MAINE DEPARTMENT OF TRANSPORTATION

2006 POST-CONSTRUCTION MONITORING REPORT:

New Gloucester Mitigation Project (MDOT PIN 3517.90)

Mosquito Brook Site

(Year 2 of 5)

&

Royal River Site

(Year 3 of 5)

Compensation for Route 26 Reconstruction Project, Gray and New Gloucester (MDOT PIN 3517.20)

ACOE Permit Number: 200201653

MDEP Permit Number: L-21048-TG-A-N

March 2007

Prepared By

MAINE DEPARTMENT OF TRANSPORTATION
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2006 Post Construction Monitoring Report: Mosquito Brook and Royal River Sites, New Gloucester (PIN 3517.90)

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1.0 PROJECT BACKGROUND

This report presents the results of the second year (2006 growing season) of post-construction monitoring at the Mosquito Brook mitigation site and the third year of monitoring at the Royal River mitigation site in New Gloucester, Cumberland County (Figure 1). The Maine Department of Transportation (MaineDOT) restored ±0.4 acres, and preserved an additional ±1.4 acres of wetland at the Mosquito Brook site; and enhanced ±2.7 acres and preserved an additional ± 23.5 acres of floodplain at the Royal River site as mitigation for the 3.37 acres of impacts to wetlands and streams associated with the construction of the Route 26 project in Gray, New Gloucester, and Poland. The proposed mitigation is described in the Wetland Mitigation Plan (the Plan) for the project dated August 2002 (Revised). This report is being submitted to comply with the conditions contained in the permits received in 2003 from the Maine Department of Environmental Protection (MDEP) (permit number L-21048-TG-A-N), and from the U.S. Army Corps of Engineers (Corps), (permit number 200201653) for the Route 26 project (PIN 3517.20). Copies of the permits are included in Appendix A.

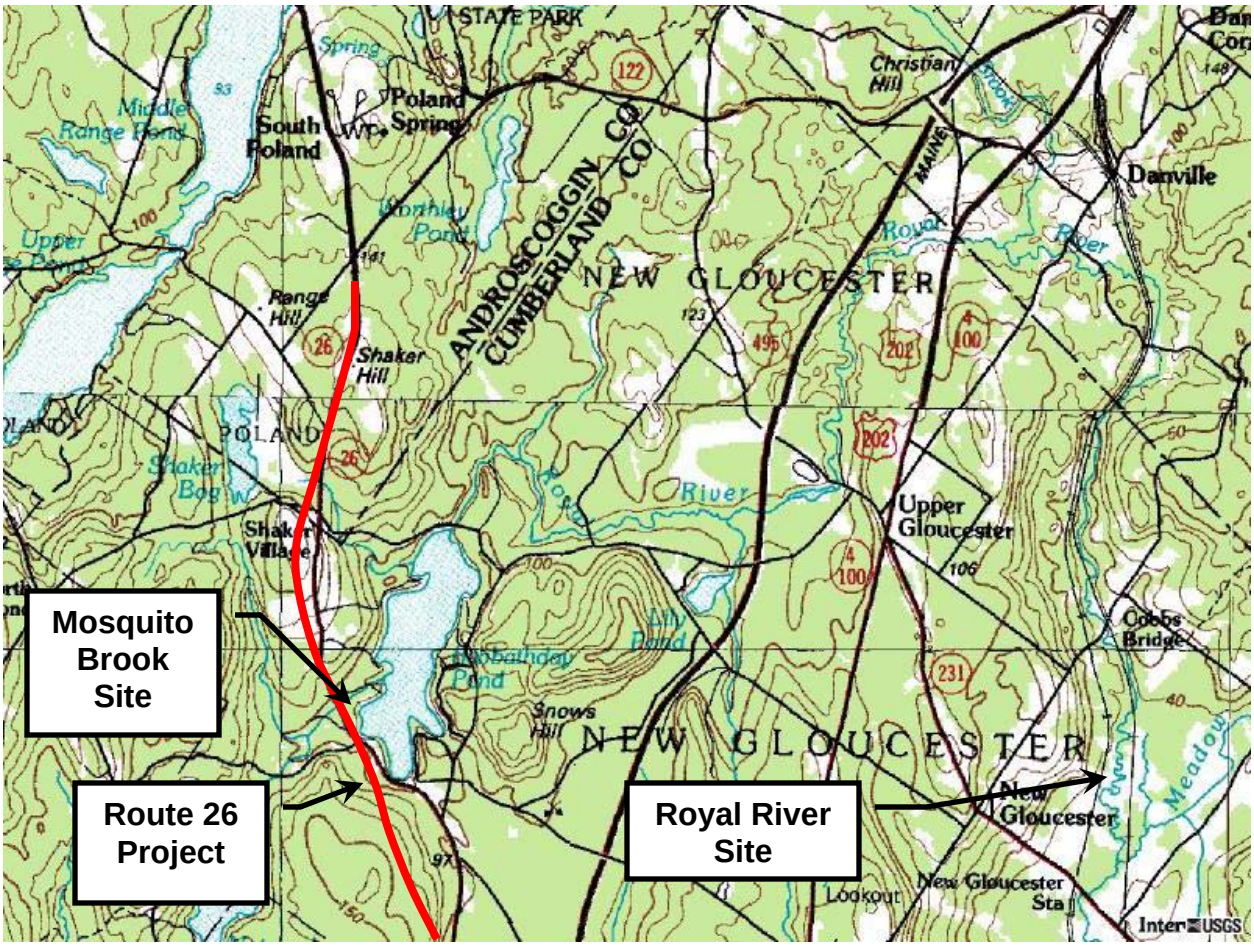
The monitoring period at both sites is 5 years. Monitoring at the Mosquito Brook and Royal River sites consists of tracking the establishment of planted stock and/or volunteer species within each site and relating the results to the required performance standards. Table 1 summarizes the findings at each site and compares them with the required performance standards.

Table 1. Summary of yearly findings and performance standards for the Mosquito Brook and Royal River sites

Performance Standard	2004 Findings (Year 1)	2005 Findings (Year 1[1] & 2)	2006 Findings (Year 2[1] & 3)	Met Standard?
Mosquito Brook Site:				
Interim woody plant densities in restoration area	n.a.	Woody volunteers beginning to colonize site	Woody volunteers beginning to colonize site	On Track
Final woody plant density in restoration area	n.a	Woody volunteers beginning to colonize site	Woody volunteers beginning to colonize site	Too early
Percent areal cover	n.a.	Area well vegetated	Area well vegetated	Yes
Invasive species control	n.a.	No plants found	One plant near site was removed	Yes
Erosion control	n.a.	Soils and slopes stable	Soils and slopes stable	Yes
Royal River Site:				
Minimum prescribed woody plant densities in enhancement area	Initial replacement plantings installed	Additional replacement plantings installed	Additional replacement plantings installed	On track
Percent areal cover	Planting areas well vegetated	same	same	Yes
Invasive species control	One purple loosestrife plant found and removed	No plants found	Three purple loosestrife plants found and clipped/removed	Yes
Erosion control	Planting areas stable	same	same	Yes
Bank stabilization	Stable slopes with no significant erosion; damage to plantings from beaver	Repair areas stable; slumping of existing shrub clump noted	Repair areas stable; damage to coir log from beaver noted	On track
Conservation easement	No inconsistent use	same	same	Yes
ATV use	Gates installed, no disturbance	same	same	Yes

[1] The Mosquito Brook site was constructed in 2004, one year after the Royal River site was completed

Figure 1. Royal River and Mosquito Brook Site Location Map



2.0 MOSQUITO BROOK SITE

2.1 Performance Standard Questions

The mitigation objectives for the Mosquito Brook site identified in the Plan were to:

- remove the existing Route 26 roadbed from the Mosquito Brook floodplain;
- restore wetland conditions and functions/values similar to the mix of PEM, PSS and PFO covertypes in the adjacent floodplain wetlands; and
- protect the mitigation area through the use of restrictive covenants.

The monitoring plan for the site calls for assessing the conditions within the restoration area and comparing the results to the following interim and final performance standards:

Woody Plants: Does the site meet the interim (3-year) density requirement for woody volunteers?
On track. Although still at an early stage, woody plant recruitment within the restoration area appears to be on track to attain the standard. The conditions noted in 2006 are described in more detail in Section 2.2.

Volunteer or Planted Woody Plants: Does the site meet the final (5-year) density requirement for woody plants?
Too early. Woody plant establishment on the site continues to develop but is still at an early stage. Densities at the site will be compared with this standard beginning in the fourth year of the monitoring period.

Percent Areal Cover: Do planned wetland areas have at least 80% areal cover of noninvasive hydrophytes?
Yes. The restoration area is well vegetated with a mix of herbaceous and woody wetland plant species. Vegetative over in within the area appears to meet the 80% cover standard based on visual inspection.

Invasive Species Control: Is common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*) and buckthorn (*Frangula alnus* syn. *Rhamnus frangula*) at the mitigation site being controlled?

Common reed, purple loosestrife and buckthorn were not found within the restoration area. One purple loosestrife plant was found along old Route 26 within 100 feet of the restoration area and was removed. Several Multiflora Rose plants were noted within the site and will be monitored.

Erosion Control: Are slopes and soils within and adjacent to the mitigation site stable?
Yes. The substrate within the restoration area and the slopes surrounding the site are stable and well vegetated.

2.2 Narrative Discussion

Monitoring Inspections

MaineDOT staff visited the site on May 16, 2006 to check site conditions during spring flooding; and on September 5, 2006 to assess the natural recruitment of woody species within the restoration area and evaluate overall site conditions. In addition, signs of wildlife use, physical damage or disturbance, and invasive species were noted.

Wetland Soils

The salvaged wetland loam placed in the restoration area during construction was stable, and well vegetated. These highly organic soils have an irregular microtopgraphy of hummocks and shallow pits. Soils within the restoration area were partially flooded in May and seasonally saturated in September.

Remedial Activities in 2006

No remedial measures were needed at the site in 2006.

Erosion Control Measures

During construction a berm of composted bark mulch was placed along the edge of the site adjacent to the existing wetland as a temporary soil erosion control measure. After the completion of site grading the woodwaste berm was knocked down and spread to maintain the hydrologic connection between the restored wetland and the adjacent wetland. No further action is needed.

Vegetative Cover

The restoration area was well vegetated with a mix of herbaceous plant species that sprouted from the salvaged loam and root masses/ plant clumps spread throughout the site. The restoration plan for the site relied on natural recruitment of wetland vegetation in place of plantings and a wetland seed mix. A dense cover of herbaceous vegetation has become established within the site. Wetland species noted during the site visit include royal fern (*Osmundia regalis*), swamp candles (*Lysimachia terrestris*), blue-joint grass (*Calamagrostis canadensis*), *Sparganium sp.* and other sedges and grasses. A complete plant list is included in Appendix B. Based on visual inspection, the site appears to meet the 80% cover standard.

Woody Plant Establishment

In September, a number of volunteer tree and shrub species were found within the restoration area. Wetland species noted included: red maple (*Acer rubrum*), white ash (*Fraxinus americana*), gray birch (*Betula populifolia*), meadowsweet (*Spiraea latifolia*), swamp dogwood (*Cornus amomum*), speckled alder (*Alnus incana ssp. rugosa*) and elderberry (*Sambucus canadensis*). Many of the species noted in the mitigation area were also found in the forested wetland adjacent to the site. A tally of woody plant volunteers was made and it was determined that the site is on track to meet the natural recruitment density standard for the site. A complete plant list is included in Appendix B.

Wildlife Use of the Site

Sightings or signs of wildlife within the site noted during visits to site in 2006 were limited to deer (tracks), and a number of aquatic insects. The proximity of the site to the road probably deters wildlife use of the site.

Other Observations

Vehicle tracks at the south end of the restoration area first noted in 2005 appear to have revegetated and have formed a shallow pool similar to other pools on the site. No other damage to the site was observed.

2.3 Remedial Measures for 2007

No remedial measures are anticipated at the Mosquito Brook site at this time. However, the following monitoring activities are planned for 2007 to assess the progress of the site toward achieving the performance standards:

- Check soil stability and hydrology in the early spring; and
- Re-assess woody species recruitment within the restored wetland.

3.0 ROYAL RIVER SITE

3.1 Performance Standard Questions

As stated in the Plan, the goal of the enhancement effort at the Royal River site is to offset the loss of wetland functions and values resulting from the Route 26 reconstruction project. To achieve this goal, the following mitigation objectives were established for the enhancement area:

- Promote the establishment of forested floodplain habitat in the currently mowed field by planting trees and shrubs;
- Stabilize sections of eroding streambank along a meander bend in the river and reduce the rate of erosion by promoting the establishment of dense woody vegetation (Note: The streambank stabilization objectives originally stated in the Plan were revised during the final design process in coordination with the Corps and DEP); and
- Place conservation easements over the site.

In accordance with the Plan, the enhancement effort is required to meet the following performance standards by the end of the 5-year monitoring period:

Plantings and Woody Volunteers: Does the site meet the minimum density requirements for planted and volunteer stock?

Yes. After installation of 140 replacement plants in October 2006, the woody plant density within the enhancement area appears to be on track to meet the density standard. The conditions noted in 2006 are described in more detail in Section 3.2.

Percent Areal Cover: Do the planted areas have at least 80% areal cover of herbaceous and woody plants?

Yes. The previously disturbed soils in planting areas have a dense cover of volunteer grasses and planted shrubs. Based on visual inspection, these areas continue to meet the 80% cover standard.

Invasive Species Control: Is common reed, purple loosestrife and buckthorn at the mitigation site being controlled?
Common reed and buckthorn were not found within the site. Three purple loosestrife plants were found within the limits of the enhancement site. One plant was found within a plant group, one plant was found within the streambank stabilization area and another was found in an unstabilized section of the streambank. All plants were either dug or the flower heads clipped, bagged, and removed from the site.

Erosion Control: Are slopes and soils within and adjacent to the mitigation site stable?
Yes. Disturbed soils in the plant groups are well vegetated and stable. The substrate and banks of the constructed pools continue to be stable.

Bank Stabilization: Has slumping within the bioengineering stabilization area been controlled and are all stabilization measures in place? Is any erosion that occurs minor and typical of this section of river?
Some bank slumping was noted in several areas along the river outside the stabilization area in May. In one area a large preexisting shrub clump slumped and came to rest at the toe of the bank. In August, in the middle section of the stabilized bank some sagging of the coir log was noted, however the bank remains stable and does not appear to be threatened. Shrub plantings along the bank in the stabilization areas experienced additional browse by beaver, but had resprouted. The conditions noted in 2006 are described in more detail in Section 3.2.

Conservation Easement: Are the terms of the conservation easement are being met?
Yes.

ATV Use: Is the use of ATV's and other motorized vehicles successfully being controlled to protect the plantings, vegetation, and soil from damage?
Yes.

3.2 Narrative Discussion

Monitoring Inspections

MaineDOT staff visited the site in May, August, and October 2006 to check overall site conditions, assess the number and species of plantings in need of replacement, oversee the installation of replacements, check the bank stabilization areas and evaluate the overall progress of the site toward meeting the performance standards. In addition, signs of wildlife use, physical damage or disturbance, and invasive species were noted.

The following is a summary of activities that occurred during the site visits:

- May – Checked the constructed pools for evidence of amphibian breeding, reviewed the plant groups and bank stabilization areas for winter damage;
- August – Reviewed the condition of planted trees and shrubs in each of the planting groups and assessed the woody plant density and checked the condition of the bank stabilization areas;
- October – Flagged plants in need of replacement and monitored the replacement planting by a landscape contractor.

Remedial Activities in 2006

The following remedial activities were undertaken during the 2006 growing season to address or repair damage to the planting groups:

- Frost heaved plants and tree protectors were reset by MaineDOT staff; and
- Approximately 140 replacement trees and shrubs comprised of red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), basswood (*Tilia americana*), swamp dogwood (*Cornus amomum*), and willow (*Salix sp.*) were installed by a landscape contractor in October. The replacement plantings were intended to offset losses from herbivory that occurred in the winter of 2005-2006 and to keep the site on track to meet the performance standards.

Plant Establishment

A total of 24 planting groups containing over 1,000 trees and shrubs are spaced within the floodplain of the Royal River and along the top of the bank. These groups are intended to provide seed sources and serve as starting points for the re-establishment of trees and shrubs within the floodplain.

An assessment of the woody plant density within the plant groups indicated that the total woody plant density and the tree density had fallen below the performance standards mostly as a result of herbivory experienced during the winter of 2005-2006. The roots and stems of a number of trees, predominantly white ash, were girdled and killed by small rodents, probably voles, despite being enclosed in plastic tree protectors. The relatively warm conditions during the winter of 2005-2006 and the lack of snow cover may have exacerbated the damage. In addition, a number of alder and willow shrubs planted along sections of the streambank were clipped at the base by beaver. These areas were located near places where trails used by beaver emerge from the river and ascend the steep muddy bank. As first noted in 2004, browsing by beaver is likely to continue unless intensive control measures, such as repeated trapping or the location and destruction of dens, are implemented. Intensive control measures may be difficult to implement at this site because of the ability of the beaver to move freely upstream and downstream, and may require permission from adjacent property owners.

The number of surviving planted trees and shrubs within the 24 groups were tallied in Augusta to determine a density for the 2.7 acre enhancement area. Based on the number of trees and shrubs in the sampled groups, the estimated total woody plant density in the enhancement area was 298 plants per acre, falling below the standard of 360 plants per acre. Of the total, 225 per acre were trees, slightly below the secondary standard requiring a minimum of 240 per acre. In accordance with the standard, more than three non-exotic woody species were present in the area including red maple, white ash (*Fraxinus americana*), green ash, hornbeam (*Carpinus caroliniana*), white pine (*Pinus strobus*), and basswood. Volunteer shrubs such as willow, elderberry (*Sambucus canadensis*), and meadowsweet that are beginning to colonize several parts of the site in substantial numbers were not counted. Future tallies will include appropriate volunteer species and are likely to result in an increase in the overall plant density.

An unexpected finding was the presence of a non-native species of alder, determined to be European or Black alder (*Alnus glutinosa*), within the plant groups. The alder are located around some of the constructed shallow pools and along the top of the streambank. Several of the alder had been clipped by beaver. All alder on the project were originally specified to be native speckled alder (*Alnus*

incana ssp. rugosa) and were supplied by a landscape contractor. The plant guarantee period for these plants has expired and any replacements would be at MaineDOT expense.

As a result of these findings, 50 replacement trees (3-4 foot) and 80 replacement shrubs (18-24 inch) were installed in October. Alders were not included in the plant list because of uncertainty over the availability of native species from the nursery. These replacements were intended to offset losses from herbivory that occurred in the winter of 2005-2006 and to keep the site on track to meet the performance standards. The plants were mulched with 4 inches of woodwaste mulch and plastic protectors were replaced on the tree species. Newly replaced plants and existing plants along the top of the streambank were hand sprayed with an environmentally safe animal repellent intended to deter additional browse by rodents, beaver, and deer.

Bank Stabilization

In early May, water levels in the Royal River were about three feet below the top of bank. Isolated incidents of bank or shrub slumping were noted along the streambank outside the limits of the stabilization areas. A large preexisting shrub clump near planting group number 5 pulled away from the bank during the winter of 2005-2006 and came to rest at the toe of slope. A previously undercut section of streambank near planting group 2 also failed, depositing large clumps of sod on the slope.

Despite the freeze-thaw conditions and repeated flooding that occurred over the winter of 2005-2006, the bioengineering measures and regraded slopes remained stable. However, slight damage to the coir log and slopes due to frost heaving or wildlife activities was noted within the stabilized section of the bank. Two slumps, approximately 2-3 feet long by 1 foot high were noted in the middle section of the stabilized bank. In addition, two short sections of the coir log had sagged approximately 1 foot as a result of beaver activity. It appears that beaver climb up on the log, then up the slope and over the narrow land bridge to reach the river on the other side. This activity does not appear to have compromised the integrity of the adjacent coir logs and blankets, but will be monitored again in 2007. The soils around these areas are well vegetated with a mix of herbaceous shrub and cover.

A number of willow, alder, viburnum and dogwood tubelings and shrubs planted on the stabilized slopes or at the top of bank were present and many plants previously browsed by beaver had resprouted and were healthy.

Wildlife Use of the Site

The shallow pools constructed in the floodplain were checked on May 3rd for signs of amphibian breeding activity. At the time of sampling, three out of four constructed pools contained water as did the reference pool. Wood frog (*Rana sylvatica*) tadpoles were noted in small numbers (<20) within Pool A as were 3 green frogs. Pool B contained approximately 8 wood frog egg masses attached to branches in the pool that had previously hatched. No spotted salamander egg masses or larvae were observed in any of the pools. A reference pool located adjacent to the enhancement area within clumps of reed canary grass contained a large number of wood tadpoles. Pool D located in the middle of the field surrounded by the large meander bend contained a small, shallow puddle in early May. The same pool had filled with water by mid-May, but by this point in the season it was too late to support breeding by obligate vernal pool species.

Numerous wildlife species, sign and tracks were noted during visits to site in 2006 including: deer (tracks), meadow vole, beaver, great blue heron, purple finch, common yellowthroat, gray tree frog, and a number of aquatic insects.

Other Observations

Two gates installed across the access road to the enhancement area remain intact. No damage or disturbance from unauthorized vehicle use within the site was noted.

3.3 Remedial Measures for 2007

No remedial measures appear to be necessary or are planned for the Royal River site in 2007 at this time. Nonetheless, the need for maintenance and replanting in order to keep the site on track to achieve the performance standards will be assessed during site visits and appropriate measures will be implemented. The following monitoring activities are planned for the site:

- Recheck the streambank stabilization areas in the spring for signs of significant erosion or damage;

- Reassess the condition of the planted trees and shrubs after bud break to identify any significant winter kill or dieback and replace as necessary under the terms of the guarantee period;
- Assess the level of natural recruitment occurring within the enhancement area of the site; and
- Watch for additional damage to the plantings from beaver and consider coordination with the property owner and the IF&W Regional Biologist regarding control options.

4.0 FUTURE MONITORING REPORTS

Annual monitoring will be conducted at the Mosquito Brook and Royal River sites again in 2007 and a summary report will be submitted to the MDEP and the Corps by March 31st, 2008 in accordance with the schedule in the Plan.

Appendix A

PERMITS

MDEP Permit Number L-21048-TG-A-N

Corps Permit Mitigation Special Conditions
(Corps Permit Number: 200201653)

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

DEPARTMENT ORDER

IN THE MATTER OF

DEPARTMENT OF TRANSPORTATION	) NATURAL RESOURCES PROTECTION ACT
Augusta, Kennebec County	) WETLAND ALTERATION AND
AUGUSTA THIRD BRIDGE	) WATER QUALITY CERTIFICATION
L-20756-4E-A-N	) FINDINGS OF FACT AND ORDER
(APPROVAL)	

Pursuant to the provisions of 38 M.R.S.A. Sections 480-A et seq. and Section 401 of the Federal Water Pollution Control Act, the Department of Environmental Protection has considered the application of DEPARTMENT OF TRANSPORTATION with the supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

A. Application: The applicant proposes to construct a new highway and bridge connecting I-95 to Route 3 in Augusta. The project includes the construction of a new I-95 interchange, a new highway on new alignment, and a new bridge crossing over the Kennebec River.

B. Summary of Proposal: The applicant is proposing to construct a third bridge in Augusta with an associated new, limited access highway approximately three miles long connecting Interstate 95 to Routes 3, 9, and U.S. 202, including a new Interstate 95 Interchange. The new bridge will cross the Kennebec River approximately one-half mile above the site of the former Edwards Dam. The bridge proposal includes two piers that will be located in the flood zone and two piers that will be located in the river channel. The proposed project will be phased as described below:

1. Phase I consists of earthwork and drainage from the Interstate to the Kennebec River;
2. Phase II consists of the construction of the Kennebec River bridge and all earthwork and drainage from the Kennebec River, east;
3. Phase III consists of the construction of the Interstate 95 overpass and the Eight Rod Road construction;
4. Phase IV consists of final paving, curb and guardrail alignment, signals at intersections, and landscaping; and
5. Phase V consists of final construction and monitoring of the compensation area.

C. Site Description: The applicant has obtained all necessary property rights as authorized under 23 M.R.S.A § 153.

2. WATER QUALITY CONSIDERATIONS:

MDOT requires that its contractors adhere to temporary erosion control measures specified in "Special Provision Section 107: Soil Erosion and Water Pollution Control." Special Provision Section 107 mandates that

to facilitate the upstream migration of Atlantic strugeon and late migrating species.

The Atlantic Salmon Commission (ASC) has commented on the proposed project and finds that the river at the proposed bridge crossing is not rearing or spawning habitat for Atlantic salmon, but is used as a migratory corridor. ASC finds that the major concern would be to prevent extensive sedimentation downstream toward Bond Brook which contains a documented sensitive salmon population. To minimize interference with migration and to limit sedimentation downstream for Bond Brook, ASC recommends that an instream work window of July1 through September 15 should be established.

The Department finds that the project as proposed will not cause any significant adverse impact to habitats provided that the applicant submits an ITP to the Department and Maine Department of Inland Fish & Wildlife (MDIFW), for review and approval, prior to beginning construction of Phase II of the proposed project. The Department also finds that an instream work window of July 1 through September 15 be established, and that work during July be limited to the pier most distant from the main channel.

4. WETLAND CONSIDERATIONS:

A. SUMMARY OF IMPACTS: The proposed project will result in approximately 476,911 square feet (10.95-acres) of wetland impact due to fill placement for construction of the new interchange, connector roads, and bridge. At least six wetland complexes have been identified and are described in detail in Exhibit 11 of the application and shown on Table 1 below. The proposed connector road will cross 14 small streams that will require culverting, impacting approximately 20,202 square feet of stream area.

Wetland ID	PFO*	PSS*	PEM*	Stream*	River*	Pond*	Shoreline**	W.S.S.*	Type	Total Impacts	Primary Functions
95-1			14,726							14,726	ST
95-2	22,974	48,079	58,495	7,192		595	1,356	10,323	PEM	165,311	ST/WL
								16,297	PSS		
A		4,345	74,764							79,091	ST
B	22,863	10,882	3,617	4,275			1,060	11,755	PSS	62,504	WL/GW/FF/SS
								8,052	PFO		
E	2,570			2,322	3,145		1,352	16,769	PFO	24,806	WL/GW/SS
G	15,365	9,626	80,555	6,413			1,595	7,966	PSS	130,484	WL/FF/SS/GW/ST
								8,964	PEM		
TOTALS	63,772	72,932	232,139	20,202	3,145	595	5,363	80,126		476,922	
* Measurements in square feet											
** Measurement in linear feet											

the selected contractor develop a specific erosion and sedimentation control plan and submit it to MDOT's Office of Environmental Services (OES) for review, comment, and approval. The plan must meet the standards and commitments described in Section II of the manual "MDOT Best Management Practices for Erosion and Sediment Control (BMP)," dated September 1997 or latest revision.

Based on past experience, the Department's Division of Watershed Management (DMW) finds that the OES's Water Resource Unit is capable of obtaining an erosion control plan from contractors that meets Department standards for the resource protection. DMW requires no further review and approval of the temporary erosion control plan provided that, prior to construction, the applicant and/or its contractor submits a final plan to the Deportment for inclusion in the project file and that the Department receives written approval of the plan from MDOT prior to the start of construction.

The Department finds that an employee of the Maine Department of Transportation qualified to assess erosion and sedimentation control measures, must submit a report summary of all work completed, erosion control compliance, and general progress of the project on a monthly basis by the 15th of each month during construction, for inspections completed during the previous month, and must notify the Department within 24 hours upon the discovery of erosional concerns or otherwise, resulting in a discharge of soil into a protected natural resource.

3. WILDLIFE HABITAT CONSIDERATIONS:

The Maine Department of Inland Fisheries & Wildlife (MDIFW) has reviewed the proposed project and finds that the portion of the project that requires work in the Kennebec river is considered work within a Significant Wildlife Habitat because this portion of the river contains two species of freshwater mussels (Yellow Lampmussel and Tidewater Mucket) that are currently listed as endangered species in the State of Maine. The Maine Endangered Species Act provides for the inadvertent incidental take of these species associated with project construction and development provided that an Incidental Take Plan (ITP) is developed and implemented. The applicant and MDIFW have met to discuss and develop an ITP that is reasonable and minimizes the incidental take of these listed species.

The Department of Marine Resources (DMR) has reviewed the project as proposed and finds that the river at the proposed bridge crossing should be considered as a migratory pathway for all anadromous fish species native the State of Maine that now have access to the 17 miles of riverine habitat above the former Edwards Dam. The majority of the anadromous fish species migrate upstream from April 1 through June 30 except Atlantic sturgeon, which would be likely to migrate upstream from mid June through July. To avoid interference with the upstream migration for the majority of the anadromous fish species in the Kennebec River, the Department of Marine Resources recommends that a timing window be established from April 1 through June 30 during which no instream work will be permitted. DMR also recommends that instream work in July be limited to the pier most distant from the main channel

The Department of Transportation conducted a delineation and a function and value assessment. Wetlands were field surveyed and delineated from May through October 1998. Delineations were done using the U.S. Army Corps of Engineers' 1987 3-parameter routine determination approach and the 1995 and 1998 Field Indicators for Identifying Hydric Soils in New England. Wetland functions and values were identified using the U.S. Army Corps of Engineers' Highway Methodology. This assessment indicated that there are six major wetland complexes identified on the project site. One complex (E) includes direct impacts to the Kennebec River and four others (95-2, B, E, & G) that impact tributary streams to the Kennebec. Wetland complex 95-2 also includes impacts to a small pond. Approximately 2,000 square feet of seasonally flooded depressions, including some areas of possible vernal pool habitat area, and approximately 80,126 square feet of freshwater wetlands of special significance will also be filled. Primary functions identified are described in Exhibit 11 of the NRPA permit application and shown on Table 1 above. The applicant has proposed mitigation to replace the functions & values of the wetlands impacted by the proposed project.

B. AVOIDANCE & MINIMIZATION: The applicant has submitted an alternative analysis for the project as proposed that demonstrates that the proposed project constitutes the least practicable damaging alternative. The applicant has modified the design and construction methods for the proposed roads, bridge, and interchange to minimize wetland impacts. The Department has reviewed these materials and finds that wetland impacts have been avoided and minimized as much as possible given the site and design constraints through the design of the project, methods of construction and stabilization, and proposed wetland compensation plan.

C. WETLAND COMPENSATION: As compensation for wetland impacts associated with the proposed project, the applicant proposes to enhance wetland and upland pasture along Riggs Brook on the Gamage Property in Augusta, Maine, and to preserve a parcel of land that will join two distinct compartments of MDIFW's Garcelon Wildlife Management Area (WMA). No opportunities exist for on-site mitigation. Multiple off-site mitigation sites were evaluated, as described in Section 2 of Exhibit 14 in the NRPA permit application.

The Riggs Brook enhancement site occupies approximately 24-acres of riparian wetland and upland along Riggs Brook, in the middle of a 100 ± acre cow pasture. The site includes approximately 2,500 feet of Riggs Brook, with approximately 10-acres of adjacent wetland and 14-acres of upland slopes extending 100 to 300 feet on either side of the brook. The proposed wetland enhancement site will be acquired by MDOT and protected from future development or agricultural uses. In addition, enhancement measures will be implemented to achieve the compensation objectives, including fencing to exclude livestock, discontinuation of mowing, repair and stabilization of eroded banks, and planting of trees and shrubs to accelerate the establishment of woody cover in wetlands and upland

buffers. Specific treatments are described in Section 3.1 of Exhibit 14 in the application and shown on the first nine plans in a set of ten, the first of which is entitled "Maine Department of Transportation Augusta Third River Crossing Project Preliminary Wetland Compensation - Project Location Map," prepared by Duke Engineering & Services, dated December, 2001.

The Spectacle Pond Preservation Site consists of nine contiguous parcels totaling approximately 146-acres, straddling the municipal boundary in northeastern Augusta and southwestern Vassalboro. The northern and southern limits of the site abut properties owned by MDIFW that have been managed as separate compartments of the Garcelon WMA. The site is mostly hardwood forested upland with all or parts of two forested/scrub shrub wetland complexes, several intermittent streams and vernal pools, and approximately 2,250 feet of frontage on Spectacle Pond. Acquisition and transfer of this site to MDIFW will fulfill a long-term management objective to connect these distinct compartments and will contribute to the objective of securing a substantial portion of the Spectacle Pond shoreline. Details of the preservation site are described in Section 3.2 of Exhibit 14 in the application and shown as plan 10 entitled "Maine Department of Transportation Augusta Third River Crossing Project Preliminary Wetland Compensation - Spectacle Pond Preservation Site Plan," prepared by Duke Engineering & Services, dated December, 2001.

D. COMPENSATION MAINTENANCE: The applicant intends to maintain the Riggs Brook mitigation area. The applicant will maintain the livestock fencing during and after the completion of the proposed five year post-construction monitoring period or until such time that the applicant transfers the mitigation parcel to a qualified third party for long-term stewardship. If such a time arises the applicant must notify the Department of the transfer candidate. Prior to the completion of 50% of the proposed project, the applicant must initiate the compensation project and notify the Department. The Department finds that the applicant must file a finalized Declaration of Covenants and Restrictions for the compensation area, referencing the final construction plans, with the Kennebec County Registry of Deeds, within six months after the initiation of the compensation project. Evidence of filing must be submitted to the Bureau of Land and Water Quality, Division of Land Resource Regulation, within 30 days of the filing date. Evidence must consist of copies of the restrictions stamped with Book and Page numbers or accompanied by a letter from the Registrar.

E. COMPENSATION MONITORING: A qualified wetland scientist will be on-site to monitor construction of the wetland compensation area. Monitoring during construction will verify that excavation, grading, planting, and erosion control measures are implemented according to plans and specifications. The applicant proposes to monitor the compensation project annually over a 5-year period starting the following spring from when planted. A qualified, professional wetland scientist must conduct all field assessments. Reports detailing the findings must be submitted to the Department

prior to December 15 of each of the reporting years. The reports must include labeled photographs representing current site conditions, and a narrative detailing existing site conditions during the monitoring event. The narrative must include, but not be limited to, vegetative coverage and success rates, vegetative community diversity, spatial extent, and wetland functions, and any measure required to remediate adverse site conditions as described in Section 14 of the NRPA application.

5. OTHER CONSIDERATIONS:

The Department has not identified any other issues involving existing scenic, aesthetic, or navigational uses, soil erosion, habitat or fisheries, the natural transfer of soil, natural flow of water, water quality, or flooding.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions:

A. The proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational, or navigational uses.

B. The proposed activity will not cause unreasonable erosion of soil or sediment provided that the project is completed as proposed and that the applicant meets all of the requirements in Finding 2

C. The proposed activity will not unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment provided that the project is completed as proposed and that the applicant meets all of the requirements in Findings 2 & 3

D. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life provided that the project is completed as proposed and that the applicant meets all of the requirements in Findings 3 & 4.

E. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.

F. The proposed activity will not violate any state water quality law including those governing the classifications of the State's waters provided that the project is completed as proposed and that the applicant meets all of the requirements in Findings 3 & 4.

G. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.

H. The proposed activity is not on or adjacent to a sand dune.

I. The proposed activity is not on an outstanding river segment as noted in Title 38 M.R.S.A. Section 480-P.

THEREFORE, the Department APPROVES the above noted application of Department of Transportation to construct a new highway with I-95 interchange and a new bridge, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations:

1. Standard Conditions of Approval, a copy attached.

2. The applicant shall take all necessary measures to ensure that their activities or those of their agents do not result in measurable erosion of soil on the site during the construction of the project covered by this approval.

3. The applicant and/or its contractor shall submit a final erosion and sedimentation control plan to the Department for inclusion in the project file and the applicant shall receive written approval of the plan from the Department prior to the start of construction.

4. The applicant shall submit an ITP to the Department and Maine Department of Inland Fish & Wildlife (MDIFW), for review and approval, prior to beginning construction of Phase II of the proposed project.

5. All instream work shall occur between July 1 and September 15.

6. Instream work in July shall be limited to the pier most distant from the main channel to facilitate the upstream migration of Atlantic strugeon and late migrating species.

7. The applicant shall submit a monthly summary report of all work completed and erosion control compliance by the 15th of each month during construction. This report shall include inspections completed during the previous month and shall notify the Department within 24 hours of discovery of any discharge of soil into a protected natural resource. This report shall be completed by an employee of the Maine Department of Transportation qualified to assess erosion and sedimentation control measures.

8. The applicant shall maintain the livestock fencing on the mitigation site during and after the completion of the proposed five year post-construction monitoring period or until such time that the applicant transfers the mitigation parcel to a qualified third party for long-term stewardship. If such a time arises, the applicant shall notify the Department of the transfer candidate.

9. Prior to the completion of 50% of the proposed project, the applicant shall initiate the compensation project and notify the Department. The applicant shall file a finalized Declaration of Covenants and Restrictions for the compensation area, referencing the final construction plans, with the Kennebec County Registry of Deeds, within six months after the initiation of the compensation project. Evidence of filing shall be submitted to the Bureau of Land and Water Quality, Division of Land Resource Regulation, within 30 days of the filing date. Evidence shall consist of copies of the restrictions stamped with Book and Page numbers or accompanied by a letter from the Registrar.

10. The applicant shall monitor the compensation project annually over a 5-year period starting the following spring from when planted. A qualified, professional wetland scientist shall conduct all field assessments. Reports detailing the findings shall be submitted to the Department prior to December 15 of each of the reporting years (year 1, 2, and 3, with a final assessment report after the 5th year following installation). The reports shall include labeled photographs representing current site conditions, and a narrative detailing existing site conditions during the monitoring event. The narrative shall include, but not be limited to, vegetative coverage and success rates, vegetative community diversity, spatial extent, and wetland functions, and any measure required to remediate adverse site conditions as described in Section 14 of the NRPA application.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED AT AUGUSTA, MAINE, THIS 13 DAY OF March, 2002.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: _____
MARTHA G. KIRKPATRICK, COMMISSIONER

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES…

Date of initial receipt of application 12/07/2001
Date of application acceptance 12/18/2001

Date filed with Board of Environmental Protection
LK/L20756AN

FILED
MAR 14 2002
BOARD OF ENVIRONMENTAL PROT.
STATE OF MAINE

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

John E. Dooley Chief Eng. — June 7, 2002

(PERMITTEE) *(DATE)*

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Christine Godfrey — 6/3/02

(DISTRICT ENGINEER) *(DATE)*

for BRIAN E. OSTERNDORF
COLONEL, CORPS OF ENGINEERS

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) *(DATE)*

☆U.S. GOVERNMENT PRINTING OFFICE: 1986 — 717-425

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. The permittee shall ensure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all

Special Conditions Continued on Page 4

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

contracts and sub–contracts for work which affects areas of Corps of Engineers' jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for the work. If the permit is issued after construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different unauthorized work in areas of Corps of Engineers jurisdiction. contractors or sub–contractors, all contractors and sub–contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub–contract shall require or allow unauthorized work in areas of Corps of Engineers jurisdiction.

2. Adequate sedimentation and erosion control devices, such as geotextile silt fences or other devices capable of filtering the fines involved, shall be installed and properly maintained to minimize impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.

3. The permittee and his contractors shall conduct a pre-construction meeting with Corps, Maine Dept. of Environmental Protection and other appropriate resource agency staff prior to construction at the project site.

4. This permit authorizes impacts to only those areas of wetlands shown on the attached plans. No other filling, clearing or other disturbance in wetlands shall occur.

5. There shall be no in-stream work in the Kennebec River from April 1 to June 30 to minimize impacts to essential fish habitat, anadromous fish, and endangered shortnose sturgeon.

6. Mitigation shall be performed in accordance with the attached mitigation plan entitled, "AUGUSTA THRID RIVER CROSSING PROJECT, PIN 556.XX, PRELIMINARY WETLAND COMPENSATION PLAN, PIN 556.44" and dated "DECEMBER 2001" and revised by the attached memo dated "February 26, 2002".

DEPARTMENT OF THE ARMY PERMIT

Permittee Maine Dept. of Transporation, 16 State House Station, Augusta, Maine 04333

Permit No. 200001630

Issuing Office New England District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

Place fill in conjunction with the construction of a new connector road from I-95 to Route 3. The work includes new right-of-way clearing, culverted or bridge crossings of Fisher and Riggs Brooks, numerous crossings of wetlands and intermittent and perennial streams, a new interchange at I-95, and a pier supported bridge crossing of the Kennebec River. Wetland and waterway impacts on the approaches to the Kennebec River crossing total approximately 7.2 acres and the three piers supporting the bridge will impact approximately 0.075 acres of river bottom.

In accordance with the attached plans "MAINE DEPT. OF TRANSPORTATION, AUGUSTA THIRD BRIDGE PROJECT, AUGUSTA, MAINE, DOT PIN 556.11" in 12 sheets undated

Project Location:

In numerous waterways and wetlands between I-95 and Route 3 at Augusta, Maine.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on JUN 03 2007. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

Appendix B

MOSQUITO BROOK VEGETATION DATA

Mosquito Brook Mitigation Site
New Gloucester, Maine
PIN 3517.97
2006 Post-construction Monitoring Assessment

Intoduction

The Maine Department of Transportation has a project that required realignment of a section of Route 26 in New Gloucester. Due to the amount of wetlands and stream bottom area impacted by the reconstruction, mitigation was required to compensate for the impacts.

The mitigation site is 0.4 acre in size and involved removing a section of the old highway and restoring it as Palustrine Scrub/Shrub and Forested wetland. The mitigation goal at this site is to restore the wetland functions and values of the impacted wetlands similar to those found in the adjacent undisturbed wetlands.

The natural upper layer of soil to a depth of approximately 12 inches, along with herbaceous vegetation and seed sources were removed from the proposed realignment section of Route 26, and placed at the mitigation site. Once the natural material was placed at the mitigation site, monitoring began to determine the success of natural recruitment of herbaceous and woody vegetation. Under the performance standards, supplemental planting at the site is required if the density of natural recruitment has not reached the standard by the third year of monitoring.

Methods

The second year of monitoring the site involved a botanical review which was performed on September 05, 2006. The tasks completed during the review are listed below:

- Identification and number of recruitment trees having a height of at least six inches.
- Identification and number of recruitment shrubs and vines.
- Identification and number of recruitment trees having a height less than six inches.
- General description of emergent vegetation with emphasis on identification of species common at the site.
- Notes regarding any rare or unusual woody or herbaceous species.
- Comparison of vegetation composition at the mitigation site to an adjacent undisturbed Palustrine Scrub/Shrub/Palustrine Forested wetland.
- Representative photographs of the site.

Results

The following is a list of recruitment tree species and numbers of each species of tree at least 6 inches in height found at the site:

Fraxinus americana White Ash 1
Betula papyrifera Paper Birch 5

Populus tremuloides Quaking Aspen 2
Quercus rubra Northern Red Oak 1
Betula populifolia Gray Birch 9
Ulmus americana American Elm 2
Acer rubrum Red Maple 3

The following is a list of recruitment shrub and vine species found at the site:

Viburnum lentago Nannyberry 5
Rosa multiflora Multiflora Rose 3
Spiraea latifolia Meadowsweet 326
Spiraea tomentosa Steeplebush 105
Cephalanthus occidentalis Buttonbush 11
Rubus hispidus Swamp Dewberry 71
Rubus idaeus Red Raspberry 116
Cornus amomum Swamp Dogwood 60
Viburnum recognitum Northern Arrowwood 18
Parthenocissus inserta Virginia Creeper 13
Aronia melanocarpa Black Chokeberry 1
Salix sp. Willow sp. 1
Ilex verticillata Common Winterberry 7
Shrubs/vines (ctnd.)

Alnus incana ssp. rugosa Speckled Alder 26
Salix discolor Pussy Willow 1
Sambucus Canadensis Common Elder 9
Myrica gale Sweet Gale 2
Rubus allegheniensis Mountain Blackberry 5
Lyonia ligustrina Maleberry 1
Rhus radicans Poison Ivy 1
Vaccinium corymbosum Highbush Blueberry 1

The following is a list of recruitment trees less than 6 inches in height:

Fraxinus americana White Ash 3
Quercus rubra Northern Red Oak 1
Acer rubrum Red Maple 2

General herbaceous vegetation description of the site has common occurrence of several *Carex spp.* Sedge spp., *Lysimachia terrestris* Swamp Candles, *Calamagrostis canadensis*, Blue-joint Grass, *Typha latifolia* Common Cattail, *Sagittaria latifolia* Broad-leaved Arrowhead, *Sparganium sp.* Bur-reed sp., *Hypericum virginicum* Marsh St. Johnswort, *Scirpus sp.* Bulrush sp., *Osmunda regalis* Royal Fern, *Boehmeria cylindrical* False Nettle, *Asclepias incarnata* Swamp Milkweed, *Lycopus uniflorus* Northern Bugleweed, *Juncus militaris* Bayonet Rush, *Dulichium arundinaceum* Three-way Sedge, *Juncus effusus* Soft Rush, *Solidago rugosa* Rough-stemmed

Goldenrod, *Impatiens capensis* Spotted Touch-me-not, *Epilobium sp.* Willow Herb sp., *Euthamia graminifolia* Lance-leaved Goldenrod, *Glyceria canadensis* Rattlesnake-grass, *Scutellaria epilobiifolia* Marsh Skullcap. The Sparganium sp. and Sagittaria latifolia occur at low spots of the site where there is water at or near the surface. *Typha latifolia* is scattered in pockets throughout the site. Several *Carex spp.* also occur scattered throughout the site. A greater amount of woody vegetation recruits occur at the middle and southern sections of the site, compared to the northern end of the site. *Impatiens capensis, Lysimachia terrestris, Osmunda regalis, Spiraea tomentosa, Spiraea latifolia,* and *Hypericum virginicum* are scattered throughout the site.

A species of special note is the *Rosa multiflora* at the site. This species is recognized as an exotic invasive species. Three individual plants were observed at various locations of the site. Throughout the site, there is a mosaic of elevational differences with a variance to approximately 18 inches. *Rosa multiflora* is not typically found in wetland conditions, but the slightly higher locations within the site may be drier than the lower elevation areas allowing for establishment of *Rosa multiflora.* This species can populate an area through seed germination and arching canes touching down and rooting. It is intolerant of shade, but with the site being open and the expectation being that a forest canopy will not be established for several more years, this species could become more abundant throughout the site eliminating areas where native vegetation could become established. This could in turn decrease native species diversity and density, create areas of the wetland inaccessible to wildlife, and may also provide less nutritive value to wildlife.

In comparing an adjacent PSS/PFO wetland (control) area to the mitigation site regarding vegetation composition, several of the same woody species occurred at both sites. The control wetland area, which is located east of the site, consisted of the following dominant vegetation:

Southerly End: Canopy: *Acer rubrum, Ulmus Americana*
Subcanopy: *Spiraea latifolia, Carex sp., Calamagrostis canadensis, Ilex verticillata, Alnus incana ssp. rugosa,* and *Osmunda regalis.*

Central Area: Canopy: *Acer rubrum*
Subcanopy: *Osmunda regalis, Calamagrostis canadensis, Ilex verticillata, Alnus incana ssp. rugosa, Carex sp.,* and *Spiraea latifolia*

Northerly End: Canopy: *Acer rubrum*
Subcanopy: *Alnus incana ssp. rugosa, Osmunda regalis, Viburnum recognitum, Viburnum lentago, Carex spp., Spiraea latifolia,* and *Ilex verticillata.*

Extreme Northerly End: Canopy: *Acer rubrum, Betula populifolia,* and *Fraxinus americana.*
Subcanopy: *Ulmus americana, Alnus incana ssp. rugosa, Cornus amomum, Osmunda regalis, Viburnum recognitum, Carex spp., Spiraea latifolia, Ilex verticillata,* and *Onoclea sensibilis.*

Discussion

Of note is the diversity of herbaceous species at the mitigation site, with numerous species observed at the site, but not observed in the control area adjacent to the site. Further investigation of numerous areas in close proximity to the mitigation site may provide an answer to where the seed source is located.

Most of the woody vegetation observed in the Palustrine Scrub/Shrub and Palustrine Forested wetland adjacent to the site were also found in the mitigation site. Establishment of herbaceous vegetation at the site is high with most of the site having a high density of grasses, sedges, rushes, and wildflowers.

In referencing the standards set for having at least 400 trees and shrubs per acre, the survey numbers indicate successful recruitment exceeding the threshold number.

Gerard Therrien, Biologist
Maine Department of Transportation

Appendix C

PHOTOGRAPHS

Photo 1. Mosquito Brook site restoration area in early spring. 5-16-06.

Photo 2. Water ponded in shallow depressions within the Mosquito Brook restoration area and the adjacent reference wetland. 5-16-06.

Photo 3. Vegetative cover within the Mosquito Brook restoration area. 9-5-06..

Photo 4. View of floodplain enhancement area at Royal River site from railroad embankment showing plant groups, shallow pool, and channel. 5-16-06.

Photo 5. View of floodplain enhancement area showing large existing shrub clump that slid into the Royal River during the winter of 2005-2006. 5-16-06.

Photo 6. View of bank erosion near plant group 2 that occurred over the winter of 2005-2006. 5-3-06.

Photo 7. View of temporary ponding in shallow pool C and surrounding plant group during amphibian survey. 5-3-06.

Photo 8. View downstream of upper section of streambank stabilization area when water level was about 3 feet below the top of bank. 5-3-06.

Photo 9. View upstream of lower section of streambank stabilization area showing bank scarring that resulted when large shrub clump located between two stabilization areas slid into river in 2004-2005. 5-3-06.

Photo 10. Mulch blankets marking the location of alder shrubs clipped by beaver. River is to the left of photo. 5-3-06.

Photo 11. Remains of planted white ash showing vole damage to roots and stem despite enclosure in plastic tree protector. 5-3-06.

Photo 12. Planted white ash completely stripped of bark by voles. Tree was inside plastic tree protector. 5-3-06.

Photo 13. Several ash in planting group at the end of the growing season. 8-24-06.

Photo 14. Several ash in planting group at the end of the growing season. 8-24-06.

Photo 15. View downstream of middle section of streambank stabilization area at the end of the third growing season. Herbaceous vegetation is well established and many previously browsed tubelings have resprouted. 8-24-06.

Photo 16. Close up of beaver trail through middle portion of streambank stabilization area. 8-24-06.

Photo 17. Close up of slump in coir log at toe as a result of beaver activity in middle section of streambank stabilization area. 8-24-06.

Photo 18. Downstream section of streambank stabilization area at the end of the third growing season showing vegetation regrowth around shrub clump that slumped previously. 8-24-06.

Photo 19. View of planted trees in plastic tree protectors and herbaceous growth around pool D in center of large meander bend in river. 8-24-06.