EXHIBIT 2

Opinion of Randy Bailey

1.0 Introduction

For this report, I was asked to evaluate the impacts of four dams on the Kennebec River (Lockwood, Hydro Kennebec, Shawmut, and Weston) and three dams on the Androscoggin River (Brunswick, Pejepscot, and Worumbo) on the behavior, habitat, and mortality to adult and juvenile Atlantic salmon which are listed as Endangered under the auspices of the Endangered Species Act (ESA). I was also asked to assess the impacts that these dams have on the recovery potential of the Gulf of Maine Distinct Population Segment (GOM DPS) of Atlantic salmon in general; suggest a list of interim measures that could be implemented immediately or in the very near future to mitigate the dams' impacts on salmon; and generally evaluate why it is important to the conservation of the species to begin implementation of concrete measures to avoid or reduce the mortality levels associated with the projects' infrastructure and operations. For the Kennebec River dams, I was asked to evaluate whether adult Atlantic salmon and American shad are present above the dams and whether any scientifically defensible, quantitative, site-specific studies have been conducted to assess the impacts of these dams on Atlantic salmon and American shad adults passing through turbines.

This report is divided into sections. **Section 1** is the introduction which outlines the issues addressed in this report and explains its format. **Section 2** contains a brief summary of my education, experience, and qualifications. **Section 3** contains a brief summary of my assessment of the status of the Atlantic salmon populations in the Kennebec and Androscoggin rivers. **Section 4** contains a brief background history on why the Atlantic salmon in these two rivers were listed, as well as some information on the Principal Component Elements (PCE's) of spawning and rearing habitats and migration corridors that will form the basis for developing a recovery plan for the conservation of the species. Section 4 also contains the list of factors I used to assess the impacts of each individual dam. These factors are directly related to my assessment of whether death, injury, or adverse change in habitat or fish behavior has been occurring at each dam. **Section 5** contains a brief summary of my conclusions regarding the dams' impacts on downstream migration of Atlantic salmon smolts and kelts (post spawning adults returning to the ocean), impacts on upstream migration including blockage and/or delay in passage, a brief summary of changes in habitats resulting from the project being in place, and a brief evaluation of the cumulative impacts of the two series of dams on the Atlantic salmon populations in the rivers. **Section 6** contains a review of the pertinent literature regarding mortality of fish passing through hydropower turbines and a description of the methods and flow data used to assess what percentage of time, based on historical flow records, all of the river flows could potentially pass through a project's turbines during the critical migration time periods (April – June and October – November) for Atlantic salmon. **Section 7** contains the assessment of each individual dam on the Kennebec River using the seven factors identified in Section 4. **Section 8** contains the same analysis for the three Androscoggin River dams. **Section**

9 is a brief assessment of the consequences to the Atlantic salmon populations of further delaying implementation of improvements in project operations and both upstream and downstream fish passage. **Section 10** is my evaluation comparing my experiences working with ESA listed fish species, the associated scientific studies, and restoration efforts in California and Oregon, with my impressions of what has been occurring in the Kennebec and Androscoggin watersheds. A list of references cited in the report is included at the end.

2.0 Qualifications and Experience

2.1 I am the owner and principal senior fishery scientist of my own aquatic resource consulting firm, Bailey Environmental. My office is located at 18294 S. Scotts Lane, Oregon City, OR.

2.2 I have 20 years of experience as a fishery biologist in various positions with the Federal government, including 9 years as the Chief of the Fisheries Division in the Alaska Regional Office of the U.S. Fish and Wildlife Service. In addition, I have 16 years of fishery biology consulting experience specializing in Endangered Species Act (ESA) issues, where my work has involved the evaluation of the impacts of human development on aquatic ecosystems, and the evaluation of scientific studies, reports, and environmental documents related to ESA compliance.

2.3 During my years of federal service, I was involved in numerous projects regarding ESA-listed fish species. My work with these projects included evaluating the impacts of resource development on listed species, planning and implementing habitat restoration projects for anadromous salmonids in the western United States, and designing and managing field studies on the life histories of Pacific salmon and other cold water fish species common to the west and Alaska. In my last federal position, I served as the Fish and Wildlife Program Manager for the Portland, Oregon, District of the U.S. Army Corps of Engineers. In this capacity, I was responsible for providing funding and program oversight for fish passage operations, involving numerous ESA-listed fish species, at 11 hydroelectric dams: three main-stem Columbia River dams and eight dams on four tributaries to the Willamette River in Oregon. In this position, I was responsible for the updating and modernization of four fish-trapping facilities on the four Willamette River tributaries and their associated "trap and truck" programs for ESA-listed winter steelhead and spring Chinook salmon. I also was responsible for interagency coordination regarding the development and implementation of an ESA Section 7 consultation for the operation of 8 dams in the Willamette River watershed, including provision for fish passage over the eight dams, and management of six associated genetics conservation hatchery programs.

2.4 In my consulting business, I have specialized in dealing with issues related to ESA-listed fish species for various clients. I have helped clients with a Section 7 consultation on Southern

California steelhead trout; provided technical review of various ESA documents, including biological opinions, recovery plans, and ecosystem restoration programs; provided policy recommendations on ESA issues; assisted in the development of the biological assessment for a consultation on operations of the California State Water Project (SWP) and the federal Central Valley Project (CVP); developed a portion of new water quality standards for the Sacramento/San Joaquin Delta; and provided technical review of over $500 million of habitat restoration projects for ESA-listed salmon and steelhead in Central California. I have developed or co-developed two ecosystem restoration plans aimed at protecting or improving conditions for listed species: one for two tributary watersheds to the Sacramento River, and one for the impacts of SWP and CVP operations with an estimated cost of approximately $5 billion. I believe that my experience with Pacific salmon and steelhead are directly applicable to Atlantic salmon, since these species have very similar life histories and habitat requirements.

2.5 I have a B.S. in Natural Resources Management, with an emphasis in Fish and Wildlife Management, from California Polytechnic State University, and an M.S. in Wildlife Management, with an emphasis in Fisheries Science, from Virginia Polytechnic Institute and State University. I am a Fellow Emeritus of the American Institute of Fishery Research Biologists, and am a Life Member of the American Fisheries Society, where I have held various offices and committee memberships over the past 40 years. A list of my publications is in the attached resume.

2.6 In preparing this report, I have personally reviewed the documents listed in the references section of this report, and other reports associated with the dams and individual studies and a number of the annual fish passage reports on both the Kennebec and Androscoggin rivers. Also, I was able to tour each of the dams and have my questions answered by representatives of the various owners/operators of the projects. In addition, I have had discussions with numerous representatives of federal and State of Maine resource agencies involved with Atlantic salmon and hydroelectric dams.

2.7 I have not testified as an expert witness within the last four years in any other case. I am being compensated by the plaintiffs at the rate $120.00 per hour.

- Lockwood Project: 5,660 cfs
- Hydro Kennebec Project: 7,800 cfs
- Shawmut Project: 6,700 cfs
- Weston Project: 6,000 cfs

Androscoggin River Projects:

- Brunswick: 7,191 cfs
- Pejepscot: 8,100 cfs
- Worumbo: 9,600 cfs

I chose to evaluate mean daily flows for the time periods April through June and October through November. These time periods are generally considered to be the downstream migration periods for Atlantic salmon: smolts and kelts in the spring, and kelts in the fall (Fay et al. 2006). Although no smolt trapping occurs in the Androscoggin or Kennebec rivers, emigrating smolts are trapped in the adjacent Sheepscot River watershed. These data show that Sheepscot origin smolts began their downstream migration about the 12th of April in 2010 and median dates of capture for all smolts in 2002, 2006, and 2010 occurring near the 1st of May in those years (See Figures 5.4.5 and 5.4.6 in U.S. Atlantic Salmon Assessment Committee 2011). Atlantic salmon kelts are known to move downstream in the fall and early spring. Results from a 2008-2009 radio telemetry movement study on adult Atlantic salmon released in the Sandy River (a tributary to the Kennebec River upstream of the Weston Project) showed that fish moved downstream as expected during the fall and winter months, with several fish moving downstream to about the Lockwood Project in April of 2009 (McCaw et al. 2009).

Kennebec River flows used in this assessment are based on 25 years (1978-2011, less 1993-2000 when no flows were recorded at this site) of mean daily flow records from the USGS North Sidney, Maine, gaging station (with flows from the Sebasticook River recorded at Pittsfield, Maine subtracted). I did not adjust the flow values obtained for watershed area differences at different points along the Kennebec because of the numerous assumptions that would be required. I reasoned that adjusting flows upward, based on an additional watershed area of 374 mi.^{2} in the Sebasticook watershed that are not measured by the Pittsfield gage, were essentially offset by flow reductions achieved by reducing the watershed area upstream of the Lockwood, Hydro Kennebec, Shawmut, and Weston projects by a maximum of 283 mi.^{2}. The net effect of not adjusting for watershed area means that the flow at each of the four projects is *overestimated* by about 15-20 percent. That means the information presented in the flow analysis figures under each Kennebec River specific project assessment (Sections 7.1-7.4) will tend to *underestimate* the percentage of time when the entire flow of the river can pass through the project turbines (i.e., river flow is $\leq$ project hydraulic capacity). I used the 5th, 10th, 25th, and 50th low flow