Relicensing Study 3.5.1

BASELINE INVENTORY OF WETLAND, RIPARIAN AND LITTORAL HABITAT IN THE TURNERS FALLS IMPOUNDMENT, AND ASSESSMENT OF OPERATIONAL IMPACTS ON SPECIAL-STATUS SPECIES

Updated Study Report Summary

Northfield Mountain Pumped Storage Project (No. 2485)

and Turners Falls Hydroelectric Project (No. 1889)

Prepared for:

FirstLight™
GDF SUEZ

Prepared by:

Kleinschmidt

GOMEZ AND SULLIVAN ENGINEERS

NEE

SEPTEMBER 2015

1.1 Study Summary

This study contains multiple elements. In addition to conducting an inventory of wetlands, riparian and littoral zone resources in the Turners Falls Impoundment (TFI), this study contains provisions for assessing Project impacts on state-listed plant species in the TFI, bypass reach and downstream of Cabot Station to the Sunderland Bridge (Route 116), and assessing Project impacts on state-listed invertebrate species that utilize riparian areas downstream of Cabot Station.

The study goals are to characterize and describe the wildlife and botanical resources within the Project Area and assess the potential impacts of Project-related water level fluctuations on identified resources. Field studies conducted in 2014 included:

- Field verification of National Wetland Inventory (NWI) mapped wetland types;
- Field data collection on submerged aquatic vegetation (SAV) and emergent aquatic vegetation (EAV) beds;
- Field data collection on the presences, abundance and extent of invasive species;
- Initial field visits and collection of baseline information on the locations and population parameters of Massachusetts state-listed rare plant species in the TFI and the 13+ miles of riverine habitat below Cabot Station to the Sunderland Bridge;
- Initial data collection on suitable habitat locations for state-listed invertebrate species including the cobblestone tiger beetle and the Puritan tiger beetle.

In 2014, biologists consulted via telephone with Jessie Leddick, Endangered Species Review Biologist with the Massachusetts Natural Heritage and Endangered Species Program (NHESP) on sensitive plant survey efforts to date, proposed survey methods, and the schedule to complete Task 3. NHESP approved rare, threatened and endangered (RTE) project botanist, Steve Johnson PhD, discussed via telephone survey parameters (i.e., survey windows and time per unit area) and methods with NHESP Conservation botanist Karro Frost.

Additional field data collection is occurring in 2015.

1.2 Study Progress Summary

Task 1: Literature Review

Prior to the field reconnaissance surveys, biologists reviewed existing information to identify areas of representative communities and potentially suitable habitat for protected species of interest. Using GIS and other available sources of information, preliminary field maps were produced to assist field surveys. Pre-survey, biologists reviewed life history information and phenology of listed plants with the potential to occur within the Project. This information was used in support of Tasks 2-8.

Task 2 Riparian and Littoral Zone Botanical Survey:

In September of 2014 SAV beds were surveyed from a boat. The perimeter of each mapped SAV bed was surveyed with a Trimble®GPS and information on dominant species and a qualitative estimate of density was made. Common SAV species included eel grass (*Vallisneria americana*), pondweeds (*Potamogeton spp*.), and coon's tail (*Ceratophyllum demersum*). Invasive submerged species identified during the survey included Eurasian milfoil (*Myriophyllum spicatum*), variable-leaf milfoil (*Myriophyllu, heterophyllum*), and curly-leaved pondweed (*Potamageton crispus*). The final report will include mapping of all areas of SAV mapped within the study area.

Emergent vegetation was surveyed and assessed throughout the summer of 2014 and included mapping and photographs. Emergent wetland information collected within the Project area has been included with the assessment of other wetlands (forested and scrub-shrub) which are included in Task 5.

Task 3 Sensitive Plant Survey:

A sensitive-plant survey and biological evaluation of the locations and population parameters of 10 state-listed rare plant species were completed in the TFI and from the Turners Falls Dam downstream to the Sunderland Bridge. Steven Johnson PhD, assisted with field surveys and providing technical expertise with this task. A data release agreement (DRA) with NHESP was completed in November 2013 to gather initial environmental occurrence (EO) of sensitive plants within the study area.

Initial river reconnaissance to identify potential suitable habitat for state-listed species at both NHESP historic EO's and at new sites that have potential habitat for these 10 targeted state-listed plant species (but were otherwise unoccupied at the time of the survey) was completed in June 2014. An application for a scientific collection permit was submitted to the Massachusetts Wildlife Division of Fisheries and Wildlife (MDFW) on June 30, 2014 prior to completing surveys in 2014.

Presence / absence surveys maps were generated in 2014 showing locations of suitable but otherwise unoccupied RTE plant habitat, occupied RTE plant habitat, historic EO, and proposed plant survey transects. Using these maps FirstLight will be consulting with NHESP for concurrence on final selection of plant transects which will be surveyed in August and September of 2015.

Task 4: Invasive Plant Survey

Biologists used a Trimble GPS at sub-foot accuracy to delineate the boundary of each infestation of invasive plant communities. Areas containing only single occurrences or small stands of invasive species were characterized with a GPS center point and radius necessary to enclose the population. For areas where invasive species are ubiquitous or impractical to map along the shoreline, surveyors characterized the invasive species population qualitatively using estimates of aerial coverage and percent of species present. Results from this work will be included in the riparian survey report (Study No. 3.4.1 *Baseline Inventory of Terrestrial Wildlife and Botanical Resources*). The most commonly occurring invasive species identified included common reed (*Phragmites australis*) and oriental bittersweet (*Celastrus orbiculatus*). Maps and descriptions of data will be included in the final report.

Task 5: Mapping of Wetlands and Waters of the United States

Within the TFI and up to 200 feet from the TFI shoreline, NWI mapped wetlands were field verified and described. Table 1 includes a summary of wetland acreage identified within the study area as well as representative species for each wetland type. A total of 117.9 acres of palustrine wetlands were identified. Information collected has been transferred to the GIS database to provide the foundation for the development of a map of the location, type, extent and photo of each wetland feature within the study area. This information will be included in the final report.

Table 1. Summary of Wetlands Identified in the Study Area.

Wetland Type	Representative Species[1]	Acres
Palustrine Emergent	pickerel weed, cattail, sedges, and rushes	66.2
Palustrine Forested	cotton wood, silver maple, red maple	49.2
Palustrine Scrub-Shrub	dogwoods, willow, and speckled alder	2.6
Total		**117.9**

[1]Scientific names and full detailed descriptions of wetland habitats will be included in the final report.

Task 6 (a/b): Project Water Level Fluctuation Assessment

In 2014 topographic survey transects were completed using an RTK survey unit at Rainbow Beach and the North Bank. A total of 24 transects were established at Rainbow Beach and four transects were established at the North Bank (Figure 1 and 2). Elevations within the beetle habitat at both Rainbow Beach and the North Bank ranged from 100.84 feet to 115.90 feet (NGVD 29). This elevation data will be used along with the results of the hydraulic modeling (Study No. 3.2.2 *Hydraulic Study of Turners Falls Impoundment, Bypass Reach and below Cabot*) to evaluate the potential effect of the Project-related water level fluctuations on Puritan and cobblestone tiger beetles.

Analysis of water level fluctuations on tiger beetles is currently underway using results from Study No. 3.2.2.

Task 7: Data Analysis

The final portion of the field studies are being completed in August and September of 2015. Data analysis will be finalized following field data collection and reported in the final report.

Task 8: Reporting

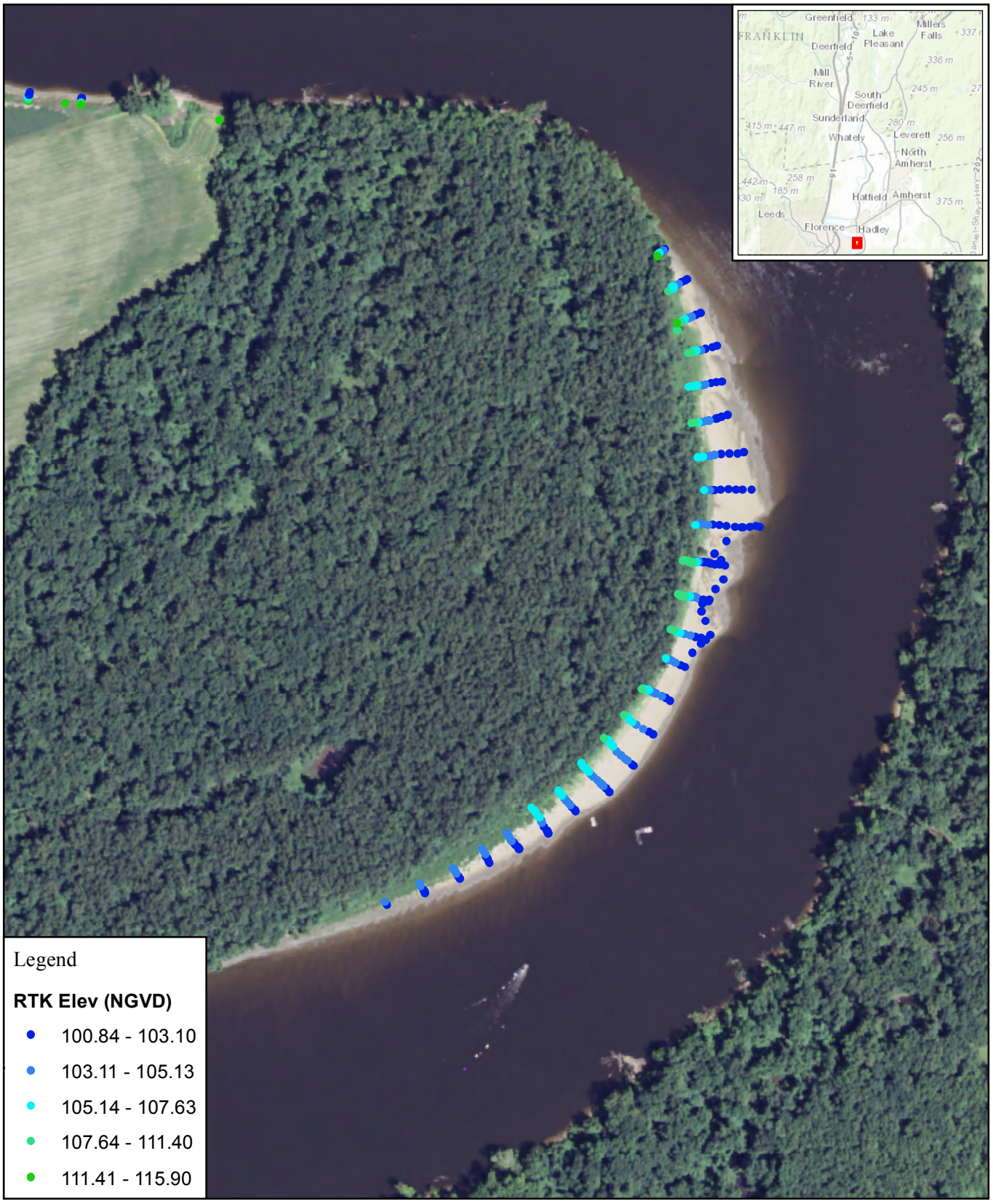
Work has begun on the report, which will be updated based on the 2015 field data collection. The report will be completed by December 31, 2015.

1.3 Variances from Study Plan and Schedule

Higher than normal river flows inundated habitats for prolonged periods of time during the 2014 survey period. Because of the high spring river flow, field studies originally scheduled to begin in early May were delayed until early June when river flows were both safer and lower to expose habitats. As a result of higher than average flows, tiger beetle surveys were delayed from the original projected survey window of early July 2014 to mid -late August 2014. Because of the delayed start, topographic surveys of habitats supporting RTE plants were not able to be completed in 2014. The work is scheduled for August and September of 2015.

1.4 Remaining Activities

- Complete topographic surveys of RTE plant habitat (August-September 2015).
- Finalize mapping of SAV and wetland data (September-October 2015).
- Finalize Study Report.



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Study No. 3.5.1
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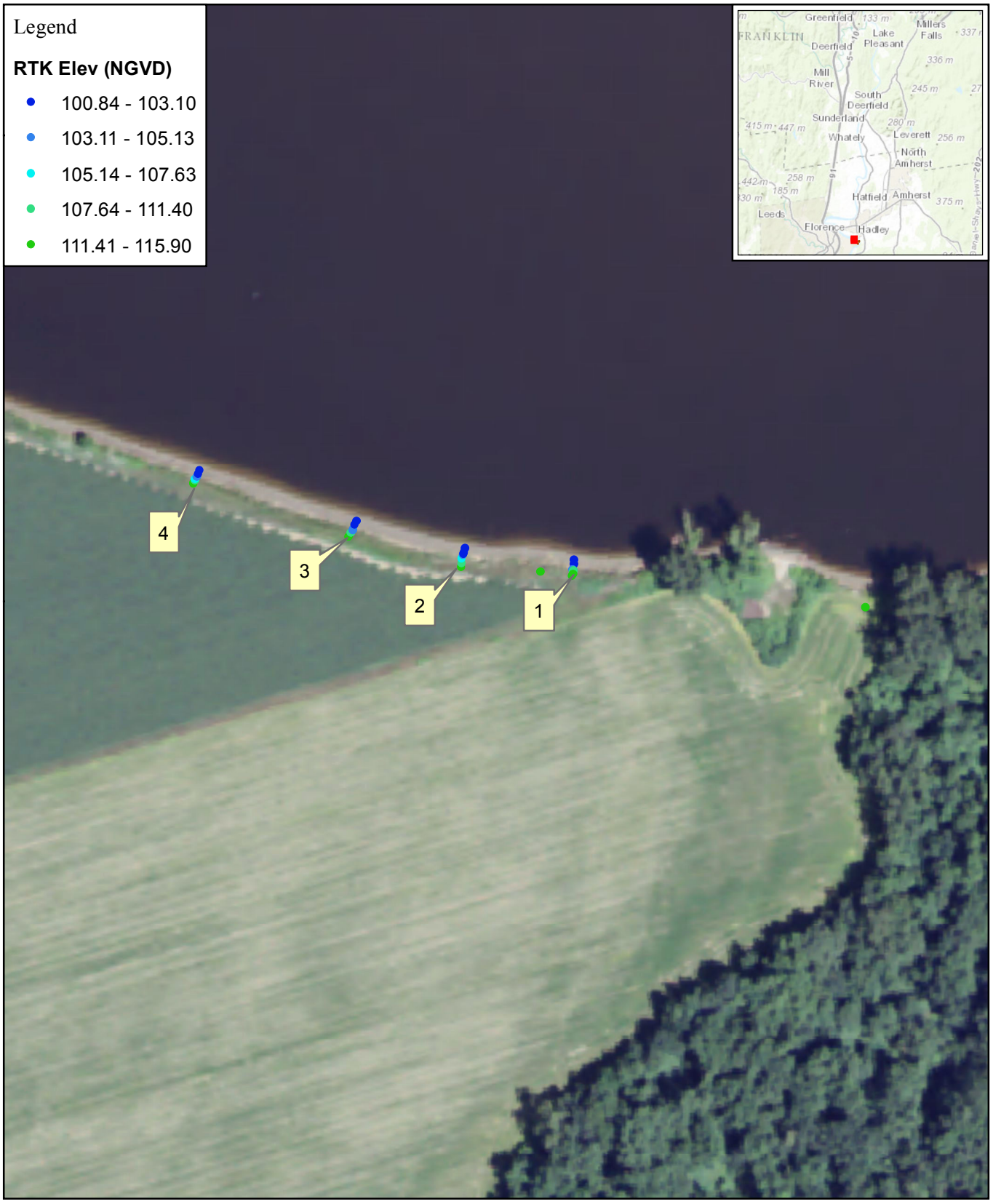
N

0 0.0375 0.075 0.15
Miles

FIGURE 1.
RAINBOW BEACH
TRANSECT LOCATIONS

Path: W:\gis\studies\3_5_1\maps\Beetle_RainbowBeachRTK.mxd



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N

0 0.0175 0.035 0.07
Miles

FIGURE 2.
NORTH BANK
TRANSECT LOCATIONS

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