

## **APPENDIX 5**

### **Description of Project Flows**

## **Appendix 5**

### **Benton Falls Hydroelectric project**

#### **Description of Project Flows**

The project is operated as a run of river plant. The downstream release through the turbine-generators plus the excess spill over the dam equals the inflow to the reservoir.

The Sebasticook River basin has a drainage area of 975 square miles and is the largest sub basin of the Kennebec River system. The project is located 5.3 miles from the confluence of the Sebasticook and Kennebec Rivers in Winslow, Maine, and almost 90 percent of the total drainage area (860 miles) is upstream of the site.

Streamflows at the project site are based on daily flow data recorded at U.S. Geological Survey (USGS) surface water Stream Gauging Station No. 01049000. The gauge is located approximately 14 miles upstream of the project site in Pittsfield, Maine, and has a period of record extending back to 1929.

## APPENDIX 6

### Water Quality

## Appendix 6

### Benton Falls Hydroelectric Project

#### Water Quality

The Sebasticook River is designated B-2 under the State of Maine surface water classification system. This designation applies to water that is acceptable for water contact recreation, for industrial and potable water supplies after treatment, and for fish and wildlife habitat. The designation represents the official State water quality objective for the Lower Sebasticook River upon which the project is located.

A 401-water quality certificate was issued to the project September 29, 1983 with a requirement to draw down the project reservoir to natural river elevation from July 1 to September 15 (see Exhibit 6-1). Originally Article 26 of the project's FERC license required the Project to draw down the impoundment in accordance with the guidelines set forth by the DEP to the natural river elevations during the summer low flow months which minimizes the project's impacts on water quality by restoring the aeration effect of the river and minimizing formation of algae blooms in the reservoir. However, the license was amended on May 3<sup>rd</sup>, 1988 (see Appendix 2-2) to change the projects operation to a run of river operating mode. The project has been operated as a run of river facility since then.

Subsequent to 2005, the project's water quality certificate was amended to incorporate fish passage facilities. (see Appendix 6-2)



APPENDIX 6-1

Water Quality Certification  
September 29, 1983



6210

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
STATE HOUSE STATION 17                      AUGUSTA, MAINE 04333

STAFF ORDER  
IN THE MATTER OF

EVERETT E. WHITMAN                      ) WATER QUALITY CERTIFICATION  
Benton, Maine, Kennebec County                      )  
BENTON FALLS HYDROELECTRIC PROJECT                      )  
02/49-7519-11040                      ) SUMMARY, FINDINGS OF FACT AND ORDER

After review of the request and related materials submitted by the applicant under the provisions of Section 401 of the Federal Water Pollution Control Act, the Department finds that:

1. The applicant proposes the construction and operation of a new hydroelectric generating facility to be located on the Sebasticook River in Benton, Maine.
2. The project is subject to the jurisdiction of the Federal Energy Regulatory Commission and the U.S. Army Corps of Engineers. The applicant has filed an application for license to develop and operate the Benton Falls Hydroelectric Project (FERC No. 5073). Water Quality Certification is, therefore, considered, pursuant to Section 401 of the Federal Water Pollution Control Act.
3. The project was approved by the Department of Inland Fisheries & Wildlife by permit #1847-11040 issued September 28, 1983, pursuant to the Stream Alteration Act, 12 M.R.S.A., Sections 7776-7780.
4. The project was approved by the Board of Environmental Protection by permit #02/49-7780-11040 issued September 28, 1983, pursuant to the Site Location of Development Act, 38, M.R.S.A., Sections 481-490.
5. Water Quality Standards will not be adversely affected by the project as approved to the point of requiring reclassification.

THEREFORE, the Department GRANTS that there is a reasonable assurance that the activity will not violate applicable Water Quality Standards, subject to the following conditions:

1. This certification is conditional upon the applicant's continual compliance with all terms and conditions of Stream Alteration Permit #1847-11040 and Great Ponds Alteration Permit #02/49-7780-11040.
2. This certification is conditional upon the Department's issuance of any Waste Discharge License and the applicant's compliance with the terms and conditions of any such license that may be required for the discharge of any pollutant from the project (e.g., bearing cooling water), pursuant to the Protection and Improvement of Waters, 38, M.R.S.A., Sections 361-452.

DONE AND DATED AT AUGUSTA, MAINE, THIS 29TH DAY OF SEPTEMBER, 1983.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 

HENRY E. WARREN, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR APPEAL PROCEDURES....

## APPENDIX 6-2

### Water Quality Certification Findings of Fact and Order Condition Compliance and New Permit



6210

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
STATE HOUSE STATION 17      AUGUSTA, MAINE 04333

DEPARTMENT ORDER

IN THE MATTER OF

BENTON FALLS ASSOCIATES	)	MAINE WATERWAY DEVELOPMENT AND
Benton, Maine	)	CONSERVATION ACT AND
Kennebec County	)	WATER QUALITY CERTIFICATION
BENTON FALLS HYDRO PROJECT	)	
FISH PASSAGE CONSTRUCTION	)	FINDINGS OF FACT AND ORDER
#L-07519-35-S-C (Approval)	)	CONDITION COMPLIANCE AND
#L-22142-34-A-N (Approval)	)	NEW PERMIT

Pursuant to the provisions of 38 MRSA Sections 464 et seq. and Sections 630 et seq., 06-096 CMR 450 (Administrative Rules for Hydropower Projects, effective date September 1, 1987), and Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act), the Department of Environmental Protection has considered the application of BENTON FALLS ASSOCIATES with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. INTRODUCTION

The applicant proposes the construction and operation of a permanent upstream fish passage facility at the Benton Falls Hydro Project, located on the Sebasticook River in the Town of Benton, Kennebec County, Maine, in compliance with the terms of Department Order #L-7519-35-R-M dated July 31, 1998. The project is operated as a hydroelectric generating facility under the terms of FERC License No. 5073.

2. PROCEDURAL HISTORY

By Order #02/49-7519-11040 dated September 29, 1983, the Board of Environmental Protection approved a permit and water quality certification for the proposed construction and licensing of the Benton Falls Hydro Project. In its approval, the Board found that adequate fish passage facilities would be needed at the project in the future to support the planned restoration of anadromous fish to the Kennebec River drainage.

On March 8, 1984, FERC issued an original license for the unconstructed Benton Falls Project that included provisions for future construction and maintenance of fish passage facilities, should they become necessary.

By Order #L-7519-35-L-M dated February 24, 1998, the Board modified the terms of its original approval for the Benton Falls Project to be consistent with the 1986 *Agreement Between the State of Maine and Kennebec Hydro Developers Group* ("1986 KHDG

BENTON FALLS ASSOCIATES  
BENTON FALLS HYDRO PROJECT  
#L-07519-35-S-C (Approval)  
L-22142-34-A-N (Approval)

) MAINE WATERWAY DEVELOPMENT AND  
) CONSERVATION ACT AND  
) WATER QUALITY CERTIFICATION  
) Page 2

*Agreement*), which became effective on January 23, 1987. Under the terms of the *1986 KHDG Agreement*, the signatory dam owners, including Benton Falls Associates, agreed to provide funds over a 12-year period to facilitate anadromous fish restoration efforts and to provide permanent fish passage at their dams during the 1999-2001 period in accordance with a revised restoration plan.

On January 25, 1989, FERC amended the license for the Benton Falls Project to incorporate the fish passage provisions of the *1986 KHDG Agreement*.

By Order #L-7519-35-R-M dated July 31, 1998, the Department modified its 1988 approval to be consistent with the *Agreement Between Members of the Kennebec Hydro Developers Group, the Kennebec Coalition, the National Marine Fisheries Service, the State of Maine, and the US Fish and Wildlife Service ("KHDG Settlement Agreement")*, dated May 26, 1998. The *1998 KHDG Settlement Agreement* was intended to: achieve a comprehensive settlement governing fisheries restoration, for numerous anadromous and catadromous species, that will rapidly assist in the restoration of these species in the Kennebec River after the termination on December 31, 1998 of the *1986 KHDG Agreement*; avoid extensive litigation over fish passage methodologies, timetables and funding; assist in the removal of the Edwards Dam; and fund the next phase of a fisheries restoration program for the Kennebec River. Benton Falls Associates was a signatory to the 1998 agreement.

On September 16, 1998, FERC amended the license for the Benton Falls Project to include the fish passage requirements set forth in the *1998 KHDG Settlement Agreement*.

By letter dated May 29, 2003, the Department of Marine Resources notified Benton Falls Associates that all of the pre-conditions of the *1998 KHDG Settlement Agreement* for the construction of upstream fish passage at the Benton Falls Project were expected to be completed by June 1, 2003. As a result, to satisfy the terms of the *KHDG Settlement Agreement* and Condition 5(C) of the Department's July 31, 1998 Order, permanent upstream fish passage facilities would need to be operational at the Benton Falls Project on or about June 1, 2004.

By letter dated June 23, 2004, the Department of Marine Resources notified Benton Falls Associates that the conditions in the *KHDG Settlement Agreement* triggering upstream fish passage at the Benton Falls Project were completely met on June 13, 2003, as follows: temporary upstream passage at Fort Halifax became operational in 2000; an Alaskan steeppass fishway was installed at the outlet of Pleasant Pond in Stetson Stream in 1999; the Newport Dam was removed in August 2002; two Alaskan steeppass fishways were installed at the outlet of Plymouth Pond in the summer of 2002; and a pool-and-chute fishway became operational at the outlet of Sebasticook Lake on June 13, 2003. As a result, under the terms of the *KHDG Settlement Agreement* and Condition 5(C) of the Department's July 31, 1998 Order, permanent upstream fish passage facilities were required to be operational at the Benton Falls Project by June 13, 2004.

By letter dated July 27, 2004, the Department notified FERC that Benton Falls Associates was in violation of the terms of its water quality certification and FERC license with respect to the construction and operation of permanent upstream fish passage facilities at the project.

By letter dated September 28, 2004, FERC concluded that Benton Falls Associates had violated the license for the project as it relates to the DEP's water quality certification and the requirement to install permanent upstream fish passage facilities at the project by June 13, 2004. By this letter, FERC directed Benton Falls Associates to consult with appropriate state and federal agencies, including the DEP, and file a mitigation plan commensurate with the impacts associated with the violation. This plan was to take into consideration any expenses incurred by the Maine Department of Marine Resources (MDMR) due to the lack of fish passage at the Benton Falls Project and was to include a schedule for its implementation and completion.

By letter dated February 25, 2005, Benton Falls Associates filed the required mitigation plan with FERC. Pursuant to the plan, Benton Falls Associates agreed to 1) pay \$18,000 to the National Fish and Wildlife Foundation, for deposit in the Kennebec River Restoration Fund, for trap and truck expenses incurred by MDMR on the Sebasticook River for the 2005 migratory season if the upstream fish passage facility is not operational by May 1, 2005, and 2) complete construction and begin operation of the upstream fish passage facility at the Benton Falls Project by May 1, 2005, or as soon as possible thereafter, but in no event later than December 31, 2005. Benton Falls Associates also agreed that the upstream fish passage facility will include a trap and sort facility, the details of which will be worked out pursuant to a separate agreement between Benton Falls Associates, MDMR, and certain other Maine State Agencies. This plan was approved by all consulting agencies, including the DEP.

On March 22, 2005, FERC approved the mitigation plan as filed by Benton Falls Associates.

### 3. FISH PASSAGE CONDITIONS

As modified by the July 31, 1998 Order, Condition 5 of the permit and water quality certification for the Benton Falls Hydro Project reads as follows:

#### "A. FISHERIES RESTORATION SUPPORT

The applicant shall provide funding, conduct studies, engage in consultation, install fish passage facilities, report on annual restoration activities, and comply with all additional duties and obligations as set forth in the *Agreement Between Members of the Kennebec Hydro Developers Group, the Kennebec Coalition, the National Marine Fisheries Service, the State of Maine, and the US Fish and Wildlife Service ("KHDG Settlement Agreement")*, dated May 26, 1998.

## APPENDIX 7

### Fish Passage and Protection

## Appendix 7

### Benton Falls Hydroelectric Project

#### Fish Passage and Protection

The Federal Energy Regulatory Commission originally licensed the Benton Falls project without a requirement for fish or eel passage facilities. Subsequently, on January 25, 1989, in accordance with provisions of the Kennebec Hydro Developers Agreement ("the KHDG Agreement"), Benton Falls Associates' ("BFA") FERC license for the BF Project was amended to require installation of upstream and downstream fish passage facilities.

In 2006 BFA completed installation of both upstream and downstream fish passage facilities. The upstream fish passage facility consists of an elevator designed to pass alewives, shad and salmon. The downstream fish passage facility consists of two conduits that maintain a minimum flow of 350 cfs or project inflow that bypass the turbines. The upstream and downstream facilities became operational in the spring of 2006. These facilities have been highly successful.

In addition to the upstream and downstream fish passage facilities that were installed in 2006, an upstream eel ramp has been installed on the eastern end of the dam. The eel ramp is maintained and operated by Benton Falls' personnel, in consultation with Maine Department of Marine Resources ("MDMR"). The eel ramp is made ready for operation by June 1 of each year and operated until the earlier of September 15 or a date mutually agreed upon with MDMR. In order to minimize downstream eel mortality BFA has developed an operating plan in cooperation with the MDMR under which plan BFA replaced the existing trash racks for its #2 unit with new trash racks with smaller spacing approved by MDMR and installed a removable screen with similar spacing for its #1 unit trash rack. The Unit #1 removable screen is lowered into place on or before September 1 of each year and maintained in place during the downstream eel migration season.

In accordance with the KHDG agreement, BFA is required to provide an annual fish passage effectiveness report to the FERC (after review by appropriate federal and state agencies). This report describes the operation of both fish and eel passage facilities. A copy of the most recent Fish Effectiveness report is attached as Exhibit 7-1



## APPENDIX 7-1

2014 Fish and Eel Passage Facility Operating Report and 2015 Proposed Operating Plan and  
FERC Letter Accepting Report

FEDERAL ENERGY REGULATORY COMMISSION  
Washington D.C. 20426

Office of Energy Projects

Project No. 5073-087—Maine  
Benton Falls Hydroelectric Project  
Benton Falls Associates

**April 28, 2015**

Richard Norman  
Benton Falls Associates  
C/O Essex Hydro  
55 Union Street, 4<sup>th</sup> Floor  
Boston, MA 02108

Subject: 2014 Fish and Eel Passage Facility Operation Report and 2015 Proposed Operating Plan

Dear Mr. Norman:

This letter acknowledges receipt of your 2014 Fish and Eel Passage Facility Operation Report and 2015 Proposed Operating Plan, filed with the Federal Energy Regulatory Commission (Commission) on April 1, 2015 for the Benton Falls Hydroelectric Project, FERC No. 5073. Your fish and eel passage reports were filed pursuant to the Commission's Order Approving Upstream Fish Passage Operation Plan and Effectiveness Study<sup>1</sup> and the September 16, 1998 amendment.<sup>2</sup> Pursuant to the Upstream Fish Passage Operation plan, you are required to file a report summarizing fish lift operations and effectiveness testing by March 31 annually.

Your report indicates that the Benton Falls fish lift passed 2,378,906 river herring, 26 American shad, and 33,554 American eels in 2014. No Atlantic salmon were observed in the fish lift in 2014. Your report notes that herring increased by approximately 100,000 from 2013. You report that the exit flume attraction flow control valve began malfunctioning on June 9, 2014 and, despite multiple attempts to repair it, failed on June 19, 2014. You completed repairs of the valve on July 4, 2014. Your

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<sup>1</sup> Order Issuing New License. 116 FERC ¶ 62,112 (issued August 9, 2006).

<sup>2</sup> Order Approving Settlement, Transferring License, and Amending Fish Passage Requirements. 84 FERC ¶ 61,227.

report explains that the failure was the result of a contractor error during its initial construction, and that you do not anticipate any similar events in the future.

During your fish lift operations, you conducted a shad upstream passage effectiveness study, in which you tagged and recorded 26 shad passing upstream of the project. You hypothesize that the exit flume attraction flow control valve failure may have contributed to recording lower numbers of shad than in 2012 or 2013. You also indicate that you prioritized repairing the control valve over tagging additional shad, which may also have contributed to the apparent lag.

The eel passage facilities passed approximately 33,554 American eels upstream between June 19 and September 9, 2014. This represents a considerable drop from the 97,481 eels passed in 2013. Your report indicates that you intend to rehabilitate sections of the eel passage facilities prior to the 2015 passage season. Your filing also describes your methodologies for passing eels downstream.

According to your report, you do not intend to modify your fish or eel passage facilities operations in 2015. While you are required to complete an Atlantic salmon passage effectiveness study, the salmon population is not currently robust enough to support a meaningful study. Pursuant to the Maine Department of Marine Resources' (MDMR) guidance, you would develop an Atlantic salmon passage effectiveness study when salmon populations increase to an appropriate level.

You provided a draft of your filing to the MDMR, Maine Department of Environmental Protection (MDEP), U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Maine Department of Inland Fisheries and Wildlife on March 2, 2015 for review and comment. On March 10, 2015, the MDMR requested that additional emphasis be added to unexpected changes in operations, as during the exit flume attraction flow control valve repair, that may have impacted fish passage. The MDMR also requested additional details regarding shad tagging efforts. You added the requested information to your final filing. On March 30, 2015, the MDEP indicated that it had no comments on the draft. No other comments were provided.

Review of your filing indicates that it fulfils the requirements of the aforementioned orders. Thank you for your cooperation. We look forward to your next report, **due March 31, 2016**. If you have any questions concerning this letter please contact me at (202) 502-8038 or [alicia.burtner@ferc.gov](mailto:alicia.burtner@ferc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Alicia Burtner". The signature is fluid and cursive, with the first name "Alicia" and last name "Burtner" clearly distinguishable.

Alicia Burtner  
Fish Biologist  
Division of Hydropower Administration  
and Compliance

## BENTON FALLS ASSOCIATES

c/o ESSEX HYDRO ASSOCIATES, LLC  
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April 1, 2015

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First St. N.E.  
Washington, DC 20426

Mr. Andrew Fisk, Director  
Bureau of Land & Water Quality  
State of Maine  
Department of Environmental Protection Augusta  
17 State House Station  
Augusta, Maine 04333

Re: Benton Falls Associates Project No. 5073  
2014 Fish and Eel Passage Facility Operating Report and 2015 Proposed Operating Plan

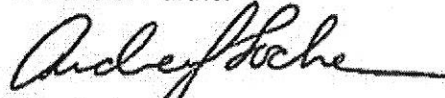
Dear Ms. Bose and Mr. Fisk,

Please find enclosed the above referenced report. A draft copy of this report was forwarded for review to the Maine Department of Marine Resources, the US Fish and Wildlife Service, the Maine Department of Inland Fisheries and Wildlife, the Maine Department of Environmental Protection, and the National Marine Fisheries Service. Their comments have been incorporated into this final report and are attached in original form in Appendix 1.

Very truly yours,

BENTON FALLS ASSOCIATES

By: Essex Hydro Associates, L.L.C.  
A General Partner



Andrew J. Locke  
President

cc: S. Shepard (USFWS)  
G. Wippelhauser (MDMR)  
S. McDermott (NMFS)  
M. Sale (LIHI)

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**2014 FISH AND EEL PASSAGE FACILITY  
OPERATING REPORT**

**AND**

**2015 PROPOSED OPERATING PLAN**

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**BENTON FALLS HYDROELECTRIC PROJECT  
FERC NO. 5073-ME**

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## 1. Introduction

Benton Falls Associates ("Benton Falls" or "Licensee") is the licensee for the Benton Falls Hydro Project, FERC No. 5073-ME ("Project"), located in the town of Benton, Maine. Benton Falls submits this *2014 Fish And Eel Passage Facility Operating Report and 2015 Proposed Operating Plan* (the "Report") in accordance with the terms of its FERC license, the water quality certification for the Project, and the terms of the 1998 Agreement Between Members of the Kennebec Hydro Developers Group, the Kennebec Coalition, the National Marine Fisheries Services, the State of Maine, and the US Fish and Wildlife Service (the "KHDP Agreement").

A draft of this Report was circulated to the Maine Department of Marine Resources ("MDMR"), the Maine Department of Inland Fisheries and Wildlife ("MDIFW"), the Maine Department of Environmental Protection ("MDEP"), the National Marine Fisheries Service ("NMFS"), and the U.S. Fish and Wildlife Service ("USFWS") prior to final publication. Copies of relevant correspondence and recommendations from these agencies are contained in the Appendix to this report. Where appropriate, we have modified the final report to incorporate agency comments or identify areas that require further agency consultation.



## **2. Project Features**

### **2.1 Dam Structure**

The Project works consist of: (1) a 500-foot-long dam with a west abutment, an L-shaped power house, a fishway bay, a 72-foot-long gated concrete section, a 50-foot-long concrete gravity spillway, 3-foot-high flashboards on the spillway section, a 175-foot-long non-overflow earth dike; (2) an 83-acre reservoir with a usable storage capacity of 200 acre-feet at the ogee crest; (3) a normal water surface elevation of 85 feet m.s.l. with the 3-foot-high flashboards installed; (4) the powerhouse, constructed integrally with the dam, consisting of two turbine generators, Unit #1, a Dominion Bridge Sultzer double regulated Kaplan turbine with a 2,800 mm diameter runner and a design hydraulic capacity of 1,765 cfs with a generator nameplate of 3,580 kW and Unit #2, an Escher Wyss double regulated Kaplan turbine with a 1,200 mm diameter runner and a design hydraulic capacity of 350 cfs with a generator nameplate capacity of 750 kW; (5) a 150-foot-long tailrace channel; (6) a substation; (7) a 170 foot long, 12 kV transmission line; and (8) appurtenant facilities. The difference in elevation between nominal headwater and tail water levels is approximately 28 feet.

### **2.2 Fish Passage Facilities**

Licensee's upstream fish passage facilities consist of a fish lift/elevator designed to pass American Shad, Alewife and Atlantic salmon and an upstream eel ramp to pass American eels. On January 3, 2005, Licensee filed with FERC functional design drawings for the permanent upstream anadromous fish passage facilities at the Project pursuant to the fish passage requirements established by the KHDG Agreement. Licensee consulted with state and federal resource agencies regarding the functional design documents and incorporated the recommendations of the resource agencies into the design. FERC approved the functional design drawings in an order issued January 24, 2005.

Construction of the permanent fish lift facility at the Project commenced in July 2005 and the facility became operational May 1, 2006 for the 2006 migration season. Beginning in 2006 and through 2014 we have produced the Report for each migration year. This 2014 Report marks the ninth year of operating the fish lift facility.

The fish lift contains a 600-gallon hopper that operates on a minimum cycle time of approximately seven minutes. The fish passage system is designed to pass an annual population of:

- 50,408 American Shad
- 767,267 Alewives
- 260 Salmon

The fish passage system consists of an automatically adjusted entrance gate, a horizontally moving crowder system, a separation screen, a single hopper, an adjustable exit flume trip gate system, an elevated exit flume to the impoundment equipped with a viewing window, fish counter and blockage screens, a downstream migrant bypass pipe to

the tailrace, attraction flow piping, and a video monitoring system.

A total attraction flow of up to 60 cubic feet per second ("cfs") can be provided at the entrance gate with 30 cfs through the exit flume and 30 cfs through gravity flow piping from the impoundment. The fish lift has an operational passage range up to 4,500 cfs. A dedicated automated programmable logic controller ("PLC") normally controls the fish lift. The PLC is located in the Project's powerhouse building, but also can be operated remotely.

The downstream fish passage facility is designed to pass all species and consists of a surface bypass system (two 3-foot wide intakes leading to a bypass pipe that discharges to the project tailrace) and turbine screening to exclude eels. Flow from the transition basin leads fish back to the river downstream of the project powerhouse through a 24-inch pipe with a total capacity of 30 cfs. This pipe discharges fish into the tailrace area of the project's smaller turbine. This system is used to provide downstream passage during the fall migration season. By license the downstream bypass is operated from June 15 to November 30.

### **2.3 Eel Passage Facility**

The Atlantic States Marine Fisheries Commission's Interstate Fishery Management Plan for American Eel ("the Plan") was adopted in 2000. The Plan calls for (1) maintaining and enhancing eel abundance in all watersheds where they now occur; (2) restoring eels to waters where they had historical presence; and (3) providing adequate escapement to the ocean of pre-spawning adult eels. To implement the Plan, MDMR made a recommendation on the appropriate location for upstream eel passage at the Project. The eel passage ramp is sited and operated to pass juvenile eels, or "elvers," which are the focus of the agencies' management objectives. Licensee installed an upstream eel ramp at the Project in the summer of 2001 and has operated it since that time.

Licensee's upstream eel passage facility consists of a ramp located at the eastern side of the concrete spillway at the dam. The ramp includes an entrance chute 14-inches wide by 62-inches long, a 36-inch by 48-inch wide turn rest pool, a 14-inch wide by 36.5 foot long main ramp, a 14 inch by approximately 12 foot exit ramp and a water pump with associated piping. The ramp entrance is located at the eastern spillway toe at around elevation 63.0' with the entrance facing north (upstream). Due to the potential for damage during spillage events, the entrance and turn/rest pool portions of the ramp were constructed of wood, with a potential future modification being the installation of a hinged aluminum section. The main ramp section extends from the turn rest pool (around elevation 66.3') to the flashboard section of the spillway at approximately elevation 88'. The exit ramp portion extends from the spillway flashboards to the upstream edge of the abutment (around elevation 89'). The main ramp and exit ramp portions are constructed using standard aluminum electrical cable tray sections. All portions of the ramp have EnkaMat substrate. Attraction and transport water is supplied from an approximately 15 gallon per minute pump discharging through a spray bar located at the extreme upstream end of the ramp.

Eels exiting the ramp either can drop directly into the head pond or into a MDMR installed floating trap box. Normally the exit ramp is directed to the floating trap box.

After consultation with the resource agencies, in 2005 Licensee installed a hinged eel screen on the trash racks of Unit #1 to facilitate downstream passage of eels. Unit #1 has trash racks that have two different clear space openings. The top 7 feet of the racks have 0.5" bars with 3" opening. The 3" opening is then split with a 0.25" bar resulting in a 1.375" clear space opening. From the bottom of the 7 feet to the bottom of the racks is a second section with 3" clear space opening. This unit has a hinged overlay that is installed by September 1 and is raised on December 1. The overlay is made of grating bars that allow a clear spacing of 1.125". On August 29, 2009 a new trash rack with 1" clear space opening was installed on Unit #2 so it could also be run during downstream eel migration. These trash racks replaced racks with 2" clear space opening. MDMR, MDEP, USFWS, MDIFW, NMFS and the FERC approved the plans for the new racks before installation.

To improve the downstream monitoring process of eel and Alewife, in 2007 a Lowrance sonar system was installed in the head pond. The Lowrance sonar system model LMS-332 was originally placed near the downstream passage entrance to see if there was a method of observing eel using the passage. Although the Lowrance was not useful for observing eel, it has been useful in observing schools of downstream alewife. When large pools of alewives are observed the top opening sluice gate can be used to move the school downstream. In addition, a camera was braced above the entrance to the downstream bypass gate. Underwater lights were installed at the bottom eight feet of the eel screen. A dusk to dawn timer controlled operation of the lights and a beacon indicator was installed at the top of the dam to verify operation.

### **3. Operational Procedures – Fish Lift**

#### **3.1 Fish Lift**

##### **Annual Schedule**

The Licensee operates the fish lift according to the following annual schedule:

##### **Start up**

- April 15 to April 30 - Conduct a visual inspection of all fish lift mechanical, electrical and structural components for signs of winter damage and repair as necessary. Energize and operate all fish lift mechanical and electrical systems. Repair and calibrate, as necessary. The final timing of the trial operation of the system will be dependent upon the presence of ice within the flume and collection chamber.

##### **Seasonal Operations**

- May 1 to June 1 – Fish lifts made as often as necessary to provide upstream

passage of alewife without undue delay. This may require additional operational changes that increase the fish lift cycle to sufficiently move a large number of fish (over 1 million), such as suspending the use of the V-trap crowder or the hopper separation gate.

- June 1 to July 1 – Fish lifts made hourly and operated according to specifications (full attraction flow and operation of the V-trap crowder and hopper separation gate).
- July 1 to Water Temperature Exceeds 24 degrees Celsius – Fish lifts made hourly and operated according to specifications. Fewer lifts or operational changes may be required based on the results of camera monitoring at the fishway entrance.
- Water Temperature below 24 degrees Celsius (late summer or early fall) to November 1 – Fish lifts made hourly and operated according to specifications. Fewer lifts or operational changes may be considered based on the results of camera monitoring at the fishway entrance.

#### Winter Shutdown

- De-energize all mechanical and electrical systems and tag out for winter.
- Shut off the attraction flow valve and tag out for winter.
- Lower the entrance gate to full down position and tag out for winter.
- Dewater the exit flume by closing the Whipps gate. Open the drain valves to pass leakage if conditions warrant, and open the flume attraction flow shutoff valve.
- Place the hopper in the storage position and secure.
- Install Styrofoam or similar product in collection chamber to prevent ice damage.
- Notify the resource agencies of any problems encountered during the annual startup of the fish lift facility that would potentially cause a delay in commencement of operations the following year.

After consultation with the resource agencies, Licensee reserves the right to modify the annual schedule based on experience gained in fish lift operation.

#### **Daily Operation**

Benton Falls personnel and MDMR operate the fish lift facility in conjunction with the automated control provided by the PLC. The fish lift is operated each day with varying cycle times based on the number of fish being lifted and consultation with MDMR and USFWS personnel.

In 2009, a significant increase in the passage of Alewives and the first observed presence of American Shad and Atlantic salmon resulted in USFWS requiring Benton Falls to modify the daily operating schedule as follows:

- May 1 to June 1 - Operate the fish lift as often as necessary to provide upstream passage of alewife without undue delay. This may require operational changes that increase the fish lift cycle sufficiently, such as temporarily suspending the use of the V-trap crowder to move a large number of fish (over 2 million);
- June 1 to July 1 - Operate the fish lift hourly and in accordance with the specifications (full attraction flow and operation of the V-trap crowder) or as otherwise directed by resource personnel;
- July 1 until water temperature exceeds 24 degrees Celsius – Fish Lifts made hourly and operated according to specifications. Fewer lifts or other operational changes to be considered based on the results of camera monitoring or observation by agency personnel at the fishway entrance.
- Water temperature below 24 degrees Celsius (late summer/early fall) to November 1 – Operate the fish lift hourly in accordance with specifications. Consider fewer lifts or other operational changes based upon agency recommendations or results of camera monitoring or observation by agency personnel at the fish way entrance.

### **3.2 Fish Passage Modifications for 2014**

After consultation with MDMR and USFWS, no modifications to the fish lift were made prior to the start of the 2014 season.

### **3.3 2014 Fish Lift Operations Schedule**

Startup tests of the fish lift were performed between May 7 and May 8, 2014. At the direction of the MDMR, the fish lift was put into operation on May 7, 2014.

### **3.4 Unexpected Changes in 2014 Fish Passage Operations**

On June 9<sup>th</sup> MDMR personnel observed that the exit flume attraction flow control valve was malfunctioning. Several attempts were made by Benton and MDMR staff to fix the valve; however, it failed on June 19<sup>th</sup>. Repairs on the valve were not completed until July 4<sup>th</sup>.

### **3.5 Results of the 2014 Fish Passage Operations Plan**

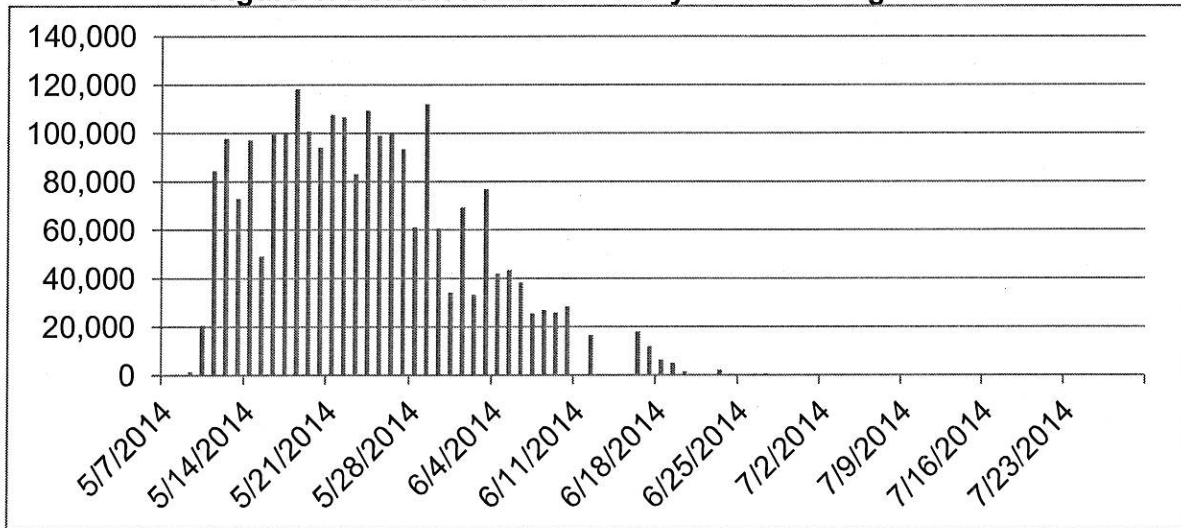
The fish counts recorded in 2014 are supported by visual and video observations and provide a reliable indication that significant quantities of alewives, a limited number of American Shad and other species, and no Atlantic salmon were transported upstream by the fish lift.



## River Herring Passage Results

The fish lift passed 2,378,906 river herring, primarily alewives, in 2014. This is approximately 106,414 more than were recorded in 2013 but 372,567 less than were recorded in 2011, the record upstream run. Figure 1 shows the daily river herring count during the upstream run.

**Figure 1: Benton Falls 2014 Daily River Herring Counts**



The peak daily count occurred on May 18 when approximately 118,245 river herring were passed upstream. The counting array was used to record passage from May 7 until June 25, at which time it was removed per the direction of MDMR personnel. The counting array was removed to allow easier passage of larger species (American Shad) through the viewing windows area. After removing the counting tube array, MDMR personnel made visual counts of river herring.

## Salmon, American Shad and Non Target Species Passage Results

From May 7 until July 30, 2 landlocked salmon, 26 American Shad and 0 Atlantic salmon passed upstream.

While the fish lift was designed to pass particular numbers of American Shad, Alewife and Atlantic salmon, resident species (i.e. smallmouth bass, landlocked salmon and white sucker) were also documented using the fish lift in 2014. A summary of all species observed in the fish lift during 2014 is included as Table 1 below.

**Table 1: Benton Falls 2014 Fish Species Count**

<b>Fish Species</b>	<b>Count</b>
River Herring - (Alewife & Blueback Herring)	2,378,906
Smallmouth Bass	552
White Sucker	742
White Perch	54
American Shad	26
Pumpkinseed Fish	5
Redbreast Sunfish	17
American Eel	33,554
Largemouth Bass	0
Striped Bass	11
Brook Trout	9
Black Crappie	1
White Catfish	26
Brown Trout	0
Yellow Perch	10
Landlocked Salmon	2
Fallfish	1
Northern Pike	0
Atlantic Salmon	0
Carp	0
Sea Lamprey	2
Rainbow Trout	0
Lake Trout	0
Splake	2
Golden Shiner	0
Common Shine	0
Brown Bullhead	0

### **3.6 Future Fish Lift Modifications**

None proposed

### **3.7 2015 Proposed Operating Schedule**

For 2015 Benton Falls plans to operate the fish lift in the same manner as 2014.

### **3.8 Effectiveness Studies**

Benton Falls is required to conduct effectiveness studies of downstream passage facilities

at the project for Alewives, American Shad ("Shad") and Atlantic salmon ("Salmon").

### Alewife

A successful alewife effectiveness test was conducted as part of the fish facility commissioning. The alewife effectiveness is demonstrated by the dramatic increase in alewife population that has been passed by the Benton Falls facility in recent years.

### Atlantic Salmon

To date there has been no attempt to conduct efficiency tests for Salmon given the lack of a large enough population to test. Only four Salmon were passed in 2009 and one in 2013. In all the other years, including 2014, no Salmon were passed by the fish lift.

During this period, Benton Falls has maintained contact with the various resource agencies regarding possible next steps. In 2014, MDMR advised Benton by letter that the Salmon population is insufficient at this time to conduct an efficiency test. MDMR also advised that should Salmon numbers increase significantly in 2014, the question of efficiency studies should be revisited; given no Salmon were pass in 2014, MDMR and Benton have not revisited when an efficiency study should be run for Salmon.

In preparation for a future Salmon passage efficiency test, Benton staff met with representatives from NOAA National Marine Fisheries Service ("NMFS") in June of 2014 to discuss and outline the process for Benton to obtain a take permit. As a result of the meeting it was agreed that Benton would work with NMFS to develop a Species Protection Plan with the ultimate goal of obtaining a take permit. As a first step, on June 16, 2014 Benton Falls filed with FERC as the Commission's nonfederal representative for the purpose of initiating informal consultation pursuant to section 7 of the Endangered Species Act with NMFS. On June 19, 2014 FERC designated Benton as the Commission's nonfederal representative. Benton is currently working on developing a draft Biological Assessment to determine the Project's impact on Salmon.

### American Shad

To date MDMR has expressed reservations about a Shad efficiency test because of the very small population that now exists in the Sebasticook River. Further, there is concern that because the species is resistant to human interference and handling, the conduct of an efficiency test might damage the existing population. With these concerns in mind, in late 2013, Benton, based on close consultation with MDMR, developed a plan to establish a baseline test of the Project's effectiveness as passing Shad downstream.

In 2014, working with Mr. Gray from MDMR, Benton conducted the efficiency test discussed in the 2013 Report<sup>1</sup>. During the 2014 period, 26 Shad were recorded passing

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<sup>1</sup> The proposed study will pit tag Shad on their ascent up-river to spawn. Pit tags will be externally mounted on the leading edge of the dorsal fin with either a modified 'T' anchor spaghetti type tag or fish hook mounted pit tag. The handling of Shad will be minimized utilizing this approach thereby limiting injury and stress to the fish prior to spawning. Shad will be tagged as captured by dip net at the excluder bars in the



upstream. The number of Shad that passed upstream in 2014 is significantly lower than 2012 and 2013. The cause of this decrease, as described in the explanation provided below by Mr. Gray, is the result of the malfunctioning exit flume attraction valve issue described in Section 3.4.

*Failure of the exit flume attraction flow gate in turn lowered the efficiency of fishing operations. While the bulk of the river herring run had passed upstream, American shad were noted in number below the project but enough attraction flow was not available due to the failed gate operator. Only one American shad was PIT tagged for the efficiency study due to the fishways inability to attract additional shad to the collection chamber. Final repairs on the exit flume attraction flow valve were completed by July 4th but the American shad run had ended by this point.<sup>2</sup>*

As noted above one Shad was tagged going upstream and was not recorded passing downstream. The 25 other Shad passed up stream were not tagged due to the focus on repairing the exit flume attraction flow gate and the expectation at the time that more Shad would be passed up stream that could be tagged; however, as noted above, by the time the exit flume attraction flow valve was fixed the Shad run had ended.

Given the lack of substantive data from 2014's test, the test results were deemed inconclusive. As such, MDMR and Benton have agreed to repeat 2014's test in 2015 in order to establish a larger set of test results. As in 2014, the goal of the test will be to establish a baseline set of data regarding Shad passage and from this data, establish a target Shad passage rate.

#### **4. Operational Procedures – Upstream Eel Passage**

##### **4.1 Upstream Eel Passage**

###### **Annual Schedule**

The Licensee operates the upstream eel ramp passage according to the following annual schedule.

###### **May 1 to May 31: Start up**

- Conduct a visual inspection of ramp structure and components for signs of winter damage. Repair as necessary.
- Install the lower entrance ramp and pumping system.

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exit flume (not all Shad will be tagged). Preference for tagging will be towards males to limit stressing the prespawn females. American Shad returning downstream will be detected using a duplex antenna array deployed in both downstream bypass weirs. Data loggers will record any detection and identify the individuals tagged and time of passage.

<sup>2</sup> Description provided by Nate Gray, Maine Department of Marine Resources, email dated March 30 2015.

- Operate all ramp mechanical and electrical systems. Repair and calibrate, as necessary.

June 1 to September 15: Daily operation

- Check the ramp on a regular basis and correct deficiencies as necessary.
- Contact MDMR staff if any problems may cause an interruption in daily operations. Record interruptions to operations for future reference.

The Licensee reserves the right, after consultation with MDMR, to modify the operating schedule based on factors and/or actual experience gained in upstream eel passage operation.

**4.2 Upstream Eel Passage Modifications for 2014**

After consultation with MDMR, Benton Falls was not required to complete any modifications in 2014.

**4.3 2014 Upstream Eel Passage Operations Schedule**

The ramp was prepared for 2014 operations during the month of May 2014. It was then monitored on a regular basis from June 19 through September 9, 2014.

**4.4 Results of the 2014 Upstream Eel Passage Operations Plan**

In 2014 the Benton Falls eel passage operated for 83 days from June 19 to September 9 during which time approximately 33,554 eel passed upstream.

Since 2001, MDMR has annually installed a floating trap box in the head pond at the top of the ramp to record upstream migrants. MDMR tends the floating trap box three to seven times per week during the migration season. Once counted and measured, the eels are released into the Benton Falls head pond.

The following table provides a summary of upstream migrating eels passed at the Project from 2001 through 2014.

Year	Startup Date	Shutdown Date	Operating Days	Eels Passed <sup>3</sup>
2001	6/6	8/24	55	229,536
2002	6/18	9/13	53	22,437
2003	6/26	9/2	15	6,421
2004	7/15	8/12	29	2,409
2005	7/13	8/29	38	469
2006	6/30	8/30	57	522
2007	7/13	8/31	38	546
2008	6/11	9/8	58	18,395
2009	7/21	9/30	72	12,288
2010	5/31	10/10	133	11,828
2011	5/10	8/26	108	34,980
2012*	6/14	8/25	73	206,040
2013	6/4	7/11	37	97,481
2014	6/19	9/9	83	33,554

\*The large amount of upstream eel passage in 2012 was likely the result of abnormally high water flows.

**Table 1 Number of Upstream Migrating Eels Passed at the Benton Falls Project**

#### **4.5 Future Upstream Eel Passage Modifications**

Benton Falls is prepared to rehabilitate the ramp prior to the upstream eel passage in 2015.

#### **4.6 2015 Proposed Operating Schedule**

For 2015 Benton Falls plans to operate the upstream eel passage in the same manner as 2014.

### **5. Operational Procedures – Downstream Eel Passage**

#### **5.1 Downstream Eel Passage**

##### **Annual Schedule**

The Licensee operates the downstream eel screen on an annual basis according to the following schedule:

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<sup>3</sup> Counts provided by MDMR.

#### August 15 to August 31: Start up

- Conduct a visual inspection of the Unit #1 eel screen and components for signs of damage. Repair as necessary.
- Operate all eel screen mechanical and electrical systems to ensure the Unit #1 screen can be lowered into place. Repair and calibrate, as necessary.
- Lower the screen to ensure proper operation.

#### September 1 to November 30: Daily operation

- Maintain the Unit #1 eel screen in its lowered position. If the Unit #1 eel screen is raised, limit operation of Unit #1 to daytime hours.
- Operate the trash rake as trash conditions dictate or, at a minimum, on a daily basis to ensure regular removal of trash from the trash racks and to determine if any eels have been entrained on either of the eel screens.
- If eel entrainment is detected, reduce Unit #1 and Unit#2 output during nighttime operation and contact DMR staff to report eel entrainment.
- Record eel entrainment and modification of operations.

#### November 30: Shutdown

- Raise the Unit #1 eel screen into the winter storage position.
- Perform any required maintenance and equipment repair. Licensee will notify MDMR staff of any problems encountered during the annual installation of the eel screen that would potentially cause a delay in commencement of operations.

Licensee, after consultation with MDMR, reserves the right to modify the annual schedule and operating plans based on actual experience gained in eel screen operation.

### **5.2 Downstream Eel Passage Modifications for 2014**

No modifications to the downstream passage were requested for 2015.

### **5.3 2014 Downstream Eel Passage Operations Schedule**

The screen was put in place August 8, 2014. The screen remained in place until November 19, 2014 at which time it was raised into its winter storage position.

Unit #1 and Unit #2 trash racks were raked on a daily basis during the eel migration season.

#### **5.4 Results of the 2014 Downstream Eel Passage Operations Plan**

Benton Falls' personnel regularly monitored the facilities cameras and sonar during the 2014 downstream migration season. Although alewife passage was indicated on the cameras, eel passage results continue to be inconclusive.

No entrained eels were discovered during 2014 operations.

#### **5.5 Future Downstream Eel Passage Modifications**

Aside from minor cosmetic repairs to the ramp, no modifications are planned for the Downstream Eel Passage in 2015.

#### **5.6 2015 Proposed Operating Schedule**

For 2015 Benton Falls plans to operate the Downstream Eel Passage in the same manner as 2014. The Unit #1 overlay screen will be removed November 30 unless river ice buildup occurs at an earlier date. Removal of the eel screen from Unit #1 earlier than November 30 would be decided in consultation with MDMR.

### **6. Agency Consultation**

During the creation of this Report, Benton Falls consulted with the following agencies for feedback and suggestions on 2014 operations:

- U.S Fish and Wildlife Service
- NOAA - National Marine Fisheries Service
- Maine Department of Environmental Protection
- State of Maine Department of Marine Resources
- Maine Department of Inland Fisheries & Wildlife

Appendix 1 contains the feedback and suggestions that were received as a result of this process. The only substantive comments received were from the Maine Department of Marine Resources and have been incorporated into the Report.

### Appendix 1

1. Copy of email requesting comments from agencies
2. State of Maine Department of Marine Resources comments – **Comments have been incorporated into report**
3. Maine Department of Environmental Protection comments
4. U.S. Fish and Wildlife Service comments – **NO COMMENT**
5. NOAA - National Marine Fisheries Service comments– **NO COMMENT**
6. Maine Department of Inland Fisheries and Wildlife comments – **NO COMMENT**

## Steve Hickey

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**From:** Wippelhauser, Gail  
**Sent:** Tuesday, March 10, 2015 12:35 PM  
**To:** 'Steve Hickey'; Steve Hickey; Keliher, Patrick; Howatt, Kathy; Brown, Michael; sean.mcdermott@noaa.gov; steven\_shepard@fws.gov  
**Subject:** RE: Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan

Steve:

The Maine Department of Marine Resources has reviewed the draft report for the 2014 season. We have three comments.

Instances of unexpected or unscheduled changes in operation such as the following which appears in the first paragraph on page 12 should appear at the beginning of the report, perhaps in a stand alone section.

- While the specific reason for the drop-off in upstream Shad passage is unknown, unexpected mechanical errors with 1) the exit flume attraction valve from June 13 until July 4 and 2) water passing over the spillway of the dam when the main turbine was offline; may have disrupted the Shad's path to the fish lift. Benton staff used their best efforts to correct these issues as quickly as possible.

Please confirm that eels are passed upstream via the fishlift and the dedicated eel passage, and verify the numbers in the report.

- According to the text on page 9 "A summary of all species observed in the fish lift during 2014 is included as Table 1 on the following page". Table 1 indicates that 33,554 American eel were passed upstream. According to the text in section 4.4 "In 2014 the Benton Falls eel passage operated for 83 days from June 19 to September 9 during which time approximately 30,062 eel passed upstream", but the table shows that 33,554 eels were passed upstream

Please explain why only 1 of 26 American shad passed upstream was tagged for the efficiency test.

Thanks you for the opportunity to comment on the report.

Gail Wippelhauser, Ph. D.  
Marine Resources Scientist  
Maine Department of Marine Resources  
#172 State House Station  
Augusta, ME 04333

Phone: 207-624-6349 Fax: 207-624-6501  
email: [gail.wippelhauser@maine.gov](mailto:gail.wippelhauser@maine.gov)

---

**From:** Steve Hickey [<mailto:shickey@essexhydro.com>]

**Sent:** Monday, March 02, 2015 4:57 PM

**To:** Steve Hickey; Keliher, Patrick; Wippelhauser, Gail; Howatt, Kathy; Brown, Michael; [sean.mcdermott@noaa.gov](mailto:sean.mcdermott@noaa.gov); [steven\\_shepard@fws.gov](mailto:steven_shepard@fws.gov)

**Subject:** RE: Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan

Please find attached a copy of the Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan. We are required to submit a final draft of the report to the Federal Energy Regulatory Commission on March 31st,

2015. Any comments you have regarding the report would be appreciated prior to Friday, April 27, 2015 so they can be included in the final draft of the report. If you do not choose to comment, a note will be included in the final report that your agency had no comments. A copy of the report has been attached to this email.

Thank you,

Stephen Hickey  
Benton Falls Associates  
c/o Essex Hydro Associates, L.L.C.  
55 Union Street, 4th Floor  
Boston, MA 02108  
tel: 617-367-0032  
fax: 617-367-3796



## Steve Hickey

---

**From:** Gray, Nate  
**Sent:** Monday, March 30, 2015 4:40 PM  
**To:** Steve Hickey  
**Subject:** RE: Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan

Steve,  
Here it is in a nutshell: And no "because"

During the course of fish passage operations it was noted by MDMR personnel that the exit flume attraction flow control valve was malfunctioning. This was first noted in the operations log on June 9<sup>th</sup>. MDMR personnel brought this to the attention of the dam operator. Several attempts were made to fix the gate control operator by cleaning the valve gate blade, loosening the packing nuts on the gate blade seal, and lubricating the valve operator ACME thread shaft. None of these attempts at repair were successful. The exit flume attraction valve continued to decline in operation until it completely failed on 6/19. Subsequent diagnosis revealed that the drive distribution from the limitorque had failed at the power head by snapping all the ring bolts. Further diagnosis revealed a sloppy installation of adapter components by the installing contractor which eventually lead to the exit flume attraction gates complete failure. Failure of the exit flume attraction flow gate in turn lowered the efficiency of fishing operations. While the bulk of the river herring run had passed upstream, American shad were noted in number below the project but enough attraction flow was not available due to the failed gate operator. Only one American shad was PIT tagged for the efficiency study due to the fishways inability to attract additional shad to the collection chamber. Final repairs on the exit flume attraction flow valve were completed by July 4<sup>th</sup> but the American shad run had ended by this point.

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**From:** Steve Hickey [mailto:[sjh@essexhydro.com](mailto:sjh@essexhydro.com)]  
**Sent:** Monday, March 30, 2015 11:33 AM  
**To:** Gray, Nate  
**Subject:** FW: Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan

Nate, I left you a message earlier today for you assistance responding to Gale's request for further information. I have highlighted her comment below. We need to submit the report to the FERC by Wednesday April 1 so your timely response would be appreciated.

Thank you,  
Steve

Stephen Hickey  
617-367-0032

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**From:** Wippelhauser, Gail [mailto:[Gail.Wippelhauser@maine.gov](mailto:Gail.Wippelhauser@maine.gov)]  
**Sent:** Tuesday, March 10, 2015 12:35 PM  
**To:** 'Steve Hickey'; Steve Hickey; Keliher, Patrick; Howatt, Kathy; Brown, Michael; [sean.mcdermott@noaa.gov](mailto:sean.mcdermott@noaa.gov); [steven\\_shepard@fws.gov](mailto:steven_shepard@fws.gov)  
**Subject:** RE: Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan

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Please explain why only 1 of 26 American shad passed upstream was tagged for the efficiency test.

Thanks you for the opportunity to comment on the report.

Gail Wippelhauser, Ph. D.  
Marine Resources Scientist  
Maine Department of Marine Resources  
#172 State House Station  
Augusta, ME 04333  
Phone: 207-624-6349 Fax: 207-624-6501  
email: [gail.wippelhauser@maine.gov](mailto:gail.wippelhauser@maine.gov)

---

**From:** Steve Hickey [<mailto:shickey@essexhydro.com>]

**Sent:** Monday, March 02, 2015 4:57 PM

**To:** Steve Hickey; Keliher, Patrick; Wippelhauser, Gail; Howatt, Kathy; Brown, Michael; [sean.mcdermott@noaa.gov](mailto:sean.mcdermott@noaa.gov); [steven\\_shepard@fws.gov](mailto:steven_shepard@fws.gov)

**Subject:** RE: Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan

Please find attached a copy of the Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan. We are required to submit a final draft of the report to the Federal Energy Regulatory Commission on March 31st, 2015. Any comments you have regarding the report would be appreciated prior to Friday, April 27, 2015 so they can be included in the final draft of the report. If you do not choose to comment, a note will be included in the final report that your agency had no comments. A copy of the report has been attached to this email.

Thank you,

Stephen Hickey  
Benton Falls Associates  
c/o Essex Hydro Associates, L.L.C.  
55 Union Street, 4th Floor  
Boston, MA 02108  
tel: 617-367-0032  
fax: 617-367-3796

## Steve Hickey

---

**From:** Howatt, Kathy  
**Sent:** Monday, March 30, 2015 3:33 PM  
**To:** Steve Hickey  
**Subject:** RE: Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan

Steve,

On March 2, 2015 the Department received a draft 2014 Fish and Eel Passage Facility Report and the 2015 Proposed Operating Plan for the Benton Falls Hydroelectric Project (FERC5073). The Department defers to fish and wildlife resource agencies for evaluation and comment on the reported results of facility operation. There are no modifications proposed for the fish life or operating plans, and therefore the Department has no comment at this time.

Kathy Davis Howatt  
Hydropower Coordinator, DLRR  
Maine Department of Environmental Protection  
207-446-2642  
[kathy.howatt@maine.gov](mailto:kathy.howatt@maine.gov)

---

**From:** Steve Hickey [<mailto:sjh@essexhydro.com>]  
**Sent:** Wednesday, March 25, 2015 8:46 AM  
**To:** Steve Hickey; Keliher, Patrick; Howatt, Kathy; Brown, Michael; [sean.mcdermott@noaa.gov](mailto:sean.mcdermott@noaa.gov); [steven\\_shepard@fws.gov](mailto:steven_shepard@fws.gov)  
**Subject:** FW: Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan

Dear all,

Please remember that any comments you have on the attached report are requested on or before 5PM this Friday, March 27, 2015. If you do not choose to comment, a note will be included in the final report that your agency had not comments. Thank you and please contact me with any questions.

Stephen Hickey  
Benton Falls Associates  
617-367-0032

---

**From:** Steve Hickey [<mailto:shickey@essexhydro.com>]  
**Sent:** Monday, March 02, 2015 4:57 PM  
**To:** Steve Hickey; [patrick.keliher@maine.gov](mailto:patrick.keliher@maine.gov); [Gail.Wippelhauser@maine.gov](mailto:Gail.Wippelhauser@maine.gov); [Kathy.Howatt@maine.gov](mailto:Kathy.Howatt@maine.gov); [Michael.Brown@maine.gov](mailto:Michael.Brown@maine.gov); [sean.mcdermott@noaa.gov](mailto:sean.mcdermott@noaa.gov); [steven\\_shepard@fws.gov](mailto:steven_shepard@fws.gov)  
**Subject:** RE: Benton Falls Associates Draft Report - 2014 Fish and Eel Passage Facility Report and 2015 Proposed Operating Plan

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Thank you,

Stephen Hickey  
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55 Union Street, 4th Floor  
Boston, MA 02108  
tel: 617-367-0032  
fax: 617-367-3796

## **APPENDIX 8**

### **Description of Watershed Protection**

## **Appendix 8**

### **Benton Falls Hydroelectric Project**

#### **Description of Watershed Protection**

The Benton Falls project is located in the village of Benton, Maine on the lower reaches of the Sebasticook River. The area around Benton village and Benton Falls sits in a broad valley cut through deep marine and lacustrine deposits of gravel, sand, silt, and clay surficial deposits. The generally flat or gently rolling topography of the valley is cut by the steep gully banks of the Sebasticook River.

Upstream in the project area, some areas of glacial till are present. However, the nearly flat to gently rolling topography continues along the Sebasticook well north of the town of Benton.

The banks of the Sebasticook within the project areas are steep and, in many areas, quite high. In many places, the generally level land near the river leaves off abruptly at steep slopes that drop as much as 50 feet to the river or to the riverside terraces.

The project is located 5.3 miles from the confluence of Sebasticook and Kennebec Rivers. Within the watershed area, the west shore consists of thin beds of alternating greenish gray pelite and micaceous quartzite. The steep banks and riverbed include prominent outcrops, which periodically resurface upstream to the upper end of the project's pool.

The Sebasticook River has a drainage area of 975 square miles and is the largest subbasin of the Kennebec River System. Within the watershed area of the project, the Sebasticook is bordered on both shores by bands of relatively steep (8 to 15 percent slope) silty loam. On the east and west shores north of the project, most of the river within the watershed area is bordered by gravel and clay. Lands near the river are primarily woodland, although some pasture and some hay land are included.

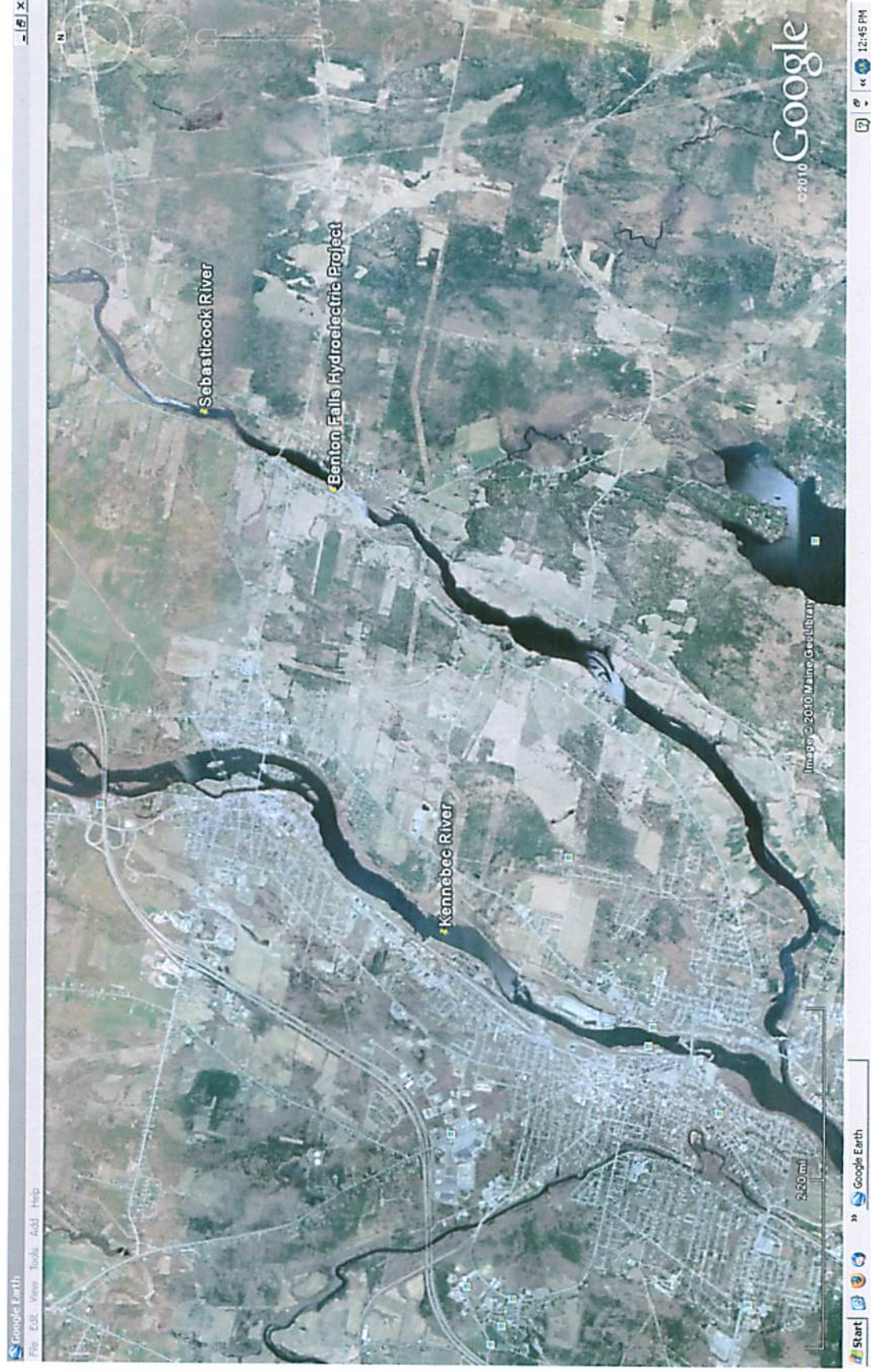
Layout and landscaping of the powerhouse grounds was designed in a manner to minimize visual impact and mitigate the project's impact on the surrounding shoreline. As a condition of issuance, the FERC License requires that BFA comply with any terms and conditions that the Federal or State fish and wildlife agencies have determined appropriate to prevent loss of, or damage to, fish and wildlife resources. There have been no deficiencies noted by any agency with jurisdiction for the plant.

## **APPENDIX 8-1**

### **Watershed Map**



## Appendix 8-1 Benton Falls Hydroelectric Project





## APPENDIX 9

### Description of Threatened and Endangered Species Protection

## Appendix 9

### Benton Falls Hydroelectric Project

#### Description of Threatened and Endangered Species Protection

No officially protected rare or endangered species are affected by the project. Per the attached letter from Gordon E. Beckett of the Department of the Interior Fish and Wildlife Service, one reportedly uncommon species of plant, riverweed, occurs in the river upstream and downstream of the plant as well as in a downstream Sebasticook tributary. The review by the USFWS shows that except for occasional transient individuals, no federally listed or proposed species are known to exist in the project impact areas (please see Exhibit 9-1).

During project operations one or more bald eagles have been observed downstream of the facility. The successful restoration of the alewife population appears to have stimulated bird activity in the area.

As a condition of issuance, the FERC license requires compliance with any terms and conditions that the Federal or State fish and wildlife agencies have determined appropriate to prevent loss of, or damage to, fish and wildlife resources. Based on commitments to comply with both state and federal agency recommendations, the facility operates within FERC and Federal or State Fish and Wildlife Agency guidelines. The project's license is subject to termination if the facility is found to be out of compliance. There have been no deficiencies noted by any agency with jurisdiction for the plant.

A Request will be submitted to the Maine Department of Inland Fisheries and Wildlife for a comprehensive list of all threatened or endangered species within the Benton project. It is believed at this moment that there are no known nesting sites or vegetation in the vicinity of the plant that are adversely impacted by the facility. The results of this inquiry will be forwarded to LIHI upon receipt.

## APPENDIX 9-1

Letter from US Department of the Interior, Fish and Wildlife Service Dated June 5, 1981



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
New England Area Office  
P. O. Box 1518  
Concord, New Hampshire 03301

JUN 5 1981

Ms. Jan P. Wells  
Aquatec, Inc.  
75 Green Mountain Drive  
South Burlington, Vermont 05401

Dear Ms. Wells:

This responds to your May 19, 1981, request for information on the presence of Federally listed and proposed endangered or threatened species within the impact area of a proposed hydroelectric project in Benton, Maine.

Our review shows that except for occasional transient individuals, no Federally listed or proposed species under our jurisdiction are known to exist in the project impact areas. Therefore, no Biological Assessment or further consultation is required with us under Section 7 of the Endangered Species Act. Should project plans change, or if additional information on listed or proposed species become available, this determination may be reconsidered.

This response relates only to endangered species under our jurisdiction. It does not address other legislation or our concerns under the Fish and Wildlife Coordination Act.

A list of Federally designated endangered and threatened species in Maine is enclosed for your information. Thank you for your cooperation and please contact us if we can be of further assistance.

Sincerely yours,

Gordon E. Beckett  
Acting Area Manager

Enclosure

## APPENDIX 10

### Letter from Maine Historic Preservation Commission Regarding Cultural Resources at the Benton Falls Project



MAINE HISTORIC PRESERVATION COMMISSION  
55 CAPITOL STREET  
65 STATE HOUSE STATION  
AUGUSTA, MAINE  
04333

JOHN ELIAS BALDACCI  
GOVERNOR

EARLE G. SHETTLEWORTH, JR.  
DIRECTOR

November 22, 2010

Mr. Stephen Hickey  
Benton Falls Associates  
c/o Essex Hydro Associates LLC  
55 Union Street, 4<sup>th</sup> Floor  
Boston, MA 02108

Re: Benton Falls project (FERC 5073), archaeological sites

Dear Mr. Hickey:

In answer to your email of November 16<sup>th</sup>, Benton Falls Associates and its predecessors have discharged all responsibilities concerning archaeological sites around the Benton Falls impoundment stemming from the Benton Falls FERC license.

To be specific, in 1988 the only remaining archaeological issue was long-term monitoring of erosion at archaeological site 53.34. That obligation was discharged by a 20 year monitoring contract with the Maine Archaeological Society, Inc. The monitoring ended in 2008, without detecting significant erosional damage to the archaeological site.

Sincerely,

Dr. Arthur Spiess  
Senior Archaeologist

arthur.spiess@maine.gov



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## APPENDIX 11

### Recreation

## Appendix 11

### Benton Falls Hydroelectric Project

#### Recreation

As a condition of its FERC license, the Benton Falls Hydroelectric facility provides canoe portage along the east bank of the Sebasticook River along with 1.6 acres of land for fishing and boat launching access. These recreational resources were developed in conjunction with the U.S. Department of the Interior ("USDOI"), the Maine State Comprehensive Outdoor Recreation Plan's goal and objectives, the Town of Benton, and the Maine Bureau of Parks and Recreation as part of the FERC licensing process. USDOI concluded at the time of licensing that the recreational resources were adequate for meeting any anticipated recreational needs at the project site.

Most recently, as a result of the successful fish restoration program, the MDMR has issued an alewife harvesting permit to the Town of Benton. BFA has entered into a cooperative agreement with Benton under which terms agents of the Town have used BFA land to harvest alewives that were surplus to the upstream migration goals of the MDMR.

The Benton Falls facility ("the facility") is in Compliance with the recreational access, accommodation and facilities conditions in its FERC license