



## New Hampshire Fish and Game Department

11 Hazen Drive, Concord, NH 03301-6500  
Headquarters: (603) 271-3421  
Web site: [www.WildNH.com](http://www.WildNH.com)

TDD Access: Relay NH 1-800-735-2964  
FAX (603) 271-1438  
E-mail: [info@wildlife.nh.gov](mailto:info@wildlife.nh.gov)

Glenn Normandeau  
Executive Director

July 11, 2013

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

RE: Final Review of the Draft Proposed Study Plans for FERC project numbers P-1904 (Vernon), P-1855 (Bellows Falls), P-1892 (Wilder), P-1889 (Turners Falls) and P-2485 (Northfield Mountain).

Dear Secretary Bose:

As the agency responsible for protecting fish and wildlife resources in New Hampshire, the New Hampshire Fish and Game Department (NHFGD) monitors and attempts to reduce the impacts of hydroelectric facilities on fish and wildlife species and their habitats. The mission of the New Hampshire Fish and Game Department (NHFGD) is to conserve, manage and protect the state's fish, wildlife and marine resources and their habitats, and to provide the public with opportunities to use and appreciate these resources.

The NHFGD submits the following attached recommendations and comments for final review of the Draft Proposed Study Plans (PSP) being developed for the Turners Falls (FERC No. 1899), Northfield Mountain (FERC No. 2485), Vernon (FERC No. 1904), Bellows Falls (FERC No. 1855), and Wilder (FERC No. 1892) projects.

Thank you for this opportunity to comment on this very important relicensing project. If you have any questions regarding these recommendations, please do not hesitate to contact either Fisheries Biologist, Matt Carpenter at 603-271-3511 or Gabe Gries at 603-352-9669.

Sincerely,

A handwritten signature in black ink, appearing to read "G. Normandeau".

Glenn Normandeau  
Executive Director

**Comments and /or recommendations on TC Study Plans taking into account first draft of study plans (4/15/13), the TC study plan meeting notes and plan action items (from conference calls during late June), and the updated study plans on TC secure website (as of 7/5/13)**

**Study 6: Water Quality Monitoring and Continuous Temperature Monitoring**

- Temperature should be monitored from April to November in order to gain a better understanding of potential project effects, especially with potential water temperature increases due to Vermont Yankee. Additionally, more temperature loggers should be placed above and below the Vermont Yankee discharge in order to differentiate between potential impacts of Vermont Yankee and TransCanada on water temperature and subsequently on the results of other studies that may be dependent on water temperature (for example, downstream migration of juvenile American shad).

**Study 7: Aquatic Habitat Mapping**

- The study plan talked about performing 1 foot contours along shorelines, but not in the main channel. They need to specify at what maximum depth they will record at 1 foot contours in order to account for shallow areas away from shorelines (i.e. humps, sunken islands, etc.). I believe we talked about areas less than 10 feet at the meeting. These shallow non-shoreline areas are very important areas for fish and are locations where depth and habitat may be more impacted by small changes in pool level.

**Study 9: Instream Flow Study**

- Delete yellow perch from species to be assessed as they do not require flowing water (per Rod Wentworth). Add sea lamprey (juvenile) and longnose dace to the list.

**Study 10: Fish Assemblage Study**

- Coefficient of variation should be reported along with mean relative abundance. Unless I read things wrong or missed something, they are describing just boat electrofishing during the day. Night is the preferred time for barge electrofishing, although it could be supplemented with minimal daytime shocking to see if any different species are captured.
- The 24 hour gill net set may cause excessive mortality. Field tests should be used to determine a set time that allows for efficient data collection while minimizing mortality. Perhaps start with 8 hour sets and increase/decrease set time as needed. If heavy mortality becomes an issue in a certain habitat type or time of day/night, then nets should be checked hourly.
- Another sampling method to consider is a seine net. A 30' bag seine may work well in shallow coves that cannot be accessed by a shock boat. A large beach seine may also work on open flats where the shock boat often scatters fish before they can be captured.

**Study 11: American Eel Study**

- Need to detail marking eels captured in eel pots as they did for those captured by electrofishing...

- The goal of the study is to collect baseline information on the eels in the mainstem, within project boundaries, so that future trends can be monitored. The actual abundance of eels potentially impacted by the projects could only be assessed by a watershed-wide survey, since eels may potentially inhabit all of the tributaries and lakes upstream of the projects. The extent of this potential habitat, which will not be surveyed, should be considered when evaluating the need for downstream eel passage.

#### **Study 12: Tessellated Darter Survey**

- There is some concern about potential fish mortality due to use of the electrified trawl.

#### **Study 13: Tributary and Backwater Area Fish Access and Habitat Study**

- Will perched culvert locations be documented? Tributary access should be examined year round as fish should be able move in and out of these backwater areas as needed.
- It is stated in study plan that “Additional water quality data will be collected in these areas (temperature, DO, ph, conductivity, and turbidity) if it is found that access to the main river is impeded.” Water quality should be collected in these backwaters regardless of fish access. While fish may have access to a backwater, water quality may not be hospitable for fish if there is not a good exchange of water between the backwater and the mainstem.
- It is not clear how tributaries will be selected in the second year of study. It will be important to let the fish data inform the relative value of a tributary or cove, as opposed to the habitat data alone.

#### **Study 14: Resident Fish Spawning in Impoundment Study**

- The study focusses on spawning habitat where water depths at the lowest operation range are wetted to a depth less than one foot. This approach discounts areas that are wetted at the highest operation range and then subsequently dewatered. Yellow perch, for example, spawn in early spring among the branches of trees that fall into the water along the shoreline. These areas may be in relatively deep water, yet the eggs may still be exposed as the impoundment is drawn down. Fish behavior and spawning habitat type should take precedence over depth when choosing areas to monitor for the impacts of water level fluctuation.
- The actual impact of water level fluctuation goes beyond direct impacts to fish eggs and spawning behavior under current conditions. Water level fluctuation has a cumulative impact on fish habitat over time by preventing the establishment of aquatic plant communities and altering sediment deposition. The predicted distribution of aquatic vegetation and various substrate types in the impoundment under a more natural flow regime should be mapped to assess the long term effects of water level fluctuation on fish spawning habitat.
- It is not clear how impacts to spawning will be adequately assessed beyond the dewatering of known nest sites. Inaccessibility of spawning habitat and nest abandonment are important impacts that will be difficult to document without extensive field observation.
- The eastern silvery minnow should be included in this study as a species that depends on backwater coves for spawning.

### **Study 15: Resident Fish Spawning in Riverine Sections Study**

- Examining project effects of scouring and sedimentation as it impacts nests would be prudent as scouring and sedimentation can impact egg survival.
- The longnose dace is a fluvial specialist that should be added to the list of target species.

### **Study 16: Sea Lamprey Spawning Assessment**

- A sample size of 20 sea lamprey for radio tagging seems low.
- An assessment of sea lamprey spawning success should include a survey for sea lamprey ammocoetes. Sea lamprey ammocoetes may be easily captured by electrofishing as the electricity forces them out of the loose sediment in which they burrow. Sample sites should be selected just downstream from identified spawning areas. Data collected on each individual should include length, weight, and maturity (a certain percentage of individuals will have fully developed eyes and teeth in preparation for migration to the ocean). This survey should be done in late August or September when juvenile sea lamprey are approaching their maximum size for the year.

### **Study 18: American Eel Upstream Passage Assessment**

- Any eels sampled should be marked (fin clip, elastomer?) in order to avoid data replication and also to possibly be able to make a population estimate.
- More could be learned by marking and releasing eels capture in eel traps than from relocating the eels upstream. This may allow for a population estimate or at least some basic movement data.

### **Study 19: American Eel Downstream Passage Assessment**

- It should not be assumed that eel passage over spillways is high as all spillways are different and simply visually observing flow going over a spillway does in no way inform fish survival. Eel survival over spillways at all dams should be examined.
- All turbine types at each dam should be tested.

### **Study 20: American Eel Downstream Migration Timing Assessment**

- In Study Goals and Objectives, third paragraph, add the following in red:

There are few American eel upstream of the TransCanada projects **in the mainstem Connecticut River**, as indicated by annual electrofishing conducted in the lower portion of Vernon impoundment by Entergy Nuclear Vermont Yankee and as summarized in the Vernon PAD, and collections made by Yoder et al. (2009) above the Bellows Falls and Wilder dams.

In Project Nexus, add the following in red:

#### **PROJECT NEXUS**

Currently the TransCanada projects have little, if any, direct effect on the overall outmigration of Connecticut River American eel because so few eels exist upstream of the TransCanada projects **in the mainstem Connecticut River**.

- Under Project Nexus, there is the following statement: “Currently the TransCanada projects have little, if any, direct effect on the overall outmigration of Connecticut River American eel because so few eels exist upstream of the TransCanada projects.” This statement should be removed for a number of reasons. For one, we do not know how many eels exist upstream of the TransCanada projects. Secondly, if there are less eels, one could interpret this as meaning TransCanada could have more of an impact on their population.
- There is disagreement with the logic that there are not enough eels to do anything but a literature review. We have no idea how many eels may be in the lakes and ponds upstream of the projects. I think that fyke nets or some other traps should be set at the mouth of the tributaries or any pinch point where eels may be captured. This would tell us as much, or more, than the eel survey about the number of eels upstream of the projects. Any eels captured would be better candidates for telemetry studies than the eels captured downstream at Holyoke. There are eels in Lake Winnepesaukee, which has a total of 9 dams downstream.

### **Study 21: American Shad Telemetry Study – Vernon**

- A sample of fish from the early, middle and late part of the run should be tagged. All tags should have “mortality add-ons” and sample sizes of tagged fish should be as high as budget allows. Fish should be tagged below Turners Falls and allowed to proceed upstream “naturally” so that fish examined at Vernon have the typical experience/history of shad that would normally be in that stretch of the river. In the study plan, only manual tracking above Vermont Yankee is proposed, but that will not help determine if Bellows Falls operations are influencing fish migration, etc... Stationary receivers need to be deployed between Vermont Yankee and Bellows Falls.

### **Study 22: Downstream Migration of Juvenile American Shad – Vernon**

- The applicant does not want to do a turbine mortality study on the Francis turbines (units 1-4) because a previous study found only 10% of Atlantic salmon smolts passed through these units and that project mortality by this route will be minimal. We cannot assume that juvenile shad will take the same routes as smolts. They should use the 2014 route selection study to see if their above assumptions are true in terms of route selection and if their assumptions are false, they should do a turbine mortality study on Units 1-4 in 2015.
- It will be best if study fish are collected above the Vernon Dam so that difference in migration timing between up and downstream fish do not bias results.
- Hydroacoustics was ruled out due, in part, to the noise and turbulence around the dam. A hydroacoustic transducer oriented across the water column at location far enough upstream of the dam to minimize interference would provide important data on the total number of juvenile shad moving into the project. This would increase the value of the video monitoring data collected at the bypass by providing a better estimate of the number of fish that use the bypass as a percentage of the total number of fish that migrated into the project area.
- Care should be taken in interpreting the results in relation to any impacts Vermont Yankee’s thermal discharge may be having on juvenile shad route selection, timing

and migration rates. As such, additional temperature loggers in this general area would be useful (see comments on Study 6).

- There are concerns about the 110 mm minimum size and the 8 day tag life. A size bias in the data may down play the role of predation and possibly over-estimate the turbine mortality. With a short tag life, you run the risk of tagging fish that are not actively migrating. It may be difficult to find an adequate number of large individuals for tagging. That said, wild fish should be preferred over hatchery fish, which may behave differently than wild fish collected from the river.

### **Study 23: Fish Impingement, Entrainment, and Survival Study**

- This is just a desktop exercise and no field work is proposed. The study is supposed to “help establish a baseline condition to assist in evaluating the number of fish entrained or impinged and the expected survival of those fish at each of the projects.” Without knowing actual numbers impinged or entrained, it is impossible to calculate the above.
- Baseline data on entrainment rates are site specific and should not be calculated by using data from studies at other dams and assuming things are the same.

### **Study 30: Recreation Facility Inventory, Use and Needs Assessment**

- Survey should cover all seasons as the public uses the river and its recreation facilities throughout the year. Study plan should include the following: 1) provide a maintenance schedule for the upcoming license period for all TransCanada recreation sites, 2). Add another question to on site interviews that ask if impoundment fluctuations have **ever** impacted their recreation (not just if fluctuations impacted their recreation on day of interview).

Document Content(s)

NHFG Final Requests.PDF.....1-6