. The 2020 study period was August 17 – October 8. Instrumentation at all Buck Development monitoring locations identified in the Revised Study Plan (RSP) and Study Plan Determination (SPD) was installed, measured, and presented in the ISR.

T. Ziegler then presented the results of the 2021 study season. The 2021 study period was June 15 – September 28. Instrumentation captured continuous temperature and dissolved oxygen (DO) data (15-min intervals) and discrete data (i.e., water temperature, DO, pH, and specific conductivity) during installation, data downloads (approximately every two to three weeks), and removal of the equipment. Vertical profiles were also collected at the Byllesby forebay/reservoir monitoring location during discrete data collection events. Turbidity data was collected at 5-minute intervals over a 1-week period September 29 – October 5, 2021 and an intensive 1-day effort on October 14, 2021.

Water temperatures, DO concentrations, turbidity, and pH measurements met Virginia Class IV (New River) water quality standards; with the exception of instantaneous surface water temperatures on several occasions during late-July and late-August 2021. There was little to no thermal or DO stratification at the Byllesby and Buck forebay monitoring locations. Specific conductivity and pH range results are suitable for aquatic species. Monthly chlorophyll-a grab sample results were non-detect indicating concentrations < 5 mg/cm^3.

Stakeholder Questions/Comments

J. Norman asked (reference slide *Air and Water Temperatures Upstream of Byllesby Reservoir*) the number of days water temperature was above 29 degrees Celsius (ºC), which is the maximum temperature standard for VA. T. Ziegler responded that there were approximately 4 days in late-July and 4 days in late-August that were over 29ºC on an instantaneous basis and the daily averages on those days were all less than 29ºC.

J. Norman stated (via WebEx chat box) there are a couple data points on 7/29/21 where discrete points have a 28.1 and 28.8 temperature and wondered at what time of day those were taken. Joe Dvorak answered that the discrete points were taken at approximately 11:45 a.m. on 7/29.

J. Norman asked if the "Depth" column on [study report] Table 3-3 (*Byllesby forebay temp profile*) is in feet or meters. Temperature is metric. J. Dvorak provided the answer in the WebEx chat that days over 29 ºC were as follows: Forebay Low & Mid monitoring locations: 1 (6/15) and Top location: 10; additionally several dates in June, July, and August. Durations were generally 2 hours or less, and that depth in Table 3-3 is in feet.

J. Norman asked about discrete vs. average temperatures for the water temperature standard and if at a later time in the day the temperatures would exceed a certain point higher than the state standard. R. McCorkle stated that the state's temperature standard does not describe whether it is instantaneous or over some daily averaging period. T. Ziegler stated that HDR has 15-minute water temperature data available, and one would anticipate temperature peaks in the early to mid-afternoon.

J. Norman asked if there is a state turbidity standard for Virginia. T. Ziegler stated there is presently no numeric standard for turbidity (only a qualitative standard); the Virginia Department of Environmental Quality (VDEQ) did not have additional information to add but noted they would check.[1] S. Kulpa noted for context that the North Carolina state standard for turbidity is 25 Nephelometric turbidity units (NTU) (10 NTU for trout waters).

Angie Grooms noted that based on the study, drag rake operations don't appear to be causing the turbidity issues. She wondered whether Appalachian/HDR had any other thoughts on the turbidity she has routinely observed downstream, as well as potential sources of the fine silt or if any non-point sources had been observed? S. Kulpa asked Eric Mularski if he could speak to any origins (non-point) field teams may have observed during shoreline surveys. E. Mularski stated he did not observe any noticeable non-point sources. Joe Grist noted that the state is looking into a numeric standard. J. Grist and John Copeland stated they had no significant input on the turbidity study at this time.

J. Norman referred to Table 3-3 of the Water Quality report asking if the values are average or instantaneous. J. Dvorak answered that they are instantaneous (discrete) measurements (not an average).

J. Callihan noted that the USR did not have the forebay monitoring locations presented on the monitoring location map (but the presentation had the locations included on the map). T. Ziegler agreed; the figure in the report will be updated in the FLA to include all of the monitoring locations for the 2020 and 2021 study periods.

J. Callihan asked what the habitat was like at the upstream monitoring location. J. Dvorak noted that the instrumentation was set in approximately 8 feet of water in rapid moving water with bedrock.

J. Callihan referred to Figure 1-6 - Bottom A and Bottom B and asked why there were two separate recordings. T. Ziegler explained that due to the biofouling issues HDR deployed two sondes at each monitoring location/depth. This redundancy would reduce data loss due to biofouling.

J. Callihan asked whether the broken flashboard was next to Tainter gate 6. T. Ziegler answered that the section of broken flashboards was next to Tainter Gate #6. [Note: this was later determined to be incorrect as it was actually spillway bay #8. For context, this is still near the center of the spillway and provided a similar flow pattern to releases from Tainter Gate #6.]

Action Item (HDR): J. Callihan asked if HDR could present for each monitoring station for each day the daily min, max, and average parameters. J. Callihan explained it would be easier for calculations and

[1] As additional information for this meeting summary, after the meeting HDR confirmed from information online that currently, Virginia regulates turbidity through general narrative criteria. Specifically, Virginia's Administrative Code lists turbidity as a substance requiring control when turbidity contravenes established standards, interferes directly or indirectly with designated uses of such water, or which are harmful to human, animal, plant, or aquatic life. (9VAC25-260-20). As opposed to numeric criteria, which establish quantitative pollution concentration limits, narrative criteria use qualitative considerations to help identify unacceptable conditions of that waterbody. Narrative criteria often supplement numeric criteria or are used when the regulated pollutant is difficult to measure. On April 12, 2021, the VDEQ issued a Notice of Intended Regulatory Action to establish first-time numeric turbidity criteria for Commonwealth surface waters in response to a directive by the State Water Control Board. This criteria has not yet been established, to the best of Appalachian's knowledge.

statistics in the Environmental Assessment to see number of days standards were exceeded. (Note: this data will be provided in the final Water Quality Study Report filed with the FLA).

J. Callihan also asked if the powerhouse had tripped on September 30 (brief periods of 0 generation). Fred Colburn confirmed later in the meeting that on Sept 30th there was a Maintenance Outage that took Buck offline.

J. Callihan noted the RSP included consultation with agencies regarding the turbidity study methods prior to the fieldwork and asked if this had been done. S. Kulpa confirmed the proposal for turbidity sampling was sent to the agencies and confirmed that no comments (from the agencies) were received. J. Callihan wondered what type of turbidity instrument was used and why there are jumps in turbidity data? T. Ziegler explained that there is a footnote in the report documenting the type of turbidity sensor used and associated issues with daylight and in-situ monitoring. T. Ziegler explained that when looking at the graph, the high points represent daytime measurements, and the data troughs are at night, which are more representative of actual conditions.

J. Callihan asked for additional information about the instrumentation used for this study. T. Ziegler explained that for the continuous turbidity monitoring study, HDR rented MS5 data sondes from OTT HydroMet which was the only equipment vendor that offered in-situ continuous turbidity monitoring equipment capability. The turbidity sensors installed in the MS5 data sondes were provided by Turner Designs. The light source used for the turbidity sensors is a light emitting diode (LED) which uses infrared wavelength to measure turbidity concentrations in the water column. As a result, the daily NTU cycling effect shown on Figure 8-1 (Attachment 8 of the Water Quality Study report) at the Byllesby upstream and Buck tailrace monitoring locations is likely due to sunlight interference with the turbidity sensors (which is inherent in continuous in-situ sampling). Baseline turbidity concentrations would be during nighttime hours when sunlight interference is minimized.

J. Callihan noted that FERC's main interest was how the trash rakes were impacting turbidity in the forebay and wanted confirmation that the track rakes were extending out to the extent they appeared to be during the scoping meeting site visit, during the 2021 sampling. T. Ziegler confirmed that the rakes do extend out but he does not believe they are extending out and down to the bottom (or as far as one would think) because the trash racks are at an incline. Turbidity measurements taken adjacent to the racks do not indicate immediate turbidity or any sort of a plume. J. Callihan asked whether there was only one rake session per day on the week-long survey. T. Ziegler explained that while automated, the rakes are run at the station level, so plant personnel operate them frequently during high flow and heavy loading, however, during this study the water was low/clear so the trash rakes did not operate more than once per day (during the morning hours). HDR also returned to do an intensive one-day study where the rakes were operated approximately every 30 minutes.

J. Callihan asked why there three instrument failures and if it was appropriate to extend the data. T. Ziegler noted that HDR is unsure as to why three of the turbidity instruments failed (although it did not appear to be the turbidity sensors themselves; but more likely the data sonde operating system). It was noted that these were rental units and they have been sent back to the vendor to determine the cause of the failure. While continuous turbidity data were not collected at Byllesby, given similar run-of-river operations, design of the trash racks, and operation of the trash rakes, it is believed the turbidity results would have been similar to those collected at Buck. J. Callihan acknowledged that operation of the trash rakes every 30-minutes seems adequate for this study.

A. Grooms asked if there were any grab samples run on a bench top turbidimeter to validate sonde measurements since sonde failure rates were high. T. Ziegler explained that in addition to the continuous monitoring turbidity probe, HDR collected data side-by-side data with the rover data sonde. However, a different technology was not used to validate readings. A. Grooms indicated that with NTU's that low, it likely wasn't necessary.

Wetlands, Riparian, and Littoral Habitat Study (Slides 29-47)

E. Mularski (study lead) introduced the Wetlands, Riparian, and Littoral Habitat Study methods and results. (Note: this study report was started and completed in 2021 and thus was not included in the ISR.)

Study Results

Approximately **95.43 acres of wetlands** were field verified:

- 50.72 acres of palustrine emergent wetlands
- 11.6 acres of palustrine scrub shrub wetlands
- 15.37 acres of palustrine forested wetlands
- 17.74 acres of rock bottom wetlands

Approximately 15,608 linear feet of riverine features were verified. Elodea was the most abundant submerged aquatic vegetation throughout the reach located close to the stream bank adjacent to wetlands. Algae was dominant in the littoral zone upstream from the Byllesby Dam where water flow was slower. Littoral Zones 6 and 8 upstream of Buck Dam exhibited the highest percentage of aquatic vegetation. The riparian area consists of approximately 177 acres and is mainly found along the shoreline, on islands, and within the bypass reach. Riverine habitats in the study area include the New River and associated tributaries. The New River is a lower perennial riverine feature on the upstream and downstream limits of the study area.

There were no observed occurrences of Virginia spirea in areas identified in the previous surveys; however, potentially suitable habitat was observed throughout the study area in rocky, low flow areas of streams, and on portions of bars and benches.

Stakeholder Questions/Comments

J. Norman asked whether drawdowns (specifically the most recent drawdown) are considered an impact to wetlands. E. Mularski and S. Kulpa acknowledged that while a drawdown could be considered an impact with adverse effects, it would be temporary. J. Norman suggested avoiding using language regarding "no impact" when there are temporary impacts. Jon Magalski noted a 2009 a study was done during a drawdown and there was no indication of impact to wetlands. J. Norman agreed that yes, there would be no change to the area/size of the community, but the drawdown would affect the use and/or function of area. Appalachian stated its intention to use clearer language in the FLA regarding wetland impacts.

J. Norman asked if HDR re-examined Virginia spirea during this survey and asked for confirmation that no instances of Virginia spirea were observed. E. Mularski noted that no occurrences of species belonging to the spirea genus were observed during the field surveys. S. Kulpa acknowledged Appalachian was not required to do a Virginia spirea survey; however, Appalachian recognized the interest and importance, and timed the wetlands survey along with the correct flowering season. The group discussed the 2021 Virginia spiraea survey findings compared to those of the 2017 survey performed by ESI. E. Mularski noted that for the 2017 effort, 100 potential habitat patches were surveyed, but only 18 were found to contain habitat low to moderate suitability, and no occurrences of this species.

Jeremy Feinberg asked about how many acres of National Wetlands Inventory (NWI) identified wetlands versus field verification wetlands there were and if these wetlands exist in any other database. E. Mularski stated that the NWI estimated 9 acres of wetlands and the field verification estimated 12 acres. The field verification was considered a confirmation of existing wetlands and not a formal wetlands delineation. The NWI can be over or underestimated, so that's why field study results are different from the NWI database. E. Mularski also noted that there is not a state mapped wetland database. J. Norman added she is comfortable with HDR's field estimation as a surrogate for true wetland delineation. She wondered if there would be disturbance periods during the future license period, and how Appalachian will address. S. Kulpa explained that any impacts to wetlands will be addressed with formal wetland/waterbody surveys, coordination with agencies, and if necessary, permits.

J. Magalski noted that Appalachian's standard practice is to perform wetland surveys prior to land disturbance.

Terrestrial Resources Study (Slides 48-67)

E. Mularski (study lead) introduced the Terrestrial Resources Study methods and results. (Note: this study report was started and completed in 2021, thus this study was not included in the ISR.)

Study Results

Terrestrial and ecological groups and community types identified in the field were consistent with similar habitat classification descriptions depicted on The Nature Conservancy Habitat Map, which identified 10 Habitat Communities. Terrestrial animal species and/or habitat use were also documented during the study. Many invasive species were noticed at low densities scattered throughout upland areas. Significant infestations of Japanese knotweed, oriental bittersweet, and multiflora rose were located primarily in riparian areas along the reservoirs and mapped in the field. Federally Protected Species included:

- Bald eagle (*Haliaeetus leucocephalus)* – BGEPA/MBTA
- Indiana bat (*Myotis sodalist*) - Endangered
- Northern long-eared bat (*Myotis septentrionalis*) - Threatened
- Virginia spirea (*Spiraea virginiana*) - Threatened

No federally listed Critical Habitat is documented in the study area. There is nesting and roosting habitat for the bald eagle within Project vicinity. In 2017, a consultant for AEP conducted an aerial helicopter transect for the proposed Byllesby-Ivanhoe 88kV Transmission Line Retirement project (not associated with the Project relicensing). One active nest was observed on the New River approximately 0.52 miles from the transmission line corridor and approximately 0.27 miles south of the Buck Dam. An unoccupied nest was identified along the New River approximately 1.1 mile north of Buck Dam at the top of transmission line.

Stakeholder Questions/Comments

J. Norman asked whether there was any infestation of multiflora or other invasive species noted in the same locations of the potential Virginia spiraea habitat (based on habitat suitability, not historical occurrences). E. Mularski noted that he didn't recall, but this could be further analyzed, and that scour along the shorelines is a habitat requirement. **Action Item** (HDR): Overlay Virginia spiraea potential habitat areas over areas where invasive species were observed. **Note**: Attachment 1 includes the Virginia spiraea and invasive species map. The invasive species locations and erosional areas do not appear to be affecting potential Virginia spiraea habitat.

J. Norman noted that spiraea is sensitive to competition as well as scour and asked whether high flow conditions in 2020 may have resulted in disruptive scour and removal of spiraea, and what kind of hydrology year the 2017 study followed. Appalachian and HDR representatives noted this species has not been confirmed to have been previously present within the Project boundary.

A. Grooms asked whether the eagle nest south of Buck Dam was on river right or left. J. Magalski answered the downstream nest is on river right. A. Grooms also wondered whether bobwhite quail were spotted in the agricultural areas downstream of Buck Dam, noting that several landowners have been working on bobwhite habitat improvement plans with the National Resource Conservation Service in an area about 1 -1.5 mile downstream of Buck Dam on river right. Any spotting of individuals would be great information and give landowners hope of success. E. Mularski confirmed that the field team detected bobwhite calls while surveying near the mentioned habitat improvement area.

J. Feinberg asked if HDR/Appalachian had recently updated the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPAC) database query since the monarch butterfly was recently added. **Action Item** (HDR): Run recent IPAC and update study report if necessary. **Note:** Attachment 2 includes the recent IPAC results which does include the monarch butterfly. Additional information will be provided in the FLA if needed.

J. Norman added that the Green Floater may be proposed for listing early next year.

Aquatic Resources Study (Slides 8-48)

Misty Huddleston (study lead) introduced the Aquatic Resources Study methods and objectives, and study results were presented by Jon Studio with EDGE Engineering & Science (EDGE). The Aquatic Resources Study results presented during the meeting consisted of the following sub-studies:

- Fish Community Survey
- Desktop Fish Impingement and Entrainment Study (including the Turbine Blade Strike Analysis)
- Macroinvertebrate and Crayfish Survey
- Mussel Community Study which was completed and presented in the ISR in 2020.

Study Results

Fish Community Survey: EDGE (led by J. Studio) completed the Fish Community Survey in accordance with the methods described in the RSP and SPD. The general fish community survey utilized boat and backpack electrofishing methods and gill net sets and was completed spring 2021.

There were 244 fish of 20 species collected using boat electrofishing from the Byllesby Pool, and 353 fish of 24 species from the Buck Pool. Backpack electrofishing sites yielded 48 fish representing 11 species upstream of Byllesby Dam, 156 fish of 18 species between dams, and 206 fish of 17 species downstream of Buck Dam. No Candy Darter were observed or collected in study samples. There were six Walleye collected in fall 2020 sampling efforts and three Walleye collected in the spring 2021 sampling effort.

Fish Impingement and Entrainment/Blade Strike Analysis: An assessment of impingement and entrainment risk at the intake structures was completed along with an assessment of turbine blade strike and fish passage survival using the 2020 USFWS Turbine Blade Strike Analysis model. Blade strike probability increases with increasing fish size; but larger fish can avoid the Project intakes. Planned upgrades from Francis to Kaplan turbines (3 of 4 turbines at Byllesby and 2 of 3 turbines at Buck) will reduce strike probability and improve passage survival for Walleye and other species at the Project:

- Cumulative Walleye passage survival after turbine upgrades for average size Walleye (approx. 15 inches long) across multiple percent flow exceedance scenarios was:
  - Estimated to be between 82.8 and 88.8 percent at Byllesby
  - Estimated to be between 82.7 and 91.4 percent at Buck
- Cumulative passage survival of multiple fish size classes for all other species with turbine upgrades was estimated:
  - Between 58.3 (30-inch fish) and 96.8 percent (2-inch fish) at Byllesby
  - Between 57.5 (30-inch fish) and 97.1 percent at Buck
- Entrained fish less than 6.0 inches at Byllesby and Buck
  - Survival with existing conditions - 86 percent or higher
  - Survival with upgraded turbines - 92 percent or higher

<u>Macroinvertebrate and Crayfish Survey:</u>

Quality habitat was observed at seven of the eight sites; one site was classified as heavily embedded (BFQT2). Habitats consisted primarily of bedrock, boulder, cobble, and gravel substrates. Qualitative Sites were classified as relatively poor-quality habitats and consisted primarily of sand, silt, and bedrock substrates.

Two native species of crayfish were collected and identified in the field during survey efforts: the Conhaway Crayfish (*Cambarus appalachiensis*) and Spiny Stream Crayfish (*Faxonius cristavarius*). Spiny Stream Crayfish were the only crayfish species collected above Byllesby. Conhaway and Spiny Stream crayfishes were collected at sites between Byllesby and Buck and downstream of Buck. No invasive species were collected at any of the sites during the study.

Stakeholder Questions/Comments

J. Norman asked about the location of the most downstream sample site in relation to furthest upstream documented occurrence for the candy darter. J. Studio clarified that the most downstream study site was located approximately 800-900 meters below Buck Dam, while the nearest known occurrence of Candy Darter is located over 5 miles downstream of Buck Dam. J. Studio noted that the survey methods would have been appropriate to detect candy darter, if it were present in the survey area.

Jessica Pica asked for an explanation for the 1.5 value used in the calculation of the intake approach velocity and requested confirmation that through-rack velocity calculations were not provided in the study report. T. Ziegler provided a description of each of the values used in the intake approach velocity calculation, including the “14” in the calculation which represents the total height of the intake structure. T. Ziegler stated that the 1.5 value is a multiplier used in the calculation to provide an estimate of the intake approach velocity. The 1.5 multiplier is a general rule of thumb used in hydraulic analyses to approximate the area from which units pull water within the water column. Using 1.5x the unit opening is a more conservative (i.e., higher) estimation of the intake velocity versus using the entire water column height. T. Ziegler also confirmed that through-rack velocity calculations were not required by the Revised Study Plan.

J. Norman requested additional details and explanation on the flow exceedance values used in the turbine blade strike analysis. S. Kulpa directed J. Norman and others to review the detailed data table provided in Table 5.14 of Attachment 2 of Appendix C to the USR, which shows the flow values associated with each percent flow exceedance referenced in the presentation and USR. J. Norman asked if J. Pica had any concerns regarding the data presented for Walleye impingement/entrainment. J. Callihan reminded the group that the results presented for Walleye depend on fish swim speeds and represent only those fish that have already been identified as susceptible to impingement/entrainment at the Project intake structures. J. Callihan further emphasized that the data assumes that Walleye would be moving downstream in a way that they would encounter the intake structures, and Walleye are unlikely to be moving downstream on a regular basis. J. Copeland agreed, stating that adult Walleye are more likely to seek habitats upstream. R. McCorkle stipulated that Walleye typically seek habitat appropriate for their specific life stage. M. Huddleston summarized the discussion, concluding that based on life history traits of the species, Walleye have a low likelihood of encountering the intakes and Project turbines.

R. McCorkle pointed out that the number of blades identified in the presentation (5 blades per Kaplan turbine) differed from what was presented in the Draft License Application (DLA) (6 blades per Kaplan turbine). S. Kulpa checked the vendor specifications and confirmed that new Mavel Kaplan turbines would have 5 blades per turbine and that this information will be corrected/confirmed in the FLA. S. Kulpa further noted that as presently proposed, unit upgrades would commence upon new license issuance and proceed at approximately one per year until 5 units have been upgraded (3 at Byllesby, 2 at Buck). HDR did not try to account for the varying unit technology over the new license term in this analysis. The remaining Francis unit at each development would be operated in a last-on/first-off manner following upgrades of the other units.

J. Norman asked for additional clarification to be provided for Tables 5-13 and 5-14 of Attachment 2 of Appendix C to the USR so that it is clear to which of the flow scenarios the results pertain. J. Callihan: also asked if the row of values that were the exact same in Table 5-13 was a typo. **Action Item** (HDR): M. Huddleston stated that it was a typo and will update the tables for clarity and share revised tables. **Note:** The updated tables are provided in Attachment 3.

J. Norman asked whether the intake velocity calculations were field verified and S. Kulpa directed her to the discussion in the ISR referring to the 15-degree angle of the trash racks which created unfavorable conditions for field measurements. J. Pica further confirmed that she was unaware of any studies that have performed field verification of desktop velocity calculations where the trash racks were angled. T. Ziegler stated that not only are the racks inclined, but the acoustic Doppler current profiler (ADCP) would need to be far enough away so the beam does not intersect the bar racks, which would require a large distance, meaning the values would no longer be representative of the existing approach velocities at the intake. J. Pica asked if there were any additional detailed drawings/information/calculations for the approach velocity. T. Ziegler indicated that the only calculations provided in the USR are included in the text since the formulas are straightforward for calculating approach velocity, unlike the more complex calculations required for through-screen velocity (which were not required). Available historical design drawings were included as an attachment to the study report.

J. Callihan requested clarification on the use of “fixed blade turbines” and asked if the turbines are adjustable over a range of flows and how spilling operations may be modified as units are ramped up and down. J. Dvorak clarified that the term “fixed blade” refers to a design where the pitch of the turbine blades is fixed and cannot be changed. With fixed blades, the range of usable flow is controlled by a combination of the turbine/generator specifications. S. Kulpa noted that upgrading the units is expected to result in a significant increase in efficiency and power generation (in megawatt-hours annually) and will be designed to operate over a larger range of flows.

There were no questions about or further discussion on the Macroinvertebrate and Crayfish Survey.

Bypass Reach Flow and Aquatic Habitat Study (Slides 113-134)

Study Results

T. Ziegler (study lead) introduced the study, methodology, and results for the Bypass Reach Flow and Aquatic Habitat Study. He explained that the Buck Development study was covered in the ISR, therefore, the focus of the USR is predominantly the Byllesby Development. The following tasks have been completed:

- Completed desktop habitat mapping and evaluation of Project inflows
- Assembled Habitat Suitability Index (HSI) criteria
- Developed model calibration target flow recommendations
- Collected field data during target flow releases into each bypass reach
- Developed and calibrated 2-D hydraulic model for each study area
- Used model to simulate potential available habit in each study area at the model calibration target flows

The Byllesby bypass reach consists of deep and shallow pools and shoal habitat types dominated by larger substrate sizes. Habitat model results indicate suitable habitat for species and life stages that prefer deep and/or slow-moving water. Increasing flow only has a marginal effect on depths and velocities. As a result, the amount of available habitat in the bypass reach is very similar over the modeled flow range (between 11 – 194 cubic feet per second [cfs]).

Questions/Comments

With respect to the “cover” variable, J. Norman asked if a single spot could have instream and overhead vegetation and how does one arrive at the percentage for vegetation. T. Ziegler stated that the study report will be clarified. **Action Item** (HDR): Add clarification and any necessary updates to Table 6-1 in the revised study report to be filed with the FLA.

J. Norman asked why HDR used the four target flows (11, 88, 158, 194 cfs). T. Ziegler stated that required target flows and range of flows were required that could be modeled up to 360 cfs. J. Norman didn’t realize that the four flows were extrapolated up to 360 cfs. T. Ziegler stated that it is more important to model lower flows correctly due to the uncertainty of bed roughness.

J. Norman asked about the velocity heat map. J. Dvorak created it for the presentation (not in the report), but HDR will add into the report. **Action Item** (HDR): Add depth and velocity “heat maps” to the revised study report to be filed with the FLA.

Woohee Choi asked about the 2-D model and the mesh sizes near the Tainter gates/inflow boundary. J. Dvorak explained that the Integrated Catchment Model (ICM) uses terrain-sensitive meshing which automatically adjusts mesh element sizes based on slope of the terrain. The Byllesby model setup limits height variation between adjacent mesh elements to no more than 0.25’. The model minimum mesh size is 2.5 square feet. This setup results in mesh elements that are approximately 5 square feet in the vicinity of the Tainter gates, and each Tainter gate is modeled using approximately 6-8 elements.

J. Norman questioned the best way to interpret the habitat results maps. T. Ziegler explained how flow descends from the spillway and pointed out Tainter Gate #6. J. Norman asked if Tainter Gate #6 would be used for operating procedures for releasing flows. J. Callihan asked if the powerhouse is operating, is the 360 cfs (or inflow) minimum flow release provided downstream via generation or at the spillway. (Appalachian and HDR confirmed that it is provided at the powerhouse but noted that the run-of-river operation of the Project typically trumps the minimum flow, and there are only a few days in a typical year where the minimum flow requirement would be triggered.) The group discussed that if powerhouse flows were cut off, it appears the side channel and crossover channel would be altered. J. Norman asked if HDR had any results representing no powerhouse flow with the 360 cfs released at the spillway. J. Callihan stated that he understood the agencies were more concerned with stranding of Walleye at Buck than at Byllesby. F. Colburn added description of the two approaches on how Appalachian opens the gates and explained how the flows are managed during outages. HDR confirmed that a 360 cfs release at the spillway had not been previously modeled but could be modeled; however, the group agreed that providing the minimum flow at the powerhouse provides more habitat benefits.

J. Norman and T. Ziegler extended the conversation regarding modeling at Byllesby and what the benefits would be regarding flow releases. Modeling different flow scenarios shows impacts of different flow scenarios. J. Norman noted that USFWS is interested in understanding the impacts of flow modifications downstream of Byllesby when the powerhouse is offline.

J. Callihan asked if there were Walleye in the area and if this exercise is warranted (at Byllesby). J. Callihan asked a follow-up question about the Buck flow model and if there is an escape pathway under the existing required ramping rate for Walleye (qualify connectivity and body depth of Walleye). Walleye stranding has been previously stated as a significant concern to agencies.

J. Copeland confirmed that Walleye do use the reach below Byllesby but agreed that the Buck bypass reach is a larger concern.

T. Ziegler stated that at Buck Tainter Gate #1 is operated so ramping doesn’t affect the side channel. A spillway flow of at least 5,000 cfs is needed to barely make a difference in water surface elevation at the lower end of the side channel (opposite side of the spillway from Tainter Gate #1). Much higher spillway flows would be needed to inundate the side channel (which occurs infrequently). When this does happen, and as these higher flows recede, there is currently no continuous escape route and a few isolated pools develop along the upper end of the side channel.

J. Callihan asked if the new Obermeyer gates reduce the frequency of flashboard failures at Buck. F. Colburn replied that installation of the Obermeyer gates at Buck does reduce the frequency of flashboard failures and reduces stress and strain on the boards, however, flashboard leakage and breakage does still happen mainly as the result of deterioration due to age of the wooden flashboards and number of flashboard sections. Appalachian does not perform general maintenance of the flashboards on a set frequency, because doing so requires a drawdown of the reservoir; repairs are made as needed and as can be completed during reservoir drawdowns for flashboard repair or other Project maintenance purposes. J. Callihan noted that replacing flashboards would require a drawdown/agency consultation. F. Colburn confirmed that agency consultation is done prior to any drawdowns.

Action Item (Appalachian): Because of limited time at the USR meeting to revisit the Buck model outputs and potential conditions or modifications of interest to agencies and stakeholders, Appalachian and HDR will plan to set up a separate, follow-up WebEx meeting for late January.

Recreation Study (Slides 136-147)

Maggie Salazar (study lead) reviewed the Recreation Study goals and results and provided an overview of the Project and non-Project Recreation Facilities.

Study Results

M. Salazar explained that the Recreation Study was completed in 2020 and gave a brief overview of the tasks and findings of the study. HDR found consistent recreation usage at most of the Project and non-Project facilities with usage peaking on weekends, holidays, and warmer months. The New River Trail provides a unique opportunity to access most of the recreation facilities in otherwise remote locations. The trail camera and online survey results indicated that fishing and canoe/kayaking were the primary recreation activities. The Buck Dam Canoe Portage was the only Project recreation facility that saw very little recreation usage, likely because it is inaccessible except by boat.

M. Salazar then presented the proposed Loafers Rest Fishing Trail and enhancements to the Loafers Rest Non-Project facility.

Questions/Comments

J. Norman asked what area would be covered by the Recreation Management Plan. S. Kulpa replied the Recreation Management Plan would encompass Project and Non-Project facilities within/in the vicinity of the FERC Project boundary.

A. Grooms stated that she appreciated the proposed Loafer's Rest improvements and asked if there has been any progress on the Thompson Campground. S. Kulpa stated she did not have any information regarding the campground, and the state agencies did not comment. David Taylor asked whether the existing walking trail at Loafers Rest would be upgraded since it is currently in poor condition. S. Kulpa said Appalachian will take the comment under consideration in preparation of the draft Recreation Management Plan (presently scheduled for development and distribution to stakeholders in advance of or with the FLA). The Virginia Department of Wildlife Resources (VDWR) agreed that the proposed Loafers Rest enhancements and fishing trail reflected what they had suggestions as improvements. D. Taylor expressed the importance of population growth in the area due to new economic development in the area, especially as it relates to usage of the New River Trail and A. Grooms concurred.

Samantha Pollak requested that the FERC Project boundary be added to any recreation map in the draft Recreation Management Plan and FLA. S. Pollak also asked about Fowler's Ferry and M. Salazar confirmed that Fowler's Ferry is outside of the Project boundary. S. Pollak asked about other recreation intended uses at Byllesby VDWR Boat Launch. J. Copeland stated that VDWR's recreation usage allows for boating and fishing. Maggie Salazar confirmed boating and fishing accounted for most of the use occurring at the Byllesby VDWR Boat Launch.

S. Pollak wondered whether drawdowns and flooding occurred often and how much the Byllesby VDWR Boat Launch was impacted by these. E. Parcell confirmed drawdowns typically happen once every other year and J. Copeland confirmed that flooding happens a few times a year. E. Parcell described Appalachian's typical process for early notification (where feasible) of agencies and stakeholders of planned drawdowns and methods for publishing this information to various outlets.

The Wildlife Viewing Plan is on the VDWR website.

Action Item (HDR): Jennifer Wampler asked for FERC Project Boundary (kmz or shp) and requested a follow-up meeting to discuss recreation, given limited attendance by the Virginia Department of Conservation and Recreation (VDCR) at the USR meeting. Appalachian and HDR will coordinate with agencies to schedule this meeting, after the new year. **Note:** The FERC Project boundary was sent (via email from M. Salazar) to J. Wampler on December 9th, 2021.

Shoreline Stability Assessment (Slides 69-82)

E. Mularski (study lead) introduced the Shoreline Stability Assessment goals and results. (Note: this study was started and completed in 2021, and therefore was not presented in the ISR.)

Study Results

A survey of the Project's reservoirs, bypass reaches, and tailrace areas was performed to characterize the shoreline, with the focus on erosion or shoreline instability using the Bank Erosion Hazard Index (BEHI). Approximately 7.25 miles of New River Shoreline was assessed. Approximately 80% of shoreline was stable and did not exhibit active erosion. Banks with some level of visible erosion had higher bank height ratios, moderate root depth, low to moderate surface protection, and moderate to high bank angles. No areas were categorized as having very high or extreme erosion potential.

Questions/Comments

No comments or questions were raised on this study.

Cultural Resources Study (Slides 148-154)

Bill Green (study lead) reviewed the Cultural Resources Study methods and results by Terracon Consultants, Inc.

Study Results

B. Green reviewed the 2020 field survey results. Most of the Area of Potential Effects (APE) is either steeply sloped or contains deeply buried historic alluvial deposits with little to no chance of containing significant archaeological resources. There is little to no erosion or other Project-related effects in any portions of the APE.

One 47.5-acre area located at the northeastern end of the Project has the potential for containing archaeological resources. The area currently is not experiencing any project-related effects. However, should ground disturbing activities take place in this area, a Phase I archaeological survey would be required in this area. (Note: this is the area of Loafer's Rest)

Three above-ground historic resources – the Byllesby and Buck Hydroelectric Facilities and the Norfolk and Western Railroad Cripple Creek Extension – are eligible for inclusion in the National Register of Historic Places (NRHP). All three were revisited and evaluated during the fieldwork and all three remain eligible for listing in the NRHP. It is Terracon's opinion that no historic properties are currently being affected by continued Project operations.

Questions/Comments

S. Pollak asked if the State Historic Preservation Officer (SHPO) had provided concurrence on this study. S. Kulpa reminded the group that SHPO had concurred on the APE, but no comments have been received from SHPO or Tribes on the Cultural Resources Study Report.

S. Pollak asked about naming conventions to the Byllesby-Buck Dam and Bill Green explained the difference in the report (due to naming conventions of previous investigations). S. Pollack asked about disturbance due to turbine replacement since the Byllesby Dam is listed on the NRHP. S. Kulpa and B. Green noted that modifications to electromechanical equipment inside the powerhouses are commonly included in the categorical exclusions/activities exempt from SHPO consultation in the Project's HPMP (under development). SHPO will have the opportunity to review the HPMP and consultation-exempt activities proposed within. E. Parcell noted that Appalachian has historically consulted SHPO prior to physical modifications of NRHP-eligible structures.

Next Steps and Discussion

E. Parcell reviewed comment deadline dates and upcoming activities.

Final Comments

J. Callihan asked F. Colburn about the 360 cfs minimum flow release. S. Kulpa shared HDR's speculation that this existing license requirement may be a relic of the operating mode (modified peaking) for the Project from the previous license.

J. Norman asked whether the turbine upgrades would result in extended periods of powerhouse outages. F. Colburn confirmed that the majority of the unit upgrade activities do not require a full station outage, as each unit has its own headgate that can be lowered to dewater the unit.

J. Callihan asked if future bypass reach flow modeling would simply be desktop work. T. Ziegler said yes, any future bypass reach flow modeling output would not require for additional fieldwork and can be run fairly quickly.

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Attachment 1

Attachment 1 – Potential Virginia Spiraea and Invasive Species Habitat

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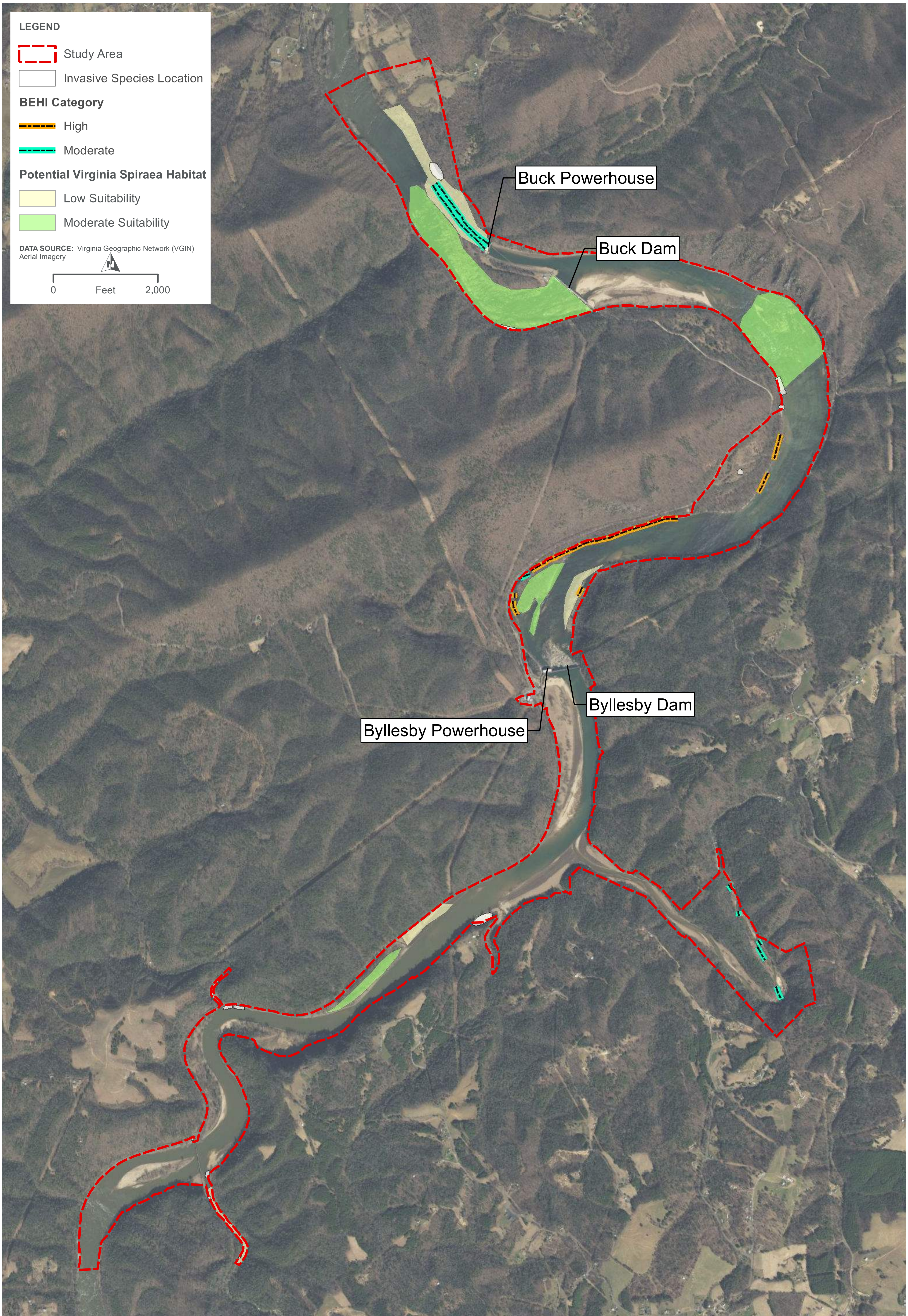

WETLANDS, RIPARIAN, AND LITTORAL HABITAT STUDY REPORT

POTENTIAL VIRGINIA SPIRAEA AND RIPARIAN HABITAT

Attachment 2

Attachment 2 – IPaC Results

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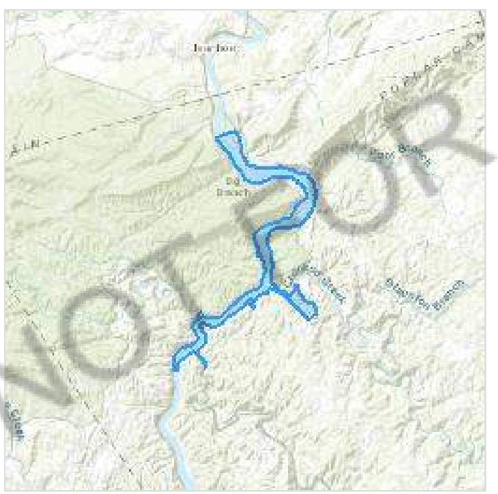
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Carroll County, Virginia



Local office

Virginia Ecological Services Field Office

(804) 693-6694
(804) 693-9032

6669 Short Lane
Gloucester, VA 23061-4410

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat Myotis sodalis Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Virginia Spiraea Spiraea virginiana Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1728	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus

Breeds Sep 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black-billed Cuckoo Coccyzus erythropthalmus

Breeds May 15 to Oct 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Black-capped Chickadee Poecile atricapillus practicus

Breeds Apr 10 to Jul 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Canada Warbler Cardellina canadensis

Breeds May 20 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Eastern Whip-poor-will Antrostomus vociferus

Breeds May 1 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina

Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

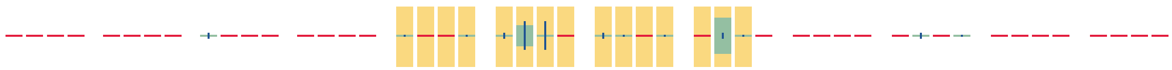
Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Black-billed Cuckoo
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

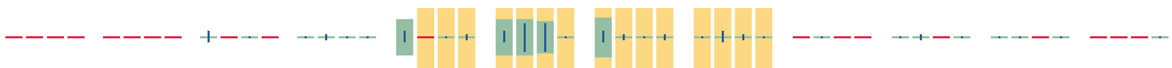
Black-capped Chickadee
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Canada Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Eastern Whip-poor-will
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

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

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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Attachment 3

Attachment 3 – Impingement and Entrainment Updated Tables

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Table 5-13. Turbine Blade Strike Probability by Project Configuration and Fish Length Under No Spill Operations[1]

Project Dam	Turbine Type	Fish Length Class (inches)								
		2	4	6	8	10	15	20	25	30
Existing Conditions – Francis Turbines Under No Spill Operations										
Byllesby	Existing (4 Francis Turbines)	4.5%	8.8%	13.3%	17.8%	22.1%	33.3%	44.5%	55.4%	66.6%
Buck	Existing (3 Francis Turbines)	4.5%	8.7%	13.2%	17.7%	21.9%	32.9%	44.0%	54.8%	65.9%
Proposed Conditions – Upgraded Turbines Under No Spill Operations										
Byllesby Proposed Condition	New Kaplan (Units 1, 2 & 3)	2.2%	4.3%	6.5%	8.7%	10.8%	16.3%	21.7%	27.1%	32.5%
	Existing Francis	4.5%	8.8%	13.3%	17.8%	22.1%	33.3%	44.5%	55.4%	66.6%
	Average Strike Probability[2]	2.8%	5.4%	8.2%	11.0%	13.6%	20.5%	27.4%	34.2%	41.0%
Buck Proposed Condition	New Kaplan (Units 1 & 2)	2.1%	4.0%	6.1%	8.1%	10.1%	15.2%	20.3%	25.3%	30.4%
	Existing Francis	4.5%	8.7%	13.2%	17.7%	21.9%	32.9%	44.0%	54.8%	65.9%
	Average Strike Probability[2]	2.9%	5.6%	8.4%	11.3%	14.0%	21.1%	28.2%	35.1%	42.2%

1) Assumes all flows directed to turbine units and with only minimum required bypass flows or spillage.
2) Reflects blended average strike probability for the 1 remaining Francis turbine and the 2(Buck), 3(Byllesby) proposed Kaplan turbines.

Table 5-14. Walleye Downstream Passage Survival Estimates for Existing and Proposed Project Configurations Under Four Spill Scenarios.

Project	Turbine Configuration	Flow Exceedance %	Volume Spill (CFS)	Spill Route Selection Probability	Turbine Strike Mortalities	Spillway Mortalities	Cumulative Downstream Passage Survival
Byllesby	Existing	4	230	0.0389	32.1%	0.2%	67.7%
Byllesby	Existing	3	1128	0.1657	24.9%	0.4%	74.7%
Byllesby	Existing	2	2355	0.2931	20.8%	0.6%	78.6%
Byllesby	Existing	1	5094	0.4728	15.9%	1.4%	82.7%
Byllesby	Proposed	4	425.6	0.0720	17.0%	0.2%	82.8%
Byllesby	Proposed	3	1324.3	0.1945	14.8%	0.4%	84.8%
Byllesby	Proposed	2	2551.2	0.3175	11.4%	0.8%	87.8%
Byllesby	Proposed	1	5290.3	0.491	9.4%	1.9%	88.8%
Buck	Existing	12	123	0.0336	28.3%	0.1%	71.1%
Buck	Existing	10	421	0.1063	27.2%	0.3%	72.5%
Buck	Existing	8	816	0.1874	24.3%	0.4%	75.2%
Buck	Existing	6	1427	0.2872	22.7%	0.8%	76.5%
Buck	Existing	4	2370	0.4010	16.1%	1.3%	82.6%
Buck	Existing	2	4495	0.5594	14.1%	1.8%	84.1%
Buck	Existing	1	7234	0.6714	9.1%	2.1%	88.8%
Buck	Proposed	12	92	0.0253	17.2%	0.1%	82.7%
Buck	Proposed	10	391	0.0987	17.5%	0.5%	82.0%
Buck	Proposed	8	786	0.1805	15.4%	0.5%	84.1%
Buck	Proposed	6	1397	0.2812	14.0%	1.1%	84.9%
Buck	Proposed	4	2340	0.3959	12.4%	0.93%	86.7%
Buck	Proposed	2	4465	0.5557	7.6%	1.8%	90.6%
Buck	Proposed	1	7204	0.6687	6.5%	2.1%	91.4%

Attachment 4

Attachment 4 – USR Meeting Presentation

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AMERICAN ELECTRIC POWER

BOUNDLESS ENERGY℠

Byllesby-Buck Hydroelectric Project

Updated Study Report Meeting
December 1, 2021

BOUNDLESS ENERGY℠

Updated Study Report

- Appalachian is pursuing a new license for the Byllesby-Buck Project (Project) pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5.

- The Updated Study Report (USR) filed on November 17, 2021 describes the methods and results of the studies conducted in support of preparing an application for new license for the Project.

- The Federal Energy Regulatory Commission's (FERC) regulations at 18 CFR §5.15(f) require Appalachian Power Company (Appalachian) to hold a meeting with participants and FERC staff within 15 days of filing the USR.

- The purpose of the USR Meeting is to discuss study results.

Meeting Agenda

Topic	Schedule
Welcome and Introduction	9:00 AM – 9:15 AM
Water Quality Study	9:15 AM – 10:15 AM
Wetlands, Riparian, and Littoral Habitat Study	10:15 AM – 10:35 AM
Terrestrial Resources Study	10:35 AM – 10:55 AM
Morning Break	10:55 AM – 11:10 AM
Shoreline Stability Assessment	11:10 AM – 11:30 AM
Aquatic Resources Study • Fish Community • Impingement and Entrainment • Macroinvertebrate and Crayfish	11:30 AM – 12:30 PM
Lunch Break	12:30 PM – 1:00 PM
Bypass Reach Flow and Aquatic Habitat Study	1:00 PM – 2:00 PM
Afternoon Break	2:00 PM – 2:10 PM
Recreation Study	2:10 PM – 3:10 PM
Cultural Resources Study	3:10 PM – 3:30 PM
Discussion, Questions, and Next Steps	3:45 PM – 4:00 PM

Completed ILP Milestones

Date	Milestone
January 7, 2019	Appalachian Filed NOI and PAD (18 CFR §5.5, 5.6)
March 8, 2019	FERC Issued Notice of PAD/NOI and Scoping Document 1 (SD1) (18 CFR §5.8(a))
April 10-11, 2019	FERC Conducted Scoping Meetings and Site Visit (18 CFR §5.8(b) (viii))
June 21, 2019	Appalachian Filed Proposed Study Plan (PSP) (18 CFR §5.11(a))
July 18, 2019	Appalachian Held Study Plan Meeting (18 CFR §5.11(e))
October 18, 2019	Appalachian Filed RSP (18 CFR §5.13(a))
November 18, 2019	FERC Issued the SPD (18 CFR §5.13(c))
July 27, 2020	Appalachian Submitted First Quarterly Report, ILP Study Update, and Request for Extension of Time File ISR
August 10, 2020	FERC Issued Order Granting Appalachian Extension of Time and Filing of ISR
August – November 2020	Appalachian Conducted First Season of Field Studies (18 CFR §5.15(a))
October 27, 2020	Appalachian Submitted Second Quarterly Progress Report (18 CFR §5.15(b))
January 18, 2021	Appalachian Submitted ISR (18 CFR §5.15(c)(1))
January 28, 2021	Appalachian Hosted ISR Meeting (18 CFR §5.15(c)(2))
February 12, 2021	Appalachian Filed ISR Meeting Summary (18 CFR §5.15(c)(3))
April 30, 2021	Appalachian Filed Third Quarterly Progress Report
July 27, 2021	Appalachian Filed Fourth Quarterly Study Progress Report
Spring – Fall 2021	Appalachian Conducted Second Year of Studies
October 1, 2021	Appalachian Filed Draft License Application (DLA) (18 CFR §5.16(a))
November 2, 2021	Appalachian Filed Fifth Quarterly Study Progress Report
November 17, 2021	Appalachian Filed Updated USR (18 CFR §5.15(f))

Studies Approved in the SPD

FERC's November 18, 2019 Study Plan Determination (SPD) for the Project directed Appalachian to conduct eight studies:

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

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Upcoming ILP Milestones

Date	Milestone
December 1, 2021	*Appalachian Host USR Meeting (18 CFR §5.15(f))*
December 16, 2021	Appalachian File USR Meeting Summary (18 CFR §5.15(f))
December 31, 2021	Stakeholders File Comments on DLA (18 CFR §5.16(e))
January 15, 2022	Stakeholders File Disagreements with USR Meeting Summary (18 CFR §5.15(f)(4)) (if necessary)
February 14, 2022	Appalachian File Response to USR Meeting Summary Disagreements (18 CFR §5.15(f)(5)) (if necessary)
February 28, 2022	Appalachian File Final License Application (18 CFR §5.17)

Water Quality Study

Byllesby Forebay 7.31.2019

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Water Quality Study

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

Specific Objectives:

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

Water Quality Study Area

Water Quality Study

Study Status

Appalachian conducted the Water Quality Study in accordance with the schedule and methods described in the RSP and SPD.

Study Periods

- 2020 study period: August 17 – October 8

  Results presented at the ISR meeting on January 28, 2021

  Monitoring locations:

  - Byllesby tailrace location
  - Buck forebay, tailrace, and bypass reach locations
- 2021 study period: June 15 – September 28

  Monitoring locations:

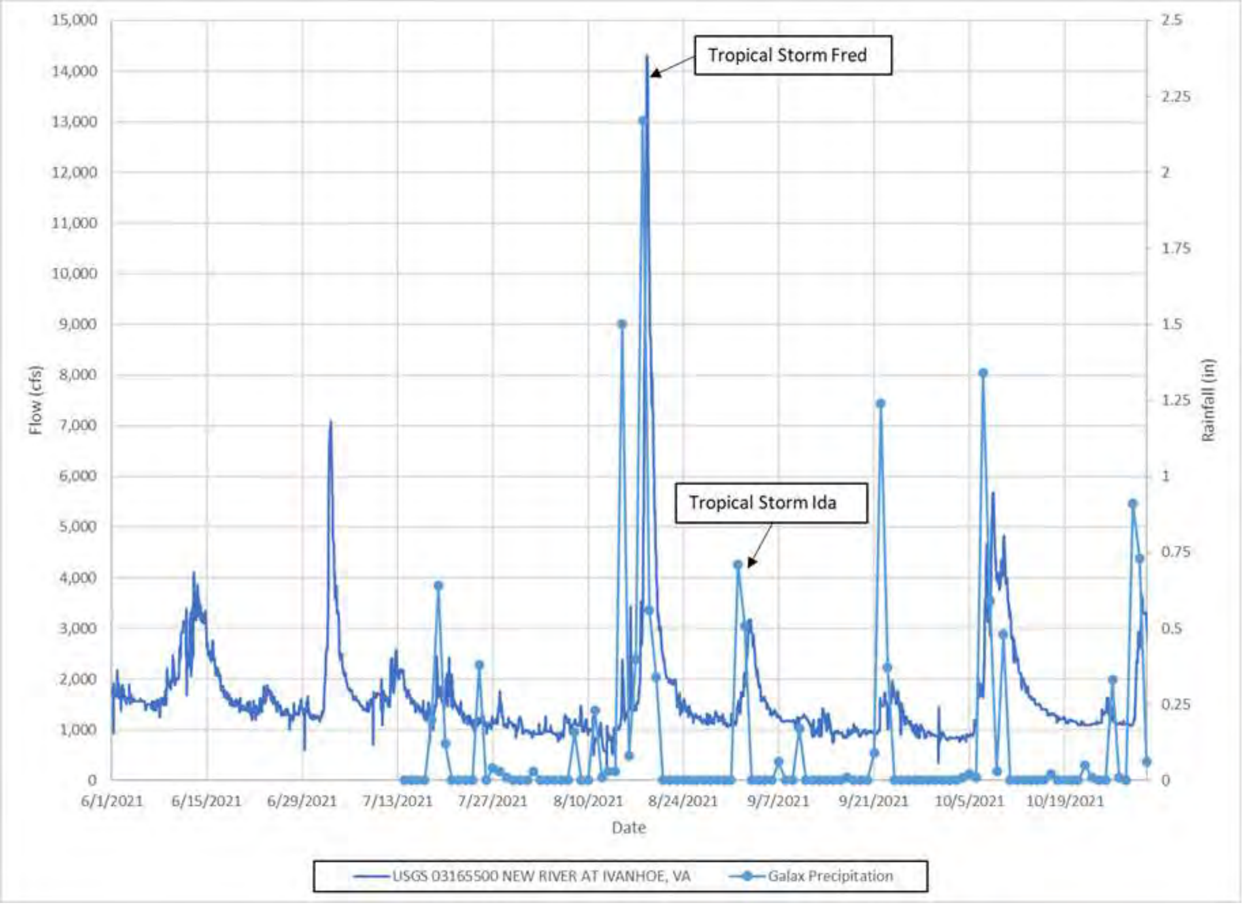
  - Byllesby upstream, forebay, tailrace, and bypass reach

Water Quality Study

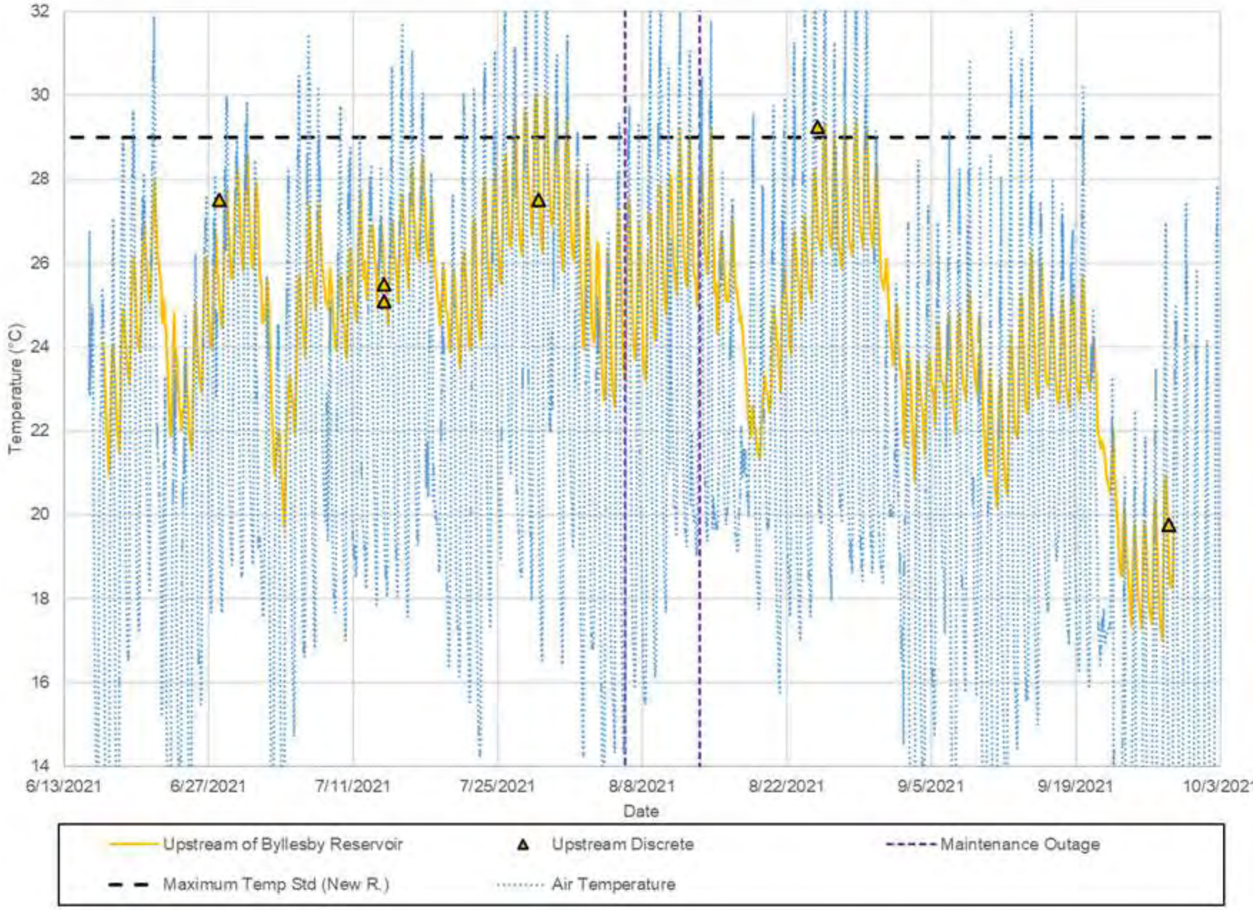
Study Methods

- Temperature and DO data collected at 15-minute intervals
- Discrete data collected during equipment installation, download events, and demobilization (temperature, DO, pH, and specific conductivity)
- Vertical profile data collected during discrete data collection events
- Turbidity data collected at 5-minute intervals over a 1-week period September 29 – October 5, 2021 and an intensive 1-day effort on October 14, 2021
- Turbidity and chlorophyll-a grab samples collected at the Byllesby and Buck forebays (July, August, and September 2021)

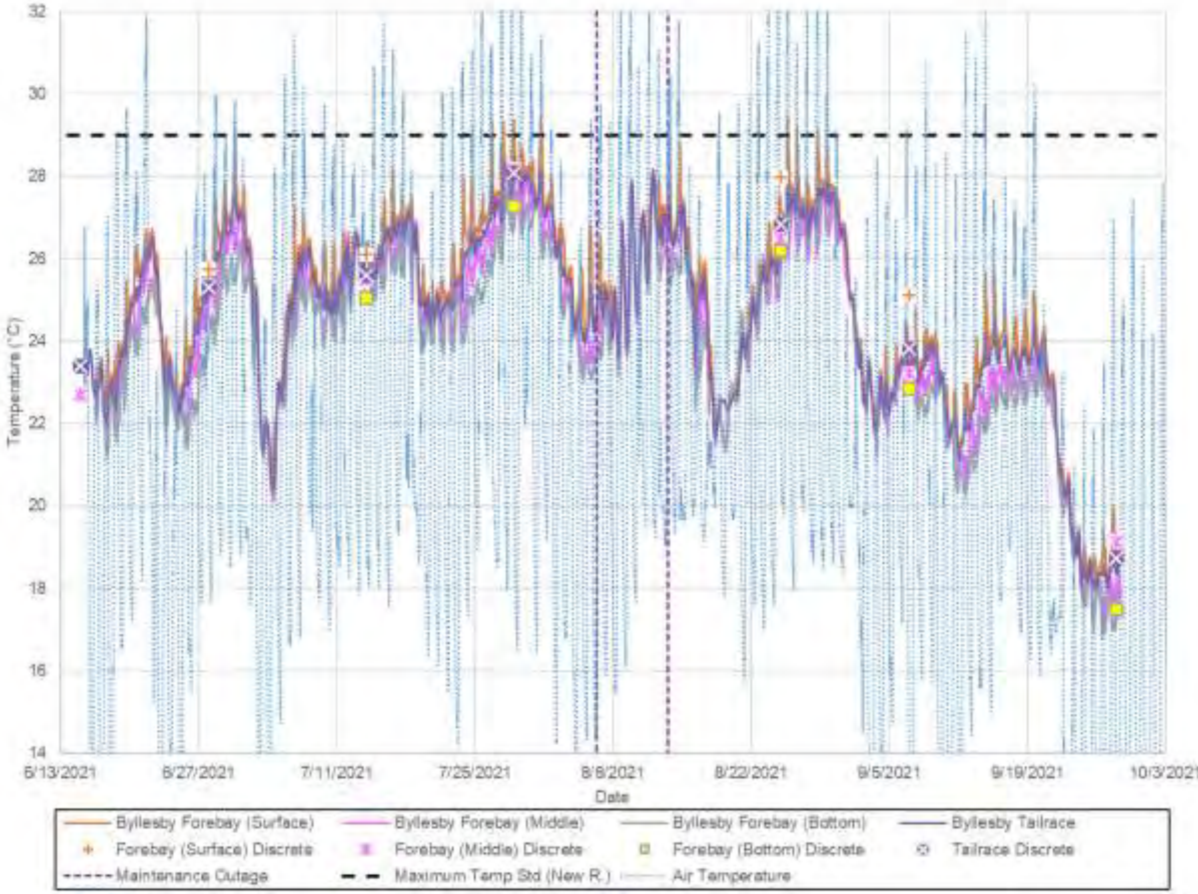
2021 Project Hydrology



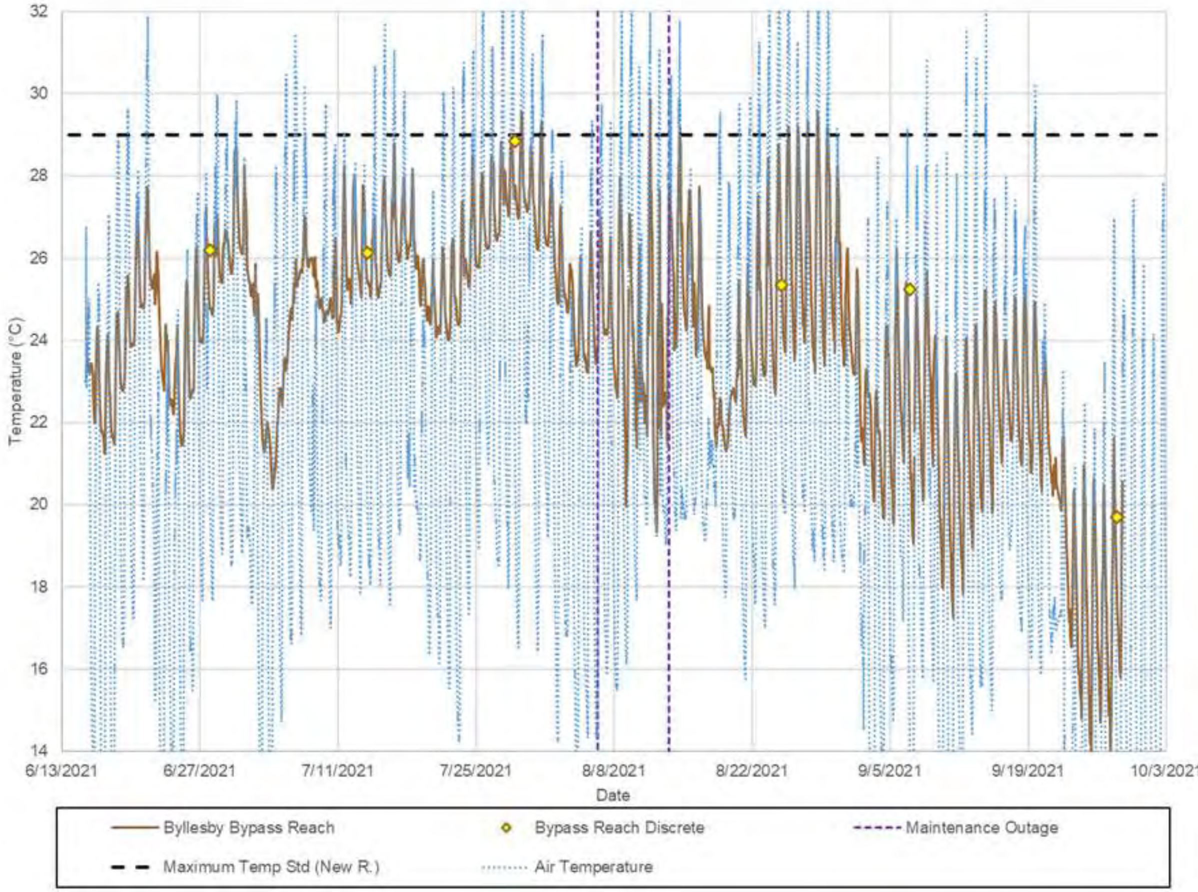
Air & Water Temperatures Upstream of Byllesby Reservoir



Air & Water Temperatures Byllesby Forebay & Tailrace



Air & Water Temperatures Byllesby Bypass Reach



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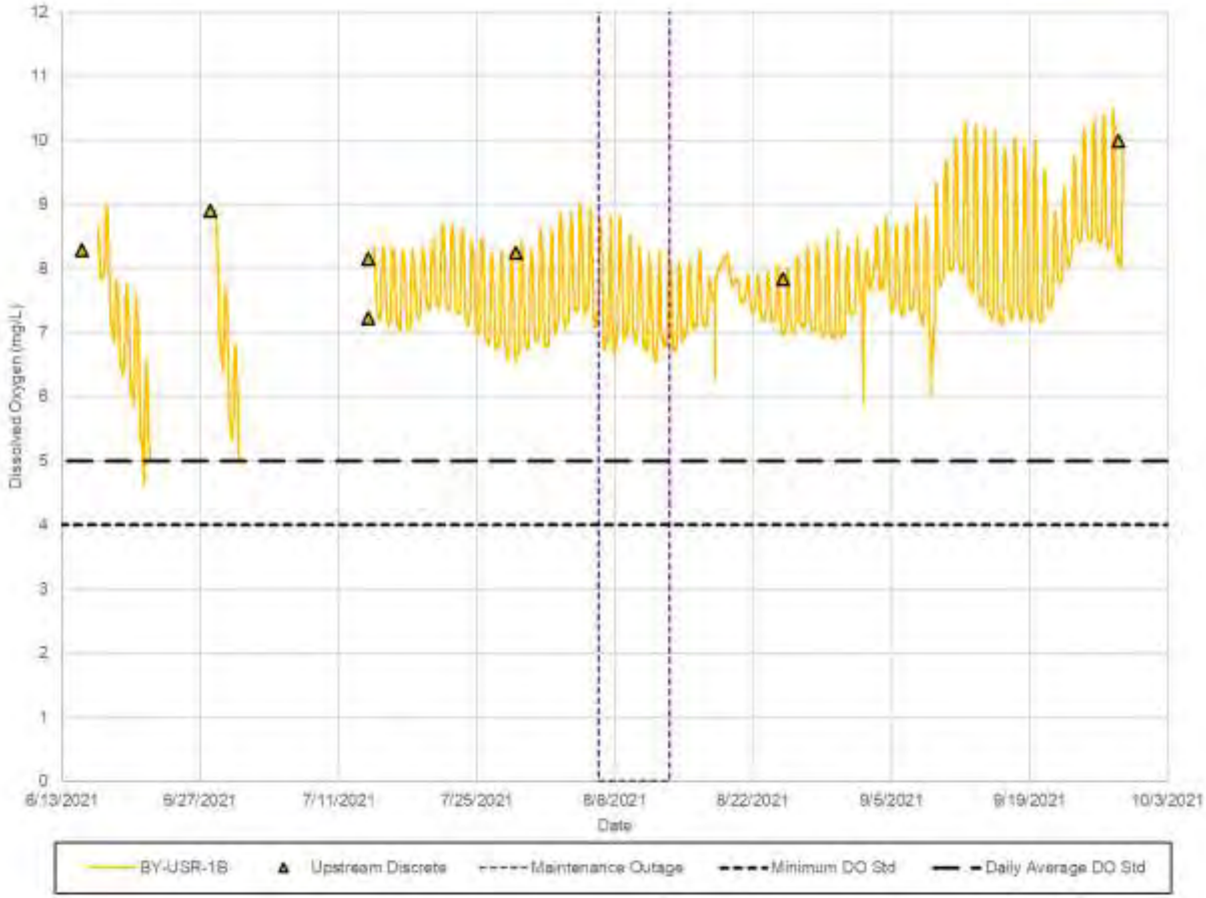
Dissolved Oxygen
Byllesby Upstream Location



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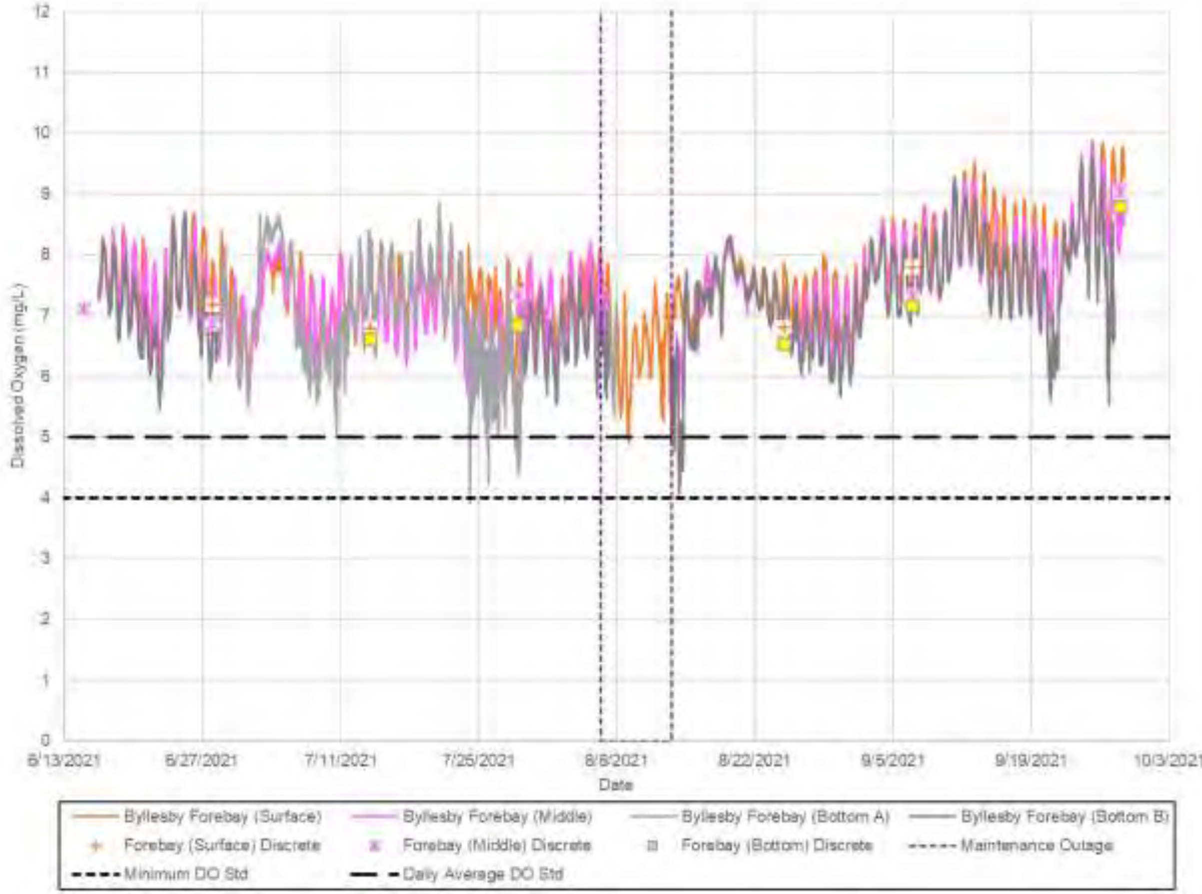
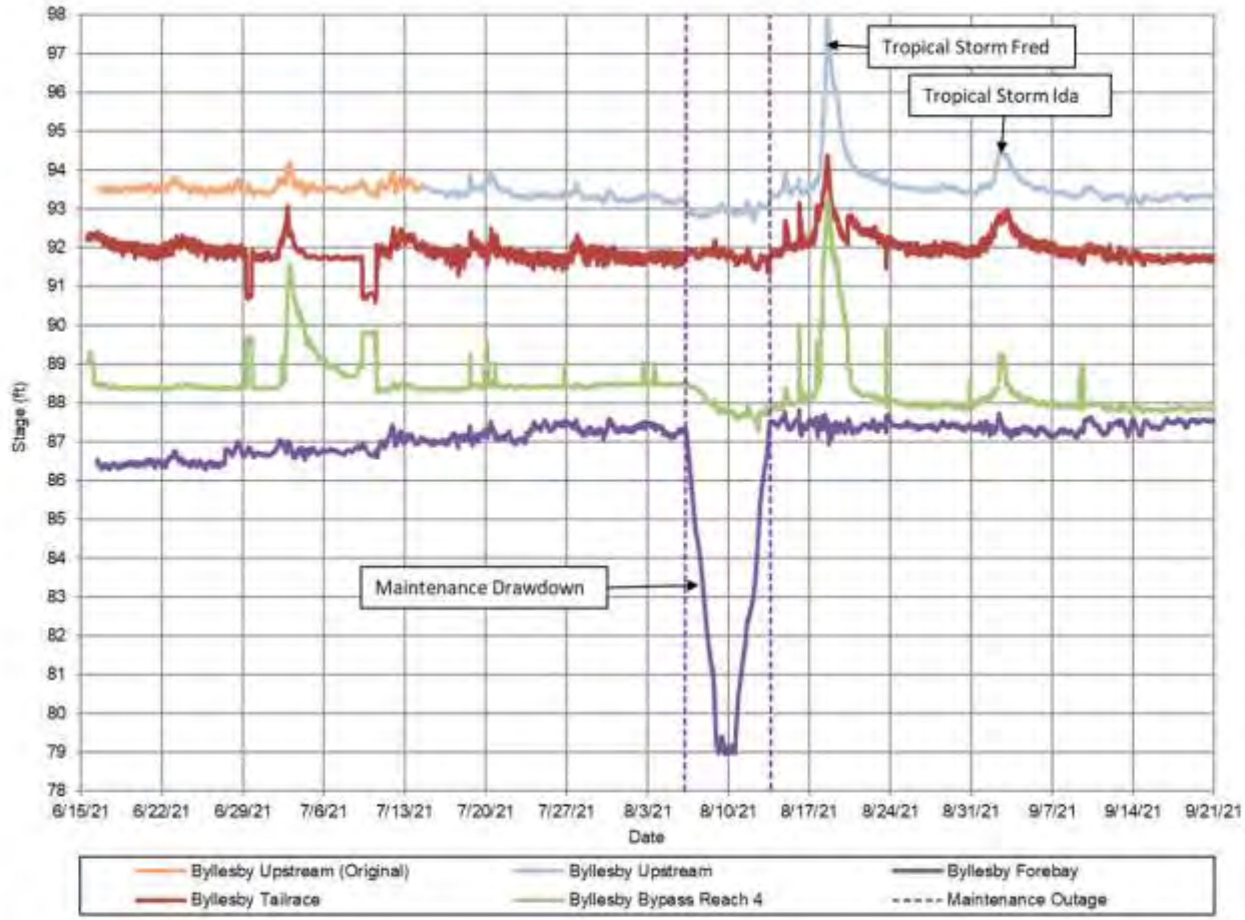
Dissolved Oxygen Byllesby Forebay



Byllesby Water Surface Elevations



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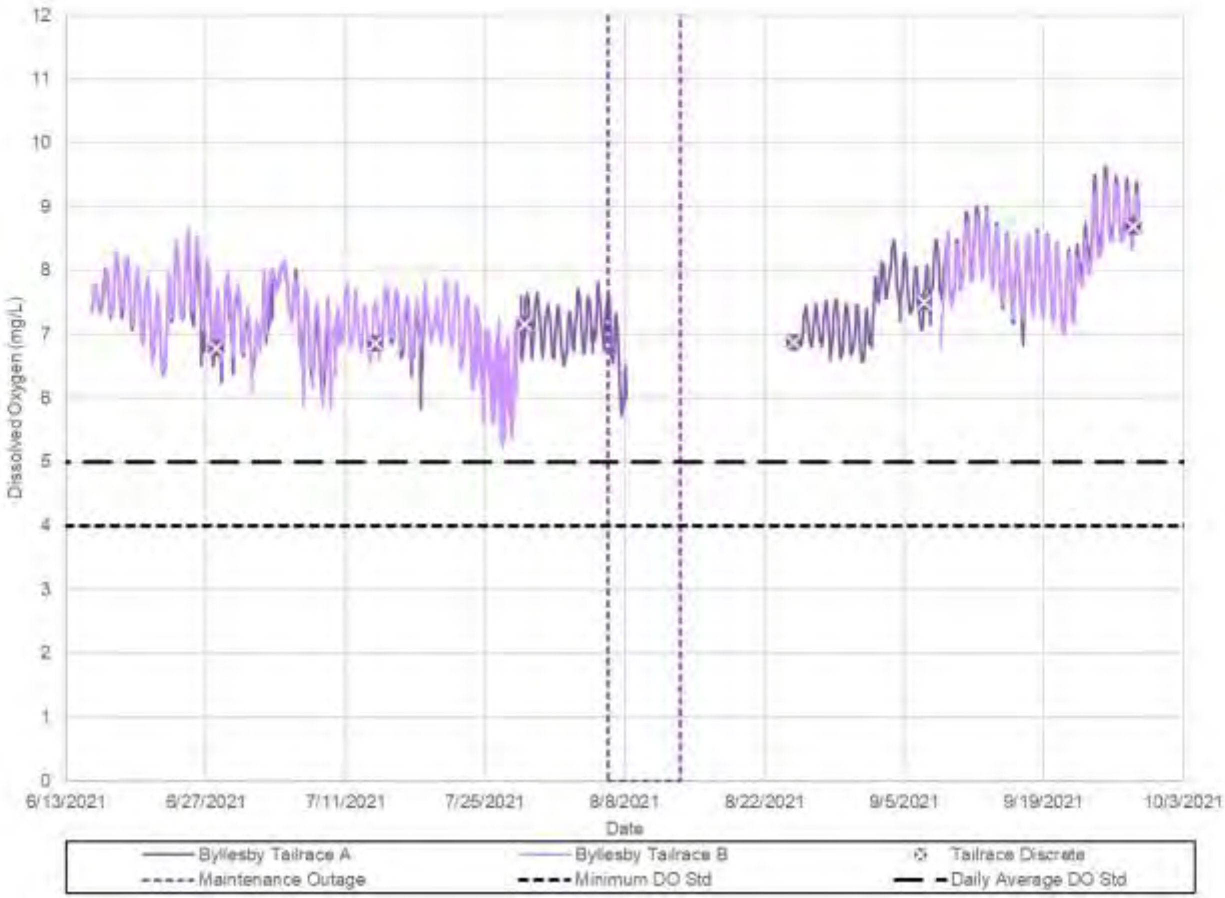
Dissolved Oxygen Byllesby Tailrace



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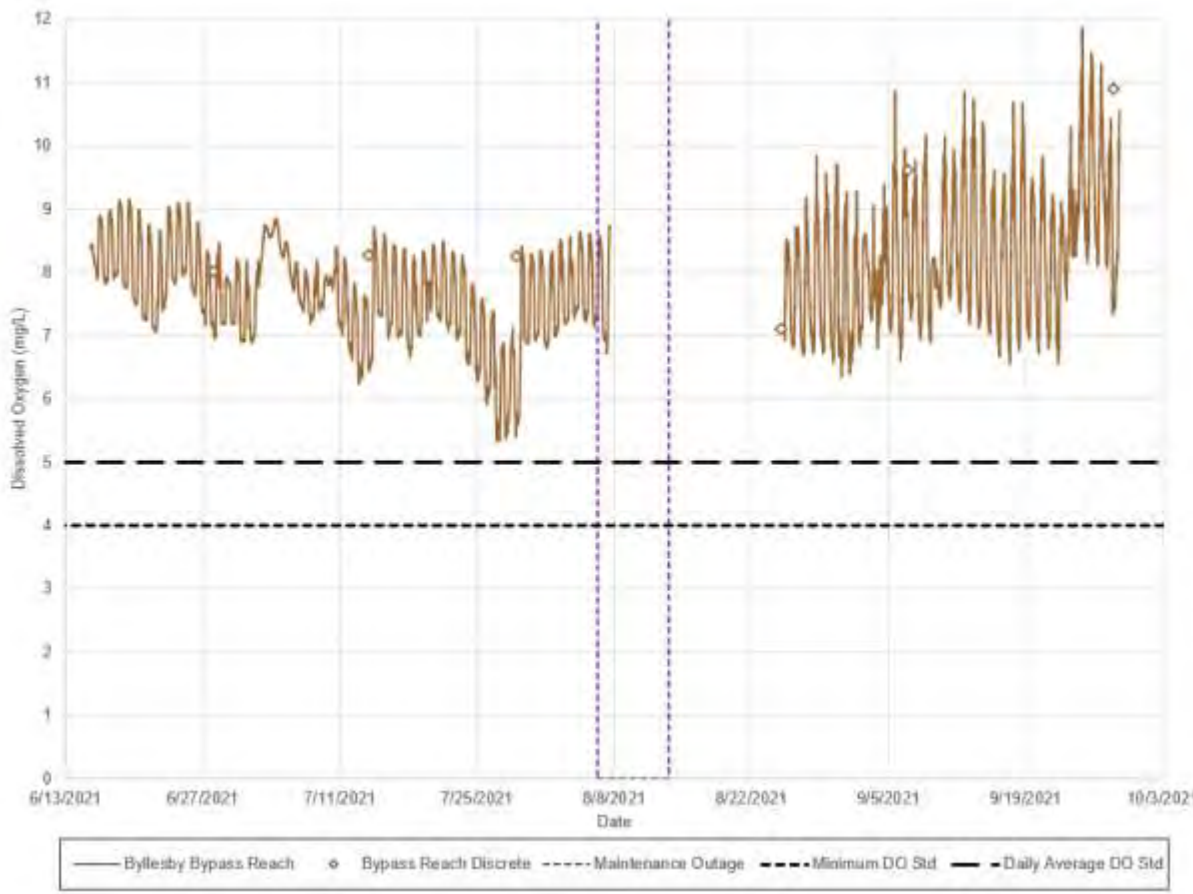
Dissolved Oxygen Byllesby Bypass Reach



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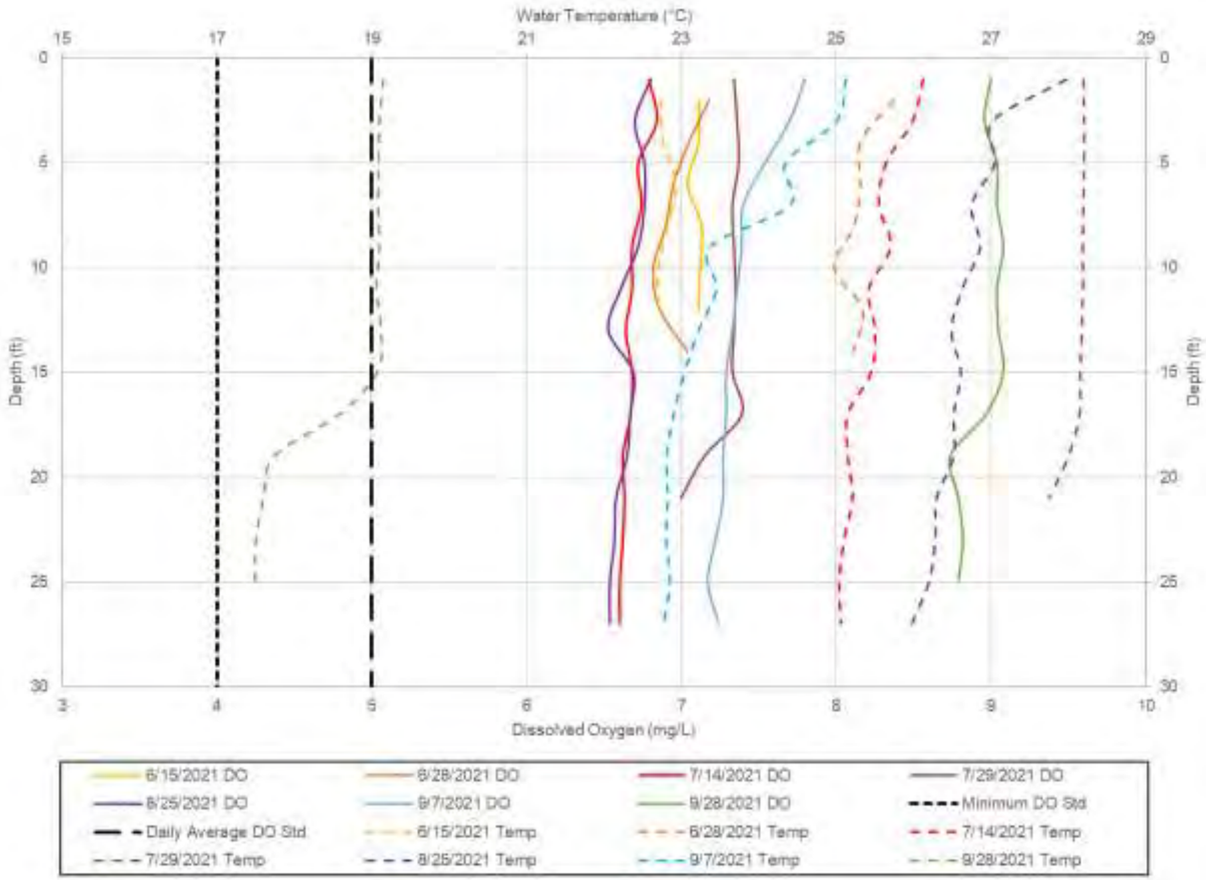
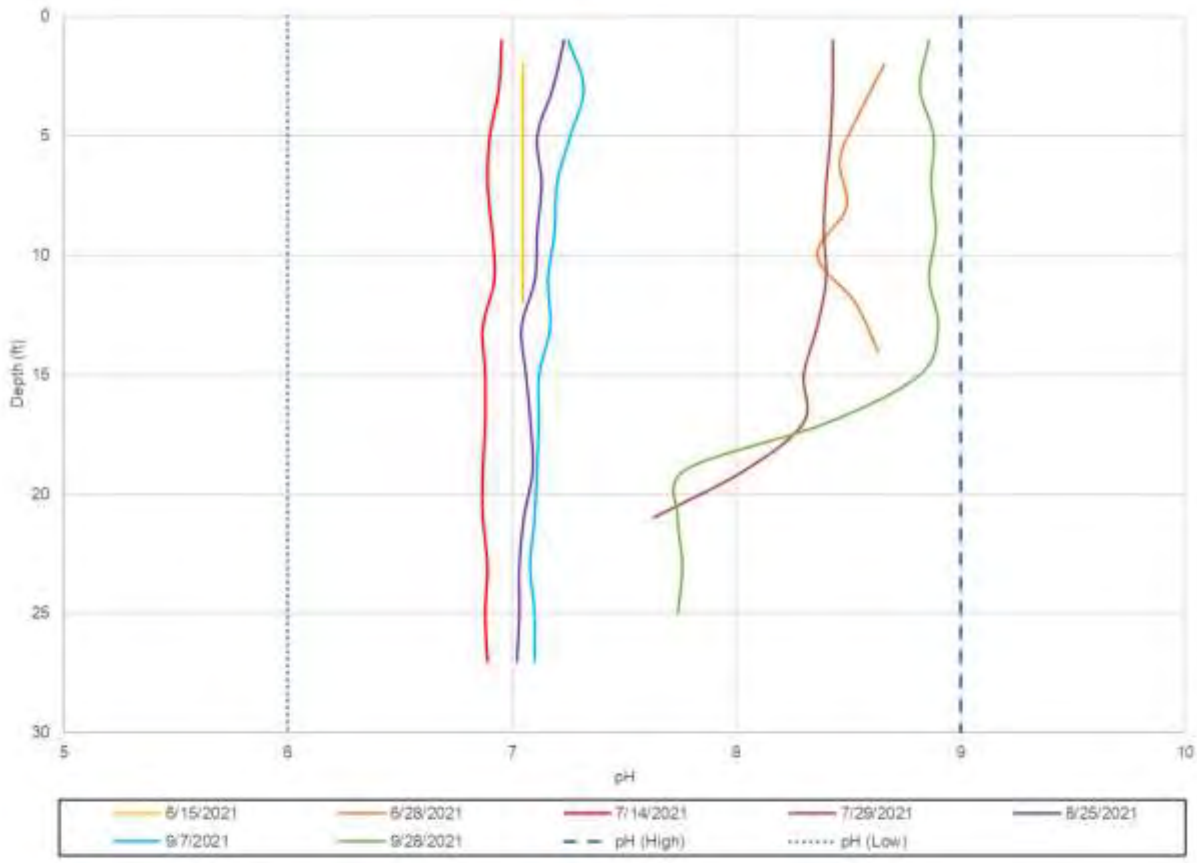
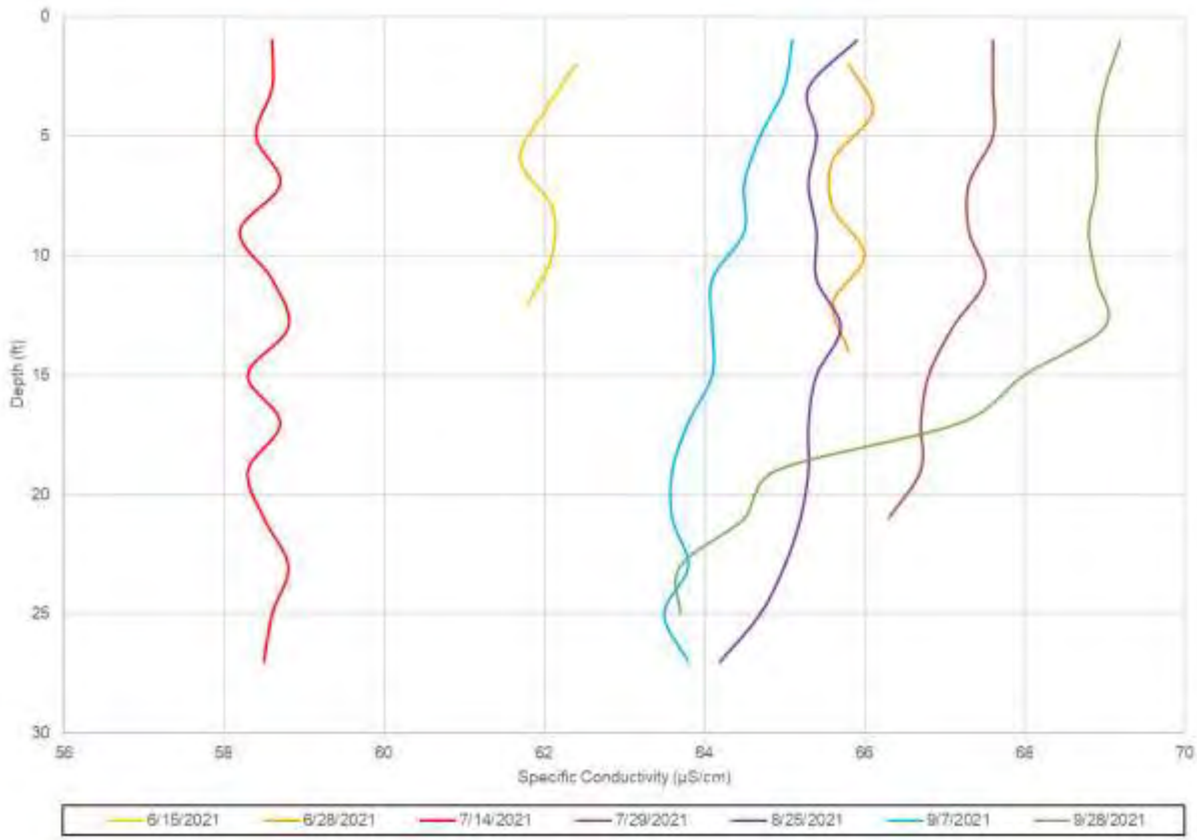
Byllesby Forebay Vertical Profiles Temperature and DO



Byllesby Forebay Vertical Profiles - pH



Byllesby Forebay Vertical Profiles Specific Conductivity



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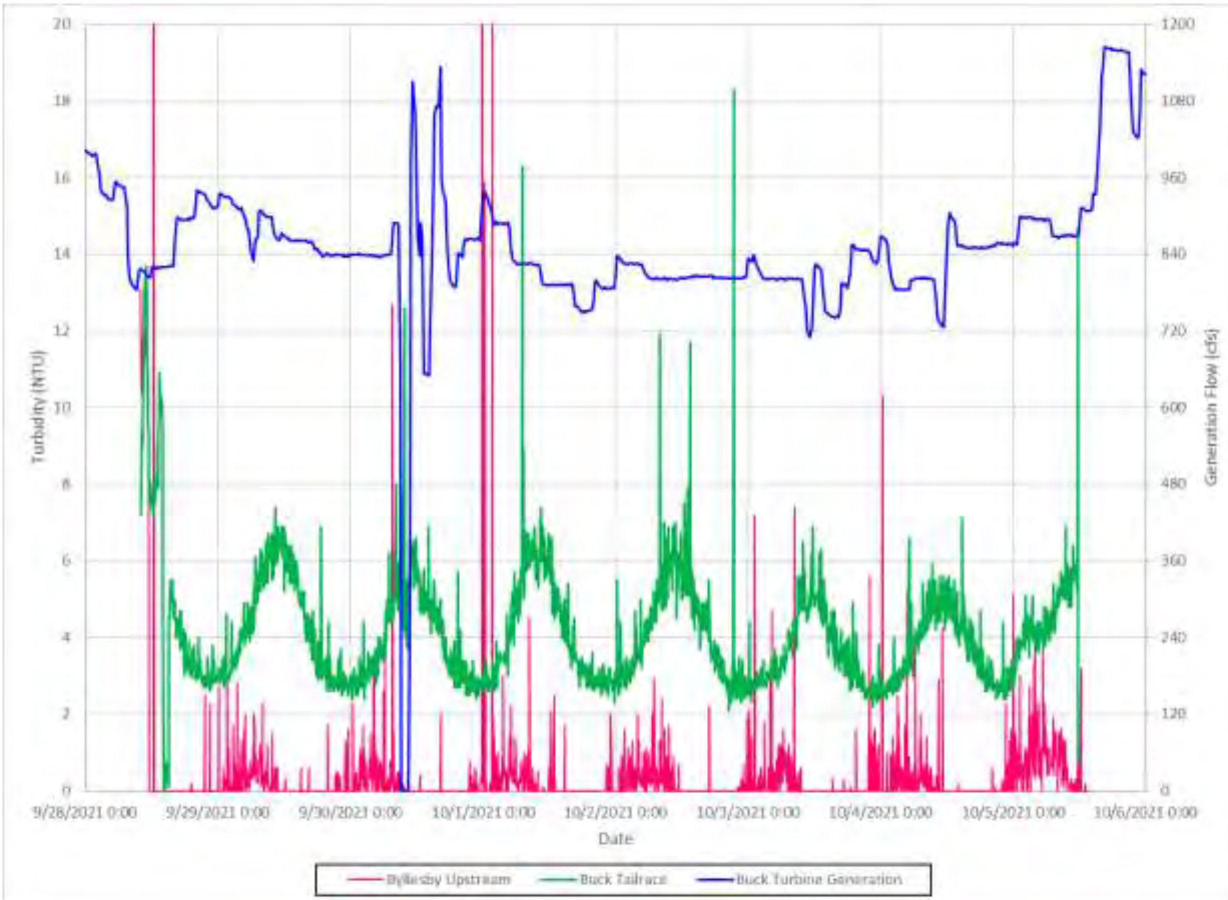
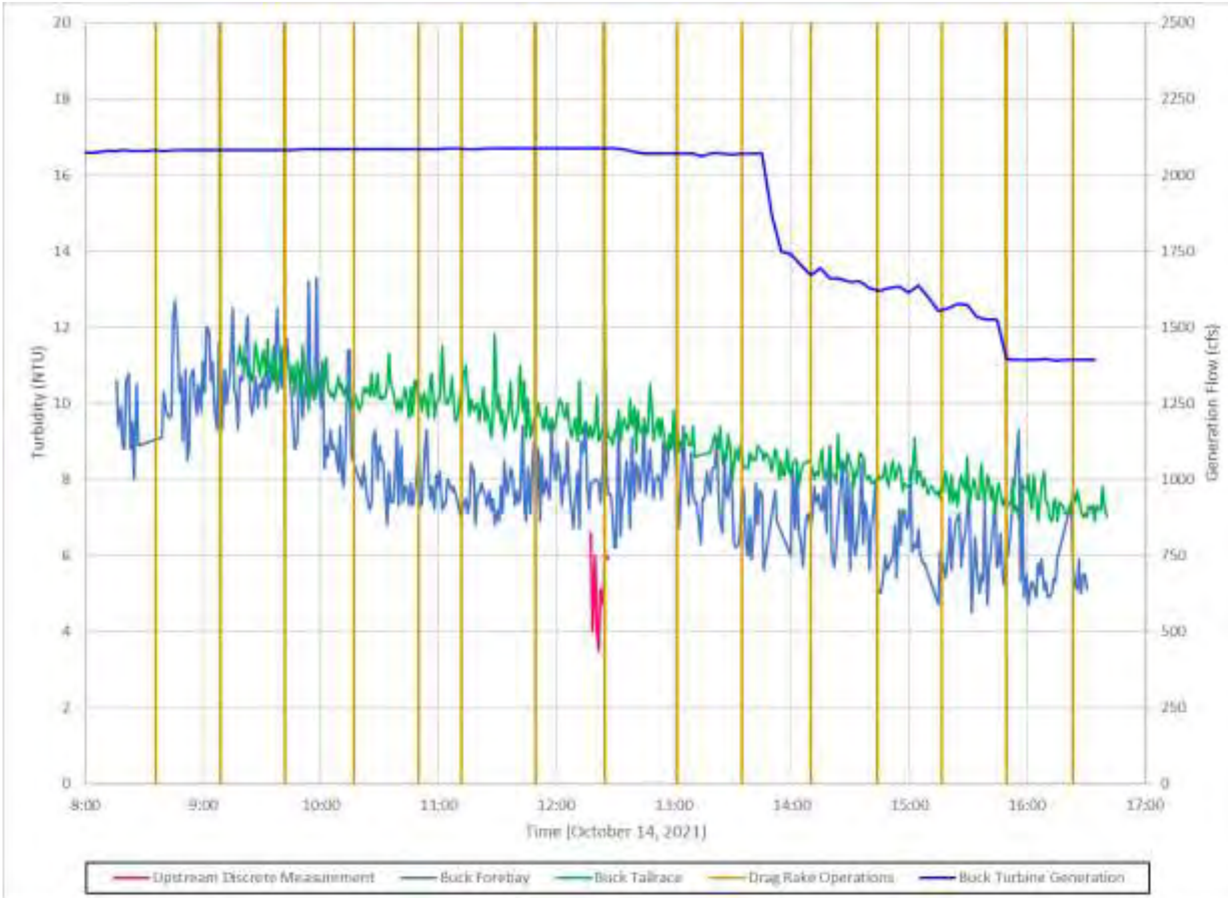
Continuous Turbidity September 29 – October 5, 2021



Continuous Turbidity & Drag Rake Operations October 14, 2021



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Water Quality Study Summary and Conclusions

- Water temperatures, DO concentrations, turbidity, and pH measurements met Virginia Class IV (New River) water quality standards; with the exception of instantaneous surface water temperatures on several occasions during late-July and late-August 2021
- Little to no thermal or DO stratification at the Byllesby and Buck forebay monitoring locations
- Specific conductivity and pH range is suitable for aquatic species
- Monthly chlorophyll-a grab sample results were non-detect indicating concentrations < 5 mg/cm^3

Byllesby Forebay and Spillway 9.9.2020

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Water Quality Study Summary and Conclusions

- Maximum turbidity concentrations from grab samples were 16.9 NTU (Byllesby) and 8.0 NTU (Buck)
- Continuous monitoring also yielded relatively low turbidity concentrations (typically < 12 NTU) with no discernible effects from station operations
- As a result, no need for additional PM&E measures to protect water quality at the Project

Buck Forebay Area
9.9.2021

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Variances from FERC-approved Study Plan

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

Wetlands, Riparian, and Littoral Habitat Study

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Wetlands, Riparian, and Littoral Habitat Study – Goals & Objectives

Study Goal: Conduct a study to identify and characterize the existing wetlands, waterbodies, and riparian and littoral vegetative habitats (including emergent and submergent aquatic vegetation beds)

Specific Objectives:

- Perform a desktop characterization using the USFWS National Wetlands Inventory (NWI), USGS National Hydrography Dataset (NHD), the VDEQ Wetland Conditional Assessment Tool (WetCAT), and other resources include GIS based topographic maps, hydrology, aerial imagery, and soil surveys to identify and describe, approximate, and classify wetlands and waterbodies within the study area.

- Perform a field verification to confirm the location of dominant vegetative communities, and vegetation classifications identified in the desktop survey.

- Field verification included identification of littoral and instream vegetation in the study area to characterize the availability of littoral, submerged, and emergent vegetative habitat.

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Wetlands, Riparian, and Littoral Habitat Study

Specific Objectives (continued):

- Develop a GIS based map using the results of the desktop characterization and field verification to identify the locations of wetlands and waterbodies according to the Cowardin Classification System.

- Riparian communities were classified according to the VDCR Natural Communities of Virginia Ecological Groups and Communities Types.

- The desktop and field verification was used to evaluate the potential for Project effects on wetlands, riparian, and littoral habitat within the study area.

Study Methods

Desktop Study

- 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.
    - USFWS NWI – estimated approximately 0.2 acres of freshwater forested/shrub wetlands and 9.6 acres of freshwater emergent wetlands.
    - VDEQ WetCAT – no resources were identified.
- Data collected during the desktop survey including the USGS topographic maps and NHD, elevation data, high-resolution orthoimagery, and NRCS soils survey were used to create habitat characterization base maps that were used to facilitate the field verification efforts.

Study Methods

Field Verification

Wetlands and Waterbodies: July 20 – July 22, 2021

- Wetland areas and streams identified in the desktop study were field-verified, but not formally delineated (i.e., no flagging or boundary marking), using the USACE Wetland Delineation Manual and Eastern Mountains and Piedmont Regional Supplement and USACE Regulatory Guidance OHWM Identification Guidance.
- Wetland scientists used handheld GPS units to estimate the boundaries of wetlands and waterbodies identified form the desktop survey as well as new surface waters not indicated on the desktop mapping.
- Identified waterbodies were photo-documented and USACE Wetland Determination Data Forms were completed at each representative wetland type.
- Data collected in the field was used to digitize the boundaries of existing wetland and waterbodies in GIS.

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Study Methods

Field Verification

Riparian Zone: July 20 – July 22, 2021

- Identification of vegetative community types by recording dominant species of vegetation at three strata (tree, sapling/shrub, and herb)
- HDR biologists used regional field guides and plant identification mobile apps to assist with identifying plans to genus and species level.
- Riparian zones identified within the study area best resembled Piedmont/Mountain Floodplain Forests and Swamps as described in the VDCR Natural Communities of Virginia Ecological Groups and Community Types.

Study Methods

Field Verification

Littoral Zone: July 20 – July 22, 2021

- Four main categories of aquatic plans include (1) algae, (2) emergency aquatic vegetation, (3) submerged aquatic vegetation, and (4) floating plants.
- Transect-based surveys were performed to characterize littoral zone aquatic habitats within the study area. **Seven transect lines** were evaluated in each of the Project reservoirs and **four transect lines** were evaluated in the tailrace and bypasses portions downstream of each dam.
- In the reservoirs - transects were **oriented parallel** to the shoreline in boat accessible areas.
- In the tailrace and bypass reaches - transects were **oriented perpendicular to the shoreline** to include littoral zones along the stream margins and potential shallows where emergent or submergent vegetation may occur.
- Transects were 100 meters in length and 1.0-square meter in area (i.e., quadrants) spaced equally along the transect line at 10-meter intervals (at all but two transects). Transects were assessed for the presence/absence of aquatic plants. The scientific name of each vegetation species was recorded during the survey.
- A vegetation sampling throw rake was deployed at each sample area on transect lines (when feasible) to capture any non-visible submerged aquatic vegetation.

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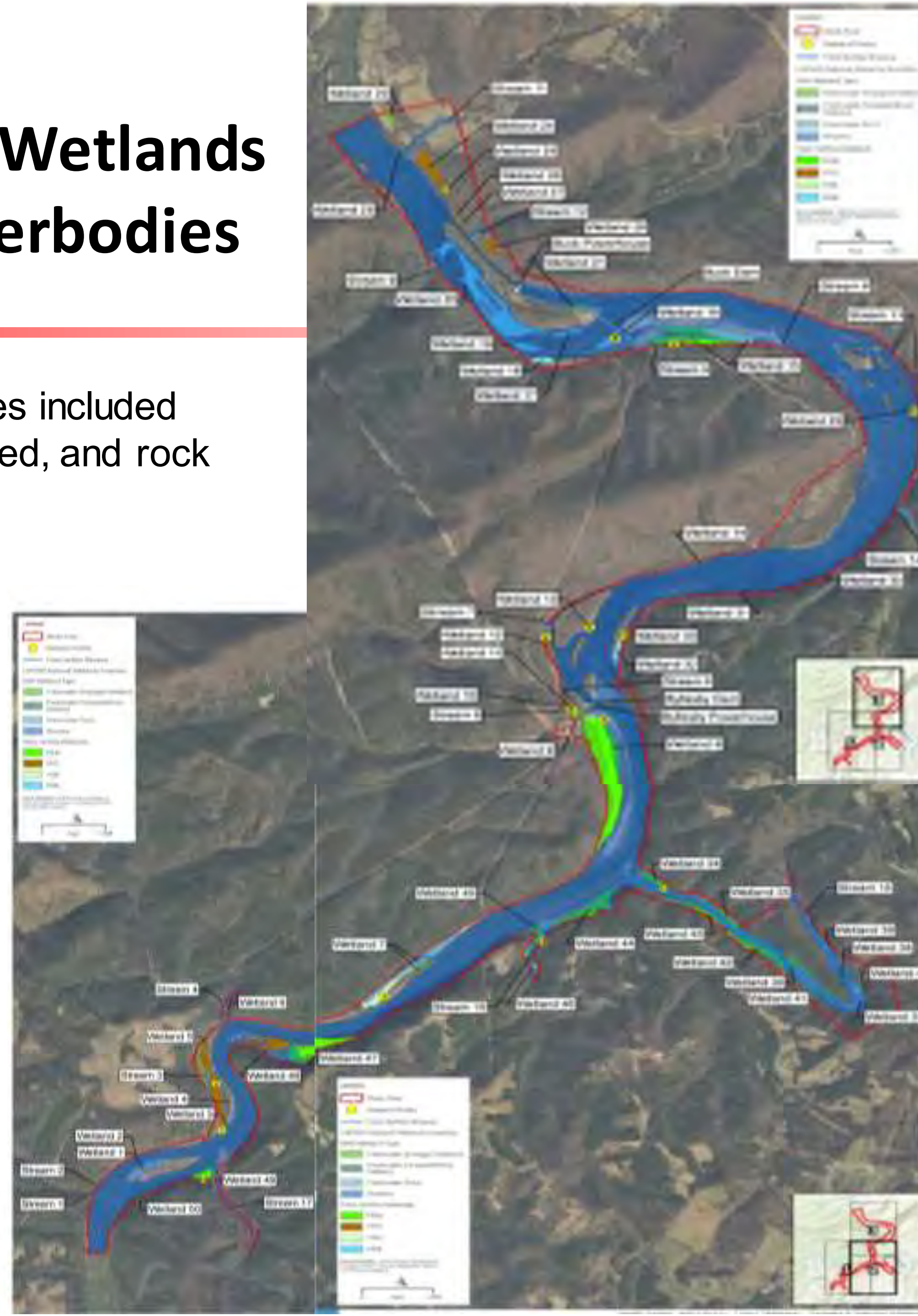
Results – Wetlands and Waterbodies

- Cowardin et. al (1979) wetland cover types included palustrine (emergent, scrub-shrub, forested, and rock bottom) and riverine systems
- Approximately **95.43 acres of wetlands** were field verified
  - 50.72 acres of palustrine emergent wetlands
  - 11.6 acres of palustrine scrub shrub wetlands
  - 15.37 acres of palustrine forested wetlands
  - 17.74 acres of rock bottom wetlands
- Approximately 15,608 liner feet of riverine features were verified.



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Results – Palustrine Forested Wetlands

- Located in higher floodplains and point bars of the New River.
- Dominant vegetation consisted of American sycamore, box elder, red maple, black walnut , and silver maple.
- The majority of understory included Japanese stilt grass, reed canary grass, false nettle, highbush blackberry and smart weed.
- Wetland hydrology indicators included soil saturation, high water tables, and areas of standing waters.
- Hydric soils indicators included depleted matrix and redox dark surface.

Results - Palustrine Scrub-Shrub Wetlands

- Located in floodplains of the New River, typically adjacent to emergent wetlands
- The shrub vegetation consisted of American sycamore, box elder, and silver maple. The herbaceous vegetation included canary reed, grass, deer tongue, falsenettle, and soft rush.
- Wetland hydrology indicators included soil saturation, high water tables, and areas of standing waters
- Soils were mostly silt and clay and exhibited hydric soils indicators.

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Results - Palustrine Emergent Wetlands

- Located as fringe wetland and floodplain wetlands along the shoreline floodplains of the New River.
- Herbaceous species is dominant and included Japanese stilt grass, soft rush, canary reed grass, deer tongue grass, cattails, falsenettle, bulrush, and woolgrass.
- Wetland hydrology indicators included soil saturation, high water tables, and areas of standing water.
- Soils were mostly silt and clay and exhibited hydric soils indicators such as depleted matrix and redox dark surface.

Results - Palustrine Rock Bottom Wetlands

- Seasonally flooded to intermittently exposed trees, shrubs, and herbaceous vegetation on boulder and cobble deposition bars, or less frequently bedrock exposures, on the shores and islands of high-gradient streams (primarily within the bypass reaches).
- Dominant trees include American sycamore, alder, and willow.
- Dominant herbaceous vegetation includes spike rush , cattails, asters, smart weed, and water willow.
- The substrate of these wetlands consisted of angular bed rock and sand bars with organic material.
- Pools of surface water were present throughout with patchy vegetation.

Results - Riverine Habitats

- Riverine habitats in the study area include the New River and associated tributaries. The New River is a lower perennial riverine feature on the upstream and downstream limits of the study area.
- There are several perennial tributaries that flow into the New River including Chestnut Creek, Crooked Creek, Rocky Branch, Poor Branch, Big Branch, and Brush Creek along with eight unnamed tributaries.
- The dominant tree vegetation in these types of wetlands include American sycamore, boxelder, cattails and reed canary grass.
- The dominant substrate included cobble to boulder sized rock along with bedrock.
- There are four intermittent streams that flow into the New River.

Results - Littoral Habitats

- Seasonally flooded to intermittently exposed herbaceous vegetation along depositional bars on the shores of the reservoirs and within the rock exposures of the bypass reaches.
- Substrates consisted of angular bed rock and depositional bars of sand and organic material. Pools of surface water were present throughout the surveyed littoral zones with patchy vegetation growth in areas that were above water level.
- Littoral zone vegetation included Elodea Spp, algae, curly-leafed pondweed, Parrot's feather, Broad leaf pondweed, smartweeds, spike rush, bulrush, rice cut grass, soft rush, water willow, shallow sedge. Curly-leafed pondweed is considered to be a non-native invasive species.

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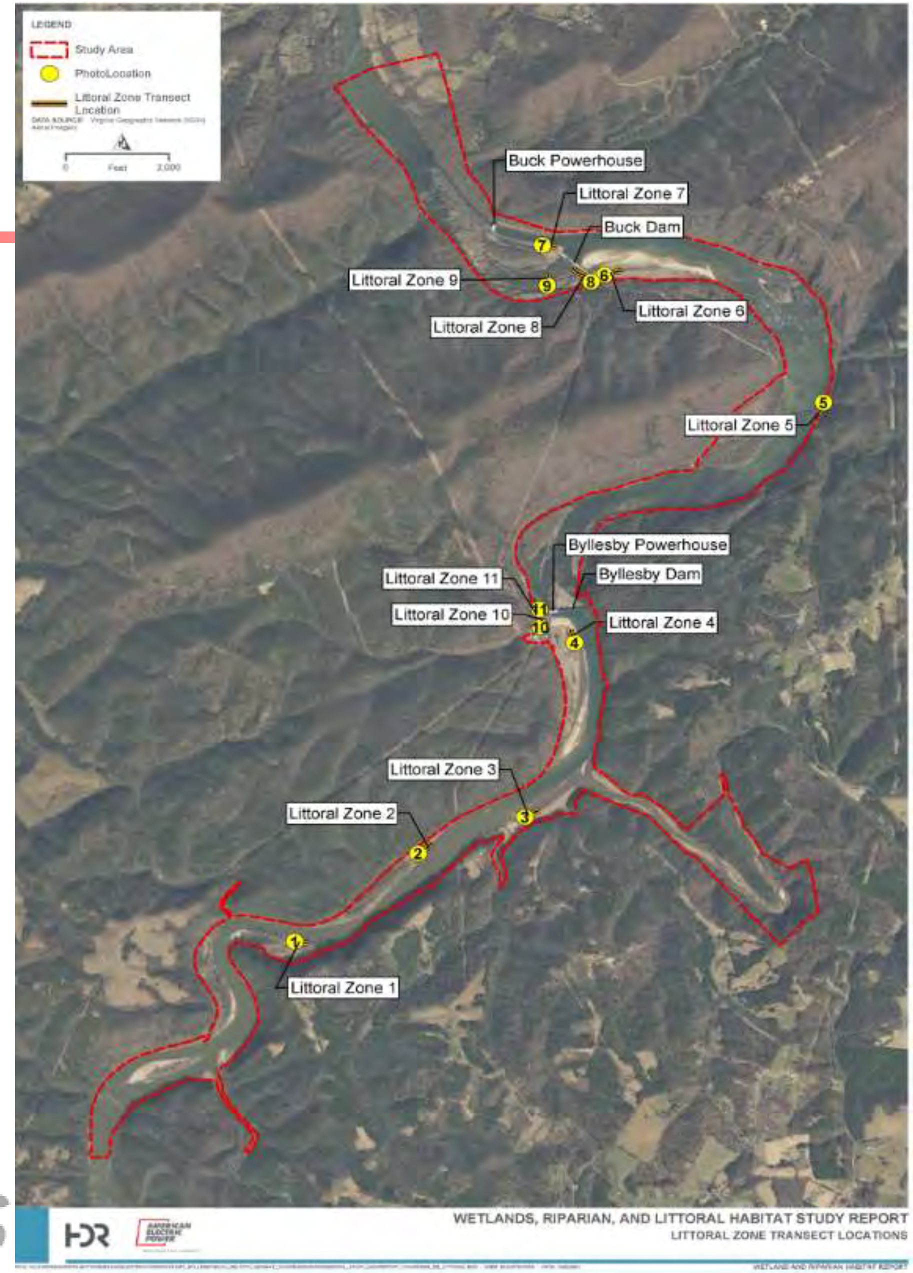
Results - Littoral Habitats

- Elodea was the most abundant SAV throughout the reach located close to the stream bank adjacent to wetlands.
- Algae was dominant in the littoral zone upstream from the Byllesby Dam where water flow was slower.
- Littoral Zones 6 and 8 upstream of Buck Dam exhibited the highest percentage of aquatic vegetation.



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Results – Riparian Habitats

The riparian area consists of approximately 177 acres and is mainly found along the shoreline, on islands, and within the bypass reach.

- Varies in width from 5 to 520 feet wide.
- Dominant vegetation in the over story includes black walnut, black cherry, red maple, Northern red oak, Eastern red cedar, Virginia pine, black willow, American sycamore, sugar maple , box elder, chestnut oak, green ash, and white pine.
- The understory typically included blackberry, mountain laurel, and witch hazel .
- The herbaceous vegetation consisted of Christmas fern, mayapple, wingstem, bedstraw, muscadine grape, Virginia creeper, cinnamon fern, and poison ivy.
- Non-native invasive species were present and included Japanese knotweed, multiflora rose, oriental bittersweet, and Tree of Heaven.

Virginia Spiraea and Riparian Habitat

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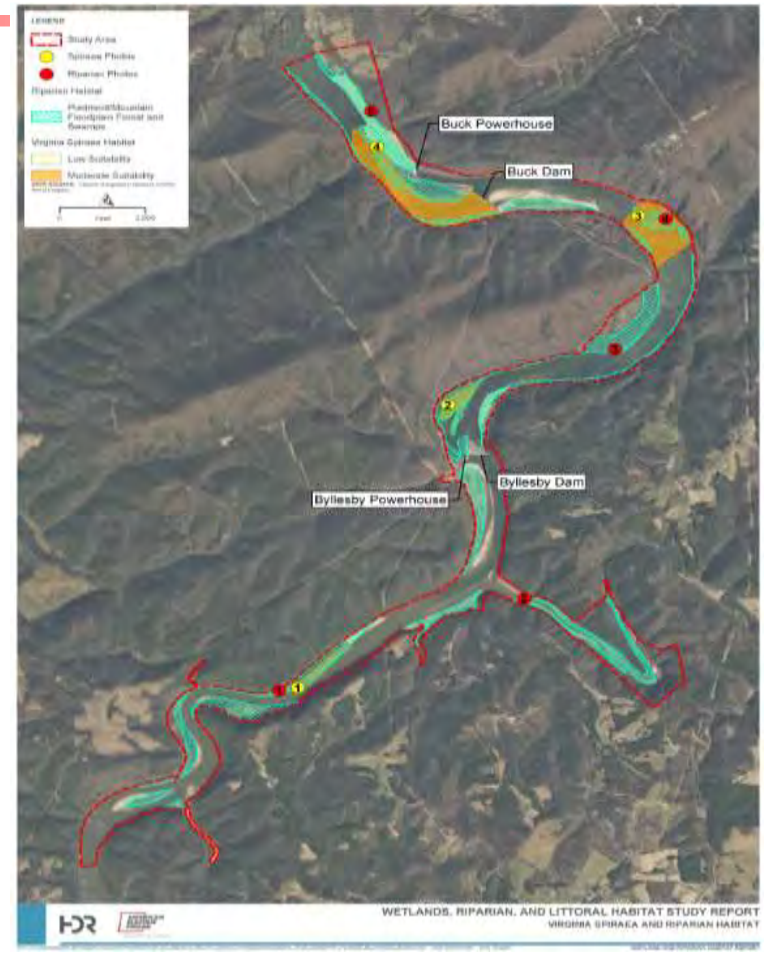
- There were no observed occurrences of **Virginia spirea (*Spiraea virginiana*)** in areas identified in the previous surveys; however, potentially suitable habitat was observed throughout the study area in rocky, low flow areas of streams, and on portions of bars and benches.
- Figure shows the location of potential Virginia spiraea habitat and provides a classification of low suitability or moderate suitability.
- More details regarding Virginia spirea are **included in the Terrestrial Resources Study** (next).



Wetland, Riparian, and Littoral Habitat Study – Project Impacts

- Periodic drawdowns for Project maintenance have the potential to temporarily dewater wetland, riparian, or littoral areas.
- Longer drawdowns may cause soils in wetland areas to lose saturation which may result in loss of wetland vegetation.
- Sediment accumulation is slowly occurring at location within and around the impoundments in some cases lead to the creation of new wetlands.
- Dredging may be required if the sediment interferes with Project operations and may require authorization from applicable environmental regulatory agencies.
- Operations and maintenance of the Project are not anticipated to have any short- or long-term, unavoidable, adverse impacts on wetland, riparian, and littoral resources.

Variances from FERC-approved Study Plan

The Wetlands, Riparian, and Littoral Habitat Study was conducted in conformance with the Commission's SPD.

Terrestrial Resources Study

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Terrestrial Resources Study

Study Goal: Conduct a study to identify and characterize the existing terrestrial habitats and resources.

Specific Objectives:

- Perform a desktop characterization of upland vegetation types using the Nature Conservancy's (TNC) Terrestrial Habitat Map.
- Classify identified plant communities according to the Virginia Department of Conservation and Recreation (VDCR) Natural Communities of Virginia Classification of Ecological Groups and Communities Types.
- Perform a characterization of the upland habitat types in relation to wildlife species know to existing or inhabit or directly observed during the field visit.
- Develop a map of upland vegetative communities and identify the locations of any invasive plant species observed during the field visit.

Terrestrial Resources Study

Federally Protected Species

- Bald eagle (*Haliaeetus leucocephalus)* – BGPA/MBTA
- Indiana bat (*Myotis sodalist*) - Endangered
- Northern long-eared bat (*Myotis septentrionalis*) - Threatened
- Virginia spirea (*Spiraea virginiana*) - Threatened
- No Critical Habitats at this location

**No surveys for protected bat species were not conducted as part of the relicensing effort since the proposed improvement plans and Project activities are not expected to involve clearing of trees in upland forested communities that provided habitat for roosting or maternity colonies.*

Terrestrial Resources Study

Bald Eagle (*Haliaeetus leucocephalus*)

- Nesting and roosting habitat within Project vicinity
- ESI conducted an aerial helicopter transect in March 2021 for the proposed Byllesby-Ivanhoe 88kV Transmission Line Retirement project (not associated with the Project relicensing)
  - One active nest was observed on the New River approximately 0.52 miles from the transmission line corridor and approximately 0.27 miles south of the Buck Dam.
  - An unoccupied nest was identified along the New River approximately 1.1 mile north of Buck Dam at the top of transmission line.
  - Three individual bald eagles were observed.
  - Project-related activities are not expected to adversely affect this species.
  - Coordination with the USFWS if future operations, modifications, or developments have the potential to affect bald eagles.

Terrestrial Resources Study

Virginia spirea (*Spiraea virginiana*)

- Listed as federally threatened and state endangered
- Historically reported by the USFWS upstream of Byllesby Dam
- No documentation or verification of any historic presence or exact location.
- ESI performed habitat and presence/absence surveys for the Virginia spirea in 2017. No species were identified.
- HDR biologists re-investigated the habitat patch locations identified in ESI report.
- Suitable habitat was photo-documented in the field.
- No individual species belonging to the Spiraea genus were identified.

Terrestrial Resources Study - Methods

- **Desktop Mapping**
  - High resolution aerial imagery
  - TNC Terrestrial Habitat Map
  - Virginia Natural Heritage Data Explorer
  - Virginia Invasive Plant Species List
  - Virginia Department of Wildlife Resources Fish and Wildlife Information Services List (list generated 511 total species, 342 were terrestrial species).

Terrestrial Resources Study

- **Field Verification** (May 26 through May 28, 2021).
  - Applicable field regional field guides and plant identification mobile apps to identify plants to genus and species level.
  - Dominant species of upland vegetation (tree, shrub, and herb strata) were recorded and characterized according to VDCR guidance.
  - Locations of significant invasive species populations were georeferenced and photographed using the ArcGIS Collector mobile app.
  - Recorded observations of terrestrial animal species and recorded general ecological community where they were observed.

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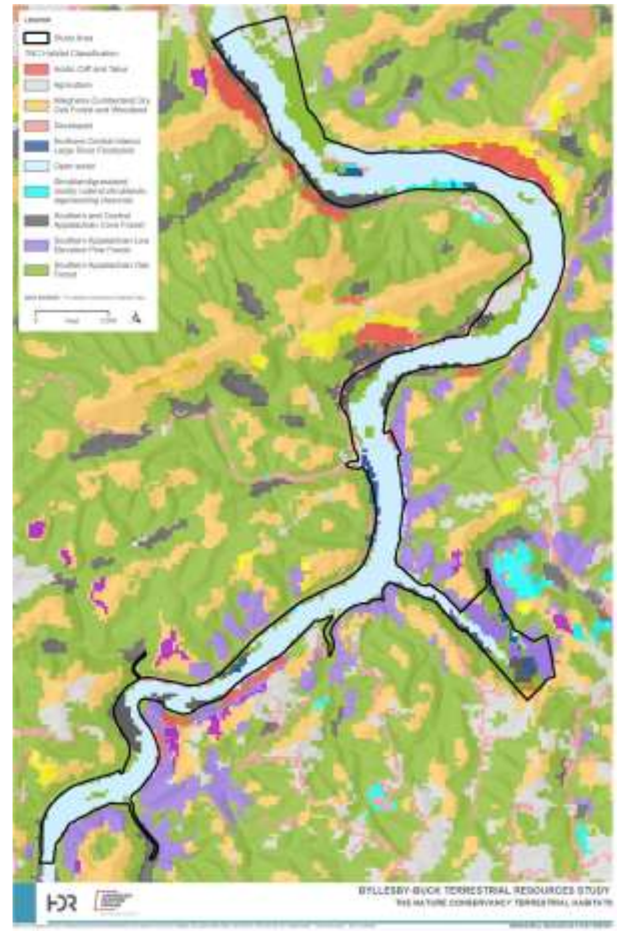
Terrestrial Resources Study – Desktop Results

The TNC Terrestrial Habitat Map identified 10 Habitat Communities including:

- Acidic Cliffs and Talus – 0.30%
- Agricultural – 4.25%
- Allegheny-Cumberland Dry Oak Forest and Woodland – 0.32%
- Developed Areas – 1.73%
- Open Water – 61.63%
- Northern-Central Interior Large River Floodplains – 2.60%
- Shrubland/grassland, regenerating clear-cuts – 0.85%
- Southern Appalachian and Central Appalachian Cove Forest – 8.75%
- Southern Appalachian Low Elevation Pine Forests – 3.61%
- Southern Appalachian Oak Forests – 15.96%

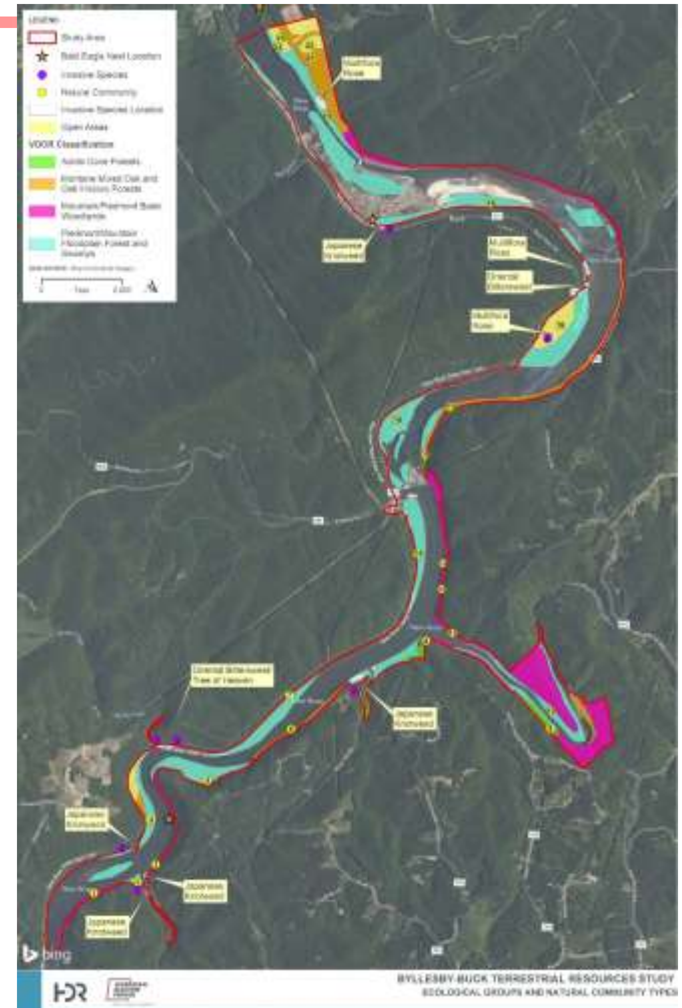


Terrestrial Resources Study

Field Verification

Four upland ecological groups and communities types were identified (using VDCR guidance)

- Acidic Cove Forest– 2.22%
- Montane Mixed Oak and Oak Hickory Forest – 12.80%
- Open Areas – 8.17%
- Mountain/Piedmont Basic Woodlands – 20.06%
- Piedmont/Mountain Floodplain Forests and Swamps – 56.75%



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Terrestrial Resources Study

Acid Cove Forests - 2.22%

- Group contains mixed hardwoods and hardwood hemlock forests of montane habitats occupying moist lower slopes, ravines, and coves underlain by sandstone, quartzite, granite, and other acidic bedrock.
- Overstory species included tulip poplar, eastern hemlock , American basswood, sweet birch, chestnut oak, shagbark hickory, and white pine.
- Understory species included flowering dogwood, witch hazel, striped maple, spicebush, wineberry with areas of dense, evergreen shrub layers including great rhododendron and mountain laurel.
- Herbaceous species included galax, trilliums, black cohosh, jewelweed, spotted lady's thumb, mayapple, wood-nettle, Virginia strawberry, violets, polypody ferns, and Christmas fern.

Terrestrial Resources Study

Montane Mixed Oak and Oak Hickory Forest – 12.8%

- Group contains a relatively diverse, mixed oak and oak-hickory forest of submesic (moist) to subxeric (dry) mountain slopes and crests mostly between 2,000 feet and 4,000 feet elevation.
- Overstory species included Chestnut oak, northern red oak, white oak, shagbark hickory, mockernut hickory, sourwood, tulip poplar, white pine, silver maple, black locust, and yellow buckeye.
- Understory species included witch hazel, striped maple, and maple-leaved viburnum.
- Herbaceous species included galax, Jack in the pulpit, spotted ladys' thumb, wood nettle, fire pink, violets, New York fern and wood ferns.

Terrestrial Resources Study

Open Areas – 8.17%

- Observed around the existing hydropower infrastructure and transmission right of way. One agricultural area was observed in the furthest downstream extent east of the New River.
- Plant species American sycamore, tulip polar, eastern redcedar, black cherry, black locust, green ash, Virginia pine, blackberry, Chinese lespedeza, Japanese clover, wingstem, goldenrods, deertongue, common dandelion, wild mint, red clover, partridge pea, plantain, ground ivy, Cherokee sedge, and Japanese honeysuckle.

Terrestrial Resources Study

Mountain/Piedmont Basic Woodlands – 20.06%

- Group represented by deciduous and mixed woodlands of xeric (dry), rocky habitats with patches of exposed outcrop barrens.
- Overstory species included Chestnut oak, northern red oak, shagbark hickory, mockernut hickory, silver maple, black cherry, white ash, and Virginia pine.
- Understory species included eastern redcedar, eastern redbud, eastern hophornbeam, slippery elm, witch hazel, blueberry, with localized patches of evergreen shrubs including great rhododendron and mountain laurel.
- Herbaceous species included smooth solomon's seal, rattlesnake weed, common mullein, licorice fern, polypody ferns, wood ferns, reindeer moss, Virginia creeper, and poison ivy.

Terrestrial Resources Study

Piedmont/Mountain Floodplain Forests and Swamps – 56.75%

- Group represented by temporary to seasonally flooded forests along the New River.
- Overstory species included American sycamore, boxelder, northern red oak, white oak, willow oak, American basswood, honey locust, black walnut, black gum, black cherry, tulip polar, red maple, silver maple, and green ash.
- Understory species included black willow, persimmon, silky dogwood, redbud, alders, elderberry, and spicebush.
- Herbaceous species included black cohosh, beggar-ticks, mayapple, bedstraw, arrow-arum, arrowheads, marsh dayflower, false nettle, clearweed, marsh seedbox, lizards's tail, soft rush, blunt spikerush, winged monkey flower, Virginia spiderwort, American bur-reed, broadleaf cattail, reed canary grass, rice cutgrass, deertongue, woolgrass, cinnamon fern, Christmas fern, Virginia creeper, and poison ivy.

Scientific Name	Common Name	Community Type
HERPETOFAUNA		
Chelydra serpentina	Common snapping turtle	Piedmont/Mountain Floodplain Forest & Swamps
Pantherophis alleghaniensis	Eastern ratsnake	Piedmont/Mountain Floodplain Forest & Swamps
Pantherophis guttatus	Red cornsnake	Piedmont/Mountain Floodplain Forest & Swamps
Pseudacris crucifer	Spring peeper	Piedmont/Mountain Floodplain Forest & Swamps
Thamnophis sirtalis	Eastern gartersnake	Montane Mixed Oak and Oak Hickory Forests
BIRDS		
Agelaius phoeniceus	Red-winged blackbird	Piedmont/Mountain Floodplain Forest & Swamps
Aix sponsa	Wood duck	Piedmont/Mountain Floodplain Forest & Swamps
Branta canadensis	Canada goose	Piedmont/Mountain Floodplain Forest & Swamps
Butoe jamaicensis	Red-tailed hawk	Open Areas
Cathartes aura	Turkey vulture	Open Areas
Cardinalis cardinalis	Northern cardinal	Piedmont/Mountain Floodplain Forest & Swamps
Colinus virginianus	Northern bobwhite	Open Areas
Dumetella carolinensis	Gray catbird	Mountain/Piedmont Basic Woodlands
Haliaeetus leucocephalus	Bald eagle	Piedmont/Mountain Floodplain Forest & Swamps
Meleagris gallopavo	Eastern wild turkey	Piedmont/Mountain Floodplain Forest & Swamps Mountain/Piedmont Basic Woodlands
Spizella pusilla	Field sparrow	Open Areas
Pandion haliaetus	Osprey	Piedmont/Mountain Floodplain Forest & Swamps
Zenaida macroura carolinensis	Mourning dove	Open Areas
MAMMALS		
Canis latrans	Coyote	Open Areas
Castor canadensis	Beaver	Piedmont/Mountain Floodplain Forest & Swamps
Lontra canadensis	North American river otter	Piedmont/Mountain Floodplain Forest & Swamps
Sylvilagus floridanus mallurus	Eastern cottontail	Open Areas
Odocoileus virginianus	White-tailed deer	All Communities
Ondatra zibethicus	Common muskrat	Piedmont/Mountain Floodplain Forest & Swamps
Sciurus niger vulpinus	Eastern fox squirrel	Piedmont/Mountain Floodplain Forest & Swamps
Sciurus carolinensis pennsylvanicus	Northern gray squirrel	Montane Mixed Oak and Oak Hickory Forests Mountain/Piedmont Basic Woodlands
Tamias striatus	Common eastern Chipmunk	Piedmont/Mountain Floodplain Forest & Swamps
Ursus americanus	Black bear	Mountain/Piedmont Basic Woodlands

Wildlife Resources

VDWR Fish and Wildlife Information Services Report

- Total of 511 animal species (including terrestrial and aquatic species) are likely to occur within a 3-mile radius.
- Of these 511 species, 342 are terrestrial species, 127 are aquatic species, and 42 are semi-aquatic species
- Wildlife species directly observed or signs of their presence

Scientific Name	Common Name	Virginia Invasiveness Rank[1]	Natural Community Location
Ailanthus altissima	Tree-of-Heaven	High	Piedmont/Mountain Floodplain Forest & Swamps
Berberis thunbergii	Japanese Barberry	Medium	Montane Mixed Oak and Oak Hickory Forests
Celastrus orbiculatus	Oriental Bittersweet	High	Piedmont/Mountain Floodplain Forest & Swamps Open Lands
Elaeagnus pungens	Thorny Olive	Low	Piedmont/Mountain Floodplain Forest & Swamps
Lespedeza cuneata	Sericea Lespedeza	High	Piedmont/Mountain Floodplain Forest & Swamps Open Lands
Lonicera japonica	Japanese Honeysuckle	High	Piedmont/Mountain Floodplain Forest & Swamps
Ligustrum sinense	Chinese Privet	High	Montane Mixed Oak and Oak Hickory Forests Mountain/Piedmont Basic Woodlands
Murdannia keisak	Marsh dewflower	High	Piedmont/Mountain Floodplain Forest & Swamps
Microstigium viminium	Japanese stiltgrass	High	Piedmont/Mountain Floodplain Forest & Swamps
Reynoutria japonica	Japanese knotweed	High	Piedmont/Mountain Floodplain Forest & Swamps
Rosa multiflora	Multiflora Rose	High	Piedmont/Mountain Floodplain Forest & Swamps Open Lands Montane Mixed Oak and Oak Hickory Forests
Rubus phoenicolasius	Wineberry	High	Acid Cove Forests
Sorghum halepense	Johnson Grass	High	Open Areas
Urtica dioica	European Stinging Nettle	High	Montane Mixed Oak and Oak Hickory Forests Mountain/Piedmont Basic Woodlands

Invasive Species

- Several species on VDCR's Virginia Invasive Species Plant List were identified throughout the study area.
  - Many species were noticed at low densities scattered throughout the study area and not feasible to map each individual location.
  - Significant infestations were mapped in the field.

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Terrestrial Resources Study - Invasive Species

- Significant infestations of Japanese knotweed, oriental bittersweet, and multiflora rose were located primarily in riparian areas along the reservoirs.

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Terrestrial Resources Study

Summary

- Terrestrial and ecological groups and community types identified in the field were consistent with similar habitat classification descriptions depicted on The Nature Conservancy Habitat Map.
- Many invasive species were noticed at low densities scattered throughout upland areas
- Significant infestations of Japanese knotweed, oriental bittersweet, and multiflora rose were located primarily in riparian areas along the reservoirs.

Terrestrial Resources Study

Project Impacts on Terrestrial Resources

- Continued operation and maintenance over the new license term is not anticipated to have any short- or long-term adverse impacts on terrestrial resources.
- Continue to operate the existing run-of-river mode for the protection of multiple resources.
- Vegetation management activities suing mostly mechanical removal techniques (e.g. mowing) on a as-needed basis.
- No extensive clearing is proposed. Trees for that provide habitat for habitat for roosting or maternity colonies for Indiana bat and northern long-eared bat and nesting and roosting trees for bald eagles would not be impacted.
- Appalachian would coordination with the USFWS and other applicable environmental resources agencies should Project operations, modifications, or development of recreational facilities affect federally protected species.

Variances from FERC-approved Study Plan

The Terrestrial Resources Study was conducted in conformance with the Commission's SPD.

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Morning Break

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Shoreline Stability Assessment

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Shoreline Stability Assessment

Study Goal and Objectives:

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

Shoreline Stability Assessment

Background and Existing Information:

- Existing vegetation is extensive along the shorelines of Project reservoirs (which helps limit the extent and severity of erosion).
- Common causes of normal bank/shoreline erosion include wave action, significant changes in water levels, rill/gullies, bank rotation, and seepage/frost wedge.
- Accumulation of sediment along the shoreline has formed permanent riparian wetland communities, increasing protection against shoreline erosion.
- Areas of shoreline erosion are mainly concentrated in areas absent of vegetation or in areas susceptible to high flows during run-off events, such as the transition areas between riverine and reservoir at the upper limits of the study area, the rapids between the dams and the tailrace below Buck Dam, and in the larger tributaries such as Crooked Creek and Chestnut Creek.

Shoreline Stability Assessment - Methods

Desktop Review

- ESRI Geographic Information System data, Virginia Geographic Information Network aerial photos, USGS topographic maps, and NRCS soil surveys to assess bank composition and erosion potential in the study area.

Field Survey (July 20-22, 2021)

- The shoreline was assessed in the field for susceptibility to erosion and the need and potential for remediation.
- 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).

Shoreline Stability Assessment Study

BEHI Methodology:

- Assesses physical and geomorphic properties of the streambank to validate the probable sources of bank instability using stream bank 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).
- These metrics are associated with scores and are totaled to categorize the overall condition of the stream reach assessed.
- *Near Bank Stress was not evaluated and sediment loading was not calculated as part of this study.*

Shoreline Stability Assessment

Description of Rosgen Metrics for BEHI Evaluation

- Ratio of bank height to bankfull height (BH) – Ratio of bank height to bankfull height. Common bankfull indicators in stable streams include top of bank, top of point bars, and other changes in channel slope. (e.g. top of bank height is 2 feet and bankfull height is 1.5 foot = 1.3)

- Ratio of root depth to bank height (RDH) – Ratio of the average plant root depth to the bank height as percent (e.g. root extending 2 feet into a 4 foot tall bank = 50%).

- Root density percentage (RD) – 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%)

- Surface protection percentage (SP) – is the percentage of the stream bank covered by plant roots, downed logs, branches, rocks, etc.

- Bank angle in degrees (BA) – is the angle of the “lower bank” – the bank from the waterline at base flow to the top of bank, as opposed to benches that are higher on the floodplain. Bank angles greater than 90% occur on undercut banks.

Shoreline Stability Assessment

Stream Characteristics used to develop BEHI and Ratings

BEHI Category	Bank height	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	<14	10	>119	10	42.51-50

Shoreline Stability Assessment - Results

- Approximately 7.25 miles of New River Shoreline was assessed.
- Approximately 80% of shoreline was stable and did not exhibit active erosion.
- Banks with some level of visible erosion had higher bank height ratios, moderate root depth, low to moderate surface protection, and moderate to high bank angles.
- No areas were categorized as having very high or extreme erosion potential.

Shoreline Stability Assessment

BEHI Scores for Erosion Areas

Erosion Area	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	286	2.95	6.95	6.95	6.95	4.95	28.75	High
Erosion Area 2	92	4.95	8.50	8.50	6.95	4.95	33.85	High
Erosion Area 3	199	4.95	2.95	4.95	4.95	4.95	22.75	Moderate
Erosion Area 4	3,006	4.95	6.95	4.95	1.45	6.95	25.25	High
Erosion Area 5	423	6.95	4.95	6.95	2.95	4.95	26.75	High
Erosion Area 6	508	6.95	4.95	6.95	2.95	4.95	26.75	High
Erosion Area 7	190	4.95	4.95	4.95	2.95	6.95	24.75	Moderate
Erosion Area 8	141	4.95	4.95	4.95	2.95	6.95	24.75	Moderate
Erosion Area 9	92	6.95	4.95	4.95	4.95	6.95	28.75	High
Erosion Area 10	107	4.95	4.95	2.95	4.95	6.95	24.75	Moderate
Erosion Area 11	295	4.95	4.95	2.95	4.95	6.95	24.75	Moderate
Erosion Area 12	261	1.45	4.95	2.95	4.95	6.95	21.25	Moderate
Erosion Area 13	215	4.95	4.95	2.95	4.95	6.95	24.75	Moderate
Erosion Area 14	1,587	1.45	4.95	2.95	4.95	6.95	21.25	Moderate
Erosion Area 15	1,550	1.45	2.95	1.45	2.95	2.95	11.75	Low

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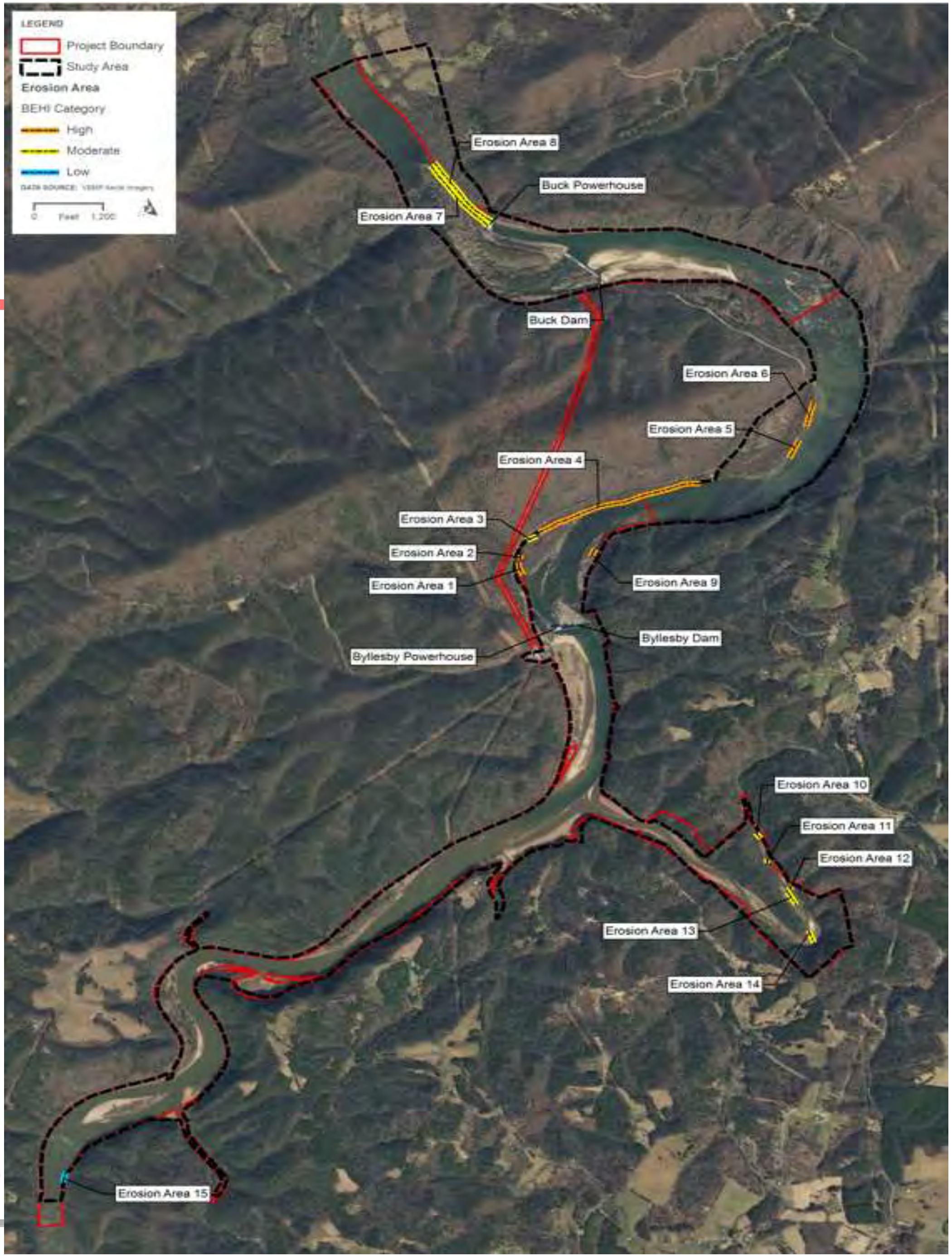
- High erosion potential: Erosion Areas 1, 2, 4, 5,6, and 9.
- Moderate erosion potential: Erosion Areas 3, 7, 8, and 10-14
- Low erosion potential: Erosion Area 15

Note that erosion categories, i.e., "high", "moderate", etc. are from Rosgen (2001). Category assignment is a quantitative process; however, consideration should be given to all factors (and the contribution of factors) that contribute to a specific score/category



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Shoreline Stability Assessment

	
Erosion Area 9: "High"	**Erosion Area 10: "Moderate"**

Shoreline Stability Assessment

	
Erosion Area 13: “Moderate”	**Erosion Area 15: “Low”**

Shoreline Stability Assessment

Summary and Discussion

- Approximately 80% of shoreline was stable and did not exhibit any active erosion.
- Erosion Areas 1, 2, 4, and 9 categorized as “high” are located downstream of Byllesby Dam and most susceptible to erosion.
- Erosion Areas 1 & 2 are adjacent to the New River Trail State Park.
- Erosion Area 4, 5, & 6 are adjacent to the New River Trail State Park, but further the multi-use trail and road are further away from the river.
- Existing bedrock and extensive established vegetation along the shorelines limit erosion potential.
- Overall, the visual inspection of the Project shoreline indicated stable banks and only localized streambank erosion.
- Appalachian proposes to continue operating the Byllesby and Buck developments as currently operated, including run-of-river operations and maintenance of existing vegetation and buffer areas.
- Appalachian does not proposed remediation of any shoreline areas in the Project Boundary at this time.

Variances from FERC-approved Study Plan

The Shoreline Stability Assessment was conducted in conformance with the Commission’s SPD.

Aquatic Resources Study: Fish Community Survey

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Fish Community Survey

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

Fish Community Survey

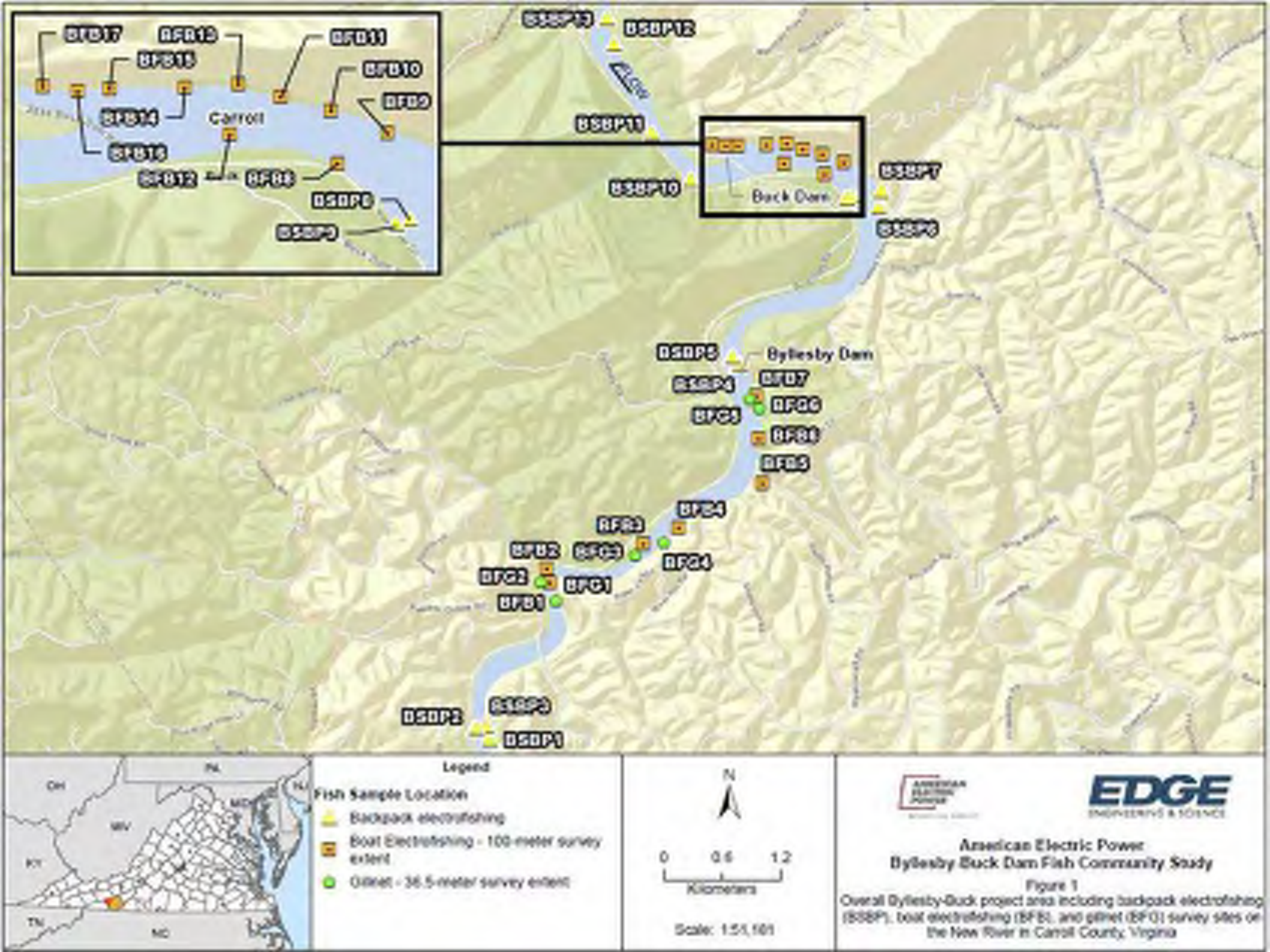
Study Status

- Appalachian completed the Fish Community Survey in accordance with the methods described in the RSP and SPD.
  - General fish community survey utilizing boat and backpack electrofishing methods and gill net sets was completed spring 2021
  - Completed assessment of impingement and entrainment at the intake structures
  - Completed passage survival assessment using USFWS Turbine Blade Strike Analysis model
  - Mussel Study was completed and presented in the ISR in 2020 and is not covered in this presentation

Fish Community Survey Methods

Sampling Method	No. Sites	Sampling Dates	
		Fall 2020	Spring 2021
Boat Electrofishing	17	Oct 22, 24-25	April 25-26, May 27
Backpack Electrofishing	13	*	April 20-23
Gillnet Sets	6	Nov 9-11, 18-20	April 20-24

- Fish ID to species, enumerated, and examined for anomalies; up to 30 individuals per taxon measured and weighed
- Calculated catch per unit effort (CPUE) as number of fish per minute and H'; Shannon index and compared results to those from historical studies



American Electric Power
Byllesby Buck Dam Fish Community Study

Figure 1
Overall Byllesby-Buck project area including backpack electrofishing (BSBP), boat electrofishing (BFB), and gillnet (BFG) survey sites on the New River in Carroll County, Virginia

Fish Community Survey Results by Method

- Boat Electrofishing Sites
  - 597 fish representing 32 species at 17 sites
  - CPUE was 0.3 – 14.2 fish/minute in Byllesby pool versus 0.5 – 9.5 fish/minute in the Buck pool
  - Diversity (H’) was 2.32 in Byllesby pool and 2.26 in the Buck pool
- Backpack Electrofishing Sites
  - 410 fish representing 24 species at 13 sites
  - CPUE of 1.7 fish/minute above Byllesby; 3.5 fish/minute between Byllesby and Buck; and 7.6 fish/minute downstream of Buck Dam
  - Diversity was 1.92 in above Byllesby Dam; 1.97 between Byllesby and Buck; and 1.98 downstream of Buck Dam
- Gillnet Sites
  - 112 fish representing 10 species at 6 sites in Byllesby Pool
  - CPUE from 0.5 to 22 fish per net set, and was 66% higher in spring
  - Diversity was 1.43

Fish Community Survey Results by Location

- Upstream of Byllesby Dam
  - 7 boat and 3 backpack electrofishing sites, 6 gillnet sites
  - 404 fish, 26 species, 5 species exclusive to this reach
- Between Byllesby and Buck dams
  - 10 boat and 6 backpack electrofishing sites
  - 509 fish from 33 species, 7 species exclusive to this reach

- Downstream of Buck Dam
  - 4 backpack electrofishing sites
  - 206 fish from 17 species, 2 species exclusive to this reach

Fish Community Survey Results - Walleye

- Collected in 3 of 6 sites with lower gradient bed slopes over sand and silt substrates
- Collected in upper, middle, and lower sections of the Byllesby pool
- 6 Walleye collected in fall 2020
- 3 Walleye collected in spring 2021

Aquatic Resources: Fish Impingement and Entrainment Study

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Fish Impingement and Entrainment Study

Study Status

- Appalachian completed the Fish Impingement and Entrainment Study in accordance with the methods described in the RSP and SPD.
  - Assessed impingement and entrainment risk at the intake structures and estimated entrainment rates
  - Completed turbine and spillway passage survival assessment using the USFWS Turbine Blade Strike Analysis model based on existing conditions
  - Repeated model evaluation for proposed turbine upgrades
    - Byllesby - Replace 3 of 4 Francis turbines with Kaplan turbines
    - Buck – Replace 2 of 3 Francis turbines with Kaplan turbines

Fish Impingement and Entrainment Study

Assessment Methods

- 2020 Study Efforts – presented in ISR
  - Compiled intake specifications, flow characteristics, and calculated approach velocity, identified target species/groups
  - Assessed potential of impingement or entrainment including intake avoidance, size exclusion, and early life stage entrainment
  - Estimated entrainment rates based on 33 facilities in EPRI database
- 2021 Study Efforts – presented in USR
  - Estimated fish passage and blade strike survival using USFWS turbine blade strike analysis model for two scenarios at the two developments
    - Assessed for current design and operations
    - Assessed for anticipated conditions after proposed turbine upgrades at Byllesby and Buck

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Proposed Turbine Upgrades

Parameters	Byllesby		
	Existing Conditions	Proposed Upgrade Conditions	
Turbine Number/Type	4 Francis	3 Kaplan	1 Francis
Number of Blades	5	5	16
Turbine Discharge (cfs)	1,467	1,348	1,467

Parameters	Buck		
	Existing Conditions	Proposed Upgrade Conditions	
Turbine Number/Type	3 Francis	2 Kaplan	1 Francis
Number of Blades	16	5	16
Turbine Discharge (cfs)	1,180	1,195	1,180

Fish Impingement and Entrainment Study

Fish Impingement and Entrainment Study

USFWS Turbine Blade Strike Analysis (TBSA)

- Modeled turbine blade strike and survival probability and spillway passage mortality under <u>two operational scenarios</u>
  - Typical/normal flow conditions – no spill beyond required min bypass flows
    - Fish size classes: 2, 4, 6, 8, 10, 15, 20, 25, and 30 inches
    - Route probabilities based on equal flow distribution to 4 turbines (1,467 cfs per unit)
  - Spilling conditions* – flows distributed to turbines or spillway based on project-specific flow exceedance percentiles
    - Fish size classes: based on site-specific Walleye data (mean length of 13.5 inches with standard deviation of 1.5 inches)
    - Route probabilities based on equal flow distribution to 4 turbines and spilling based on flow exceedances (4, 3, 2, and 1 percent)

*The probability of a fish passing through a turbine or via spill was assumed to be in direct proportion to the volume of flow passing through each route. A spillway and bypass passage survival rate of 97 percent was assumed based on the average of 136 survival tests conducted with juvenile salmonids on the Columbia river (Amaral et al. 2013).

Fish Impingement and Entrainment Study

Downstream Fish Passage Assessment

- Model analysis of two operational scenarios was performed for two turbine conditions
  - Existing conditions - Maximum flows based on turbine capacity of the existing Francis turbines
    - Flows distributed equally between 4 existing Francis turbines
  - Proposed conditions - Maximum flows based on turbine capacity with installation of the proposed upgrade to Kaplan turbines
    - Flows distributed based on proportion of flow capacity of combined Kaplan and Francis turbines
- Analyses were performed separately for Byllesby and Buck developments

Fish Impingement and Entrainment Study

Intake Approach Velocities

- With existing turbines
  - Byllesby – 5,868 cfs / (143 ft x 14 ft x1.5) = 2.0 ft/sec (fps)
  - Buck – 3,540 cfs / (104 ft x 14 ft x 1.5) = 1.6 fps
- With upgraded turbines
  - Byllesby – 5,511 cfs / (143 ft x 14 ft x1.5) = 1.84 fps
  - Buck - 3,570 cfs / (104 ft x 14 ft x 1.5) = 1.63 fps

Fish Impingement and Entrainment Study –Blade Strike Model Results

Project Dam	Turbine Type	Average Turbine Blade Strike Probability								
		Fish Length Class (inches)								
		2	4	6	8	10	15	20	25	30
Byllesby										
Existing	4 Francis (existing)	4.5%	8.8%	13.3%	17.8%	22.1%	33.3%	44.5%	55.4%	66.6%
Proposed	3 Kaplan (new), 1 Francis (existing)	2.8%	5.4%	8.2%	11.0%	13.6%	20.5%	27.4%	34.2%	41.0%
Buck										
Existing	3 Francis (existing)	4.5%	8.7%	13.2%	17.7%	21.9%	32.9%	44.0%	54.8%	65.9%
Proposed	2 Kaplan (new), 1 Francis (existing)	2.9%	5.6%	8.4%	11.3%	14.0%	21.1%	28.2%	35.1%	42.2%

Fish Impingement and Entrainment Study –Blade Strike Model Results

Cumulative Downstream Passage Survival (Percent) for Walleye							
	Flow Volume Exceedance Percentiles						
Byllesby Development	**1**	**2**	**3**	**4**			
Existing Conditions	82.70%	78.60%	74.70%	67.70%			
Proposed Upgrades	88.80%	87.80%	84.80%	82.80%			
Buck Development	**1**	**2**	**4**	**6**	**8**	**10**	**12**
Existing Conditions	88.80%	84.10%	82.60%	76.50%	75.20%	72.50%	71.10%
Proposed Upgrades	91.40%	90.60%	86.70%	84.90%	84.10%	82.00%	82.70%

Fish Impingement and Entrainment Study

Turbine Blade Strike Results Summary

- Cumulative Walleye passage survival after turbine upgrades
  - Between 82.8 and 88.8 percent at Byllesby
  - Between 82.7 and 92.4 percent at Buck
- Cumulative passage survival all other species with turbine upgrades
  - Between 58.3 (30-inch fish) and 96.8 percent at Byllesby
  - Between 57.5 (30-inch fish) and 97.1 percent at Buck
- Entrained fish less than 6.0 inches at Byllesby and Buck
  - Survival with existing conditions - 86 percent or higher
  - Survival with upgraded turbines - 92 percent or higher

Variances from FERC-approved Study Plan

Variances from FERC-approved Study Plan:

- Intake velocity
  - Unable to evaluate with ADCP due to high flow events and station operation
  - Determined using desktop calculation
  - Angled trashracks would require ADCP measurement some distance upstream
- Backpack electrofishing methods
  - Proposed two seasons but unable to complete during fall 2020 due to precipitation and high flows

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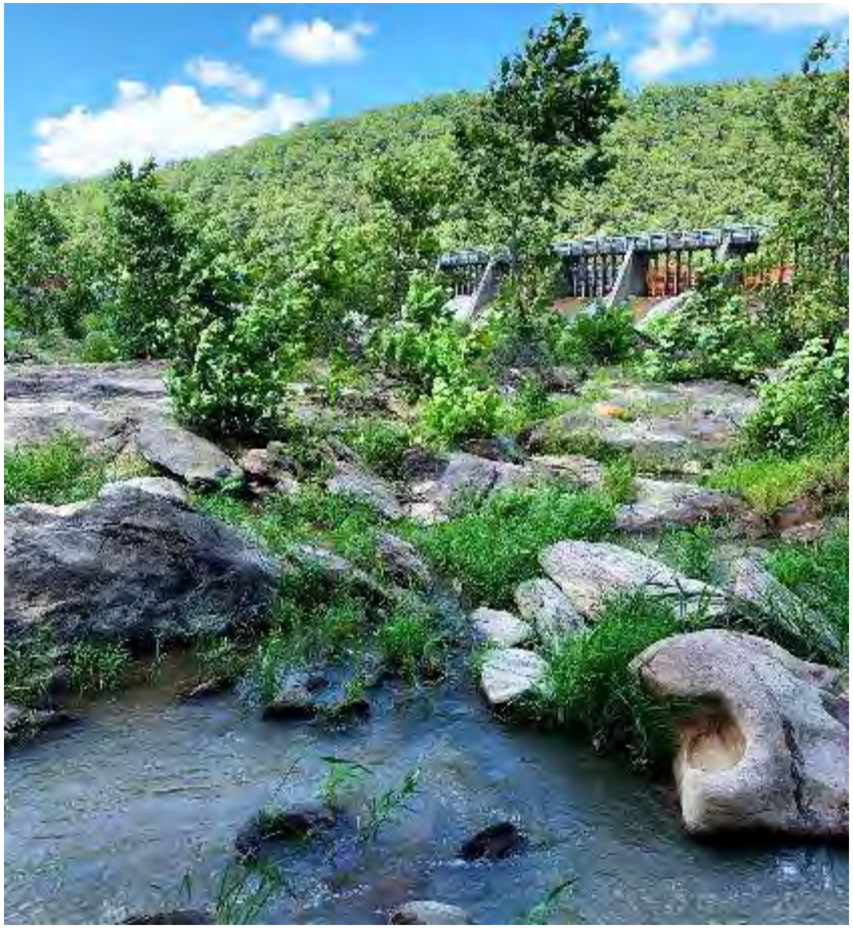
Aquatic Resources: Macroinvertebrate and Crayfish Survey



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Macroinvertebrate and Crayfish Survey

Study Goal:

- Obtain current information on the benthic aquatic community in the New River in the vicinity of the Project to support an analysis of Project effects.

Specific Objectives:

- Quantify the amount of benthic habitat available for macroinvertebrates and crayfish within each bypass reach;
- Collect a baseline of existing macroinvertebrate and crayfish communities in the vicinity of the Project using two temporally independent sampling efforts (fall 2020 index period and spring 2021 index period)

Macroinvertebrate and Crayfish Survey

Study Status:

- Appalachian completed study activities for the Benthic Aquatic Resources Study in accordance with the schedule and methods described in the RSP and SPD
- Fall sampling performed October 6 – 8, 2020
- Coordinated with agencies to receive waiver of instream work time of year restrictions
- Spring sampling performed April 20 – 23, 2021

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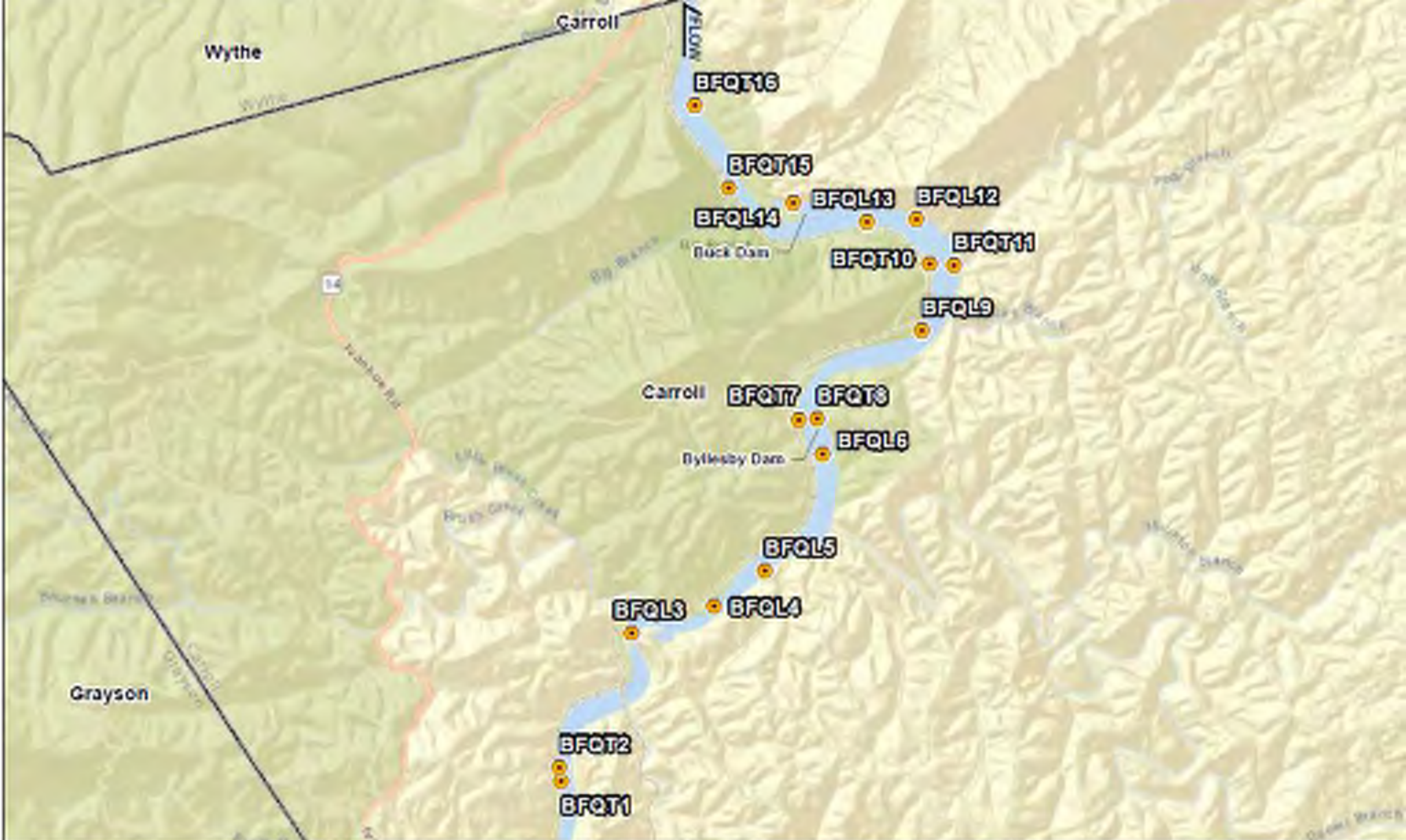
Macroinvertebrate and Crayfish Survey

Summary of Study Methods

- Quantitative Samples
  - 8 riffle/run sites along 100-m transects, two sites upstream of Byllesby Dam, four sites between Byllesby and Buck Dam, and two sites downstream of Buck Dam
  - Each site consists of 6 kick net sets composited into one sample
  - Each sample equals approximately 2 square meters
  - Crayfish data supplemented with seine hauls

- Qualitative Samples
  - 8 pool sites, four sites upstream of Byllesby Dam and four sites between Byllesby and Buck Dam
  - 20 dip-net grabs of representative habitats in proportion to their availability
  - Each sample covers approximately 1 linear meter of habitat



Legend

Macroinvertebrate Sample Location

County Boundary

N

0 0.75 1.5

Kilometers

Scale: 1:59,055

EDGE
ENGINEERING & SCIENCE

American Electric Power
Byllesby-Buck Benthic Aquatic Resource

Figure 1

Overall Byllesby-Buck project area including quantitative (BFQT) and qualitative (BFQL) macroinvertebrate survey sites on the New River in Carroll County, Virginia.

Macroinvertebrate and Crayfish Survey

Summary of Study Results

- Quantitative Sites
  - Good quality habitat at seven of the eight sites; one site heavily embedded (BFQT2)
  - Habitats consisted primarily of bedrock, boulder, cobble, and gravel substrates

- Qualitative Sites
  - Relatively poor habitat at all sites
  - Habitat consisted primarily of sand, silt, and bedrock substrates

Macroinvertebrate and Crayfish Survey

Summary of Study Results – Macroinvertebrate Metrics

- Upstream of Byllesby Dam
  - 49 taxa from 2 quantitative and 4 qualitative sites
  - 4 of 6 sites ranked good based on Hilsenhoff Biotic Index (HBI*) values
  - VSCI** in riffles from 57.3 (fall) and 65.9 (spring) and pools were from 35.8 (fall) and 26.9 (spring)
- Between Byllesby and Buck dams
  - 53 taxa from 4 quantitative and 4 qualitative sites
  - HBI values were good to very good to excellent
  - VSCI in riffles from 62.9 (fall) and 54.9 (spring) and pools from 39.5 (fall) and 36.0 (spring)
- Downstream of Buck Dam
  - 30 taxa from 2 quantitative sites
  - Sites generally good to very good based on HBI values
  - VSCI in riffles from 58.8 (fall) and 59.0 (spring)

**HBI measures the health of the stream community based on their pollution tolerance.

**VSCI measures level of site impairment compared to regional stream conditions.

Macroinvertebrate and Crayfish Survey

Summary of Study Results - Crayfish

- Two native species of crayfish collected and identified in the field during survey efforts
  - Conhaway Crayfish (*Cambarus appalachiensis*)
  - Spiny Stream Crayfish (*Faxonius cristavarius*)
- Spiny Stream Crayfish collected above Byllesby
- Conhaway and Spiny Stream crayfishes collected at sites between Byllesby and Buck and downstream of Buck
- No invasive species collected

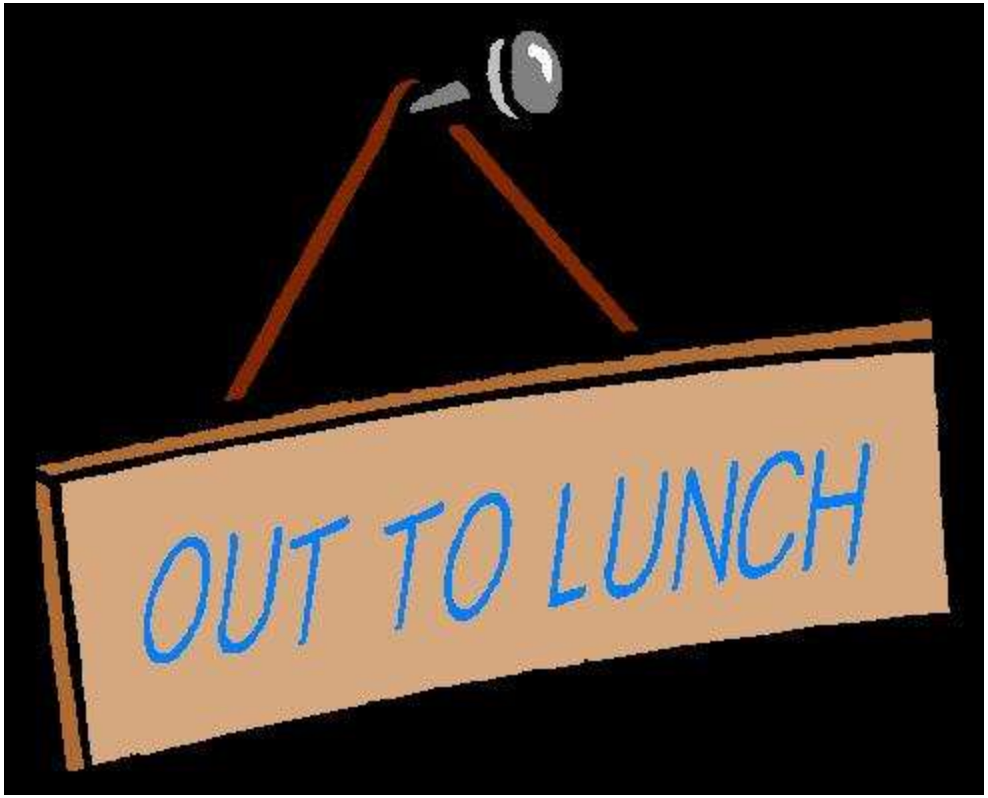
Variances from FERC-Approved Study Plan

- The Fish Community Study was conducted in conformance with the Commission's RSP and SPD.

Walleye

Kanawha Sculpin

30-Minute Lunch Break



Bypass Reach Flow and Aquatic Habitat Study

Byllesby Bypass Reach 7.28.2021
Flow 88 cfs

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Bypass Reach Flow and Aquatic Habitat Study

Study Goal: Conduct a flow and habitat assessment of the bypass reaches and tailrace areas for the Byllesby and Buck developments using desktop, field survey, and hydraulic/habitat modeling methodologies

Specific Objectives

- Delineate and quantify aquatic habitats and substrate types within the bypass reaches
- Identify and characterize locations of habitat management interest within the bypass reaches
- Determine surface water travel times and water surface elevation responses at various gate openings to:
  - Evaluate the existing ramping rates (Buck only) required by the existing license
  - Evaluate potential available habitat under the existing 360 cfs minimum downstream flow requirement
  - Evaluate potential seasonal minimum flow releases in the bypass reach

Bypass Reach Flow and Aquatic Habitat Study

Study Status

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

Study Periods

- Buck study period: August 17 – October 8, 2020
  - 2-D model development and habitat model results at the calibration flows were presented at the ISR meeting on January 28, 2021
- Byllesby study period: July 28 – September 9, 2021
  - 2-D model development and habitat model results at the calibration flows will be presented at the USR meeting on December 1, 2021

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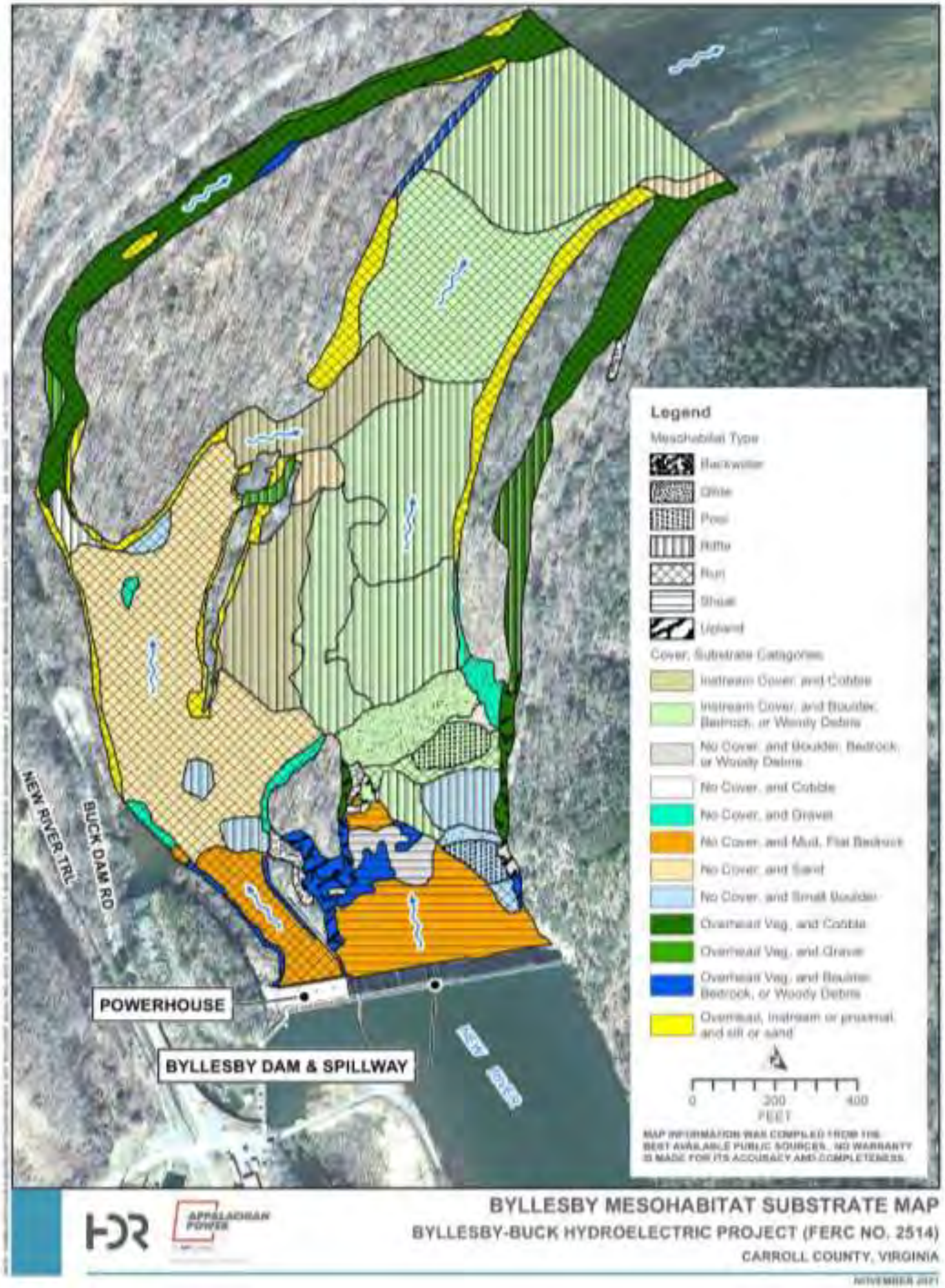
Bypass Reach Flow and Aquatic Habitat Study

Study Methods and Results

- Completed desktop habitat mapping and evaluation of Project inflows
- Assembled Habitat Suitability Index (HSI) criteria
- Developed model calibration target flow recommendations
- Collected field data during target flow releases into each bypass reach
- Developed and calibrated 2-D hydraulic model for each study area
- Used model to simulate potential available habit in each study area at the model calibration target flows

Byllesby Study Area

Byllesby Mesohabitat Substrate Map



Byllesby Aquatic Habitat Characteristics

Habitat Characteristic	Area (acres)	Percent (%)
Cover		
Instream Cover	18.7	46.5
No Cover	12.3	30.8
Overhead Vegetation	9.1	22.7
Substrate		
Boulder, Bedrock, or Woody Debris	17.4	43.4
Cobble	8.0	20.1
Sand	6.4	15.9
Mud or Flat Bedrock	3.2	7.9
Silt or Sand	2.6	6.5
Small Boulder	1.5	3.7
Gravel	1.1	2.6
Mesohabitat		
Run	17.7	44.2
Riffle	16.4	41.0
Shoal	2.9	7.2
Glide	1.3	3.3
Upland	0.9	2.2
Pool	0.6	1.4
Backw ater	0.5	0.7

Byllesby Bypass Reach 7.31.2019 Leakage Flow (11 cfs)

Byllesby Side Channel
9.09.2021 47 cfs

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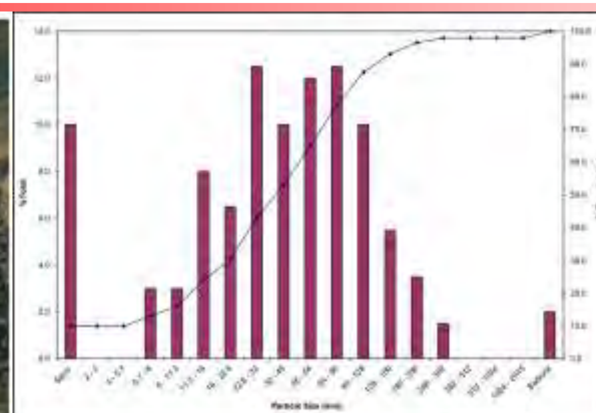
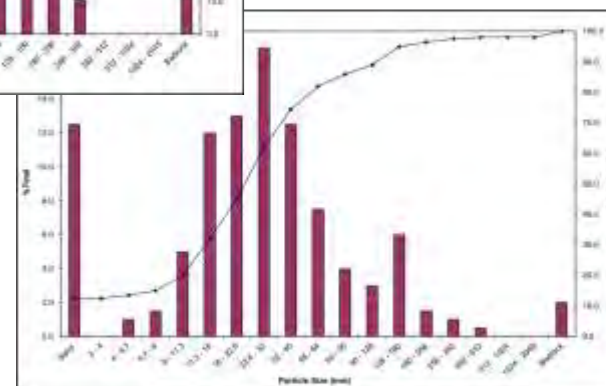
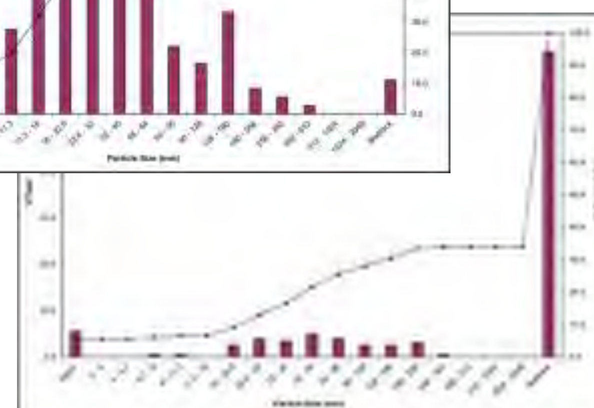
Particle Size Distribution Results
Byllesby Study Area



Side Channel



Cross-over Channel



Bypass Reach

Species of Interest Walleye and Guilds

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


Walleye
Courtesy: Virginia DWR


Redbreast Sunfish
Courtesy: Virginia DWR


Silver Redhorse
Courtesy: USGS


Shorthead Redhorse
Courtesy: Iowa DNR

Byllesby 2-D Hydraulic Model Calibration Flows

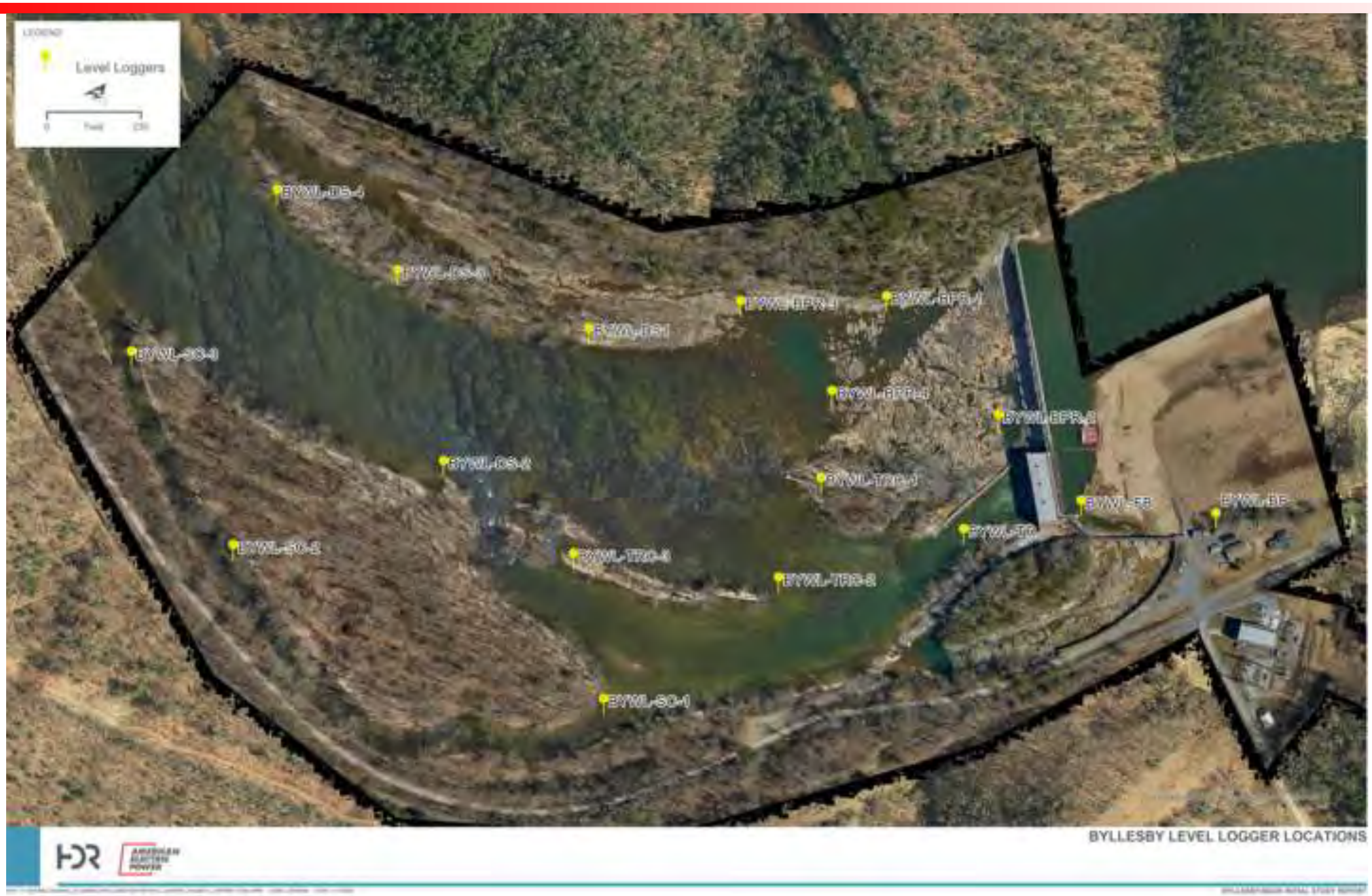
Byllesby Bypass Reach 9.08.2021 Flow 11 cfs

Measured Flows:

- Leakage: 11 cfs (upper photo)
- Low: 88 cfs
- Middle: 158 cfs
- High: 194 cfs (lower photo)

Byllesby Bypass Reach
9.09.2021 Flow 194 cfs

Byllesby 2-D Hydraulic Model Water Surface Elevation Monitoring



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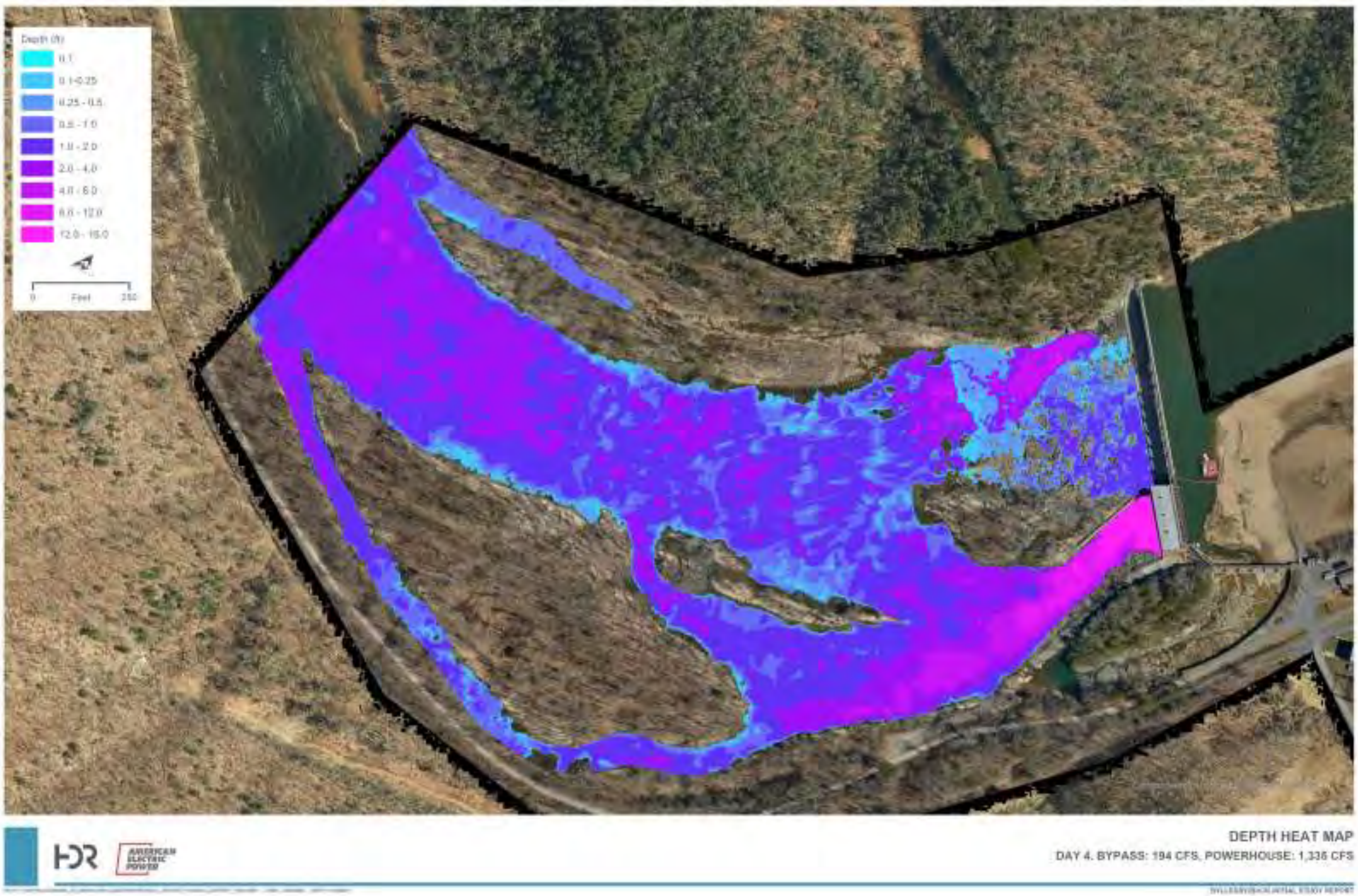
Byllesby 2-D Hydraulic Model Calibration Results

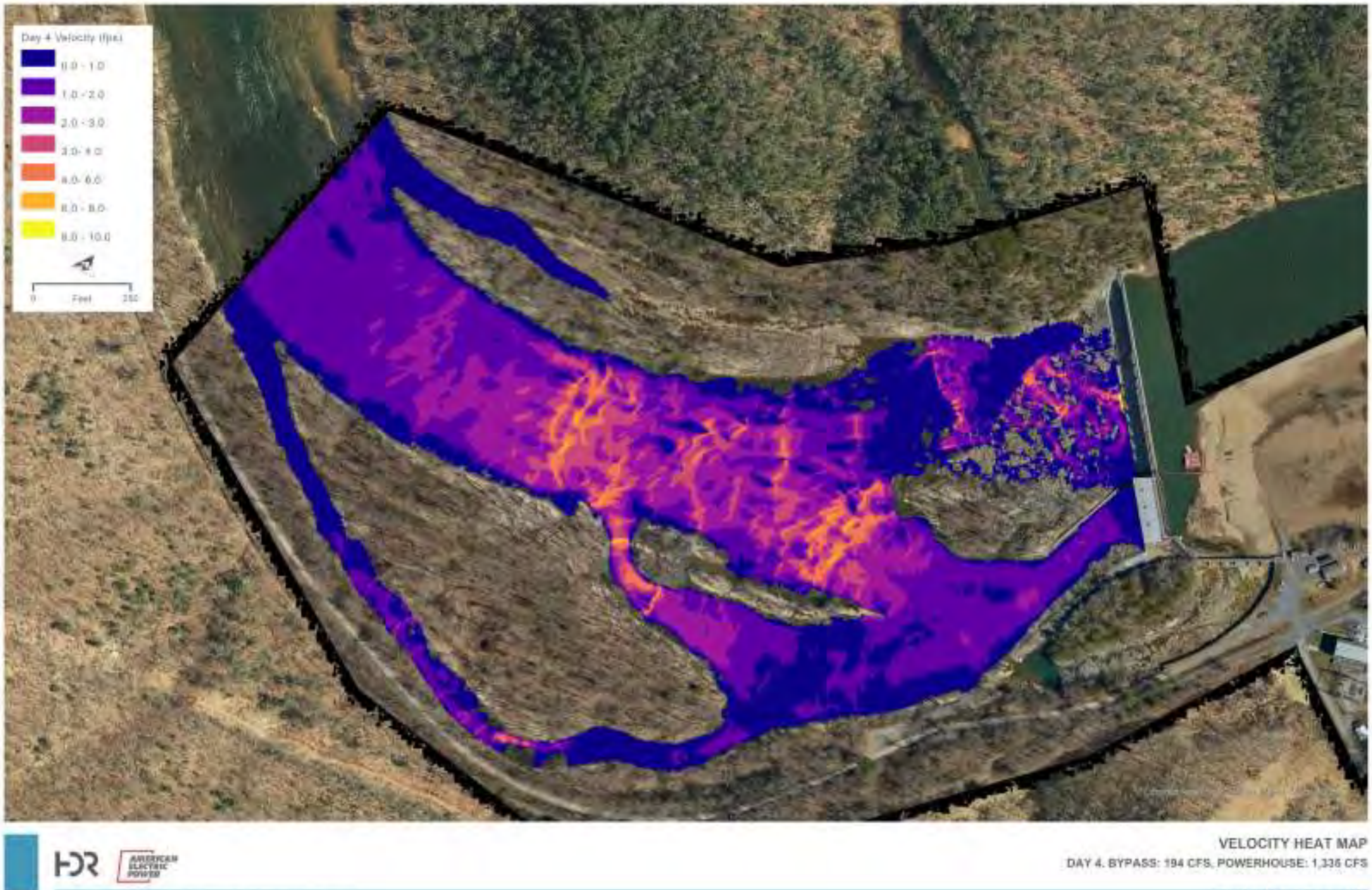
Bypass Reach Flow	Level Logger Time (hr:min)	Model Time (hr:min)	Level Logger Delta (hr:min)	Modeled vs Measured WSEL Average Delta*	
				Percentage	Magnitude (ft)
Day 1 (Leakage)	N/A	N/A	N/A	0.01%	0.2
Day 2 (Low)	N/A	N/A	N/A	-0.02%	-0.3
Day 3 (Mid)	0:06	0:05	0:01	0.01%	0.1
Day 4 (High)	0:02	0:01	0:01	0.01%	0.2

*WSEL comparisons made at level logger locations

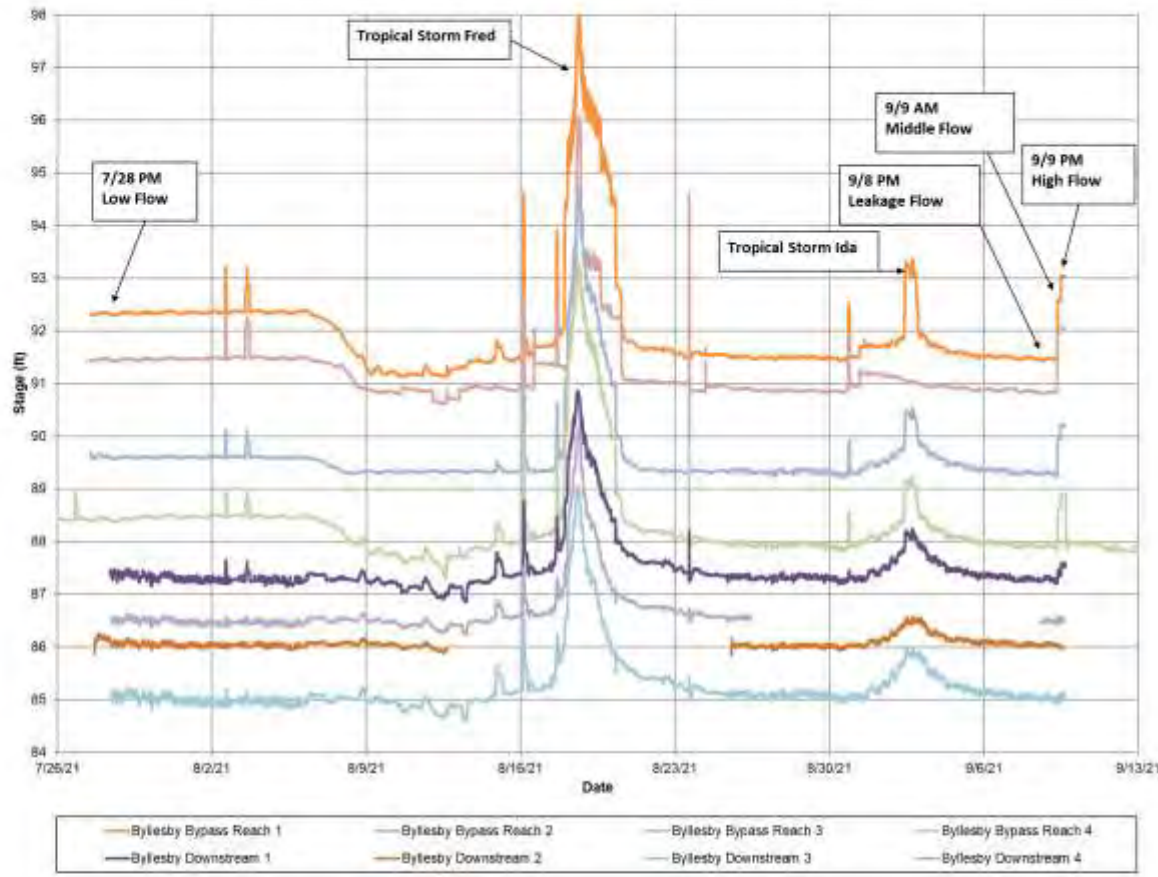
Byllesby 2-D Hydraulic Model Calibration Results: Depth



Byllesby 2-D Hydraulic Model Calibration Results: Velocity



Byllesby Bypass and Downstream Reach: Water Surface Elevations



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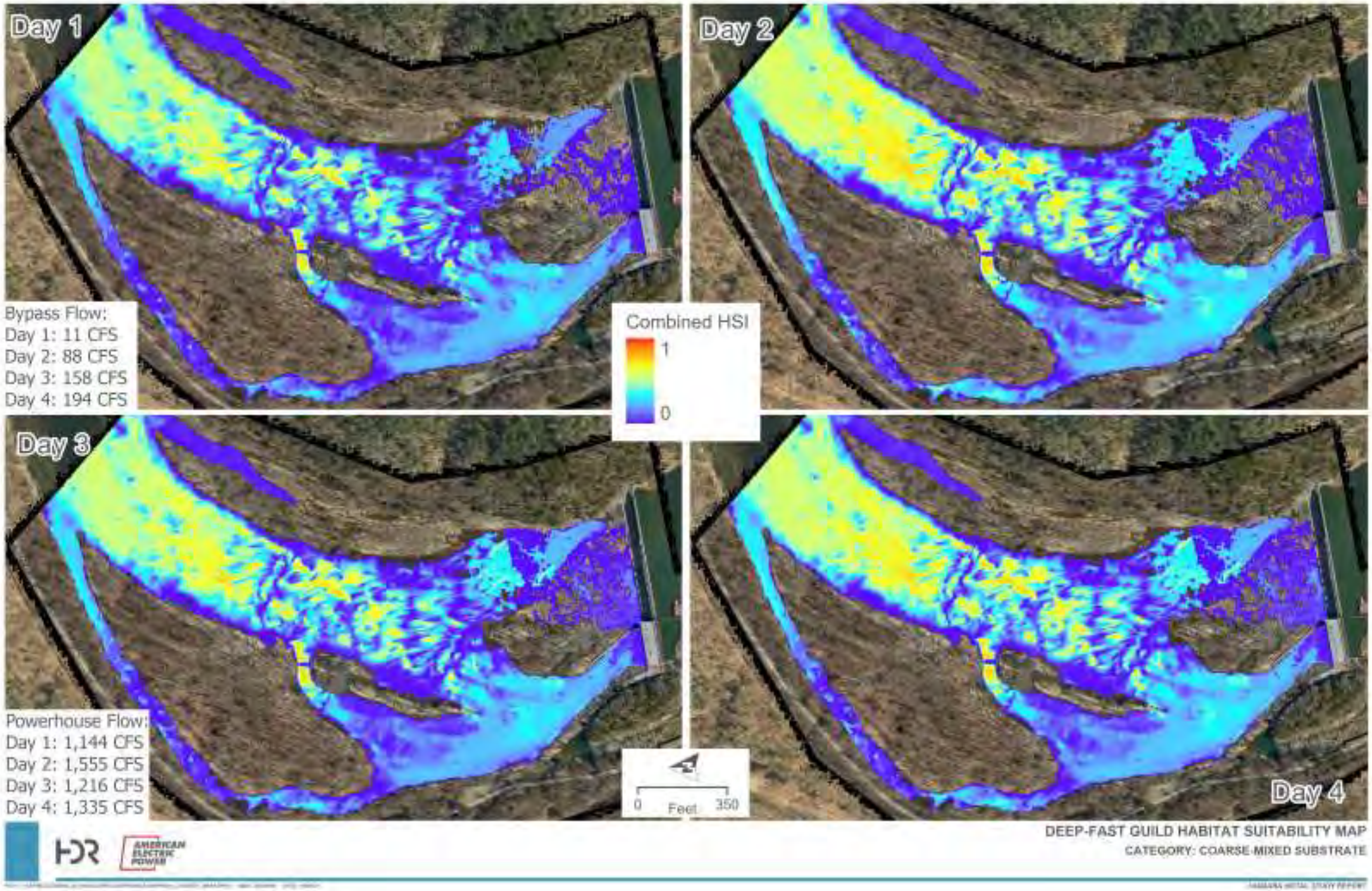
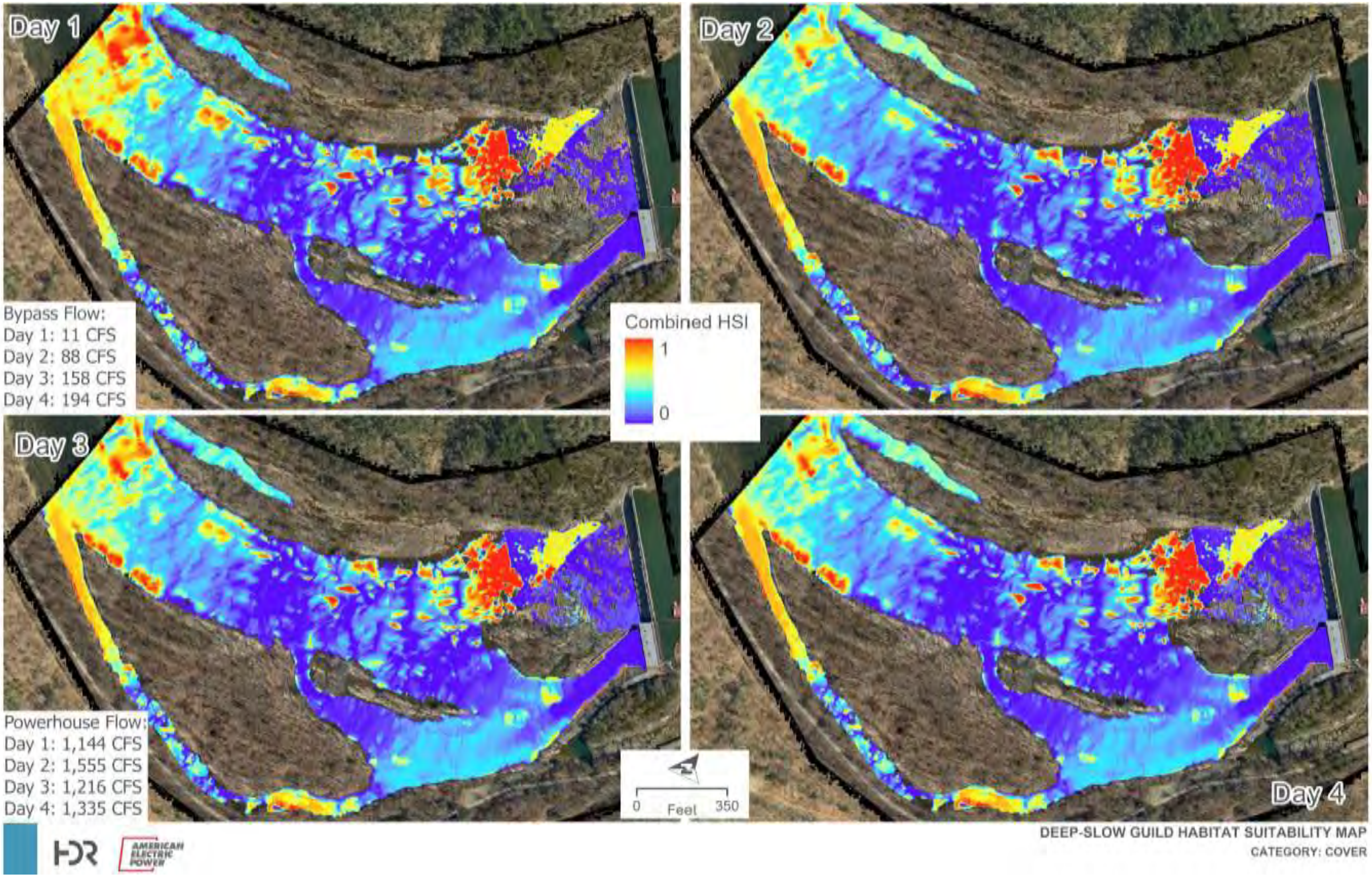
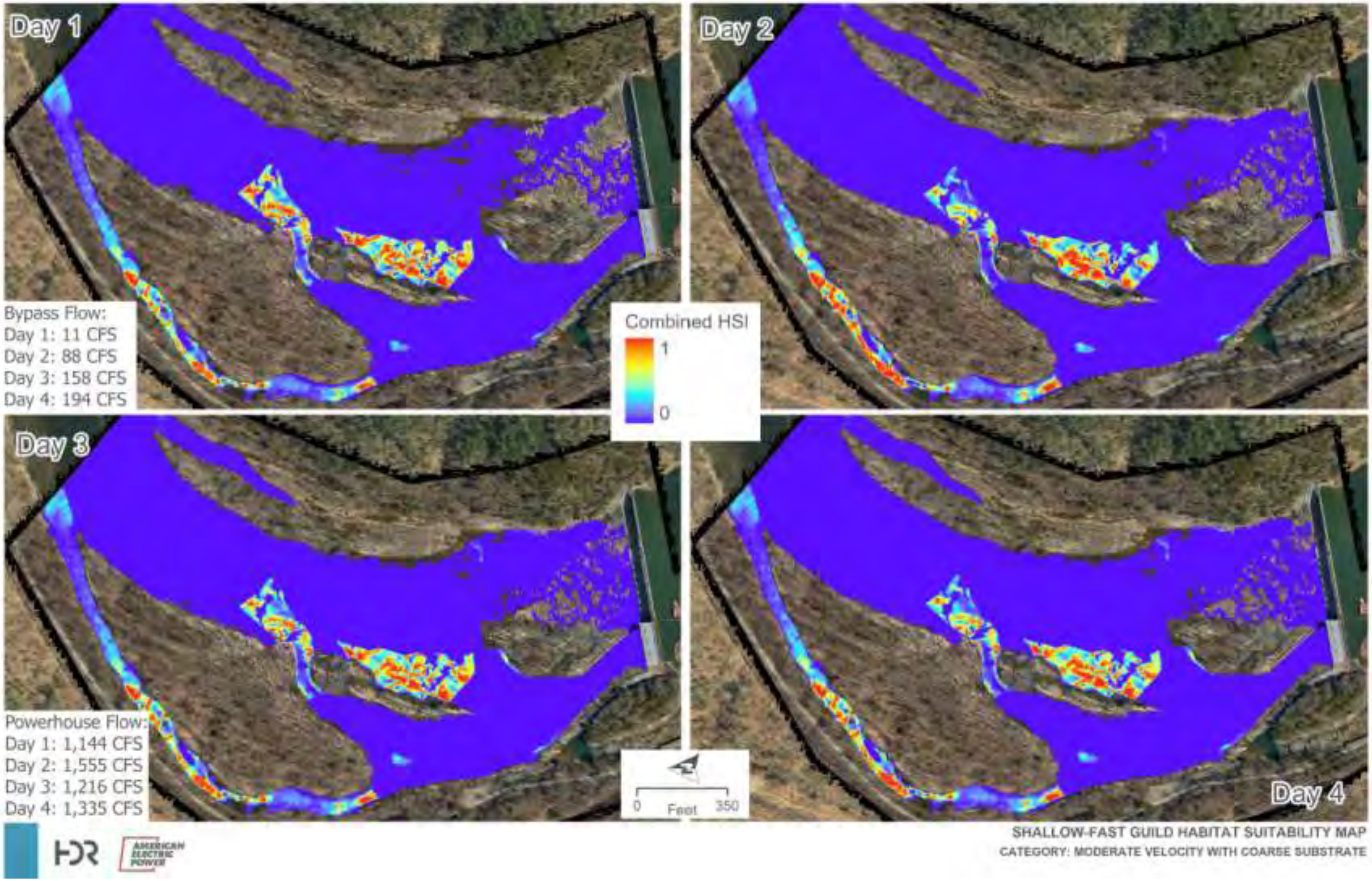
Habitat Results: Deep-Fast Guild



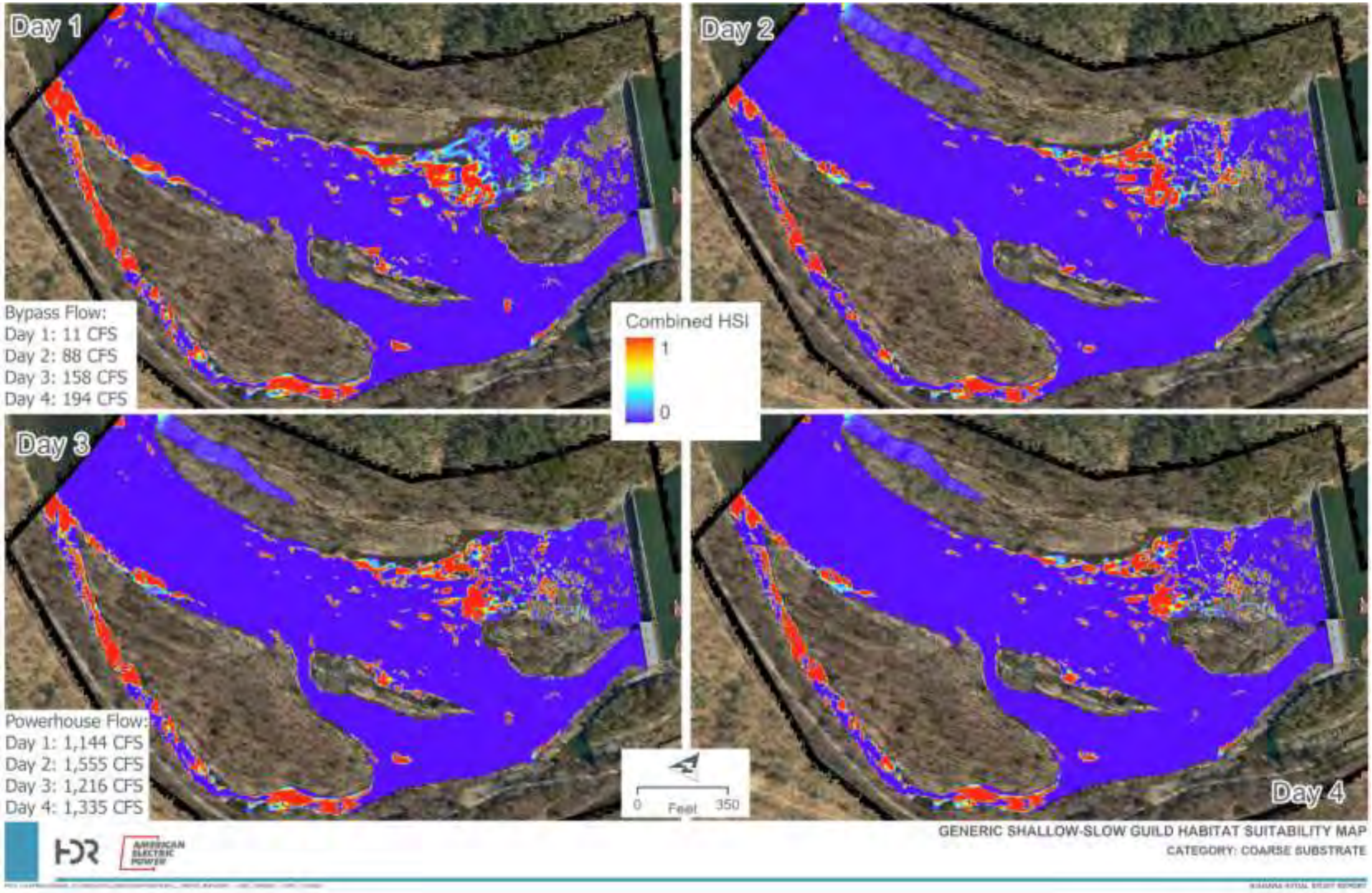
Habitat Results: Deep-Slow Guild



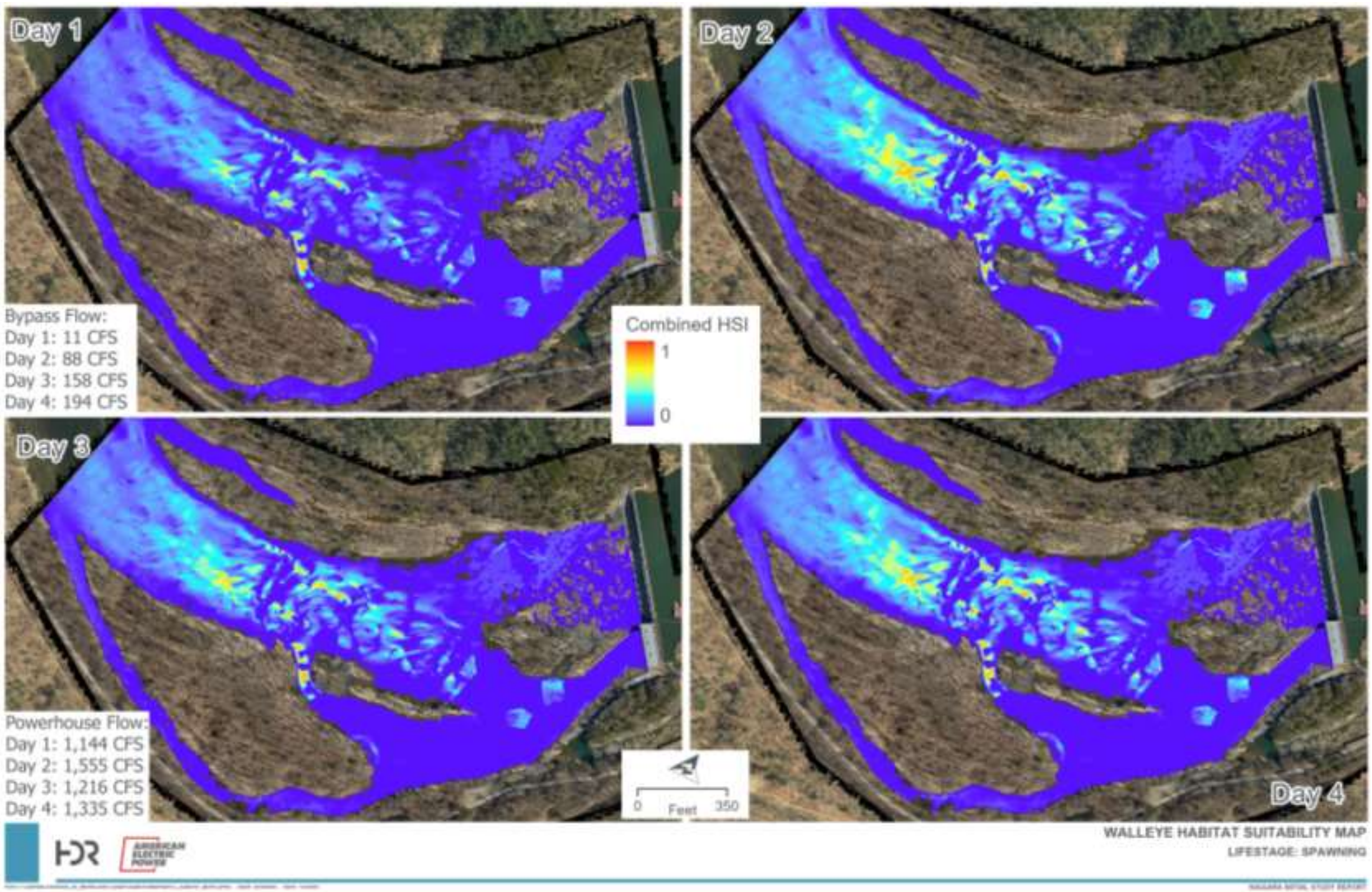
Habitat Results: Shallow-Fast Guild



Habitat Results: Shallow-Slow Guild



Habitat Results: Walleye Spawning



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Byllesby Bypass Reach Summary and Conclusions

- The bypass reach consists of deep and shallow pools and shoal habitat types dominated by larger substrate sizes
- Habitat model results indicate suitable habitat for species and life stages that prefer deep and/or slow-moving water
- Increasing flow only has a marginal effect on depths and velocities
- As a result, the amount of available habitat in the bypass reach is very similar over the modeled flow range (between 11 – 194 cfs)

Byllesby Bypass Reach 9.8.2021
Leakage Flow 11 cfs

Variances from FERC-approved Study Plan

The Bypass Reach Flow and Aquatic Habitat Study was conducted in conformance with the Commission's SPD.

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15-minute break

Recreation Study

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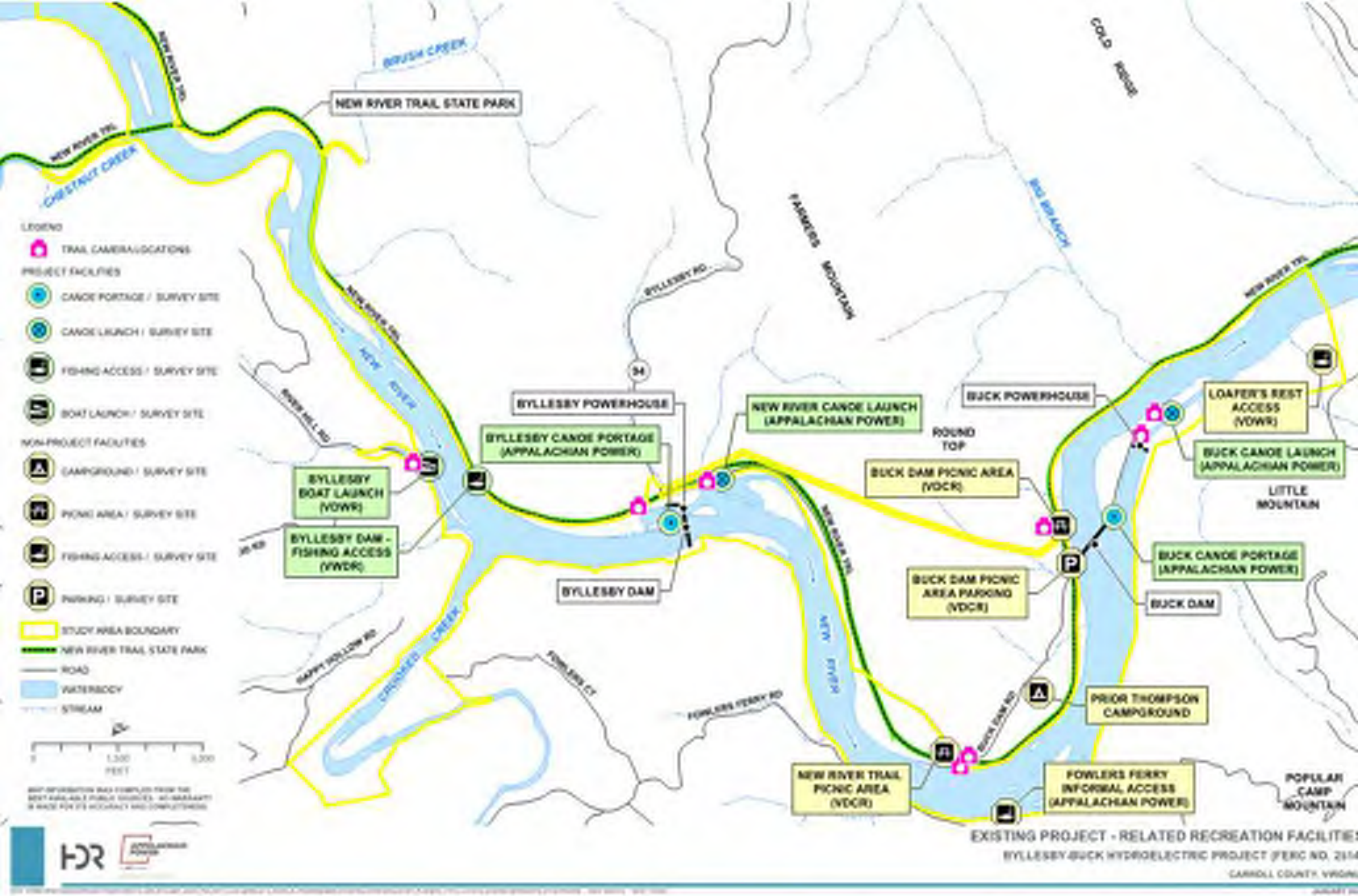
Recreation Study

Study Status

Appalachian completed the Recreation Study in accordance with the methods described in the RSP and SPD.

The approved Study Plan defines four primary tasks for the Recreation Study:

- Recreation Facility Inventory and Condition Assessment
- Site Visit with Stakeholders
- Recreation Use Visitor Online Survey
- Recreation Use Documentation



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Project and Non-Project Recreation Facilities Studied

Recreation Facility	Recreation Facility Inventory and Condition Assessment	Site Visit with Stakeholders	Recreation Visitor Use Online Survey	Recreational Use Documentation - Trail Camera
Byllesby Development				
Byllesby VDWR Boat Launch	x	x	x	x
Byllesby Canoe Portage	x	x	x	x
New River Canoe Launch	x	x	x	x
VDWR Fishing Site	x			
Buck Development				
Buck Dam Picnic Area	x	x	x	x
New River Trail Picnic Area	x	x	x	x (Upper and Lower)
Buck Dam Canoe Portage	x	x	x	x
Loafer's Rest			x	x (Buck tailrace)

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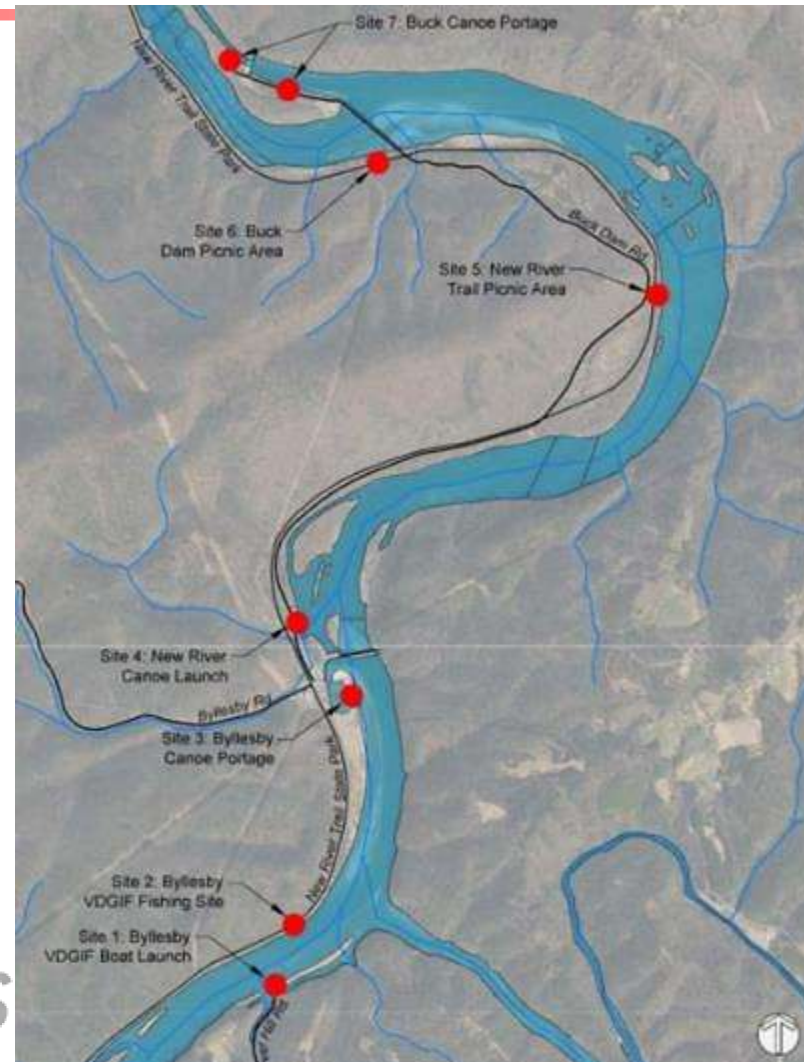
Recreation Study: Recreation Facility Inventory and Condition Assessment

Land Planning Design Associates (LPDA), conducted a Recreation Facility Inventory and Condition Assessment of seven Project and Non-Project recreation facilities.

LPDA recorded specific criteria for each facility and completed a qualitative assessment of the condition of the facilities.



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Recreation Study: Recreation Visitor Use Online Survey

- From April 21, 2020 to December 1, 2020, Appalachian received 142 responses to the online survey.
- Provided a method for existing and potential recreation visitors to respond and provide feedback on recreation opportunities for Project and Non-Project facilities.
- Outreach methods included: posted signs, coordinated with stakeholders, included in ILP Progress Report, and social media.

Primary Activity	Use (%)
Fishing	48
Canoeing/kayaking	20
Sight-seeing	11
Biking	9
Picnicking	4
Hiking	2
Hunting	2
Wildlife Viewing	2
Swimming	1

Recreation Study: Recreation Use Documentation

Summary of Study Methods

- Eight trail cameras were installed from October 2019 - November 2020.
- Recorded time, temperature, date, and recreation usage.

Recreation Study Summary

- Consistent recreation usage at most of the Project and Non-Project facilities, with usage peaking on the weekends, holidays, and warmer months, as anticipated.
- The New River Trail provides a unique opportunity to access most of the recreation facilities in otherwise remote locations.
- The trail camera and online survey results indicated that fishing and canoe/kayaking were the primary recreation activities.
- The Buck Dam Canoe Portage was the only Project recreation facility that saw very little recreation usage, likely because it is inaccessible except by canoe/kayak.

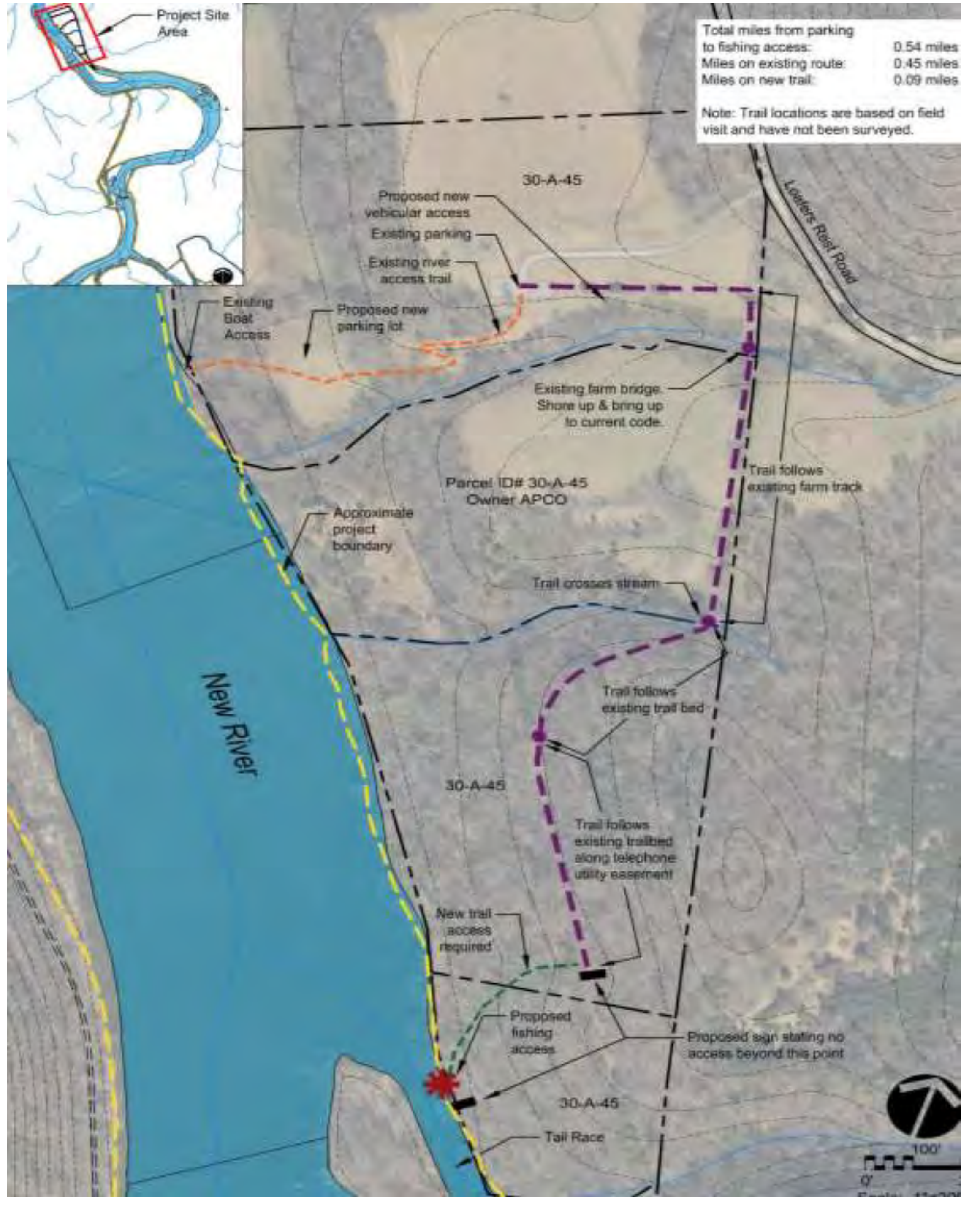
Recreation Study: Site Visit with Stakeholders to Discuss Existing and Future Recreational Opportunities

- Documentation of the virtual meeting (October 21, 2020) and site visit (October 28, 2020).

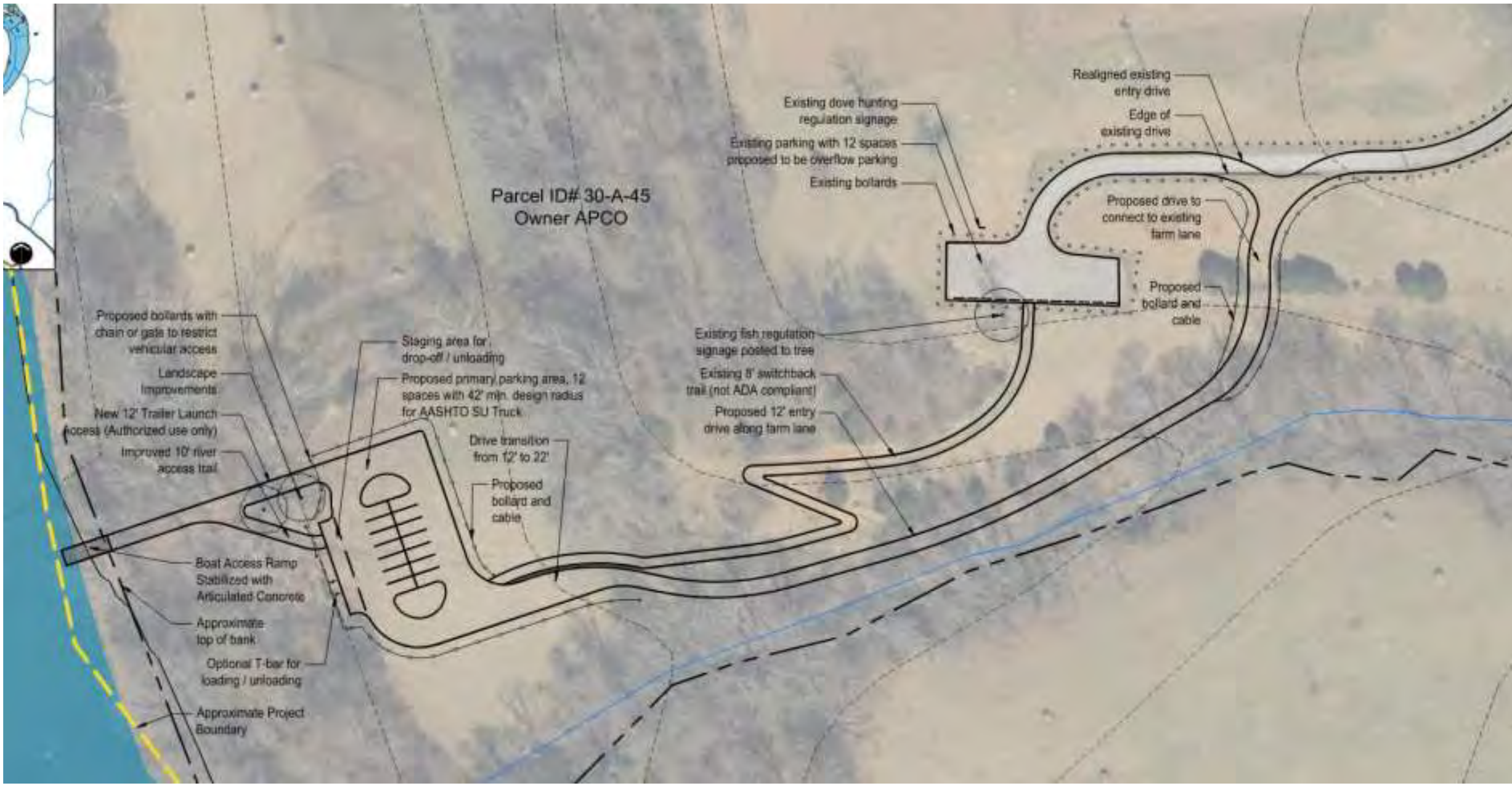
2021 site visits and meetings included:

- Site visit to the VDWR Loafer's Rest recreation facility with VDWR, Appalachian, and Appalachian's consultants on March 24, 2021.
- Conference call with VDWR, Appalachian, and Appalachian's consultants for the Recreation Study on June 29, 2021 to discuss priorities for potential Project and Non-Project recreation facility improvements and to introduce preliminary concepts for development of the VDWR Loafer's Rest recreation facility.

Proposed Loafer's Rest Fishing Trail



Proposed Loafer's Rest Improvements



Variances from FERC-approved Study Plan

The Recreation Study was conducted in conformance with the Commission's SPD.

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Cultural Resources Study

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Cultural Resources Study

Tasks completed in the Cultural Resources Study:

- Consultation for the APE Determination (Task 1),
- Background Research and Archival Review of the Study Area (Task 2),
- Phase I Reconnaissance Survey of the Area of Potential Effects (APE) (Task 3).
- Inventory of Traditional Cultural Properties (TCPs) (Task 4).
  - No TCPs Identified
- Update to the Cultural Resources Management Plan (Task 5)
  - *ongoing

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Cultural Resources Study Findings

Terracon conducted an archaeological assessment of the Project APE in October 2020, and geomorphological investigations occurred in October 2020 and April 2021.

- Most of the APE is either steeply sloped or contains deeply buried historic alluvial deposits with little to no chance of containing significant archaeological resources.
- There is little to no erosion or other Project-related effects in any portions of the APE.
- One 47.5-acre area located at the northeastern end of the Project has the potential for containing archaeological resources. The area currently is not experiencing any project-related effects. However, should ground disturbing activities take place in this area, a Phase I archaeological survey would be required in this area.

Figure 24. Area recommended for additional investigations
Base Map: Austinville, VA (1979) USGS 7.5' topographic quadrangle

Area Recommended for Additional Survey
Byllesby Buck Study Area/APE
Archaeological Site

Cultural Resources Study Findings

Three above-ground historic resources – the Byllesby and Buck Hydroelectric Facilities and the Norfolk and Western Railroad Cripple Creek Extension – are eligible for inclusion in the National Register of Historic Places (NRHP). All three were revisited and evaluated during the fieldwork and all three remain eligible for listing in the NRHP.

- It is Terracon's opinion that no historic properties are currently being affected by continued Project operations.

None of the resources identified through Terracon's research will be affected by the Project.

Variances from FERC-approved Study Plan

The Cultural Resources Study was conducted in conformance with the Commission's SPD. The final Study Report was filed with the Draft License Application on October 1, 2021 and is not included in the USR (PRIV). A draft Historic Resources Management Plan will be filed with the Final License Application in 2022.

USR Meeting: Stakeholder Participation

- Appalachian will file the Updated Study Report Meeting Summary with FERC by December 16, 2021.
- Meeting summary disagreements, requests for modifications to studies, or requests for new studies should be filed with FERC by January 15, 2022.
  - If requesting modifications to studies, stakeholders must take into account FERC's Criteria for Modification of Approved Studies (18 CFR § 5.15(d)).
  - If requesting new studies, stakeholders must take into account FERC's 7 Criteria for New Study (18 CFR § 5.15(e)).
- Stakeholders File Comments on the DLA with FERC by December 31, 2021.
- Appalachian will file responses to meeting summary disagreements by February 14, 2022.
- Stakeholders can contact Appalachian with questions or comments:

Elizabeth Parcell
(540) 985-2441
ebparcell@aep.com

Jonathan Magalski
(614) 716-2240
jmmagalski@aep.com

Closing

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Subject: FW: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Updated Study Report Meeting Summary

Attachments: AEP to FERC BB USR Mtg Summary Transmittal_12.16.2021.pdf; 20211216 _AEP_to_FERC_USR Meeting Summary.pdf

From: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>
Sent: Friday, December 17, 2021 11:20 AM
To: ACHP - John Eddins <jeddins@achp.gov>; American Whitewater - Kevin Colburn <kevin@americanwhitewater.org>; Angie Grooms <angie.grooms750@gmail.com>; Appalachian Trail Conservancy - Andrew Downs <adowns@appalachiantrail.org>; Carroll County - Rex Hill <rex.hill@carrollcountyva.gov>; Carroll County Administrator - Steve Truitt <steve.truitt@carrollcountyva.gov>; Catawba Indian Nation - Caitlin Rogers <caitlin.rogers@catawba.com>; Cherokee Nation - Elizabeth Toombs <elizabeth-toombs@cherokee.org>; David Taylor <jklfloat@embarqmail.com>; Delaware Nation - Erin Paden <epaden@delawarenation-nsn.gov>; Fish and Wildlife Conservation - Caitlin Carey <cscarey@vt.edu>; Fish and Wildlife Conservation - Donald J. Orth <dorth@vt.edu>; Friends of the Rivers of Virginia - Bill Tanger <riverdancer1943@gmail.com>; Friends of the Rivers of Virginia - Richard Roth <rroth@radford.edu>; Harold Peterson <harold.peterson@bia.gov>; New River Conservancy - George Santucci <george@newriverconservancy.org>; New River Conservancy - Laura Walters <claytorlakegirl@gmail.com>; New River Outdoor Adventures - Tim Dixon <newriveroutdooradventures@yahoo.com>; New River Regional Water Authority - Zachary Slate <newriverwater@gmail.com>; New River Trail State Park - Sam Sweeney <Sam.Sweeney@dcr.virginia.gov>; Terry Clouthier Pamunkey THPO <terry.clouthier@pamunkey.org>; Town of Fries - Scott McCoy <townoffries@friesva.com>; Town of Wytheville - Dr. Beth Taylor, Mayor <beth.taylor@wytheville.org>; USFWS Chesapeake Bay Field Office - Janet Norman <janet_norman@fws.gov>; USGS - Mark Bennett <mrbennet@USGS.gov>; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov) <emma.williams@governor.virginia.gov>; VADCR - Jennifer Wampler <jennifer.wampler@dcr.virginia.gov>; VADCR - Jimmy Elliott <james.elliott@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADCR - Sharon Ewing <sharon.ewing@dcr.virginia.gov>; VADEQ <eir@deq.virginia.gov>; VADEQ - Bettina Rayfield <Bettina.rayfield@deq.virginia.gov>; VADEQ - Joe Grist <joseph.grist@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; VADEQ - Scott Kudlas <scott.kudlas@deq.virginia.gov>; VADEQ - Tony Cario <anthony.cario@deq.virginia.gov>; VADHR - Timothy Roberts <tim.roberts@dhr.virginia.gov>; VADWR - Jeff Williams <jeff.williams@dwr.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; WADWR - John Copeland <John.Copeland@dwr.virginia.gov>; Wythe County Admin - Stephen Bear <sdbear@wytheco.org>
Cc: 'ebparcell@aep.com' <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>; Salazar, Maggie <Maggie.Salazar@hdrinc.com>
Subject: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Updated Study Report Meeting Summary

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Pursuant to the ILP, Appalachian conducted a virtual Updated Study Report (USR) Meeting for the Project on December 1, 2021 and filed a summary of the meeting with FERC on December 16, 2021. The USR Meeting presentation was included as an attachment to the USR Meeting summary. On behalf of Appalachian, we are notifying stakeholders of the availability of the USR Meeting summary and presentation. For your convenience, a copy of the cover letter for this filing is attached. Appalachian encourages stakeholders to view the complete filing online at FERC's eLibrary at eLibrary | File List (ferc.gov) or on the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck).

Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com.

On behalf of AEP and the Byllesby-Buck Project relicensing team, thank you for your participation in this process, and we hope you and your families have safe and restful holiday season.

Sarah Kulpa
Project Manager

HDR
440 S. Church Street, Suite 900
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Subject: FW: Corrected Table for Byllesby-Buck (VA)? #2514 -- Filing of Updated Study Report

From: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>
Sent: Friday, December 17, 2021 5:05 PM
To: Norman, Janet <janet_norman@fws.gov>; Elizabeth B Parcell <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>
Cc: McCorkle, Richard <richard_mccorkle@fws.gov>; Pica, Jessica E <jessica_pica@fws.gov>; Salazar, Maggie <Maggie.Salazar@hdrinc.com>
Subject: RE: Corrected Table for Byllesby-Buck (VA)? #2514 -- Filing of Updated Study Report

Hi Janet,

Sorry for the delayed response, but thanks for the follow-up. You'll have seen by now that we just wrapped up the USR meeting summary and filed that with FERC yesterday. The meeting summary highlighted action items and included as attachments those we were able to address on this schedule, and others will be addressed in the final study reports filed with the final license application.

Thanks again for your time and comments/questions during the USR meeting. We will reconnect after the holidays, and plan to schedule a follow-up meeting to focus on the bypass flow studies.

I hope you get to enjoy some time off over the next couple weeks. Happy holidays, and be well!

Sarah Kulpa
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From: Norman, Janet <janet_norman@fws.gov>
Sent: Tuesday, December 7, 2021 11:20 AM
To: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>; Elizabeth B Parcell <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>
Cc: McCorkle, Richard <richard_mccorkle@fws.gov>; Pica, Jessica E <jessica_pica@fws.gov>
Subject: Corrected Table for Byllesby-Buck (VA)? #2514 -- Filing of Updated Study Report

Hi Liz, Sarah, Jonathan,

While my pre-holiday brain remembers it, I was hoping you could send a couple items from our action list on the Byllesby-Buck Updated Study Report.
One of which was the corrected Table 5-13 Turbine Blade Strike Probability by Project Configuration and Fish Length. to insert on page 5-25. As we recall, the erroneous 33.3% probability was inserted across the row.

I have vague recollection that there may have been one more item we spoke about distributing shortly after meeting on our action list? Currently escapes me.

Also, the soonest you have the detailed meeting summary, I would appreciate seeing that for my review. Thank you!

Janet

Janet Norman (she, her)
Fish and Wildlife Biologist
USFWS Chesapeake Bay Field Office
(cell) 410-320-5519

Teleworking, not in this office space currently:
177 Admiral Cochrane Dr.
Annapolis, MD 21401

From: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>
Sent: Thursday, November 18, 2021 7:26 AM
To: ACHP - John Eddins <jeddins@achp.gov>; Colburn, Kevin <kevin@americanwhitewater.org>; Angie Grooms <angie.grooms750@gmail.com>; Andrew Downs <adowns@appalachiantrail.org>; Carroll County - Rex Hill <rex.hill@carrollcountyva.gov>; Carroll County Administrator - Steve Truitt <steve.truitt@carrollcountyva.gov>; Catawba Indian Nation - Caitlin Rogers <caitlin.rogers@catawba.com>; Cherokee Nation - Elizabeth Toombs <elizabeth-toombs@cherokee.org>; David Taylor <jklfloat@embarqmail.com>; epaden <epaden@delawarenation-nsn.gov>; Fish and Wildlife Conservation - Caitlin Carey <cscarey@vt.edu>; Fish and Wildlife Conservation - Donald J. Orth <dorth@vt.edu>; riverdancer1943 <riverdancer1943@gmail.com>; Friends of the Rivers of Virginia - Richard Roth <rroth@radford.edu>; Peterson, Harold S <Harold.Peterson@bia.gov>; New River Conservancy - George Santucci <george@newriverconservancy.org>; New River Conservancy - Laura Walters <claytorlakegirl@gmail.com>; New River Outdoor Adventures - Tim Dixon <newriveroutdooradventures@yahoo.com>; New River Regional Water Authority - Zachary Slate <newriverwater@gmail.com>; New River Trail State Park - Sam Sweeney <Sam.Sweeney@dcr.virginia.gov>; Terry Clouthier Pamunkey THPO <terry.clouthier@pamunkey.org>; Town of Fries - Scott McCoy <townoffries@friesva.com>; Town of Wytheville - Dr. Beth Taylor, Mayor <beth.taylor@wytheville.org>; Norman, Janet <janet_norman@fws.gov>; Bennett, Mark R <mrbennet@usgs.gov>; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov) <emma.williams@governor.virginia.gov>; Wampler, Jennifer (DCR) <Jennifer.Wampler@dcr.virginia.gov>; VADCR - Jimmy Elliott <james.elliott@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADCR - Sharon Ewing <sharon.ewing@dcr.virginia.gov>; VADEQ <eir@deq.virginia.gov>; VADEQ - Bettina Rayfield <Bettina.rayfield@deq.virginia.gov>; VADEQ - Joe Grist <joseph.grist@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; Kudlas, Scott (DEQ) <scott.kudlas@deq.virginia.gov>; VADEQ - Tony Cario <anthony.cario@deq.virginia.gov>; Roberts, Tim (DHR) <tim.roberts@dhr.virginia.gov>; VADWR - Jeff Williams <jeff.williams@dwr.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; WADWR - John Copeland <John.Copeland@dwr.virginia.gov>; Wythe County Admin - Stephen Bear <sdbear@wytheco.org>
Cc: 'ebparcell@aep.com' <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>; Salazar, Maggie <Maggie.Salazar@hdrinc.com>
Subject: [EXTERNAL] Byllesby-Buck Hydroelectric Project (VA) -- Filing of Updated Study Report

Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP). Pursuant to the ILP, Appalachian filed the Updated Study Report (USR) for the Project on November 17, 2021. The USR describes the Licensee's overall progress in implementing the study plan and schedule, summarizes study results, and describes any variances from the study plan and schedule approved by the Commission.

On behalf of Appalachian, we are notifying stakeholders of the availability of the USR. For your convenience, a copy of the cover letter filed with the USR is attached. Appalachian encourages stakeholders to view the complete filing online at FERC's eLibrary at eLibrary | File List (ferc.gov). Appalachian will also be adding the USR to the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck) in the coming days.

The Commission's regulations require Appalachian to hold a meeting with participants and FERC staff within 15 days of filing the USR. **Accordingly, Appalachian will hold a virtual USR Meeting via Webex from 9 AM to approximately 4 PM on Wednesday, December 1, 2021.** Appalachian requests that the stakeholders interested in participating in the Virtual USR Meeting contact Maggie Salazar at maggie.salazar@hdrinc.com on or before close of business Monday, November 29, 2021 to obtain instructions to join the virtual meeting.

Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com.

On behalf of AEP and the Byllesby-Buck Project relicensing team, thank you for your participation in this process, and we hope you and your families have a healthy, safe, and happy Thanksgiving.

Sarah Kulpa
Project Manager

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FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
December 20, 2021

OFFICE OF ENERGY PROJECTS

Project No. 2514-186 – Virginia
Byllesby-Buck Hydroelectric Project
Appalachian Power Company

VIA FERC Service

Ms. Elizabeth Parcell, Process Supervisor
American Electric Power Service Corporation
40 Franklin Road SW
Roanoke, VA 24011

Reference: Comments on Draft License Application

Dear Ms. Parcell:

Pursuant to 18 CFR § 5.16(c), this letter contains Commission staff's comments on Appalachian Power Company's (Appalachian's) October 1, 2021 draft license application (DLA) for the Byllesby-Buck Hydroelectric Project. Our specific comments on the DLA are outlined in Appendix A. Please incorporate your response to comments on the DLA in the final license application (FLA). We may request additional information at a later date regarding this project.

The DLA does not contain a Supporting Design Report (SDR), as required by sections 4.51(g) and 4.41(g)(3) of the Commission's regulations. In Exhibit F of the DLA, Appalachian states that given the project has been inspected by an independent consultant within the past five years and an updated Potential Failure Modes Analysis Review Memo was filed with the Commission on September 30, 2019, in accordance with the Commission's Part 12 Dam Safety regulations, that further discussions regarding geological and subsurface investigations, hydrologic and hydraulic analyses, and stability analyses for all major structures will not be reiterated as part of an SDR. Although this statement is not an explicit request for a waiver of the requirement that Exhibit F contains an SDR, the statement implies that Appalachian does not intend to file an SDR with the FLA.

While we understand that your project is subject to the Commission's Part 12 requirements on an on-going basis, an SDR is a standard requirement for an FLA in accordance with sections 4.51(g) and 4.41(g)(3) of the Commission's regulations. Therefore, the SDR should be included in your FLA in accordance with the regulations.

If you have any questions, please contact Jody Callihan at (202) 502-8278, or via e-mail at jody.callihan@ferc.gov.

Sincerely,

Vince Yearick
Director
Division of Hydropower Licensing

Attachment: Appendix A – Comments on the Draft License Application

APPENDIX A
Comments on the Draft License Application

General

1. Sections 5.17(e) and 4.38(b)(2)(vi) of the Commission's regulations require that every application for a license for a project with a capacity of 80 megawatts or less must include in its application copies of statements of whether it is seeking benefits under section 210 of the Public Utilities Regulatory Policies Act of 1978 (PURPA). The draft license application (DLA) does not indicate whether Appalachian is seeking PURPA benefits. Therefore, in the final license application (FLA), please indicate if benefits are being sought under 210 of PURPA; if so, provide the necessary documentation for doing so in accordance with section 4.38(b)(2)(vi) of the Commission's regulations.

Exhibit A

2. Exhibit A contains several inconsistencies regarding the rated capacities of the existing and proposed turbine-generator units at each development. For the Byllesby Development, table A.4-1 reports the rated capacity of each existing generator (units 1 through 4) as 5,400 kilowatts (kW), but table A.4-5 lists the existing capacities of each generator as 5,440 kW. Also, table A.4-2 indicates the ratings of the proposed (new) generators at Byllesby (units 1, 2, and 4) as 5,296.5 kW, but table A.4-6 lists the rated capacities for the new generators as 5,450 kW each. Further, the generator capacity of unit 3 at Byllesby (which is not proposed to be replaced) is listed as 5,440 kW in table A.4-6, but 5,400 kW in tables A.4-1 and A.4-2. For the Buck Development, the turbine capacity for the existing unit 2 (which is not proposed to be replaced) is reported as 3,360 kW in table A.4-3, but 3,335 kW in table A.4-6. Also, the rated capacities for the new generators proposed to be installed at Buck (units 1 and 3) are reported as 3,690 kW in table A.4-4, but 3,770 kW in table A.4. In the FLA, please correct these inconsistencies and update all tables and text in the application to reflect the correct rated capacities of all existing and proposed turbines and generators at the project, as this information will allow Commission staff to determine the authorized installed capacity of the project as defined in section 11.1(i) of the Commission's regulations.

3. Page B-20 of Exhibit B states that power generated at the project is to be utilized by Appalachian's 'internal customers.' It is unclear who these internal customers are. Therefore, in the FLA, please identify, and describe in further detail, Appalachian's internal customers.

Exhibit B

4. Page B-11 of Exhibit B states that spillage into the bypassed reach is more common at the Buck Development than at the Byllesby Development due to the lower

maximum hydraulic capacity of Buck—3,540 cubic feet per second (cfs)—compared to Byllesby (5,868 cfs). However, table B.1-1, which reports spillage frequencies, indicates the opposite pattern is true and that spillage is more common at Byllesby than at Buck. Therefore, in the FLA, please correct this discrepancy regarding spillage frequencies at the two developments.

5. Pages B-4 through B-6 of Exhibit B state that the project's flashboards are manually released only after all Tainter and Obermeyer gates are fully open and impoundment levels continue to rise. In the FLA, please specify the flows at which manual tripping of the flashboards commences at each development.

6. Section B.2.5 of Exhibit B provides the maximum hydraulic capacities of each development under both existing and proposed conditions (i.e., if the new turbine-generator units were to be installed), but there is no indication of the minimum hydraulic capacities of each development under the proposed operating conditions, as required by section 4.51(e)(2)(iii) of the Commission's regulations. Therefore, in the FLA please specify the minimum hydraulic capacity of each development, as well as the minimum hydraulic capacities of each proposed turbine unit if the minimum hydraulic capacities are expected to differ among the new turbine units proposed to be installed at each development.

7. Page B-11 of Exhibit B states the monthly flow duration curves presented in the DLA are based on pro-rated flows from a U.S. Geological Survey (USGS) gage (No. 03165500) located near Ivanhoe, Virginia, downstream of the project. However, page E-37 of Exhibit E states the monthly flow duration curves are based on pro-rated flows from a USGS gage (No. 03164000) located upstream of the project, near Galax, Virginia. Please clarify this discrepancy in the FLA.

8. Several of the monthly flow duration curves for the Byllesby and Buck developments are mis-labeled with the incorrect month; specifically, figures B.5-17, B.5-18, B.5-19, B.5-20, and B.5-40. In the FLA, please provide the correct captions for these figures.

<u>Exhibit D</u>

9. Section 4.51(e)(2)(iii) of the Commission's regulations requires applicants that are applying for a new license, and are not a municipality or state, to provide an estimate of the amount which would be payable if the project were to be taken over pursuant to section 14 of the Federal Power Act upon expiration of the license in effect [*see* U.S.C. 807], including severance damages. No estimate of severance damages was provided in the DLA; therefore, please provide this information in the FLA.

<u>Exhibit E</u>

Agency consultation

10. Page E-16 of Exhibit E states that by letter dated September 1, 2017, the Virginia Department of Environmental Quality's (Virginia DEQ's) Office of Environmental Impact Review confirmed that Carroll County is not located within Virginia's coastal management area. However, no copy of this letter is provided in the Consultation Summary. Therefore, please include a copy of this letter in the Consultation Summary filed with the FLA.

Aquatic Resources

11. Section E.9.2.2.5 of Exhibit E discusses the eastern hellbender and states that although the species is presumed to occur within the project boundary, the bypassed reaches do not contain suitable habitat (woody debris and logs) and therefore no effect from project operations is anticipated. However, the eastern hellbender also utilizes rocks, boulders, and cobbles as key habitat features and the Bypass Reach Flow and Aquatic Habitat Study indicated the presence of such features (as well as some degree of woody debris) in both reaches. Therefore, in the FLA, please explain how the results from the Bypass Reach Flow and Aquatic Habitat Study—indicating potentially suitable habitat in the bypassed reaches—bear on the determination in the DLA that the bypassed reaches do not contain suitable eastern hellbender habitat and that project effects are not anticipated.

12. Section E.11.1.2.3 of Exhibit E states that one eastern hellbender was documented at the Fries Project in 2018. However, the Environmental Assessment issued for the Fries Project in December 2020 notes that two eastern hellbenders were documented within the Fries project boundary in 2018; one upstream of the dam and one downstream. In the FLA, please update section E.11.1.2.3 of Exhibit E to correctly reflect those findings. Additionally, section 11.1.2.3 references the most recent records of eastern hellbender in the 'mainstem of the upper New River' as being from 2002 and 2014. Please define the bounds of the mainstem upper New River and update the year of the last recorded capture or observation to 2018 if the Fries Project falls within those bounds.

Terrestrial Resources and Threatened and Endangered Species

13. Section E.10.1.2 of Exhibit E states that 9.17 total acres of wetland habitat are present within the project boundary based on data from the National Wetlands Inventory. However, results from the Wetlands, Riparian, and Littoral Habitat Study presented in the Updated Study Report (USR) indicated that more than 90 total acres of wetlands are present in the project area. In the FLA, please provide updated wetland acreages that

include the new totals from the USR.

14. Section E.11.1.1 of Exhibit E states that a review of federally listed species was conducted using the U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC) tool on December 18, 2018. Because such reviews need to be verified after 90 days due to the potential listing of new threatened, endangered, or candidate species (e.g., Monarch Butterfly), please provide an updated IPaC review in the FLA.

15. Section E.11.1.2.3 of Exhibit E discusses the bog turtle, a federally threatened species, and uses findings from a study by Carey et al. (2017) at the Fries Hydroelectric Project—located approximately 5.3 river-miles upstream of the Byllesby-Buck Project—to conclude that this species is unlikely to occur in the vicinity of the Byllesby-Buck Project. In the FLA, please explain why the Carey et al. (2017) study is sufficient for determining that the bog turtle is unlikely to occur at the Byllesby-Buck Project.

16. Section E.13.3 of Exhibit E states that recreation facility enhancements are anticipated at the Virginia Department of Wildlife Resources' Loafers Rest recreation area that is located on the western bank of the New River directly adjacent to the northern (downstream) limit of the project boundary. However, there is little discussion about the extent of such enhancements and how they could impact existing terrestrial and wetland resources, or how construction, maintenance, and visitor use could affect wildlife and protected species that may occur within or adjacent to the proposed facility. Therefore, in the FLA, please include a discussion of the potential effects, if any, of these proposed enhancements on terrestrial and wetland resources, including any rare, threatened, or endangered species.

Recreation Resources

17. Please include, in the FLA, a figure indicating the locations where trail cameras were installed during the Recreation Study.

18. Page E-137 of Exhibit E refers to the New River Canoe Launch as the "Byllesby portage put-in." In the FLA, please use consistent names throughout the document when referring to facilities.

19. Figure E.13-1 indicates the boundary of the Recreation Study area but does not include the project boundary. In the FLA, please also denote the project boundary on this figure.

20. In the FLA, please include a figure depicting land ownership parcels within the project area and also indicate the project boundary so that staff can clearly understand

how existing and proposed recreation facilities in the project vicinity correspond to property owned by other entities.

Cultural Resources

21. Section E.14.2.1.2 of Exhibit E lists the three above-ground resources within the project area that are eligible for listing in the National Register of Historic Places, including the: (1) Buck Hydroelectric Facility (017-0022), (2) Byllesby Dam (017-5154), and (3) Norfolk and Western Railway Cripple Creek Extension (077-5068). However, in table E.14-1 the resource numbered 017-5154 is listed as the "Byllesby Hydroelectric Facility" and not the "Byllesby Dam." In the FLA, please use consistent references for each resource.

Exhibit G

22. Page G-2 of Exhibit G states there are no federal lands within the proposed project boundary. However, based on Sheets 1 and 3 of Exhibit G and Figure E.2-2 of Exhibit E, the nearly 2-mile-long transmission line corridor that Appalachian proposes to add to the existing project boundary—and spans from the Buck powerhouse to the Byllesby switchyard/control house—appears to cross the Jefferson National Forest. In the FLA, please clarify whether the proposed transmission corridor represents an inholding[1] or is located on federal lands. If the transmission line corridor is located on federal lands, please update the Exhibit G filed with the FLA, accordingly, by providing the information specified in section 4.41(h)(3) of the Commission's regulations.

23. Section 4.51(h) of the Commission's regulations requires, in part, that an application includes an Exhibit G with a map or series of maps that complies with section 4.41(h) of the Commission's regulations. Section 4.41(h) requires an applicant to provide the project boundary data in a geo-referenced electronic format. However, no project boundary data in a geo-referenced electronic format are provided in the DLA. Therefore, please provide this information in the FLA. In addition, each map and drawing should conform to section 4.39 of the Commission's regulations.

24. Section 4.39(a) of the Commission's regulations requires that Exhibit G maps and drawings be stamped by a registered land surveyor. The Exhibit G maps and drawings provided in the DLA lack a registered land surveyor's stamp. Therefore, all Exhibit G maps and drawings in the FLA should contain a stamp from a registered land surveyor.

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[1] Inholdings represent private lands located within the boundaries of National Forests that were not taken during condemnation proceedings when a National Forest was created. *See Central Vermont Public Service Corporation*, 54 FERC ¶ 61,132 (1991).

Ann Jennings
Secretary of Natural Resources

COMMONWEALTH of VIRGINIA
Department of Wildlife Resources

Ryan J. Brown
Executive Director

December 22, 2021

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

Re: *Comments on the Draft License Application for the Byllesby-Buck Hydroelectric Project Federal Energy Regulatory Commission (FERC) Project Number 2514-186.*

Dear Secretary Bose:

Virginia Department of Wildlife Resources aquatic biologists reviewed the Draft License Application (DLA) dated October 1, 2021 for the Byllesby-Buck Hydroelectric Project FERC Number 2514-186 on the New River in Carroll County, Virginia. Following are our DLA comments.

General Comments

In general, it is difficult to provide comprehensive comments on the DLA because it was prepared in advance of the Updated Study Report (USR) filing and the USR meeting, resulting in multiple points where the document does not provide enough information from completed Project studies to evaluate Project impacts indicating needed Protection, Mitigation, and Enhancement Measures (PME). Incomplete studies at the time the DLA was prepared included Water Quality, Wetlands, Riparian, and Littoral Habitat, Terrestrial Resources, Shoreline Stability Assessment, Aquatic Resources, Bypass Reach and Aquatic Habitat, and Cultural Resources. As a result, we will provide further comments on Project impacts related to these studies during the Final License Application (FLA) comment period.

Specific Comments

Exhibit E

Section E.9.2.2.5 of Exhibit E includes a section discussing Eastern Hellbender and the lack of availability of suitable woody debris habitat in the bypass reaches, leading to a conclusion that 'no effect of Project operations on this species is anticipated'. The Bypass Reach Flow and Aquatic Habitat Study indicates that suitable habitat for this species is found in the bypass reaches, including rock, boulder, cobble, and some woody debris, so further analysis of this conclusion needs to be provided in the FLA.

Section E.9.3 of Exhibit E discusses PME measures including a discussion of the existing ramping rate requirements for the Buck Bypass Reach. We support additional discussion of ramping rate requirements with particular emphasis on impacts during the spring Walleye spawning season.

Section E.10.3 discusses PME measures related to the wetland, riparian, and littoral habitats at the Project, including a discussion of suspending the Wildlife Management Plan in place under the current license. Results of the Wetland, Riparian, and Littoral Habitat Study should be used to develop a Wildlife Management Plan that examines enhancing Project wetlands for specific wildlife species, including ways to enhance some of the more significant wetlands for waterfowl use. Maintaining wetland resources at the Project to benefit waterfowl and waterfowl hunters will also provide additional recreational enhancement. Department of Wildlife Resources staff are available to discuss the development of a Wetland Management Plan.

Section E.13.3 discusses a forthcoming Recreation Management Plan, including potential improvements to signage within the Project boundary, upgrades to the Byllesby Boat Launch, improvements to the Buck portage put-in, and the construction of new facilities at the Loafer's Rest Area, leased by Appalachian Power Company to the Virginia Department of Wildlife Resources. Our Department staff will participate in the development of this plan. Further collaboration on the Recreation Management Plan is advisable prior to filing the FLA.

Thank you for the opportunity to provide comments on the Draft License Application for the Byllesby-Buck Hydroelectric Project. If you need further information about our comments, please contact me at John.Copeland@dwr.virginia.gov or (540) 871-6064.

Sincerely,

John R Copeland

John R. Copeland
Fisheries Biologist
Blacksburg Office

Cc: M. Bednarski
A. Ewing
T. Hampton
J. Trollinger
B. Watson
J. Williams

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
http://www.fws.gov/chesapeakebay

December 29, 2021

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: DLC, HL – 11.2
888 First Street, N.E.
Washington, DC 20426

Re: Byllesby-Buck Hydroelectric Project (P-2514), Request for Comment on the Draft License Application, Carroll County, Virginia

Dear Secretary Bose:

The U.S. Fish and Wildlife Service (Service) appreciates the opportunity to provide comment on resource concerns related to the Draft License Application (DLA) dated October 1, 2021 for the Byllesby-Buck Hydroelectric Project (P-2514-186). The project consists of the existing Byllesby Dam and Buck Dam and hydroelectric generating and transmission facilities originally built in 1912, located in Carroll County, Virginia on the New River. The project has a combined capacity of 30.1 Megawatts (MW), operating as a run-of-river mode with no additional storage capacity. This letter is submitted under the following authorities: Fish and Wildlife Coordination Act, as amended; Federal Power Act, as amended; and Endangered Species Act, as amended.

General Comments

The Service supports the December 22, 2021 comments on the DLA provided by the Virginia Department of Wildlife Resources (VA DWR), and hopes that the issues they have raised, that the Service shares, will be addressed in the Final License Application (FLA). Their expertise and recommendations for safe outdoor recreation access are important to one of the Service's national priorities, Connecting People to Nature. The proposed Recreation Management Plan would benefit from VA DWR knowledge and input prior to the development of the FLA.

The Service has been involved with the applicant and Federal Energy Regulatory Commission (FERC) staff on the Updated Study Report (USR) and the Initial Study Reports. As the USR was submitted on November 17, 2021 and a joint agency meeting on the USR held on December 1, 2021, with agency comments due January 16, 2022, a number of our questions and comments have not been incorporated or addressed in the October 1, 2021 DLA. We request further consideration of these detailed issues in the FLA, to include but not limited to instream flow and hydraulic conditions, the impingement/entrainment study and conclusions, aquatic community interconnections, federally listed and rare species, and wetland habitats and water quality.

Specific Comments

Section A.3.2.1, Byllesby Development, and B.1.2, Project Operation: The Service recommends that Appalachian prioritize excess flow releases through Obermeyer gates near the right descending bank in order to prioritize release of excess flow into the thalweg portion of the bypass reach. This would mimic natural flow conditions and reduce stranding potential in adjacent areas. As an alternative, the Service recommends consideration of an increase in the minimum flow to the bypass reach that will maintain pool connectivity**.**

Section A.3.2.2, Buck Development, and B.1.2, Project Operation: The Service recommends that Appalachian consider replacing flashboard gates near the left descending bank of the Buck bypass reach with Obermeyer gates in order to allow Appalachian to prioritize excess flow releases into the thalweg portion of the bypass reach. This would mimic natural flow conditions and reduce stranding potential in adjacent areas. As an alternative, the Service recommends consideration of an increase in the minimum flow to the bypass reach that will maintain pool connectivity.

Section A.3.5.1, Byllesby Development Bypass Reach: This bypass reach appears to be significantly longer than 475 feet. The distance downstream from the base of the spillway to the downstream end of the island separating the tailrace channel from the bypass reach is approximately 590 feet (measured in both Google Earth Pro and ArcMap), and it appears that mixing of the powerhouse discharge and the bypass reach flow during periods of low inflow (e.g., leakage flow only) does not occur until approximately 800 feet downstream from the spillway. For calibration purposes, the Service measured other features such as the Byllesby spillway, and we found our measurements of such features to be consistent with the Project Description. The only significant inconsistency we found was between our measurement of the Byllesby bypass reach and the description of this feature in this and other sections of the DLA.

Section A.4.2.2, Proposed Upgrade, second paragraph, last sentence: The DLA states that the new Kaplan turbines would each have 6 runner blades. This does not agree with information provided during the December 1, 2021 USR meeting, which described the proposed new turbines as having 5 runner blades. The Service pointed out this discrepancy during the meeting, and Appalachian stated that this would be corrected in the FLA.
Although safer than the Francis turbines they are replacing, the proposed new Mavel KV2650K5 Kaplan turbines, with 5 blades each, and a rotation speed of 189.47 rotations per minute (rpm), do not represent the current best available technology for avoiding significant levels of injury and mortality to fish passing through the powerhouse. The Service recommends consideration of more fish-friendly turbines (e.g., Natel Restoration Hydro Turbines; Voith fish-friendly turbines).

The Service recommends that Appalachian work with the Service to plan and design a safer alternative downstream route of passage. The Service does not recognize passage through the turbine intakes as an acceptable downstream route for fish (USFWS 2019).

Section A.4.3.2, Buck Development Proposed Upgrade, second paragraph, last sentence: As in the previous section, the provided turbine specifications do not completely agree with those provided during the USR meeting (discrepancy regarding number of blades on each turbine). These proposed new turbines will have somewhat slower rotation speeds (156.52 rpm) and will be safer than the Francis turbines they are replacing. However, considering the rotation speed, the number of blades, and the results of the Turbine Blade Strike Analysis, it is the Service's opinion that these turbines do not represent the best available technology for avoiding unacceptable levels of injury or mortality to fish passing through the powerhouse.

A.5, Transmission: The Service recommends as a Protection, Mitigation and Enhancement (P, M, & E) measure, appropriate time of year restrictions for any tree cutting associated with transmission right of way (ROW) maintenance, to avoid adverse effects to federally listed bats, as well as to migratory birds during the nesting season. Most of the approximate 2-mile-long right of way occurs through suitable summer (forest) roosting habitat for Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*). Further explanation to the current regulations for northern long ear bat can be found at the link below. The Service advises maintaining coordination as the project progresses.
https://www.fws.gov/midwest/endangered/mammals/nleb/FAQsFinal4dRuleNLEB.html

Table B.1.1. Non-Exceedence Probability of Discharge to the Bypass Reaches
Table B.1.1. in the DLA presents hydraulic capacity of the turbines related to hydrologic inputs to the powerhouse to depict the percent of time in average, dry and wet years that releases of water will occur on an annual and monthly basis into the Byllebsy bypass and Buck bypass reaches. Using non-exceedence data is a flipped depiction of how the Service would prefer to see the data presented. In the FLA, the table should present exceedence probability such that the dry year annual release probability into the bypass reaches would be 1.9 percent for Buck and 3.0 percent for Byllesby, and for the months of March, April, May, June, September, October, November and December, 0 percent release would occur for Buck, and 0 percent release for Byllesby in March, April, May, June, September, October and December.

Table B.1.1. Note also states a “30-year” record. Use of 1996-2000 gage data is a 25-year record, to correct for the FLA, with the addition of the gage name (Ivanhoe VA) as well as the given number. As the previous page B-2 states in the DLA, “Gate openings are planned and based on monitoring of the USGS gage at Galax, VA and Byllesby and Buck forebay elevations,” a clarification in the FLA of when Galax gage data are used and when Ivanhoe gage data are used would be helpful.

B.2.3. Flows and B.5 Flow Figures
The DLA presents a 25-year period of record for hydrologic analysis. While it is appropriate to use the more modern record of 1996 – 2020, the Service’s Design Manual for Fish Passage recommends a 30-year period of record. We understand that the New River at Ivanhoe, VA gage station (# 03165500) discontinuity of record prior to 1996 limits this available record.

Within the flow figure depiction of annual and monthly exceedance flows, the use of a scale from 0 cubic feet per second (cfs) to 40,000 cfs is inappropriately large for meaningful interpretation of the data. The results are flattened curves in the 10 percent exceedance to 99.9 percent exceedance which fail to provide the information needed for analysis. The FLA should depict hydrologic data so that magnitude, seasonality and duration can be assessed for a variety of parameters to analyze inflows and riverine ecological patterns. The Nature Conservancy’s Indicators of Hydrologic Alteration (IHA) method provides a number of parameters to consider for turbine hydraulic capacity flows and the low flow portion of the hydrograph which are of interest to us. The project’s run of river operation without additional storage capacity does not alter the high flow hydrograph as a project with storage would.

Exhibit E:
E.2.6, Downstream Reach Gradients; and E.5.3, Project Waters: As previously stated, the Service believes the estimated length of the Byllesby bypass reach (475 feet) is a significant underestimate.

E.5.3, Project Waters: See previous comment regarding stated length of the Byllesby bypass reach.

E.5.6, Project Operations: The Service supports discussion on the continuation of ramping rates as currently required under License Article 406, and optimization of these rates for the spring spawning season of Walleye (*Sander vitreus*), among other resources.

E.6.2, Applicant's Proposal: The Service recommends that the Applicant consider more fish-friendly turbines (e.g., Natel Restoration Turbine; Voith) to replace Byllesby Units 1, 2 and 4, and Buck Units 1 and 3. Although the proposed turbines would be less hazardous than the Francis turbines they will replace, they do not appear to be the best technology available for preventing a significant level of injuries and mortality to fish that pass through the powerhouses, based on the results of the Turbine Blade Strike Analyses conducted in support of relicensing. The Service would be happy to discuss this issue with the Applicant. Aside from the above recommendation, any additional recommendations will be provided in our comments on the FLA because of the number of relicensing studies that were not yet completed or reported on as of the filing of the DLA.

E.8.1.4.1, Approved Water Quality Standards, and Table E.8-4. Numeric Water Quality Criteria for Class IV Waters: The Service recognizes that the Project is not required to meet water quality criteria beyond those presented in this table. However, we note for the record and for future reference that the dissolved oxygen (DO) criteria are not fully supportive of optimal growth conditions for fish. According to the 1986 EPA water quality criteria, DO effects in non-salmonid (warm) waters for early life stage warm-water fishes are no production impairment at 6.5 mg/L, slight production impairment at 5.5 mg/L, and moderate production impairment at 5 mg/L. For other life stages, there is no production impairment at 6 mg/L, and slight production impairment at 5 mg/L.

A literature review by Chamberlain et al. (1980) found that largemouth bass (*Micropterus salmoides*) experienced reduced larval growth at 6 mg/L (temperature: 20-23 degrees C), and juvenile swimming speed was reduced at DO concentrations of < 5.0-6.0 mg/L (temperature = 25 degrees C). Carlson and Siefert (1974) concluded that DO concentrations up to 6.3 mg/L reduced the growth of early stages of the largemouth bass by 10 to 20 percent.

Stewart et al. (1967) observed reduced growth of juvenile largemouth bass at 5.9 mg/L and lower concentrations, with significant growth reductions at concentrations below 5.5 mg/L. In general, prolonged exposure to 4 mg/L causes acute mortality in many invertebrates and non-salmonid fish embryos (Gray *et al.* 2002). Severe production impairment of early-life-stage non-salmonid species occurs when oxygen falls below 4.5 mg/L (EPA 1986). The Habitat Suitability Index Model for largemouth bass considers a DO concentration of 5-8 mg/L as providing a suitability of 80 percent during midsummer within pools or littoral areas, and a concentration of 8 mg/L as being optimal (suitability rating of 100 percent) (Stuber et al. 1982). Optimal DO concentration for walleye spawning and embryo development is $\geq$ 6.5 mg/L (McMahon et al. 1984).

E.9.1.1.2, Bypass Reaches: As previously discussed, the Service questions the defined length of the Byllesby bypass reach as being only 475 feet long.

E.9.2.1.1, Studies in Support of the Current Relicensing, Bypass Reach Flow and Aquatic Habitat Study: As this study was not completed at the time of the filing of the DLA, the Service will provide its comments in response to the USR and FLA when it is filed.

E.9.2.1.3, Impingement and Entrainment Study (Preliminary Results): Because the DLA presents only preliminary results from this study, the Service will reserve the bulk of its comments on this study until we provide our comments on the USR and the FLA. However, we note that the Turbine Blade Strike Analysis (TBSA) modeling conducted as a part of this study used a tail length of only 13.5 inches for walleye, apparently based on fisheries sampling conducted in support of relicensing. Walleye lengths of 20-22 inches or greater are known in the New River (J. Copeland, personal communication, 12/22/2021). It is also important to note that walleye do not move upstream only. A 1992-1994 discharge netting study at the Townsend Project on the Beaver River (Ohio River tributary) in Pennsylvania collected walleye moving downstream through the powerhouse during all months of the year except for June, and captured walleye tail lengths ranged up to 18-19 inches (RMC 1994).

In addition, on page E-62 of the DLA, there is information regarding surveys of the upper New River from 2004 to 2014 in which collected walleye ranged in length from 13 to 29 inches, with an average of 17 inches. Furthermore, the relicensing study represents only a snapshot in time, and fish tail lengths recorded during the study may not be representative of maximum tail lengths attained by key species such as walleye at any given time during the next license term, nor could the relicensing surveys be expected to capture 100 percent of individuals present in the project impoundment such that measured tail lengths of captured fish would be representative of the full range of tail lengths for the target species. It is standard practice for a comprehensive desktop entrainment and impingement study to be conducted that includes estimates of blade strike mortality to estimate mortality rates for the typical maximum tail length of a target species. Therefore, the Service requests that additional Turbine Blade Strike Analysis modeling be conducted for walleye up to a maximum tail length of 29 inches and a standard deviation of 1.5 inches. The requested information is needed in order to estimate survival rates for the largest walleye that may pass through Project turbines.

E.9.2.2.5, Effects of Continued Project Operation on Species of Special Concern, Eastern Hellbender:

The Service does not agree with the DLA's conclusion the bypass reaches do not contain suitable habitat for Eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*). These statements should be re-examined in the FLA. The Eastern hellbender does not require woody debris or logs, and is often found using crevices in boulder-dominated and bedrock-dominated habitats which are prevalent in the Project bypass reaches. An E. hellbender individual was found in 2018 above the dam of the nearby Fries Hydroelectric Project, as the DLA notes. The FLA would benefit from information found within the E. Hellbender Species Status Assessment Report, final version 1.1 (USFWS, 2018).

E.9.3, Protection, Mitigation, and Enhancement Measures Proposed by the Applicant, Resource Agencies, and/or Other Consulting Parties: Because the Bypass Reach Flow and Aquatic Habitat Study results have not been finalized as of the filing of the DLA, the Service will provide its comments and recommendations regarding any need for higher minimum flows to the bypass reaches and/or continuation of ramping rates after a more complete review of the results of that study.

The DLA states that, "For the protection of mussels, Appalachian will continue to consult with USFWS and VDWR in advance of reservoir drawdowns..." The Service believes additional P,M,& E measures should be proposed in the FLA. The final Species Status Assessment Report for Green Floater and listing determination will occur sometime in early 2022. This information could help shape additional conservation measures needed for the species. Fish host species required for the species to successfully reproduce should be considered and protected, especially with new research on possible host fish for green floater and differing reproductive strategies. Fish hosts for the state listed mussels Pistolgrip (*Tritogonia verrucosa*) and Tennessee heelsplitter (*Lasmigona holstonia*) should also be considered for focus and protection measures. Minimization of turbine impacts to fish hosts should be included in the FLA.

E.11.1.1, Federally Listed Threatened, Endangered, and Candidate Species: The Service will be recommending a Time of Year Restriction (TOYR) for any tree-cutting associated with transmission line ROW maintenance that may be conducted during the next license term, in order to protect roosting Indiana bats and northern long-eared bat.

E.11.3. Virginia Spiraea: The DLA does not note that the Service initiated a 5-year review under the Endangered Species Act for the riverine plant, Virginia spiraea (*Spiraea virginiana*) on September 4, 2019. On final publication of the review, the FLA should consider these data along with information from the USR in its discussion of the species and potential protection, mitigation and enhancement measures.

The Service appreciates the opportunity to provide comment on the DLA for the Byllesby-Buck Hydroelectric Project. We anticipate more discussion and recommendations as Updated Study Report results are analyzed among the resource agencies and applicant. If you have any questions regarding our comments, please contact Janet Norman of my staff at Janet_Norman@fws.gov or 410-320-5519.

Sincerely,

Alfred Pinkney, acting Field Supervisor for

Genevieve LaRouche
Field Supervisor

References:

Carlson, A.R., and R.E. Siefert. 1974. Effects of reduced oxygen on the embryos and larvae of lake trout (*Salvelinus namaycush*) and largemouth bass (*Micropterus salmoides*). J. Fish. Res. Board Can. 31:1393-1396.

Chamberlain, A.J., T. Kellar, and D. Maraldo. 1980. Water Quality Requirements for Sport Fishes of the Grand River Watershed: A Literature Review. Grand River Water Management Study Technical Report Series, Report # 13. Ontario Ministry of Natural Resources, Ontario, Canada.

EPA. 1986. Quality Criteria for Water. EPA: 440/5-86-001.

Gray, J.S., R.S. Wu, and Y.Y. Or. 2002. Effects of hypoxia and organic enrichment on the coastal marine environment. Mar Ecol Prog Ser 238: 249-279.

McMahon, T.E., J.W. Terrell, and P.C. Nelson. 1984. Habitat suitability information: Walleye.
RMC Environmental Services, Inc. 1994. Draft report on fish entrainment at the Townsend Dam, New Brighton, Pennsylvania (FERC Project No. 3451).

U.S. Fish and Wildlife Service. 2018. Species status assessment report for the Eastern Hellbender (*Cryptobranchus alleganiensis alleganiensis*). 104 pp.

U.S. Fish and Wildlife Service (USFWS). 2019. Fish Passage Engineering Design Criteria. U.S. Fish and Wildlife Service Northeast Region, Hadley, MA. 248 pp.

U.S. Fish and Wildlife Service. Endangered and Threatened Wildlife and Plants; Initiation of 5 - Year Reviews of Seven Northeastern Species. 84 FR 46562-46563, September 4, 2019. https://www.govinfo.gov/content/pkg/FR-2019-09-04/pdf/2019-19056.pdf#page=1

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
January 18, 2022

OFFICE OF ENERGY PROJECTS

Project No. 2514-186 – Virginia
Byllesby-Buck Hydroelectric Project
Appalachian Power Company

VIA FERC Service

Ms. Elizabeth Parcell, Process Supervisor
American Electric Power Service Corporation
40 Franklin Road SW
Roanoke, VA 24011

Reference: Comments on Updated Study Report and Meeting Summary

Dear Ms. Parcell:

On November 17, 2021, Appalachian Power Company (Appalachian) filed the Updated Study Report (USR) for the Byllesby-Buck Hydroelectric Project (Byllesby-Buck Project) describing Appalachian's progress in implementing the approved study plans. On December 4, 2021, Appalachian held a meeting on the USR. On December 16, 2021, Appalachian filed its Updated Study Report Meeting Summary (Meeting Summary).

We have reviewed the USR and the Meeting Summary and provide staff's comments in Appendix A, pursuant to 18 CFR § 5.15(f). Unless otherwise noted, responses to staff's comments should be provided in the final license application.

If you have any questions, please contact Jody Callihan at (202) 502-8278, or via e-mail at jody.callihan@ferc.gov.

Sincerely,

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

Attachment: Appendix A – Comments on the Updated Study Report (USR) and Meeting Summary

APPENDIX A
Comments on the Updated Study Report (USR) and Meeting Summary

Water Quality Study

1. Continuously recorded (15-minute) water temperature and dissolved oxygen (DO) data from each monitoring location during the 2020 and 2021 water quality monitoring seasons are presented graphically in Attachments 1 and 2 of the Water Quality Study Report filed with the USR. While these plots are useful in discerning general trends and differences in water quality parameters among the various monitoring locations, it is difficult to ascertain from these graphs the number of days that temperature and DO values were inconsistent with state water quality standards or to quantify the degree of stratification in the project's impoundments.[1] Therefore, to assist staff's analysis of project effects on water quality, please provide a series of tables, or a spreadsheet file, that reports for each day of the 2020 and 2021 monitoring seasons, the daily minimum, maximum, and average water temperatures and DO values at each continuous water quality monitoring site, including each monitoring depth in the Byllesby and Buck impoundments. Please provide all water temperature data in degrees Fahrenheit and all DO data in units of milligrams per liter (mg/L).

2. Figure 8.1 of Attachment 8 of the Water Quality Study Report does not indicate the timing of drag rake operations at each development (Byllesby and Buck), as is shown by vertical reference lines on a similar figure in the report (figure 8.2). Therefore, please add reference lines to figure 8.1 to indicate the timing of drag rake operations at each development.

Bypassed Reach Flow and Aquatic Habitat Study

3. As indicated at both the USR and Initial Study Report (ISR) meetings, the potential stranding of walleye in the Buck bypassed reach during spill events in the spring spawning season is a concern. While a two-dimensional (2-D) hydraulic model was developed to simulate water depths and flow patterns in the Buck bypassed reach under the currently required ramping rate,[2] the USR contains no information on the body depths

[1] As part of this study, continuous data loggers (for water temperature and DO) were deployed at three depths in the Byllesby impoundment and two depths in the Buck impoundment.

[2] Article 406 of the current license states that following periods of spill from the Buck spillway when a spillway gate has been opened 2 feet of more, the licensee shall discharge flows through a 2-foot-opening for at least 3 hours. The licensee shall then reduce the opening to 1 foot for at least an additional 3 hours. Thereafter, the licensee

of walleye. Therefore, to aid staff in their interpretation of the additional modeling scenario requested below in item 4, please provide body depth data for the size range of walleye that would be expected to occur in this portion of the New River during the spring spawning season. This information will help staff determine whether the existing ramping rate provides adequate escape routes (of sufficient water depth) for any walleye that may be attracted to intermittent spill flows and enter the Buck bypassed reach during the spring spawning season. Please consult with the Virginia Department of Wildlife Resources (DWR) to determine if body depth data are available for the New River strain of walleye; if such data are not available, data from nearby river systems may be used; in either case, please specify the sample sizes for all provided body depth data. Lastly, please file copies of any stranding reports or incidents (for walleye or other species) that Virginia DWR may have in its possession or be aware of, as this could provide information on the potential stranding locations in the Buck bypassed reach as well as the sizes of stranded fish.

4. The approved study plan states that model simulations will be performed to evaluate flow releases from *various spillway gates and spill configurations* [emphasis added] to determine flow patterns and hydraulic connectivity at downstream locations of interest. However, the 2-D hydraulic model developed for the Buck Development was only used to evaluate flow patterns under a single spill configuration, that of the existing ramping rate, whereby down-ramping flows are released into the bypassed reach through Tainter Gate 1. Therefore, to help inform an analysis of the optimal spillway gate through which down-ramping flows should be released to minimize the stranding risk of walleye in the Buck bypassed reach and to ensure the study is completed in accordance with the approved study plan, please perform a modeling scenario that simulates water depths and velocities in the Buck bypassed reach under the currently required ramping rate but releases down-ramping flows through Obermeyer Gate 10 instead of Tainter Gate 1.[3] If the currently required ramping rate (i.e., down-ramping flows of the same magnitude and duration as are currently released through Tainter Gate 1) cannot be achieved with the Obermeyer gates, please explain why, and use the Tainter gate nearest the stranding area of concern (i.e., the southeastern portion of the bypassed reach immediately downstream of the spillway) as the release location for down-ramping flows.

Model output should include, at a minimum, depth and velocity heat maps for each of four modeled flows: (1) leakage; and flows equivalent to Tainter Gate openings of (2) 0.5 foot (~210 cfs), (3) 1.0 foot (~354 cfs), and (4) 2.0 feet (~714 cfs). The depth and velocity heat maps should be similar to figures 4-12 through 4-19 of the Buck

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may close the gate. *See Appalachian Power Co.,* 66 FERC ¶ 62,188 (1994).

[3] Obermeyer Gate 10 is the gate closest to the area of concern for walleye stranding; whereas Tainter Gate 1 is the most distant gate from this area of concern (*see* figure 4-2 of the Bypassed Reach Flow and Aquatic Habitat Study Report).

Bypassed Reach Integrated Catchment Model (ICM) Development Report. In addition, for both release locations (Tainter Gate 1 and Obermeyer Gate 10 or the nearest feasible gate), please use the body depth information requested in item 3 above, to generate a new series of figures that are similar to the heat maps but instead show only those portions of the bypassed reach that have sufficient water depths (based on body size data) for walleye to swim through. Such maps should be generated for the both the smallest- and largest-sized walleye expected in the bypassed reach (based on consultation with Virginia DWR as described above) for each combination of release location (i.e., Tainter Gate 1 vs. Obermeyer Gate 10) and modeled flow (leakage, ~210 cfs, ~354 cfs, and ~714 cfs). This information will allow staff to assess if there are any differences in stranding risk and flow patterns (i.e., escape paths and connectivity in the bypassed reach) between these two different release locations for down-ramping flows.

5. The current license does not specify where the required 360-cfs minimum flow must be released at each development.[4] Appalachian currently provides this minimum flow via generation (i.e., as part of the flow through each powerhouse) and monitors compliance with the required minimum flow using flow data from a United States Geological Survey gage (No. 01365500) located about 2.5 river miles downstream of the Buck Development.[5]

The approved study plan states that the 2-D hydraulic models developed for Byllesby and Buck will be used to evaluate the relationship between minimum flow releases to the tailwater areas versus the bypassed reaches with respect to aquatic (fish) habitat. There was also discussion at the USR Meeting as to how the hydraulic connectivity of side channels, which can serve as important aquatic habitat for fish and freshwater mussels due to their relatively unique substrate composition (i.e., predominantly gravel and cobble vs. bedrock), may vary depending on the release location (powerhouse vs. bypassed reach) of the currently required 360-cfs minimum flow.[6] However, the currently required minimum flow at each development (360 cfs) was not explicitly included (modeled) as a test flow; the only flows evaluated were those used to develop and calibrate the models. Therefore, to allow staff to assess the potential benefits of releasing the currently required 360-cfs minimum flow into the bypassed reaches, rather than through the powerhouses, please use the 2-D hydraulic models that

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[4] Article 406 of the current license states that the licensee shall release from the project reservoirs into the New River a minimum flow of 360 cfs, or inflow to the project, whichever is less, to protect aquatic resources downstream of the Byllesby and Buck powerhouses. *See Appalachian Power Co.,* 66 FERC ¶ 62,188 (1994).

[5] *See* Environmental Inspection Report issued on November 14, 2018. Accession No. 20181114-3030.

[6] *See* USR Meeting Summary at 12.

were developed for Byllesby and Buck to simulate habitat conditions (i.e., water depths and velocities) in each bypassed reach (Byllesby and Buck) under both existing project operation (i.e., whereby the minimum flow is included as part of the generation flows through each powerhouse) and a potential future operational scenario whereby a continuous 360-cfs minimum flow is released into each bypassed reach via Tainter Gate 1 at Buck and Tainter Gate 6 at Byllesby. This information would aid in minimum flow evaluations (e.g., the release location of minimum flows at each development) and ensure the study is completed in accordance with the approved study plan.

Habitat conditions should be evaluated across a range of inflow conditions, including low-, mid-, and high-inflows; for example, the 90% exceedance, 50% exceedance (median), and 10% exceedance inflows, respectively. Also, the powerhouses should be 'operating' during the model simulations, with the amount of flow being passed through each powerhouse dependent on the particular combination of minimum flow release location (spillway vs. powerhouse) and inflow (low-, mid-, and high-) being modeled. In addition to depth and velocity heat maps for each combination of release location by inflow, model outputs should include habitat suitability maps (similar to the figures provided in Attachment 3 of the Bypassed Reach Flow and Aquatic Habitat Study Report) and also tabulate, for each release location by inflow combination, the weighted usable area (WUAs) for the species (all life stages of walleye) and guilds specified in Table 5-3 of the Bypassed Reach Flow and Aquatic Habitat Study Report.

6. The Buck Bypassed Reach ICM Model Development Report contains depth and velocity heat maps for each of the test flows used to calibrate the model (i.e., leakage, 210 cfs, 354 cfs, and 714 cfs). However, no such heat maps are provided for the Byllesby Development. Therefore, please provide, in your filing, the depth and velocity heat maps for each of the four test flows (leakage, 88 cfs, 158 cfs, and 194 cfs) that were used to develop the 2-D hydraulic model for the Byllesby Development. On each heat map, please indicate the magnitude of flows that were being released (spilled) into the bypassed reach and passed through the powerhouse, similar to figures 4-12 through 4-19 of the Buck Bypassed Reach ICM Model Development Report.

7. At the USR Meeting, Appalachian indicated that its current practice to ensure run-of-river operation during a powerhouse outage or complete station trip at either development is to immediately open spillway gates to ensure that total outflow from the project continues to approximate inflows. Please describe how it is possible for the spillway gates at each development to be operated during station outages (e.g., via backup generators, etc.). Also, please describe the maximum amount of inflow that can be passed through each powerhouse when all of its turbine units are non-operational (e.g., during complete station outages or unit trips); and describe whether it is possible to release the currently required 360-cfs minimum flow through the powerhouses during such non-operational periods.

8. Page 7 of the Buck Bypassed Reach ICM Development Report states that additional bathymetry data for two pools on the southeast side of the Buck bypassed reach (*see* figure 2-3 of Attachment 1 of the report) may need to be collected and incorporated into the 2-D hydraulic model for the Buck Development. However, no additional bathymetry data appears to have been collected for this area, nor does there appear to be any plans for additional field work based on Appalachian's comments at the USR meeting. Therefore, please explain why additional bathymetry data was not collected for this area—which is the main stranding area of concern for walleye—and describe why the existing bathymetry data from this area is sufficient for modeling purposes.

9. Based on figure 3-1 of the Buck Bypassed Reach ICM Development Report, there appears to be a small tributary that enters the bypassed reach along its southern shoreline, approximately mid-way down the reach. Please describe if, and how, inflow from this tributary was accounted for in your calculations of the amount of leakage flow through each of the spillway gates at the Buck Development (Table 2-2). Also, please confirm that the standing pools of water located upstream of this tributary (along the southeastern bank of the bypassed reach, immediately below the spillway) are maintained by leakage through the flashboard bays farthest away from the powerhouse (i.e., bays 15-22).

10. The colors in the legend for figure 6-8 of the Bypassed Reach Flow and Aquatic Habitat Study Report do not match, or correspond to, the colors used in the graphic of this figure. Also, in figure 6-9 (of the same report), the colors on the plot are very difficult to distinguish from one another. Therefore, please provide updated figures for figures 6-8 and 6-9 that contain appropriately labeled legends and sufficient color distinctions to allow readers to distinguish the various water level logger locations more easily.

11. During the USR meeting, Commission staff asked if any observations of eastern hellbender, formal or incidental, had been made during the study period or any of the individual studies conducted therein. However, the Meeting Summary did not include this question or any response from the applicant. Therefore, please address this question in the license application.

<u>Wetlands, Riparian, and Littoral Habitat Study</u>

12. Page 7 of the Meeting Summary includes a question and comments about wetland acreages associated with the Wetlands, Riparian, and Littoral Habitat Study. In particular, the summary states that the "NWI estimated 9 acres of wetlands and the field verification estimated 12 acres of wetlands." Given that the NWI estimated 9 acres and the Wetlands, Riparian, and Littoral Habitat Study reported a total of 95.43 field-verified wetland acres, it is unclear what the 'estimated 12 acres' refers to specifically. Therefore, please explain and clarify the difference between field verifications that estimated 12

acres of wetlands versus those that estimated 95.43 acres of wetlands.

Cultural Resources Study

13. The Consulting Party Distribution List in the Cultural Resources Study Report only contains three Tribes as having received the report. However, page 4 of the Distribution List of the draft license application (DLA) includes additional Tribes. Moving forward, please ensure that all Tribes who are included on the Distribution List of the DLA receive a copy of all study reports related to cultural resources, including the Cultural Resources Study Report filed with the Commission on September 13, 2021.

Andrew Wheeler
Secretary of Natural Resources

COMMONWEALTH of VIRGINIA

Department of Wildlife Resources

Ryan J. Brown
Executive Director

January 18, 2022

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

Re: *Comments on the Updated Study Report Meeting Summary for the Byllesby-Buck Hydroelectric Project Federal Energy Regulatory Commission (FERC) Project Number 2514-186.*

Dear Secretary Bose:

Virginia Department of Wildlife Resources aquatic biologists reviewed the Updated Study Report (USR) Meeting Summary dated December 16, 2021 for the Byllesby-Buck Hydroelectric Project FERC Number 2514-186 on the New River in Carroll County, Virginia. Following are our comments on the USR Meeting Summary.

General Comments

The December 1, 2021 USR Meeting and the December 16, 2021 USR Meeting Summary provided a comprehensive review of completed Project studies that were not previously reported in the Initial Study Report Meeting on January 28, 2021. The temporal displacement of these two Study reports and associated meetings makes it difficult to comprehensively examine all of the Study Reports in terms of evaluating Project impacts indicating needed Protection, Mitigation, and Enhancement Measures (PME). Therefore, our agency comments will be more comprehensive after the Final License Application (FLA) is filed, since the FLA will take a comprehensive approach to evaluating all Project studies and needed PME.

Specific Comments

Wetland, Riparian, and Littoral Habitat Study

The Wetland, Riparian, and Littoral Habitat Study delineated significant acreage of wetlands, including nearly 78 acres of palustrine emergent, scrub shrub, and forested wetlands. These significant Project wetland resources result in a legal obligation for Appalachian Power Company in terms of continued protection, but they also present an opportunity to provide wildlife and recreational benefits that were not discussed in the meeting summary. Instead, discussion of the study results focused on potential disruptions created by periodic Project drawdowns, creation of additional wetland areas due to river sediment accumulation, and management actions if dredging is required. The Draft License Application, filed prior to the meeting summary, indicated that the Wildlife Management Plan in place under the current license will be suspended, downplaying the wildlife and recreational importance of Project wetland resources. Results of the Wetland, Riparian, and Littoral Habitat Study could inform development of a Wildlife Management Plan to enhance Project wetlands for specific wildlife species, including ways to enhance some of the more significant wetlands for waterfowl use. Maintaining wetland resources at the Project to benefit waterfowl and waterfowl hunters would also provide additional recreational enhancement not outlined in the Recreation Study. Department of Wildlife Resources staff are available to discuss the development of a Wetland Management Plan.

Bypass Reach Flow and Aquatic Habitat Study

We support the comments of our partner agency, the U.S. Fish and Wildlife Service, regarding the Bypass Reach Flow and Aquatic Habitat Study, particularly with regard to reducing fish stranding, but also in terms of the actual length of the Byllesby bypass reach, instream flow modeling and instream flow needs, and native fish species benefited by the guilds examined. We emphasize the following points regarding how this study was conducted that are important to appropriate management of these formerly riverine habitats.

1. During this Study, as reported in the USR Meeting Summary, the DLA, and the USR, bypass flow to the Byllesby bypass reach was provided through Tainter Gate #6. A primary discharge from this gate, located near the center of the Byllesby Dam spillway, may have hindered the results of this study in the Byllesby bypass reach, since the location of this release point ignores the location of the thalweg on the right descending bank. As a result, the evaluation of bypass reach flows for this portion of the Project may not fully demonstrate how bypass reach flows can improve downstream connectivity and reduce potential stranding in the bypass reach.
2. During this Study, as reported in the USR Meeting Summary, the DLA, and the USR, bypass flow to the Buck bypass reach was provided through Tainter Gate #1. A primary discharge from this gate, located near the right descending bank of the Buck Dam spillway, may have hindered the results of this study in the Buck bypass reach, since the location of this release point ignores the location of the thalweg on the left descending bank. As a result, the evaluation of bypass reach flows for this portion of the Project may not fully demonstrate how bypass reach flows can improve downstream connectivity and reduce potential stranding in the bypass reach. As stated in our comments to date, we have a continuing concern about Walleye stranding in the Buck bypass reach, particularly during the spring Walleye spawning season when the Buck bypass is more frequently activated than at other times of the year.
3. We agree with the U.S. Fish and Wildlife Service's evaluation of the interpretation of Buck bypass reach model results for the Walleye spawning stage when they state that the most suitable habitat is provided under the highest flow release scenario (714 cfs). Walleye spawning requires attractant flows and suitable spawning substrate. Creating suitable spawning conditions for the New River strain Walleye strain is a high priority for our agency, as outlined in our New River Walleye Management Plan, filed as a management plan under this Project. The

Buck bypass reach was formerly fully functioning riverine habitat that provided Walleye spawning habitat, so its potential importance to the New River Walleye population should be an important consideration in managing bypass reach flows.

Fish Impingement and Entrainment Study

We support the comments of our partner agency, the U.S. Fish and Wildlife Service, particularly with regard to turbine blade strike and spillway survival assessment and intake velocity measurements. In addition, we emphasize the following point regarding this study: With a total of only nine Walleye collected during the Aquatic Resources Study, using the mean total length of Walleye collected (13.5 inches, Standard Deviation of 1.5 inches) for the Impingement and Entrainment Study did not capture a realistic size distribution of Walleye using the Byllesby Buck Project Area. As a result, we support the U.S. Fish and Wildlife Service recommendation to perform additional Turbine Blade Strike Analysis for Walleye up to a maximum total length of 18 inches, based on the minimum size Walleye excluded from the intake of 18.5 inches total length, since the 2.25-inch clear bar spacing on the trash racks excludes Walleye of that length and larger.

Recreation Study

The Recreation Study was completed to our satisfaction, with the exception of documenting use of the Buck tailrace area, where use was discouraged by the presence of No Trespassing signs in close proximity to the dam, resulting in capturing virtually no human activity on cameras installed to assess use. As stated in our comments on the DLA, we support a collaborative approach to developing a Recreation Management Plan, including potential improvements to signage within the Project boundary, upgrades to the Byllesby Boat Launch, improvements to the Buck portage put-in, and the construction of new facilities at the Loafer's Rest Area, leased by Appalachian Power Company to the Virginia Department of Wildlife Resources. Our Department staff will participate in the development of this plan. Further collaboration on the Recreation Management Plan is advisable prior to filing the FLA.

Thank you for the opportunity to provide comments on the USR Meeting Summary for the Byllesby-Buck Hydroelectric Project. If you need further information about our comments, please contact me at John.Copeland@dwr.virginia.gov or (540) 871-6064.

Sincerely,

John R. Copeland

John R. Copeland
Fisheries Biologist
Blacksburg Office

Cc: M. Bednarski
T. Hampton
A. Martin
J. Trollinger
B. Watson
J. Williams

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
http://www.fws.gov/chesapeakebay

January 18, 2022

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: DLC, HL – 11.2
888 First Street, N.E.
Washington, DC 20426

Re: Byllesby-Buck Hydroelectric Project (P-2514), Request for Comment on the Updated Study Report, Carroll County, Virginia

Dear Secretary Bose:

The U.S. Fish and Wildlife Service (Service) appreciates the opportunity to provide comment on resource concerns related to the Updated Study Report (USR) dated November 17, 2021, the USR Meeting on December 1, 2021, and the USR Meeting Summary dated December 16, 2021, for the Byllesby-Buck Hydroelectric Project (P-2514). The project consists of the existing Byllesby Dam and Buck Dam and hydroelectric generating and transmission facilities originally built in 1912, located in Carroll County, Virginia on the New River. The project has a combined capacity of 30.1 Megawatts (MW), operating as a run-of-river mode with no additional storage capacity. This letter is submitted under the following authorities: Fish and Wildlife Coordination Act, as amended; Federal Power Act, as amended; and Endangered Species Act, as amended.

General Comments

The Service provided comments on December 29, 2021 on the Draft License Application (DLA) document dated October 2021, which these comments supplement and amend slightly in some parts. We will be providing more comprehensive comments on needed Protection, Mitigation, and Enhancement (PME) Measures after the release of the Final License Application (FLA), as our DLA and USR comments and upcoming discussion points are resolved and integrated.

Specific Comments-Bypass Reach Flow and Aquatic Habitat Study Report

4 Background and Existing Information

The Byllesby bypass reach appears to be significantly longer than 475 feet. The distance downstream from the base of the spillway to the downstream end of the island separating the tailrace channel from the bypass reach is approximately 590 feet (measured in both Google Earth Pro and ArcMap), and it appears that mixing of the powerhouse discharge and the bypass reach flow during periods of low inflow (e.g., Leakage Flow only) does not occur until approximately 800 feet downstream from the spillway. Further supporting this is the mesohabitat mapping which shows run habitat on the powerhouse discharge side meeting riffle habitat on the bypass reach side, at the downstream end of the island separating the two. The riverbed elevation would typically be expected to be higher in a riffle than in an adjacent run. For calibration purposes, the Service measured other features such as the Byllesby spillway, and we found our measurements of such features to be consistent with the Project Description. The Project Description should be updated to reflect an accurate description of the Byllesby bypass reach.

5.3 Desktop Mesohabitat Mapping

The explanation of the assessment of cover types does not explain how the desktop habitat designation was verified in the field. Section 6.3.2. mentions that field investigation (as necessary) was done in September 2020. How much of the area was field verified? How do the LiDAR categories designated for cover (1-18 in Table 5-1) match to the narrative description in the original Habitat Suitability Criteria narratives?

5.4.1 Flow and Water Level Assessment

The Service questions the prioritization of Byllesby Tainter Gate #6 as the first gate operated for releases into the bypass reach. Although this gate is near the center of the spillway structure, the downstream thalweg appears to be closer to the right descending bank (RDB). Releasing flows through Obermeyer gates closer to the RDB would better mimic natural conditions where low flows are mostly confined to the thalweg. This approach may also reduce fish stranding potential by avoiding short-duration wetting of adjacent, higher-elevation portions of the bypass reach. Obermeyer gate #11 or #12 should be considered as the primary gate for flow releases to this bypass reach.

We also question the use of Buck Tainter Gate #1 as the first gate opened to release flows into the Buck bypass reach. The downstream thalweg appears to mostly follow the left descending bank (LDB), as would be expected (i.e., the thalweg typically follows the outside of a channel bend). However, the section of the spillway near the LDB is a flashboard section which does not allow for automated flow releases. Therefore, the Service recommends consideration of Obermeyer Gate #10 for flow releases to the Byllesby spillway. We recognize that under current operations, incremental Tainter gate settings are utilized for providing the ramping flows. The Service requests further analysis and discussion of this issue.

5.6.1.3 Habitat Suitability Index (HSI) Criteria

This section lists the source documents for the numerical HSI curves used for each life stage, but does not indicate if those curves were developed from research immediately prior to the source documents publication of 2010, 2007, and 2008, or if they used prior published curves from earlier decades. How does research in the current decade after 2010 corroborate or contrast with the knowledge that went into earlier HIS curve development? Please provide the narrative of original HSI sources and their reference data sources. Attachment 2 only has numeric values of the HSI curves.

6.3.1 and 6.3.2 Byllesby Bypass Reach and Buck Bypass Reach

As the Service discussed in the USR joint agency meeting on December 1, 2021, we would like to understand how the Habitat Characteristic Classification designations equate to our understanding of riverine habitat. Instream Cover and Overhead Vegetation are not necessarily mutually exclusive categories, as the Tables 6-1 and 6-2 sum their percentages, with No Cover, to one hundred. Please provide the specific definitions for each category used from the model, and how they were assessed.

6.6.1 Aquatic Habitat Evaluation Results, Byllesby Habitat Model Results

Deep-Fast Guild: The Service mostly agrees that there is little to no potential habitat under any flow scenario in the Byllesby bypass reach for the Deep-Fast Guild; however, there is a slight increase in habitat suitability for both the coarse substrate-associated representative (adult shorthead redhorse, *Moxostoma macrolepidotum*) and the fine substrate-associated guild representative (adult silver redhorse, *Moxostoma anisurum*) across all flows above leakage. However, no optimal habitat is gained, and the quantity of habitat gained is minimal.

Deep-Slow Guild: No significant habitat improvements at any of the higher flows.

Shallow-Fast Guild: The Service agrees that there is little to no available habitat in the bypass reach for this guild under any of the modeled flow scenarios.

Shallow-Slow Guild: The Service agrees that the largest amount of potential available habitat, mostly at the lower end of the bypass reach, is for the generic shallow-slow guild with coarse substrate (represented by the spawning life stage of the redbreast sunfish, *Lepomis auritis*). There is a significant increase in habitat suitability in the lower Byllesby bypass reach, especially in the thalweg, under the Low Flow release scenario, 88 cubic feet per second (cfs). An increase in minimum flow to the Low Flow release would also benefit the spawning life stage of the bigmouth chub (*Nocomis platyrhynchus*), a New River endemic species that was included in both the Shallow-Slow guild and the Deep-Fast guild for the Fries (FERC No. 2883) relicensing bypass reach study (Kleinschmidt 2016). The bigmouth chub prefers coarse substrate and flowing water for spawning. Water depths and velocities in spawning habitats vary across studies. All life stages of another New River endemic, the New River shiner (*Notropis scabriceps*), were also included in this guild for the Fries study and would likely benefit from this flow enhancement.

Walleye: The Service agrees with the study conclusions regarding habitat suitability for walleye (*Sander vitreus*) in the Byllesby bypass reach. There are no clear or substantial benefits in the Byllesby bypass reach to any of the walleye life stages under any of the flow releases.

Summary Conclusions for the Byllesby Bypass Reach: The Service also considered negative tradeoffs (e.g., loss of habitat or reduction in habitat suitability for a particular guild or life stage with increased flows to the bypass reach). The greatest gains in habitat with the fewest negative tradeoffs appear to be associated with the Low Flow release (88 cfs). In addition, the Byllesby bypass reach wetted area had a relative increase the most from Leakage Flow to Low Flow (by 1 acre), compared to the wetted area increases corresponding with the Mid Flow (0.3-acre increase) and High Flow (0.1-acre increase). Although, absolute total increase in wetted area could increase primary productivity instream and macroinvertebrate prey habitat. When considering these tradeoffs, one should also consider what percentage of the mean inflow each bypass reach flow represents. The Leakage Flow represents less than 0.5 percent of the annual mean inflow, whereas a minimum flow release of 88 cfs represents 3.9 percent of the annual mean flow.

In order to prioritize spawning habitat for the endemic bigmouth chub and habitat for all life stages of the New River shiner, the Service will be recommending an increase in the minimum flow, to 88 cfs, to the Byllesby bypass reach. A minimum flow of 88 cfs represents only 3.9 percent of the annual mean in-flow to the Project.

6.6.2 Aquatic Habitat Evaluation Results, Buck Habitat Model Results

Deep-Fast Guild: The Service agrees with the USR's conclusions for this guild. For the Deep-Fast, Coarse-Mixed Substrate guild, there was a significant increase in suitable habitat through both the upper and the lower portions of the reach at the High Flow release, 714 cfs. There was also a marked improvement in habitat suitability, although not as much, at the Mid Flow release (354 cfs), and slight improvement at the Low Flow release (210.7 cfs). These increased flows could be expected to increase suitable adult and spawning habitat for the endemic bigmouth chub. We note that at the High Flow release, there was a reduced powerhouse discharge (1,925 cfs) that resulted in a slight reduction in habitat suitability downstream of both the bypass reach and the discharge channel. While this does not appear to be directly related to the increased bypass reach flow, it may be indirectly related, in that an increased minimum flow to the bypass reach will result in reduced powerhouse generation on some days, depending on available inflow. Although the representative for this guild is the adult life stage of the shorthead redhorse, the spawning life stage of the bigmouth chub also fits in this guild, and the effect on generation of an increased minimum flow to the bypass reach would likely be minimal during this species' spring spawning season.

For the Deep-Fast guild with Fine Substrate and No cover, there is only a slight habitat suitability increase, incrementally, with increasing flow releases, but habitat suitability in some narrow bands adjacent to the thalweg in the lower part of the bypass reach increases to around 0.75 at the High Flow release.

Deep-Slow Guild: The Service agrees with the USR's interpretation of the model results for this guild. For the Deep-Slow guild with No Cover, there were very small additions of optimal habitat with increasing flow releases. The High Flow release shows more dispersion of small patches of optimal habitat, while the Mid Flow release shows fewer patches but a larger patch near the lower end of the bypass reach. Based on these tradeoffs, the preferential option is unclear between the Mid Flow and High Flow releases as to which provides the most benefit.

For the Deep-Slow guild with Cover, results were similar to the above guild with no cover. Suitable habitat increases with increasing flows, but a large patch seen at the lower end of the bypass reach at Mid Flow is reduced (optimal areas reduced to highly suitable) from Mid Flow to High Flow; i.e., a flow of 354 cfs appears to provide the most optimal habitat for this guild. The endemic New River shiner would likely benefit from a flow of 354 cfs to the Buck bypass reach, and the endemic Appalachia darter (*Percina gymnocephala*) might also benefit outside of its spawning season.

Shallow-Fast Guild: The Service agrees with the USR's conclusions regarding Buck bypass reach habitat for this guild under the different target flows. For the Shallow-Fast guild with

Moderate Velocity and Coarse Substrate, suitable and optimal habitat increase with increasing flows, although the upper part of the reach decreases in optimal habitat from Mid to High Flow, with a corresponding increase in optimal habitat in the lower part of the reach over these flows (tradeoff). There are significant increases also seen in both upper and lower portions of the bypass reach at the Low Flow release (210.7 cfs).

Shallow-Slow Guild: For the Shallow-Slow Guild associated with Fine Substrate and No Cover, there are no clear or substantial habitat improvements in the Buck bypass reach under any of the flow scenarios.

For the Shallow-Slow Guild associated with Coarse Substrate, there are tradeoffs, but the Low Flow release (210.7 cfs) appears to provide the greatest overall habitat benefits throughout the Buck bypass reach.

Walleye: For the walleye adult life stage, the Service agrees that the results indicate little to no suitable habitat under any of the target flow scenarios. There is little difference between flows; increasing flow releases result in increases in marginal habitat quantity, but there is no obvious increase in habitat suitability with increasing flow.

For walleye fry, there are tradeoffs, and we do not completely agree with the Applicant's interpretation of the results. Optimal habitat at the lower end of the Buck bypass reach becomes unsuitable above leakage flow, but a Mid Flow (354 cfs) release appears to provide the greatest increase in dispersed suitable and optimal habitat patches. We agree that the largest patch of optimal habitat is seen at Leakage Flow, at the lower end of the bypass reach, but the Mid Flow release clearly provides more optimal habitat than does the Low Flow release, based on the study results.

For the walleye juvenile life stage, there were no significant improvements at any flow, except for some marginal habitat increase at the 354 cfs Mid Flow and the small amount of increased potential habitat described in the USR.

For the walleye spawning stage, the Service does not completely agree with the Applicant's interpretation of the model results. Walleye spawning habitat suitability clearly improves with increasing flows to the Buck bypass reach, with the most suitable habitat provided under the High Flow release scenario (714 cfs). The reduction in habitat suitability downstream of the bypass reach and just downstream of the tailrace channel is related to the reduced powerhouse discharge on Day 4, compared to that of Day 3, and is not directly related to the increased flow to the bypass reach. Indirectly, a minimum flow of 714 cfs to the bypass reach would reduce the number of days that the powerhouse can generate at the Day 3 level. However, under the Day 3 scenario, the combined HSI score just downstream of the tailrace channel appears to be around

0.75 (i.e., sub-optimal), so this decline in suitability under the Day 4 scenario is an acceptable tradeoff for the increase in optimal and suitable habitat in the Buck bypass reach under the Day 4 scenario.

Summary conclusions for the Buck bypass reach: The High Flow 714 cfs release resulted in the greatest overall improvement in habitat suitability when considering all species and guilds together, and the Mid Flow release was a close second, based on the model results. However, tradeoffs in reduced habitat downstream of the tailrace should also be considered. Leakage flow represents only 0.75 percent of the mean annual inflow to the Buck development, while the 210.7 cfs Low Flow release represents 9.3 percent of the mean annual inflow, the 354 cfs Mid Flow release represents 15.6 percent of the mean annual inflow, and the 714 cfs High Flow release represents 31.4 percent of the mean annual inflow. Considering all of the above, the Service will be recommending an increase in the minimum flow to the Buck bypass reach, to 354 cfs.

Section 7.1.3 Identify and Characterize Locations of Habitat Management Interest

While the Service does not disagree with the USR's conclusions regarding the habitat benefits of maintaining run-of-river operations through the Byllesby powerhouse, we believe that the Low Flow release (88 cfs) to the Byllesby bypass reach provides enough habitat benefits to justify the tradeoff in slightly reduced powerhouse generation flows to the tailrace, cross-over channel and side channel.

We also question whether negative effects of reduced powerhouse generation were sufficiently tested, considering the limited range of modeled generation flows (from 1,144 cfs to 1,555 cfs) and the fact that the highest generation flow did not correspond with the lowest bypass reach flow release, nor did the lowest generation flow correspond with the highest bypass reach flow release, under the various test scenarios. We understand that this aspect of the study was dictated by Project inflow, and was not within the Applicant's control, but a true test of these tradeoffs would require a greater range of generation flows (Byllesby powerhouse hydraulic capacity is more than 3x the highest generation flow in the study), and incrementally increasing bypass reach flows tested against incrementally decreasing powerhouse generation flows.

The Day 2 flow to the Byllesby bypass reach (88 cfs; recommended by the Service) corresponded with the highest powerhouse discharge flow to the tailrace, cross-over channel and side channel, such that the study did not evaluate a corresponding decrease in flow to these other Project features. The goal of systematically evaluating and balancing the needs and priorities of the various flow-related resources (as stated in Section 5, Methodology, Page 9 of the USR) was not completely met by this study, because there was no true evaluation of balancing of flow distribution. Negative tradeoffs proportional to the bypass reach flow releases were not sufficiently tested. Therefore, the Service focused its evaluation of study results primarily on the effects of the different test flows released to the bypass reaches. In addition, a finding of the study (Page 31) was that bypass flow releases did not influence water surface elevations in the tailrace, cross-over channel, or side channel areas.

7.1.4 Efficacy of Existing Powerhouse Minimum Flow Requirement

The Service does not agree with the statement in the last paragraph of this section that, from an aquatic habitat perspective, it likely makes no substantial difference which gate is used to release the minimum downstream flow requirement. The thalweg is near the eastern bank (RDB), and the minimum flow should be released through the gate that is most directly aligned with the thalweg.

7.1.5 Evaluate the Impacts of Seasonal Minimum Flows

The Service does not completely agree with the stated conclusions in this section. Model results indicated a significant increase in habitat suitability for the generic shallow-slow guild with coarse substrate (represented by the spawning life stage of the redbreast sunfish) in the lower Byllesby bypass reach, especially in the thalweg, under the Low Flow release scenario (88 cfs). In addition, although the Service had sufficient opportunity to influence the list of species to be evaluated, a thorough evaluation of all possible benefits to aquatic organisms would be well beyond the practicable scope of the study, and existing research (e.g. TNC Indicators of Hydrologic Alteration) supports a minimum flow to the Byllesby bypass reach that is greater than 0.5 percent of the annual mean inflow to the Project (current minimum flow provided through leakage).

7.2.6 Evaluate the Impacts of Seasonal Minimum Flows

For reasons discussed above, the Service does not agree with the conclusions in this section.

Water Quality Study Report

The Service did not have any significant issues with the completion of this study.

Wetland, Riparian and Littoral Habitat Study

The Service notes the utility this study shows in field verification of data, especially for jurisdictional wetlands, as documented wetlands increased greatly over desktop analysis projections. Nearly 78 acres of palustrine emergent, scrub shrub and forested wetlands are important wildlife resources for waterfowl and fish and aquatic communities. The Service supports continued consultation with the Virginia Department of Wildlife Resources staff in developing the Wetland Management Plan.

As we noted in the USR Meeting, impacts to wetland resources, even temporary drawdown impacts for months of maintenance or other factors, should be documented. Persistence of wetland vegetation is only one component of wetland habitat, and the seasonal presence or lack of hydrology must be factored into consideration.

Aquatic Resources Study Report, Attachment 1, 2020-2021 Fish Community Study Report

Water quality data and velocity data were collected at sampling sites which included the bypass reaches. What were the flows (cfs) to the bypass during the surveys? The Service did not see this information in the USR. If this information was not documented at the time of the surveys, it should be possible to look back to the dates and times of the surveys and provide this information.

Attachment 2, Fish Impingement and Entrainment Study Report

4.2.2.3 Turbine Blade Strike and Spillway Survival Assessment, top of page 4-4

A spillway and bypass passage survival rate of 97 percent was assumed based on the average of 136 survival tests conducted with juvenile salmonids on the Columbia River (Amaral et al. 2013). How does the spillway from the cited study compare to the Project spillways with regards to the drop in elevation from the downstream end of the spillway apron to the riverbed and plunge pool depth below the dam apron? There appears to be a drop in elevation from the Byllesby spillway apron to the riverbed below, with little to no plunge pool below most of the spillway gates. The Service requests additional information to support the assumption of 97 percent survival of fish passing via the spillways.

5.1.1.3 and 5.1.2.3 Intake Velocities

Were the submerged heights of the intake structures used to calculate velocities, or were the total heights (including non-submerged sections) of the intake structures used in the calculations? If non-submerged sections of the intake dimensions were used in the calculations, then the resulting calculated velocities will be underestimates. The Service has previously requested design plans of the intake structures, and water surface elevations. Without that detailed information, we cannot verify that the applicant's velocity calculations were performed according to the parameters the Service uses for calculations. Drawings presented in Appendix I, Additional Intake Drawings are insufficient.

5.2.2.1 Intake Avoidance

This section states that burst swim speed data were compiled from the literature, however if data for a specific species or group was not directly available, it was calculated as 2x the critical swim speed based on Bell (1991). Bell (1991) does not define "critical" swim speed. The three swim speeds defined by Bell (1991) are cruising, sustained, and darting. To which of these does "critical swim speed" equate?

5.2.2.2 Impingement Risk

The Service previously provided our December 30, 2021 Draft License Application (DLA) comments regarding the tail length used for walleye in the Turbine Blade Strike Analysis (TBSA). In those comments, we noted that walleye up to 29 inches in tail length have been collected from the New River and stating, therefore, that this should be the maximum length used in the TBSA, as opposed to the upper limit of 13.5 which was used in this study, based on the 2020-2021 surveys. However, we did not take into account the clear bar spacing on the trash racks, and the body width to length scaling factor for walleye. Based on the scaling factor, this study determined that walleye with a tail length of 18.5 inches or greater will be excluded from the Project intakes. Therefore, we revise our previous request in our DLA comments, to conduct additional TBSA modeling for walleye, using 18 inches as the tail length upper limit for this species.

Table 5-11. Range of Monthly Turbine Entrainment Potential for the Target Species at the Byllesby Development

This table indicates low monthly entrainment potential for walleye in all months except for June and July. However, we note that a 1992-1994 discharge netting study at the Townsend Project on the Beaver River (Ohio River tributary) in Pennsylvania collected walleye moving downstream through the powerhouse during all months of the year except for June (RMC 1994).

5.2.3.3 Turbine Blade Strike Analysis, page 5-24, second paragraph, last sentence

This sentence refers to Table 5-6 which summarizes body length to width ratios and minimum length of at which fish species would be excluded by the trash racks. The minimum size of exclusion for larger bodied species of 14.5 to 18 inches does not completely agree with the table (upper end of range is 18.5 inches in the table).

Table 5-14. Walleye Downstream Passage Survival Estimates for Existing and Proposed Project Configurations at Varying Amounts of Spill

The Service previously provided DLA comments pertaining to the maximum tail length used for walleye in the TBSA modeling, stating that walleye up to 29 inches have been collected from the New River. The maximum length used in the TBSA modeling was only 13.5 inches, based on specimens collected during the 2020-2021 surveys. The minimum length for this species that would be excluded from the powerhouses, based on the clear bar spacing of the trash racks, would be 18.5 inches. Therefore, the Service requests that additional TBSA modeling be conducted for walleye up to a maximum tail length of 18 inches, and that this table be revised to reflect the updated survival rates based on the additional modeling.

7 Variances from FERC-approved Study Plan

Were the submerged heights of the intake structures used to calculate velocities, or were the total heights (including non-submerged sections) of the intake structures used in the calculations? If non-submerged sections of the intake dimensions were used in the calculations, then the resulting calculated velocities will be underestimates. The Service has previously requested design plans of the intake structures, and water surface elevations. Without that detailed information, we cannot verify that the applicant's velocity calculations were performed according to the parameters we use.

Conclusion

The Service appreciates the opportunity to provide comment on the USR for the Byllesby-Buck Hydroelectric Project. If you have any questions regarding our comments, please contact Janet Norman of my staff at Janet_Norman@fws.gov or 410-320-5519, and Rick McCorkle of the Pennsylvania Field Office at Richard_McCorkle@fws.gov or 302-382-0284.

Sincerely,

Acting for Genevieve LaRouche
Field Supervisor

References:

Kleinschmidt. 2016. Memorandum from Shane Boring to resource agencies regarding Guilding of Target Species for Fries Flow Demonstration Study. October 5, 2016.

Subject: FW: Byllesby-Buck Draft Recreation Management Plan
Attachments: Byllesby Buck Draft Recreation Management Plan_20220126.pdf; Appencies A-E.pdf

From: Elizabeth B Parcell <ebparcell@aep.com>
Sent: Wednesday, January 26, 2022 4:03 PM
To: Norman, Janet <janet_norman@fws.gov>; Grist, Joseph <joseph.grist@deq.virginia.gov>; Copeland, John <john.copeland@dwr.virginia.gov>; Williams, Jeff (DGIF) <jeff.williams@dwr.virginia.gov>; Wampler, Jennifer <jennifer.wampler@dcr.virginia.gov>; Sweeney, Samuel <sam.sweeney@dcr.virginia.gov>; Carroll County - Rex Hill <rex.hill@carrollcountyva.gov>; Laura Walters (claytorlakegirl@gmail.com) <claytorlakegirl@gmail.com>; beth.taylor@wytheville.org
Cc: Salazar, Maggie <Maggie.Salazar@hdrinc.com>; Kulpa, Sarah <sarah.kulpa@hdrinc.com>; Jonathan M Magalski <jmmagalski@aep.com>
Subject: Byllesby-Buck Draft Recreation Management Plan

Good afternoon,

Attached please find the draft Recreation Management Plan in support of the relicensing of the Byllesby-Buck Project. We would appreciate if you could provide comments as soon as practicable or within 30 days (before February 25, 2022). Appalachian intends to incorporate comments from this group as applicable and file a Final Recreation Management Plan with FERC in conjunction with or following the Final License Application (FLA) to be filed by February 28, 2022. Appalachian would be glad to convene a call with your organization or this group if there are comments or issues you would like to discuss.

Many thanks,

Liz Parcell

ELIZABETH B PARCELL | **PROCESS SUPV**
EBPARCELL@AEP.COM | D:540.985.2441
40 FRANKLIN ROAD SW, ROANOKE, VA 24011

Subject: FW: Byllesby-Buck USR FERC Comment re Walleye Body Depth Data

From: Elizabeth B Parcell <ebparcell@aep.com>
Sent: Thursday, January 27, 2022 12:48 PM
To: Copeland, John <john.copeland@dwr.virginia.gov>
Cc: Kulpa, Sarah <sarah.kulpa@hdrinc.com>; Jonathan M Magalski <jmmagalski@aep.com>; Salazar, Maggie <Maggie.Salazar@hdrinc.com>
Subject: Byllesby-Buck USR FERC Comment re Walleye Body Depth Data

John,

You may have noticed that FERC had a USR comment on walleye body depth. Specifically, they stated:

As indicated at both the USR and Initial Study Report (ISR) meetings, the potential stranding of walleye in the Buck bypassed reach during spill events in the spring spawning season is a concern. While a two-dimensional (2-D) hydraulic model was developed to simulate water depths and flow patterns in the Buck bypassed reach under the currently required ramping rate, the USR contains no information on the body depths of walleye. Therefore, to aid staff in their interpretation of the additional modeling scenario requested below in item 4, please provide body depth data for the size range of walleye that would be expected to occur in this portion of the New River during the spring spawning season. This information will help staff determine whether the existing ramping rate provides adequate escape routes (of sufficient water depth) for any walleye that may be attracted to intermittent spill flows and enter the Buck bypassed reach during the spring spawning season.

Any chance that you might have relevant data for the New River strain of walleye that you could share with us to support our analyses? If so, we would welcome receipt as soon as possible. If not, do you have data from nearby river systems that could be used? In either case, please specify the sample sizes for all provided body depth data. Lastly, please provide copies of any stranding reports or incidents (for walleye or other species) that VDWR may have in its possession or be aware of, as this could provide information on the potential stranding locations in the Buck bypassed reach as well as the sizes of stranded fish.

Many thanks. We appreciate your help and insight, as always.

Liz

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY

ELIZABETH B PARCELL | **PROCESS SUPV**
EBPARCELL@AEP.COM | D:540.985.2441 | C:540.529.4191
40 FRANKLIN ROAD SW, ROANOKE, VA 24011

Subject: FW: Byllesby-Buck USR FERC Comment re Walleye Body Depth Data
Attachments: PICT0027.JPG; PICT0030.JPG; PICT0029.JPG; PICT0032.JPG; PICT0031.JPG; PICT0033.JPG; Staunton River WAE TL Body Depth Data 25 Jan 2022.pdf

From: Copeland, John <john.copeland@dwr.virginia.gov>
Sent: Friday, January 28, 2022 2:35 PM
To: Elizabeth B Parcell <ebparcell@aep.com>
Cc: Kulpa, Sarah <sarah.kulpa@hdrinc.com>; Jonathan M Magalski <jmmagalski@aep.com>; Salazar, Maggie <Maggie.Salazar@hdrinc.com>; Williams, Jeff (DGIF) <jeff.williams@dwr.virginia.gov>; John Copeland <john.copeland@dwr.virginia.gov>
Subject: Re: Byllesby-Buck USR FERC Comment re Walleye Body Depth Data

Liz et. al.:

Walleye Body Depth Data
I wanted to respond before the weekend, since our call is Tuesday afternoon. After reading what you referenced below in the FERC comment letter, I called our statewide Walleye Committee Chairperson, George Palmer, to ask about the existence of such data. He responded (as I had already done in my head) that it would be unusual for anyone to have that data, unless a university researcher was doing something like that.

Well, since we need it for this purpose, George initiated getting preliminary data (attached here, less 1 Walleye that is included below in the email I received from Dan Michaelson) from Walleye broodstock collections they started earlier this week on the Staunton River in Brookneal and Long Island, downstream from your Smith Mountain/Leesville Project. At this point, we only have 23 Walleye total lengths and body depths to share. The team will be out 2 days next week and will collect more data then. One difference between the Staunton River and New River Walleye populations may be the ultimate body size being bigger in the New River, so any use of this data should be done with that understanding. Given a few more days, I can provide some population level comparisons between the 2 river Walleye populations (like Stock Density Indices, Average Total Lengths, etc.), but it will require me soliciting that data from George Palmer or one of his colleagues, Dan Michaelson or Hunter Hatcher in Farmville, VA. I have those statistics or can easily generate them for the New River Walleye population.

We will have the opportunity to get similar data from the New River when we start our broodstock collections in mid-late February. Using that data will be more relevant in applying it to the Buck Bypass Reach. Let's discuss it further at our meeting on February 1, because I don't know enough about your timeline to know if it's possible to get the data in that timeframe.

Stranding in the Buck Bypass Reach
I suggest we have more discussion about this one in our meeting on Tuesday. I'm in the process of interviewing current and former employees of our agency about this one. In fact, at the time you sent this email yesterday, I was interviewing retired VDWR Marion Office Conservation Police Lt. Rex Hill, who is now a Carroll County Supervisor, about events he observed stretching back into the 1970's. Formal reports are simply not available, but I can connect you with people who can testify to these events. In fact, I've asked for the current Carroll County Conservation Police Officer, Ben Boyette, to be on the call Tuesday. He's very familiar with occurrences of this nature in the Buck Bypass Reach over his years in the county and is contacting the retired county officer as well. **If possible, it would be good to put this topic up**

front in Tuesday's agenda so Officer Boyette can share his knowledge with the group and not have to sit through all the biological discussions.

I was able to get pictures of a Buck Bypass fish stranding event in 2010 subsequent to the ice dam that broke loose that winter. If you look closely at some of the pictures, you will see pieces of flashboard risers scattered throughout the bypass reach. From the vegetation observed in this photo, with trees fully leafed out, it appears to be well into at least the spring season. George Palmer sent me those pictures. I also called Bill Kittrell, retired Marion aquatics manager, to ask his recollections about it. He remembered it well, but again, no record appears to exist other than these photos (attached below, including 1 dead Walleye), nor could Bill recall the month it happened. This Walleye looks to be at least 12 inches, based on the type of teardrop net we use. We're still using the same nets.

That's all I have to report at this point.

From: Michaelson, Daniel <dan.michaelson@dwr.virginia.gov>
Sent: Wednesday, January 26, 2022 8:45 AM
To: Copeland John fhg96061 <john.copeland@dwr.virginia.gov>
Subject: WAE & truck specs

Hello John,

Attached are WAE data from yesterday (1/25/2022) at the Staunton River. I did not get the back of the data sheet copied but it was only one fish:
WAE 478 mm 84 mm (depth) M

Staunton River - Long Island - 2:51 (these are in hours and minutes by-the-way)

Two boats at Brookneal, one at Long Island.

Give me a call today if this isn't the data you're looking for. Depth measure was just a max depth of belly to top of dorsal (pretty much in front of the dorsal fin).

Dan M.

On Thu, Jan 27, 2022 at 12:48 PM Elizabeth B Parcell <ebparcell@aep.com> wrote:

> John,
>
> You may have noticed that FERC had a USR comment on walleye body depth. Specifically, they stated:
>
> *As indicated at both the USR and Initial Study Report (ISR) meetings, the potential stranding of walleye in the Buck bypassed reach during spill events in the spring spawning season is a concern. While a two-dimensional (2-D) hydraulic model was developed to simulate water depths and flow patterns in the Buck bypassed reach under the currently required ramping rate, the USR contains no information on the body depths of walleye. Therefore, to aid staff in their interpretation of the additional modeling scenario requested below in item 4, please provide body depth data for the size range of walleye that would be expected to occur in this portion of the New River during the spring spawning season. This information will help staff determine whether the existing ramping rate provides adequate escape routes (of*

sufficient water depth) for any walleye that may be attracted to intermittent spill flows and enter the Buck bypassed reach during the spring spawning season.

Any chance that you might have relevant data for the New River strain of walleye that you could share with us to support our analyses? If so, we would welcome receipt as soon as possible. If not, do you have data from nearby river systems that could be used? In either case, please specify the sample sizes for all provided body depth data. Lastly, please provide copies of any stranding reports or incidents (for walleye or other species) that VDWR may have in its possession or be aware of, as this could provide information on the potential stranding locations in the Buck bypassed reach as well as the sizes of stranded fish.

Many thanks. We appreciate your help and insight, as always.

Liz

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EBPARCELL@AEP.COM | D:540.985.2441 | C:540.529.4191
40 FRANKLIN ROAD SW, ROANOKE, VA 24011

STAUNTON RIVER

Location Brookneal

Date 1-25-22

Effort 1:25 + 1:00

Gear

Temp. 2 °C

Comments 1360 cfs WAE ~~tagging~~

Species	Length	Depth ~~Length~~	Sex ~~Length~~	Tag ~~Length~~	BC	Species	Length	Weight
WAE	511	110	F	601				
	458	84	M	602				
	465	80	M	603				
	502	108	F	604				
	505	92	F	605				
	485	100	F	606				
	509	104	F	607				
	449	84	M	608				
	484	100	F	609				
	425	80	M	610				
	496	95	F	611				
	382	76	M	612				
	525	111	F	613				
	494	98	F	614				
	526	100	F	615				
	510	100	F	616				
	454	88	M	617				
	470	94	F	618				
	511	108	F	619				
	501	90	~~M~~ F	620				
	482	99	F	621				
	486	99	F	622				

Subject:	Byllesby-Buck Bypass Flow and Aquatic Habitat Discussion
Location:	WebEx
Start:	Tue 2/1/2022 3:30 PM
End:	Tue 2/1/2022 5:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer:	Salazar, Maggie
Required Attendees:	Elizabeth B Parcell; Jonathan M Magalski; Kulpa, Sarah; Ziegler, Ty; Dvorak, Joseph; Boyette, Benjamin; Copeland, John; richard_mccorkle@fws.gov; janet_norman@fws.gov; Frederick A Colburn; joseph.grist@deq.virginia.gov; Jeff Williams; Smith, Brennan; Huddleston, Misty; scott.smith@dwr.virginia.gov; Mike.Pinder@dwr.virginia.gov; Brian Watson

Follow-up discussion to the USR meeting.

-- Do not delete or change any of the following text. --

When it's time, join your Webex meeting here.

Join meeting

More ways to join:

Join from the meeting link
https://meethdr.webex.com/meethdr/j.php?MTID=m044cac28d3452b640ea49ccf09942ec4

Join by meeting number
Meeting number (access code): 2483 485 1571
Meeting password: f33JVRHWKT3

Tap to join from a mobile device (attendees only)
+1-408-418-9388,,24834851571## United States Toll

Join by phone
+1-408-418-9388 United States Toll
Global call-in numbers

Join from a video system or application

Subject: FW: J. D. Kloepfer's Contact

From: Kleopfer, John <john.kleopfer@dwr.virginia.gov>
Sent: Thursday, February 3, 2022 7:58 AM
To: Copeland, John <john.copeland@dwr.virginia.gov>
Cc: Williams, Jeff (DGIF) <jeff.williams@dwr.virginia.gov>; Huddleston, Misty <Misty.Huddleston@hdrinc.com>; Salazar, Maggie <Maggie.Salazar@hdrinc.com>; Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>; Martin, Amy <amy.martin@dwr.virginia.gov>; Hopkins, William <hopkinsw@vt.edu>
Subject: Re: J. D. Kloepfer's Contact

John,
Thank you for the background information and introduction. The effects of hydroelectric power on hellbenders is poorly studied and therefore poorly understood. As we all know, modification of stream flow for hydroelectric power can alter stream ecosystems. Changes to stream flow can alter invertebrate drift and species diversity. Stream flow alteration could therefore impact hellbenders by changing the abundance and diversity of vertebrate and invertebrate prey. Reduction in flow may also affect the respiratory ability of hellbenders because gas exchange is increased by flowing water. I looped in Dr. Bill Hopkins from VT, who has done a lot of work on hellbenders in Virginia. I also included Amy Martin (Environmental Services Manager) in this correspondence, since I'm assuming this project will go through the environmental review process.

Misty,
I'm available early next week to discuss.

On Thu, Feb 3, 2022 at 6:27 AM Copeland, John <john.copeland@dwr.virginia.gov> wrote:

> J.D.
>
> I did not try to call you again on Tuesday because I, like you, was slammed with other things before my conference call with the U.S. Fish and Wildlife Service, Appalachian Power Company, and Region 2 and 3 aquatics staff. You will be contacted by one of the consultants with HDR Inc, the consulting firm for the Byllesby Buck relicensing. So you are familiar with why they are contacting you, here's a brief overview.
>
> The Byllesby Buck hydroelectric project on the New River is located in a remote section in Carroll County. This is an approximately 30MW hydro generation system, so it's nearly half the production capacity of Claytor Lake Dam. The mainstem New River dams are primarily owned and operated by Appalachian Power. Their consultant for the relicensing is HDR Inc. https://www.hdrinc.com/. Relicensing is a fast-moving process with tight timelines. **HDR is planning to file the Final License Application for the Project on February 28, 2022.**
>
> In the current discussion of instream flow needs in the bypass reaches below these dams, our primary discussion right now is the Buck Bypass Reach, which is about 3/4 of a mile of formerly mainstem river. https://www.google.com/maps/place/Buck+Dam/@36.8065405,-80.940762,666m/data=!3m1!1e3!4m5!3m4!1s0x8851fa43359d82a1:0x7ba31982ad535ba2!8m2!3d36.8078216!4d-80.9388261 It does not get regular flows as a result.

The Byllesby Bypass Reach (the upstream dam) is shorter, with an approximately 400+ foot bypass reach. https://www.google.com/maps/place/Byllesby+Dam,+Ivanhoe,+VA+24350/@36.78683,-80.9353715,488m/data=!3m1!1e3!4m5!3m4!1s0x8851fa7a1fe04ca5:0xf8278eefaf7769ac!8m2!3d36.7851212!4d-80.9331397

During development of relicensing study plans to establish background biological and other information in 2020 and 2021, we discussed Eastern Hellbender. Appalachian Power Company agreed to assume the presence of this species without doing costly survey work. That decision leads to this email and the need for your input. HDR is using high resolution photography and a 2-D flow model to look at instream flow needs for the Project. In our meeting on Tuesday, I was amazed at the level of detail available to examine habitat in the Buck bypass reach.

As I understand it, Misty will contact you regarding having an online meeting for you to look at that information with HDR's team and provide an initial assessment of potential Eastern hellbender habitat.

Thanks J.D.!

John R. Copeland

Fisheries Biologist III

Cell 540.871.6064

Virginia Department of Wildlife Resources

CONSERVE. CONNECT. PROTECT.

A 2206 South Main Street, Suite C, Blacksburg, VA 24060

www.dwr.virginia.gov

---------- Forwarded message ---------
From: **Huddleston, Misty** <Misty.Huddleston@hdrinc.com>
Date: Wed, Feb 2, 2022 at 11:15 AM
Subject: RE: J. D. Kloepfer's Contact
To: Copeland, John <john.copeland@dwr.virginia.gov>
Cc: Williams, Jeff (DGIF) <jeff.williams@dwr.virginia.gov>, Salazar, Maggie <Maggie.Salazar@hdrinc.com>, Kulpa, Sarah <sarah.kulpa@hdrinc.com>

John,

Thanks for passing along the contact information.

Misty

Misty Huddleston, PhD

Associate, SR. Environmental Scientist
D 704.248.3614 **M** 865.556.9153

hdrinc.com/follow-us

From: Copeland, John <john.copeland@dwr.virginia.gov>
Sent: Wednesday, February 2, 2022 6:03 AM
To: Huddleston, Misty <Misty.Huddleston@hdrinc.com>
Cc: John Copeland <john.copeland@dwr.virginia.gov>; Williams, Jeff (DGIF) <jeff.williams@dwr.virginia.gov>; Salazar, Maggie <Maggie.Salazar@hdrinc.com>; Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>
Subject: J. D. Kloepfer's Contact

Misty:

I think you were the person on the call yesterday who asked for J.D. (John) Kloepfer's contact information regarding getting him on the phone to discuss Eastern Hellbender habitat in the Buck Bypass reach. With the photography you have and can display, he should be able to provide feedback. I was not able to get him on the phone prior to our call yesterday, but he may have a collections database as well.

Following is what you need to contact him.

John (goes by J.D.) Kloepfer

Contact details

john.kleopfer@dwr.virginia.gov

john.kleopfer@dgif.virginia.gov • Obsolete

Directory profile

john.kleopfer@dwr.virginia.gov

(804) 829-6703 • Work

Route 5 Williamsburg VA 23185 • Work

John R. Copeland

Fisheries Biologist III

Cell 540.871.6064

Virginia Department of Wildlife Resources

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A 2206 South Main Street, Suite C, Blacksburg, VA 24060

www.dwr.virginia.gov

Appalachian Power Company
P. O. Box 2021
Roanoke, VA 24022-2121
aep.com

Via Electronic Filing February 14, 2022

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

Subject: Byllesby-Buck Hydroelectric Project (FERC No. 2514-186)
Response to Comments on the Updated Study Report
Request for Extension of Time to File Revised Study Reports

Dear Secretary Bose:

Appalachian Power Company (Appalachian or Licensee), a unit of American Electric Power (AEP), is the Licensee, owner, and operator of the two-development Byllesby-Buck Hydroelectric Project (Project) (Project No. 2514), located on the upper New River in Carroll 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 new license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5. Appalachian has conducted studies in accordance with 18 CFR §5.15, as provided in the Revised Study Report (RSP) and as subsequently modified by FERC's Study Plan Determination (SPD). Pursuant to the ILP, Appalachian filed the Updated Study Report (USR) for the Project on November 17, 2021. Additionally, Appalachian held a USR Meeting with stakeholders and FERC staff via WebEx on December 1, 2021. A USR Meeting summary was filed with FERC on December 16, 2021. The deadline to submit any disputes or requests to amend studies was January 15, 2022[1]. Comment letters were received from FERC, U.S. Fish and Wildlife Service (USFWS or Service) and Virginia Department of Wildlife Resources (VDWR) on January 18, 2022.

Appalachian received numerous comments from FERC staff and agencies, some requiring additional analyses to adequately address comments. Given the extensive comments and additional amount of time required to respond to these comments, Appalachian has developed a comment-response table included in Attachment 1. The comment-response table provides information on how a comment has been or will be addressed, and in what document(s) additional information will be provided.

[1] Because this date fell on a Saturday (January 15, 2022) and Monday, January 17, 2022 was a federal holiday, the deadline for filing USR comments was extended to January 18, 2022.

Appalachian is in the process of developing the Final License Application (FLA) which will be filed with FERC by February 28, 2022. The FLA will include additional information to address comments received on the USR to the extent possible. Additionally, Appalachian is currently completing additional analyses and revising study reports to address comments on the USR. As previously mentioned, there are numerous comments requiring a significant effort to adequately address concerns. Therefore, Appalachian is respectfully requesting an extension of time to submit the revised Aquatic Resources and Bypass Reach Flow and Aquatic Habitat study reports as supplemental information to the FLA, within 45 days of the February 28th FLA filing (April 14, 2022).

If there are any questions regarding this filing or request, please do not hesitate to contact me at (540) 985-2441 or via email at ebparcell@aep.com.

Sincerely,

Elizabeth Parcell
Process Supervisor
American Electric Power Services Corporation

cc: Distribution List
Jonathan Magalski (AEP)

Attachment

Byllesby/Buck Hydroelectric Project (FERC No. 2514)
Distribution List

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Hon. Morgan Griffith
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US House of Representatives
Christiansburg District Office
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Mr. Michael Reynolds
Acting Director, Headquarters
US National Park Service
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Byllesby/Buck Hydroelectric Project (FERC No. 2514)
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Mr. Rex Hill
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Mr. Scott McCoy
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Byllesby/Buck Hydroelectric Project (FERC No. 2514)
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Mayor
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Byllesby/Buck Hydroelectric Project (FERC No. 2514)
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Attachment 1

Response to USR Comments Received

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Entity	Topic	Agency Comment	Comment Response
FERC	Water Quality Study	Continuously recorded (15-minute) water temperature and dissolved oxygen (DO) data from each monitoring location during the 2020 and 2021 water quality monitoring seasons are presented graphically in Attachments 1 and 2 of the Water Quality Study Report filed with the USR. While these plots are useful in discerning general trends and differences in water quality parameters among the various monitoring locations, it is difficult to ascertain from these graphs the number of days that temperature and DO values were inconsistent with state water quality standards or to quantify the degree of stratification in the project's impoundments. Therefore, to assist staff's analysis of project effects on water quality, please provide a series of tables, or a spreadsheet file, that reports for each day of the 2020 and 2021 monitoring seasons, the daily minimum, maximum, and average water temperatures and DO values at each continuous water quality monitoring site, including each monitoring depth in the Byllesby and Buck impoundments. Please provide all water temperature data in degrees Fahrenheit and all DO data in units of milligrams per liter (mg/L).	Tables or a spreadsheet file that includes the daily minimum, maximum, and average water temperatures and DO values at each of the continuous water quality monitoring sites for the 2020 and 2021 monitoring seasons will be provided in the revised Water Quality Study report to be filed with FERC as part of the FLA. All temperature data will be provided in degrees Fahrenheit and all DO data will be provided in milligrams per liter.
FERC	Water Quality Study	Figure 8.1 of Attachment 8 of the Water Quality Study Report does not indicate the timing of drag rake operations at each development (Byllesby and Buck), as is shown by vertical reference lines on a similar figure in the report (figure 8.2). Therefore, please add reference lines to figure 8.1 to indicate the timing of drag rake operations at each development.	Figure 8.1 in the Water Quality Study report has been updated to indicate the timing of drag rake operations at each development. The revised Water Quality Study report will be filed with FERC with the FLA.
FERC	Bypass Flow and Aquatic Habitat Study	As indicated at both the USR and Initial Study Report (ISR) meetings, the potential stranding of walleye in the Buck bypassed reach during spill events in the spring spawning season is a concern. While a two-dimensional (2-D) hydraulic model was developed to simulate water depths and flow patterns in the Buck bypassed reach under the currently required ramping rate,2 the USR contains no information on the body depths of walleye. Therefore, to aid staff in their interpretation of the additional modeling scenario requested below in item 4, please provide body depth data for the size range of walleye that would be expected to occur in this portion of the New River during the spring spawning season. This information will help staff determine whether the existing ramping rate provides adequate escape routes (of sufficient water depth) for any walleye that may be attracted to intermittent spill flows and enter the Buck bypassed reach during the spring spawning season. Please consult with the Virginia Department of Wildlife Resources (DWR) to determine if body depth data are available for the New River strain of walleye; if such data are not available, data from nearby river systems may be used; in either case, please specify the sample sizes for all provided body depth data. Lastly, please file copies of any stranding reports or incidents (for walleye or other species) that Virginia DWR may have in its possession or be aware of, as this could provide information on the potential stranding locations in the Buck bypassed reach as well as the sizes of stranded fish.	Appalachian is consulting with the VDWR to determine if body depth data are available for the New River strain of Walleye, or data from nearby river systems if unavailable for New River strain. Appalachian will file with FERC, with the FLA if received in time or as supplemental information after the FLA as part of the revised Aquatic Resources Study Report, copies of any available stranding reports or incidents (for Walleye or other species) provided by VDWR.
FERC	Bypass Flow and Aquatic Habitat Study	The approved study plan states that model simulations will be performed to evaluate flow releases from various spillway gates and spill configurations [emphasis added] to determine flow patterns and hydraulic connectivity at downstream locations of interest. However, the 2-D hydraulic model developed for the Buck Development was only used to evaluate flow patterns under a single spill configuration, that of the existing ramping rate, whereby down-ramping flows are released into the bypassed reach through Tainter Gate 1. Therefore, to help inform an analysis of the optimal spillway gate through which down-ramping flows should be released to minimize the stranding risk of walleye in the Buck bypassed reach and to ensure the study is completed in accordance with the approved study plan, please perform a modeling scenario that simulates water depths and velocities in the Buck bypassed reach under the currently required ramping rate but releases down-ramping flows through Obermeyer Gate 10 instead of Tainter Gate 1. (Obermeyer Gate 10 is the gate closest to the area of concern for walleye stranding; whereas Tainter Gate 1 is the most distant gate from this area of concern (see figure 4-2 of the Bypassed Reach Flow and Aquatic Habitat Study Report). If the currently required ramping rate (i.e., down-ramping flows of the same magnitude and duration as are currently released through Tainter Gate 1) cannot be achieved with the Obermeyer gates, please explain why, and use the Tainter gate nearest the stranding area of concern (i.e., the southeastern portion of the bypassed reach immediately downstream of the spillway) as the release location for down-ramping flows.	Appalachian will include additional summary information comparing releases from Buck Tainter Gate 1 and Buck Obermeyer Gates in the FLA. Additional figures and analysis will be included, if and as appropriate, in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.

FERC	Bypass Flow and Aquatic Habitat Study	Model output should include, at a minimum, depth and velocity heat maps for each of four modeled flows: (1) leakage; and flows equivalent to Tainter Gate openings of (2) 0.5 foot (~210 cfs), (3) 1.0 foot (~354 cfs), and (4) 2.0 feet (~714 cfs). The depth and velocity heat maps should be similar to figures 4-12 through 4-19 of the Buck Bypassed Reach Integrated Catchment Model (ICM) Development Report. In addition, for both release locations (Tainter Gate 1 and Obermeyer Gate 10 or the nearest feasible gate), please use the body depth information requested in item 3 above, to generate a new series of figures that are similar to the heat maps but instead show only those portions of the bypassed reach that have sufficient water depths (based on body size data) for walleye to swim through. Such maps should be generated for the both the smallest- and largest-sized walleye expected in the bypassed reach (based on consultation with Virginia DWR as described above) for each combination of release location (i.e., Tainter Gate 1 vs. Obermeyer Gate 10) and modeled flow (leakage, ~210 cfs, ~354 cfs, and ~714 cfs). This information will allow staff to assess if there are any differences in stranding risk and flow patterns (i.e., escape paths and connectivity in the bypassed reach) between these two different release locations for down-ramping flows.	Appalachian will conduct additional analyses per FERC's previous comment and provide new figures in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
FERC	Bypass Flow and Aquatic Habitat Study	The current license does not specify where the required 360-cfs minimum flow must be released at each development. Appalachian currently provides this minimum flow via generation (i.e., as part of the flow through each powerhouse) and monitors compliance with the required minimum flow using flow data from a United States Geological Survey gage (No. 01365500) located about 2.5 river miles downstream of the Buck Development. The approved study plan states that the 2-D hydraulic models developed for Byllesby and Buck will be used to evaluate the relationship between minimum flow releases to the tailwater areas versus the bypassed reaches with respect to aquatic (fish) habitat. There was also discussion at the USR Meeting as to how the hydraulic connectivity of side channels, which can serve as important aquatic habitat for fish and freshwater mussels due to their relatively unique substrate composition (i.e., predominantly gravel and cobble vs. bedrock), may vary depending on the release location (powerhouse vs. bypassed reach) of the currently required 360-cfs minimum flow. However, the currently required minimum flow at each development (360 cfs) was not explicitly included (modeled) as a test flow; the only flows evaluated were those used to develop and calibrate the models. Therefore, to allow staff to assess the potential benefits of releasing the currently required 360-cfs minimum flow into the bypassed reaches, rather than through the powerhouses, please use the 2-D hydraulic models that were developed for Byllesby and Buck to simulate habitat conditions (i.e., water depths and velocities) in each bypassed reach (Byllesby and Buck) under both existing project operation (i.e., whereby the minimum flow is included as part of the generation flows through each powerhouse) and a potential future operational scenario whereby a continuous 360-cfs minimum flow is released into each bypassed reach via Tainter Gate 1 at Buck and Tainter Gate 6 at Byllesby. This information would aid in minimum flow evaluations (e.g., the release location of minimum flows at each development) and ensure the study is completed in accordance with the approved study plan.	Appalachian will use the 2-D hydraulic models that were developed for Byllesby and Buck to simulate habitat conditions in each bypass reach as requested. This information will be summarized in Exhibit E of the FLA and may be supported by information to be included in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
FERC	Bypass Flow and Aquatic Habitat Study	Habitat conditions should be evaluated across a range of inflow conditions, including low-, mid-, and high-inflows; for example, the 90% exceedance, 50% exceedance (median), and 10% exceedance inflows, respectively. Also, the powerhouses should be ‘operating’ during the model simulations, with the amount of flow being passed through each powerhouse dependent on the particular combination of minimum flow release location (spillway vs. powerhouse) and inflow (low-, mid-, and high-) being modeled. In addition to depth and velocity heat maps for each combination of release location by inflow, model outputs should include habitat suitability maps (similar to the figures provided in Attachment 3 of the Bypassed Reach Flow and Aquatic Habitat Study Report) and also tabulate, for each release location by inflow combination, the weighted usable area (WUAs) for the species (all life stages of walleye) and guilds specified in Table 5-3 of the Bypassed Reach Flow and Aquatic Habitat Study Report.	Appalachian will provide model results for a range of inflow conditions as requested, in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
FERC	Bypass Flow and Aquatic Habitat Study	The Buck Bypassed Reach ICM Model Development Report contains depth and velocity heat maps for each of the test flows used to calibrate the model (i.e., leakage, 210 cfs, 354 cfs, and 714 cfs). However, no such heat maps are provided for the Byllesby Development. Therefore, please provide, in your filing, the depth and velocity heat maps for each of the four test flows (leakage, 88 cfs, 158 cfs, and 194 cfs) that were used to develop the 2-D hydraulic model for the Byllesby Development. On each heat map, please indicate the magnitude of flows that were being released (spilled) into the bypassed reach and passed through the powerhouse, similar to figures 4-12 through 4-19 of the Buck Bypassed Reach ICM Model Development Report.	Appalachian will revise the Bypass Flow and Aquatic Habitat Study report to include the depth and velocity heat maps for each of the four test flows. Additionally, each heat mapwill be updated to indicate the magnitude of flows that were being released (spilled) into the bypass reach and passed through the powerhouse.The revised Bypass Flow and Aquatic Habitat Study report will be filed with FERC as supplemental information after the FLA.

FERC	Bypass Flow and Aquatic Habitat Study	At the USR Meeting, Appalachian indicated that its current practice to ensure run-of-river operation during a powerhouse outage or complete station trip at either development is to immediately open spillway gates to ensure that total outflow from the project continues to approximate inflows. Please describe how it is possible for the spillway gates at each development to be operated during station outages (e.g., via backup generators, etc.). Also, please describe the maximum amount of inflow that can be passed through each powerhouse when all of its turbine units are non-operational (e.g., during complete station outages or unit trips); and describe whether it is possible to release the currently required 360-cfs minimum flow through the powerhouses during such non-operational periods.	Appalachian will provide additional description of Project operation of spillway gates during an outage in the FLA.
FERC	Bypass Flow and Aquatic Habitat Study	Page 7 of the Buck Bypassed Reach ICM Development Report states that additional bathymetry data for two pools on the southeast side of the Buck bypassed reach (see figure 2-3 of Attachment 1 of the report) may need to be collected and incorporated into the 2-D hydraulic model for the Buck Development. However, no additional bathymetry data appears to have been collected for this area, nor does there appear to be any plans for additional field work based on Appalachian's comments at the USR meeting. Therefore, please explain why additional bathymetry data was not collected for this area—which is the main stranding area of concern for walleye—and describe why the existing bathymetry data from this area is sufficient for modeling purposes.	Appalachian will address this comment in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA. No additional field data collection is planned or believed by Appalachian to be needed for the purposes of this study.
FERC	Bypass Flow and Aquatic Habitat Study	Based on figure 3-1 of the Buck Bypassed Reach ICM Development Report, there appears to be a small tributary that enters the bypassed reach along its southern shoreline, approximately mid-way down the reach. Please describe if, and how, inflow from this tributary was accounted for in your calculations of the amount of leakage flow through each of the spillway gates at the Buck Development (Table 2-2). Also, please confirm that the standing pools of water located upstream of this tributary (along the southeastern bank of the bypassed reach, immediately below the spillway) are maintained by leakage through the flashboard bays farthest away from the powerhouse (i.e., bays 15-22).	Appalachian will revise the Bypass Flow and Aquatic Habitat Study report to provide additional details regarding the small tributary entering the bypass reach and the standing pools located upstream of the tributary. The revised Bypass Flow and Aquatic Habitat Study report will `be filed with FERC as supplemental information after the FLA.
FERC	Bypass Flow and Aquatic Habitat Study	The colors in the legend for figure 6-8 of the Bypassed Reach Flow and Aquatic Habitat Study Report do not match, or correspond to, the colors used in the graphic of this figure. Also, in figure 6-9 (of the same report), the colors on the plot are very difficult to distinguish from one another. Therefore, please provide updated figures for figures 6-8 and 6-9 that contain appropriately labeled legends and sufficient color distinctions to allow readers to distinguish the various water level logger locations more easily.	Appalachian will update the figures included in the Bypass Flow and Aquatic Habitat Study report and carry the changes over into Exhibit E of the FLA, to the extent updates can be made prior to the FLA filing. The revised Bypass Flow and Aquatic Habitat Study report will `be filed with FERC as supplemental information after the FLA.
FERC	Bypass Flow and Aquatic Habitat Study	During the USR meeting, Commission staff asked if any observations of eastern hellbender, formal or incidental, had been made during the study period or any of the individual studies conducted therein. However, the Meeting Summary did not include this question or any response from the applicant. Therefore, please address this question in the license application.	No hellbenders were observed or reported during execution of the relicensing studies. Appalachian will address FERC's question regarding whether any observations of eastern hellbender had been made during the study period or any of the other relicensing studies in the FLA.
FERC	Wetland, Riparian, and Littoral Habitat Study	Page 7 of the Meeting Summary includes a question and comments about wetland acreages associated with the Wetlands, Riparian, and Littoral Habitat Study. In particular, the summary states that the "NWI estimated 9 acres of wetlands and the field verification estimated 12 acres of wetlands." Given that the NWI estimated 9 acres and the Wetlands, Riparian, and Littoral Habitat Study reported a total of 95.43 field-verified wetland acres, it is unclear what the 'estimated 12 acres' refers to specifically. Therefore, please explain and clarify the difference between field verifications that estimated 12 acres of wetlands versus those that estimated 95.43 acres of wetlands.	Appalachian will revise the Wetland, Riparian, and Littoral Habitat Study report to clarify the estimated wetland acreages, and the revised study report will be filed with the FLA. Additionally, as applicable, wetland descriptions in the FLA will reflect this updated information.
FERC	Cultural Resoures Study	The Consulting Party Distribution List in the Cultural Resources Study Report only contains three Tribes as having received the report. However, page 4 of the Distribution List of the draft license application (DLA) includes additional Tribes. Moving forward, please ensure that all Tribes who are included on the Distribution List of the DLA receive a copy of all study reports related to cultural resources, including the Cultural Resources Study Report filed with the Commission on September 13, 2021.	Tribes that did not respond to the initial and follow up consultation were excluded by Appalachian's cultural resources consultant from subsequent distribution as the lack of response implied they had no interest in the undertaking. Appalachian has retained the Tribes listed for the DLA distribution on the distribution of the FLA.
USFWS	Background and Existing Information	The Byllesby bypass reach appears to be significantly longer than 475 feet. The distance downstream from the base of the spillway to the downstream end of the island separating the tailrace channel from the bypass reach is approximately 590 feet (measured in both Google Earth Pro and ArcMap), and it appears that mixing of the powerhouse discharge and the bypass reach flow during periods of low inflow (e.g., Leakage Flow only) does not occur until approximately 800 feet downstream from the spillway. Further supporting this is the mesohabitat mapping which shows run habitat on the powerhouse discharge side meeting riffle habitat on the bypass reach side, at the downstream end of the island separating the two. The riverbed elevation would typically be expected to be higher in a riffle than in an adjacent run. For calibration purposes, the Service measured other features such as the Byllesby spillway, and we found our measurements of such features to be consistent with the Project Description. The Project Description should be updated to reflect an accurate description of the Byllesby bypass reach.	The Project description will be updated in the FLA (Exhibits A and E) and, as necessary, in all revised study reports to accurately reflect the Byllesby bypass reach.

USFWS	Habitat Assessment	The explanation of the assessment of cover types does not explain how the desktop habitat designation was verified in the field. Section 6.3.2. mentions that field investigation (as necessary) was done in September 2020. How much of the area was field verified? How do the LiDAR categories designated for cover (1-18 in Table 5-1) match to the narrative description in the original Habitat Suitability Criteria narratives?	Appalachian will include additional information to respond to the USFWS's comment in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
USFWS	Bypass Flow and Aquatic Habitat Study	The Service questions the prioritization of Byllesby Tainter Gate #6 as the first gate operated for releases into the bypass reach. Although this gate is near the center of the spillway structure, the downstream thalweg appears to be closer to the right descending bank (RDB). Releasing flows through Obermeyer gates closer to the RDB would better mimic natural conditions where low flows are mostly confined to the thalweg. This approach may also reduce fish stranding potential by avoiding short-duration wetting of adjacent, higher-elevation portions of the bypass reach. Obermeyer gate #11 or #12 should be considered as the primary gate for flow releases to this bypass reach. We also question the use of Buck Tainter Gate #1 as the first gate opened to release flows into the Buck bypass reach. The downstream thalweg appears to mostly follow the left descending bank (LDB), as would be expected (i.e., the thalweg typically follows the outside of a channel bend). However, the section of the spillway near the LDB is a flashboard section which does not allow for automated flow releases. Therefore, the Service recommends consideration of Obermeyer Gate #10 for flow releases to the Byllesby spillway. We recognize that under current operations, incremental Tainter gate settings are utilized for providing the ramping flows. The Service requests further analysis and discussion of this issue.	See response to Comment 4 above.
USFWS	Habitat Assessment	This section lists the source documents for the numerical HSI curves used for each life stage, but does not indicate if those curves were developed from research immediately prior to the source documents publication of 2010, 2007, and 2008, or if they used prior published curves from earlier decades. How does research in the current decade after 2010 corroborate or contrast with the knowledge that went into earlier HIS curve development? Please provide the narrative of original HSI sources and their reference data sources. Attachment 2 only has numeric values of the HSI curves.	Appalachian will include additional information to respond to the USFWS's comment in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
USFWS	Habitat Assessment	As the Service discussed in the USR joint agency meeting on December 1, 2021, we would like to understand how the Habitat Characteristic Classification designations equate to our understanding of riverine habitat. Instream Cover and Overhead Vegetation are not necessarily mutually exclusive categories, as the Tables 6-1 and 6-2 sum their percentages, with No Cover, to one hundred. Please provide the specific definitions for each category used from the model, and how they were assessed.	Appalachian will provide clarification or definitions for each category used from the model and provide an explanation of how they were assessed in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
USFWS	Byllesby Habitat Assessment	The Service mostly agrees that there is little to no potential habitat under any flow scenario in the Byllesby bypass reach for the Deep-Fast Guild; however, there is a slight increase in habitat suitability for both the coarse substrate-associated representative (adult shorthead redhorse, Moxostoma macrolepidotum) and the fine substrate-associated guild representative (adult silver redhorse, Moxostoma anisurum) across all flows above leakage. However, no optimal habitat is gained, and the quantity of habitat gained is minimal.	Comment acknowledged. No changes are required to Exhibit E or the Bypass Flow and Aquatic Habitat Study report.
USFWS	Byllesby Habitat Assessment	The Service also considered negative tradeoffs (e.g., loss of habitat or reduction in habitat suitability for a particular guild or life stage with increased flows to the bypass reach). The greatest gains in habitat with the fewest negative tradeoffs appear to be associated with the Low Flow release (88 cfs). In addition, the Byllesby bypass reach wetted area had a relative increase the most from Leakage Flow to Low Flow (by 1 acre), compared to the wetted area increases corresponding with the Mid Flow (0.3-acre increase) and High Flow (0.1-acre increase). Although, absolute total increase in wetted area could increase primary productivity instream and macroinvertebrate prey habitat. When considering these tradeoffs, one should also consider what percentage of the mean inflow each bypass reach flow represents. The Leakage Flow represents less than 0.5 percent of the annual mean inflow, whereas a minimum flow release of 88 cfs represents 3.9 percent of the annual mean flow. In order to prioritize spawning habitat for the endemic bigmouth chub and habitat for all life stages of the New River shiner, the Service will be recommending an increase in the minimum flow, to 88 cfs, to the Byllesby bypass reach. A minimum flow of 88 cfs represents only 3.9 percent of the annual mean in-flow to the Project.	Appalachian will include summary information to support evaluation of the USFWS's preliminary recommendation in Exhibit E of the FLA. Additional analysis may be included, if and as appropriate, in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.

USFWS	Buck Habitat Assessment	For the walleye adult life stage, the Service agrees that the results indicate little to no suitable habitat under any of the target flow scenarios. There is little difference between flows; increasing flow releases result in increases in marginal habitat quantity, but there is no obvious increase in habitat suitability with increasing flow. For walleye fry, there are tradeoffs, and we do not completely agree with the Applicant's interpretation of the results. Optimal habitat at the lower end of the Buck bypass reach becomes unsuitable above leakage flow, but a Mid Flow (354 cfs) release appears to provide the greatest increase in dispersed suitable and optimal habitat patches. We agree that the largest patch of optimal habitat is seen at Leakage Flow, at the lower end of the bypass reach, but the Mid Flow release clearly provides more optimal habitat than does the Low Flow release, based on the study results. For the walleye juvenile life stage, there were no significant improvements at any flow, except for some marginal habitat increase at the 354 cfs Mid Flow and the small amount of increased potential habitat described in the USR. For the walleye spawning stage, the Service does not completely agree with the Applicant's interpretation of the model results. Walleye spawning habitat suitability clearly improves with increasing flows to the Buck bypass reach, with the most suitable habitat provided under the High Flow release scenario (714 cfs). The reduction in habitat suitability downstream of the bypass reach and just downstream of the tailrace channel is related to the reduced powerhouse discharge on Day 4, compared to that of Day 3, and is not directly related to the increased flow to the bypass reach. Indirectly, a minimum flow of 714 cfs to the bypass reach would reduce the number of days that the powerhouse can generate at the Day 3 level. However, under the Day 3 scenario, the combined HSI score just downstream of the tailrace channel appears to be around 0.75 (i.e., sub-optimal), so this decline in suitability under the Day 4 scenario is an acceptable tradeoff for the increase in optimal and suitable habitat in the Buck bypass reach under the Day 4 scenario.	Appalachian will include summary information to support evaluation of the USFWS's comment in Exhibit E of the FLA. Additional analysis may be included, if and as appropriate, in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
USFWS	Buck Habitat Assessment	The High Flow 714 cfs release resulted in the greatest overall improvement in habitat suitability when considering all species and guilds together, and the Mid Flow release was a close second, based on the model results. However, tradeoffs in reduced habitat downstream of the tailrace should also be considered. Leakage flow represents only 0.75 percent of the mean annual inflow to the Buck development, while the 210.7 cfs Low Flow release represents 9.3 percent of the mean annual inflow, the 354 cfs Mid Flow release represents 15.6 percent of the mean annual inflow, and the 714 cfs High Flow release represents 31.4 percent of the mean annual inflow. Considering all of the above, the Service will be recommending an increase in the minimum flow to the Buck bypass reach, to 354 cfs.	Appalachian will include summary information to support evaluation of the USFWS's preliminary recommendation in Exhibit E of the FLA. Additional analysis may be included, if and as appropriate, in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
USFWS	Byllesby Habitat Assessment	While the Service does not disagree with the USR's conclusions regarding the habitat benefits of maintaining run-of-river operations through the Byllesby powerhouse, we believe that the Low Flow release (88 cfs) to the Byllesby bypass reach provides enough habitat benefits to justify the tradeoff in slightly reduced powerhouse generation flows to the tailrace, cross-over channel and side channel. We also question whether negative effects of reduced powerhouse generation were sufficiently tested, considering the limited range of modeled generation flows (from 1,144 cfs to 1,555 cfs) and the fact that the highest generation flow did not correspond with the lowest bypass reach flow release, nor did the lowest generation flow correspond with the highest bypass reach flow release, under the various test scenarios. We understand that this aspect of the study was dictated by Project inflow, and was not within the Applicant's control, but a true test of these tradeoffs would require a greater range of generation flows (Byllesby powerhouse hydraulic capacity is more than 3x the highest generation flow in the study), and incrementally increasing bypass reach flows tested against incrementally decreasing powerhouse generation flows. The Day 2 flow to the Byllesby bypass reach (88 cfs; recommended by the Service) corresponded with the highest powerhouse discharge flow to the tailrace, cross-over channel and side channel, such that the study did not evaluate a corresponding decrease in flow to these other Project features. The goal of systematically evaluating and balancing the needs and priorities of the various flow-related resources (as stated in Section 5, Methodology, Page 9 of the USR) was not completely met by this study, because there was no true evaluation of balancing of flow distribution. Negative tradeoffs proportional to the bypass reach flow releases were not sufficiently tested. Therefore, the Service focused its evaluation of study results primarily on the effects of the different test flows released to the bypass reaches. In addition, a finding of the study (Page 31) was that bypass flow releases did not influence water surface elevations in the tailrace, cross-over channel, or side channel areas.	Appalachian will include summary information to support evaluation of the USFWS's comment in Exhibit E of the FLA. Additional analysis may be included, if and as appropriate, in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.

USFWS	Bypass Flow and Aquatic Habitat Study	The Service does not agree with the statement in the last paragraph of this section that, from an aquatic habitat perspective, it likely makes no substantial difference which gate is used to release the minimum downstream flow requirement. The thalweg is near the eastern bank (RDB), and the minimum flow should be released through the gate that is most directly aligned with the thalweg.	Appalachian will include summary information to support evaluation of the USFWS's comment in Exhibit E of the FLA. Additional analysis may be included, if and as appropriate, in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
USFWS	Bypass Flow and Aquatic Habitat Study	The Service does not completely agree with the stated conclusions in this section. Model results indicated a significant increase in habitat suitability for the generic shallow-slow guild with coarse substrate (represented by the spawning life stage of the redbreast sunfish) in the lower Byllesby bypass reach, especially in the thalweg, under the Low Flow release scenario (88 cfs). In addition, although the Service had sufficient opportunity to influence the list of species to be evaluated, a thorough evaluation of all possible benefits to aquatic organisms would be well beyond the practicable scope of the study, and existing research (e.g. TNC Indicators of Hydrologic Alteration) supports a minimum flow to the Byllesby bypass reach that is greater than 0.5 percent of the annual mean inflow to the Project (current minimum flow provided through leakage). The Service does not agree with the conclusions in this section.	Appalachian will include summary information to support evaluation of the USFWS's comment in Exhibit E of the FLA. Additional analysis may be included, if and as appropriate, in the revised Bypass Flow and Aquatic Habitat Study report, to be filed with FERC as supplemental information after the FLA.
USFWS	Wetland, Riparian, and Littoral Habitat Study	The Service notes the utility this study shows in field verification of data, especially for jurisdictional wetlands, as documented wetlands increased greatly over desktop analysis projections. Nearly 78 acres of palustrine emergent, scrub shrub and forested wetlands are important wildlife resources for waterfowl and fish and aquatic communities. The Service supports continued consultation with the Virginia Department of Wildlife Resources staff in developing the Wetland Management Plan. As we noted in the USR Meeting, impacts to wetland resources, even temporary drawdown impacts for months of maintenance or other factors, should be documented. Persistence of wetland vegetation is only one component of wetland habitat, and the seasonal presence or lack of hydrology must be factored into consideration.	Comment noted and to be taken into consideration in Appalachian's preparation of the FLA.
USFWS	Aquatic Resources Study	Water quality data and velocity data were collected at sampling sites which included the bypass reaches. What were the flows (cfs) to the bypass during the surveys? The Service did not see this information in the USR. If this information was not documented at the time of the surveys, it should be possible to look back to the dates and times of the surveys and provide this information.	Appalachian will provide the flows (cfs) in the bypass reaches at the times when water quality and velocity data were collected in the FLA, as well as the revised Aquatic Resources Study report to be filed as supplemental information after the FLA.
USFWS	Aquatic Resources Study	A spillway and bypass passage survival rate of 97 percent was assumed based on the average of 136 survival tests conducted with juvenile salmonids on the Columbia River (Amaral et al. 2013). How does the spillway from the cited study compare to the Project spillways with regards to the drop in elevation from the downstream end of the spillway apron to the riverbed and plunge pool depth below the dam apron? There appears to be a drop in elevation from the Byllesby spillway apron to the riverbed below, with little to no plunge pool below most of the spillway gates. The Service requests additional information to support the assumption of 97 percent survival of fish passing via the spillways.	Appalachian will revise the Aquatic Resources Study report to address the USFWS's comment.
USFWS	Aquatic Resources Study	Were the submerged heights of the intake structures used to calculate velocities, or were the total heights (including non-submerged sections) of the intake structures used in the calculations? If non-submerged sections of the intake dimensions were used in the calculations, then the resulting calculated velocities will be underestimates. The Service has previously requested design plans of the intake structures, and water surface elevations. Without that detailed information, we cannot verify that the applicant’s velocity calculations were performed according to the parameters the Service uses for calculations. Drawings presented in Appendix I, Additional Intake Drawings are insufficient.	The Aquatic Resources Study report will be revised to address the USFWS' comment.
USFWS	Aquatic Resources Study	This section states that burst swim speed data were compiled from the literature, however if data for a specific species or group was not directly available, it was calculated as 2x the critical swim speed based on Bell (1991). Bell (1991) does not define “critical” swim speed. The three swim speeds defined by Bell (1991) are cruising, sustained, and darting. To which of these does “critical swim speed” equate?	The Aquatic Resources Study report will be revised to address the USFWS' comment.

USFWS	Aquatic Resources Study	The Service previously provided our December 30, 2021 Draft License Application (DLA) comments regarding the tail length used for walleye in the Turbine Blade Strike Analysis (TBSA). In those comments, we noted that walleye up to 29 inches in tail length have been collected from the New River and stating, therefore, that this should be the maximum length used in the TBSA, as opposed to the upper limit of 13.5 which was used in this study, based on the 2020-2021 surveys. However, we did not take into account the clear bar spacing on the trash racks, and the body width to length scaling factor for walleye. Based on the scaling factor, this study determined that walleye with a tail length of 18.5 inches or greater will be excluded from the Project intakes. Therefore, we revise our previous request in our DLA comments, to conduct additional TBSA modeling for walleye, using 18 inches as the tail length upper limit for this species.	The Aquatic Resources Study report will be revised to address the USFWS' comment.
USFWS	Aquatic Resources Study	Table 5-11 indicates low monthly entrainment potential for walleye in all months except for June and July. However, we note that a 1992-1994 discharge netting study at the Townsend Project on the Beaver River (Ohio River tributary) in Pennsylvania collected walleye moving downstream through the powerhouse during all months of the year except for June (RMC 1994).	Appalachian will address USFWS' comment in the Final License Application and revised Aquatic Resources Study report.
USFWS	Aquatic Resources Study	5.2.3.3 Turbine Blade Strike Analysis, page 5-24, second paragraph, last sentence. This sentence refers to Table 5-6 which summarizes body length to width ratios and minimum length of at which fish species would be excluded by the trash racks. The minimum size of exclusion for larger bodied species of 14.5 to 18 inches does not completely agree with the table (upper end of range is 18.5 inches in the table).	The Aquatic Resources Study report will be revised to address the USFWS' comment.
USFWS	Aquatic Resources Study	The Service previously provided DLA comments pertaining to the maximum tail length used for walleye in the TBSA modeling, stating that walleye up to 29 inches have been collected from the New River. The maximum length used in the TBSA modeling was only 13.5 inches, based on specimens collected during the 2020-2021 surveys. The minimum length for this species that would be excluded from the powerhouses, based on the clear bar spacing of the trash racks, would be 18.5 inches. Therefore, the Service requests that additional TBSA modeling be conducted for walleye up to a maximum tail length of 18 inches, and that this table be revised to reflect the updated survival rates based on the additional modeling.	The Aquatic Resources Study report will be revised to address the USFWS' comment. The revised study report will be filed with FERC as supplemental information after the FLA.
USFWS	Aquatic Resources Study	Were the submerged heights of the intake structures used to calculate velocities, or were the total heights (including non-submerged sections) of the intake structures used in the calculations? If non-submerged sections of the intake dimensions were used in the calculations, then the resulting calculated velocities will be underestimates. The Service has previously requested design plans of the intake structures, and water surface elevations. Without that detailed information, we cannot verify that the applicant's velocity calculations were performed according to the parameters we use.	The Aquatic Resources Study report will be revised to address the USFWS' comment. The revised study report will be filed with FERC as supplemental information after the FLA. Appalachian notes that while additional historical design drawings for the Byllesby Development have been located and will be included, Appalachian has not been able to locate this design information in a different format.
VDWR	Wetland, Riparian, and Littoral Habitat Study	Results of the Wetland, Riparian, and Littoral Habitat Study could inform development of a Wildlife Management Plan to enhance Project wetlands for specific wildlife species, including ways to enhance some of the more significant wetlands for waterfowl use. Maintaining wetland resources at the Project to benefit waterfowl and waterfowl hunters would also provide additional recreation enhancement not outlined in the Recreation Study. Department of Wildlife Resources staff are available to discuss the development of a Wetlands Management Plan.	Comment noted and to be taken into consideration in Appalachian's preparation of the FLA.
VDWR	Bypass Flow and Aquatic Habitat Study	We support the comments of our partner agency, the U.S. Fish and Wildlife Service, regarding the Bypass Reach Flow and Aquatic Habitat Study, particularly with regard to reducing fish stranding, but also in terms of the actual length of the Byllesby bypass reach, instream flow modeling and instream flow needs, and native fish species benefited by the guilds examined. We emphasize the following points regarding how this study was conducted that are important to appropriate management of these formerly riverine habitats.	Comment acknowledged. No changes have been made to the Bypass Flow and Aquatic Habitat Study report.
VDWR	Bypass Flow and Aquatic Habitat Study	During this Study, as reported in the USR Meeting Summary, the DLA, and the USR, bypass flow to the Byllesby bypass reach was provided through Tainter Gate #6. A primary discharge from this gate, located near the center of the Byllesby Dam spillway, may have hindered the results of this study in the Byllesby bypass reach, since the location of this release point ignores the location of the thalweg on the right descending bank. As a result, the evaluation of bypass reach flows for this portion of the Project may not fully demonstrate how bypass reach flows can improve downstream connectivity and reduce potential stranding in the bypass reach.	See response to Comment 4 above.

VDWR	Bypass Flow and Aquatic Habitat Study	During this Study, as reported in the USR Meeting Summary, the DLA, and the USR, bypass flow to the Buck bypass reach was provided through Tainter Gate #1. A primary discharge from this gate, located near the right descending bank of the Buck Dam spillway, may have hindered the results of this study in the Buck bypass reach, since the location of this release point ignores the location of the thalweg on the left descending bank. As a result, the evaluation of bypass reach flows for this portion of the Project may not fully demonstrate how bypass reach flows can improve downstream connectivity and reduce potential stranding in the bypass reach. As stated in our comments to date, we have a continuing concern about Walleye stranding in the Buck bypass reach, particularly during the spring Walleye spawning season when the Buck bypass is more frequently activated than at other times of the year.	See response to Comment 4 above.
VDWR	Bypass Flow and Aquatic Habitat Study	We agree with the U.S. Fish and Wildlife Service's evaluation of the interpretation of Buck bypass reach model results for the Walleye spawning stage when they state that the most suitable habitat is provided under the highest flow release scenario (714 cfs). Walleye spawning requires attractant flows and suitable spawning substrate. Creating suitable spawning conditions for the New River strain Walleye strain is a high priority for our agency, as outlined in our New River Walleye Management Plan, filed as a management plan under this Project. The Buck bypass reach was formerly fully functioning riverine habitat that provided Walleye spawning habitat, so its potential importance to the New River Walleye population should be an important consideration in managing bypass reach flows.	Comment noted and to be taken into consideration in Appalachian's preparation of the FLA.
VDWR	Aquatic Resources Study	We support the comments of our partner agency, the U.S. Fish and Wildlife Service, particularly with regard to turbine blade strike and spillway survival assessment and intake velocity measurements. In addition, we emphasize the following point regarding this study: With a total of only nine Walleye collected during the Aquatic Resources Study, using the mean total length of Walleye collected (13.5 inches, Standard Deviation of 1.5 inches) for the Impingement and Entrainment Study did not capture a realistic size distribution of Walleye using the Byllesby Buck Project Area. As a result, we support the U.S. Fish and Wildlife Service recommendation to perform additional Turbine Blade Strike Analysis for Walleye up to a maximum total length of 18 inches, based on the minimum size Walleye excluded from the intake of 18.5 inches total length, since the 2.25-inch clear bar spacing on the trash racks excludes Walleye of that length and larger.	The Aquatic Resources Study report will be revised to address the VDWR's comment. The revised study report will be filed with FERC as supplemental information after the FLA.
VDWR	Recreation Study	The Recreation Study was completed to our satisfaction, with the exception of documenting use of the Buck tailrace area, where use was discouraged by the presence of No Trespassing signs in close proximity to the dam, resulting in capturing virtually no human activity on cameras installed to assess use. As stated in our comments on the DLA, we support a collaborative approach to developing a Recreation Management Plan, including potential improvements to signage within the Project boundary, upgrades to the Byllesby Boat Launch, improvements to the Buck postage put-in, and the construction of new facilities at the Loafer's Rest Area, leased by Appalachian Power Company to the Virginia Department of Wildlife Resources. Our Department staff will participate in the development of this plan. Further collaboration on the Recreation Management Plan is advisable prior to filing the FLA.	Comment acknowledged. No changes have been made to the Recreation Study report.

Subject: FW: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Response to Comments on USR/Request for Extension of Time to file Revised Study Reports
Attachments: Byllesby-Buck Project_Response to USR Comments Transmittal.pdf

From: Kulpa, Sarah <Sarah.Kulpa@hdrinc.com>
Sent: Tuesday, February 15, 2022 6:56 AM
To: ACHP - John Eddins <jeddins@achp.gov>; American Whitewater - Kevin Colburn <kevin@americanwhitewater.org>; Angie Grooms <angie.grooms750@gmail.com>; Appalachian Trail Conservancy - Andrew Downs <adowns@appalachiantrail.org>; Carroll County - Rex Hill <rex.hill@carrollcountyva.gov>; Carroll County Administrator - Steve Truitt <steve.truitt@carrollcountyva.gov>; Catawba Indian Nation - Caitlin Rogers <caitlin.rogers@catawba.com>; Cherokee Nation - Elizabeth Toombs <elizabeth-toombs@cherokee.org>; David Taylor <jklfloat@embarqmail.com>; Delaware Nation - Erin Paden <epaden@delawarenation-nsn.gov>; Fish and Wildlife Conservation - Caitlin Carey <cscarey@vt.edu>; Fish and Wildlife Conservation - Donald J. Orth <dorth@vt.edu>; Friends of the Rivers of Virginia - Bill Tanger <riverdancer1943@gmail.com>; Friends of the Rivers of Virginia - Richard Roth <rroth@radford.edu>; Harold Peterson <harold.peterson@bia.gov>; New River Conservancy - George Santucci <george@newriverconservancy.org>; New River Conservancy - Laura Walters <claytorlakegirl@gmail.com>; New River Outdoor Adventures - Tim Dixon <newriveroutdooradventures@yahoo.com>; New River Regional Water Authority - Zachary Slate <newriverwater@gmail.com>; New River Trail State Park - Sam Sweeney <Sam.Sweeney@dcr.virginia.gov>; Terry Clouthier Pamunkey THPO <terry.clouthier@pamunkey.org>; Town of Fries - Scott McCoy <townoffries@friesva.com>; Town of Wytheville - Dr. Beth Taylor, Mayor <beth.taylor@wytheville.org>; USFWS Chesapeake Bay Field Office - Janet Norman <janet_norman@fws.gov>; USGS - Mark Bennett <mrbennet@USGS.gov>; VA Council on Indians - Emma Williams (emma.williams@governor.virginia.gov) <emma.williams@governor.virginia.gov>; VADCR - Jennifer Wampler <jennifer.wampler@dcr.virginia.gov>; VADCR - Jimmy Elliott <james.elliott@dcr.virginia.gov>; VADCR - Robbie Ruhr <Robbie.Rhur@dcr.virginia.gov>; VADCR - Sharon Ewing <sharon.ewing@dcr.virginia.gov>; VADEQ <eir@deq.virginia.gov>; VADEQ - Bettina Rayfield <Bettina.rayfield@deq.virginia.gov>; VADEQ - Joe Grist <joseph.grist@deq.virginia.gov>; VADEQ - Matthew Link <matthew.link@deq.virginia.gov>; VADEQ - Scott Kudlas <scott.kudlas@deq.virginia.gov>; VADEQ - Tony Cario <anthony.cario@deq.virginia.gov>; VADHR - Timothy Roberts <tim.roberts@dhr.virginia.gov>; VADWR - Jeff Williams <jeff.williams@dwr.virginia.gov>; Virginia Department of Conservation and Recreation - Rene Hypes <rene.hypes@dcr.virginia.gov>; WADWR - John Copeland <John.Copeland@dwr.virginia.gov>; Wythe County Admin - Stephen Bear <sdbear@wytheco.org>
Cc: 'ebparcell@aep.com' <ebparcell@aep.com>; Jonathan M Magalski <jmmagalski@aep.com>; Salazar, Maggie <Maggie.Salazar@hdrinc.com>
Subject: Byllesby-Buck Hydroelectric Project (VA) -- Filing of Response to Comments on USR/Request for Extension of Time to file Revised Study Reports

Good morning Byllesby-Buck Hydroelectric Project Stakeholders:

Appalachian Power Company (Appalachian), a unit of American Electric Power (AEP), is the licensee, owner and operator of the Byllesby-Buck Hydroelectric Project (FERC No. 2514) (Project) located on the New River in Carroll County, Virginia. The Project is operated under a license issued by the Federal Energy Regulatory Commission (FERC). The existing FERC license for the Project expires on February 29, 2024. Appalachian is pursuing a new license for the continued operation of the Project in accordance with FERC's Integrated Licensing Process (ILP).

Appalachian received numerous USR comments from FERC staff and agencies, some requiring additional analyses to adequately address comments. Given the extensive comments and additional amount of time required to respond to these comments, Appalachian has filed with FERC a request for extension of time to submit the revised Aquatic Resources and Bypass Reach Flow and Aquatic Habitat study reports. Appalachian plans to file these two revised study reports within 45 days of the Final License Application (FLA) filing.

The FLA filing is still planned for February 28, 2022 (regulatory deadline). The FLA will include additional information to address comments received on the USR to the extent possible. Attachment 1 of Appalachian's recent filing includes a comment-response table which provides information on how a comment has been or will be addressed, and in what document(s) additional information will be provided.

On behalf of Appalachian, we are notifying stakeholders of the filing of this request for extension of time request to respond to the USR comments. For your convenience, a copy of the transmittal letter for this filing is attached. Appalachian encourages stakeholders to view the complete filing online at FERC's eLibrary at eLibrary | File List (ferc.gov) or on the Project's public relicensing website (http://www.aephydro.com/HydroPlant/ByllesbyBuck).

Should you have any questions regarding this filing, please contact Liz Parcell with AEP at (540) 985-2441 or ebparcell@aep.com.

On behalf of AEP and the Byllesby-Buck Project relicensing team, thank you for your participation in this process.

Sarah Kulpa
Vice President, South Atlantic Area Resources Business Group Manager

HDR
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Charlotte, NC 28202-2075
D 704.248.3620 **M** 315.415.8703
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Subject:	RE: Eastern Hellbender Habitat at Byllesby-Buck
Location:	Webex Conference Call
Start:	Wed 2/16/2022 1:00 PM
End:	Wed 2/16/2022 2:00 PM
Recurrence:	(none)
Meeting Status:	Accepted
Organizer:	Huddleston, Misty
Required Attendees:	Jonathan M Magalski; john.kleopfer@dwr.virginia.gov; Dvorak, Joseph
Optional Attendees:	Kulpa, Sarah

Good morning. Looks like Wednesday, February 16th from 1 to 2pm is the best time for the group to get together. We can discuss Eastern Hellbender habitat requirements and review relevant data collected at the Project. Look forward to speaking with you then.

Thanks,
Misty

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When it's time, join your Webex meeting here.

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More ways to join:

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Meeting number (access code): 2483 648 8099
Meeting password: pGXRaAWm636

Tap to join from a mobile device (attendees only)
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Join by phone
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Global call-in numbers

Subject:	Byllesby Bypass Flow and Aquatic Habitat Discussion
Location:	WebEx
Start:	Wed 2/16/2022 3:30 PM
End:	Wed 2/16/2022 5:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer:	Salazar, Maggie
Required Attendees:	Ziegler, Ty; Kulpa, Sarah; Elizabeth B Parcell; Jonathan M Magalski; Dvorak, Joseph; joseph.grist@deq.virginia.gov; richard_mccorkle@fws.gov; janet_norman@fws.gov; Copeland, John; Jeff Williams; Frederick A Colburn; Huddleston, Misty

Working session to review the findings of the Byllesby bypass flow and aquatic habitat study.

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Meeting password: 79wSbaBtpP6

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You can also dial 173.243.2.68 and enter your meeting number.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
February 17, 2022

OFFICE OF ENERGY PROJECTS

Project No. 2514-186 – Virginia
Byllesby-Buck Hydroelectric Project
Appalachian Power Company

VIA FERC Service

Ms. Elizabeth Parcell, Process Supervisor
American Electric Power Service Corporation
40 Franklin Road SW
Roanoke, VA 24011

Reference: Schedule for Filing Outstanding Information

Dear Ms. Parcell:

On November 17, 2021, Appalachian Power Company (Appalachian) filed an Updated Study Report (USR) for the two-development Byllesby-Buck Hydroelectric Project (project). Appalachian held a USR meeting on December 4, 2021 and filed a USR Meeting Summary (Meeting Summary) on December 16, 2021. Comments on the USR and Meeting Summary, and requests for additional analyses were filed by Commission staff, the U.S. Fish and Wildlife Service (FWS), and the Virginia Department of Wildlife Resources (Virginia DWR).

On February 14, 2022, Appalachian filed a letter indicating, among other things, that it will not be able to complete its remaining work under the approved study plan in time to include the results in the license application due by February 28, 2022. Appalachian states that it intends to complete the remaining work and file the results by April 14, 2022. Section 5.18(e) of the Commission's regulations requires a license applicant to include a schedule with its license application for completing any remaining work under the previously approved study plan, as it may have been amended. Therefore, if Appalachian is unable to complete the remaining work and include the results in the license application, Appalachian should include its proposed schedule with the license application as directed by section 5.18(e).

If you have any questions, please contact Jody Callihan at (202) 502-8278, or via e-mail at jody.callihan@ferc.gov.

Sincerely,

Vince Yearick
Director
Division of Hydropower Licensing