STATE OF MAINE
BOARD OF ENVIRONMENTAL PROTECTION

IN RE PETITIONS FOR REVOCATION, MODIFICATION OR SUSPENSION OF PERMITS AND WATER QUALITY CERTIFICATIONS FOR THE LOCKWOOD, HYDRO KENNEBEC, SHAWMUT AND WESTON HYDRO PROJECTS

Merimil Limited Partnership Lockwood Hydro Project #L-20218-33-C-N	)))	
Hydro Kennebec Limited Partnership Hydro-Kennebec Project #L-11244-35-A-N	)))	**PRE-FILED REBUTTAL TESTIMONY OF BRANDON H. KULIK ON BEHALF OF FPL ENERGY MAINE HYDRO, LLC AND MERIMIL LIMITED PARTNERSHIP (LOCKWOOD, SHAWMUT AND WESTON PROJECTS)**
FPL Energy Maine Hydro, LLC Shawmut Hydro Project #L-19751-33-A-M	)))	
FPL Energy Maine Hydro, LLC Weston Hydro Project #L-17472-33-C-M	)))	

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PRE-FILED REBUTTAL TESTIMONY AND EXHIBITS OF BRANDON H. KULIK

- Upstream anadromous fish passage at the Shawmut and Weston projects.
- Downstream anadromous fish passage at the Weston, Shawmut and Lockwood projects.

February 7, 2007

PRE-FILED REBUTTALTESTIMONY AND EXHIBITS OF BRANDON H. KULIK

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PURPOSE AND SCOPE OF REBUTTAL TESTIMONY

The purpose and scope of this rebuttal testimony is to refute erroneous claims made by Friends of Merrymeeting Bay (FOMB) and Douglas Watts in their direct testimony specifically on the subject of anadromous fish passage at the Lockwood, Shawmut and Weston Dams on the Kennebec River.

SUMMARY OF REBUTTAL TESTIMONY

The pre-filed direct testimony of FOMB and Mr. Watts claim, in brief, that 1) there are massive anadromous fish kills at some of the subject projects, 2) the presence of the dams precludes anadromous fish passage, and 3) existing anadromous fish passage measures at the dams are inadequate. It is my professional opinion that neither FOMB nor Mr. Watts has presented any credible information meeting their burden of proof that the upstream or downstream fish passage provisions at these sites are precluding restoration of anadromous fish in the Kennebec River. Therefore, the Board should deny the petitions.

REBUTTAL OF FOMB'S TESTIMONY

The Lockwood, Shawmut And Weston Dams Do Not Preclude Upstream Passage Of Native Migratory Fish.

FOMB's "*Overview of how petitioners know that dams kill and injure fish and eels and reduce their habitat*" (Direct testimony at page 3) is flawed and inaccurate with respect to anadromous fish passage. First, FOMB states that "*DMR has documented upstream passage problems for fish at the four dams in the department's Kennebec River Diadromous Fish Restoration Annual Reports.*" (Page 3, ¶ 6.b) However, FOMB does not subsequently produce any such documentation. Instead, they provide a discussion of upstream fish passage via a fish pump at a site on another river (which in fact demonstrates no problem whatsoever) that is not relevant to the subject Kennebec dams.

Also, FOMB states without any reference or proof that "*DEP has acknowledged that upstream 'trap and lift' equipment at the dams have not worked for shad"* (page 3, ¶ 6.b). However, in a conversation with Dana Murch, Director of Dams and Hydropower of Maine Department of Environmental Protection (DEP) on January 23, 2007, Mr. Murch disagreed that DEP has ever taken that position, and he could not recall any record of such a statement from DEP. Mr. Murch stated that DEP's understanding from MDMR is that record high flows during the 2006 shad migration season curtailed fish use of the Lockwood trap and lift facility as was the experience on rivers throughout the region.

FOMB also erroneously claims that "*Fish ladders, even if available are not used by certain species, and then "trap and truck" becomes the method of choice for moving fish above multiple barriers as is done at Lockwood*" (page 12, ¶ 27). This unsupported

statement suggests that trapping and trucking of fish is a choice of last resort. This claim is contradicted by decades of experience with fishways throughout the Eastern seaboard. There is simply no connection between fish ladder efficiency and use of trap and truck.

In any case, the Lockwood dam is not equipped with a fish ladder. Rather, it is equipped with a state-of-the-art fish lift that was designed in consultation with fish passage engineers from the U.S. Fish and Wildlife Service. Fish lifts are readily used by Atlantic salmon, American shad and river herring, which are the anadromous species under consideration in this proceeding. Fish lifts have successfully passed these anadromous fish at many locations in the northeast, including the Cataract and Skelton projects on the Saco River; the Benton Falls and Burnham projects on the Sebasticook River; the Lawrence and Lowell projects on the Merrimack River in Massachusetts; the Holyoke project on the Connecticut River in Massachusetts; and the Conowingo project on the Susquehanna River in Pennsylvania.

Trap and truck provides benefits to fishery management during early stages of anadromous fish restoration as I described in my pre-filed direct testimony at page 11. Trap and truck also is widely used as a first-phase interim fish passage technique to quickly collect and move upstream-migrating fish directly to spawning habitat during the early stages of fish stock restoration until the migrating fish population increases to the point where the volume of fish moving means that building a permanent fishway is justified. Thus, there is no basis for FOMB's portrayal of trap and truck as a last-resort or inferior fish passage measure.

FOMB states that "*Possible injury may result from trapping, pumping, handling, sorting and trucking.*" (Page 12, ¶ 27). Exhibit W/FOMB-14 purports to demonstrate, based on the fish pump and trucking operations at Fort Halifax, that upstream fish passage via a fish lift and trucking such as that provided at Lockwood, results in undue injury to fish. To the contrary, the data in Exhibit W/FOMB-14 actually show that injuries are very low (less than 1%). Furthermore, the exhibit shows no data related to lifting fish in an elevator as conducted at Lockwood. The common fish handling factor between Lockwood and Fort Halifax is handling and trucking. Here, Exhibit W/FOMB-14 clearly shows that handling and trucking mortality is negligible (two-one hundredths of one percent), and certainly not an undue adverse impact or threat to the environment.

Moreover, FOMB's testimony and exhibit omits DMR's related written assessment of the mortality of trap and truck measures, which clearly contradicts FOMB's claims. From the 2003 DMR Report that FOMB relies on (KHDG 2004; EXHIBIT FPLE-34): *"The number of mortalities due to handling was very low in 2003. In fact the trucking mortality (mortality=33 fish) rate of 0.02% was the lowest ever."*

For the subsequent year, MDMR wrote (KHDG 2005; EXHIBIT FPLE-35): *"The number of mortalities due to handling was very low in 2004. In fact the trucking mortality (mortality=186 fish) rate of 0.12% was the second lowest ever."*

For 2005, MDMR stated (KHDG 2006; EXHIBIT FPLE-36): *"The number of mortalities due to handling was very low in 2005. Overall handling mortality was 0.44%. Trucking mortality was very low; 23 fish in 2005 compared to 185 fish in 2004 for a trucking mortality rate of 0.03%."*

Likewise, Atlantic salmon handling has been satisfactory as well. As I reported in my direct testimony at pages 10 and 11, the MASC monitored Atlantic salmon trapped and trucked from Lockwood to the Sandy River in 2006 and stated that these fish appear to be fit and healthy following the trap and truck process. Thus, the fish handling experience from the Kennebec clearly contradicts FOMB's generalizations.

FOMB states that "*American shad are extraordinarily sensitive and have not been found to enter the fish lift or trap.*" (Page 12, ¶ 27) To the contrary, as I have stated on page 3 of my rebuttal testimony, American shad do in fact enter similar fish lifts routinely on the Saco, Merrimack, Connecticut and Susquehanna Rivers. In fact the American shad program that historically provides broodstock for the Kennebec collects and trucks shad that are first obtained from fish lifts on the Merrimack and/or Connecticut rivers and trucked hundreds of miles to Maine (KHDG 2006).

The Lockwood fish lift has only operated for one year (2006). According to MDMR[1] the reason that no American shad entered the Lockwood fish lift in 2006 was related to

[1] http://www.maine.gov/dmr/rm/stockenhancement/kennebec/fishpass.htm

extremely high flows that aborted many American shad runs throughout the region and was **not** a flaw in the fish lift:

> *"Several factors have resulted in poor upstream fish passage for…American shad in 2006. River discharge started to increase again at the beginning of June when blueback herring and American shad would normally be starting to migrate. All three fish lifts ceased operations on June 9 and remained offline until June 16-19* ***due to extremely high flows, which set new maximum discharge records for both the Kennebec and the Sebasticook*** (emphasis added)***.*** *As of June 22, flows remained well above the median. Other large river systems in Maine (Penobscot, Saco, Androscoggin) and Massachusetts (Merrimack) have reported poor fish passage due to high flows".*

It is my best professional judgment that there is no basis for categorically concluding that American shad will not use the Lockwood fish lift as implied by FOMB, because numerous similar fish lifts that have well-established records of passing shad also did not attract American shad in 2006 due to record high river flows.

FOMB states that even if a fish lift was risk-free to fish, that upstream passage is inherently inefficient. To support this, FOMB tries to compare numbers of alewife passed at a pump and trap at Fort Halifax to an estimate of the total size of the alewife run. However, this is misleading, as;

1. the Fort Halifax fish pump has no similarity to the Lockwood fish lift (an entirely different fish passage system), and
2. MDMR has made a resource management decision not to pass all of the fish at Fort Halifax.

According to FOMB, 100,000-140,000 of an estimated two million alewives arriving at Fort Halifax are passed upstream (page 12, ¶ 27). However, FOMB neglects to inform the Board that the number of alewives passed upstream is not related to fish passage efficiency, but is capped by DMR, and that there is no need or desire to pass all alewives upstream to meet fishery management goals. A pre-determined number of fish (the escapement requirement) are allowed to pass upstream to promote sufficient spawning to maintain future runs of alewives. Additional fish could be readily passed upstream if deemed necessary by MDMR merely by running the fish pump for more days and/or increasing the frequency of truck trips. The number of fish passed upstream is presently capped at six adult alewives per acre of spawning habitat, which MDMR has determined provides sufficient spawning escapement to maintain the stock. Thus, the number of acres of upstream spawning habitat dictates the number of fish passed upstream. According to the KHDG report, from which FOMB only selectively cites:

> "*A total of 13,400 lake acres were stocked to a density of approximately 6 alewives per acre… The alewife stocking program in the Phase I lakes required 10 days to complete…*"

After the desired numbers of fish are passed, DMR elects to cease fish passage operations; the surplus fish that are not passed upstream are available for commercial and recreational harvest, and consumption by predators such as eagles, ospreys and striped bass. MDMR has estimated (based on fishing permit reports) that the annual number of alewives killed by commercial harvest below Fort Halifax fluctuates but has ranged as high as 458,040 fish (KHDG 2005). This, by FOMB's reckoning, is almost 25% of the entire annual alewife run.

From the Maine DMR 2005 report (KHDG, 2006):

Year	Reported Landings
2004	102,480 fish
2003	136,000 fish
2002	458,040 fish
2001	69,000 fish
2000	54,000 fish

FOMB also fails to note that, in fact, according to the same report, the trap/truck efficiencies at Fort Halifax were so high that it allowed DMR staff to easily perform supplemental stocking of over 50,000 alewives in 24 additional ponds in 11 other drainages. This in fact provides an opportune collateral benefit to statewide alewife restoration programs. All of these objective data contradict the notion that upstream fish passage is inherently inefficient, and supports the fact that trap and truck operations can quickly and effectively stock large portions of a watershed. In addition, this example is readily transferable to the Kennebec projects, where escapement requirements will define the number of fish that must pass upstream, not the total number or fish that show up below a dam. According to DMR (KHDG, 2004) a total of approximately 8,600 alewives will satisfy the spawning escapement needs for the Kennebec upstream from the Lockwood dam.

The Lockwood, Shawmut And Weston Dams Do Not Preclude Downstream Passage Of Native Anadromous Fish.

FOMB states that "*In fact there have been massive kills of alewives observed at the Shawmut, Burnham, Benton Falls and American Tissue dams*" (page 13, ¶ 28). The

Board should first be aware that only one of these dams, Shawmut, is even on the Kennebec River. The Burnham and Benton Falls dams are on the Sebasticook River and the American Tissue dam is on the Cobosseecontee Stream. Also, FOMB provides no documentation of a "massive" fish kill occurring at the Shawmut dam. Rather, Exhibit W/FOMB-15 merely shows a photograph of one alewife labeled "Shawmut" but there is no photographic or other confirmation as to the actual location or number of fish involved. If "massive" alewife kills were in fact occurring at Shawmut, certainly there would be documented reports on file with MDMR or other forms of evidence - but in fact there are none. Furthermore, as noted in Mr. Richter's rebuttal testimony (page 4), Dr. Gail Wippelhauser, a senior fishery biologist at DMR who manages anadromous fish restoration on the Kennebec River stated that she had no knowledge or information about any type of "massive" alewife kill below Shawmut.

FOMB states at page 13, ¶ 28 that "*As the state attempts to restock Atlantic salmon…one of our major concerns is how returning adults and smolt will regain access to tidewater*". But as already described in my direct testimony at pages 13-15,

1. the projects feature existing downstream passage provisions,
2. there is ample evidence that most smolt would pass downstream during the spring months when high flows provide substantial spillage over the dam spillways and/or through the by-pass gates that are specifically opened to provide downstream passage, and
3. scientific studies (Franke et al., 1997) demonstrate that of the remaining fish passing downstream via turbines, most would survive.

Furthermore, as described in Mr. Richter's pre-filed direct testimony at pages 8-10, additional studies of the existing downstream passage routes for smolt and adult salmon will be conducted using conventional, state-of-the-art methods to address this same question. The results will be reviewed and evaluated by technical experts from federal and State fisheries agencies. The need for, and design of any additional downstream passage measures will be dictated by study results as is the norm at most other hydroelectric projects in New England. There is ample precedent for this approach in Maine, where such studies have been conducted to address downstream anadromous fish passage at many dams, including those on the Saco and Penobscot rivers, as a routine part of the fish passage consultation process between licensees and agencies.

REBUTTAL OF DOUGLAS WATTS' TESTIMONY

Existing Fish Passage Conditions At The Lockwood, Shawmut And Weston Dams Do Not Preclude Anadromous Fish Passage Restoration.

Watts (¶ 15) states that "…*these four dams continue to have this same deleterious effect* (i.e. referring to Watts ¶ 14 "complete extirpation") *on the ability of these indigenous migratory fish species to live and inhabit their normal, natural and historic habitat.*" As noted in my prefiled direct testimony at page 16, Watts' statement is contradicted by the fact that the abundance of anadromous fish of the Kennebec River has increased according to MDMR monitoring, other surveys, and available commercial harvesting information. Because anadromous species abundance is increasing, then it cannot objectively be claimed that these fish are being extirpated by fish passage conditions (which conditions will be enhanced further under existing plans). Furthermore, these dams have fish passage provisions promoting upstream and downstream passage which

provides access to the spawning and rearing habitat necessary to allow the populations to grow.

Watts, at ¶¶ 16 and 18 respectively, claims that "*These four dams…completely prevent these indigenous migratory fish species from swimming upstream in the Kennebec River past these dams to occupy their normal, natural and historic habitat…*" and "*these four dams are utterly and completely impassable to these five species during their upstream migration.* As I have discussed in direct testimony at pages 9-11, this is factually incorrect. Anadromous fish can entirely bypass these four dams because they are afforded access to their upstream habitat through the implementation of the trap and truck program at Lockwood.

Watts (¶ 19): "*Today these four dams are completely impassable to these five indigenous migratory fish species during their upstream migration from the Atlantic Ocean.*" Please see my response to items 15, 16, and 18 above.

CONCLUSION

FOMB and Mr. Watts claims that 1) there are massive anadromous fish kills at some of the subject projects, 2) the presence of the dams precludes anadromous fish passage, and 3) existing anadromous fish passage measures at the dams are inadequate are inaccurate and unsupported by the evidence. It is my professional opinion that neither FOMB nor Mr. Watts have presented any credible information meeting their burden of proof that the upstream or downstream fish passage provisions at these sites are precluding restoration

of anadromous fish in the Kennebec River. Therefore, the Board should deny the petitions.

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Franke, G.F., D.R. Webb, R.K. Fisher, D. Mathur, P.N. Hopping, P.A. March, M.R. Headrick, I.T. Laczo, Y. Ventikos, F. Sotiropoulus. 1997. *Development of environmentally advanced hydropower turbine system design concepts.* U.S. Dept. of Energy and Hydropower Research Foundation. July 1997.

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Dated: FEBRUARY 2, 2007

Brandon H. Kulik

STATE OF Maine
COUNTY OF Somerset

Personally appeared before me the above-named Brandon H. Kulik and made oath that the foregoing is true and accurate to the best of his knowledge and belief.

Dated: 2/2/07

Notary Public
My Commission Expires: Stephanie K. Estes
Notary Public, Maine
My Commission Expires
July 28, 2010

EXHIBIT FPLE-34

Maine DMR Discussion of Trap and Truck (From Page 3 of Kennebec River Anadromous Fish Restoration – Annual Progress Report, 2003).
Maine Department of Marine Resources (KHDG 2004).

from DMR upon request.

1.2 Overview

On May 8, DMR received reports from FPLE consulting biologist Jason Seiders that small schools of alewives were observed below Fort Halifax in Winslow. However, larger numbers of alewives did not appear for several more days, delaying the onset of pumping until May 16.

Between May 16 and June 12, 2004, a total of 135,368 alewives were collected with the fish pump. Overall, pump efficiency (fish/day) at Fort Halifax was similar to historical pump efficiencies. It operated for a total of 22 days and an average 6,153 adult alewives were collected daily. The variation in the number of fish collected is due to a number of factors, including environmental conditions causing variation in fish densities below the dam (e.g., high water and/or depressed water temperatures), truck loading time, and trip length.

The timing of the alewife run was a little later than average. **See Table 1**. Historically (1994-2003), the mean date by which 50% of alewives have been collected is May 25. In 2003, the 50% date of alewife trapping was May 27 (Day 9 of pump operation). The 25% quartile was only one later, while the 75% quartile was three days later.

Based on ten years of data (1994-2003), the average peak date of alewife pumping is May 23. **See Table 2**. In 2003, the peak was on May 21 (15,467 alewives collected with the fish pump); however, there were also 13,970 adult alewives collected on May 27.

The number of mortalities due to handling was very low in 2003. In fact, the trucking mortality (mortality=33 fish) rate of 0.02% was the lowest ever. **See Table 3.**

Phase I Habitat

In 2003, a total of 75,190 broodstock alewives were stocked into ten of the 11 upriver Phase I lakes in the Kennebec River watershed. **See Table 4.** In total, 13,400 acres of lake surface area were stocked to a density of approximately six alewives/acre. Due to a concern about the ability

EXHIBIT FPLE-35

Maine DMR Discussion of Trap and Truck (From Page 3 of Kennebec River Anadromous Fish Restoration – Annual Progress Report, 2004).
Maine Department of Marine Resources (KHDG 2005).

The timing of the alewife run was a little earlier than average (Table 1). Historically (1994-2003), the mean date by which 50% of alewives have been collected is May 24. In 2004, the 50% date of alewife trapping was May 18 (Day 7 of pump operation). The 25% quartile was reached on May 13; the 75% quartile was reached on May 24.

Based on 11 years of data (1994-2004), the average peak date of alewife pumping is May 22. In 2004, the peak was on May 13 when 16,761 alewives collected with the fish pump; however, there were also 14,213 alewives collected on May 18 and 15,228 collected on May 24 (Table 2). The number of mortalities due to handling was very low in 2004. In fact, the trucking mortality (mortality=186 fish) rate of 0.12% was the second lowest ever (Table 2)

Phase I Habitat

In 2004, a total of 77,644 broodstock alewives were truck-stocked into 10 of the 11 upriver Phase I lakes in the Kennebec River watershed (Table 3). An additional 4,018 were hand-dipped at Webber Pond on two separate occasions, bringing total transfers to 81,662. A total of 13,400 acres of lake surface area were stocked to a density of approximately six alewives/acre except Douglas Pond, where stocking densities approached full escapement of 36/acre. Due to a concern about the ability of alewives being able to leave the pond, Three-cornered Pond was not stocked in 2004. The results of surveys conducted during the winter/spring of 2005 will determine whether this waterbody will be stocked in 2005.

In total, 37 alewife-stocking trips were made to the upriver ponds in 2004, averaging 2,098 alewives per trip (Tables 4 & 5). All 37 trips originated from Fort Halifax, as the Sebasticook River was once again the sole source of alewife broodstock. The alewife stocking program in the Phase I lakes required 10 days to complete between May 10 and May 24, 2004. All of Phase I lakes were stocked by May 24. The most stocking trips completed to the Phase I ponds in one day was seven, occurring on May 13.

Phase II Restoration

No Phase II lakes were stocked in 2004. DMR delayed stocking of Great Moose Pond until improvements can be made in the downstream passage facility. The outlet of the downstream passage facility discharged onto large rocks, so a contractor was retained by DMR in February 2004 to remove them. However, the plunging flow still lands on ledge. A plunge pool needs to be constructed or the pipe needs to be extended before alewives are stocked in Great Moose

EXHIBIT FPLE-36

Maine DMR Discussion of Trap and Truck (From Pages 6 & 7 of Kennebec River Anadromous Fish Restoration – Annual Progress Report, 2005).
Maine Department of Marine Resources (KHDG 2006).

temperatures due to a large 3 day rain event ended pumping operations for ten days. On June 2nd adequate numbers of alewives had returned to the tailrace and stocking operations resumed.

On June 23rd FPL operations personnel replaced the project's flashboards. The headpond was drawn to below crest and the flashboards were installed. FPL has instituted new guidelines for operations personnel and biologists during the herring migration season that state spill over the crest of the dam is to be maintained until FPL biologists safely remove any fish from the ledges to prevent stranding when spill is discontinued. Once the flashboards are installed, the headpond level is to be maintained 0.5 feet below the top of the boards. These procedures, coupled with relatively low spring flows, prevented spill over the crest of the dam onto the south ledges, thereby preventing alewives from ascending the ledges and possibly becoming stranded with the loss of spill.

Between May 17th and June 4th, 2005, a total of 82,475 alewives were collected with the fish pump. It operated for a total of 10 days (seven fewer than in 2004) and an average 8,247 adult alewives (8,584 in 2004) was collected daily. The variation in the number of fish collected is due to a number of factors including environmental conditions causing variation in fish densities below the dam (e.g. high water and/or depressed water temperatures), truck loading time, commercial fishing effort and trip length.

The timing of the alewife run was a little earlier than average (Table 1). Historically (1994-2004), the mean date by which 50% of alewives have been collected is May 24. In 2005, the 50% date of alewife trapping was May 21 (Day 5 of pump operation). The 25% quartile was reached on May 18; the 75% quartile was reached on June 3rd.

Based on 11 years of data (1994-2004), the average peak date of alewife pumping is May 22. In 2005, the peak was on May 18 when 15,281 alewives collected with the fish pump; however, there were also 15,139 alewives collected on May 19 and 13,988 collected on June 3rd (Table 2). The number of mortalities due to handling was very low in 2005. Overall handling mortality was .44%. Trucking mortality was very low; 23 fish, in 2005 compared to 186in 2004 for a trucking mortality rate of 0.33%. Pump mortality at Fort Halifax was 338 individuals. Hhowever, 296 mortalities were the result of two emergency shutdowns where the Fort Halifax Project lost power. It should be noted that several thousand fish were released alive during these

shutdowns. The 296 mortalities consisted of the fish trapped in the pipe system until power was restored

Phase I Habitat

In 2005, a total of 73,463 brood stock alewives were stocked into 10 of the 12 upriver Phase I lakes in the Kennebec River watershed (Table 3). An additional 17,346 were hand-dipped at Webber Pond bringing total transfers to 90,809. Three-Mile and Three-cornered Pond were not stocked in 2005, however due to the high spring flows resulting in good passage adult alewives did migrate upstream from Webber Pond. An individual adult and juvenile were captured at the outlet of Three-mile Pond on October 14th in a Fyke Net. It is unknown how many individuals may have migrated into Three-mile or Three-cornered Ponds. DMR employees surveyed the stream connecting Three-mile and Webber Ponds in July and concluded that even at the then low water conditions that there was adequate passage between the two water bodies for migrating alewives.

In total, 38 alewife-stocking trips (54 tanks) were made to the upriver ponds in 2005, averaging 1,399 alewives per tank (Tables 4 & 5). All 38 trips originated from Fort Halifax, as the Sebasticook River was once again the sole source of alewife broodstock. The alewife stocking program in the Phase I lakes required 10 days to complete between May 16th and June 7th, 2004. The most stocking trips completed to the Phase I ponds in one day was seven, occurring on May 18th and 19th.

Phase II Restoration

No Phase II lakes were stocked in 2005. DMR delayed stocking of Great Moose Pond until improvements can be made in the down stream passage facility. The plunging flow lands on ledge. A plunge pool needs to be constructed or the pipe needs to be extended before alewives are stocked in Great Moose Pond. DMR continued to focus its efforts on obtaining fish passage in the Pioneer and Waverly dams in Pittsfield. DMR met with town officials and The Natural Resources Conservation Service to investigate funding possibilities.

Non-Phase I Transfers

In 2005, transfers from Fort Halifax to waters other than Phase I lakes totaled 8,113 alewives loaded, with 0 trucking mortalities (Table 6). The stocking of non-Phase I habitat with Fort Halifax alewives was far less than previous years due to the reduced number of alewives