151 FERC ¶ 61,116
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Norman C. Bay, Chairman;
Philip D. Moeller, Cheryl A. LaFleur,
Tony Clark, and Colette D. Honorable.

TransCanada Hydro Northeast Inc. Project Nos. 1892-027
1855-046
1904-074

ORDER GRANTING REHEARING AND APPROVING REVISED STUDY 22

(Issued May 14, 2015)

I. INTRODUCTION

1. On February 21, 2014, the Director, Office of Energy Projects (Director), issued a study plan determination letter to TransCanada Hydro Northeast Inc. (TransCanada), licensee for the Wilder Hydroelectric Project No. 1892, Bellows Falls Hydroelectric Project No. 1855, and the Vernon Hydroelectric Project No. 1904, located on the Connecticut River in New Hampshire (NH) and Vermont (VT). On March 24, 2014, TransCanada filed a request for rehearing objecting to the study plan's requirement that TransCanada develop and implement a hydroacoustic[1] study to monitor downstream passage of juvenile American shad and adult American eels at the Vernon Hydroelectric Project. As discussed below, we grant TransCanada's request for rehearing and delete the hydroacoustic study requirement. In addition, we approve its February 3, 2015 Revised Study 22 regarding juvenile shad.

[1] "Hydroacoustics" is a term that refers to the study and application of sound in water. A hydroacoustic study can be either passive (listening for sounds) or active (making a sound and listening for the echo). Depending on the equipment used, an active hydroacoustic system can provide information about the distance to, number of, and size of underwater objects, including fish. In some cases, active hydroacoustics has been used to identify fish species. The study at issue in this proceeding is an active hydroacoustic study.

II. BACKGROUND

2. The Vernon Hydroelectric Project is located on the Connecticut River in Windham County, VT, and Cheshire County, NH. The dam and powerhouse are located on the Connecticut River at river mile (RM) 141.9. The project impoundment extends upstream approximately 26 miles, ending about six miles downstream of the Bellows Falls Project. The Bellows Falls Hydroelectric Project is located on the Connecticut River in Windsor and Windham Counties, VT, and Cheshire and Sullivan Counties, NH. The project's dam, canal, and powerhouse are located at RM 173.7; the project impoundment extends upstream approximately 26 miles. The Wilder Hydroelectric Project is located on the Connecticut River in Orange and Windsor Counties, VT, and Grafton County, NH. The project's dam and powerhouse are located at RM 217.4; the project impoundment extends upstream about 45 miles.

3. The licenses for the Wilder, Bellows Falls, and Vernon Hydroelectric Projects expire on April 30, 2018.

4. On October 31, 2012, TransCanada initiated the integrated licensing process (ILP) pursuant to part 5 of the Commission's regulations[2] by filing Notices of Intent (NOI) to seek new licenses for the three projects, and Pre-Application Documents (PAD) for each project.[3] As part of the ILP, TransCanada is required to consult with resource agencies, tribes, and other stakeholders to develop plans and subsequently conduct studies that will serve to inform Commission staff's environmental analysis and, ultimately, the Commission's decision on whether and, if so, under what conditions, to issue a new license for a project. The studies will also provide information to resource agencies as they provide comments, recommendations, and in some cases, terms and conditions for inclusion in any licenses that may be issued for the projects.

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[2] 18 C.F.R. pt. 5 (2014).

[3] On October 31, 2012, FirstLight Hydro Generating Company (FirstLight), the licensee of the Turners Falls Hydroelectric Project No. 1889 and the Northfield Mountain Pumped Storage Project No. 2485, which are also located on the Connecticut River downstream of the Vernon Project, filed a single NOI and PAD for its projects. The Commission staff's Scoping Document 1, issued on December 21, 2012, indicated its intent to prepare a single environmental impact statement for the five combined TransCanada and FirstLight projects.

5. As discussed in more detail below, at issue in this proceeding is the Director's study plan determination with respect to study requests regarding potential project impacts on American shad and American eel.

American Eel

6. The American eel is a catadromous species, meaning that it spawns in the ocean and spends the rest of its life in freshwater or estuarine habitat. Juvenile American eel migrate upstream during the months of April through October and may take several years to move from the ocean to rearing habitat throughout river basins. Sexually mature adult American eel (called silver eels) can be as long as 50 inches and migrate once in their lifetime back to the ocean to spawn. Silver eels are usually 3 to 24 years old when they initiate this migration. Most silver eels move on dark, rainy nights during September through December.[4]

7. The amount of rearing habitat and abundance of American eel upstream of the three TransCanada dams is unknown; however, American eel is known to have occurred throughout the basin historically,[5] and is currently present in the project areas and areas upstream of the Vernon impoundment.[6] To improve the efficiency and survival of upstream migrating eels, some dams within the Connecticut River basin have upstream passage facilities suitable for American eel.[7]

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[4] *See* Electric Power Research Institute (EPRI), *American Eel (Anguilla Rostrate) Scoping Study: A Literature and Data Review of Life History, Stock Status, Population Dynamics, and Hydroelectric Impacts* (1999); www.wildlife.state.nh.us/marine/marine_PDFs/American_Eels_GulfOfMaine.pdf; and http://www.fws.gov/northeast/newsroom/pdf/Americaneel9.26.11.2.pdf

[5] Scarola, J.F., *Freshwater Fishes of New Hampshire*, New Hampshire Fish and Game Department, Concord, MA, (1973).

[6] Yoder, C.O., L.E. Hersha and B. Appel, *Fish Assemblage and Habitat Assessment of the Upper Connecticut River: Preliminary Results and Data Presentation* (final project report to U.S. EPA, Region 1, Boston, MA), Center for Applied Bioassessment and Biocriteria, Midwest Biodiversity Institute, Columbus, OH (2009).

[7] Gephard, S. and J. McMenemy, *An Overview of the Program to Restore Atlantic Salmon and Other Diadromous Fishes to the Connecticut River With Notes on the Current Statuses of These Species in the River*, American Fisheries Society Monograph

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8. Several entities are involved in efforts to manage and restore American eel populations. In 2000, the Atlantic States Marine Fisheries Commission (Marine Fisheries Commission) issued an American eel management plan with recommendations for improving upstream and downstream passage for eels at hydroelectric projects throughout the east coast of the United States. The Connecticut River Atlantic Salmon Commission (Salmon Commission) is currently developing an eel management plan for the Connecticut River basin. The U.S. Fish and Wildlife Service (FWS) is currently reviewing a second petition (the first petition was unsuccessful) to have the American eel listed under the Endangered Species Act. Measures to protect juvenile and silver eels on their upstream and downstream migrations are routinely recommended or prescribed by state and federal agencies throughout New England and other parts of the east coast.

American Shad

9. American shad are anadromous, in that adult shad live in the ocean but return to freshwater rivers to spawn. Upstream shad migration occurs in the spring, and adults migrate over 100 miles upstream in some rivers. After hatching, the juveniles spend two to three months in the river before migrating downstream in the fall.

10. In the Connecticut River, the upstream spawning migration occurs from April through July with peak spawning occurring in June.[8] Adult American shad in the Connecticut River migrate upstream as far as the Bellows Falls Project dam (RM 173.7).[9] The amount of spawning habitat between the Vernon Project and the Bellows Falls Project is unknown, but juvenile American shad have been collected in fish surveys conducted by the owners of the Vermont Yankee Nuclear Power Station (Vermont Yankee) in the Vernon impoundment.[10] The exact timing of the juvenile American shad

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9:287-317 (2004).

[8] Savoy, T.F. and V.A. Crecco, *American Shad Early Life History and Recruitment in the Connecticut River; A 40-Year History,* American Fisheries Society Monograph 9:407-417 (2004).

[9] The falls at Bellows Falls, Vermont, are recognized as the historical upstream limit of migration for American shad in the Connecticut River. *See* Langdon, R.W., M.T. Ferguson, and K.M. Cox, *Fishes of Vermont,* Vermont Department of Fish and Wildlife, Waterbury, Vermont (2006).

[10] Connecticut Division of Marine Fisheries, Massachusetts Division of Marine

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downstream migration in the Vernon impoundment is unknown, but it may start as early as August[11] and continue into November.[12]

11. A primary objective of American shad management plans implemented by the Marine Fisheries Commission in 2010[13] and the Salmon Commission in 1992[14] is maximizing survival of juvenile shad migrating downstream. Juvenile shad successfully use several different types of downstream passage facilities, such as surface weirs and fish bypasses, at other New England hydropower projects. TransCanada attempted to evaluate downstream fish passage at the Vernon Project for juvenile shad in 1991, 1992, and 2009, but, according to TransCanada, these studies were inconclusive.[15] TransCanada evaluated survival through one of the project turbines (i.e., Unit 10, which is a Francis turbine) in 1995; however, the two other types of turbines (i.e., four Kaplan turbines and four smaller Francis turbines) are untested.[16]

Fisheries, Massachusetts Division of Fisheries and Wildlife, New Hampshire Fish and Game Department, and U.S. Fish and Wildlife Service, *American Shad Habitat Plan for the Connecticut River* (February 6, 2014).

[11] *See* O'Donnell M.J. and B.H. Letcher, *Size and Age Distributions of Juvenile Connecticut River American Shad Above Hadley Falls; Influence on Outmigration Representation and Timing*, River Research and Applications (2008).

[12] *See* New Hampshire Fish and Game Department staff's statements in the transcript of November 20, 2014 technical conference filed December 20, 2014.

[13] *Interstate Fishery Management Plan for Shad and River Herring*, Atlantic States Marine Fisheries Commission, Washington DC (2010).

[14] *A Management Plan for American Shad in the Connecticut River Basin*, Connecticut River Atlantic Salmon Commission, Sunderland, MA (1992).

[15] *See* TransCanada's February 3, 2015 Revised Study Plan 22, discussed in more detail below.

[16] *Id*. As discussed in more detail below, TransCanada has proposed to evaluate downstream passage route selection and survival for juvenile shad in 2015.

A. Study Plan Requests

12. Pursuant to section 5.9 of the Commission's regulations,[17] the FWS, New Hampshire Fish and Game Department (New Hampshire FGD), and Vermont Agency for Natural Resources (Vermont ANR), filed requests for studies related to American eel and American shad passage and abundance.[18] The agencies' requests, as relevant here, were virtually identical and included three studies pertaining to American eel and one study pertaining to juvenile American shad:

1) *American Eel Survey*: A survey to provide baseline data regarding the presence of American eel upstream of the Vernon, Bellows Falls, and Wilder dams, conducted through a combination of electroshocking and eel pots;

2) *Downstream American Eel Passage Assessment*: Study downstream passage of American silver eel at the Vernon, Bellows Falls, and Wilder Projects using radio telemetry; [19]

3) *American Eel Downstream Migration Assessment*: Field studies to evaluate the timing of downstream migratory movements of American eels on the mainstem Connecticut River, preferably by active trapping methods. The FWS noted that "these methods are technically challenging on larger mainstem rivers," adding that "[p]assive monitoring of migrant eels using hydroacoustic methods offers an alternative to active trapping;" [20]

4) *Downstream Migration of Juvenile American Shad*: A study to determine the impact of Vernon Project operations on the downstream migration of juvenile

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[17] 18 C.F.R. § 5.9 (2014).

[18] FWS filed its study requests on March 4, 2013; Vermont ANR filed its requests on March 1, 2013; and New Hampshire FGD filed its requests on February 27, 2013.

[19] Radio telemetry is a method for tracking individual fish that employs radio transmitters fixed onto or inside fish.

[20] FWS March 4, 2013 Study Request at 78-79.

American shad through a combination of approaches, including hydroacoustics, radio telemetry, and balloon tags.[21] In its request, FWS stated:

> Project discharge adjustments at the dam should be examined relative to timing, duration, and magnitude[22] of juvenile shad migration to and through the dam, with hydroacoustic equipment for natural/wild fish information…Additional hydroacoustic assessment immediately upstream and downstream of the Vernon Dam will provide information on the timing of migration to and through this area.[23]

B. TransCanada's Proposed Study Plan

13. On April 16, 2013, based on study requests and stakeholder comments on the PAD, TransCanada filed its Proposed Study Plan pursuant to section 5.11(a) of the Commission's regulations.[24] The Plan contained 33 proposed studies including, as relevant here, studies related to American eel and juvenile American shad.

14. Study 11, *American Eel Survey*, proposed to survey the mainstem reaches of the Vernon, Bellows Falls, and Wilder Projects and the mouths of tributaries to the project impoundments to determine the distribution of American eels upstream of the projects. Study 18, *American Eel Upstream Passage Assessment*, proposed to study juvenile American eel abundance at tailrace and spillway locations, and assess the feasibility of

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[21] Balloon tagging is a method for evaluating downstream passage survival through turbines, through fish passage facilities, or over dam spillways. Fish are tagged with one or more small balloons, within which a chemical reaction occurs while the fish is in the water that inflates the balloon after passage, allowing the fish to be buoyed to the water surface and collected for inspection.

[22] Generally, "timing" refers to the time of arrival and departure of migratory fish (shad and eels) at the project (not the timing of passage of the fish through turbines, gates, or fish pipes). "Duration" generally refers to the duration of the period when out-migrating shad or silver eels are present at the project. "Magnitude" of the migration run of shad or eels generally refers to the number of shad or eels in the migration.

[23] FWS March 4, 2013 Study Request at 60-61.

[24] 18 C.F.R. § 5.11 (2014).

improving upstream passage of juvenile eels at the Vernon, Bellows Falls, and Wilder Projects to access habitat upstream of the dam. Study 19, *American Eel Downstream Passage Assessment*, proposed to evaluate the movement rates, route selection, and downstream passage survival of migrating adult silver eels at the three TransCanada projects using radio telemetry and balloon tags. Study 20, *American Eel Downstream Migration Timing Assessment*, proposed a literature search to assess the timing of downstream adult silver eel migration in the Connecticut River Basin, and to describe the effects of environmental factors on migration timing. Study 22, *Downstream Migration of Juvenile American Shad*, proposed to study (1) the timing and duration of the juvenile shad downstream migration as well as juvenile shad route selection, and migration delay,[25] using tagged hatchery-reared juvenile shad with radio tags; and (2) evaluate juvenile shad turbine passage survival by releasing juvenile shad tagged with balloon tags into the project's turbines.

15. With respect to Study 22, TransCanada rejected the resource agencies' requests to use hydroacoustic technology, asserting that its use has known limitations based on a 2009 study[26] (2009 Vernon Study), the objective of which was to estimate the proportional route selection of emigrating juvenile American shad through Vernon Dam's ten turbine units, the fish pipe,[27] and the fish tube,[28] through fixed-aspect hydroacoustics placed behind the trashracks.[29] TransCanada explained that the results of the 2009 Vernon Study were "disappointing," as the study was not able to provide information on

[25] "Delay" generally refers to the difference between what would be expected in "unobstructed" passage time versus passage time that is affected by the project.

[26] Normandeau Associates, Inc., *Route Selection of Emigrating Juvenile American Shad at the Vernon Project* (2009).

[27] The fish pipe is the downstream fish passage structure located between turbine units 4 and 5.

[28] The fish tube is a smaller downstream fish passage structure located on the Vermont side of the powerhouse.

[29] A trashrack is a structure on the upstream side of the turbine intake comprising vertically-oriented bars with spacing sufficient to prevent debris such as trees and trash from passing through the turbines.

proportional route selection among generating units and passage routes, as was intended.[30]

16. On July 9, 2013, TransCanada filed revisions to its Proposed Study Plan, which it stated were intended to provide "updated" information for stakeholders when filing their comments on the Proposed Study Plan by the July 15, 2013 deadline.[31] TransCanada again, as relevant here, declined requests to both conduct field studies to determine the migration timing of silver phase American eels (TransCanada would instead rely on the literature review in Study 20), and use hydroacoustic technology for any studies.[32]

C. Comments on TransCanada's Proposed Study Plan

17. In its July 15, 2013 comments on TransCanada's Proposed Study Plan, FWS explained why it believed that, contrary to TransCanada's assertion, the findings from the 2009 Vernon Study should not be discounted. FWS noted that, based on its discussion with the company that provided the study equipment, the 2009 Vernon Study was restricted to a limited number of transducers that were mounted on fixed, non-adjustable mounts that did not allow for transducer adjustments to achieve a cleaner signal.[33] FWS stated that, despite the disappointing results, "properly deployed hydroacoustic transducers would provide quality data to address the study objectives."[34]

18. FWS also noted that hydroacoustic technology would be of use in assessing silver eel outmigration (timing, duration, magnitude) as that period overlaps with juvenile shad.

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[30] TransCanada April 16 Proposed Study Plan at 148.

[31] Comments on an applicant's proposed study plan must be filed within 90 days after the proposed study plan is filed. *See* 18 C.F.R. § 5.12 (2014).

[32] TransCanada April 16 Proposed Study Plan at 213-14.

[33] FWS July 15, 2013 Comments at 13. A hydroacoustic transducer transmits a pulse of acoustic energy into the water. When the acoustic pulse encounters an object, such as a fish, some of the energy is reflected back to the transducer as an echo. The transducer converts the echo into electrical signals that can be used to estimate the number of, size of, and distance to the reflecting objects.

[34] *Id.*

FWS concluded that analyses of hydroacoustic data "would substantially improve our understanding of project impacts and inform any potential mitigative measures."[35]

19. On July 11, 2013, New Hampshire FGD also filed comments on the Proposed Study Plan, in which it stated that, with respect to Study 22, a hydroacoustic transducer oriented across the water column at a location far enough upstream of Vernon Dam to minimize interference would provide important data on the total number of juvenile shad moving into the project, and would thereby "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 area."[36]

20. New Hampshire FGD also challenged TransCanada's assertion that limiting Study 20, *American Eel Downstream Migration Timing Assessment*, to a literature review was sufficient to assess the timing of American eels migrating from the Connecticut River to their spawning grounds. New Hampshire FGD disagreed with TransCanada's position that its projects would have little impact on the overall outmigration of Connecticut River American eel because so few eels exist upstream of the Vernon dam. New Hampshire FGD noted that it is not known how many eels exist upstream of the TransCanada projects, and if there are indeed fewer eels downstream of the dam than upstream, "one could interpret this as meaning TransCanada could have more of an impact on their population."[37] New Hampshire FGD added that, because "we have no idea how many eels may be in the lakes and ponds upstream of the projects," fyke nets or other types of traps should be set at the mouth of the tributaries or any pinch point where eels may be captured.[38]

21. On July 15, 2013, Vermont ANR filed comments on the Proposed Study Plan, in which it also challenged TransCanada's statement that a literature review of downstream eel migration pursuant to proposed Study 20 was sufficient It noted:

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[35] *Id.*

[36] New Hampshire FGD July 11, 2013 Comments at 5.

[37] *Id.*

[38] *Id.* A fyke net is a long, stationary, conical net designed to guide eels into the net.

> considering there have been no targeted eel surveys in riverine and lacustrine habitat on the Lower Connecticut River as well as in the ponds and tributaries of the Connecticut River basin, it is unknown how many eels are residing within and/or outside of project bounds.[39]

22. With respect to proposed Study 22, Vermont ANR and New Hampshire FGD agreed with FWS that hydroacoustic technology should be used to determine whether project operations affect juvenile American shad outmigration, survival, production, and recruitment. Vermont ANR noted that the use of hydroacoustics in the forebay at Vernon dam would not only provide a more accurate picture of the timing, duration, and magnitude of juvenile shad migration through the Vernon Project, it would also provide a more accurate picture of the timing and duration of the other migratory species such as American eels.[40]

D. TransCanada's Revised Study Plan

23. On August 14, 2013, TransCanada filed with the Commission its Revised Study Plan pursuant to section 5.13(a) of the Commission's regulations,[41] which reflected comments received during the study plan meetings and discussions, and the formal comments filed by stakeholders with the Commission.

24. The Revised Study Plan included, as relevant here, the studies that TransCanada stated were in alignment with the resource agencies' study requests as described above for the juvenile American shad and the American eel. In particular, TransCanada retained its proposal in Study 22 to tag hatchery-reared juvenile shad with radio tags and balloon tags as set forth in the Proposed Study Plan.

1) Study 11, *American Eel Survey*: A study to characterize the distribution and relative abundance of American eel within the project-affected reaches of the Connecticut River and within the project's hydraulic influence of select tributaries;

2) Study 18, *American Eel Upstream Passage Assessment:* Visual surveys downstream of each dam to identify areas where eels concentrate in an attempt to

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[39] Vermont ANR July 15, 2013 Comments at 23.

[40] *Id.* at 27.

[41] 18 C.F.R. § 5.13(a) (2014).

migrate upstream. Shortly after these areas are identified, TransCanada will deploy eel traps to determine if eels could be passed upstream in substantial numbers. The surveys will be conducted in year one, and the eel traps will be installed in year two, based on suitable eel concentrations detected in year one;

3) Study 19, *American Eel Downstream Passage Assessment:* Radio tagging and systematically monitoring fish movements and passage through each of the routes through the projects. Methods incorporate the use of radio telemetry and balloon tag methodology. Downstream passage survival will focus on turbine passage, rather than at all potential passage routes at each project, as requested by the resource agencies;

4) Study 20, *American Eel Downstream Migration Timing Assessment:* A review of available literature for the Connecticut River Basin and other rivers in the Northeast to characterize the general timing of the adult silver eel downstream migration;

5) Study 22, *Downstream Migration of Juvenile American Shad-Vernon:* A study to evaluate whether turbine passage adversely affects juvenile American shad survival and provide information about route selection, migration timing and forebay residency time. Monitoring methods include radio telemetry, balloon tags, and a single-beam hydroacoustic transducer to monitor the Vernon Project forebay in the immediate vicinity of the downstream fish bypass pipe.

The studies are described in greater detail below.

25. Notably, although TransCanada had previously declined the resource agencies' requests for a hydroacoustic array immediately upstream and downstream of the Vernon dam, Study 22 now proposed to use a single beam hydroacoustic transducer near the Vernon dam's downstream fish passage pipe to provide "additional…qualitative information" on the timing, duration, and relative abundance of the American shad.[42] TransCanada proposed that Study 22 be conducted in the fall of the first study year (2014). It estimated that the study, with the addition of the single-beam transducer, would cost between $360,000 and $420,000 for one year.

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[42] TransCanada's Revised Study Plan at 223. A single–beam transducer is the simplest type of hydroacoustic transducer. With a single-beam echo sounder, a target is detected in the beam; the distance to the target is known, but the target's specific location within the beam is unknown.

E. Comments on TransCanada's Revised Study Plan

26. In its August 29, 2013 comments on TransCanada's Revised Study Plan, FWS reiterated the need for Study 22 to include a multi-unit array of hydroacoustic transducers in order to gain the most comprehensive understanding of the juvenile shad outmigration and its relationship to project operations and environmental conditions. FWS added that, while a single transducer near the fish pipe may provide sufficient insight into the timing, duration, and relative abundance of the run, it would not allow for an assessment of delay at the project.[43] FWS suggested that the way to gain the most comprehensive understanding of the juvenile shad outmigration and its relationship to project operations and environmental conditions is to have transducers "at all possible passage routes (i.e., intake, fish bypasses, spillway gates)."[44] Additionally, FWS asserted that it may not be possible to rear a sufficient number of shad for Study 22, hatchery-reared juvenile shad might behave differently from wild juvenile shad, and TransCanada proposed too few trials (i.e., releases of tagged fish) to thoroughly evaluate downstream juvenile shad passage over a range of environmental and operating conditions.

27. FWS and Vermont ANR commented that a comprehensive hydroacoustic array would continuously collect information about juvenile shad migration, timing, passage route selection, and delay during a variety of operating and environmental conditions, and could confirm that the hatchery-reared radio-tagged shad behave similarly to wild shad with respect to passage route selection. Vermont ANR and New Hampshire FGD suggested that a comprehensive hydroacoustic study at the Vernon Project could provide additional project-specific data on silver eels that could supplement the eel survey data in Study 11, the literature review required by Study 20, and the telemetry data collected in Study 19. Vermont ANR and New Hampshire FGD also suggested that such a hydroacoustic study could provide better information about wild, untagged eels that may behave differently from eels used in the telemetry study.

28. On August 27, 2013, Entergy announced its plan to decommission Vermont Yankee in the fourth quarter of 2014. Because operation of Vermont Yankee has influenced Connecticut River water temperatures within the Vernon impoundment and downstream through the Turners Falls Project since Vermont Yankee began operating in 1972,[45] staff concluded that the baseline environmental condition would change after

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[43] FWS August 29, 2013 Comment at 4.

[44] *Id.*

[45] During project operations, Vermont Yankee withdrew its cooling water from

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2014, and that any aquatic studies could produce invalid data for licensing decisions if conducted while Vermont Yankee was still operating.

29. On November 26, 2013, staff held a technical meeting for stakeholders to identify resource studies that may be affected by Vermont Yankee's closure. Staff's agenda for discussion comprised 20 of TransCanada's studies in its Revised Study Plan (including Studies 11, 18, 19, 20, and 22) that potentially could be affected, and included discussion of a possible new study that staff deemed the "*Vernon Hydroacoustic Study*."[46]

30. On December 31, 2013, TransCanada submitted revisions to its Revised Study Plan based on discussions held at the November 26 technical meeting and other comments received after the technical meeting. To ensure the baseline for evaluation of the three projects reflects the actual baseline environmental conditions after 2014, TransCanada and stakeholders agreed to delay initiation of all American eel and American shad studies (Studies 11, 18, 19, 20, and 22) until after the shutdown of Vermont Yankee at the end of 2014.[47] With respect to Study 18, TransCanada made some minor additional revisions, changing the study period from two years to one year.

31. On January 10, 2014, TransCanada filed additional comments on the yet-to-be determined need for the resource agencies requested hydroacoustic technology in several of the fish passage studies in its Revised Study Plan. TransCanada reiterated its contention that its proposed Study 22 "will adequately meet the goals and objectives of the various study requests associated with downstream migrants." [48]

32. In response to FWS' assertion that TransCanada's proposal to use a single transducer directed towards the fish pipe would not allow for an assessment of delay at the project, TransCanada stated that it had conducted passage delay assessments utilizing radio telemetry methods at Vernon dam for more than 20 years, and saw no reason to do

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and discharged it back to the Vernon reservoir.

[46] Staff stated at the meeting that the *Vernon Hydroacoustic Study* was being treated as a requested study that was not adopted by TransCanada. *See* November 26, 2013 Technical Meeting Transcript at p. 71 (filed in FERC's eLibrary under Project No. 1892).

[47] Vermont Yankee ceased operations on December 29, 2014.

[48] TransCanada January 10, 2014 Comments at 2.

more. TransCanada added that FWS' request for a "multi-unit array of hydroacoustic transducers at all possible passage routes (i.e., intake, fish bypasses, spillway gates)," would require a complex network of more than 30 transducers on the upstream side of the dam to cover each potential exit route, and would add $530,000-$600,000 to TransCanada's estimated one-year study cost of $360,000-$420,000.[49] TransCanada added that requiring transducers on the upstream side of the dam "does not even begin to assess the downstream area as requested in the original March 1, 2013 FWS study request…"[50]

F. Director's Study Plan Determination

33. On February 21, 2014, the Director issued a Study Plan Determination for Aquatic Studies, which, with some modifications, requires TransCanada to conduct the 20 aquatic studies it had proposed.[51] Specifically, the Director approved without modification TransCanada's proposed Study 11, *American Eel Survey*; Study 18, *American Eel Upstream Passage Assessment;* Study 19, *American Eel Downstream Passage Assessment*; and Study 22, *Downstream Migration of Juvenile American Shad*.

34. In order to provide information on the timing and duration of the juvenile shad downstream migration, Study 22, *Downstream Migration of Juvenile American Shad*, included the use of a single-beam hydroacoustic transducer to monitor fish passage through a downstream fish pipe. As noted earlier, pursuant to Study 22, TransCanada would tag hatchery-reared juvenile shad with radio tags to evaluate downstream passage route selection and passage delay. Study 22 also included evaluating juvenile shad turbine passage survival by releasing juvenile shad tagged with balloon tags into the project's turbines. TransCanada would collect hydroacoustic data at the downstream fish pipe from early September to the end of October 2015. TransCanada would also visually monitor for juvenile shad in the project forebay twice each week and collect length data by collecting shad from the forebay with a lift net.

35. However, the Director concluded that proposed Study 22 would not provide needed information regarding the Vernon, Bellows Falls, and Wilder Project effects on

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[49] *Id.* at 3.

[50] *Id.*

[51] The Director previously issued the study plan determination for TransCanada's 13 proposed non-aquatic studies, on September 13, 2013.

downstream migratory delay. The Director noted that, because the source of the radio-tagged shad is unknown and stresses associated with tagging, holding, and transport will occur, the radio-tagged juvenile shad may not be representative of wild, untagged juvenile shad, and therefore, may not be suitable to evaluate migratory delay. The Director concluded that a hydroacoustic study could therefore inform Study 22. Accordingly, the Director required that TransCanada perform a "comprehensive hydroacoustic study" (*Vernon Hydroacoustic Study)* to evaluate the downstream migration of, and related project effects on, juvenile out-migrating shad, including migratory delays at the Vernon Project.[52]

36. The Director also determined that, in addition to augmenting Study 22, the *Vernon Hydroacoustic Study* could help inform the analyses in the three studies pertaining to the American eel (Studies 11, 19, and 20).[53] The Director concluded that the installation of a hydroacoustic array at Vernon dam would provide data on the out-migrating population of adult silver American eel from upstream of Vernon dam in an efficient and cost-effective manner, because the study would be conducted at one key project location (Vernon dam) rather than the entire watershed area upstream. The Director added that

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[52] February 2014 Study Plan Determination at B-34.

[53] *Id.* at B-36. With respect to Study 11, *American Eel Survey*, the Director agreed with the resource agencies that TransCanada's proposed study would not evaluate the population of eels that pass through the project areas and reside outside of the influence of the projects within the Connecticut River watershed and that, without more, would likely misinform an analysis of potential project effects by underestimating the population of eels affected by the projects. *Id.* The Director also found that the data generated from the *Vernon Hydroacoustic Study* could be used in the analysis of Study 19, *American Eel Downstream Passage Assessment*. With respect to Study 20, *American Eel Downstream Migration Timing Assessment*, which consists of a review of available literature to characterize the general timing of the Connecticut River American eel downstream migration, the Director noted agency concerns that the study lacks a field component and concurred with the resource agencies that providing a field component like the *Vernon Hydroacoustic Study* to sample out-migrating silver eels would provide empirical data. *Id.* at B-27. The Director noted that the data from the *Vernon Hydroacoustic Study* could be incorporated into the Study 20 analysis to quantify and characterize the outmigration of silver phase American eels within the Connecticut River basin upstream of Vernon dam, and would provide the information on the timing and magnitude of downstream American eel migration necessary to evaluate potential project effects on American eel. *Id.* at B-27, B-28.

data provided by proposed Study 18, *American Eel Upstream Passage Assessment*, along with data from Study 11, could be used to make some assumptions on the distribution and relative abundance of eels upstream of each project. The Director stated that this information, when coupled with data from the *Vernon Hydroacoustic Study*, could be used to estimate the number of adult silver eel out-migrating past each project, thereby supporting an analysis of the need for downstream fish passage measures at each of the three TransCanada projects.[54] The Director added that, because downstream adult silver eel migration may vary significantly from year to year, TransCanada was required to conduct the comprehensive hydroacoustic study for two years.[55]

37. The Director did not explicitly set forth what the "comprehensive hydroacoustic study" should include in terms of technology or methodologies, such as whether the study should use single-beam, split-beam,[56] or acoustic imaging technology;[57] which possible passage routes would be monitored (e.g. all turbine intakes and/or all spill gates); the placement of hydroacoustic arrays; or the duration of each study season. However, the study was to be developed in consultation with FWS, Vermont ANR, New Hampshire FGD, and Commission staff to determine the run timing, duration, and magnitude of downstream migrating juvenile shad. TransCanada was to file for Commission approval the *Vernon Hydroacoustic Study* when it filed its initial study report in September 2014.[58]

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[54] *Id.*

[55] *Id.* At B-35, B-36.

[56] A split-beam uses a single beam but divides the transducer face into four quadrants, allowing the location of the target to be triangulated to a specific location within the beam. Split-beam transducers are superior to single-beam transducers for counting objects, estimating the size of objects, and tracking objects within the beam.

[57] Acoustic imaging systems use transducers that transmit multiple beams to create a two-dimensional image of underwater objects, which can be used to identify fish species with distinct shapes or swimming patterns. However, to produce a high quality image, the distance between the target object and transducer must be less than approximately 15 to 20 feet.

[58] *Id.* at B-36. The Director concluded that, based on TransCanada's estimates set forth in its Revised Study Plan, the development and implementation of the *Vernon Hydroacoustic Study* would increase the cost of TransCanada's study plan by $530,000 to $600,000.

G. TransCanada's Request for Rehearing

38. On March 24, 2014, TransCanada timely filed a request for rehearing challenging the inclusion of the *Vernon Hydroacoustic Study* in the Study Plan Determination.[59] On April 23, 2014, and May 5, 2014, FWS and New Hampshire FGD, respectively, filed comments on TransCanada's rehearing request.[60]

39. On rehearing, TransCanada challenges the need for the *Vernon Hydroacoustic Study*. TransCanada asserts that this study is not warranted because the use of hydroacoustic technology to inform studies 11, 19, 20, and 22 is not a generally accepted practice in the scientific community. TransCanada states that its other proposed methods are scientifically accepted and would meet the objectives of each study. It adds that the high cost of a comprehensive hydroacoustic study far exceeds the incremental amount of information that a comprehensive hydroacoustic study would provide.

40. TransCanada adds that radio tagging is the best method to evaluate the effects of project operation on passage route selection and delay for both juvenile shad and silver eels. Furthermore, TransCanada states that the limitations of hydroacoustic technology prevent the collection of the information the resource agencies requested.

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[59] On September 15, 2014, while rehearing of the Study Plan Determination was pending, TransCanada filed a proposed plan for Study 34, *Vernon Hydroacoustic Study*, as required by the Study Plan Determination. The proposed Study 34 did not include the required comprehensive hydroacoustic array, but instead proposed to monitor the fish bypass using a single hydroacoustic transducer, as it is required to do as part of Study 22, and use visual observations and field sampling to confirm the presence of juvenile shad. TransCanada reiterated its concern that the application of hydroacoustic technology to monitor eels "is speculative at best because there are no widely accepted or used protocols for applying this technology to eels," nor are there adequate supporting studies that suggest any meaningful information on eels may be gained. TransCanada's September 15, 2014 Study 34 at 4. Vermont ANR and FWS filed comments on the proposed plan, reiterating their support for a comprehensive hydroacoustic study and explaining why TransCanada's proposed study would not be sufficient. *See* Vermont ANR's and FWS' Comments filed October 10 and 14, 2014, respectively.

[60] Commission regulations provide that an answer may not be made to a request for rehearing, unless the decisional authority orders otherwise. 18 C.F.R. §§ 385.213(a)(2), 385.713(d) (2014). The agencies did not ask for waiver of the regulations, and we see no reason to allow the answers.

41. TransCanada also argues that the Director "grossly misapplied TransCanada's cost estimates" for the *Vernon Hydroacoustic Study*. TransCanada states that the additional cost of $530,000 to $600,000 cited by the Director derives from TransCanada's estimated cost of a *single*, rather than multi-unit, hydroacoustic array. TransCanada asserts that, at a minimum, the "comprehensive hydroacoustic study demanded by the Director would require three such arrays plus hydroacoustic transducers mounted on the dam at passage routes" costing a total of $5.86 million to $8.16 million over two years.

42. TransCanada asserts that the Director erred in failing to analyze the incremental value of the low quality information derived from hydroacoustic technology in light of the exorbitant cost.[61]

43. Finally, TransCanada argues that the requirement to conduct the *Vernon Hydroacoustic Study* for two years, rather than one, is not based on substantial evidence in the record.

44. In an effort to better understand how the resource agencies define delay, timing, magnitude, and duration of the downstream migrations for juvenile shad and silver eels, and to gather technical information about hydroacoustic technology, staff held a technical conference on November 20, 2014 with interested entities.

H. November 20, 2014 Technical Conference

45. The technical conference included little discussion of Studies 11, 18, and 20, as there was general agreement on the need for these studies and the required methods for conducting them. However, the resource agencies identified several concerns over Study 19, *American Eel Downstream Passage Assessment*, and Study 22, *Downstream Migration of Juvenile American Shad Study-Vernon*, and described why they believe that a comprehensive hydroacoustic study is warranted. The agencies discussed the need for TransCanada to collect information about delay, passage selection, and passage survival for juvenile shad and adult silver eels for all likely operating and environmental conditions that could occur during the downstream migration period, rather than only during the conditions that occur during the passage trials proposed for Studies 19 and 22.

[61] Request for Rehearing at 21.

46. The agencies added that TransCanada should identify times and conditions when peaks in the numbers of juvenile shad and adult silver eels migrating downstream occur, in addition to documenting when each species' migration begins and ends. The agencies asserted that hydroacoustic technology is the only method that could collect the requested information during all likely operating and environmental conditions because hydroacoustic technology can collect data continuously. Finally, the agencies reiterated concerns that the results of Studies 19 and 22 may be biased and unreliable if the origin of study fish is from outside the Vernon Project area or if the behavior of the study fish is affected by being held in tanks and having radio transmitters attached to them.

47. TransCanada provided technical information about the application, and what it believes are the limits, of hydroacoustic technology, and discussed the feasibility of collecting the type and amount of information requested by the agencies. TransCanada stated that individual fish or schools of fish (in the case of shad) cannot be tracked from one transducer to another, and that fish or schools that leave and re-enter an area monitored by a transducer cannot be identified (that is, there is no way to determine if the fish are new fish entering the area or fish that had been previously recorded). TransCanada explained that it is therefore not possible to evaluate changes in delay and passage route selection in the manner that the agencies requested. TransCanada added that collecting data continuously for the large number of transducers required in order to study all passage routes would generate a tremendous amount of data that could not be analyzed within the time constraints of the licensing process.[62]

48. TransCanada also presented the results of a controlled experiment it conducted in the Fall of 2014 that evaluated potential tagging effects on hatchery-reared juvenile shad and wild juvenile shad caught just upstream of the Vernon dam. The objective of the experiment was to evaluate whether the tagging process and/or the tag itself affect the behavior of shad. In addition to hatchery-reared and wild fish, the evaluation included two different sized radio tags and two distinct attachment methods. TransCanada

[62] TransCanada's $8.16 million cost estimate for the *Vernon Hydroacoustic Study* appears to presume using three hydroacoustic arrays (upstream, in the forebay, and downstream of the dam), additional transducers located at expected passage routes (primary spill gates, fish bypasses, and at the project's 10 turbine intakes), and additional equipment placements and alternative hydroacoustic technologies such as acoustic imaging systems or dual-frequency identification systems. However, we do not believe that the Study Plan Determination intended for hydroacoustic coverage to be provided at all *potential* means of passage. Rather, TransCanada could have developed a more appropriate, and less costly, alternative in consultation with the resource agencies.

summarized data from the evaluation, which concluded that new, smaller radio tags could be effectively used on wild juvenile shad. On November 26, 2014, TransCanada filed a report on the evaluation.

49. On February 3, 2015, TransCanada filed a Revised Study 22, which incorporates the results of the evaluation, as explained below.

I. TransCanada's Revised Study 22

50. In its February 3, 2015 Revised Study 22, TransCanada explains that its objectives are intended to address FWS' concerns about an overreliance on radio telemetry to meet Study 22's goals and objectives. Based on the results of the Fall 2014 evaluation's tag trials, and additional consultation with the resource agencies and stakeholders, TransCanada proposes to: tag and release up to 320 wild-caught juvenile shad from mid-September through mid-November in 2015, thereby eliminating the need to use hatchery fish. TransCanada would collect wild juvenile shad twice per week and release the fish in 16 groups of 20 throughout this period.

51. In addition, TransCanada proposes to monitor the fish bypass pipe with a split-beam transducer instead of a single beam transducer which, it asserts, would provide more accurate estimates of fish size and number as well as information about fish movement (i.e., speed and direction). TransCanada proposes to operate the transducer from August 15 to November 15 of 2015. TransCanada's estimated cost range for completing the study is $627,000-$687,000. The remaining methods set forth in its previous Study 22 are unchanged.

52. No comments were filed on the Revised Study 22.

III. DISCUSSION

53. We have reviewed the arguments presented by the agencies and the licensee, including the information provided at the November 14, 2014 Technical Conference, and we believe that the *Vernon Hydroacoustic Study* is not necessary to evaluate the effects of the Wilder, Bellows Falls, and Vernon Projects on American eel.

54. Eels are known to occur above the Vernon Project, and Study 11, *American Eel Survey*, will provide additional data about their distribution and relative abundance. Study 18, *American Eel Upstream Passage Assessment*, will provide information about the upstream movements of juvenile eels and will evaluate the feasibility and location of a permanent upstream eel ladder. Study 19, *American Eel Downstream Passage Assessment*, will provide project-specific information about adult silver eel behavior as they approach the Vernon Dam. Telemetry of radio-tagged adult silver eels will provide

information about delay and route selection.[63] The turbine survival component of Study 19 will provide Commission staff with information on eel survival rates for each turbine type used at each project.[64] Field collections of adult eels in the Vernon Project area pursuant to Study 11 will likely provide an idea of eel abundance upstream of the Vernon Project. Extreme data in either direction (very high numbers or very low numbers) will give the Commission an indication of the number of adult silver eels that may be present during the migration period. Information about eel run timing and duration is generally available from the literature, especially studies that have been conducted in New England, and Study 20, *American Eel Downstream Migration Timing Assessment*, should adequately summarize this information.

55. In sum, studies 11, 18, 19, and 20 will gather a variety of information on American eel, including some information about upstream distribution, migration timing, duration, delay, route selection, and turbine survival, and allow the Commission to develop any license articles that may be necessary to protect juvenile and adult silver eels at the Vernon Project.[65] If, after the completion of the first-year studies, Commission

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[63] While using eels from others watersheds could result in some complications for interpreting the data, TransCanada developed detailed handling protocols in Study 19 for minimizing the handling stress of the fish.

[64] If the existing downstream passage survival rates through the dam are high, then the number of adult silver eels moving downstream is essentially irrelevant for our purposes here. Similarly, if downstream passage survival is low, but can be improved with low-cost, limited modifications, the adult silver eel numbers may also not be needed. For example, there are three different types of turbines at the Vernon Project. If two of the turbines have high survival rates, and the third type of turbine has low survival rates, then one option to consider is requiring TransCanada to cease operation of the third type of turbine during the migration season, or operate this turbine type as the last turbine on and the first turbine off.

Under Study 18, TransCanada will also study the number of juvenile eels in the area immediately downstream of Vernon dam. If the results indicate that there are very few juvenile eels trying to migrate upstream past Vernon dam, and upstream field collections indicate adult eel numbers upstream of the dam are very low, then it may be prudent to delay any necessary downstream passage measures until after safe and effective upstream passage is provided for juvenile eels.

[65] If these studies prove unsuccessful, or they provide inconclusive results, additional studies, including additional hydroacoustic sampling, could be performed

(continued ...)

staff concludes that more information about adult silver eel numbers is needed, staff could require TransCanada to conduct more studies during an additional study season, including field studies during the downstream migration season.

56. As for shad, we have reviewed the arguments presented by the agencies and the licensee, including the information provided at the November 14, 2014 Technical Conference and the Revised Study 22, and we believe that the *Vernon Hydroacoustic Study* is not necessary to evaluate the effects of the Wilder, Bellows Falls, and Vernon Projects on shad.

57. TransCanada's Revised Study 22, which includes collection and tagging of wild juvenile shad test fish twice per week from mid-September to mid-November, would span the majority of the juvenile shad downstream migration period, thereby providing information about the timing and duration of the downstream migration. Additionally, TransCanada's proposal to monitor the fish pipe's entrance with a split-beam transducer would provide some supplemental information about the timing and duration of the juvenile shad migration.

58. Additionally, because the Revised Study 22 would include the collection and testing of wild juvenile shad throughout the downstream migration period, concerns about the use of hatchery fish and testing under a limited range of environmental and operational conditions would be eliminated.

59. In any event, we believe that the *Vernon Hydroacoustic Study* is not the appropriate tool in this instance because it would not provide needed information about route selection or delay for juvenile shad or silver eels at the Vernon Project.

60. Because hydroacoustic technology cannot positively identify species, using hydroacoustics to assess the timing, duration, and magnitude of the downstream juvenile shad and adult silver eel migrations would require a number of assumptions. For instance, researchers would likely need to assume that any dense schools of 3- to 4-inch-long fish moving through the transducer fields during the fall would be juvenile shad, which would be reasonable since they are the only species this size that would likely to exhibit this behavior. However, it is less clear how to treat individuals and small schools of 3- to 4-inch-long fish, since a variety of species could create these hydroacoustic signals. These data would either need to be disregarded since they may not be juvenile shad or they all would need to be treated as juvenile shad.

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during a future study season.

61. Moreover, juvenile shad downstream migration rates peak during late afternoon and early evening, but some shad continue to migrate downstream at night.[66] Schooling behavior for juvenile shad breaks down at night, making it possible that juvenile shad move downstream individually at night.[67] As a result, the decision to disregard or lump data for individuals and small schools could significantly influence the results of the study if large numbers of juvenile shad migrate downstream at night as individuals or in small schools. Similarly, identifying eels with hydroacoustics can be unreliable. Studies have shown that eels, because of their size, shape, and swimming motion can be identified using hydroacoustics;[68] however, this works only when eels are close to the transducer and if the eel is oriented in a particular way within the transducer's image cone. At the November 2014 technical conference, TransCanada explained that, if not properly oriented within the image cone, eels could be confused with other relatively long, thin fish such as pickerel or walleye.

62. To evaluate route selection or delay, tracks for individual fish are necessary to analyze how fish approach different passage routes and to identify changes in swimming speed or direction that could indicate delay. Unlike radio telemetry methods, hydroacoustics cannot be used to track individual fish or schools of fish moving through a large area because: (1) the area monitored by a single hydroacoustic transducer would be very small (e.g., approximately an 8-foot circle based on the physical characteristics of the project dam and the depth of the river); (2) many transducers would be needed to monitor all potential passage routes at the project dam and there is no way to track individual fish or individual schools moving from the area monitored by one transducer to an area monitored by a different transducer as the individual fish or school search for a passage routes; and (3) there is no way to identify an individual fish or school that leaves and then re-enters the area monitored by a single transducer while searching for a passage route. In contrast, the data from radio tags track individual fish as they approach the dam from upstream, encounter passage routes at the dam, and pass through dam, which

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[66] O'Leary, J.A., B. Kynard, B.C. Marcy, Jr., *Behavior, Length, and Sex Ratio of Seaward-Migrating Juvenile American shad and Blueback Herring in the Connecticut River*, Transactions of the American Fisheries Society, 115:529-536 (1986).

[67] *Id*.

[68] Haro, A., D. Degan, J. Home, B. Kulik, and J. Boubee, *An Investigation of the Feasibility of Employing Hydroacoustic Monitoring As a Means to Detect the Presence and Movement of Large, Adult Eels (Genus Anguilla)*, Conte Anadromous Fish Research Center, Internal Report No. 99-01, U.S. Geological Survey, Montague, MA (1999).

allows for a detailed analysis of route selection and quantification of the amount of time required to pass the dam (i.e., delay).[69]

63. It is certainly possible that a comprehensive hydroacoustic array could provide some information to corroborate the results of the other eel studies (i.e., information on delay and route selection); however, the only unique information about American eel that the resource agencies attribute to the *Vernon Hydroacoustic Study* would be an estimate of the relative abundance of eels migrating past the Vernon Project. In our view, we do not find it particularly useful to know at this time, if at all, how many American adult silver eels are currently migrating downstream past the Vernon Project. Instead, we find that a stepped approach, whereby TransCanada first conducts studies 11, 18, 19, and 20, to determine the effects on upstream and downstream passage, is reasonable.

64. Commission staff originally required the comprehensive hydroacoustic study to corroborate the data from the other studies and rule out any problems from using hatchery-reared juvenile shad in the tagging studies. However, for the reasons stated above, and because TransCanada's February 2015 Revised Study 22 includes the use of new, smaller tags that can be used on wild juvenile shad, there is no reasonable basis for conducting a comprehensive hydroacoustic study for juvenile shad at this time.

65. We therefore find that the *Vernon Hydroacoustic Study*, a comprehensive two-year hydroacoustic study, is not warranted.[70] Rather, the information necessary to evaluate the effects of the Wilder, Bellows Falls, and Vernon Projects on American eel and American shad can likely be obtained from Studies 11, 18, 19, 20, and TransCanada's Revised Study 22. If these studies prove unsuccessful, or they provide inconclusive results, additional studies, including additional hydroacoustic sampling, could be performed during a future study season.

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[69] *See* Adams, N. S., J. W. Beeman, and J. H. Eiler, *Telemetry Techniques: A User Guide for Fisheries Research*, American Fisheries Society, Bethesda, Maryland (2012); and Venditti, D.A, D.W. Rondorf, and J.M. Kraut, *Migratory Behavior and Forebay Delay of Radio-tagged Juvenile Fall Chinook Salmon in a Lower Snake River Impoundment*, North American Journal of Fisheries Management 20:41-52 (2000).

[70] Because we conclude that the *Vernon Hydroacoustic Study* is not necessary at this time, we need not act on TransCanada's Proposed Study 34, filed on September 14, 2014.

66. Accordingly, we grant rehearing and delete Study 34, *Vernon Hydroacoustic Study*, from the Study Plan Determination. In addition, we approve TransCanada's February 2015 Revised Study 22, *Downstream Migration of Juvenile American Shad-Vernon*.

The Commission orders:

(A) The request for rehearing filed by TransCanada on March 24, 2014, is granted.

(B) Study 34, *Vernon Hydroacoustic Study*, as set forth in the Director's February 21, 2014 Study Plan Determination, is removed.

(C) TransCanada's February 3, 2015 Revised Study 22, *Downstream Migration of Juvenile American Shad-Vernon*, is approved and replaces Study 22 in the Director's February 21, 2014 Study Plan Determination.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.