Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

January 6, 2014

Mr. John S. Howard
Director - FERC Hydro Compliance
FirstLight Hydro Generating Company
Northfield Mountain Station
99 Millers Falls Road
Northfield, MA 01360

COMMENTS
Northfield Mountain Pumped Storage Project No. 2485
Turners Falls Project No. 1889
Draft Modified Revised Study Plan, Study No. 3.5.1 (Baseline Inventory of Wetland, Riparian and Littoral Habitat in the Turners Falls Impoundment, and Assessment of Operation Impacts on Special Status Species)

Dear Mr. Howard,

The Massachusetts Division of Fisheries and Wildlife (Division) is the agency responsible for the protection and management of the fish and wildlife resources of the Commonwealth of Massachusetts. The Division is also responsible for the regulatory protection of imperiled species and their habitats as codified under the Massachusetts Endangered Species Act (M.G.L. c.131A). The Massachusetts Endangered Species Act (MESA) was enacted in December 1990. Implementing regulations (321 CMR 10.00) were promulgated in 1992 and recently revised and implemented as of November 2010. The MESA provides a framework for review of projects or activities that occur within mapped areas of the state, called *Priority Habitat*, and published in the Natural Heritage Atlas. As such, we monitor operations at hydroelectric projects within the Commonwealth, as well as comment on proposed hydroelectric facilities. The Division would like to offer the following comments in response to the December 6, 2013 submission of FirstLight Hydro Generating Company's "Draft of Modified Study Plan, Study No. 3.5.1 (Baseline Inventory of Wetland, Riparian and Littoral Habitat in the Turners Falls Impoundment, and Assessment of Operation Impacts on Special Status Species)" (hereinafter, the "MRSP") for the Turners Falls Hydroelectric Project (P-1889) and Northfield Mountain Pumped Storage Project (P-2485).

Comments:

Please note that all page references herein refer to the 'Track Changes' version of the MRSP sent via email to Division staff on 12/9/2013 by Jason George of Gomez & Sullivan Engineers, PC.

Further, the Division shall be notified, in the form of a Massachusetts Rare Animal, Plant, or Vernal Pool Observation Form, of any state-listed species or vernal pools observed during field surveys associated with any field work referenced within the MRSP. FirstLight can take

advantage of the Division's new data submittal tool, the Vernal Pool & Rare Species Information System (VPRS):

http://www.mass.gov/dfwele/dfw/nhesp/species_info/vprs_home.htm

Existing Information and Need for Additional Information

1. In the third paragraph of page 7, the MRSP notes that Omland (2002) and Abbot (2003a) describe suitable habitat for the Puritan Tiger Beetle as "sparsely vegetated beaches at least 50m long and 5m wide…" The Division notes that in Massachusetts, Puritan Tiger Beetles have been observed in patch sizes that are smaller than those referenced by Omland (2002) and Abbot (2003a) and thus utilizing such large patch size parameters would miss critical suitable habitat for the Puritan Tiger Beetle. The Division would therefore suggest that the minimum beach dimensions used to define suitable habitat for Puritan Tiger Beetle be revised to *20m long* and 5m wide to be consistent with habitat observation in Massachusetts.

Task 3: Sensitive Plant Survey

1. In the third paragraph of page 15, the MRSP suggests that information from the 2-D hydraulic model and transect information from the IFIM study will be used to evaluate hydraulic conditions within the bypass reach and in the vicinity of Cabot Station. We believe that this approach will provide sufficient data to enable a thorough understanding of hydraulic conditions within these areas.

2. In the second paragraph of page 15, the MRSP suggests that up to fifteen (15) transects will be established at a combination of occupied and unoccupied sites within the Turners Fall Dam Impoundment and downstream of Cabot Station to the Route 116 Bridge in Sunderland. The Division supports this revision to the study plan, but would suggest further modifying the MRSP in order to more clearly articulate transect placement to the greatest extent feasible in advance of habitat assessments and field surveys, primarily in terms of how the transects are distributed.

   Occupied/Known Sites: As noted in the MRSP, seven of the ten identified state-listed plant species are known to occur within the bypass reach and areas in the vicinity of Cabot Station (see Table 1, attached to this letter). The Division concurs that the state-listed plants within the bypass reach and areas in vicinity of Cabot Station will be sufficiently studied as described in the third paragraph of page 15 and amended as noted above in #1 and 2. However, there are five additional, distinct sites in which state-listed plants are known to occur and will not be sufficiently represented if not directly studied. These sites include Pauchaug Brook, one island in the town of Deerfield ("Deerfield Island"), and three islands in the town of Sunderland ("Sunderland Island, North", "Sunderland Island, Central", and "Sunderland Island, South"). Understanding the hydrology within these known locations is the first and most important step in understanding and developing habitat suitability parameters of target state-listed plants as well as the relationship of these parameters to project operations. Therefore, the Division would recommend placing eight (8) of the fifteen (15) proposed transects within these additional areas as described in Table 2. Such a distribution of transects should allow accurate modeling of hydraulic conditions with some degree of within-species replication at each known state-listed plant sites.

Table 2: Recommended distribution of eight (8) transects at knonw state-plant locations. Exact locations to be determined in consultation with the Division.

Location name Key	# Transects
Pauchaug Brook	2
Deerfield Island	1
Sunderland Island, North	1
Sunderland Island, Central	2
Sunderland Island, South	2

Because several species are known to occur in only a single location (including *Alnus viridis ssp. crispa*, *Eleocharis diandra*, *Oligoneuron album* and *Symphyotrichum tradescantii*), the Division would also suggest placement of additional transects *if* additional occupied sites for these species are identified outside of known areas. If available, understanding the hydrology at more than one location would help increase the accuracy of estimated habitat suitability parameters.

Unoccupied, Suitable Sites: Additionally, the Division would recommend placing at least eight (8) transects in unoccupied, otherwise suitable sites identified during habitat assessment and field survey activities. This would account for the remaining seven (7) transect plus increase the total number by one. In an effort to ensure sufficient coverage of suitable habitats, the Division notes that the ten target state-listed plant species inhabit four (4) relatively distinct habitat types (in which multiple species overlap), as further described in Table 2, below. Assuming that a sufficient number of sites are identified for each habitat type, the Division would recommend placing a minimum of two (2) transects within suitable habitats of each habitat type (e.g., one transect at each of two distinct sites for each habitat type provided below).

Table 3: Recommended distribution of additional eight (8) transects within unoccupied, otherwise suitable sites of state-listed plants by habitat type. Exact locations to be determined in consultation with the Division.

Habitat Key	Habitat Description	State-listed Plant Species	# Transects
A	Ledgy, cobbly beaches with zone of river scour; upstream points of islands	• *Deschampsia cespitosa ssp. glauca* • *Prunus pumila var. depressa* • *Salix exigua ssp. interior*	2
B	Open sandy/silty river banks	• *Eleocharis diandra* • *Eleocharis intermedia* • *Eleocharis ovata*	2
C	Exposed ledge outcrops within spring high water zones	• *Oligoneuron album* • *Symphyotrichum tradescantii*	2
D	Rock ledges and cobbly, gravelly shores	• *Alnus viridis ssp. crispa*	2

In advance of survey results, the Division would preliminarily recommend that these eight transects be distributed as evenly as possible between Cabot Station and the Route 116 Bridge in Sunderland, and/or if available, upstream of the Pauchaug Brook site.

However, should field surveys identify one or more of the distinct habitat types outlined above within the Turner's Falls Dam Impoundment south of Pauchaug Brook, the Division would recommend additional consultation in order to identify the most suitable transect locations.

In total, the Division is agreeing to the proposed fifteen transects with a single transect added relative to those proposed in the MRSP: eight (8) in the *known* named sites outside of the bypass reach/ vicinity of Cabot Station per Table 2, and eight (8) in *unoccupied, suitable* sites distributed evenly between Cabot Station and the Route 116 Bridge in Sunderland stratified by habitat type per Table 1& 3. This yields an increase by one transect for a total of sixteen (16) transects.

3. In the fourth paragraph of page 14, the MRSP suggests that, with regard to field surveys, "data [to be] collected will include qualitative assessment of the habitat quality (e.g., invasive plants present / erosion / high recreation area, etc.) and where plant species are observed, the overall plant community health and vigor." In the second paragraph of page 16, the MRSP continues that other data to be collected during field surveys will include the "spatial extent of the population, the number of individuals (or visual estimates thereof), substrate type, and spatial extent of potentially suitable habitat (even if unoccupied)."

   Data collection should also include the vertical elevation of each plant observed (the elevation at the point where the plant emerges from the substrate) and, in cases where more than one plant is observed (e.g., a population), the maximum and minimum elevations occupied by the population should be measured. Data collection should also include substrate (including particle size, soil texture, and percent cover), percent slope, aspect, maturity/life stage of observed individuals, and "clumpiness" (see metrics used by Invasive Plant Atlas of New England or similar). Finally, evaluations of plant vigor are typically susceptible to high inter-observer bias and would suggest that the MRSP be updated to describe how this will be controlled for.

4. The Division understands that this as well as other study plans will collectively require extensive on-the-ground surveys. Field work related to the 2-D hydraulic model within Reach 3 and in the vicinity of Cabot Station, where seven of the ten target state-listed plant species are known to exist, are likely to be particularly extensive. Therefore, the Division would recommend that the MRSP be updated to include plans for avoiding and minimizing the potential for inadvertent "take" of state-listed plants and their habitats during on-the-ground field surveys (all studies). Field-survey personnel should avoid cutting and, to the greatest extent practicable, minimize trampling of vegetation in known habitats for state-listed plants. The Division also recommends that field personnel be provided educational materials regarding the location of critical habitats and, when useful to field personnel, that state-listed plants and critical habitats be delineated on-the-ground. We look forward to working together to describe a suitable approach to minimizing this potential.

Task 4: Invasive Plant Survey

In addition to the nine (9) invasive plant species specifically referenced in the MRSP, Table 3.5.1-2 should be updated to include three (3) additional non-native species, including *Alnus glutinosa* (European Alder), *Salix purpurea*, and *Salix exigua* (not *ssp. interior*). It is our understanding that these non-native species were previously planted by FirstLight and/or its contractors within the

Turners Falls Dam Impoundment as part of a bank stabilization project (NHESP No. 01-9378, EOEA No. 14286) required under the existing FERC license.

Task 6a: Tiger Beetle Habitat Field Evaluation

1. In the fourth paragraph of page 20, the MRSP suggests that "on the ground reconnaissance surveys in the known and historic locations of beetle habitat and survey (both horizontal and vertical control) the microhabitat" will be completed. The MRSP continues that "field assessments will occur from Cabot Station downstream to the vicinity of Rainbow Beach at five (5) occupied and historical areas to identify potential habitat locations…" The MRSP also states that a qualified beetle biologist will float down the river to identify potentially suitable habitat, but that any identified beaches need to be within 1-2 km of Rainbow Beach because research suggests that Puritan Tiger Beetles don't move farther than that.

   Identifying the location and extent of potential habitat (both occupied and unoccupied) is a necessary first step in understanding how project operations may impact both species and their ability to persist. The Division believes that currently unknown but potentially suitable habitats may exist for both species, and note that dispersal over distances greater than 1-2km is known for many tiger beetles; Kapitulik (2008), reporting on the 2007 season, reported a re-capture of a marked Puritan Tiger Beetle over 1 mile north of Rainbow Beach (where it was initially marked). As further outlined in comments submitted by USFWS on December 26, 2013, if assessments show that project operations impact known historic or present habitats, a potential mitigation strategy – in addition to evaluating whether changes to project operations could minimize those impacts – might include assessing the feasibility of introducing both species into potentially suitable habitats beyond those that might be available through natural colonization. Therefore, we recommend that habitat assessments for both species be conducted by a qualified biologist to identify *all* potentially suitable habitats.

2. In the fifth paragraph of page 20, the MRSP suggests that, to assess microhabitat variables for Puritan Tiger Beetle, one transect will be placed at each of five known habitat locations (including Rainbow Beach, three upstream sites, and one downstream site). The Division notes that pre-determining a specific number of transects within each site, in advance of conducting field assessments, may not yield an accurate and representative assessment of variability within potentially suitable habitats. For example, for a site with no significant variation in habitat – as measured with respect to slope or grain/particle size – one transect may be sufficient to model the hydrology of the site. However, multiple transects may be required if a site exhibits significant within-site variability in slope or grain size. Therefore, the Division would recommend that the number and location of transects within each of the five known sites be determined after habitat assessments have been conducted, in consultation with the Division and USFWS.

   In the second paragraph of page 21, the MRSP suggests that "biologists will boat down the river stopping at each vegetated beach that is at least 5m wide and 50m long…" As outlined above, the Division would suggest that the minimum beach dimensions used to define suitable habitat for Puritan Tiger Beetle be revised to 5m wide and *20m long*. (See comments above, "Existing Information and Need for Additional Information".

3. The Division notes that this section does not explicitly propose to locate transects within *suitable, unoccupied* habitats for the Cobblestone Tiger Beetle. In the second paragraph

under Task 6b, the MRSP confirms that, instead, the Proponent will "utilize the 2-D model data that will be developed as part of the IFIM Study No. 3.3.1" to collect information necessary to model hydrology at the single location known to currently support the Cobblestone Tiger Beetle. Although the Division supports this approach within the *known* site, the Division believes that other potentially suitable habitats may exist for the Cobblestone Tiger Beetle that are not currently known. As provided above, we recommend that a habitat assessment be conducted in order to identify *all* potentially suitable habitats for this species. Additionally, we recommend that fine-scale assessment of hydrology and other factors should occur at a minimum of four (4) additional occupied/unoccupied sites (if available). As described above, the number and location of transects at each selected site should be determined in consultation with the Division.

Task 6b: Water Level Fluctuation Evaluation

4. As further outlined in comments submitted by USFWS on Thursday, December 26, 2013, the MRSP suggests that model outputs will include model transects showing water surface elevation. Although the change in water surface elevation is of primary importance in evaluating the potential impact of project operations on tiger beetle habitats, we are also interested in the duration and frequency of elevational changes. Therefore, the Division requests that FirstLight provide (in tabular or graphic format) the amount of time and how often a given water surface elevation (e.g., base flow, peak generation, etc.) occurs based on historical project operations during the period(s) of interest. This analysis should not require collection of any additional field data, but instead, incorporate the appropriate time-step output from historical project operations data into the model.

Thank you for this opportunity to comment. If you have any questions regarding this letter, please contact Jesse Emerson Leddick, Endangered Species Review Biologist, at (508) 389-6386 or jesse.leddick@state.ma.us.

Sincerely,

Thomas W. French

Thomas W. French, Ph.D.
Assistant Director for the Natural Heritage & Endangered Species Program

Attachment (1): *Table 1: Location of state-listed plants by site and habitat class based on known sites.*

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Table 1: Location of state-listed plants by site and habitat class based on known sites grouped by habitat class. The "x" indicates a known occurrence of the indicated plant. The lettered habitat class, A-D, matches that defined and used in Table 3, and is repeated for convenience: A, ledgy, cobbly beaches with zone of river scour, upstream points of islands; B, open sandy/silty river banks; C, exposed ledge outcrops within spring high water zones; D, rock ledges and cobbly, gravelly shores.

Scientific Name	Common Name	Bypassed Reach & Cabot Station	Pauchaug Brook	Deerfield Island	Sunderland Island, North	Sunderland Island, Central	Sunderland Island, South	Total Sites / Species	Habitat Class
Deschampsia cespitosa ssp. glauca	Tufted Hairgrass	x		x		x		3	A
Prunus pumila var. depressa	Sandbar Cherry	x		x			x	3	A
Salix exigua ssp. interior	Sandbar Willow	x		x				2	A
Eleocharis diandra	Wright's Spike-rush		x					1	B
Eleocharis intermedia	Intermediate Spike-sedge		x			x	x	3	B
Eleocharis ovata	Ovate Spike-sedge		x		x			2	B
Eragrostis frankii	Frank's Lovegrass	x	x			x		3	B
Oligoneuron album	Upland White Aster	x						1	C
Symphyotrichum tradescantii	Tradescant's Aster	x						1	C
Alnus viridis ssp. crispa	Mountain Alder	x						1	D

Document Content(s)