



May 11, 2017

**VIA ELECTRONIC FILING**

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

Re: FirstLight Hydro Generating Company, Turners Falls Hydroelectric Project (FERC No. 1889) and Northfield Mountain Pumped Storage Project (FERC No. 2485).  
Status of Additional Data Required by February 17 Study Plan Determination Letter

Dear Secretary Bose:

On February 17, 2017 FERC issued its Study Plan Determination Letter on 10 reports filed by FirstLight Hydro Generating Company (FirstLight) as part of the relicensing of the Turners Falls Hydroelectric Project (TF Project, FERC No. 1889) and Northfield Mountain Pumped Storage Project (NMPS Project, FERC No. 2485). In its Determination Letter, FERC requested FirstLight conduct follow-up work on two studies as discussed below.

**Study No. 3.3.1 Instream Flow Studies in Bypass Channel and below Cabot Station**

In its Determination Letter, FERC required FirstLight to consult with agencies in developing habitat suitability index (HSI) curves for Sea Lamprey spawning (based on the findings from Study No. 3.3.15). As part of Study 3.3.15, FirstLight collected depth, velocity and substrate data at five Sea Lamprey spawning locations including three in tributaries- Fall River, Millers River and Ashuelot River and two on the Connecticut River mainstem—near the Hatfield “S” Curve located below Cabot Station and just below the Vernon Project. FERC stated “*Because this site-specific habitat data is specific to the project area and would be useful for adjusting or verifying the HSI curves taken from the literature, we recommend FirstLight consult with the agencies and use the data collected at documented sea lamprey spawning sites in study 3.3.15 to make adjustments to (or verify) the literature-based curves. If use of this data result in adjustments to the HSI curves, we recommend that FirstLight incorporate the new curves into the PHABSIM model and produce revised estimates of WUA for sea lamprey spawning in the bypassed reach and downstream of Cabot Station and file an addendum to the study by May 15, 2017*”.

On March 16, 2017, FirstLight held its study report meeting on five studies that had been filed with FERC on March 1, 2017. In the agenda for the March 16, 2017 meeting, FirstLight indicated it would also like to consult with stakeholders on a method of developing the Sea Lamprey spawning HSI curves. Based on feedback at the meeting, it was agreed that FirstLight would develop two sets of HSI curves based on a) using all five Sea Lamprey spawning locations and b) using only the two spawning locations on the Connecticut River mainstem.

Following the March 16<sup>th</sup> meeting, on April 12, 2017 FirstLight emailed stakeholders a memo that included three sets of HSI curves based on a) using all five Sea Lamprey spawning locations, b) using only the two spawning locations on the Connecticut River mainstem and c) using only the two spawning locations (Hatfield S curve and Fall River) where ammocoetes were documented. FirstLight requested comments on the memo by April 21, 2017.

**Douglas Bennett**

Acting Plant Manager- Massachusetts Hydro  
FirstLight Power Resources, Inc.  
99 Millers Fall Road  
Northfield, MA 01360  
Tel. (413) 659-4489/ Fax (413) 659-4459  
E-mail: douglas.bennett@firstlightpower.com

As of today's filing, the Sea Lamprey spawning HSI curves have not been finalized as consultation is still ongoing. All correspondence to and from stakeholders is included in [Attachment A](#) (including the memo). Because the HSI curves have not been finalized FirstLight has not run the new curves through the PHABSIM modeling. FirstLight proposes to file the revised estimates of weighted usable area in the bypass reach and downstream of Cabot Station within 60 days of reaching agreement of the HSI curves.

Study No. 3.3.15 Assessment of Adult Sea Lamprey spawning within the Turners Falls Project and Northfield Mountain Project

In FERC's Determination Letter, there was discussion about the potential exposure of sea lamprey redds under low flow conditions compared to the higher flow conditions that occurred between June 19 – July 10, 2015 (the study period). In its Determination Letter FERC required FirstLight to “consult with the stakeholders and establish parameters for a low-flow scenario or scenarios and then run the hydraulic model for the selected low-flow scenarios. These modeling results should be used to describe, in an addendum to be filed by May 15, 2017, inundation and exposure of the locations where the 29 redds were documented. “

On April 12, 2017 FirstLight emailed stakeholders with the following:

- Sea lamprey were documented at the Hatfield S Curve, Stebbins Island, and three tributaries- Fall River, Millers River and Ashuelot River.
- No hydraulic model exists for the Fall, Millers and Ashuelot Rivers so it is not possible to determine the impact of Project operations on these redd locations.
- In addition, for the hydraulic model below the Montague USGS Gage, there is no transect located at the Hatfield S Curve, thus it is not possible to assess this location (the same was noted in the Study 3.3.15 Report).
- FirstLight proposes to assess the six (6) redds that were located near Stebbins Island to determine if they become exposed.
- To conduct this analysis, FirstLight proposes to develop an elevation duration curve using simulated water level data from the HEC-RAS hydraulic model at the redd location for the period 2000-2015. Thus, the hydraulic model would be operated in an unsteady mode and would simulate on an hourly basis the water level at Stebbins Island for the period May 20 to July 31 (the assumed Sea Lamprey spawning period).
- From these data, an elevation duration curve would be developed and the elevations of the redds at Stebbins Island shown—similar to that provided in Appendix A of the Sea Lamprey Report.

As of today's filing, comments on the above approach have been not been received. FirstLight proposes to file the proposed analysis within 60 days of reaching agreement on the approach.

If you have any questions regarding the above, please do not hesitate to contact me. Thank you for your assistance in this matter.

Sincerely,



Douglas Bennett  
Acting Plant Manager

Attached: Attachment A- Correspondence related to Sea Lamprey HSI Curves

**ATTACHMENT A:**  
**CORRESPONDENCE RELATED TO SEA LAMPREY HSI CURVES**

## **Proposed Sea Lamprey HSI Curves from Sea Lamprey Study (Study 3.3.15)**

### **Background**

On October 14, 2016, FirstLight filed Study No. 3.3.15 *Assessment of Adult Sea Lamprey Spawning within the Turners Falls and Northfield Mountain Project Area* with FERC. After holding a study plan meeting, receiving stakeholder comments on Study No. 3.3.15, and FirstLight responding to comments, FERC issued its Determination on Requests for Study Modifications and New Studies on February 17, 2017. Relative to the Sea Lamprey spawning habitat suitability index curves, the Determination Letter stated:

*FirstLight followed the methodology of the approved study plan by using HSI curves from the literature, which were chosen in consultation with stakeholders. However, data collected during study 3.3.15 describes habitat used by spawning sea lamprey in the project area and could be used to adjust or verify the HSI curves used in Study 3.3.1<sup>1</sup>. HSI curves based on site-specific data would likely represent spawning lamprey habitat preferences in the project area more accurately than the curves taken from the literature. We expect that incorporating this information would require some consultation with stakeholders and potentially rerunning the PHABSIM model, but we would not expect this to be a costly effort (section 5.9(b)(7)). Because this site-specific habitat data is specific to the project area and would be useful for adjusting or verifying the HSI curves taken from the literature, we recommend that FirstLight consult with the agencies and use the data collected at documented sea lamprey spawning sites in study 3.3.15 to adjust (or verify) the literature-based HSI curves. If use of this data results in adjustments to the HSI curves, we recommend that FirstLight incorporate the new curves into the PHABSIM model and produce revised estimates of WUA for sea lamprey spawning in the bypassed reach and downstream of Cabot Station and file an addendum to the study by May 15, 2017.*

### **Introduction**

As noted above, during the 2015 field work for Study No. 3.3.15 FirstLight empirically documented that Sea lamprey spawning redds were formed at depths and velocities outside of the published habitat suitability index values (HSI) recommended by the agencies and stakeholder in the Turners Falls IFIM study (Study 3.3.1). At the request of stakeholders and FERC, FirstLight incorporated these new data to refine the HSI criteria, and provide new Category II utilization curves. The five spawning sites monitored during this study for velocity and depth included Stebbins Island (mainstem site), Ashuelot River, Millers River, Fall River and the Hatfield S curve (mainstem site) (see Figure 1 for Lamprey Redds locations).

At a March 16, 2017 meeting to discuss other study results, FirstLight presented a method to develop Category II utilization curves for Sea Lamprey spawning and incubation. FirstLight indicated at the meeting it would develop two sets of HSI curves for depth and velocity. One set would include all five study sites; the other would include only the two mainstem sites.

### **Methods**

FirstLight created frequency histograms from depth and velocity values obtained from Study No. 3.3.15. FirstLight did not incorporate changes to substrate criteria, because the data matched the existing criteria (a mix of gravel and cobble at spawning sites). The frequency histograms for velocity and depth were then converted to probabilities and normalized so the probability of the bin with the highest frequency was 1.0. Then, the inflection points were identified using professional judgement, and drafted habitat suitability curves.

---

<sup>1</sup> Study 3.3.15 documented depth, velocity and substrate at a total of 29 sea lamprey redds (spawning sites).

Histograms were created for velocities and depths at all sites (including tributaries), and two subsets, including: only the mainstem Connecticut River sites, and only those sites where lamprey were observed to be on the nest during observation periods. The Hatfield and Fall River sites captured ammocoetes, therefore all depth and velocity measurements were used from these sites to produce the lamprey presence curves. The other three sites (Ashuelot, Stebbins Island and Millers River) did not capture any ammocoetes, but any presence of Lamprey was noted in the data and only data from those dates were used in the Lamprey presence curves.

## **Results**

Figures 2-9 provide results. Figure 2 includes the frequency of all velocity measurements throughout the 2015 study binned into 0.5 ft/s increments as noted on the x-axis; Figure 3 depicts velocities recorded at all mainstem redds; Figure 4 provides data from redds where the presence of lamprey was confirmed. Figures 6, 7, and 8 provide the same respective information for depth observations.

Velocity selection ranged from 0.49 (n =22) to 5.49 ft /sec. (n= 2) for data collected at all sites, with the modal velocity selected being 1.5-1.99 ft/sec. (Figure 2) For those nests with confirmed lamprey present (n=38) velocities selected by fish ranged from 0-0.49 (n=7) up to 2.99 (n=2) with a modal value of 0.5 - 0.99 (n = 12) (Figure 4).

Depth selection ranged from 0.5 (n= 7) to 8.99 (n =2) ft. for data collected at all sites, with the modal depth selected being 1.5-1.99 (n=37) ft/sec. (Figure 6) For those nests with confirmed lamprey present, depths selected by fish ranged from 0.5-0.99 (n=6) up to 7.99 (n=1) with a modal value of 1.5 -1.99 (n = 9) (Figure 8).

Figure 5 compares potential HSI criteria for velocity for all sites, Connecticut River mainstem sites, and sites where lamprey were present on redds to the existing criteria used in study 3.3.1; Figure 9 provides the same respective information for depth suitability.

## **Discussion**

The use of data sets based on redds where spawning fish were directly observed could potentially be considered the most conservative set of data as fish were empirically observed as using the site. However, these data rely on a relatively small sample size. To increase sample size, the other two data sets were also considered. The largest data set were the observations obtained from all sites, however, this set also includes records from tributaries where relative stream channel size and available ranges of depths and velocities do not reflect full range of physical conditions found in the larger and deeper Connecticut mainstem. Inclusion of tributary data points would therefore potentially introduce a bias to the results. Use of the data sets obtained from all mainstem sites has the advantage of relying on a reasonable sample size (n=46). The fact that some of these nests did not necessarily include observed adult lamprey is not necessarily a disqualifying consideration, as the redd creation in such circumstances likely occurred prior to the survey date, and those redds were already in incubation when detected by the survey. If the assumption can be made that redd formation was evidence of a volitional habitat use decision made by adult lamprey, then this data set provides a reasonable sample size to characterize depth and velocities selected by the species.

## **Recommendation**

It is recommended that the data set based on all mainstem observations be relied on to revise the depth and velocity criteria for the Sea Lamprey spawning HSI criteria.

# FIGURES

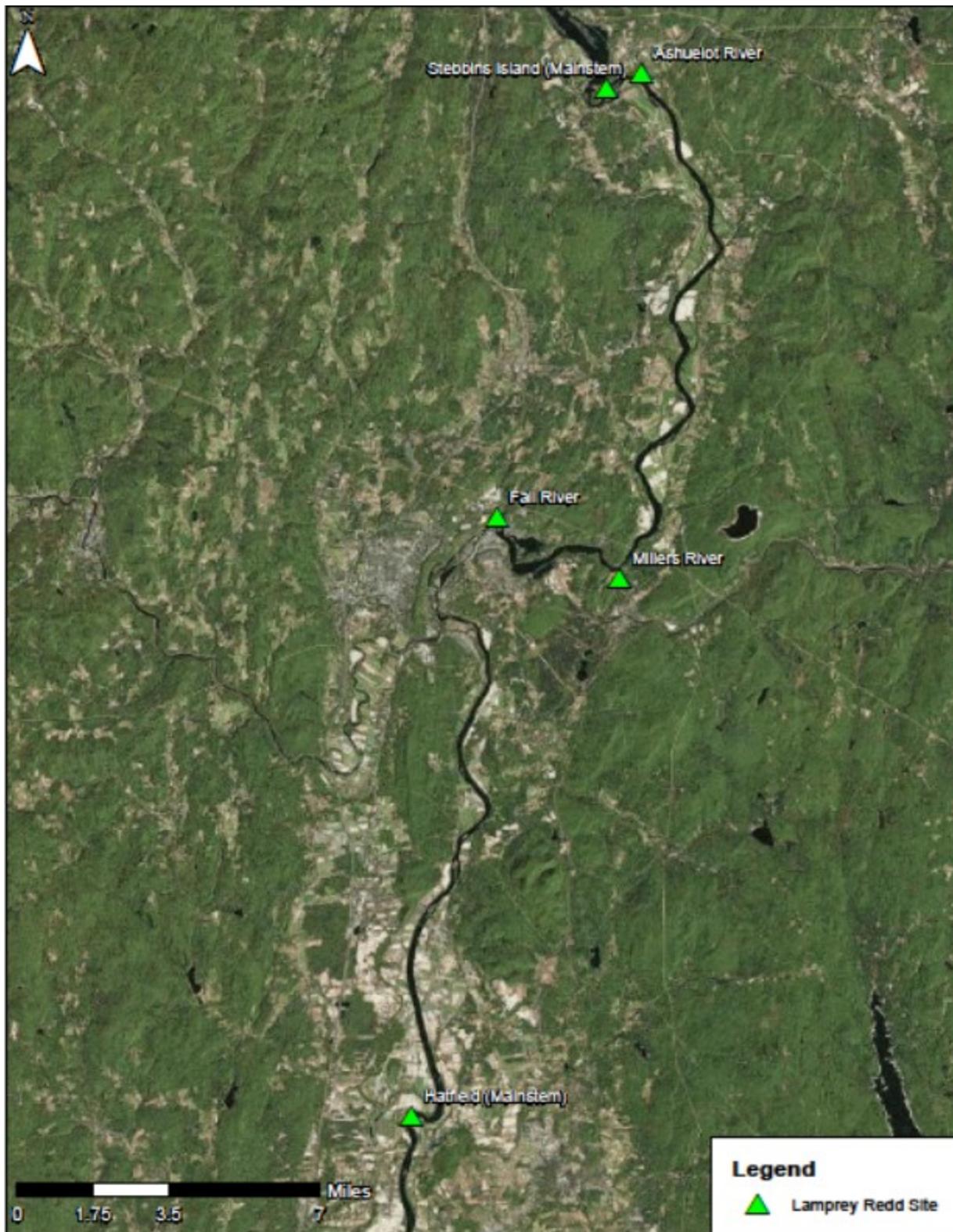
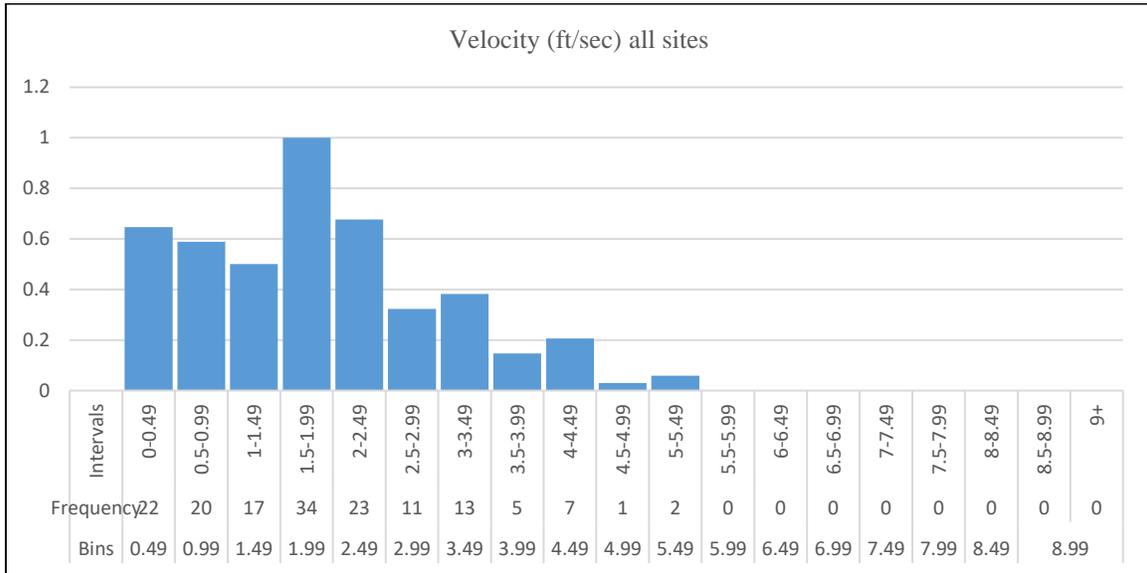
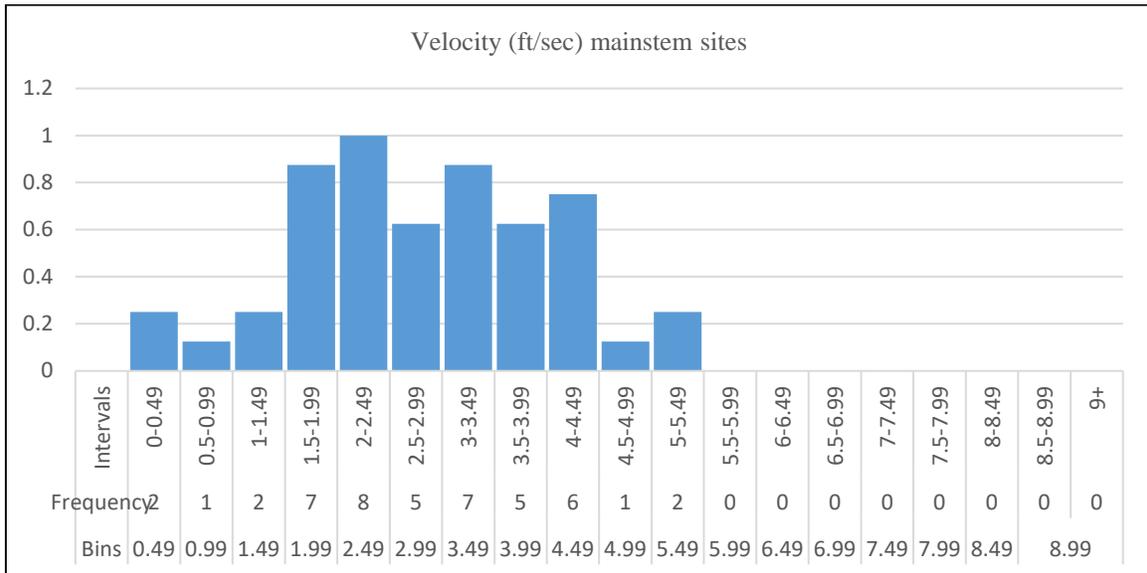


Figure 1: Location Map of Lamprey Redds

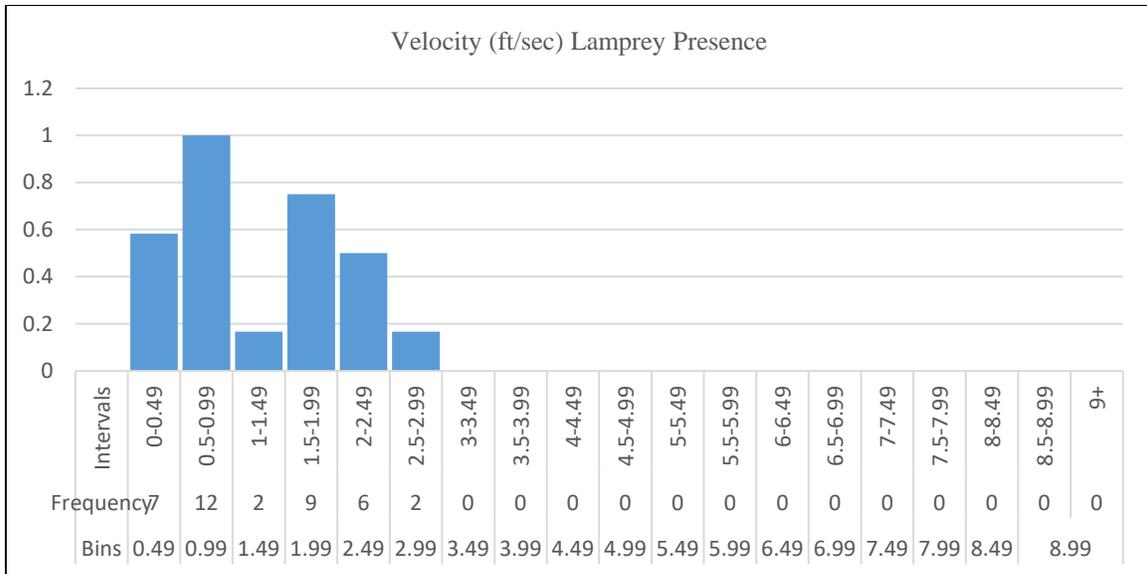
**Velocity:**



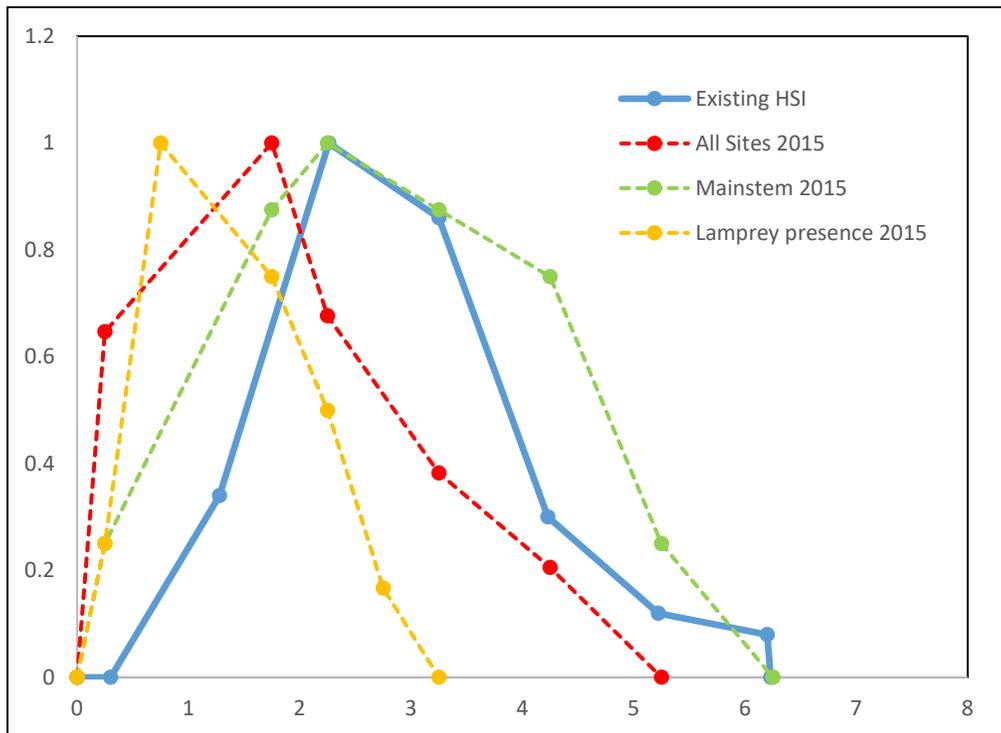
**Figure 2: Histogram of the frequency of velocity measurements (ft/sec) taken in the Lamprey Spawning Study 3.3.15 in 2015 for all sites monitored.**



**Figure 3: Histogram of the frequency of velocity measurements (ft/sec) taken in the Lamprey Spawning Study 3.3.15 in 2015 for mainstem sites (Hatfield S curve and Stebbins Island).**

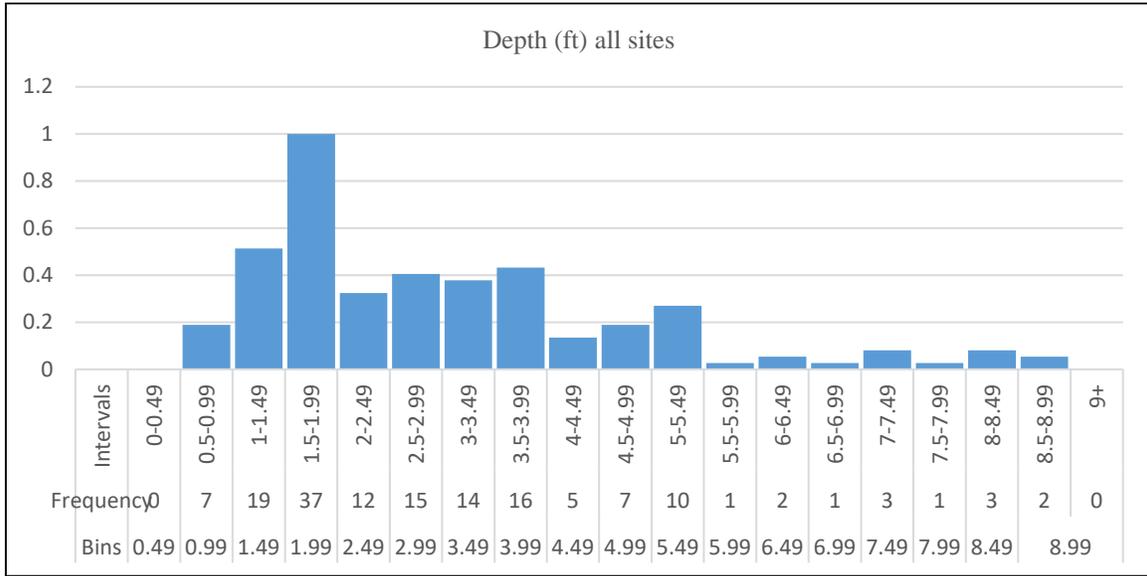


**Figure 4: Histogram of the frequency of velocity measurements (ft/sec) taken in the Lamprey Spawning Study 3.3.15 in 2015 for known Lamprey presence**

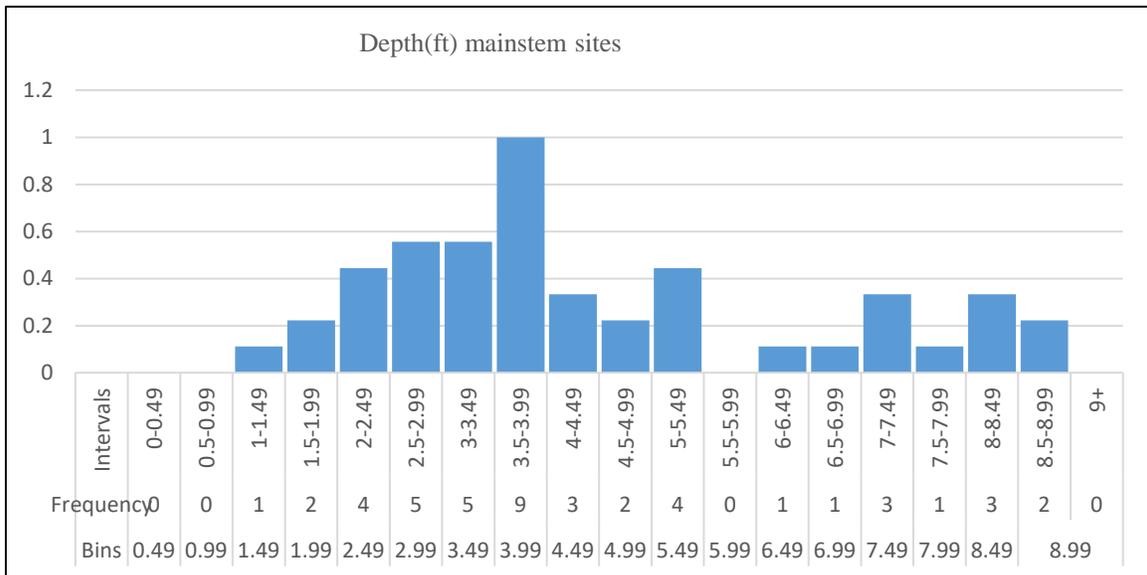


**Figure 5: Existing HSI velocity curve for spawning Lamprey (blue), including normalized HSI values for all sites measured in 2015 (red), mainstem sites (Hatfield and Stebbins Island – green), and observations when Lamprey were present on redds being measured (yellow)**

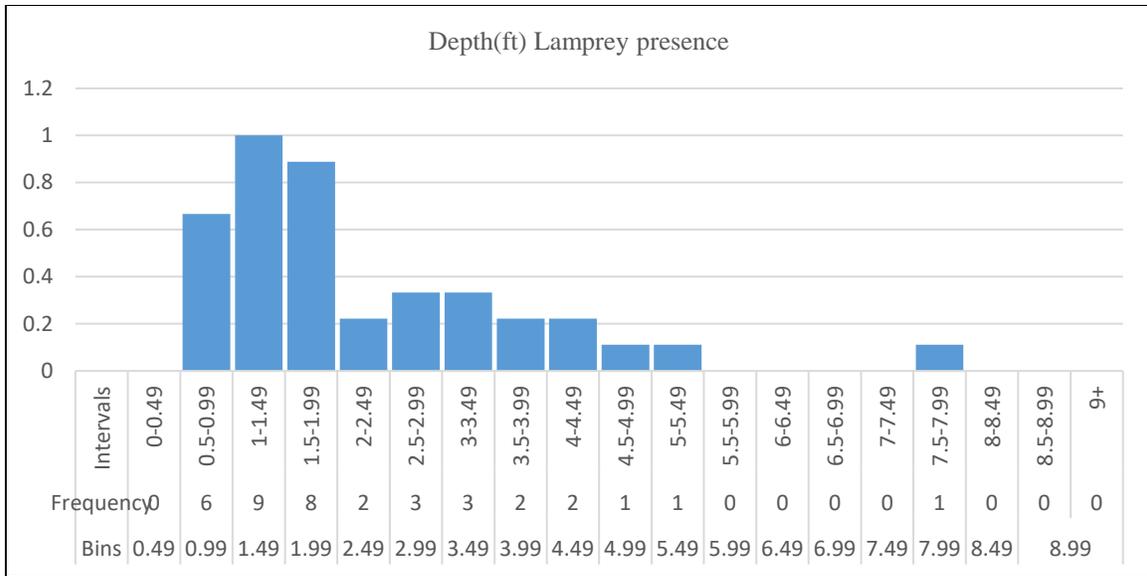
**Depth:**



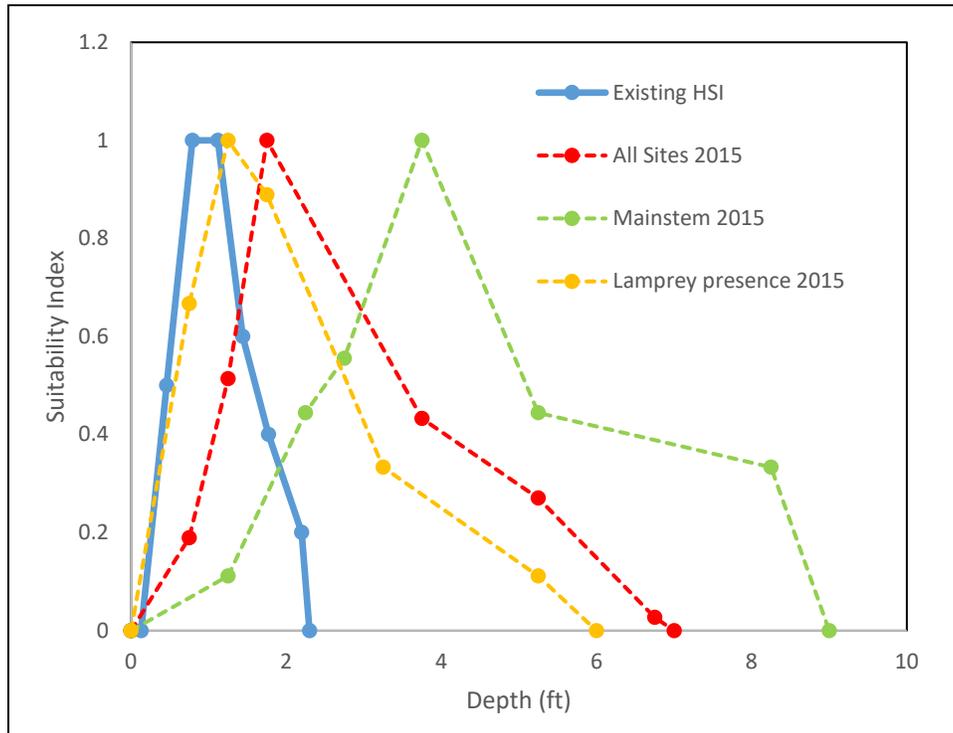
**Figure 6: Histogram of the frequency of depth measurements (ft/) taken in the Lamprey Spawning Study 3.3.15 in 2015 for all sites**



**Figure 7: Histogram of the frequency of depth measurements (ft/) taken in the Lamprey Spawning Study 3.3.15 in 2015 for mainstem sites (Hatfield S curve and Stebbins Island).**



**Figure 8: Histogram of the frequency of depth measurements (ft/) taken in the Lamprey Spawning Study 3.3.15 in 2015 for known Lamprey presence.**



**Figure 9: Existing HSI depth curve for spawning Lamprey (blue), including normalized HSI values for all sites measured in 2015 (red), mainstem sites (Hatfield and Stebbins Island – green), and observations when Lamprey were present on redds being measured (yellow)**

**From:** Mark Wamser  
**To:** [John Warner - US Fish and Wildlife Service \(john\\_warner@fws.gov\)](mailto:john_warner@fws.gov); [Ken Sprankle \(ken\\_sprankle@fws.gov\)](mailto:ken_sprankle@fws.gov); [Melissa Grader \(melissa\\_grader@fws.gov\)](mailto:melissa_grader@fws.gov); ["Julianne\\_rosset@fws.gov"](mailto:julianne_rosset@fws.gov); [brett\\_towler@fws.gov](mailto:brett_towler@fws.gov); [Caleb Slater \(caleb\\_slater@state.ma.us\)](mailto:caleb_slater@state.ma.us); [Jesse Leddick \(jesse\\_leddick@state.ma.us\)](mailto:jesse_leddick@state.ma.us); [peter\\_hazellton@state.ma.us](mailto:peter_hazellton@state.ma.us); [Bob Kubit \(robert.kubit@state.ma.us\)](mailto:rob_kubit@state.ma.us); [Foulis, David \(DEP\) \(david.foulis@state.ma.us\)](mailto:david.foulis@state.ma.us); [Harrington, Brian D \(DEP\) \(brian.d.harrington@state.ma.us\)](mailto:brian.d.harrington@state.ma.us); ["david.cameron@state.ma.us"](mailto:david.cameron@state.ma.us); [Julie Crocker \(julie.crocker@noaa.gov\)](mailto:julie.crocker@noaa.gov); ["William McDavitt - NOAA Affiliate"](mailto:william.mcdavitt@noaa.gov); ["jeff.murphy@noaa.gov"](mailto:jeff.murphy@noaa.gov); ["Bjorn Lake - NOAA Federal"](mailto:bjorn.lake@noaa.gov); [susan.tuxbury@noaa.gov](mailto:susan.tuxbury@noaa.gov); [Kevin R. Mendik - National Park Service North Atlantic Region \(kevin\\_mendik@nps.gov\)](mailto:kevin.r.mendik@nps.gov); ["Don Pugh"](mailto:don.pugh@tnc.org); [kkennedy@tnc.org](mailto:kkennedy@tnc.org); ["Karl Meyer"](mailto:karl.meyer@ferc.gov); [Andrea Donlon \(adonlon@ctriver.org\)](mailto:andrea.donlon@ctriver.org); [johnbenn@sover.net](mailto:johnbenn@sover.net); [Tom Miner \(wtminer@crocker.com\)](mailto:tom.miner@crocker.com); [Kimberly Noake MacPhee \(kmacphee@frcog.org\)](mailto:kimberly.noake@ferc.gov); [mjbathory@comcast.net](mailto:mjbathory@comcast.net); [Brandon Cherry \(brandon.cherry@ferc.gov\)](mailto:brandon.cherry@ferc.gov); ["stephen.kartalia@ferc.gov"](mailto:stephen.kartalia@ferc.gov); ["william.connelly@ferc.gov"](mailto:william.connelly@ferc.gov); ["patrick.criple@ferc.gov"](mailto:patrick.criple@ferc.gov); ["john.baummer@ferc.gov"](mailto:john.baummer@ferc.gov); ["nicholas.ettema@ferc.gov"](mailto:nicholas.ettema@ferc.gov); [aharo@usgs.gov](mailto:aharo@usgs.gov); ["TCastro Santos@usgs.gov"](mailto:tcastro@usgs.gov); [Norm Sims \(normsims@me.com\)](mailto:norm.sims@me.com); [Bob Nasdor \(bob@americanwhitewater.org\)](mailto:bob.nasdor@americanwhitewater.org); [Tom Christopher \(tom.christopher@comcast.net\)](mailto:tom.christopher@comcast.net); [John Ragonese \(john\\_ragonese@transcanada.com\)](mailto:john.ragonese@transcanada.com); [Jennifer Griffin \(jennifer\\_griffin@transcanada.com\)](mailto:jennifer.griffin@hged.com); [Paul Ducheneay \(ducheneay@hged.com\)](mailto:paul.ducheney@hged.com)  
**Cc:** [Chris Tomichek \(Chris.Tomichek@KleinschmidtGroup.com\)](mailto:chris.tomichek@kleinschmidtgroup.com); [Tom Sullivan](mailto:tom.sullivan@ferc.gov); [Gary Lemay](mailto:gary.lemay@ferc.gov); [John Hart](mailto:john.hart@ferc.gov); ["James Donohue"](mailto:james.donohue@ferc.gov); [Doug Bennett \(Douglas.bennett@firstlightpower.com\)](mailto:doug.bennett@firstlightpower.com); [Don Traester \(donald.traester@firstlightpower.com\)](mailto:donald.traester@firstlightpower.com); [Bakas, Gus](mailto:bakas.gus@ferc.gov); [Stira, Robert](mailto:stira.robert@ferc.gov); [Kendra Gorski](mailto:kendra.gorski@ferc.gov); ["mas@vnf.com"](mailto:mas@vnf.com); ["Julia Wood \(jsw@vnf.com\)"](mailto:julia.wood@ferc.gov); [Jason George](mailto:jason.george@ferc.gov)  
**Subject:** IFIM Study and Sea Lamprey  
**Date:** Wednesday, April 12, 2017 1:37:00 PM  
**Attachments:** [Lamprey HSI category II .docx](#)

---

Stakeholders:

### Study No. 3.3.1: IFIM Study

In FERC's 2/17/2017 Study Plan Determination Letter it required FirstLight to consult with agencies in developing HSI curves for Sea Lamprey spawning (based on the findings from Study No. 3.3.15). Please find attached a memo outlining development of the Sea Lamprey spawning HSI curves along with a recommendation. FERC stated in its Determination Letter ".....we recommend that FirstLight incorporate the new curves into the PHABSIM model and produce revised estimates of WUA for sea lamprey spawning in the bypassed reach and downstream of Cabot Station and file an addendum to the study by May 15, 2017."

Because the May 15, 2017 deadline is approaching quickly, we would like your comments, sent via email to [mwamser@gomezandsullivan.com](mailto:mwamser@gomezandsullivan.com) by **April 21**. If there is consensus on the HSI curves, we will target completing the revised estimates for WUA in the bypass reach and downstream of Cabot and file it with FERC on May 15, 2017. However, if a call is needed requiring further discussion, we will likely request an extension from FERC of the May 15 deadline.

### Study No. 3.3.15 Sea Lamprey

Also in FERC's 2/17/2017 Study Plan Determination Letter there was discussion about the potential exposure of sea lamprey redds under low flow conditions compared to the higher flow conditions that occurred between June 19 – July 10, 2015 (the study period). In its Determination Letter FERC required FirstLight to "consult with the stakeholders and establish parameters for a low-flow scenario or scenarios and then run the hydraulic model for the selected low-flow scenarios. These modeling results should be used to describe, in an addendum to be filed by May 15, 2017, inundation and exposure of the locations where the 29 redds were documented." FirstLight proposes the following:

- Sea lamprey were documented at the Hatfield S Curve, Stebbins Island, and three tributaries- Fall River, Millers River and Ashuelot River.
- No hydraulic model exists for the Fall, Millers and Ashuelot Rivers so it is not possible to

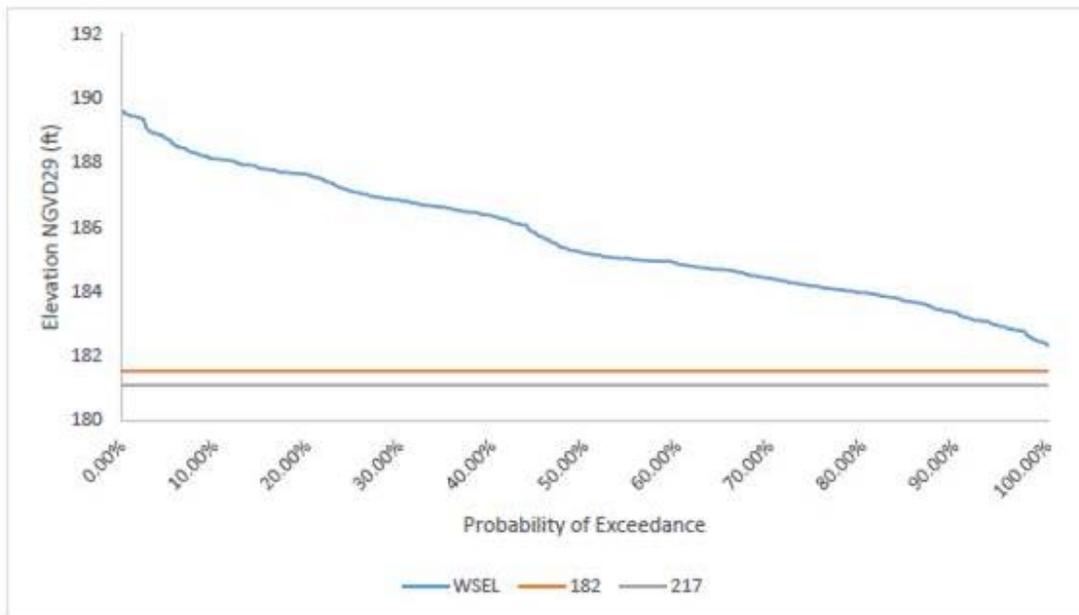
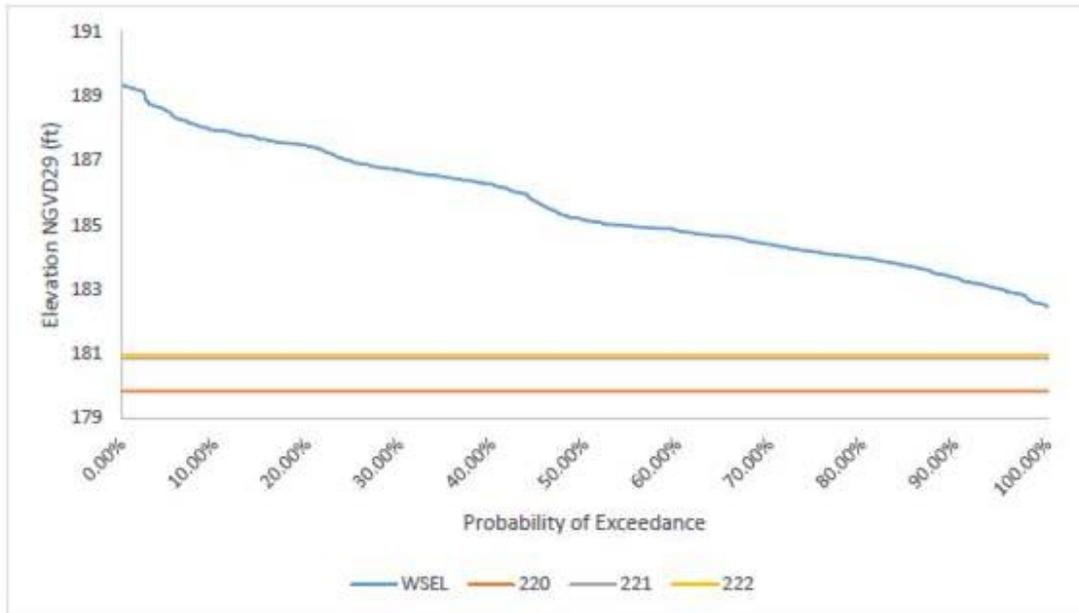
determine the impact of Project operations on these redd locations.

- In addition, for the hydraulic model below the Montague USGS Gage, there is no transect located at the Hatfield S Curve, thus it is not possible to assess this locations (the same was noted in the Study 3.3.15 Report)
- FL proposes to assess the 6 redds that were located near Stebbins Island to determine if they become exposed.
- To conduct this analysis, FL proposes to develop an elevation duration curve using simulated water level data from the HEC-RAS hydraulic model at the redd location for the period 2000-2015. Thus, the hydraulic model would be operated in an unsteady mode and would simulate on an hourly basis the water level at Stebbins Island for the period May 20 to July 31 (the assumed Sea Lamprey spawning period).
- From this data an elevation duration curve would be developed and the elevations of the redds at Stebbins Island shown—similar to that provided in Appendix A of the Sea Lamprey Report (see below).

Again, because the May 15, 2017 deadline is approaching quickly, we would like your comments, sent via email to [mwamser@gomezandsullivan.com](mailto:mwamser@gomezandsullivan.com) by April 21.

If you have any questions, please feel free to contact me. Thanks Mark

WATER SURFACE ELEVATION CURVE FOR STEBBINS ISLAND REDDS RELATIVE TO THE REDD LOCATION (JUNE 19<sup>TH</sup> TO JULY 10<sup>TH</sup>, 2015):



Mark Wamser, PE  
 Senior Water Resource Engineer  
 Gomez and Sullivan Engineers, DPC  
 41 Liberty Hill Road  
 PO Box 2179  
 Henniker, NH 03242  
 P 603-428-4960

C 603-568-6088

F 603-428-3973



**From:** Mark Wamser  
**To:** [John Warner - US Fish and Wildlife Service \(john\\_warner@fws.gov\)](mailto:john_warner@fws.gov); [Ken Sprankle \(ken\\_sprankle@fws.gov\)](mailto:ken_sprankle@fws.gov); [Melissa Grader \(melissa\\_grader@fws.gov\)](mailto:melissa_grader@fws.gov); [Julianne Rosset \(julianne\\_rosset@fws.gov\)](mailto:julianne_rosset@fws.gov); [Brett Towler \(brett\\_towler@fws.gov\)](mailto:brett_towler@fws.gov); [Caleb Slater \(caleb\\_slater@state.ma.us\)](mailto:caleb_slater@state.ma.us); [Jesse Leddick \(jesse\\_leddick@state.ma.us\)](mailto:jesse_leddick@state.ma.us); [Peter Hazellton \(peter\\_hazellton@state.ma.us\)](mailto:peter_hazellton@state.ma.us); [Bob Kubit \(robert.kubit@state.ma.us\)](mailto:rob_kubit@state.ma.us); [Foulis, David \(DEP\) \(david.foulis@state.ma.us\)](mailto:david.foulis@state.ma.us); [Harrington, Brian D \(DEP\) \(brian.d.harrington@state.ma.us\)](mailto:brian.d.harrington@state.ma.us); ["David Cameron \(david.cameron@state.ma.us\)"; \[Julie Crocker \\(julie.crocker@noaa.gov\\)\]\(mailto:julie.crocker@noaa.gov\); \[William McDavitt - NOAA Affiliate \\(william.mcdavitt@noaa.gov\\)\]\(mailto:william.mcdavitt@noaa.gov\); \[Jeff Murphy \\(jeff.murphy@noaa.gov\\)\]\(mailto:jeff.murphy@noaa.gov\); \[Bjorn Lake - NOAA Federal \\(bjorn.lake@noaa.gov\\)\]\(mailto:bjorn.lake@noaa.gov\); \[Susan Tuxbury \\(susan.tuxbury@noaa.gov\\)\]\(mailto:susan.tuxbury@noaa.gov\); \[Kevin R. Mendik - National Park Service North Atlantic Region \\(kevin\\\_mendik@nps.gov\\)\]\(mailto:kevin.r.mendik@nps.gov\); \["Don Pugh" \\(kennedy@tnc.org\\)\]\(mailto:don.pugh@tnc.org\); \["Karl Meyer" \\(karl.meyer@trc.org\\)\]\(mailto:karl.meyer@trc.org\); \[Andrea Donlon \\(adonlon@ctriver.org\\)\]\(mailto:andrea.donlon@ctriver.org\); \[John Benn \\(johnbenn@sover.net\\)\]\(mailto:johnbenn@sover.net\); \[Tom Miner \\(wtminer@crocker.com\\)\]\(mailto:tom.miner@crocker.com\); \[Kimberly Noake MacPhee \\(kmacphee@frcog.org\\)\]\(mailto:kimberly.noake@frcog.org\); \[mjbathory@comcast.net\]\(mailto:mjbathory@comcast.net\); \[Brandon Cherry \\(brandon.cherry@ferc.gov\\)\]\(mailto:brandon.cherry@ferc.gov\); \["Stephen Kartalia \\(stephen.kartalia@ferc.gov\\)"; \\[William Connelly \\\(william.connelly@ferc.gov\\\)\\]\\(mailto:william.connelly@ferc.gov\\); \\[Patrick Crile \\\(patrick.crile@ferc.gov\\\)\\]\\(mailto:patrick.crile@ferc.gov\\); \\[John Baummer \\\(john.baummer@ferc.gov\\\)\\]\\(mailto:john.baummer@ferc.gov\\); \\["Nicholas Ettema \\\(nicholas.ettema@ferc.gov\\\)"; \\\[Aharo \\\\(aharo@usgs.gov\\\\)\\\]\\\(mailto:aharo@usgs.gov\\\); \\\["TCastro Santos \\\\(tcastro@usgs.gov\\\\)"; \\\\[Norm Sims \\\\\(normsims@me.com\\\\\)\\\\]\\\\(mailto:norm.sims@me.com\\\\); \\\\[Bob Nasdor \\\\\(bob@americanwhitewater.org\\\\\)\\\\]\\\\(mailto:bob.nasdor@americanwhitewater.org\\\\); \\\\[Tom Christopher \\\\\(tom.christopher@comcast.net\\\\\)\\\\]\\\\(mailto:tom.christopher@comcast.net\\\\); \\\\[John Ragonese \\\\\(john\\\\\\_ragonese@transcanada.com\\\\\)\\\\]\\\\(mailto:john.ragonese@transcanada.com\\\\); \\\\[Jennifer Griffin \\\\\(jennifer\\\\\\_griffin@transcanada.com\\\\\)\\\\]\\\\(mailto:jennifer.griffin@transcanada.com\\\\); \\\\[Paul Ducheneay \\\\\(ducheney@hged.com\\\\\)\\\\]\\\\(mailto:paul.ducheney@hged.com\\\\)\\\]\\\(mailto:tcastro@usgs.gov\\\)\\]\\(mailto:nicholas.ettema@ferc.gov\\)\]\(mailto:stephen.kartalia@ferc.gov\)](mailto:david.cameron@state.ma.us)

**Cc:** [Chris Tomichek \(Chris.Tomichek@KleinschmidtGroup.com\)](mailto:chris.tomichek@kleinschmidtgroup.com); [Tom Sullivan](mailto:tom.sullivan@ferc.gov); [Gary Lemay](mailto:gary.lemay@ferc.gov); [John Hart](mailto:john.hart@ferc.gov); ["James Donohue" \(james.donohue@ferc.gov\)](mailto:james.donohue@ferc.gov); [Doug Bennett \(Doug.bennett@firstlightpower.com\)](mailto:doug.bennett@firstlightpower.com); [Don Traester \(donald.traester@firstlightpower.com\)](mailto:don.traester@firstlightpower.com); [Stira, Robert](mailto:stira.robert@ferc.gov); [Kendra Gorski](mailto:kendra.gorski@ferc.gov); ["mas@vnf.com"](mailto:mas@vnf.com); ["Julia Wood \(jsw@vnf.com\)"; \[Jason George\]\(mailto:jason.george@ferc.gov\); \[Alex Malvezzi\]\(mailto:alex.malvezzi@ferc.gov\)](mailto:julia.wood@vnf.com)

**Subject:** RE: IFIM Study and Sea Lamprey  
**Date:** Tuesday, May 02, 2017 7:39:00 AM  
**Attachments:** [Lamprey HSI category II .docx](#)

---

All-

I understand that folks are very busy; however, could you please review the email I sent on April 12th relative to the habitat suitability index (HSI) curves for Sea Lamprey spawning (I re-attached the memo). As requested by FERC in its February 17, 2017 Determination Letter, FL is required to consult with the stakeholders and file proposed Sea Lamprey spawning HSI curves along with incorporating the new curves in the PHASIM model. FERC set a due date of May 15, 2017 for both finalizing the Sea Lamprey spawning HSI curves and running the new curves in the PHASIM model. Given that it is May 2, it is unlikely FL will be able to complete this work by May 15, 2017; however, we would at least like to file the consultation record on the HSI curves by May 15, 2017.

If you have any questions, please feel free to contact me. Much appreciated, Mark

Mark Wamser, PE  
Senior Water Resource Engineer  
Gomez and Sullivan Engineers, DPC  
41 Liberty Hill Road  
PO Box 2179  
Henniker, NH 03242  
P 603-428-4960  
C 603-568-6088  
F 603-428-3973



---

**From:** Mark Wamser

**Sent:** Wednesday, April 12, 2017 1:38 PM

**To:** John Warner - US Fish and Wildlife Service ([john\\_warner@fws.gov](mailto:john_warner@fws.gov)) <[john\\_warner@fws.gov](mailto:john_warner@fws.gov)>; Ken Sprankle ([ken\\_sprankle@fws.gov](mailto:ken_sprankle@fws.gov)) <[ken\\_sprankle@fws.gov](mailto:ken_sprankle@fws.gov)>; Melissa Grader ([melissa\\_grader@fws.gov](mailto:melissa_grader@fws.gov)) <[melissa\\_grader@fws.gov](mailto:melissa_grader@fws.gov)>; Julianne Rosset ([julianne\\_rosset@fws.gov](mailto:julianne_rosset@fws.gov)) <[julianne\\_rosset@fws.gov](mailto:julianne_rosset@fws.gov)>; Brett Towler ([brett\\_towler@fws.gov](mailto:brett_towler@fws.gov)); Caleb Slater ([caleb.slater@state.ma.us](mailto:caleb.slater@state.ma.us)) <[caleb.slater@state.ma.us](mailto:caleb.slater@state.ma.us)>; Jesse

**From:** [Warner, John](#)  
**To:** [Mark Wamser](#)  
**Cc:** [Ken Sprankle \(ken\\_sprankle@fws.gov\)](#); [Melissa Grader \(melissa\\_grader@fws.gov\)](#); [julianne\\_rosset@fws.gov](#); [brett\\_towler@fws.gov](#); [Caleb Slater \(caleb.slater@state.ma.us\)](#); [Jesse Leddick \(jesse.lednick@state.ma.us\)](#); [peter.hazelton@state.ma.us](#); [Bob Kubit \(robert.kubit@state.ma.us\)](#); [Foulis, David \(DEP\) \(david.foulis@state.ma.us\)](#); [Harrington, Brian D \(DEP\) \(brian.d.harrington@state.ma.us\)](#); [david.cameron@state.ma.us](#); [Julie Crocker \(julie.crocker@noaa.gov\)](#); [William McDavitt - NOAA Affiliate: jeff.murphy@noaa.gov](#); [Bjorn Lake - NOAA Federal: susan.tuxbury@noaa.gov](#); [Mendik, Kevin](#); [Don Pugh](#); [kkennedy@tnc.org](#); [Karl Meyer](#); [Andrea Donlon \(adonlon@ctriver.org\)](#); [johnbenn@sover.net](#); [Tom Miner \(wtminer@crocker.com\)](#); [Kimberly Noake MacPhee \(kmacphee@frcog.org\)](#); [mjbathory@comcast.net](#); [Brandon Cherry \(brandon.cherry@ferc.gov\)](#); [stephen.kartalia@ferc.gov](#); [william.connelly@ferc.gov](#); [patrick.crile@ferc.gov](#); [john.baummer@ferc.gov](#); [nicholas.ettema@ferc.gov](#); [aharo@usgs.gov](#); [TCastro\\_Santos@usgs.gov](#); [Norm Sims \(normsims@me.com\)](#); [Bob Nasdor \(bob@americanwhitewater.org\)](#); [Tom Christopher \(tom.christopher@comcast.net\)](#); [Ragonese, John](#); [Jennifer Griffin \(jennifer\\_griffin@transcanada.com\)](#); [Paul Duchenev \(duchenev@hged.com\)](#); [Tomcheck, Chris](#); [Tom Sullivan](#); [Gary Lemay](#); [John Hart](#); [James.Donohue](#); [Doug Bennett \(Douglas.bennett@firstlightpower.com\)](#); [Don Traester \(donald.traester@firstlightpower.com\)](#); [Stira, Robert](#); [Kendra Gorski](#); [Swiger, Mike](#); [Wood, Julia](#); [Jason George](#); [Alex Malvezzi](#)  
**Subject:** Re: IFIM Study and Sea Lamprey  
**Date:** Tuesday, May 02, 2017 8:03:01 AM

---

Hey Mark - We discussed this among the fisheries folks and solicited info from TransCanada/GreatRiver on their active redd data. We received the depth data but were waiting to see if we could get the velocity data to integrate with the FL data and try to get one consistent set of curves for all the CTRiver projects - I will check on the status of that and get back to you - JW

On Tue, May 2, 2017 at 7:39 AM, Mark Wamser <[mwamser@gomezandsullivan.com](mailto:mwamser@gomezandsullivan.com)> wrote:

All-

I understand that folks are very busy; however, could you please review the email I sent on April 12th relative to the habitat suitability index (HSI) curves for Sea Lamprey spawning (I re-attached the memo). As requested by FERC in its February 17, 2017 Determination Letter, FL is required to consult with the stakeholders and file proposed Sea Lamprey spawning HSI curves along with incorporating the new curves in the PHASIM model. FERC set a due date of May 15, 2017 for both finalizing the Sea Lamprey spawning HSI curves and running the new curves in the PHASIM model. Given that it is May 2, it is unlikely FL will be able to complete this work by May 15, 2017; however, we would at least like to file the consultation record on the HSI curves by May 15, 2017.

If you have any questions, please feel free to contact me. Much appreciated, Mark

Mark Wamser, PE

Senior Water Resource Engineer

Gomez and Sullivan Engineers, DPC

41 Liberty Hill Road

PO Box 2179

Henniker, NH 03242

**From:** [John Ragonese](#)  
**To:** [Warner, John](#); [Mark Wamser](#)  
**Cc:** [Ken Sprankle \(ken\\_sprankle@fws.gov\)](#); [Melissa Grader \(melissa\\_grader@fws.gov\)](#); [julianne\\_rosset@fws.gov](#); [brett\\_towler@fws.gov](#); [Caleb Slater \(caleb.slater@state.ma.us\)](#); [Jesse Leddick \(jesse.leddick@state.ma.us\)](#); [peter.hazelton@state.ma.us](#); [Bob Kubit \(robert.kubit@state.ma.us\)](#); [Foulis, David \(DEP\) \(david.foulis@state.ma.us\)](#); [Harrington, Brian D \(DEP\) \(brian.d.harrington@state.ma.us\)](#); [david.cameron@state.ma.us](#); [Julie Crocker \(julie.crocker@noaa.gov\)](#); [William McDavitt - NOAA Affiliate](#); [jeff.murphy@noaa.gov](#); [Bjorn Lake - NOAA Federal](#); [susan.tuxbury@noaa.gov](#); [Mendik, Kevin](#); [Don Pugh](#); [kkennedy@tnc.org](#); [Karl Meyer](#); [Andrea Donlon \(adonlon@ctriver.org\)](#); [johnbenn@sover.net](#); [Tom Miner \(wtminer@crocker.com\)](#); [Kimberly Noake MacPhee \(kmacphee@frcog.org\)](#); [mjbathory@comcast.net](#); [Brandon Cherry \(brandon.cherry@ferc.gov\)](#); [stephen.kartalia@ferc.gov](#); [william.connelly@ferc.gov](#); [patrick.crile@ferc.gov](#); [john.baummer@ferc.gov](#); [nicholas.ettema@ferc.gov](#); [aharo@usgs.gov](#); [TCastro\\_Santos@usgs.gov](#); [Norm Sims \(normsims@me.com\)](#); [Bob Nasdor \(bob@americanwhitewater.org\)](#); [Tom Christopher \(tom.christopher@comcast.net\)](#); [Ragonese, John](#); [Jennifer Griffin \(jennifer\\_griffin@transcanada.com\)](#); [Paul Duchenev \(duchenev@hged.com\)](#); [Tomichack, Chris](#); [Tom Sullivan](#); [Gary Lemay](#); [John Hart](#); [James.Donohue](#); [Doug Bennett \(Douglas.bennett@firstlightpower.com\)](#); [Don Traester \(donald.traester@firstlightpower.com\)](#); [Stira, Robert](#); [Kendra Gorski](#); [Swiger, Mike](#); [Wood, Julia](#); [Jason George](#); [Alex Malvezzi](#)  
**Subject:** Re: IFIM Study and Sea Lamprey  
**Date:** Wednesday, May 03, 2017 12:22:41 PM  
**Attachments:** [Study 16 Measured Velocities.xlsx](#)

---

Hera ya go. sorry for delay. we have been out straight...

John Ragonese  
FERC License Manager  
Great River Hydro, LLC  
One Harbour Place; Suite 330  
Portsmouth, NH 03801  
Work: 603-559-5513; Cell (best option) 603-498-2851  
[jragonese@greatriverhydro.com](mailto:jragonese@greatriverhydro.com)

---

**From:** Warner, John <[john\\_warner@fws.gov](mailto:john_warner@fws.gov)>  
**Sent:** Tuesday, May 2, 2017 8:02:17 AM  
**To:** Mark Wamser  
**Cc:** Ken Sprankle ([ken\\_sprankle@fws.gov](mailto:ken_sprankle@fws.gov)); Melissa Grader ([melissa\\_grader@fws.gov](mailto:melissa_grader@fws.gov)); [julianne\\_rosset@fws.gov](mailto:julianne_rosset@fws.gov); [brett\\_towler@fws.gov](mailto:brett_towler@fws.gov); [Caleb Slater \(caleb.slater@state.ma.us\)](mailto:Caleb.Slater@state.ma.us); [Jesse Leddick \(jesse.leddick@state.ma.us\)](mailto:Jesse.Leddick@state.ma.us); [peter.hazelton@state.ma.us](mailto:peter.hazelton@state.ma.us); [Bob Kubit \(robert.kubit@state.ma.us\)](mailto:Bob.Kubit@state.ma.us); [Foulis, David \(DEP\) \(david.foulis@state.ma.us\)](mailto:Foulis.David@state.ma.us); [Harrington, Brian D \(DEP\) \(brian.d.harrington@state.ma.us\)](mailto:Harrington.BrianD@state.ma.us); [david.cameron@state.ma.us](mailto:david.cameron@state.ma.us); [Julie Crocker \(julie.crocker@noaa.gov\)](mailto:Julie.Crocker@noaa.gov); [William McDavitt - NOAA Affiliate](#); [jeff.murphy@noaa.gov](mailto:jeff.murphy@noaa.gov); [Bjorn Lake - NOAA Federal](#); [susan.tuxbury@noaa.gov](mailto:susan.tuxbury@noaa.gov); [Mendik, Kevin](#); [Don Pugh](#); [kkennedy@tnc.org](mailto:kkennedy@tnc.org); [Karl Meyer](#); [Andrea Donlon \(adonlon@ctriver.org\)](#); [johnbenn@sover.net](mailto:johnbenn@sover.net); [Tom Miner \(wtminer@crocker.com\)](mailto:Tom.Miner@crocker.com); [Kimberly Noake MacPhee \(kmacphee@frcog.org\)](mailto:Kimberly.NoakeMacPhee@frcog.org); [mjbathory@comcast.net](mailto:mjbathory@comcast.net); [Brandon Cherry \(brandon.cherry@ferc.gov\)](mailto:Brandon.Cherry@ferc.gov); [stephen.kartalia@ferc.gov](mailto:stephen.kartalia@ferc.gov); [william.connelly@ferc.gov](mailto:william.connelly@ferc.gov); [patrick.crile@ferc.gov](mailto:patrick.crile@ferc.gov); [john.baummer@ferc.gov](mailto:john.baummer@ferc.gov); [nicholas.ettema@ferc.gov](mailto:nicholas.ettema@ferc.gov); [aharo@usgs.gov](mailto:aharo@usgs.gov); [TCastro\\_Santos@usgs.gov](mailto:TCastro_Santos@usgs.gov); [Norm Sims \(normsims@me.com\)](mailto:Norm.Sims@me.com); [Bob Nasdor \(bob@americanwhitewater.org\)](mailto:Bob.Nasdor@americanwhitewater.org); [Tom Christopher \(tom.christopher@comcast.net\)](mailto:Tom.Christopher@comcast.net); [Ragonese, John](#); [Jennifer Griffin \(jennifer\\_griffin@transcanada.com\)](mailto:Jennifer.Griffin@transcanada.com); [Paul Duchenev \(duchenev@hged.com\)](mailto:Paul.Duchenev@hged.com); [Tomichack, Chris](#); [Tom Sullivan](#); [Gary Lemay](#); [John Hart](#); [James.Donohue](mailto:James.Donohue); [Doug Bennett \(Douglas.bennett@firstlightpower.com\)](mailto:Doug.Bennett@firstlightpower.com); [Don Traester \(donald.traester@firstlightpower.com\)](mailto:Don.Traester@firstlightpower.com); [Stira, Robert](#); [Kendra Gorski](#); [Swiger, Mike](#); [Wood, Julia](#); [Jason George](#); [Alex Malvezzi](#)  
**Subject:** Re: IFIM Study and Sea Lamprey

Hey Mark - We discussed this among the fisheries folks and solicited info from