Proposed Study Plan Meeting

October 4, 2017

Mongaup River Hydroelectric Projects

Swinging Bridge Project (FERC No. 10482)

Mongaup Falls Project (FERC No. 10481)

Rio Project (FERC No. 9690)

EAGLE CREEK
RENEWABLE ENERGY
— EXCELLENCE IN HYDRO —

Meeting Agenda

- Introductions
- Meeting Objectives
- Schedule Overview
- Brief Overview of Projects
- Proposed Studies – Lunch around 12:00
- Additional Requested Studies
- Questions Regarding PAD Questions and Clarifications
- Next Steps and Questions

Meeting Objectives

- Review the studies outlined in the Proposed Study Plan (PSP)
- Address questions and provide clarifications regarding the PSP
- Help ensure that the appropriate studies are being performed in support of issuance of the new licenses and Section 401 Water Quality Certificate(s)

ILP Schedule – through March 2019

Activity	Date
Filed Pre-Application Document (PAD) and Notice of Intent (NOI)	March 30, 2017
Issue Notice of Commencement of Proceeding and Scoping Document 1 (SD1)	May 30, 2017
Hold Scoping Meetings and Site Visit	June 21 and 22, 2017
Stakeholders filed comments and study requests	July 29, 2017
Issued Scoping Document 2 (SD2)	September 12, 2017
Filed Proposed Study Plan (PSP)	September 12, 2017
Hold Study Plan Meeting	**October 4, 2017**
Stakeholders File Comments on PSP with FERC	**December 11, 2017**
File Revised Study Plan (RSP) with FERC	January 10, 2018
Stakeholders File Comments on RSP with FERC	January 25, 2018
FERC Issues Study Plan Determination	February 9, 2018
Conduct Studies	Spring/Summer 2018
Three Month Progress Reports	May 1, August 1, November 1, 2018
File Initial Study Report with FERC	February 9, 2019
Hold Initial Study Report Meeting	February 24, 2019
File Initial Study Report Meeting Summary with FERC	March 11, 2019

ILP Schedule – Additional Milestones

Activity	Date
Conduct Studies (If necessary)	Spring/Summer 2019
Three Month Progress Reports (If necessary)	May 1, August 1, November 1, 2019
File Draft License Application (DLAs)	November 2, 2019
Comments on DLAs	January 31, 2020
File Updated Study Report with FERC (If necessary)	February 9, 2020
Hold Updated Study Report Meeting (If necessary)	February 24, 2020
File Updated Study Report Meeting Summary with FERC (If necessary)	March 10, 2020
File Final License Applications	March 31, 2020

Comment Letters and Study Requests

- A total of 37 letters were filed with FERC.
- Twelve stakeholders filed comments specific to the content of the PAD and/or SD1. These stakeholders consisted of FERC, USFWS, NPS, NYSDEC, Town of Thompson, AW, AMC, Kayak and Canoe Club of NY, Iroquois Hunting and Fishing Club, HOOT, Swinging Bridge Property Owners Association, and Nicholas LaHowchic.
- Nine stakeholders filed formal ILP study requests. These stakeholders consisted of FERC, USFWS, NPS, NYSDEC, AW, AMC, Kayak and Canoe Club of NY, HOOT, and Swinging Bridge Property Owners Association.
- In addition, within the 37 letters, stakeholders filed general information, statements, and/or informal study requests related to the Projects and/or relicensing process.
- Copies of the 37 letters are provided in Appendix B of the PSP.
- Responses to the comments are provided in Appendix C of the PSP.

FERC Criteria for Study Requests

1. Describe the goals and objectives of each study proposal and the information to be obtained.
2. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.
3. If the requestor is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.
4. Describe existing information concerning the subject of the study proposal and the need for additional information.
5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied and how the study results would inform the development of license requirements.
6. Explain how any proposed study methodology is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.
7. Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

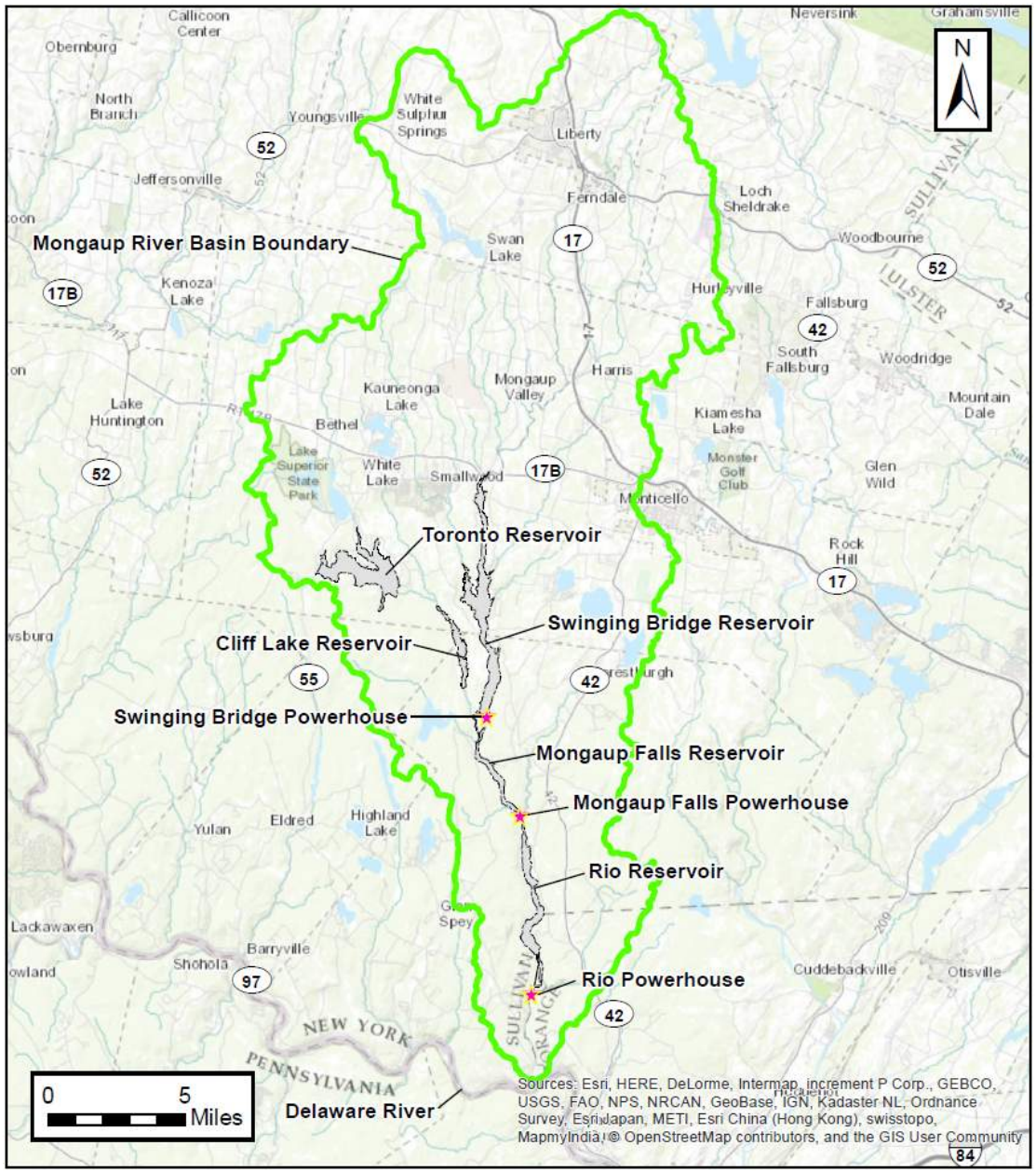
Project Overviews

Mongaup River Hydroelectric Projects

- Three separate FERC-licensed projects
  - Swinging Bridge – 10482
    - Toronto Development (storage)
    - Cliff Lake Development (storage)
    - Swinging Bridge Development
  - Mongaup Falls – 10481
  - Rio – 9690
- Licenses issued April 14, 1992
- Licenses expire March 31, 2022
- Three co-licensees (collectively Eagle Creek Hydro)
  - Eagle Creek Hydro Power, LLC
  - Eagle Creek Water Resources, LLC
  - Eagle Creek Land Resources, LLC

General Location

- Located in Sullivan and Orange Counties
- Toronto and Cliff Lake Reservoirs are located on Black Lake Creek
- Swinging Bridge, Mongaup Falls, and Rio Reservoirs are located on Mongaup River



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Toronto Development

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Cliff Lake Development

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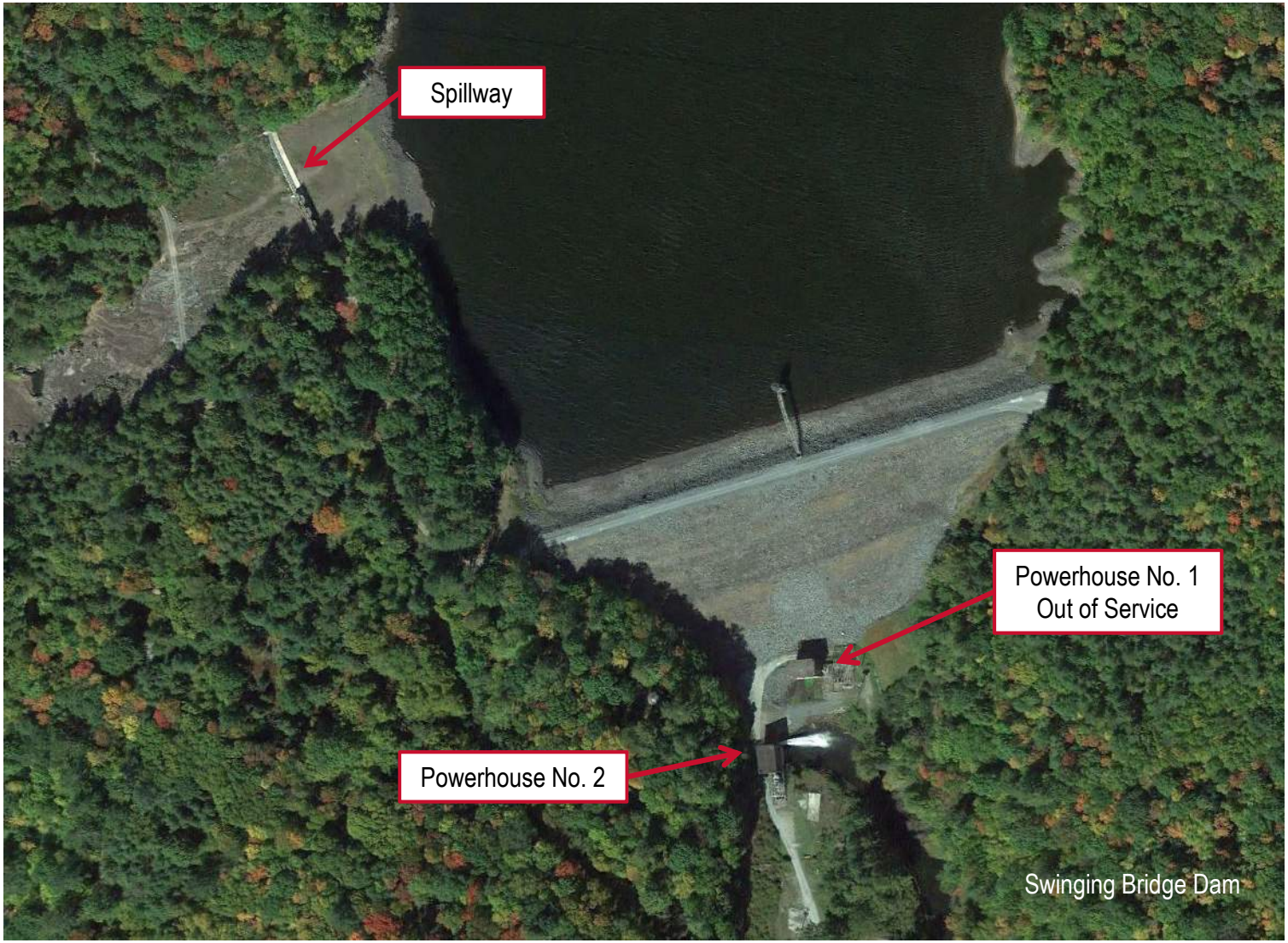
Swinging Bridge Development



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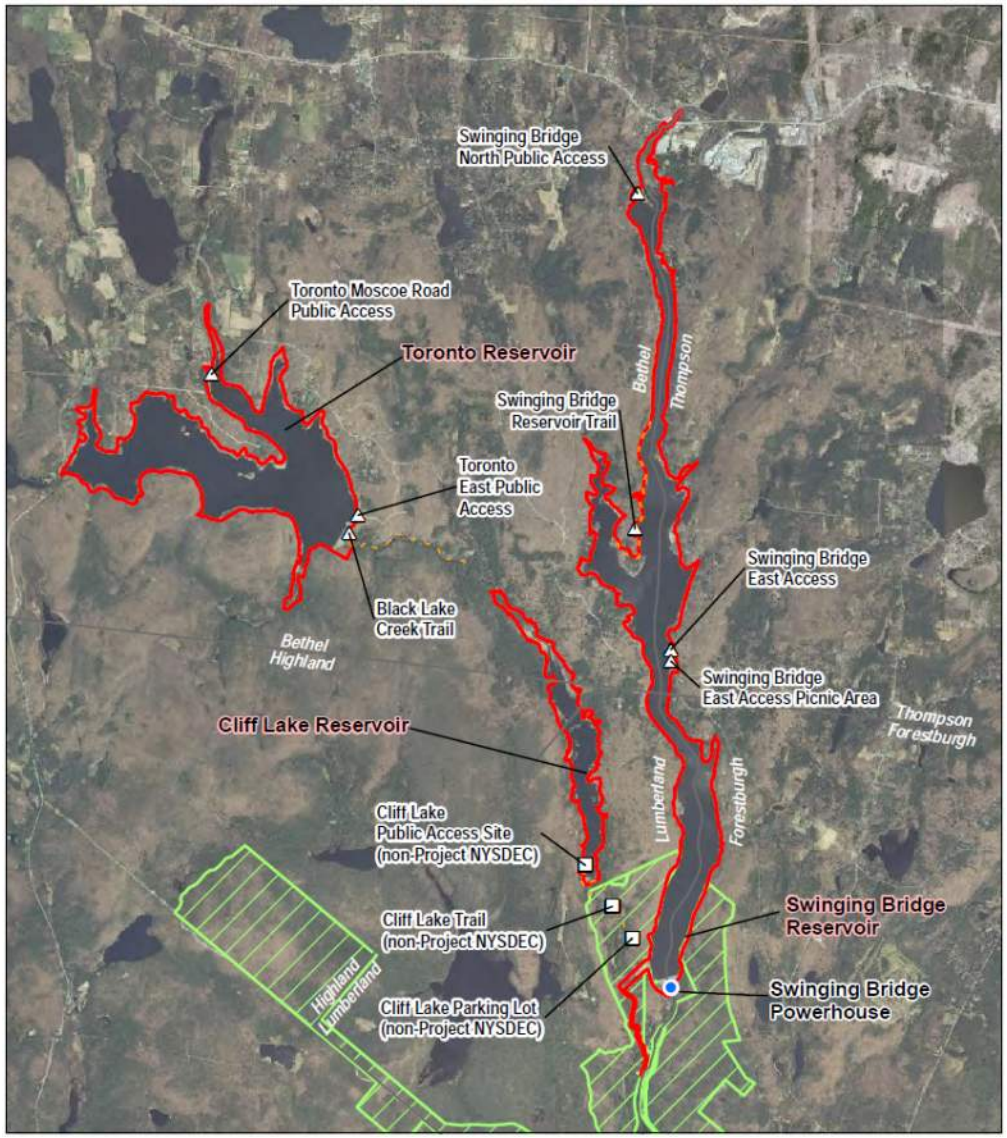
Swinging Bridge Project Recreation

- Toronto
  - Moscoe Road Public Access
  - East Public Access
  - Black Lake Creek Trail
- Cliff Lake
  - NYSDEC Public Access and Trail
- Swinging Bridge
  - North Public Access
  - Reservoir Trail
  - East Access and Picnic Area



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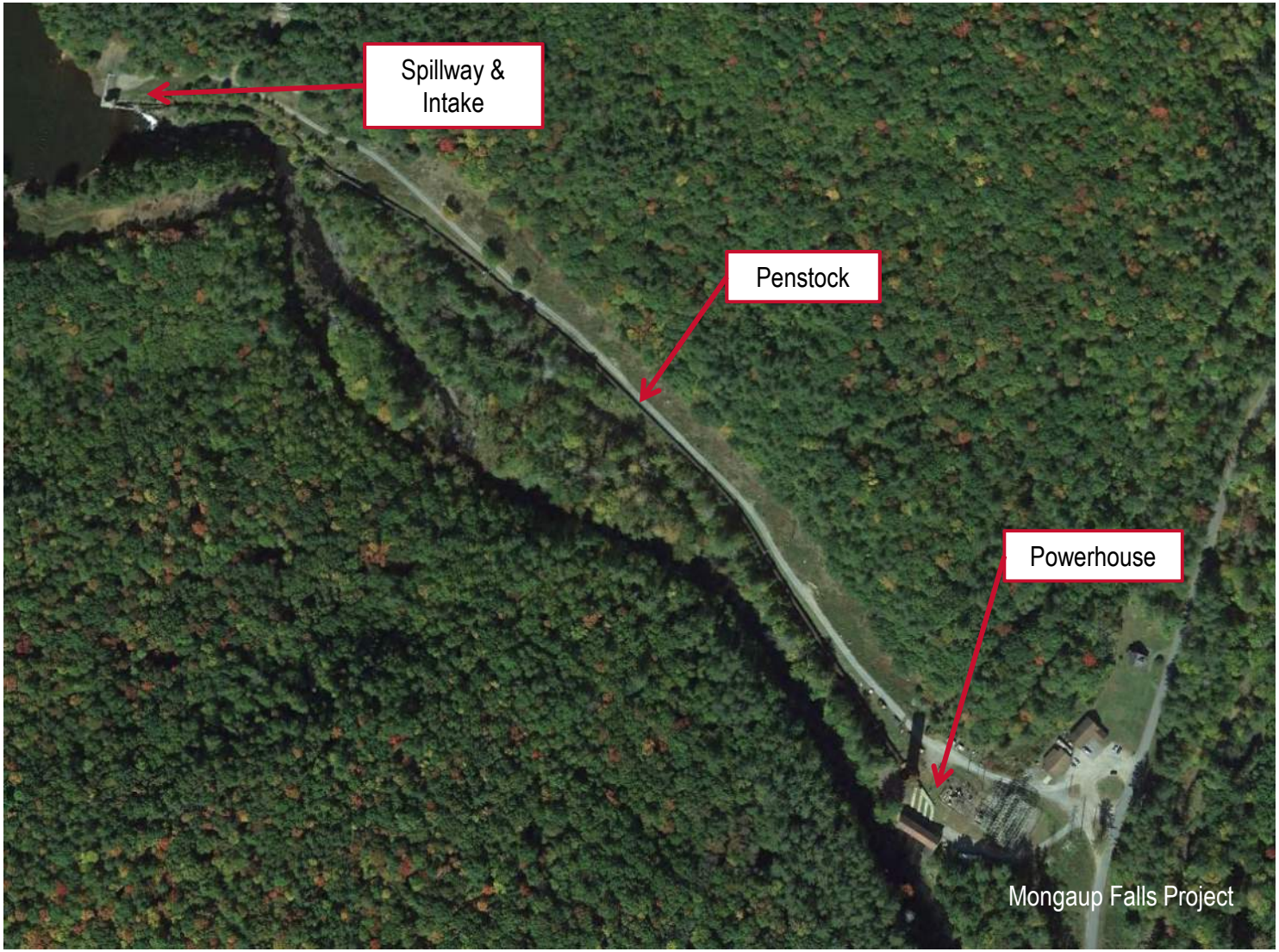
Mongaup Falls Project



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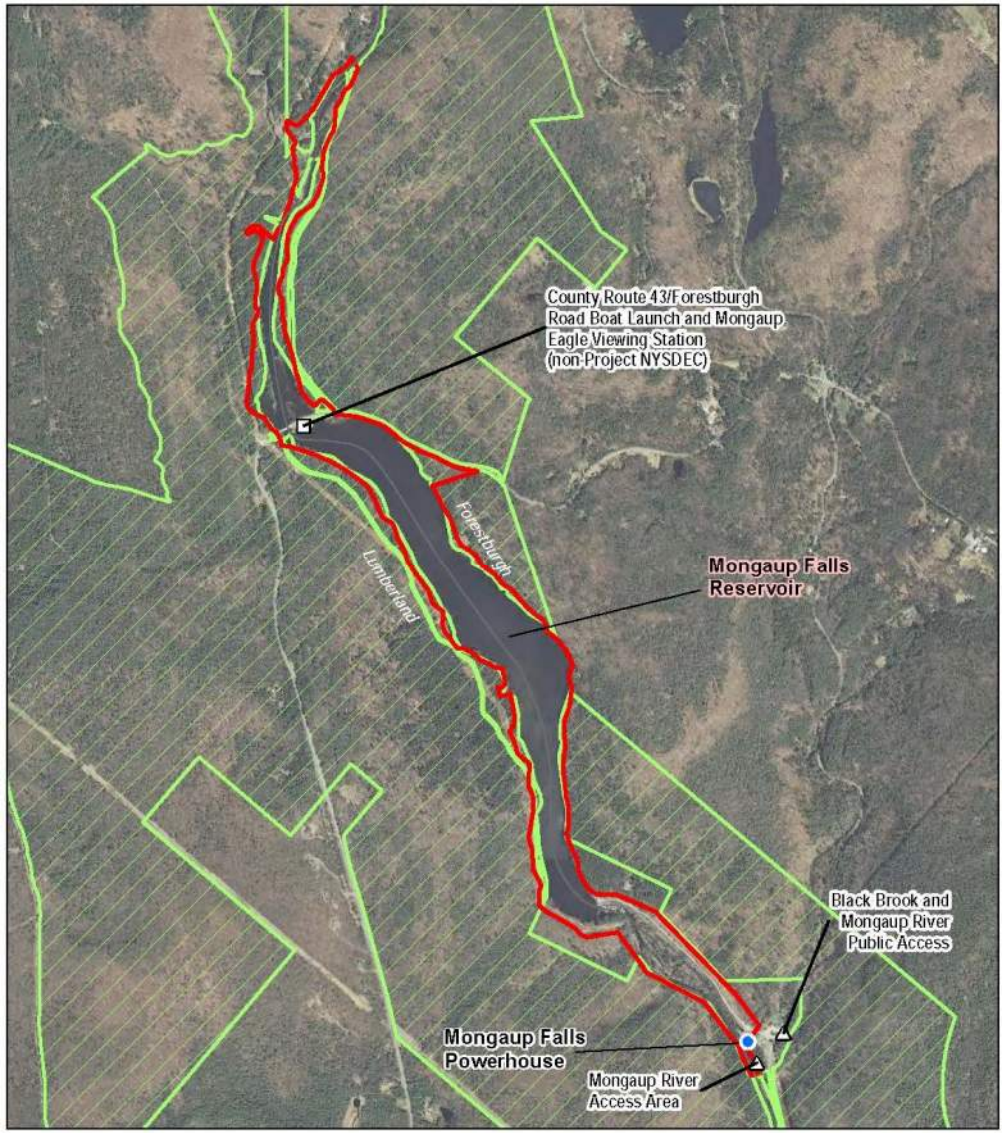
Mongaup Falls Project

- Recreation
  - Black Brook and Mongaup River Public Access
  - County Route 43/Forestburgh Road Boat Launch
  - Eagle Viewing Station (NYSDEC)



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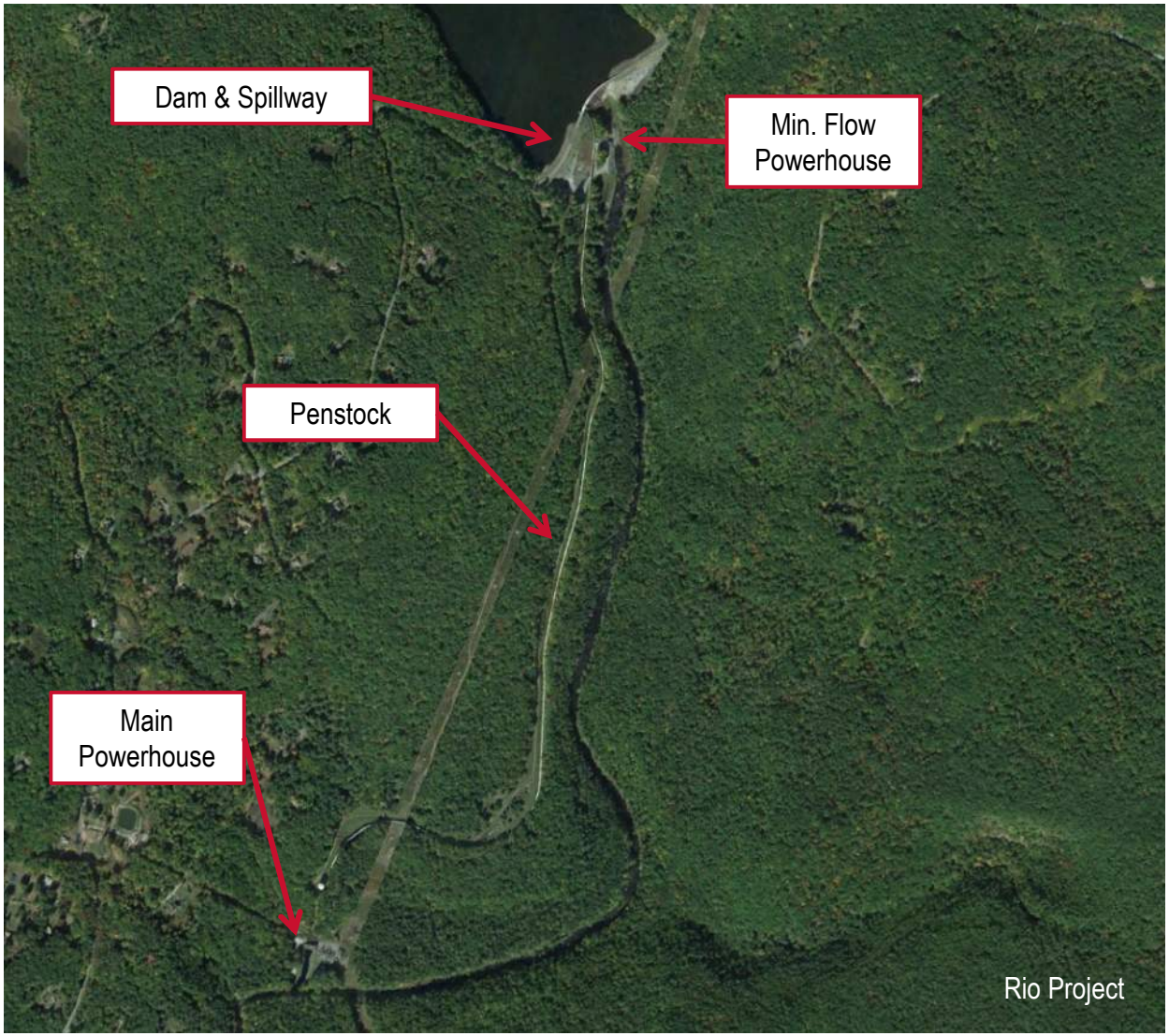
Rio Project



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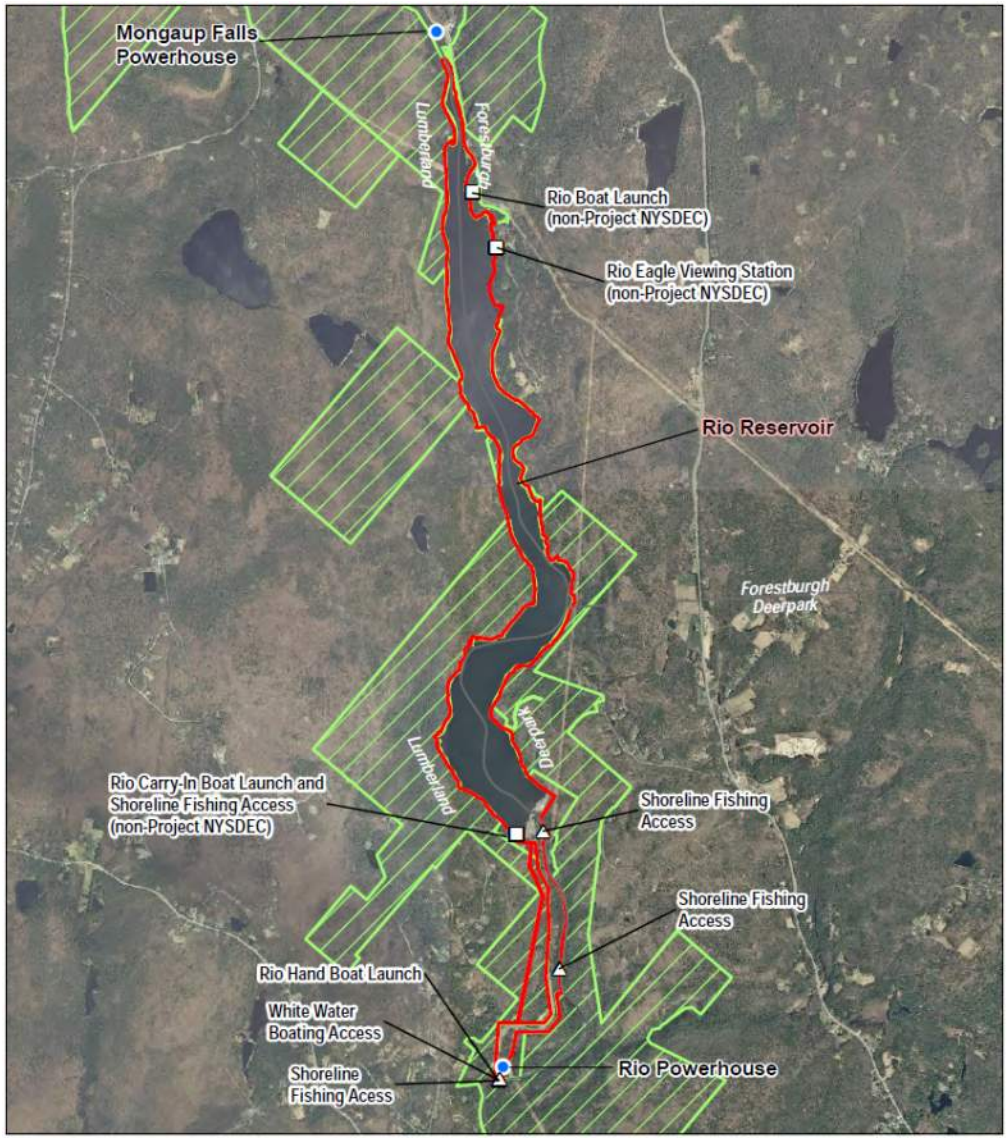
Rio Project

- Recreation
  - Rio Boat Launch (NYSDEC)
  - Eagle View Station (NYSDEC)
  - Carry-In Boat Launch & Shoreline Fishing Access (NYSDEC)
  - Multiple Downstream Shoreline Fishing Access
  - Hand Boat Launch
  - Whitewater Boating Access



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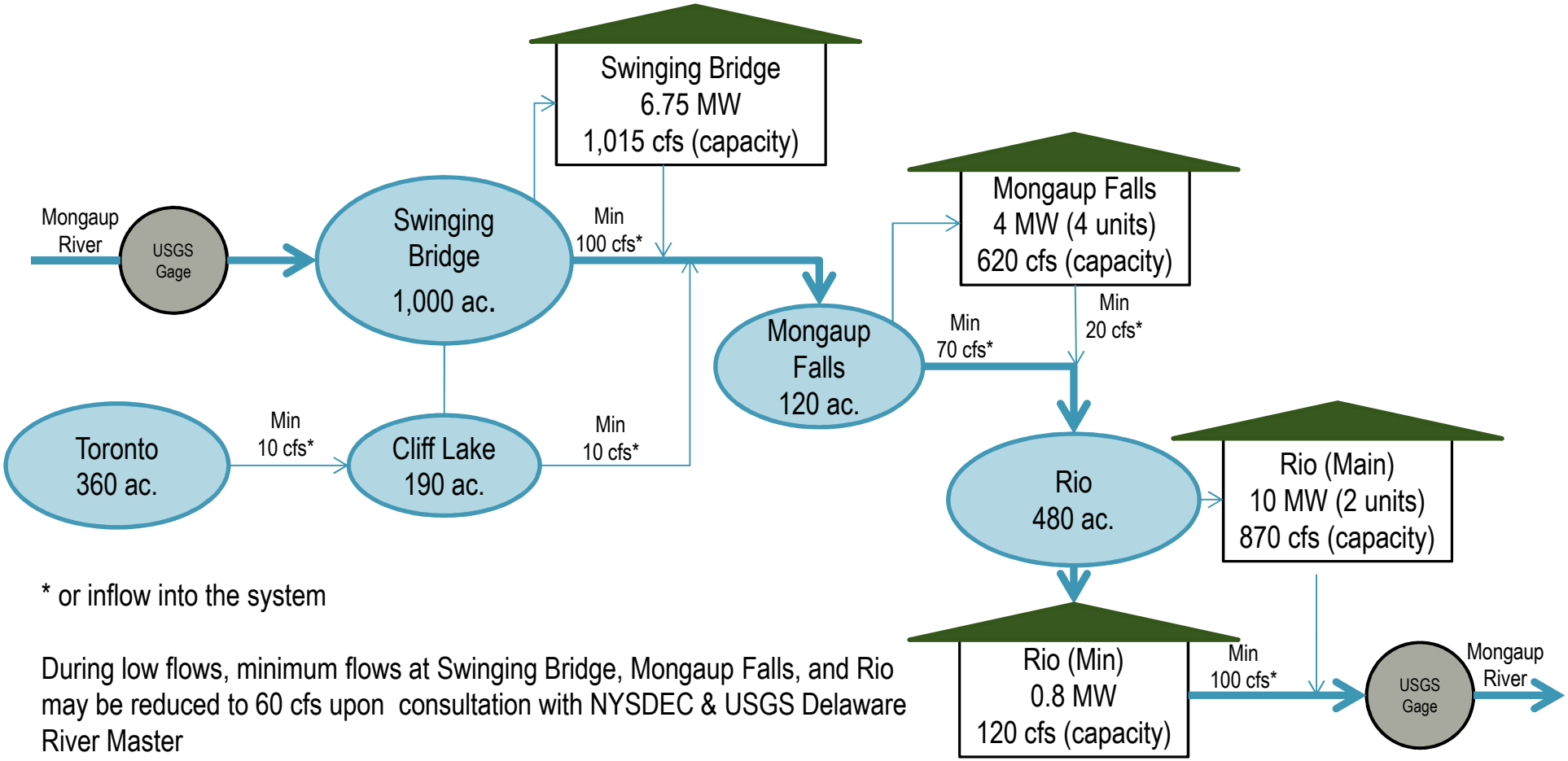
Current and Proposed Operations

- Normal Conditions Operating Plan
- Drought Conditions Operating Plan



* or inflow into the system

During low flows, minimum flows at Swinging Bridge, Mongaup Falls, and Rio may be reduced to 60 cfs upon consultation with NYSDEC & USGS Delaware River Master

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Proposed Studies

Proposed Studies

- Reservoir Water Level Fluctuation/Operation Study
- Aquatic Habitat Assessment Study
- Fisheries Survey Study
- Fish Passage Study
- Water Quality Study
- Macroinvertebrate and Mussel Survey Study
- Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment Study
- Whitewater Boating Assessment Study
- Shoreline Management Assessment Study
- Cultural Resources Study

Reservoir Water Level Fluctuation/Operation Study

Reservoir Water Level Fluctuation/Operation Study

Goals and Objectives

- Develop an operations model that may be used to predict reservoir elevations for each of the Mongaup River Project reservoirs under various operation constraints (e.g., minimum flow, reservoir level, and hydrology).
  - The operations model will support an assessment of potential Project effects on aquatic, terrestrial, recreation, land use, and aesthetic resources that may result from proposed or recommended Project operational scenarios.
  - For each Project reservoir, the model will use historic hydrology to predict reservoir outflow, reservoir elevations, surface areas, and corresponding Project generation at an hourly time-step.
- Support the requests from NPS, HOOT, and Swinging Bridge Property Owners Association.

Reservoir Water Level Fluctuation/Operation Study

Study Requests (FERC, USFWS, NYSDEC, NPS, HOOT, Swinging Bridge Property Owners Association)

- Develop a reservoir operations model to predict reservoir elevation at the Projects' reservoirs under different operation scenarios (FERC).
- Conduct impoundment fluctuation study to assist in the determination of the potential aquatic resources that are being impacted and to what degree (USFWS and NYSDEC).
  - Eagle Creek is proposing to address this request through a combination of the Aquatic Habitat Assessment Study (Section 6) and the results of this proposed Reservoir Water Level Fluctuation/Operation Study.
- Conduct a flow study to compare resulting flows for various USGS gage locations on the Delaware River above and below the Mongaup River under timeframes of influence and non-influence by Mongaup Project releases (NPS).
  - Eagle Creek is proposing to address this request through the results of this proposed Reservoir Water Level Fluctuation/Operation Study.

Reservoir Water Level Fluctuation/Operation Study

- Conduct a Toronto Reservoir recreation needs and impacts study to, among other objectives, evaluate the impact of Toronto Reservoir elevation and reservoir fluctuations on recreation use at the reservoir (HOOT).
  - Eagle Creek is proposing to address this request through a combination of the Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment Study and the results of this Reservoir Water Level Fluctuation/Operation Study.
- Conduct a flow/recreation use study to examine the impact of the current minimum flow releases on water levels in the Swinging Bridge Reservoir (Swinging Bridge Property Owners Association).
  - Eagle Creek is proposing to address this request through the results of this proposed Reservoir Water Level Fluctuation/Operation Study.

Study Area

- Upstream extent of Swinging Bridge project boundary to USGS gage downstream of Rio.

Reservoir Water Level Fluctuation/Operation Study

Methodology

- Develop, calibrate, and validate an operations model that integrates each of the Mongaup River Projects and supports the evaluation of proposed and potential recommendations for Project operations at an hourly time-step and under various reservoir inflow and outflow conditions. The operations model will be capable of predicting reservoir elevations, surface areas, available storage, and generation that would result from various operational scenarios.
  - The model will derive a calculation of storage for the Projects at various depths and the degree to which different flow releases can be maintained at differing starting elevations. Estimates will be based on cubic feet per second (cfs) estimates of the releases in relation to total storage.
- Prepare a consolidated table that presents the relevant elevations for operation of the Mongaup River Projects.
  - The table will include the dam crest, maximum and minimum fluctuation ranges, intake/outlet gate inverts (and height), required seasonal limitations on fluctuations and their duration, and proposed target elevations and duration.

Reservoir Water Level Fluctuation/Operation Study

- Develop a table that presents the volume released from each reservoir to meet the minimum flow target over the course of the year compared to the amount released for generation on a typical year.
- The model will support evaluations associated with potential impacts to recreation and impoundment elevations based on various operating scenarios for the Projects.
- Graph the flows associated with the USGS gage immediately downstream of the Rio powerhouse, as well as the USGS Delaware River gages located immediately upstream and downstream of the confluence of the Mongaup River and the Delaware River. The data from the three gages will be graphed separately, as well as on a combined graph for comparison.

Deviations from Requested Studies

- Reservoir mapping is being proposed as a component of the Aquatic Habitat Assessment Study.

Aquatic Habitat Assessment Study

Aquatic Habitat Assessment Study

Goals and Objectives

- Conduct a combination of field surveys and desktop analysis to identify and map aquatic habitats within the Projects' reservoirs fluctuation zones.
- Document rare, threatened, and endangered (RTE) species observed during aquatic habitat mapping.
- Document the presence and general behavior of bald eagles observed during mapping activities.
- Document invasive species observed during aquatic habitat mapping.
- Verify NWI and NYSDEC mapped wetlands within the Projects' boundaries.
- Document unique attributes such as fish spawning beds, mussel beds, or shell material observed during aquatic habitat mapping.
- Describe the potential influences of the Projects' operations on aquatic habitats within the impoundments.

Aquatic Habitat Assessment Study

Study Requests (FERC, USFWS, NYSDEC, and HOOT)

Aquatic Habitat Mapping

- Conduct field surveys of aquatic habitat during full-pool from the head of each of the Project's reservoirs to the associated dam (FERC).
- Categorize habitat survey information per accepted practices in the scientific community (e.g., habitat type, substrate type, depths, etc.) and plot on aerial maps that demarcate proposed minimum and maximum reservoir elevations (FERC).
- Collect in-situ water quality data (temperature, dissolved oxygen (DO), pH, and conductivity) and document the presence of invasive aquatic vegetation (species and location) (FERC).
- Prepare a report that includes a summary of the data collected. Include in the report, aerial habitat maps that demarcate proposed minimum and maximum reservoir elevations; habitat descriptions; Project operations, reservoir elevations, and surface areas during the surveys; effects of proposed Project operations on the aquatic habitat(s); and in-situ water quality data. Include all data used to develop the report in an appendix (FERC).

Aquatic Habitat Assessment Study

Special-status Wildlife Species and Habitat Assessment

- Prior to field surveys, confirm the candidate list of special-status wildlife species in consultation with the USFWS and NYSDEC (FERC).
- Determine recommended survey protocols for each species through consultation (FERC).
- Use habitat maps and/or aerial photographs to determine habitats that have the potential to support special-status wildlife species for field surveys (FERC).
- Conduct field surveys in appropriate habitats by experienced individuals (FERC).
- Conduct multiple field surveys that cover the entire area directly and indirectly affected by the Project during the appropriate seasons (FERC).
- Survey Project features that may provide suitable roosting and hibernating habitat for special-status bat species (FERC).
- Document and locate on maps the abundance, distribution, and habitat use of all special-status species and their potential habitat showing relation to Project features (FERC).
- Prepare a report that includes the results of the surveys and mapping efforts and identifies, describes, and assesses the extent to which Project-related actions and activities may affect special-status wildlife area (FERC).

Aquatic Habitat Assessment Study

Special-status Plant Species and Noxious Weed Assessment

- Prior to field surveys, confirm the current list of special-status plants in consultation with USFWS and NYSDEC (FERC).
- Use habitat maps and/or aerial photographs to determine vegetation cover types that have the potential to support special-status plant species for field surveys (FERC).
- Conduct field surveys in appropriate areas by experienced individuals for special-status plant species and aquatic and noxious weeds (FERC).
- Conduct two seasons of field surveys that cover the entire area affected by the Project during the appropriate blooming periods (FERC).
- Document and locate on maps the abundance and distribution of all special-status species and their relationship to Project features (FERC).
- Identify the current extent of weed infestation in a general sense throughout the Project area, the species that occur, and the relative abundance of each species (FERC).
- Prepare a report that includes the results of the surveys and mapping efforts and identifies, describes, and assesses the extent to which Project-related actions and activities may affect special-status plants and noxious weeds (FERC).

Aquatic Habitat Assessment Study

Impoundment Fluctuation Study

- Map the aerial extent and habitat in the fluctuation zones at full pond and at drawdowns consistent with Project operations. The maps should identify the extent of the changes in and adjacent to the impoundment areas, substrate and type of habitat, the depth at various pond levels, and any important habitat types (i.e., wetlands and submerged aquatic vegetation) that may be present. Steep slopes, fluctuations in stream flow, and fluctuations in reservoir elevations can lead to mass movement, and we recommend that eroding or potentially erodible areas within the fluctuation zone be evaluated and included in the maps (USFWS and NYSDEC).

Wetland Delineation

- Document and characterize all wetlands and other aquatic vegetation within the vicinity of the Projects (USFWS and NYSDEC).

General

- Conduct an aquatic habitat study to evaluate impact from operation on littoral habitat (e.g., largemouth bass spawning habitat) at Toronto Reservoir (HOOT).

Aquatic Habitat Assessment Study

Study Area

- Project boundary, focusing on aquatic habitat within each of the Projects' reservoirs.

Methodology

- Identify and map the aquatic habitat present within the Projects' reservoirs fluctuation zones and delineate the relative quantity and spatial distribution of the habitat types, using a combination of field surveys and desktop analysis.
  - As conditions allow, conduct field surveys to identify aquatic habitat types in the five reservoirs associated with the fluctuation zones ranging from full pond to the lower target elevation.
  - As operations and hydrology allow, obtain available field data with limited impact on surface water levels following Labor Day in 2018.
- Delineate habitats in the five reservoirs by boat, or on foot where too shallow. These will occur during full pond elevations of the reservoirs to evaluate the extent of wetted habitat, as well as the lower target elevation. Mapping will be conducted in the field using handheld global positioning system (GPS) units, and the upstream and downstream boundaries of each habitat unit within the study area will be delineated and geo-referenced. As data allows, the reservoir shorelines will be mapped at 5-foot contours.

Aquatic Habitat Assessment Study

- Record additional features of habitats, including dominate and subdominate substrates, relative embeddedness, cover type and relative abundance, estimated bank slope, range and average water depths, general shoreline description, and photos of representative habitat types, where appropriate.
- Record biological characteristics during habitat surveys, including readily observable aquatic fauna. Fish spawning beds, mussel beds, or evidence of shell material observed during the aquatic habitat surveys will be documented and their location recorded using GPS.
- Field verify existing NWI and NYSDEC wetland maps within the Projects' boundaries during the field surveys, and major discrepancies will be noted on aerial maps and provided in the study report.
- Collect in-situ water quality data during the surveys at the beginning and end of the each day during the field survey. Document the presence of invasive species. Note the presence of habitat suitable for listed species and document observations of listed species, including bald eagles, during the surveys.

Aquatic Habitat Assessment Study

Deviations from Requested Studies

- Incorporate the requested details from the study requests for aquatic habitat mapping, with the addition of surveying for listed species habitat, bald eagles, and invasive species.
- Conduct the habitat mapping when the reservoirs are drawn down as a result of normal operations and based on available hydrology, in addition to when the reservoirs are at full pond elevations as requested by FERC. This will allow for the collection and mapping of habitat information for the fluctuation zone.
- Perform the components of the Special-Status Plant Species and Noxious Weed Assessment and Special-Status Wildlife Species and Habitat Assessment requested by FERC during one season, as compared to multiple seasons.

Fisheries Survey Study

Fisheries Survey Study

Goals and Objectives

- Supplement existing baseline fisheries dataset for the Projects by obtaining additional baseline data for the existing fishery resources in the Projects' impoundments, tailraces, downstream riverine corridors, and bypass reaches during late summer/early fall.

Fisheries Survey Study

Study Requests (FERC, USFWS, and NYSDEC)

- Conduct electrofishing surveys during late summer or fall in each of the Project impoundments, tailwaters, downstream riverine corridors, and bypassed reaches (FERC).
- Conduct sampling in order to observe annual juvenile production (juvenile fish would be large enough to collect) (FERC).
- Establish sampling locations that represent the full extent and types of habitat in the study area (FERC).
- Separately target upstream (late spring/early summer for elvers and yellow eels) and downstream (fall for silver eels) migrating American eels for sampling using generally accepted methods, such as electrofishing, trap/fyke netting, eel pots, etc., to provide data on the abundance of American eels at various life stages and where they tend to congregate (FERC).
- Identify to species and count all collected fish while weighing and measuring only a subsample. Measure eye diameters of captured American eels for use in evaluating the silver eels phase. Identify and record the habitat type and substrate of each sampling location, and record in-situ water quality conditions (temperature, DO, pH, conductivity) (FERC).
- Prepare a report that includes a summary of the data above (FERC).

Fisheries Survey Study

- Conduct fisheries surveys in the vicinity of the Projects including the Projects' reservoirs (and the Black Brook diversion impoundment), the Mongaup River from above the Swinging Bridge Reservoir to the confluence with the Delaware River, Black Lake Creek from above the Toronto Reservoir to the confluence with the Mongaup River, and Black Brook from above the diversion impoundment to the confluence with the Mongaup River (USFWS).
- Conduct a fisheries survey using a variety of sampling gear, including gill nets, trap nets, seines, and electroshocking (USFWS).
- Conduct the study for one full year, with provision for a second year of study if data collected are inadequate based on review by USFWS and NYSDEC (USFWS).
- Collect information including species, size, age, sex, and condition, as well as movement patterns and habitat utilization (USFWS).
- Collect standard water quality data (water temperature, DO, pH, etc.) in conjunction with these surveys (USFWS).
- The survey should focus on general fishery resources as well as important game, interjurisdictional, and migratory species in the vicinity of the Projects, such as walleye, trout (brook, brown, and rainbow), bass (largemouth and smallmouth), American shad, white sucker, and American eel (USFWS).
- Compare the current fisheries populations to those sampled during the original licensing (USFWS).

Fisheries Survey Study

- Conduct a fisheries survey in the vicinity of the Mongaup River Projects, including areas upstream and downstream of the dams (NYSDEC).
- Conduct a fisheries survey using a variety of sampling gear, including gill nets, trap nets, seines, and electroshocking (NYSDEC).
- Conduct the study for one full year, with provision for a second year of study if data collected are inadequate based on review by USFWS and NYSDEC (NYSDEC).
- The survey should cover at least three seasons (spring, summer, and fall) and all four seasons, if possible (NYSDEC).
- Collect information including species, size, age, sex, and condition, as well as movement patterns and habitat utilization (NYSDEC).
- Collect standard water quality data (water temperature, DO, pH, etc.) in conjunction with these surveys (NYSDEC).
- The survey should focus on general fishery resources (NYSDEC).

Study Area

- Project boundary, focusing on the Projects' impoundments, tailraces, downstream riverine corridors, and bypass reaches.

Fisheries Survey Study

Methodology

Collector Permits

- Obtain the required collector permits – sampling work will not begin prior to receiving the necessary permits.

Late Summer/Early Fall Baseline Survey

- Perform the fisheries survey in late summer/early fall to collect baseline fisheries community data in the Project's impoundments, tailraces, and bypasses reaches. Site-specific conditions will dictate how sampling gear will be used, but it is expected to include backpack electrofishing (Smith-Root Model 12), boat electrofishing (an 18-foot aluminum Monarch® jon boat equipped with a Smith-Root® 7.5.0 gas-powered pulsator [GPP] portable electrofisher), deployment of gill nets (if suitable depths occur in the impoundment), and/or eel pots.
  - The sampling methods used will be based on effectiveness and personnel safety considerations at various locations in the study area. Effective sampling will depend on habitat characteristics such as water depth, bottom features/substrates, water velocity, and water clarity. Sampling locations will be selected according to habitat type, with the goal of obtaining representative samples in the five impoundments, tailraces/discharges, and bypassed reaches.

Fisheries Survey Study

Late Summer/Early Fall Baseline Survey

- Identify and count sampled fish. Game species (e.g., trout species, smallmouth bass, walleye, and yellow perch) of up to 30 individuals, as well as species of interest (e.g., American eel), will be weighed and measured. The remaining individuals will be counted and recorded on standard field data sheets. Capture location and gear type will also be documented. Relative abundance, size structure, and catch-per-unit effort will be determined from the collected data. Fish will be released unless required for confirmation of species identification.
- Collect in-situ water quality data at each sampling location (e.g., reservoir or downstream reach) at the beginning and end of the sampling event each day concurrent with fish surveys. A Hydrolab MS5 multiparameter sonde (or similar model) will be used to record water quality measurements, including pH, DO, temperature, and specific conductivity. Water clarity will be determined by standard Secchi Disk (as possible). Sampling date, time, duration, location, and general observations of physical habitat characteristics, such as bottom substrate, cover type, and station depth, will also be recorded. Site GPS coordinates will be determined and locations will be identified on a Project area map.

Fisheries Survey Study

Deviations from Requested Studies

- As compared to three seasons (spring, summer, and fall) and a fourth season if possible as requested by NYSDEC, sampling would be performed during the late summer/early fall. Eagle Creek believes that the late summer/early fall surveys will provide the information necessary to understand the fish populations associated with the Projects.
- Eagle Creek is not proposing to conduct the fisheries sampling in the downstream riverine corridors (e.g., downstream of Rio Powerhouse) as requested by FERC and USFWS. Sampling within the habitats most affected by Project operations (i.e., tailraces, impoundments, and bypassed reaches) will provide an adequate representation of the fisheries community found in the Project areas.
- FERC requested extensive targeted American eel sampling. Eagle Creek believes that if American eels are present, they will be captured during the late summer/early fall sampling events via electroshocking or eel pots. Eagle Creek does not believe that an upstream and downstream migration timing study would produce useful data. The late summer/early fall survey will provide data on American eel presence upstream of the Rio Project. See the Fish Passage Study Plan for details about researching potential timing of upstream and downstream eel migrations in the vicinity of the Projects.

Fish Passage Study

Fish Passage Study

Goals and Objectives

- Collect site-specific information and conduct a literature review of fish passage alternatives to evaluate options at the five Project dams as well as the Black Brook Development.

Fish Passage Study

Study Requests (USFWS and NYSDEC)

- Collect field data related to downstream passage and entrainment of fish at the five Project dams as well as the Black Brook Development (USFWS).
- Evaluate the potential for entrainment mortality at the Projects through a desktop analysis of previous entrainment mortality studies at projects with similar head, turbine, and operational characteristics, as available (USFWS).
- Collect site-specific data from the Projects and conduct a preliminary analysis for feasibility to aid in the design of protection and passage facilities (USFWS).
- Conduct a literature review of existing downstream passage alternatives that can be applied to the Project to keep fish out of turbines and get safely downstream (NYSDEC).
- Collect site-specific information to aid in the design of protection and passage facilities, such as flows, water velocities, depths, and substrates (NYSDEC).
- Collect existing data on target fish swim speeds, migration behavior, and the use of attractants and repellants that can help guide fish safely downstream (NYSDEC).

Fish Passage Study

Study Area

- Project boundary with focus downstream of Mongaup Falls.

Methodology

- Perform desktop research regarding the timing of upstream and downstream American eel migration in the Mongaup River and Delaware River Watersheds to inform the timing of potential American eel passage or protection measures that may be proposed.
- Based on the results of the proposed Fisheries Survey Study, perform a literature review of the applicability and potential means of providing fish passage at the structures for those migratory species identified during the Fisheries Survey. In particular, the literature review will address upstream and downstream passage designs for migratory species such as American eel. Facilities at similar hydroelectric dams will be investigated. Information on passage requirements, such as swimming speeds, water column locations, attractants, and repellants that can guide fish will be collected.
- Conduct a site visit with relevant stakeholders (e.g., USFWS and NYSDEC) to review the facilities relative to the migratory species identified and the potential for passage and/or protection structures. The meeting will include a visit to the Projects.

Fish Passage Study

Deviations from Requested Studies

- Eagle Creek has not adopted the USFWS request to conduct an entrainment mortality assessment as part of this study. Eagle Creek believes that the 1992-1993 empirical site-specific data is sufficient to support this relicensing process and is more valuable than using data from other sites. In addition, Eagle Creek believes that the study was well conducted and well representative of entrainment effects that occur at the Projects. The findings from the requested desktop entrainment analysis are anticipated to yield similar results that will be sufficient to support the issuance of new licenses.

- The several issues with the 1992-1993 studies that were listed by the USFWS in their study request are common in field entrainment studies, including those found in the Electric Power Research Institute entrainment database, which would be used for the desktop entrainment analysis not adopted herein.

Water Quality Study

Water Quality Study

Goals and Objectives

- Monitor baseline water quality within the Projects' streams and reservoirs to evaluate potential effects on water quality and determine compliance with applicable state water quality standards.

Water Quality Study

Study Requests (FERC, USFWS, NYSDEC, and HOOT)

Stream Reach Water Quality Study

- Using generally accepted practices in the scientific community, monitor water quality (DO and water temperature) from June 1 through September 30 on a 15-minute interval at the following locations:
  - Black Lake Creek at the discharge of the Toronto Reservoir;
  - Immediately upstream of the mouth of Black Lake Creek at Cliff Lake;
  - Black Lake Creek at the discharge of Cliff Lake;
  - Black Lake Creek immediately upstream of its confluence with the Mongaup River;
  - Mongaup River immediately upstream of the Mongaup Falls Project reservoir;
  - Mongaup River immediately downstream of the Mongaup Falls Project's minimum flow outlet structure discharge (upper extent of the bypass reach);
  - Mongaup River immediately upstream of the Mongaup Falls tailrace (lower extent of the bypassed reach);
  - Mongaup River immediately downstream of the Rio minimum flow powerhouse (upper extent of the bypassed reach); and
  - Mongaup River immediately upstream of the Rio Project's tailrace (lower extent of the bypassed reach) (FERC).

Water Quality Study

Stream Reach Water Quality Study

- Document and record stream flows within each Project-affected stream reach during the study period on the same 15-minute interval that water quality data is collected (FERC).
- Record ambient air temperature at each water quality monitoring location during the study period (FERC).
- Prepare a comprehensive water quality study report for each of the Projects' affected stream reaches that incorporates all existing water quality data collected pursuant to the current license and USGS Gage Station No. 01433500, the new water quality data collected pursuant to this study request, and considers the influence of ambient air temperature and stream flows on water quality within the Project-affected stream reaches (FERC).

Water Quality Study

Reservoir Water Quality Study

- Using generally accepted practices in the scientific community, monitor water quality (e.g., water temperature and DO) within each of the Projects' reservoirs from ice-off in the spring until ice-on in the winter. Water quality data must be monitored at appropriate locations within each reservoir and at 1-meter increments in depth from the reservoir surface to its bottom. An additional monitoring location must be established at the Project intakes (depth and location) within each reservoir. Data collected should be sufficiently robust to evaluate and consider what, if any, short- and/or long-term (seasonal) influences Project operations may have on reservoir water quality (e.g., thermocline depth, water temperature, etc.) (FERC).
- Prepare a comprehensive water quality study report for each of the Projects' reservoirs that incorporates the water quality data collected pursuant to this study request and, as appropriate, the in-situ water quality data collected pursuant to the aquatic habitat mapping study discussed above (FERC).

General

- Monitor water temperature and dissolved oxygen on a continuous basis for at least one full year, along with monthly sampling of other parameters such as pH, turbidity, and conductivity (USFWS).
- Collect water quality data, beyond the data currently collected below the Projects' powerhouses, in the impoundments, the bypass reaches, and the areas upstream and downstream from the Projects, as well as tributary streams that are sampled for the fisheries study (USFWS).

Water Quality Study

- Monitor water temperature and DO on a continuous basis for at least one full year, along with monthly sampling of other parameters such as pH, turbidity, and conductivity (NYSDEC).
- Collect data in the impoundments, the bypass reaches, and the areas upstream and downstream from the Projects (NYSDEC).
- Summarize data in a manner to allow for appropriate analysis of the current flow regime (NYSDEC).
- Explore and model the potential effectiveness of methods for mitigating water quality problems (NYSDEC).
- Provide data and an analysis of how the Toronto Reservoir's ability to meet state water quality criteria is affected by Project operations. If such data do not exist, conduct a water quality study on which to base an analysis of the impact of Project operations on Toronto Reservoir water quality (HOOT).

Study Area

- Project boundary, focusing on streams and reservoirs.

Water Quality Study

Methodology

Task 1 – Continuous Water Temperature and DO Monitoring

Collect hourly water temperature and DO data from June 1 through September 30 at the following 18 locations:

- One representative location within the Toronto Reservoir;
- One location in the immediate vicinity and at the depth(s) of the Toronto gate(s);
- Black Lake Creek at the discharge of the Toronto Reservoir;
- Immediately upstream of the mouth of Black Lake Creek at Cliff Lake;
- One representative location within the Cliff Lake Reservoir;
- One location in the immediate vicinity and at the depth of the Cliff Lake sluice gate;
- Black Lake Creek at the discharge of Cliff Lake;
- One representative location within Swinging Bridge Reservoir;
- One location in the immediate vicinity and at the depth of the Swinging Bridge intake structure for Unit No. 2 powerhouse;
- Mongaup River downstream of the Swinging Bridge Unit No. 2 powerhouse (i.e., continuation of the established monitoring location);
- One representative location within Mongaup Falls Reservoir;

Water Quality Study

- One location in the immediate vicinity and at the depth of the Mongaup Falls intake structure;
- Mongaup River immediately downstream of the Mongaup Falls Project's minimum flow outlet structure discharge (upper extent of the bypass reach);
- Mongaup River downstream of the Mongaup Falls powerhouse (i.e., continuation of the established monitoring location);
- One representative location within Rio Reservoir;
- One location in the immediate vicinity and at the depth of the Rio intake structure;
- Mongaup River immediately downstream of the Rio minimum flow powerhouse (i.e., continuation of the established monitoring location); and
- Mongaup River immediately downstream of the Rio main powerhouse (i.e., the currently established monitoring location via use of the USGS gaging station).

Water quality loggers will be deployed at representative locations from June 1 through September 30. Water quality equipment will be calibrated prior to deployment. Data will be downloaded every 7 to 10 days throughout the monitoring period. Routine maintenance (i.e., cleaning loggers) will occur throughout the monitoring period, as necessary. Water quality monitoring locations will be geo-referenced using GPS and will be selected with consideration of worker safety (e.g., in front of intakes and near high flow velocity areas).

Water Quality Study

Task 2 – Routine Water Quality Monitoring

- Collect In-situ water quality data, including water temperature, DO, pH, and specific conductance at each of the continuous monitoring sites using a MS5 Hach Hydrolab® or equivalent during water quality data download events. In addition, water quality data will also be collected concurrent with the Fisheries Survey Study and Macroinvertebrate Study field activities.

Task 3 – Reservoir Profile Data

- Collect profile data (water temperature and DO) in each of the five reservoirs at a single location upstream of the dam intakes/gates in safe locations during the summer months (June 1 through September 30). Profile data will be collected every 7 to 10 days (concurrent with data download events at the continuous monitoring locations) at approximately 1-meter intervals from the water surface to a depth two meters below the elevation indicating anoxic conditions or the bottom or the reservoir, whichever is encountered first.

Water Quality Study

Task 4 – Comparison with Historic Water Quality Data

- Compare the water quality data collected during this study with historic data collected to date and in association with the original licenses to evaluate any change in conditions since that time.

Deviations from Requested Studies

Stream Reach Water Quality Study

- Eagle Creek is proposing to monitor DO and water temperature from June through September as requested by FERC rather that throughout an entire year.
- Eagle Creek is proposing to monitor DO and water temperature on an hourly basis, rather than at 15-minutes intervals.
- Eagle Creek is not proposing to model mitigative water quality measures at this time.

Water Quality Study

Stream Reach Water Quality Study

- Eagle Creek believes the proposed monitoring in the dam tailraces/discharges and in the upper extent of the Rio and Mongaup Falls bypassed reaches will provide sufficient data to evaluate Project effects on water quality in the stream reaches. Therefore, Eagle Creek is proposing to continuously monitor DO and water temperature at the locations requested by FERC, with the exception of those listed below:
  - Black Lake Creek immediately upstream of its confluence with the Mongaup River;
  - Mongaup River immediately upstream of the Mongaup Falls Reservoir;
  - Mongaup River immediately upstream of the Mongaup Falls tailrace (lower extent of the bypassed reach); and
  - Mongaup River immediately upstream of the Rio Project's tailrace (lower extent of the bypassed reach).
- Eagle Creek is not proposing to collect field data for ambient air temperature, as requested by FERC.

Water Quality Study

Reservoir Water Quality Study

- Eagle Creek is adopting the requested reservoir water quality study as requested by FERC, USFWS, and NYSDEC, with modification. Eagle Creek is proposing to collect reservoir profile data at one location upstream of the intakes where practicable for each of the five reservoirs during the summer months (June through September), as opposed to collecting profile data from ice-off in the spring to ice-on in the winter at two locations in each reservoir, as requested by FERC.

Macroinvertebrate and Mussel Survey Study

Macroinvertebrate and Mussel Survey Study

Goals and Objectives

- Conduct a field survey to evaluate the macroinvertebrate and mussel community within the Projects' streams and reservoirs.

Macroinvertebrate and Mussel Survey Study

Study Requests (USFWS and NYSDEC)

- Conduct one year of macroinvertebrate community sampling, including freshwater mussels (USFWS).
- Collect data from the impoundments, the bypassed reaches, and areas upstream and downstream from the Projects (USFWS).
- Information is needed regarding macroinvertebrate populations in the impoundment and downstream of the dam and tailrace as well as the bypass reaches of the Mongaup Projects (NYSDEC).
- Conduct a critical evaluation (both qualitative and quantitative) of macroinvertebrate communities in all instream habitats affected by the operation of the Mongaup River Projects (NYSDEC).
- Sampling should be conducted seasonally and include the use of both shallow water and deep water sampling gear (NYSDEC).
- Collections should be stratified by microhabitat (sediment size) (NYSDEC).
- Macroinvertebrates should be identified to species (NYSDEC).
- Since any one sampling year may experience atypical environmental conditions, more than one year of data collection is recommended to try to capture typical environmental conditions and to establish current baseline conditions (NYSDEC).

Macroinvertebrate and Mussel Survey Study

Study Area

- Project boundary, focusing on streams and reservoirs.

Methodology

Sample Collection

- Evaluate aquatic macroinvertebrate communities using the NYSDEC's Standard Operating Procedure: Biological Monitoring of Surface Waters in New York State (NYSDEC 2016). Sampling will occur in the reservoirs, the bypass reaches, and in an area downstream from each Project. A Petite Ponar grab sampler will be used to collect quantitative samples at a single site in each reservoir. Four replicates will be collected at each site, which will each be processed separately. Contents of the sampler will be sieved in a bucket with a U.S. No. 30 standard sieve and large debris will be discarded after careful inspection and removal of all organisms.

Macroinvertebrate and Mussel Survey Study

- Semi-quantitative kick sampling will used in the wadeable flowing areas. Kick sampling will be conducted in suitable riffle habitat and non-riffle habitat (i.e., run, pool) at one location in the bypass reaches below the Mongaup Falls Dam and Rio Dam and in a wadeable sample reach downstream of each Project reservoir consisting of: 1) within Black Lake Creek downstream of the Toronto Reservoir, 2) within Black Lake Creek downstream of the Cliff Lake Reservoir, 3) within the Mongaup River downstream of the Swinging Bridge Reservoir (below the confluence with Black Lake Creek), 4) within the Mongaup River downstream of the Mongaup Falls Reservoir (below the confluence with Black Brook), and 5) within the Mongaup River below the Rio Reservoir (below the confluence with the Rio powerhouse tailrace). Four replicates will be collected at each site, each of which will be processed separately. Upon completion of each replicate, the contents in the net will be emptied into a pan containing stream water, and large debris will be discarded after careful inspection and removal of all organisms.
- At each site, physical data (wetted width, depth, velocity, substrate type and size, embeddedness, canopy cover, and water temperature) and water quality data will be collected.

Macroinvertebrate and Mussel Survey Study

Sample Sorting

- In the laboratory, three of the four replicate samples will be processed separately. Ponar samples will be drained through a U.S. No. 40 standard sieve. The sample will be transferred to a pan and a small amount of the sample will be randomly removed with a spatula, placed in a petri dish, and examined under a microscope.
- Kick samples will be drained through a U.S. No. 60 sieve and placed in a gridded pan for subsample removal. A subsample will be randomly removed from a grid section with a spatula, placed in a petri dish, and examined under a microscope. All invertebrates that are larger than 1.5 millimeters (mm) will be removed, counted, and sorted into major taxonomic groups. Sorting will continue until approximately 300 to 350 organisms have been removed for identification within a complete subsample, or the entire sample has been processed. The total number of subsamples sorted will be recorded and used to calculate density estimates. A rapid, 5-minute, large-rare scan will be conducted on the remaining subsample after 350 organisms have been removed to assure other taxa were not overlooked. For purposes of evaluating water quality, a random 100 organisms from the riffle samples will be used to calculate the Biological Assessment Profile (BAP).

Macroinvertebrate and Mussel Survey Study

Data Analysis

- All organisms will be identified to the lowest practicable taxon. Data obtained from the 350-organism replicate subsamples will be applied to standard indices, such as:
  - Species Richness - The total number of species or taxa found in the sample. Higher species richness values are often associated with good water quality conditions.
  - Hilsenhoff Biotic Index (HBI) - This index is a measure of the tolerance of the organisms in the sample to organic pollution and low DO concentrations. Low HBI values are associated with good water quality.
  - Ephemeroptera, Plecoptera, Trichoptera Taxa Richness (EPT richness) - The total number of species or mayfly (Ephemeroptera), stonefly (Plecoptera), and caddisfly (Trichoptera) taxa in the subsample. These are considered mostly clean-water organisms and their presence is associated with good water quality.
  - Percent Model Affinity - A measure of the similarity of the subsample to a model non-impacted community based on the percent abundance of seven major groups.
  - Species Dominance - The percent contribution of the most numerous species, which is a measure of community balance, or evenness of the distribution of individuals among the species.
  - Species Diversity - A value that combines species richness and community balance (evenness). High species-diversity values are associated with diverse, well-balanced communities.

Macroinvertebrate and Mussel Survey Study

Data Analysis

- Samples collected in riffle habitats will undergo further analysis, where 100 organisms will be randomly selected via computer generation from each of the 350-organism replicate subsamples. The average index value will be calculated for each site and will be converted to a common water quality impact scale, which ranges from 0 (severe impact) to 10 (non-impact). The mean score of the four family-level indices or BAP will be calculated and used to indicate the overall level of water quality impact. Typically, BAP scores increase with water quality.

Macroinvertebrate and Mussel Survey Study

Mussel Analysis

- A qualitative mussel survey will be conducted in representative habitats (e.g., pool, riffle, run) in up to four representative areas downstream of the Projects' reservoirs, which will include the Projects' bypass reaches. Depending on water depths and flow conditions, the surveys are expected to consist of qualitative visual timed-searches using snorkel, view buckets, or wading of shallow water areas.
- Starting from the downstream end of a transect or survey site, the visual survey will consist of searching for freshwater mussels or shell material in a meandering or "zig-zag" pattern, being sure to include representative habitats of the river reach between the powerhouse and the downstream confluence. Shoreline areas will also be searched for evidence of any shell material or middens.
- Observed mussels will be counted and identified to species and carefully placed back into the same habitat. Basic habitat information such as substrate type (e.g. gravel, cobble, boulder), water depth, habitat type (e.g., riffle, run, pool), cover type (e.g. woody debris), stream width, and qualitative water velocity will be recorded.
- Data will be recorded on field data sheets and mussel locations marked on field maps. Representative photographs will be taken for each species as vouchers.

Macroinvertebrate and Mussel Survey Study

Deviations from Requested Studies

- NYSDEC requested two years of study. Eagle Creek is proposing to conduct a study during a single field season and believes that given the flexibility to collect the samples during appropriate flows during the season, an accurate representation of the macroinvertebrate and mussel community will be identified in the Project areas.

- USFWS requested macroinvertebrate and mussel surveys be performed in the impoundments, the bypassed reaches, and areas upstream and downstream from the Projects. Eagle Creek is proposing to collected data from the impoundments, the bypassed reaches, and areas downstream from the Projects, as Eagle Creek believes this will provide an accurate representation of the macroinvertebrate and mussel community potentially affected by the operations of the Projects.

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

Goals and Objectives

- Complete a baseline inventory of the existing recreation facilities at the Projects.
- Compile data on the existing recreation use, access, and demand at the Projects.
- Obtain information about the condition of existing recreation facilities and access sites at the Projects (including the non-Project NYSDEC sites listed in Table 11-1).
- Obtain information on the existing recreation use, access, and demand at the Projects.
- Conduct an assessment of the need to enhance recreation opportunities and access at the Projects.
- Quantify and map the relationship between reservoir surface area and reservoir levels (obtained from the operations model in Section 5).
- Use the information obtained during the study to inform the development of a Recreation Management Plan to be submitted with the Draft and/or Final License Application.

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

Study Requests (FERC, NPS, NYSDEC, HOOT, and Swinging Bridge Property Owners Association)

- Update existing data on recreation resources adjacent to and within the Projects through site assessment and consultation with public and private recreation providers (FERC).
- Update the inventory of informal and formal public and private waterfront recreational sites/facilities within and adjacent to the Project boundaries. Identify all informal and formal public and private recreational sites/facilities within the Project areas (FERC).
- Develop and implement a site condition evaluation criterion of measurable and manageable indicators for facilities and dispersed recreation area conditions. Site condition assessments should be conducted at all formal and informal publicly accessible recreation sites. Eagle Creek should also consult with the NYSDEC on the need of including other NYSDEC recreational developments that serve the Projects into the site condition assessment (FERC).
- The use and needs assessment should include all recreation activity types known to occur or potentially occurring at the Projects. Specific methods should include visitor observations and on-site visitor intercept surveys at formal and informal public recreation areas at the Projects' reservoirs and riverine areas, including the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace (FERC).

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

- Specific methods for each sampling approach in the use and needs assessment:
  - The visitor observations should capture information such as location, date, time, weather, number of vehicles, watercraft (if any), number of recreation users or party size, and recreation activity engaged in (FERC).
  - The visitor survey sampling should be based on a stratified random sample that includes all seasons, various locations, and various times of week and day to enable representative responses from the visitors, while ensuring interview coverage during key times (FERC).
  - The survey instrument should include items that assess visitor perceptions of crowding, recreational conflict, conflicts between the public and adjacent property owner(s), welcoming public access, adequacy and placement of signage, adequacy of recreation facilities and access to the Projects, and effects of Project operations and management on recreation and recreation opportunities at the Projects (FERC).
- In conjunction with the Whitewater Study, consult with stakeholder groups to develop a whitewater boating-specific addendum to the survey instrument that would rate satisfaction with the current whitewater boating flow release schedule, access facilities, and boating information (FERC).
- Quantify annual recreation use by activity type and season to include both formal and informal publicly accessible recreation sites (FERC).

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

- The needs assessment should also include a future demand estimate from both current use and unmet demand based on guidance from Haas et al. (2007) based on (1) prior and current Project use data; (2) state, regional, and national recreation trend data; and (3) population growth data (FERC).
- Quantify and map the relationship between reservoir surface area and reservoir levels for the range of operation at each Project reservoir (FERC).
- Identify potential measures to alleviate or reduce any negative effects of Project operations, to enhance existing recreation opportunities, and (if appropriate) provide additional public access at the Project reservoirs or riverine reaches (FERC).
- Develop a Recreation Management Plan for the Projects (FERC).
- Conduct a recreation site inventory for all publicly accessible Project sites and informal sites within the Project-affected area to document existing facilities and resources (NPS).
- Amenities at each site will be recorded along with digital photos and GPS points (NPS).
- Formal and informal river access sites will be visually assessed and photographed to record any opportunities or challenges for craft or anglers (NPS).
- The inventory should cover all four seasons (NPS).
- The study should review land ownership (including the applicants) surrounding the Project area and investigate shoreline slope conditions (e.g., steepness, length) for alternative public access options (NPS).

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

- Assess the inventory information in conjunction with a visitor intercept survey (NPS).
- Conduct a use and needs assessment to document recreation activity types known to occur or potentially occurring in the Project- affected area (NPS).
- Collect existing recreational visitor use data through existing public use (traffic counters, spot counts, and visitor intercept interviews) (NPS).
- Collect potential recreational visitor use data through questionnaire (NPS).
- Future use estimates should be calculated by assessing future demand for recreation activities and population trends for the expected term of the new license. Growth in recreation activities and recreation use projections for the anticipated growth in recreational use through 2060 should be developed using Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends (Cordell et al., 1999), and Outdoor Recreation Participation in the United States – Projections to 2060 (Bowker et al., 2012) (NPS).
- Study should provide information on the existing public access facilities in the vicinity of the Mongaup River Projects within 1 mile upstream and downstream of the Projects' boundary, including the potential to create additional public access where feasible and the current condition of the existing public access facilities and the need for improvements, especially upgrades that would be necessary (NYSDEC).

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

- An evaluation of alternatives for improving access to Cliff Lake and identify any potential impacts that the increased use of Cliff Lake may have on the fishery or nesting eagles (NYSDEC).
- Expansion of stream access below all the Projects should be looked at, including additional parking, foot trails, and the potential for permanent easement with NYSDEC for Public Fishing Rights should be explored on all properties not owned by NYSDEC (NYSDEC).
- The Licensee should conduct a Toronto Reservoir Recreation Needs and Impacts Study that evaluates Toronto Reservoir elevation fluctuations on recreation use at the reservoir, estimates the future recreation demand for Toronto Reservoir, evaluates the adequacy of existing recreation facilities, and studies the potential for developing new recreation facilities (HOOT).
- Develop a Recreation Plan for Toronto Reservoir (HOOT).
- The study should estimate likely recreation use if Toronto Reservoir water level were maintained at 1,218 msl, plus or minus 2 feet, during the recreation season, and at 1,215 msl, plus or minus 5 feet, year-round, and should compare that estimated use against current recreational capacity at the reservoir (HOOT).

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

- The flow/recreational use study should examine the impact of the current minimum flow releases on water levels in the Swinging Bridge Reservoir and, if such minimum flow releases currently do not maintain adequate levels, whether they can be lowered to raise water levels during drought periods (Swinging Bridge Property Owners Association).
- Obtain information on changes and increases in recreational usage of the Swinging Bridge Reservoir by lakeshore residents and others outside the immediate area (Swinging Bridge Property Owners Association).
- Obtain information on changes to recreational usage of the Mongaup River (Swinging Bridge Property Owners Association).
- Obtain information on whether current minimum flow releases have maintained adequate water levels in the Swinging Bridge Reservoir for recreational purposes in all years since the initial license was issued for the months April through October (Swinging Bridge Property Owners Association).
- Obtain information on sediment deposits on bottom of Swinging Bridge Reservoir to determine if current minimum water levels still support recreational uses (Swinging Bridge Property Owners Association).
- Obtain information on whether minimum flow levels could be reduced without materially impacting recreational usage of Mongaup River (Swinging Bridge Property Owners Association).

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

Study Area

Project boundary, focusing on existing Mongaup River Projects formal and informal recreation sites (including the non-Project NYSDEC sites listed in Table 11-1).

Swinging Bridge Project
Swinging Bridge North Public Access
Swinging Bridge Reservoir Trail (Swinging Bridge Peninsula Trail)
Swinging Bridge East Access
Swinging Bridge East Access Picnic Area
Toronto Moscoe Road Public Access
Toronto East Public Access
Black Lake Creek Trail (Toronto East Parking Lot Trail)
Cliff Lake Trail
Cliff Lake Parking Lot
Cliff Lake Public Access Site
Mongaup Falls Project
County Route 43/Forestburgh Road Boat Launch
Mongaup Eagle Viewing Station
Black Brook and Mongaup River Public Access Area
Mongaup River Access Area
Rio Project
Rio Boat Launch
Rio Eagle Viewing Station
Shoreline Fishing Access (western shoreline of Mongaup River downstream of the Rio Reservoir)
Shoreline Fishing Access (western shoreline of Mongaup River downstream of the Rio Reservoir)
Rio Carry-In Boat Launch and Shoreline Fishing Access
Rio Hand Boat Launch
Whitewater Boating Access
Shoreline Fishing Access (adjacent to Whitewater Boating Access)

Table 11-1 Mongaup River Projects Formal and Informal Recreation Sites

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

Methodology

Conduct a Recreation Facility Inventory

- Eagle Creek will update existing data on recreation resources adjacent to and within the Projects through site assessment and consultation with public and private recreation providers.
- For the site assessment, a standardized site inventory form (Figure 11-4 in the PSP) will be used to evaluate each formal and informal recreation site listed in Table 11-1 to determine the general condition of the facilities and available amenities.
  - The inventory will be conducted once.
  - Photos of the recreation sites will be taken and a GPS datapoint will be recorded while in the field for each facility at the recreation area, which will be entered into a GIS format.
- For privately-owned recreation sites within and abutting the Project reservoirs, such as marinas, Eagle Creek will conduct background research to identify these sites and will consult with their owners to obtain information on the site's available amenities and services, as well as hours of operation.
  - Photos of these sites will be taken and a GPS datapoint will be recorded while in the field, which will be entered into a GIS format.

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

Recreation Use and Needs Assessment

- Eagle Creek will conduct a recreation use and needs assessment for the Projects using a combination of methods – spot counts, visitor intercept surveys, and actual use numbers for recreation sites where use numbers are collected. The field work will be conducted between the months of March 2018 through October 2018.
- Spot Counts
  - Spot counts will be conducted at each formal and informal recreation site listed in Table 11-1.
  - Spot counts will be conducted at each survey location on two weekdays and two weekend days a month and on one day of the following holiday weekends between March and October: Memorial Day, Independence Day (weekend closest to July 4th), Labor Day, and Columbus Day, and on the opening day of trout season (typically April 1).
  - Consistent with standard sampling techniques, all sampling days will be randomly selected and survey routes will be completed on a rotating basis and at different times of day to account for time-of-use patterns and to eliminate sampling bias.

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

- User Contact Survey
  - A proposed user contact survey has been developed (Figure 11-5 in the PSP) to determine users' perceptions with respect to their recreation use of the formal and informal recreation sites listed in Table 11-1.
  - The survey will be administered during the spot count site visits to the formal and informal recreation sites listed in Table 11-1. Surveys will be administered for approximately two hours at each survey location.

- Actual Use Records
  - Actual use records to the extent they are readily available for the Whitewater Boating Access Area and any of the sites managed by the NYSDEC, will be utilized as an additional method of determining the level of use.

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

Quantification of the Relationship between Reservoir Surface Area and Reservoir Levels

- As discussed in Section 5 of the PSP, an operations model will be developed that can be used to predict reservoir elevations for each of the reservoirs of the Mongaup River Projects under various operation constraints (e.g., minimum flow, reservoir level, etc.).
- The operations model will be used to quantify and map the relationship between reservoir surface area and reservoir levels for the range of operation at each Project reservoir.

Report

- The results of the recreation facilities inventory and the recreation use and needs assessment will be included in a report.

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

Deviations from Requested Studies

- FERC requested that the survey instrument include a whitewater-specific boating addendum to rate satisfaction with the current whitewater boating flow release schedule, access facilities, and boating information. The survey instrument in Figure 11-5 does not include a whitewater boating-specific addendum because a separate whitewater-specific survey instrument will be used as part of the Whitewater Boating Assessment.
- FERC requested that the use and needs assessment should include all recreation activity types known to occur or potentially occurring at the Projects. Due to the minimal amount of winter recreation use of the Projects, the spot counts and surveys will not be conducted during the months of November – February. In June 2013, Eagle Creek filed with the Commission the results of a winter monitoring study of the Toronto East Access Area, one of the more heavily used of the recreation sites associated with the Projects (Eagle Creek 2013). In that filing, Eagle Creek proposed that it would not provide a ranger to monitor the site during the winter months. In an order dated March 13, 2014, the Commission approved with one exception Eagle Creek's proposal for operation of the Toronto East Access Area (FERC 2014). That exception did not relate to the proposal to forego monitoring of the site during the winter months.

Recreation Facility Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area

- NPS requested that the Licensee collect data on potential (future) recreational visitors through a mailed or online questionnaire. The Licensee is not proposing to survey potential *i.e.*, non-users, of the Projects because there could be a number of reasons why people do not utilize the Projects, many of which are unrelated to recreation or the Projects. FERC has rejected requests to survey potential recreational visitors in other relicensing proceedings *(e.g.,* FERC 2015; FERC 2013).
- NPS requested that the recreation site inventory cover all four seasons. The recreation facility inventory would be conducted once during the study period, because this is standard practice and allows sufficient information to be gathered as to the condition of a recreation site.
- FERC and HOOT requested that a Recreation Management Plan be developed as part of the study. A Recreation Management Plan will be developed after completion of the study. The results of this study would inform the development of a Recreation Management Plan that would be submitted with the Draft and/or Final License Application.
- NYSDEC requested an evaluation of alternatives for improving access to Cliff Lake Reservoir and expansion of stream access below all the Projects. NPS requested that the study should review land ownership (including the applicants) surrounding the Project area and investigate shoreline slope conditions (e.g., steepness, length) for alternative public access options. HOOT requested that the study examine the potential for developing new recreation facilities. Evaluation of additional alternative or enhanced recreational access or facilities are not included in this study plan because it would be premature at this time. Such an evaluation would be considered during the development of the Recreation Management Plan if the study determines that there is a need.

Whitewater Boating Assessment Study

Whitewater Boating Assessment Study

Goals and Objectives

- The goals and objectives of the whitewater study are to evaluate whitewater boating opportunities at the Rio Project.

Whitewater Boating Assessment Study

Study Requests (FERC, AW/KCCNY/AMC)

- Evaluate the adequacy and appropriateness of the current whitewater boating opportunities at the Project, including flow releases and access facilities (FERC).
- Assess whitewater boating opportunities in the bypassed reach between the Rio Project minimum flow powerhouse tailrace and the main powerhouse tailrace (FERC).
- Identify potential measures to enhance whitewater boating opportunities (FERC).
- Include consultation with stakeholder groups to develop a whitewater boating-specific addendum to the recreation use/user survey instrument that would rate satisfaction with the current whitewater boating flow release schedule, access facilities, and boating information (FERC).
- The study report should include an assessment of opportunities to modify or enhance the current whitewater flow release schedule, boater access facilities, and/or boating information (FERC).

Whitewater Boating Assessment Study

- Conduct a whitewater flow study for the Rio Project that assesses the presence, quality, access needs, flow information needs, and preferred flow ranges for river-based boating resources in a stepwise manner, including quantitative and qualitative descriptions of:
  - Effects of a range of optimal and acceptable flows on whitewater recreation opportunities for whitewater paddling in the natural river channel, including the bypassed reach, from the Rio Dam to the confluence of the Mongaup River with the Delaware River (AW/KCCNY/AMC).
  - Frequency, timing, duration, and predictability of optimal and acceptable paddling flows under current, proposed, and alternative modes of operation (AW/KCCNY/AMC).
  - Need for and definition of adequate put-in and take-out points that promote car-top boating and also identify the need for parking areas (AW/KCCNY/AMC).
  - Location, challenge, and other recreational attributes associated with specific rapids and other river features (AW/KCCNY/AMC).
  - Access needs of whitewater boating use and the current and potential river access options for whitewater and other paddling (AW/KCCNY/AMC).
  - Flow information needs of whitewater boating and the current and potential flow information distribution system (AW/KCCNY/AMC).

Whitewater Boating Assessment Study

Study Area

- The study area includes two reaches:
  - 1.5-mile-long bypass reach below Rio Dam to the Rio Project powerhouse; and
  - 3-mile river reach from the Rio Project powerhouse to the Mongaup River's confluence with the Delaware River.

Whitewater Boating Assessment Study

Methodology

Literature Review

- Conduct a review of reasonably available literature regarding existing recreational boating opportunities on the Mongaup River below Rio Dam (both reaches).
  - Research via internet, libraries, tourist/visitor bureaus, agencies, municipalities, and recreation user group documents (whitewater boating guides, etc.).
  - Review will also include other recreational whitewater boating opportunities in the region.
  - Literature will be analyzed to evaluate: 1) the physical characteristics of the stream reach; 2) the availability of whitewater boating facilities/amenities; and 3) the relationship between stream flow and whitewater opportunities.

Hydrologic Assessment

- Conduct a hydrologic assessment of whitewater boating opportunities downstream of Rio Dam to the confluence with the Delaware River.
  - Summarize recreation-relevant hydrology of the reach and identify operational constraints on flow regimes and the resulting availability of recreational boating flows. Data sources will include: USGS gage data; Project operational data; and modeling data.
  - Summarize hydrologic conditions using a variety of graphs, tables, and statistics relevant to recreational boating use; focus on average and dry water-year conditions.
  - Consider the typical operation of the Rio Project and the resulting flows in the Mongaup River downstream of the Rio Project.

Whitewater Boating Assessment Study

Boater Survey

- Conduct a structured survey of whitewater boaters to gain both quantitative and qualitative information regarding recreational boating use of the Mongaup River between the Rio Dam and the Delaware River.
  - Utilize standardized questionnaire.
  - Interview whitewater boaters at both put-in and take-out locations to gain first-hand knowledge of boating conditions on the river reach.
  - Survey responses will be analyzed and a summary of interview responses will be included in the study report.

Evaluation of Current Rio Project Whitewater Boating Accesses

- Review existing put-in and take-out whitewater boating locations and facilities along the Mongaup River between Rio Dam and the Delaware River.
- Existing access locations will be surveyed for use and adequacy of the facilities to allow whitewater boaters safe and accessible ingress and egress.

Prepare Report

- Study results will be presented in a Whitewater Boating Assessment study report.

Whitewater Boating Assessment Study

Deviations from Requested Studies

- AW/AMC/KCCNY requested a controlled flow whitewater boating assessment, including multiple on water-flow assessments. The Licensee is not proposing to conduct an on-water controlled flow evaluation at this time as the need for such is dependent on the results of this assessment.
- AW/AMC/KCCNY requested that the Licensee evaluate opportunities to modify or enhance the current whitewater flow release schedule, boater access facilities, and/or boating information. The Licensee is not proposing to evaluate such opportunities at this time because the need for modifications or enhancements, if any, is dependent on the results of this assessment.

Shoreline Management Assessment Study

Shoreline Management Assessment Study

Goals and Objectives

- Obtain information on the adequacy and appropriateness of current shoreline management practices.
- Solicit information using a questionnaire from abutting shoreline property owners at Swinging Bridge and Toronto reservoirs about their recreation activity participation, areas visited, perspectives about reservoir levels and current shoreline management practices, perceived conflicts and crowding, and their satisfaction with or desire for recreational opportunities and facilities.
- Use the study results along with resource information derived from other studies to inform the development of a Shoreline Management Plan that would be submitted with the Draft and/or Final License Application.

Shoreline Management Assessment Study

Study Requests (FERC)

- Develop a questionnaire to solicit information from shoreline property owners at each Project reservoir about their recreation activity participation, areas visited, perspectives about reservoir levels and current shoreline management practices, perceived conflicts and crowding, and their satisfaction with or desire for recreational opportunities and facilities (FERC).
- Consult with representatives of the various shoreline property owners on the most effective means of distributing the questionnaire and follow the Dillman (2014) tailored design method (FERC).
- Consult with interested stakeholders, including property owner representatives and the NYSDEC, and Commission staff in the development of the questionnaire (FERC).
- Prepare a detailed report of the study results (FERC).
- Use study results in conjunction with the results of the other recreation studies to inform the development of a Shoreline Management Plan (FERC).

Shoreline Management Assessment Study

Study Area

- Because private residential development primarily exists at Swinging Bridge and Toronto reservoirs, this shoreline management assessment focuses on Swinging Bridge and Toronto reservoirs.

Methodology

Questionnaire

- Finalize the draft questionnaire included in Figure 13-1 in the PSP upon receipt of FERC's Study Plan Determination.
- Consult with representatives of the various shoreline property owners regarding the most effective means of distributing the questionnaire.
- The questionnaire will most likely be administered as a direct mail survey to residential abutters, following a modified Dillman approach.
  - Mail the questionnaire in spring 2018 to residential abutters.
- A follow-up will be mailed approximately two weeks later to those residences who have not returned a survey.

Shoreline Management Assessment Study

Data Analysis and Reporting

- Information collected from the survey will be entered into spreadsheets for analysis.
- The report for this study will summarize the responses received on the questionnaire and include all survey responses in an appendix.
- Information from this study will be used to inform a Shoreline Management Plan along with information from other relevant resource studies being conducted at the Project's reservoirs.

Deviations from Requested Studies

- FERC's request for a shoreline management assessment appears to derive, in part, from complaints received from abutting property owners regarding shoreline management practices. Because private residential development primarily exists at Swinging Bridge and Toronto reservoirs, this shoreline management assessment focuses on these two reservoirs.
- FERC requested that a Shoreline Management Plan be developed. A Shoreline Management Plan for the Swinging Bridge Project will be developed as part of the Draft and/or Final License Application instead of as a part of the study because the results of this study and other relevant studies are needed to inform the development of a Shoreline Management Plan.

Cultural Resources Study

Cultural Resources Study

Goals and Objectives

- Locate cultural resources that are listed in or eligible for listing in the National Register of Historic Places (NRHP) and may be affected by Project operations and maintenance:
  - Archaeological sites;
  - Project facilities;
  - Historic structures; and
  - Other places of religious and cultural significance to Indian tribes.
- If existing or potential Project-related adverse effects are identified on NRHP-eligible cultural resources, a historic properties management plan (HPMP) would be prepared and made part of any new licenses issued by the Commission.

Cultural Resources Study

Study Requests (FERC)

- Conduct a study of cultural Resources at the Mongaup River Hydroelectric Project to meet the requirements of the National Historic Preservation Act (NHPA) (FERC).

Study Area

- Lands within the defined FERC Project boundary: Area of Potential Effects (APE).

Cultural Resources Study

Methodology

APE Determination

- Eagle Creek proposes to define the APE for this undertaking as the following:

  - *The APE for the Mongaup River Hydroelectric Projects is the lands within the defined FERC Project boundary.*

- Eagle Creek will consult with NYSHPO, the Delaware Nation, and Delaware Indian Tribe to seek written concurrence regarding the Project's APE prior to conducting field work associated with this study.

Cultural Resources Study

<u>Phase IA Literature Review and Sensitivity Assessment</u>

- Conduct a Phase IA literature review and archaeological sensitivity assessment of the Projects' proposed APE in accordance with the New York Archaeological Council's 1994 *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (as adopted by NYSHPO) (New York Archaeological Council 1994) using the following sources of information:
  - NYSHPO's and New York State Museum's archaeological site files;
  - Building and structure inventory forms on file with NYSHPO;
  - Archaeological site files and data available from the relicensing parties;
  - Historic maps of the Projects' vicinity;
  - Relevant historical accounts of the Project area;
  - Environmental information, including mapped soils, bedrock geology, physiography, and hydrology in the vicinity of the Projects; and
  - Reports on archaeological and architectural resource studies conducted within the Projects' vicinity.

Cultural Resources Study

Phase IA Archaeological and Historic Structures Field Survey

- Conduct a comprehensive archaeological resources survey and inventory within the APE. Survey work will include:
  - Systematic pedestrian survey of all accessible areas of the APE.
  - Recording, mapping, and photography of all archaeological sites consistent with NYSHPO standards.
- Conduct a survey of architectural and engineering resources aged 50 years or older within the APE, including:
  - Survey of both Project-related facilities and non-Project related facilities.
  - All work conducted according to NYSHPO standards for historic resources survey, including site maps, survey files, photographs, and data entry into the online CRIS system.
  - Each surveyed architectural resource will be evaluated for its NRHP-eligibility.

Native American Consultation

- Contact the Delaware Nation and Delaware Tribe to obtain information of any place of religious or cultural significance (i.e., traditional cultural properties, past villages or sites, gathering areas) and provide the draft cultural resources study report for comment. If such cultural resources exist within the APE, Eagle Creek will assess their NRHP-eligibility (if applicable) and potential or existing Project-related effects.

Cultural Resources Study

Reporting

- Prepare a cultural resources study report that contains the following:
  - Discussion of the Phase IA archaeological assessment;
  - Discussion of the historic structures survey; and
  - Results of discussion with the Delaware Nation and Delaware Indian Tribe.

- Report will be prepared in accordance with NYSHPO's standards and guidelines. Specifically, the report will include:
  - Results of the background literature review including previous studies;
  - Maps and descriptions of reported archaeological and historic resources within the APE;
  - Research and field survey methods;
  - Tribal consultation history;
  - Discussion of the cultural history of the Project area;
  - Recommendations as to whether a Phase IB archaeological assessment should be conducted;
  - NRHP-eligibility recommendations for the historic structures surveyed; and
  - Section 106 effects assessments (as applicable).

Cultural Resources Study

Deviations from Requested Studies

- FERC requested that Phase IA, Phase IB (if needed), and Phase II (if needed) archaeological studies be completed within one study season. At this time, it is unknown whether Phase IB or Phase II archaeological assessments will be needed and, therefore, would not be completed within one study season. Eagle Creek will propose such studies, if applicable, after consultation with the NYSHPO, the Delaware Nation, and Delaware Indian Tribe on the report for the Phase IA archaeological assessment.

- FERC requested that the Licensee prepare an HPMP as part of the study. At this time, it is unknown whether an HPMP will be needed. If needed, Eagle Creek will prepare an HPMP for inclusion in the Draft and/or Final License Application. The HPMP will be prepared in accordance with the Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects, published by the Commission and the Advisory Council on Historic Preservation (ACHP) on May 20, 2002 and will address the items therein.

Requested Studies Not Adopted

Requested Studies Not Adopted

- Swinging Bridge Spillway Habitat Study
- Bald Eagle Management Study
- Black Brook Dam Removal Study
- Base and Bypass Flow Study
- Socioeconomic Impacts Study

Swinging Bridge Spillway Habitat Study

Discussion

- There is no evidence of a problem and/or the study request is an attempt to search for the existence of a “nexus” (Study Criteria No. 5).
- Study request does not propose a specific methodology, proposes a methodology that is untried or uncertain, or proposed a methodology that will not meet the stated objective or yield the intended results (Study Criteria No 6).
- Study request does not provide an estimate of effort and cost (Study Criteria No. 7).

Bald Eagle Management Study

Discussion

- Study request is not necessary because existing information is sufficient to answer the questions posed (Study Criteria No. 4).
- There is no evidence of a problem and/or the study request is an attempt to search for the existence of a “nexus” (Study Criteria No. 5).
- Study request does not propose a specific methodology, proposes a methodology that is untried or uncertain, or proposed a methodology that will not meet the stated objective or yield the intended results (Study Criteria No 6).
- Study request does not provide an estimate of effort and cost (Study Criteria No. 7).

Additional Information

- Eagle Creek is not proposing any construction or tree-clearing activities associated with the issuance of the new licenses.
- Although Eagle Creek is not adopting this study as requested, Eagle Creek recognizes that personnel will be on-site during other relicensing field studies, which provides Eagle Creek opportunities to collect incidental data while on-site for other field studies. Therefore, Eagle Creek is proposing to document observed bald eagle nest locations, individual sightings, and behavior while on-site for other relicensing field study activities. Whereas this proposal does not include a bald eagle-specific survey or study or any winter surveys, incidental observations of bald eagles will be documented in field logs during field activities. Information obtained during these events will be incorporated into the Aquatic Habitat Assessment Study Report.

Black Brook Dam Removal Study

Discussion

- There is no evidence of a problem and/or the study request is an attempt to search for the existence of a “nexus” (Study Criteria No. 5).
- Study request does not propose a specific methodology, proposes a methodology that is untried or uncertain, or proposed a methodology that will not meet the stated objective or yield the intended results (Study Criteria No. 6).
- Study request does not provide an estimate of effort and cost (Study Criteria No. 7).

Base and Bypass Flow Study

Discussion

- Study request is not necessary because existing information is sufficient to answer the questions posed (Study Criteria No. 4).
- Study request does not propose a specific methodology, proposes a methodology that is untried or uncertain, or proposed a methodology that will not meet the stated objective or yield the intended results (Study Criteria No. 6).
- Study request does not provide an estimate of effort and cost (Study Criteria No. 7).

Socioeconomic Impacts Study

Discussion

- There is no evidence of a problem and/or the study request is an attempt to search for the existence of a “nexus” (Study Criteria No. 5).
- Study request does not propose a specific methodology, proposes a methodology that is untried or uncertain, or proposed a methodology that will not meet the stated objective or yield the intended results (Study Criteria No. 6).
- Study request does not provide an estimate of effort and cost (Study Criteria No. 7).

Informal Study Requests

Informal Study Requests

Geology Study

- The Iroquois Hunting and Fishing Club requested a geology study to identify unique or sensitive physical features on the Toronto Reservoir and adjacent lands. Eagle Creek is not adopting this study because there is a lack of connection between operation of the Toronto Development and an effect on a resource, the study request is an attempt to search for the existence of a “nexus,” when there is no evidence of a problem, and the study would not support development of new license conditions.

Aesthetics Study

- The Iroquois Hunting and Fishing Club requested an aesthetics study for Toronto Reservoir to identify scenic views known to be of importance or value to the area residents. Eagle Creek is not adopting this study as requested. While the study request does not meet FERC’s study criteria, Eagle Creek is proposing to collect information on important scenic views as part of the Recreation Facilities Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment, as well as the Shoreline Management Assessment.

Terrestrial and Aquatic Ecology Study

- The Iroquois Hunting and Fishing Club requested a terrestrial and aquatic ecology study of the Toronto Reservoir. This study was not adopted by Eagle Creek as a stand-alone study, but aspects of this study request have been incorporated into other studies, such as the Aquatic Habitat Mapping Study, Fisheries Survey Study, Macroinvertebrate and Mussel Survey Study, and Water Quality Study.

Informal Study Requests

Water Resources and Wetland Resource Study

- The Iroquois Hunting and Fishing Club requested a water resources and wetland resources study to describe the surface water, ground water, and wetland resources on the site and adjacent area of the Toronto Reservoir. Eagle Creek is not adopting this study as requested. While the study request does not meet FERC's study criteria, Eagle Creek is proposing to collect information on surface water and wetland resources as part of other studies, such as the Aquatic Habitat Mapping Study and Water Quality Study.

Water and Surface Navigability Study

- The Iroquois Hunting and Fishing Club requested a water and surface navigability study to evaluate the existing water surface use patterns in the near-shore area of the Toronto Reservoir including the types and sizes of boats, sailing vessels, and personal watercraft and the general patterns of boat traffic flow using the Toronto Reservoir. While the study request does not meet FERC's study criteria, the types and sizes of boats and patterns of boat traffic flow on a body of water is generally a matter of state regulation and information collected would not inform the development of new license conditions. Eagle Creek, however, is proposing to collect information regarding use of the formal and informal Project recreation sites as part of the Recreation Facilities Inventory, Recreation Use and Needs Assessment, and Reservoir Surface Area Assessment.

Similar Study Requests

Similar Study Requests

Special-Status Wildlife Species and Habitat Assessment

- The Special-Status Wildlife Species and Habitat Assessment was requested by FERC. This study was not adopted by Eagle Creek as a standalone study, but special-status wildlife species and habitat surveying is proposed as part of the Aquatic Habitat Mapping Study.

Special-Status Plant Species and Noxious Weed Assessment

- The Special-Status Plant Species and Noxious Weed Assessment was requested by FERC. This study was not adopted by Eagle Creek as a standalone study, but special-status plant and noxious weed surveying is proposed as part of the Aquatic Habitat Mapping Study.

Wetland Delineation

- The Wetland Delineation was requested by the USFWS and NYSDEC. This study was not adopted by Eagle Creek as a standalone study, but Eagle Creek is proposing to verify National Wetland Inventory (NWI) and NYSDEC mapped wetlands as part of the Aquatic Habitat Mapping Study.

Response to PAD Questions

Response to PAD Questions

June 22, 2017 – Andrew Boyar comment:

The minimum flow is inadequate. Before the construction of these projects, nature did a better job of providing adequate stream flow. Now streams flow is artificially controlled. Complaints in the past that the brook has dried-up have not been responded to, so either:

1. "Min-flows" must be recalculated to prevent dewatering of this important Brook Trout Fishery, or
2. If "min-flows" are correctly calculated, they must be met and adhered to in order to prevent decimation of this fishery by dewatering.

Eagle Creek response:

With the potential exception of one maintenance activity (June 3, 2015 [for 2 hours for a tunnel survey]), Eagle Creek is not aware of any time that the required minimum flows have not been provided or any time that brooks or creeks associated with the Projects have dried up.

Response to PAD Questions

June 28, 2017 – TU comment:

This watershed and the chain of reservoirs, generating stations, and the connecting river and feeder streams constitute remarkable trout habitat. As such, it has been a blue-ribbon Brown and Brook Trout fishery in the past. We have reports of dewatering issues, and dried up streams just when water releases are needed the most. Those problems can be cured with better management practices including aeration valves to increase oxygen content coupled with suitable minimum flow requirements that are consistently met. We have reports of total dewatering which are particularly devastating to the Brook Trout population below both Cliff Lake and Toronto Reservoir. We believe that particular attention should be paid to this Brook Trout habitat.

Eagle Creek response:

Eagle Creek is not aware of occurrences of dewatering of any creeks or brooks associated with the Projects. In addition, Eagle Creek notes that the “blue-ribbon Brown and Brook trout fishery” associated with Black Lake Creek is likely the result of the presence of the Projects, as well as Eagle Creek’s compliance with providing the required 10 cfs minimum flow below Toronto and Cliff Lake Dams. In addition, there is no indication for the need for aeration valves or other modifications to the existing release structures.

Response to PAD Questions

June 28, 2017 – TU comment:

I direct your specific attention to 1 + miles of Black Lake Brook from Toronto Reservoir to Cliff Lake Reservoir and 1 + miles of Black Lake Brook from Cliff Lake Reservoir to the Mongaup River just below the Swinging Bridge Powerhouse. These combined 2+ miles constitute an amazing (but threatened) Brook Trout Fishery. (See attached highlighted location map.) This remarkable fishery merits an adequate "minimum-flow" (these sections require valve releases from both Toronto and Cliff Lake) to prevent the repeated dewatering which has been occurring.

Eagle Creek response:

Eagle Creek is not aware of occurrences of dewatering of any creeks or brooks associated with the Projects.

Response to PAD Questions

June 28, 2017 – TU comment:

The minimum flow is inadequate. Before the construction of these projects, nature did a better job of providing adequate stream flow. Now stream flow is artificially controlled. Complaints in the past that the brook has dried-up have not resolved the problem, so either:

1. "Min-flows" must be recalculated to prevent dewatering of this important Brook Trout Fishery, or
2. If "min-flows" are correctly calculated, they must be met and adhered to in order to prevent decimation of this fishery by Dewatering. Also, installation of aeration valves at both of these impoundments would improve the overall health of the Black Lake Brook.

Eagle Creek response:

Given the natural hydrology of the watershed and the ability of the reservoirs, which were constructed between 1923 and 1939, to provide a flow into Black Lake Creek during drier periods, Eagle Creek questions the statement that “nature did a better job of providing adequate streamflow.”

Response to PAD Questions

July 5, 2017 – Joyce, John, and Travis Caracci comment:
Additionally, I suggest that the access road be made more, "ACCESSIBLE" and the "PRIVATE PROPERTY" signs erected by Eagle Creek be placed elsewhere. The public, especially people in the community have a right to access the road. Thank you for listening to the PUBLIC!!!

Eagle Creek response:
Eagle Creek notes that these signs were erected by a third party and not under the direction of Eagle Creek.

Response to PAD Questions

July 26, 2017 – USFWS comment:

In Section 4.3.1, we recommend including that the Swinging Bridge Dam spillway routes water back into Black Lake Creek, a bypassed reach, not immediately into the Mongaup River.

Eagle Creek response:

- To be included in the application to be filed with FERC.
- Flows over the Swinging Bridge spillway would discharge into Black Lake Creek downstream of the Cliff Lake development, which subsequently discharges into the Mongaup River below the Swinging Bridge Dam. Flows through the Swinging Bridge powerhouse discharge to the Mongaup River.

Response to PAD Questions

July 26, 2017 – USFWS comment:

In Section 4.7, the Applicant indicates that an amendment may be pursued to install a minimum flow unit at the Swinging Bridge Project. The Service is concerned with the timing of this potential amendment as relicensing is intended to be a comprehensive review of the existing Projects. At this time, we recommend pursuing any potential minimum flow unit at Swinging Bridge as part of the relicensing process.

Eagle Creek response:

The Swinging Bridge Project has an existing FERC license scheduled to expire on March 31, 2022. Eagle Creek is currently pursuing authorization for installation and operation of Unit No. 3 through a separate amendment process, as compared to the relicensing process, given the existing contract between Eagle Creek and the New York State Energy Research and Development Authority (NYSERDA) that requires that the new base flow unit be operational by July 31, 2019. The contract is based on Eagle Creek's successful bid for New York renewable energy incentives associated with the development and in support of New York State's Clean Energy Standard (CES) and goal that 50 percent of New York's electricity come from renewable energy sources by 2030. Eagle Creek's proposed minimum base flow unit has been determined by NYSERDA to support both the CES and the State's goal. Based on the contract between Eagle Creek and NYSERDA, if the Unit No. 3 is not operational by July 31, 2019, the NYSERDA contract will become null and void and Eagle Creek will lose the financial deposits paid to New York State to date.

Questions or Follow up

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EAGLE CREEK RENEWABLE ENERGY
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