



Maine Coastal Program
Maine State Planning Office
38 State House Station
Augusta, Maine 04333

**HABITAT RESTORATION INVENTORY
SUMMARY REPORT
FOR THE
ROYAL RIVER, SPRUCE CREEK, AND LOWER KENNEBEC
RIVER ESTUARY
VOLUME I**



DECEMBER 2005

**Prepared by: Northern Ecological Associates, Inc.
451 Presumpscot Street
Portland, Maine 04103**

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TABLE OF CONTENTS

SECTION	PAGE
VOLUME I	
1.0 INTRODUCTION	1
1.1 GOALS AND OBJECTIVES OF THE INVENTORY	1
1.2 BACKGROUND INFORMATION ON THE WATERSHEDS	5
1.2.1 Spruce Creek	5
1.2.2 Royal River	7
1.2.3 Lower Kennebec River Estuary	8
2.0 METHODOLOGY	10
2.1 PRELIMINARY IDENTIFICATION OF POTENTIAL SITES	10
2.2 FIELD DATA COLLECTION AND SITE EVALUATION	10
2.3 DATA FORM	11
2.4 DISSEMINATION OF INFORMATION	14
2.4.1 Habitat Restoration Inventory Database	14
2.4.2 GIS Data	14
3.0 RESULTS OF HABITAT RESTORATION INVENTORY	16
3.1 OVERALL RESULTS	16
3.2 RESULTS FOR INDIVIDUAL WATERBODIES	19
3.2.1 Spruce Creek	19
Description of Waterbody and Surrounding Area.....	19
Summary of Field Evaluations.....	20
Notable Sites or Issues	20
Common Sources or Indicators of Degradation	25
Docks and Piers	26
Recent Spruce Creek Association Activity	26
3.2.2 Royal River	27
Description of Waterbody and Surrounding Area.....	27
Summary of Field Evaluations.....	28
Notable Sites or Issues	28
Common Sources or Indicators of Degradation	35
Recent Friends of the Royal River Activity	35
3.2.3 Lower Kennebec River Estuary	36
Description of Waterbody and Surrounding Area.....	36
Summary of Field Evaluations.....	37
Notable Sites or Issues	41
Common Sources or Indicators of Degradation	43
Fringing Salt Marshes	43
4.0 RECOMMENDATIONS	45
4.1 WATERSHED SPECIFIC RECOMMENDATIONS	45

TABLE OF CONTENTS (continued)

SECTION	PAGE
4.1.1 Recommendations for Spruce Creek.....	45
4.1.2 Recommendations for Royal River.....	45
4.1.3 Recommendations for Lower Kennebec River Estuary	46
4.2 GENERAL WATERSHED RECOMMENDATIONS	47
4.2.1 Inadequate Riparian Buffers.....	47
4.2.2 Invasive Species	47
4.2.3 Erosion, Undercutting and Root Exposure.....	48
4.2.4 Undersized or Elevated Culverts	48
4.2.5 Summary of Waterbody Issues and Opportunities.....	48
5.0 LITERATURE CITED.....	50

VOLUME II - APPENDICES

Appendix A. Field Data Form

Appendix B. List of all Sites and Restoration Site Summary Reports

Appendix C. Additional Figures

LIST OF TABLES

Table	Page
Table 1. Key Personnel	11
Table 2. Overall Results.....	17
Table 3. Number of Sources of Degradation Identified Along Each Waterbody.....	17
Table 4. Number of Sites with Field Indicators of Degraded Conditions, by Waterbody.....	18
Table 5. Spruce Creek Restoration Sites with a Degradation Score of Greater than 3.0.....	20
Table 6. Royal River Restoration Sites with a Degradation Score of Greater than 3.0.....	32
Table 7. Lower Kennebec River Estuary Restoration Sites with a Degradation Score of Greater than 3.0.....	41
Table 8. Summary of Restoration Inventory by Waterbody.....	46

LIST OF FIGURES

Figure	Page
Figure 1. Spruce Creek Study Area Location Map.....	2
Figure 2. Royal River Study Area Location Map.....	3
Figure 3. Kennebec River Estuary Study Area Location Map.....	4
Figure 4. Location of Docks in the Spruce Creek Study Area.....	6
Figure 5A. Restoration Sites Identified in the Spruce Creek Study Area.....	21
Figure 5B. Restoration Sites Identified in the Spruce Creek Study Area.....	22
Figure 5C. Restoration Sites Identified in the Spruce Creek Study Area.....	23
Figure 6A. Restoration Sites Identified in the Royal River Study Area.....	29
Figure 6B. Restoration Sites Identified in the Royal River Study Area.....	30
Figure 6C. Restoration Sites Identified in the Royal River Study Area.....	31
Figure 7A. Restoration Sites Identified in the Lower Kennebec River Estuary Study Area.....	38
Figure 7B. Restoration Sites Identified in the Lower Kennebec River Estuary Study Area.....	39
Figure 7C. Restoration Sites Identified in the Lower Kennebec River Estuary Study Area.....	40

1.0 INTRODUCTION

This Habitat Restoration Inventory (HRI) Summary Report summarizes efforts by the State Planning Office, Maine Coastal Program (MCP) to identify, evaluate, and document potential habitat and environmental restoration opportunities in, and directly adjacent to, specific areas along the coast in southern Maine. Northern Ecological Associates, Inc., was contracted by MCP to conduct the HRI, and summarize its findings in this Restoration Site Screening Report.

Specifically, this HRI concentrated on the following three water bodies and coastal areas, or general study areas:

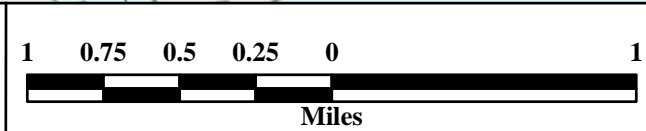
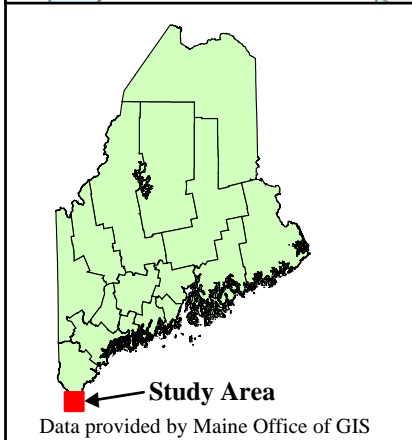
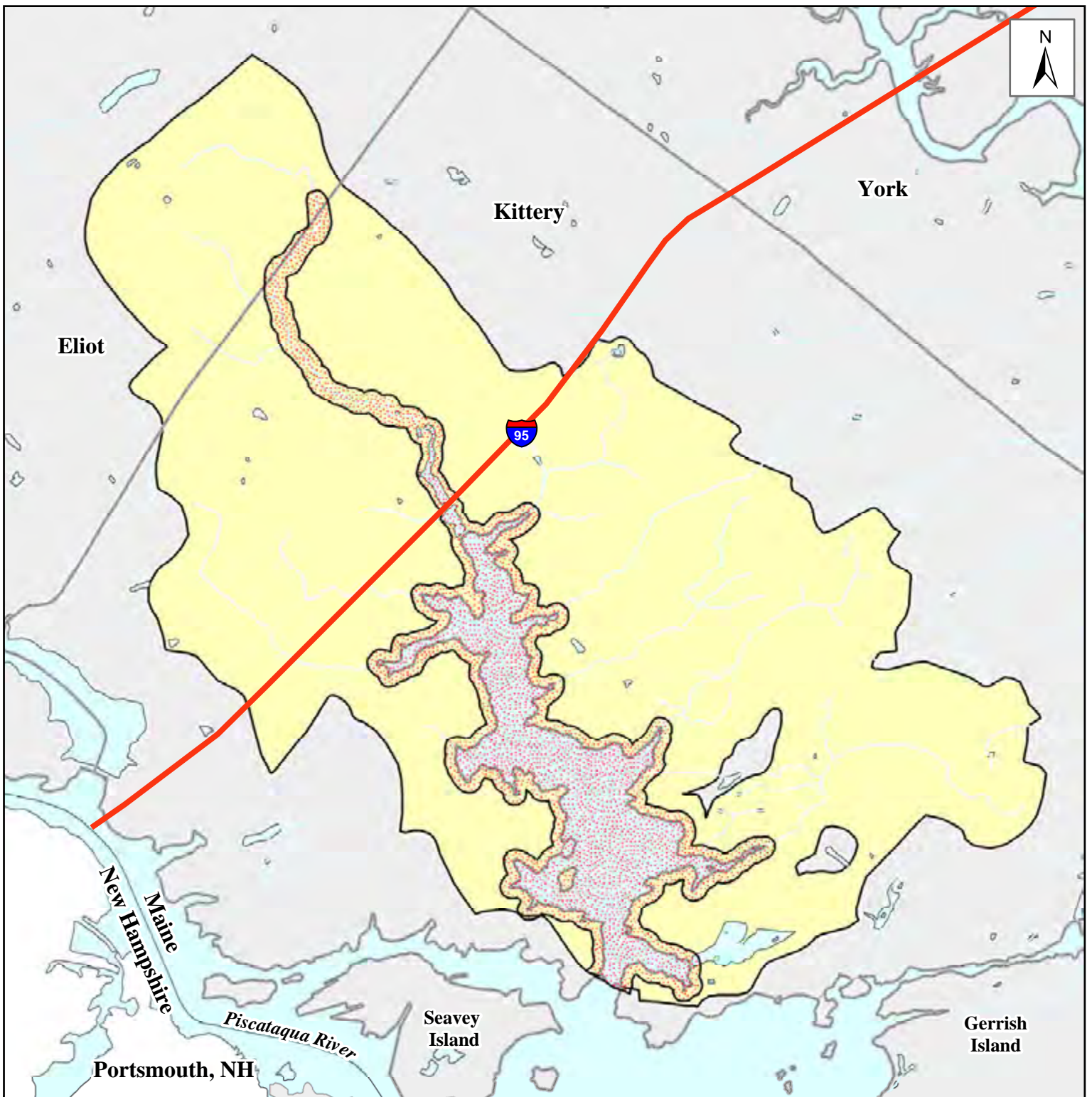
- Spruce Creek in the Town of Kittery, York County (Figure 1).
- Royal River in the towns of Yarmouth, North Yarmouth, Gray, and New Gloucester, in Cumberland County, and the Town of Auburn, Androscoggin County (Figure 2).
- Lower Kennebec River Estuary and various inlets, coves, and beach areas in the City of Bath, and the towns of Phippsburg, Arrowsic, Georgetown, West Bath, and Woolwich, Sagadahoc County (Figure 3).

This report presents the objectives of the HRI, the methods used in site identification and evaluation process, and provides a summary of the restoration sites identified during this survey. This report also includes the following: the Restoration Site Data Form (Volume II, Appendix A); a List of Restoration Sites and Restoration Site Summary Reports for all three study areas (Volume II, Appendix B); and additional figures of the location of restoration sites on digital-orthophotoquads (Volume II, Appendix C).

1.1 GOALS AND OBJECTIVES OF THE INVENTORY

The southern portion of the Maine coast is the most heavily developed region of the state. Coastal land has been subjected to extensive commercial and residential development, and major shoreline alterations have occurred associated with roads, installation of culverts, railroads, and other infrastructure. This development has resulted in a large variety of types and degrees of environmental and habitat degradation that have caused lower water quality, lower habitat value for the large variety of fish and wildlife found in the area, and have reduced the aesthetic quality of the coastal area.

The mission of the MCP is to “promote sustainable economic development, encourage environmental stewardship and education, conserve and manage marine fisheries, reduce coastal hazards, and improve public access” (MCP 2005). In accordance with this mission, the MCP identified a lack of information on environmentally degraded sites along the Maine coast and connecting rivers and creeks. To address this information gap, MCP initiated this inventory to identify restoration needs and opportunities in selected areas along the Maine coast. In selecting the three study areas for this project, MCP selected areas that had active local interest groups that would be interested in using the data collected to make improvements in their watershed.



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




-  Study Area
-  Spruce Creek Watershed
-  Ponds, Lakes, & Rivers
-  Town Boundary
-  Interstate

Figure 1. Spruce Creek Study Area Location.

Prepared For:



Prepared By:



Date:

08/05

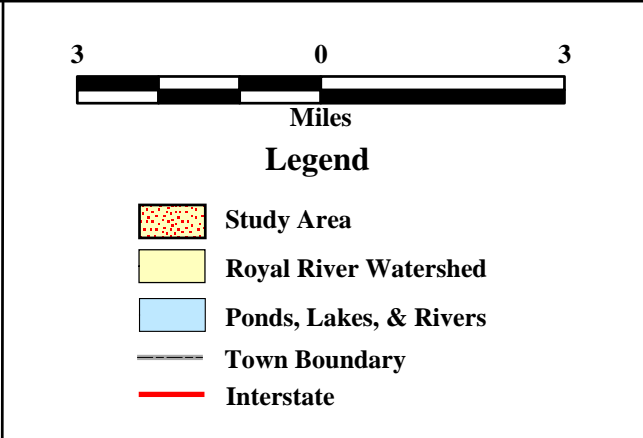
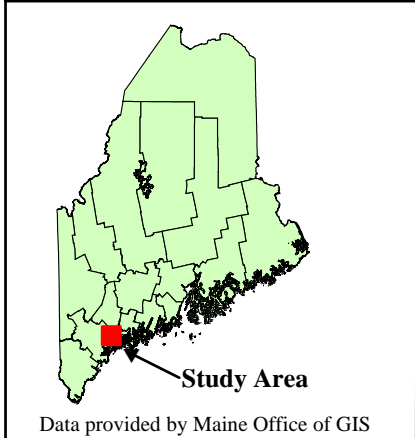
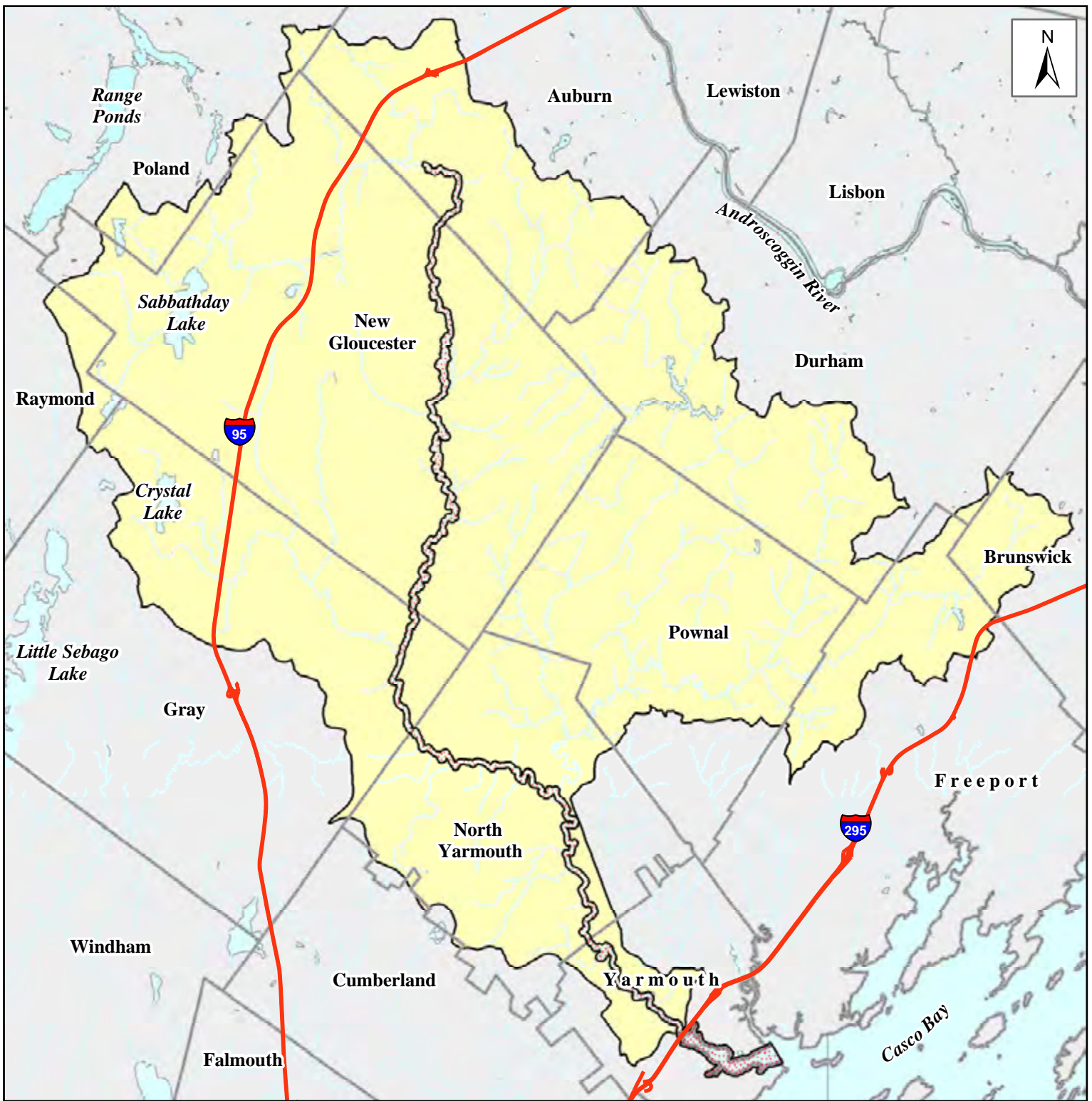




Figure 2. Royal River Study Area Location.

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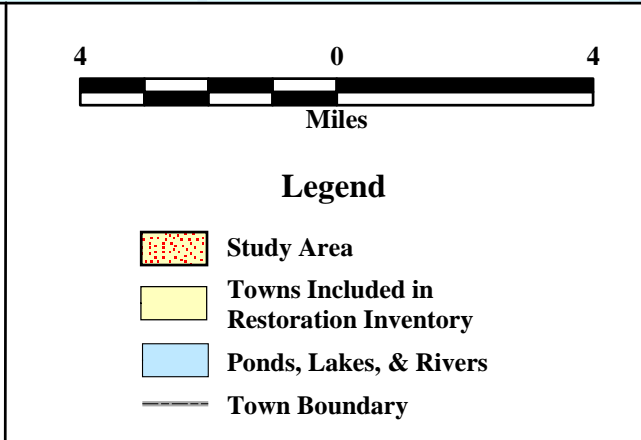
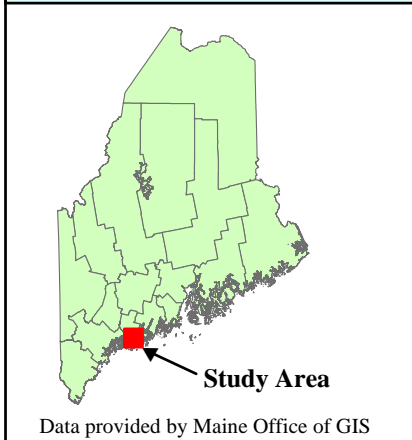




Figure 3. Kennebec River Estuary Study Area Location.

Prepared For: 

Prepared By:  **NEA**

Date: 12/05

The objectives of the HRI effort were to:

1. Identify potential restoration sites along the waterbody, and up to 250 feet of the adjacent riparian and buffer areas, within the Spruce Creek and Royal River watersheds. Also, identify potential restoration sites in the Sagadahoc County watershed, focusing on the lower Kennebec River and various inlets, coves, and beach areas that impact salt marsh and fringing salt marsh.
2. Screen and prioritize restoration sites.
3. Organize restoration information into a database of potential restoration sites.

In addition, several secondary objectives were identified. These included the following:

1. Inventory all docks and piers in the Spruce Creek system, regardless of restoration need (Figure 4).
2. Map fringing salt marshes along the Kennebec River and adjacent coves and inlets (See figures in Appendix C).

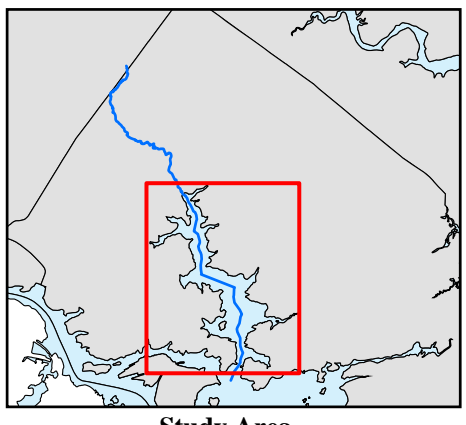
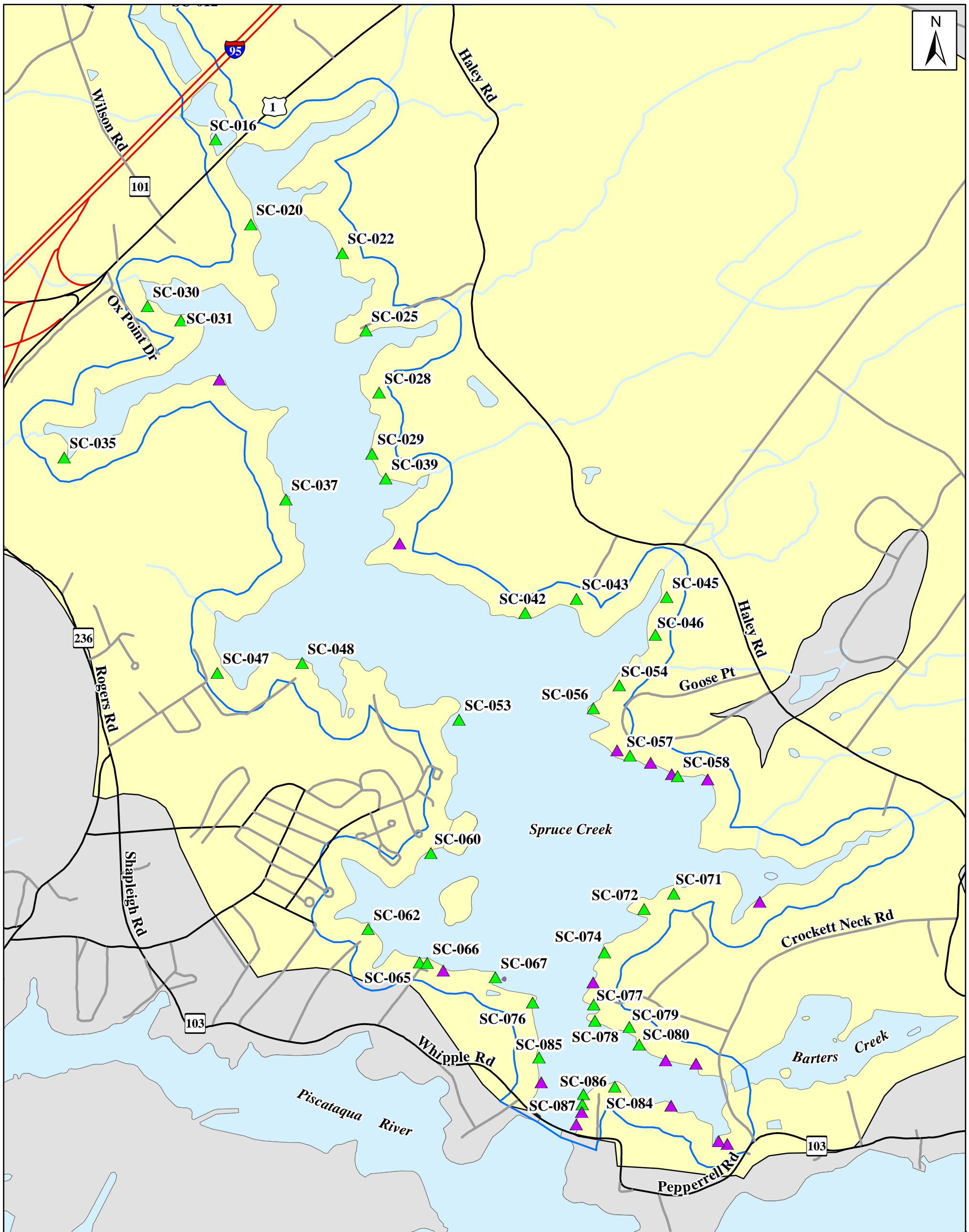
1.2 BACKGROUND INFORMATION ON THE WATERSHEDS

This section contains general background information on each of the three study areas for the HRI: Spruce Creek in York County, Royal River in Cumberland and Androscoggin counties, and the Kennebec River Estuary in Sagadahoc County, Maine (Figures 1, 2, and 3).

1.2.1 Spruce Creek

The Spruce Creek Watershed begins in the Town of Elliot, Maine, and encompasses an area that is approximately 6,109 acres (9.6 square miles). Approximately 10% of the watershed drains Elliot (611 acres) whereas the remaining 5,498 acres drain approximately 52% of the Town of Kittery, Maine. The headwaters of Spruce Creek consist of three unnamed tributaries that converge in Elliot. From there, the creek runs south and becomes tidally influenced after entering Kittery. The estuarine body of Spruce Creek is influenced by six fresh water streams (Wilson Creek, Fuller Brook, Hill Creek, Hutchins Creek, Crocker's Brook, and Barter's Creek) before it outlets into the Piscataqua River (WNERR 2003, SCA 2005).

Five different types of freshwater wetlands can be identified throughout the watershed, as well as two rare plant populations of swamp saxifrage (*Saxifraga pensylvanica*) and spicebush (*Lindera benzoin*) (MEDOC 1999). Spruce Creek Watershed also supports a vast diversity of wildlife including a variety of avian, mammalian, and fish species. An assessment of aerial photographs revealed that approximately 75% of the surrounding land is presently being used for commercial/residential purposes, 15% is dedicated to agricultural lands and undeveloped or cleared properties, and the remaining 10% is forested.



Study Area

Data provided by Maine Office of GIS



Legend

- ▲ Dock (Restoration Recommended)
- ▲ Dock (Restoration Not Recommended)
- Spruce Creek Watershed
- Ponds, Lakes, & Rivers
- 250 Foot Buffer
- Town Boundary
- Interstate
- Local Road
- Primary Road

Figure 4. Location of Docks in the Spruce Creek Study Area.

Prepared For:

Prepared By:

Date: 08/05

In 1927 a tidal dam structure was built at State Route 1 in Kittery, thereby reducing tidal flow upstream by approximately 22%. A reduction in tidal flow and an increase in development pressures over the next half century led to the inevitable decrease in overall health of the watershed as factors such as an increase in densities of fecal coliform bacteria and algae lowered the quality of the water. As a result, an effort to increase flow was undertaken and slight improvements were made by installing culverts, implementing dredging, and the removal of tidal restrictions (SCA 2005). The Maine Watershed Management Committee has included Spruce Creek as one of their non-point source priority watersheds as well as one of seven Maine State coastal watersheds most likely to be developed (MEDEP 2005a).

The health of the watershed has also been listed by the Maine DEP as a Class SB (middle-rank) for tidal sections, and Class B (middle rank) for non-tidal sections. For tidal sections, the minimum standard mandates dissolved oxygen levels of no less than 85% saturation for tidal sections, and no less than 75% saturation or 7 mg/L, whichever is greater, for non-tidal sections. Acceptable levels of coliform bacteria and other indicator species must also be maintained, as set forth by the United States Department of Food and Drug Administration (MEDEP 1999).

The Spruce Creek shoreline has been designated a scenic resource, and includes scenic vistas from many of the roads that cross the creek. Additionally, the shoreline has potential archaeological value, and has been designated as archaeologically sensitive (KCC 1999).

The Spruce Creek Association (SCA) is the local interest group concerned with the Spruce Creek watershed. SCA aims to provide “an organized framework to coordinate the assessment of the Spruce Creek watershed's conditions and to implement and monitor proven management practices that support environmental and economic stability for the communities of the Spruce Creek Watershed and adjacent areas” (SCA 2005). The goals of SCA include providing stewardship and coordinating efforts to promote the health of the Spruce Creek Watershed (SCA 2005). Additional information on recent efforts by SCA is included in Section 3.2.1.

1.2.2 Royal River

The Royal River is approximately 39 miles long and traverses through Cumberland and Androscoggin counties in southern Maine. Its headwaters begin in Sabbathday Lake, New Gloucester, and eventually it empties into Casco Bay in the Town of Yarmouth. The Royal River Watershed is joined by three tributaries (Collyer Brook, Chandler Brook, and the East Branch of Chandler Brook) all of which are responsible for draining the surrounding lands that encompass the towns of Auburn, Poland, Raymond, New Gloucester, Gray, Cumberland, Pownal, Durham, Brunswick, Freeport, North Yarmouth, and Yarmouth. The watershed covers an area that is approximately 91,451 acres (142 square miles) in area (FRR 2001).

The Royal River Watershed is largely made up of mixed coniferous-hardwood forest (69%), open areas such as agricultural fields and grasslands (17%), open water (1%), wetlands (8%), and various grades of developed land (5%) (FRR 2001). Wildlife is plentiful throughout the watershed. The northern and western portions of the river support native brown (*Salmo trutta*) and brook trout (*Salvelinus fontinalis*) and marine game fish can be found throughout the southern reaches. Bald eagles (*Haliaeetus leucocephalus*) and spotted turtles (*Clemmys guttata*)

are Federally threatened and state threatened species, respectively, that reside in the watershed (USEPA 2000).

The Royal River is generally classified as a Class B river, making it suitable for recreation, power generation, and for a treated drinking water supply source (although it is not currently being used as a drinking water source). Water quality sampling conducted by the Friends of the Royal River from 1993 to 1999 generally showed minimal change, with the exception of sampling sites in the East Chandler Brook tributary. Non-point sources of pollution is believed to have contributed to some sampling stations failing to meet State dissolved oxygen and bacteria levels (FRR 2005a). Maine Department of Environmental Protection has listed the Royal River Estuary as one of their non-point source priority watersheds.

According to the USGS (2005), the average annual streamflow rate between 1950 and 2003 was 272 cubic feet per second (ft³/s) with the lowest flow (118 ft³/s) recorded in 1965 and the highest velocity (454 ft³/s) recorded in 1983. Because of its streamflow consistency, in the early 1800s the river provided hydroelectric power to 14 mills in Yarmouth and stimulated economic growth during the 19th century (FRR 2005a). The Sparhawk Mill in Yarmouth still produces electric power from the river. Although the majority of the watershed remains undeveloped, the potential for commercial/residential growth exists. Population projections based on Maine State Planning Office and Greater Portland Council of Governments data suggest that the Royal River communities will experience an 11% increase in population from 2000 to 2010 (FRR 2005a).

The Royal River has many scenic areas and views that can be enjoyed by the public. There also are abundant opportunities for the public to access the river for recreation purposes, including public rights-of-way, conservation areas along the banks of the river, public boat launches, and parks (FRR 2005a).

The Friends of the Royal River (FRR) is the local interest group concerned with the Royal River. FRR is “a not-for-profit organization that works to conserve the natural, historic, scenic and recreational values of the Royal River Watershed” (FRR 2005b). FRR’s goals include promoting public participation in conservation, monitoring and protecting water quality and wildlife habitat, and preserving the overall integrity of the Royal River Watershed (FRR 2005b).

1.2.3 Lower Kennebec River Estuary

The Kennebec River is approximately 230 miles long, originating from the Moose River and Moosehead Lake, north of Skowhegan, Maine (Maine Rivers 2005). The Kennebec River joins five rivers in Merrymeeting Bay, which consists of an inland, freshwater tidal delta, before continuing south to the Gulf of Maine (TNC 2005). This project focuses on this lower section of the Kennebec River: the Lower Kennebec River Estuary, in Sagadahoc County.

The Lower Kennebec River Estuary, including Merrymeeting Bay, is the largest tidal estuary on the east coast north of Chesapeake Bay (MSPO 2005). It is one of the State of Maine’s five Focus Areas within the Atlantic Coast Joint Venture of the North American Waterfowl Management Plan (USFWS 2005). The Lower Kennebec River Estuary includes extensive fresh water and saltwater tidal marshes and mudflats, including over 20% of Maine’s tidal marshes.

These areas offer valuable feeding, nesting, and resting habitat for a wide variety of migratory waterfowl, shorebirds, and wading birds. The Lower Kennebec River also provides habitat for several Federally listed endangered or threatened species, include bald eagle, roseate tern (*Sterna dougallii*), piping plover (*Charadrius melodus*), and shortnose sturgeon (*Acipenser brevirostrum*), and for all 10 of Maine's migratory fish species, include Atlantic salmon, rainbow smelt, alewives, and shad (TNC 2005).

Through a collaborative effort of state agency, non-profit, and local interest groups, the Maine Wetlands Protection Coalition (Coalition) has leveraged more than \$9 million to protect more than 6,300 acres of wetlands and associated upland buffers along the Lower Kennebec River and Merrymeeting Bay. The Coalition has used unique partnering opportunities, focusing on the collective strengths of each Coalition member. Management of protected lands is shared by private landowners, non-governmental organizations, and/or the Maine Department of Inland Fisheries and Wildlife. The Coalition continues to work to find funds for additional habitat protection projects in the area (USFWS 2005).

The Lower Kennebec Regional Land Trust (LKRLT) is a local interest group that is concerned with the Lower Kennebec River Estuary. LKRLT is "a membership supported, non-profit conservation land trust dedicated to preserving, for public benefit, the open space and natural environment of the lower Kennebec River watershed." LKRLT is "committed to identifying and protecting lands in the region having ecological, agricultural, scenic or historic significance and providing access to owned properties for traditional non-motorized low impact recreation." LKRLT has worked in partnership with the Coalition to protect thousands of acres of valuable wetland and upland habitat in the watershed (LKRLT 2005).

2.0 METHODOLOGY

The MCP Habitat Inventory was designed to document specific locations of habitat degradation and potential threats to the environmental quality of the main waterbodies, estuaries, and associated coastal areas of Spruce Creek, Royal River, and the Kennebec River Estuary, and to facilitate restoration of those sites. To accomplish this, the effort was divided into three tasks: 1) review background information to identify potential sites; 2) conduct field data collection and evaluation of potential sites; and, 3) organize information from potential sites in a database for dissemination to interested parties.

Potential sites were defined as those that met the following two criteria: 1) existing conditions that were degraded enough to warrant restoration effort; and, 2) they had reasonable potential for restoration. Examples of typical restoration sites that were documented include the following: sites where forested buffers were replaced by mowed lawns, agricultural areas, or impervious surfaces; unstable shoreline banks; impaired shoreline vegetation; potential sources of nutrients or pollution; docks and piers; dams; and, degraded in-stream habitat. All sites were adjacent to the waterbodies of interest, or along the primary tributaries.

2.1 PRELIMINARY IDENTIFICATION OF POTENTIAL SITES

A review of existing background information was conducted to lay the groundwork for a focused field data collection effort. Sources included *Return the Tides* (Bonebakker et al. 1999); USFWS habitat maps; Maine Office of GIS natural resource data; Maine Department of Environmental Protection (MEDEP) wetland and water quality data (MEDEP 1999 and 2005b); ongoing research by Dr. Pamela Morgan, University of New England, and Wells National Estuarine Research Reserve in Casco Bay's fringing marshes (Morgan et al. 2005); and, high resolution orthographic photographs (MEGIS 2001). In addition, knowledgeable local interest groups such as SCA and FRR were contacted for information on potential restoration sites.

2.2 FIELD DATA COLLECTION AND SITE EVALUATION

Due to the limited number of specific potential sites that were identified during the background data review process, a full on-site evaluation of all waterbodies in the inventory area was warranted. The overall goal of site evaluations was to identify sites, characterize the existing condition at each potential site, and to identify restoration opportunity, including an estimate of cost, challenges to restoration, and likely restoration options. One specific objective of the field evaluations was to collect enough information regarding specific site characteristics to allow for the evaluation and comparison of sites based on the level and types of degradation.

A two-person team of scientists from Northern Ecological Associates, Inc., conducted on-site field evaluations of all waterbodies, and all surveys were completed between June and October 2005. Approximately 154 miles of river banks and estuarine waters were evaluated, which included 19 miles of river banks and shoreline of Spruce Creek (Figure 1), 63 miles of river banks along the Royal River (Figure 2), and 72 miles of shoreline and tributaries in the lower Kennebec River estuary (Figure 3). Sampling events were scheduled to capture normal average waterbody conditions by avoiding sampling during periods of drought or excessive rainfall. Teams had expertise in identifying habitat restoration opportunities in anadromous fish habitat,

riverine restoration, coastal wetland restoration, and tidal/intertidal habitats and all participants were experienced in the ecology of freshwater and coastal systems, restoration planning, data collection, GPS data collection, and QA/QC procedures. Table 1 provides a list of key personnel who completed significant portions of HRI sampling and data analysis.

Table 1. Key Personnel

Name	Title
David Santillo, Ph.D.	Principal Ecologist, Professional Wetland Scientist
Sarah Watts	Senior Environmental Biologist
Janelle Lavallee	GIS Manager
Dan Soucie	GIS Associate

Field evaluations included a qualitative visual assessment of upland, wetland, and in-stream habitats, identification of specific restoration options for each site, photographic documentation of site conditions, and GPS data collection to record site location. GPS coordinates were taken at approximately the center of the linear distance of each site. In cases where a specific feature within the site needed to be documented, a GPS coordinate was recorded at the location of the feature. Surveys were conducted on foot or using various watercraft to evaluate the conditions along each segment of the waterbody and the perimeter of the estuary.

Field team members evaluated characteristics within the waterbody, the shoreline bank, and up to 250 feet of the adjacent riparian and buffer areas to identify areas in need of restoration. Surveys were extended beyond the 250-foot area when warranted.

2.3 DATA FORM

To standardize the evaluation process, a standardized field data collection form was developed. The form contained multiple components, including:

- Component 1: Site Identification, Overall Restoration Feasibility, and General Description of Area Covered;
- Component 2: Sources of Degradation;
- Component 3: Indicators of Degradation and Degradation Score,
- Component 4: Additional Site Information; and,
- Component 5: Preliminary Cost Estimates

Each component is discussed in detail below and a copy of the data form is provided in Volume II, Appendix A. This information was used to assist in the evaluation of restoration need and potential at each site.

Component 1: Site Identification, Overall Restoration Feasibility, and General Description of Areas Covered

The *Site Identification, Overall Restoration Feasibility, and General Description* portions of the data form were developed to facilitate rapid assessment and documentation of potential restoration sites. The primary purpose of this section was to document the location and characteristics of the site, identify the overall restoration feasibility of the site and likelihood for success, and to give a general description of the area covered. Information in this section of the form includes a site-ID, survey date, location (i.e., state, county, town), latitude/longitude, length of evaluation area, and a description of the restoration problem, surrounding habitats and land/uses, and potential challenges to restoration. Teams documented the physical characteristics of the site with photographs and collected a GPS coordinate at approximately the center of each potential site. The length of evaluation area was recorded and represents the linear distance (in feet) of shoreline or waterbody that was in need of restoration.

Component 2: Sources (or causes) of Degradation

The *Source(s) of Degradation* section of the data form was used to document the sources, or causes, of degradation observed at each site. The field team documented any of the following 13 general sources of degradation that were observed by circling the source on the data form:

- 1) Rip-rap or other artificial hard structure;
- 2) Fill/debris/trash;
- 3) Drainage issue;
- 4) All-terrain Vehicle (ATV) or off-road vehicle damage/farm equipment;
- 5) Culvert issue;
- 6) Invasive plant species;
- 7) Impervious surface;
- 8) Dams or other major obstructions;
- 9) Land clearing (differs from other categories in that the cleared areas were not permanently maintained in accordance with right-of-way management requirements);
- 10) Maintained right-of-way (power or gas utilities, roads, railroads where vegetation is permanently maintained in low herb/shrub cover as part of utility/infrastructure management requirements);
- 11) Unstable bank;
- 12) Land use activities with high potential to input nutrients or pollutants into the waterbody; and,
- 13) Dock/pier/jetty that extends out into channel.

Component 3: Indicators of Degradation and Degradation Score

The *Indicators of Degradation* portion of the data form was used to document the types and severity of degradation observed on each site. These indicators of degradation refer to the onsite degraded environmental conditions that have resulted from the source(s) of degradation identified on the site. For example, sites that may have (#12) Unstable Banks (above) as a source of degradation may have field indicators of that degradation that included (#11) Inadequate Buffer and (#4) Low Bank Stability/ Erosion (below).

The field team documented the presence of any of the 14 indicators by assigning a degradation score ranging from 0.1 to 1.0 that represented the degree of degradation for each indicator observed. A score of 1.0 represented the most degraded conditions and a value of 0.1 represented the least degraded. Scores for all indicators of degradation were combined to get a final degradation score. The maximum score any site could receive was 14.0, which could occur if all indicators of degradation were observed and each indicator had a degradation score of 1.0 (indicating severely degraded condition). Indicators of degradation include the following:

- 1) Low water quality/clarity;
- 2) Impediment to natural water flow;
- 3) Obstruction to fish passage;
- 4) Low bank stability/erosion;
- 5) Evidence of extreme flooding;
- 6) Concentrated high velocity runoff into waterbody;
- 7) Lack of, or impaired, riparian vegetation;
- 8) Unnatural channel;
- 9) Unnatural sediment accumulation;
- 10) Impaired aesthetic quality;
- 11) Inadequate buffer;
- 12) Close proximity to a nutrient/pollution source;
- 13) Wetland loss; and,
- 14) Direct disturbance to substrate.

Component 4: Additional Site Information

The *Additional Site Information* section of the data form was used to document additional details regarding the environmental conditions of some sites with potential for restoration. Similar to the *Site Identification, Overall Restoration Feasibility, and General Description of Areas Covered* component, information from this part of the form prompts the evaluator to include additional detail on the severity of degradation at a site. The *Additional Site Information* component provides additional details within seven broad environmental parameters (i.e., percent bare ground in riparian zone, percent of cover of invasive/non-native plant species within 50 feet of waterbody, presence of significant wildlife attractors, number of layers/structure in buffer, steepness of banks, impervious surfaces within 250 feet of channel, and riffle embeddedness/degree of siltation). The *Additional Site Information* output essentially provides additional detail regarding the ecological conditions of a site. In some cases, this information was not filled out if the reviewer did not feel they could adequately assess these conditions.

Component 5: Preliminary Cost Estimates

The field team evaluated each site to determine the effort and costs likely to be associated with restoration of the site relative to other sites. The *Preliminary Cost Estimates* section of the form provides a list of potential factors that may contribute to restoration cost. Team members checked all potential factors applicable to the site, added factors not on the list when observed, and assigned a cost rank based on the following broad categories: Low = < \$5,000, Low-Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate-High = >

\$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, and Very High = > \$100,000. This cost rank appears in the database and is one of the search options. The cost rank is very conceptual and is intended to provide an additional level of information to assist users in screening, evaluating, and selecting potential restoration sites relative to the other sites identified in this survey. More information would be necessary to fully and accurately evaluate restoration costs at each site.

2.4 DISSEMINATION OF INFORMATION

2.4.1 Habitat Restoration Inventory Database

An interactive database was created for the HRI in Microsoft Access 2000 (Microsoft Inc., Redmond, WA) data management software to facilitate data entry, storage, evaluation, and report generation for the study. The database was designed to receive and store all raw data in a limited number of master tables. A database Graphic User Interface (GUI), or data entry screen was created to facilitate entry of raw field data, allow the user to query the data in a variety of ways, and produce summary reports for each potential restoration site. The databases included password access measures to limit database access by un-authorized personnel.

The database offers a user-friendly format to query the database based on criteria such as town, waterbody, source(s) of degradation identified on site, cost, size of restoration area, restoration type, restoration habitat, and restoration project status. The results of queries are presented in table format, with links to the Restoration Site Summary Report for each site identified in that query. Examples of summary reports are available in Volume II, Appendix B. The summary report provides detailed information regarding the environmental degradation observed on site, the severity of degradation, recommendations for restoration, estimated restoration cost, notable challenges to restoration, as well as information on land ownership, restoration project contacts, site location, surrounding land uses, restoration project schedule, and potential funding sources. The summary report also includes a photograph of the site and the location of the site on at least 1-foot resolution digital orthoquads/aerial photography.

2.4.2 GIS Data

GIS technology was used to identify potential restoration sites prior to fieldwork. Base data layers, including digital orthoquads (MEGIS 2001), MEDOT roads, hydrography, watershed boundaries, and town and county boundaries were obtained from the Maine Office of GIS. Digital orthoquads included 0.5-foot resolution aerial photography for Cumberland County and part of Sagadahoc County, and 1-foot resolution aerial photography for York County and the remainder of Sagadahoc County. All base layers were overlaid on the aerial photos and analyzed to select potential restoration sites using ArcGIS 8.3. The base layers also were used to create maps for field data collection.

GPS coordinates were collected for potential restoration sites identified during the course of fieldwork using a Magellan Meridian Platinum handheld, WAAS enabled, GPS unit. Coordinates were collected in Geographic coordinate system, using WGS 84 datum, in decimal degrees, with 3-meter accuracy. Latitude and Longitude coordinates were collected in the center of each site and recorded on field data collection sheets. For sites that were easily identifiable on

the aerial photography, data points were digitized on MEGIS digital orthoquads, and X, Y coordinates were subsequently added to the shapefile.

Field data were processed in the office to aid in analysis, database development, and report preparation. GPS coordinates collected for potential restoration sites were compiled and entered into a spreadsheet. Coordinates were converted to a shapefile using ArcGIS 8.3 and the shapefile was overlaid on aerial photos and other base layers. Coordinates were also entered into the HRI database. These data were also used to create all report figures, presentation images, and site images for the database.

3.0 RESULTS OF HABITAT RESTORATION INVENTORY

The following section provides a summary of the results of the HRI. All results presented here were based entirely on an evaluation of the information from data forms that contained the following five components: 1) *Site Identification, Overall Restoration Feasibility, and General Description of Area Covered*, 2) *Sources of Degradation*, 3) *Indicators of Degradation and Degradation Score*, 4) *Additional Site Information*, and 5) *Preliminary Cost Estimates*.

3.1 OVERALL RESULTS

Three hundred thirty (330) potential restoration sites were identified within the three study areas. Each of the 13 sources of degradation listed in Section 2.3 was identified. The number included 90 sites along Spruce Creek (Figures 5a, b and c), 107 sites in the Royal River study area (Figures 6a, b and c), and 133 sites in the lower Kennebec River Estuary (Figures 7a, b, and c) (Table 2). A list of all sites and site summary reports for each site are provided in Volume II, Appendix B.

Spruce Creek had the highest density of degraded sites observed with an average of 4.8 sites per mile of shoreline. The Royal River had 1.7 sites per mile of shoreline, and the Kennebec had 1.8 sites per mile of shoreline surveyed. The density of degraded sites per mile is a general characterization of how degraded the waterbodies were. However, density of sites per mile is somewhat misleading because one site may cover several thousand feet of the waterbody. In terms of actual linear distance of shoreline in need of restoration, Spruce Creek had the most area with degraded habitat, with 19.7% of shoreline in need of some form of habitat restoration, followed by Kennebec River (13.4%), and finally Royal River (12.4%) (Table 2).

Seven hundred-eleven (711) individual examples of sources of degradation were observed in the three study areas (Table 3), with 205 in Spruce Creek, 255 in the Royal River, and 251 in the Lower Kennebec River Estuary. Of the 14 potential indicators of degradation listed in Section 2.3, 13 were observed in the field (Table 4). Sites identified had one or more field indicators of degradation, resulting in a total of 900 observances of degraded conditions among the three watersheds. Of these, 257 were observed in Spruce Creek, 311 in the Royal River, and 332 in the Lower Kennebec River Estuary (Table 4).

Lack of adequate vegetated buffer of well-vegetated shrubs and trees was the most commonly encountered indicator of degradation with 247 occurrences throughout the three study areas (Table 4). Widening buffers to 250 feet where possible, and enhancing existing buffers to improve vegetative layers and density of cover would improve the environmental conditions at 75% of the 330 potential restoration sites.

Table 2. Overall Results by Waterbody.

	Spruce Creek	Royal River	Lower Kennebec River Estuary
Number of Sites Identified	90	107	133
Miles of Shoreline Surveyed	18.7	62.8	72
Density of Sites (sites/mile of shoreline surveyed)	4.8	1.7	1.8
Approximate Linear Feet of Degraded Conditions	19,418	40,953	50,855
Percent of Shoreline in Need of Restoration	19.7%	12.4%	13.4%

Table 3. Number of Sources of Degradation Identified Along Each Waterbody.

Source of Degradation	Spruce Creek	Royal River	Lower Kennebec River Estuary	TOTAL
Land clearing (not right-of-way)	48	37	96	181
Land use activity as a potential source of nutrients/pollution	35	39	39	113
Unstable bank	6	46	4	56
Dock/pier/jetty that extends into channel	34	4	35	73
Rip-rap (or other artificial hard structure)	17	31	13	61
Maintained right-of-way clearings	11	34	12	57
Fill/debris/trash	23	8	8	39
Impervious surface	9	16	17	42
Invasive plant species	8	24	7	39
Culvert issue	5	10	13	28
Dam/obstruction	4	2	5	11
ATV/off-road vehicle damage/farm equipment	2	1	0	3
Drainage issue	3	3	2	8
TOTAL	205	255	251	711

Table 4. Number of Sites with Field Indicators of Degraded Conditions, by Waterbody.

Degraded Condition	Spruce Creek	Royal River	Lower Kennebec River Estuary	TOTAL
Buffer of well-vegetated shrubs and/or trees < 250 ft. wide (adjacent to waterbody and/or associated wetland)	68	68	111	247
Adjacent to sources of potential high nutrient input or pollution (i.e., golf courses, agricultural areas, housing developments, large lawns) AND has a small buffer (< 250 ft)	58	50	85	193
Apparent lack of or impaired native vegetation along shoreline and/or bank (vegetation in freshwater and tidal systems)	48	50	34	132
Impaired aesthetic quality	44	27	36	107
Low bank stability/erosion (evidence of bank failure, fallen trees, undercutting, no overhanging vegetation on bank tops)	7	53	3	63
Impediment to natural water flow (constrictions, restrictions, redirection of flow)	8	18	18	44
Unnatural channel (downcutting, widening, straightening, or evidence of manmade structures in or along channel that alter channel or reduce erosion of banks)	4	26	11	41
Direct disturbance to in-stream substrate	6	0	12	18
Wetland loss (filled or hydrologic connection impaired)	5	0	11	16
Low water quality/clarity (turbid, muddy, surface sheen, algal growth, smell of pollutants)	5	7	1	13
Obstruction to fish passage (seasonal water withdrawal, dams, culverts that obstruct passage, diversions)	2	2	8	12
Evidence of unnatural sediment build-up/accumulation	1	7	1	9
Areas of concentrated high velocity runoff into waterbody (i.e., paved gullies, steep swales)	1	3	1	5
Evidence of repeated flooding/severe flooding (watermarks, sediment deposits, flood damage)	0	0	0	0
TOTAL	257	311	332	900

3.2 RESULTS FOR INDIVIDUAL WATERBODIES

This section contains specific information on each of the waterbodies surveyed for this study. A general characterization of the physical characteristics and ecological setting of each waterbody and a summary of the restoration issues specific to each waterbody are provided.

3.2.1 Spruce Creek

Description of Waterbody and Surrounding Area

Surveys were conducted along approximately 9.6 miles of Spruce Creek. The survey covered approximately 98,736 linear feet (18.7 miles) of shoreline along both banks of the creek and the perimeter of the estuary (Figure 1). The survey area extends from the headwaters of Spruce Creek southeast to the Route 103 Bridge in the Town of Kittery. The nature of Spruce Creek varies significantly along its course. The upper portion of the creek, starting in the Town of Elliot and extending into the Town of Kittery, is mostly a marshy and loosely defined channel that is blocked in areas by cattail and other freshwater wetland vegetation; bottom substrate in this section is silt and muck.

The middle stretch from approximately 0.25 mile south of the Eliot-Kittery town line to around Route 101 is a meandering and well-defined stream that averages about 15 to 20 feet wide. This section alternates between slow moving portions that are greater than 4 feet deep with silty bottom substrate and with bordering wetlands, and swift moving and shallow (approximately 1 foot depth) sections with rock/cobble bottoms and upland and relatively steep banks. In-stream habitat is mostly pools and runs, with some riffles and small rapids present in rocky sections.

Tidal influence begins approximately at Route 101, where Spruce Creek widens to an average of about 35 feet wide, and the meanders of the creek lengthen a bit. This section is bordered by a 200-ft wide fringe salt marsh. The creek widens significantly at Picott Road and is extensively influenced by the culvert and water control structure at Route 1 in Kittery (See *Recent Spruce Creek Association Activity* for information on removal of the water control structure). Finally, the section below Route 1 is fully tidal.

The drop in stream elevation from the start of the survey area to Route 1 is approximately 20 feet. The creek is essentially at sea level below Route 1. Water is generally clear throughout the freshwater portion of Spruce Creek, with tannins from decaying leaves giving the water a brownish color. A significant percentage of the entire course of Spruce Creek has banks that consist of fringe wetland within a wetland floodplain that ranges from 50 to 300 feet wide. Evidence of natural stream course migration within this floodplain is evident in scattered areas, with natural areas of bank erosion.

Overall, approximately 75% of Spruce Creek is surrounded by low to moderate density residential and commercial development. Approximately 15% is surrounded by agricultural or other cleared land, and 10% is forested. Just about all of the bordering agricultural land is located north of Picott Road. The majority of the adjacent land use downstream of Route 1 is for residential and commercial use.

Significant direct alterations to the channel include bridge abutments/culverts associated with six primary/secondary road crossings. These features contribute to some alteration of velocity and flow of water in Spruce Creek from its natural condition, impair the natural shoreline bank, and roads associated with these areas promote runoff of pollutants from the road surface into the waterbody.

Summary of Field Evaluations

Ninety (90) potential restoration sites were identified along Spruce Creek (Figure 5 A, B and C). A list of all sites and site summary reports for each site are provided in Volume II, Appendix B. All 13 sources of degradation were found along Spruce Creek and 205 individual examples of these were observed (Table 3). Of the field indicators of degraded conditions, all but one (i.e., evidence of repeated flooding/severe flooding) was present in Spruce Creek.

The most common source of environmental degradation was land clearing, which was observed at 48 sites (53%) (Table 3). The most common indicator of degradation was the lack of adequate buffer (i.e., forested buffer \geq 250 feet), which was noted at 68 (76%) of all restoration sites on Spruce Creek (Table 4). Usually one or more additional indicators of degradation was also present within sites identified for buffer restoration, such as sites adjacent to sources of potential high nutrient input or pollution, or apparent lack of or impaired native vegetation along shoreline and/or bank.

Approximately 19,418 linear feet of habitat (19.7% of the linear distance of the shoreline) along Spruce Creek was in some state of environmental degradation.

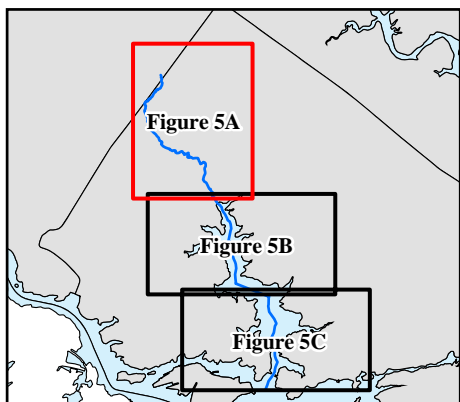
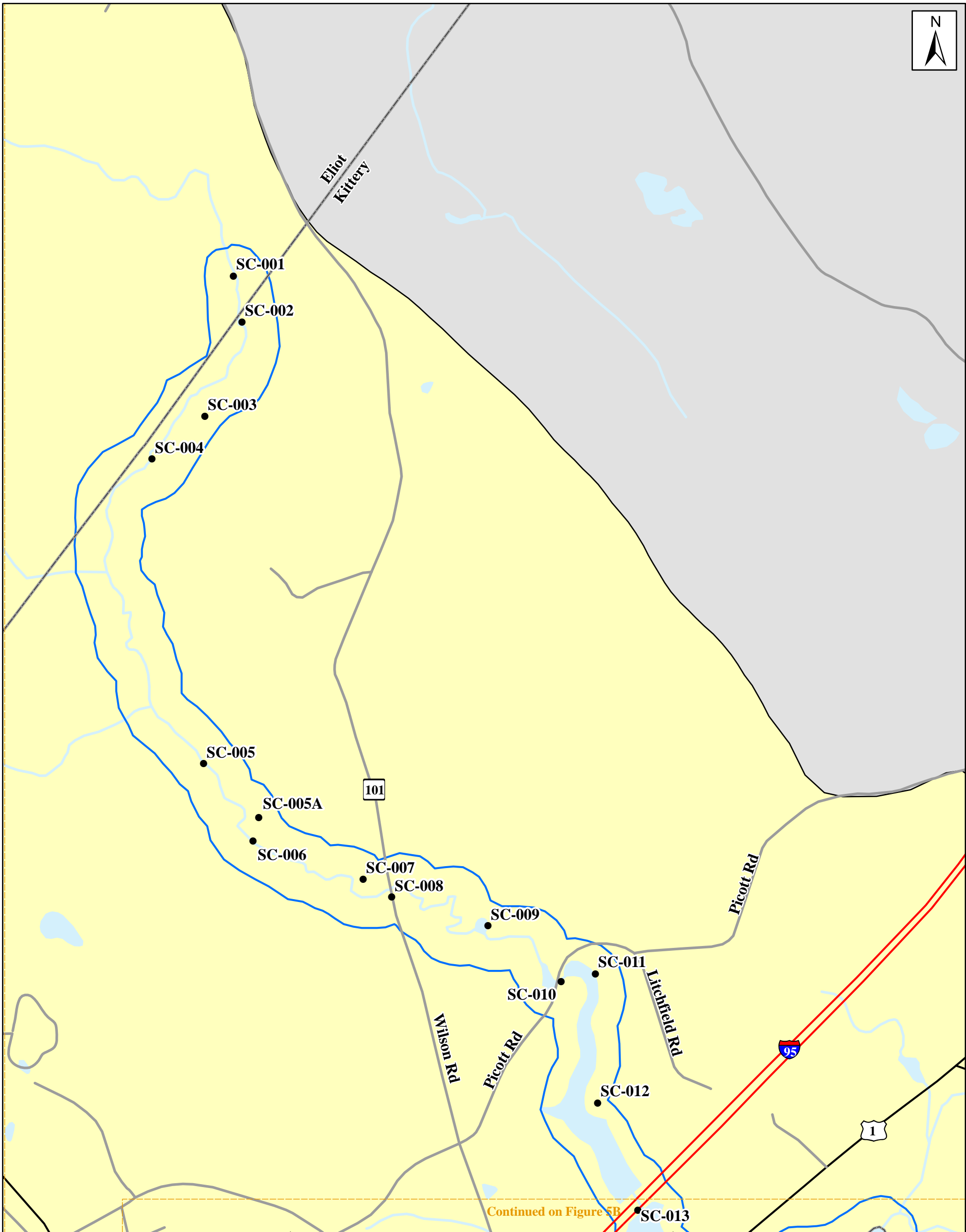
Notable Sites or Issues

Degradation scores of restoration sites along Spruce Creek (i.e., degree of environmental degradation at each site) ranged from 0.20 to 4.1 and only five sites (6% of all sites) had degradations scores greater than 3.0 (Table 5). Based on the range of conditions observed in the study area, moderately degraded sites were considered to be those sites with a degradation score of greater than 3.0.

Table 5. Spruce Creek Restoration Sites with a Degradation Score of Greater than 3.0.

Site ID	Size (linear feet)	# of Indicators of Degradation	Degradation Score¹	Primary Issues
SC-001	25	6	3.10	Impacts associated with agricultural area and farm road through stream.
SC-004	30	7	3.75	Impacts associated with agricultural area and farm road through stream.
SC-010	100	7	3.25	Impacts associated with road crossing.
SC-017	90	7	4.10	Impacts associated with road crossing.
SC-039A	75	6	3.15	Impacts associated with a dam/impoundment.

¹ Higher score indicates a higher level of habitat degradation.



Figures

Data provided by Maine Office of GIS

500 250 0 500 1,000



Feet

Legend










- | | | | |
|-------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------|---------------|
|  | Spruce Creek Watershed |  | Town Boundary |
|  | Ponds, Lakes, & Rivers |  | Interstate |
|  | 250 Foot Buffer |  | Local Road |
|  | Habitat Restoration Site |  | Primary Road |
| | |  | Railroad |

Figure 5A. Restoration Sites Identified in the Spruce Creek Study Area.

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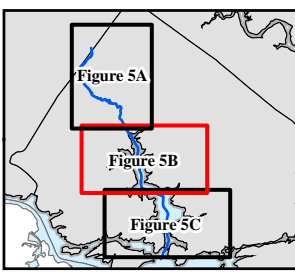
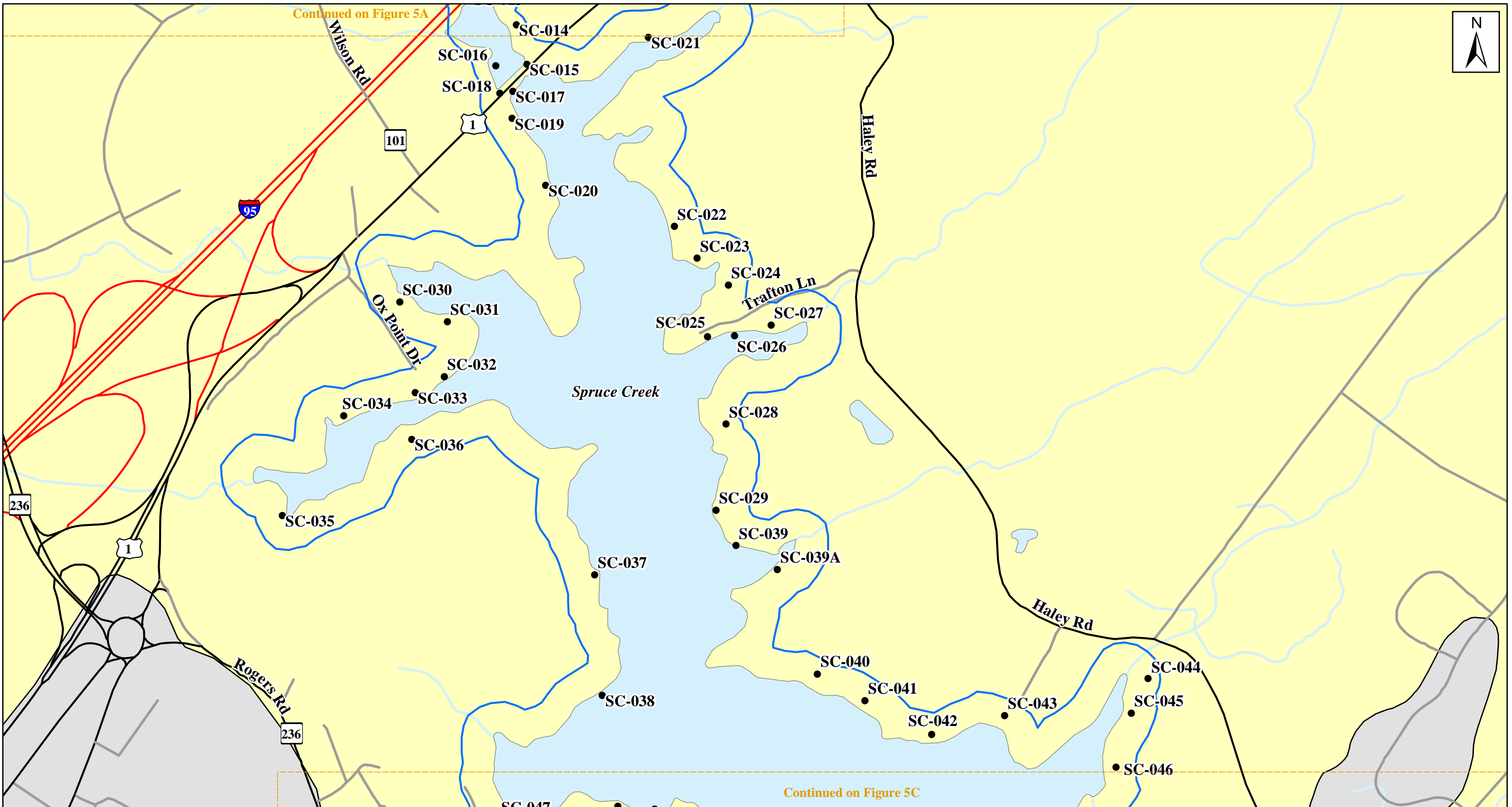


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Date:

08/05



Figures
Data provided by Maine Office of GIS



- Legend**
- Spruce Creek Watershed
 - Ponds, Lakes, & Rivers
 - 250 Foot Buffer
 - Habitat Restoration Site
 - Interstate
 - Local Road
 - Primary Road

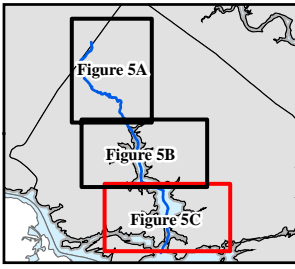
Figure 5B. Restoration Sites Identified in the Spruce Creek Study Area.

Prepared For:

Prepared By: Date: 08/05



Continued on Figure 5B



Figures
Data provided by Maine Office of GIS



Legend

- Spruce Creek Watershed
- Ponds, Lakes, & Rivers
- 250 Foot Buffer
- Habitat Restoration Site
- Interstate
- Local Road
- Primary Road

Figure 5C. Restoration Sites Identified in the Spruce Creek Study Area.

Prepared For:

Prepared By: Date: 08/05

Each of the 90 sites identified during this survey is deserving of further evaluation to determine suitability for restoration. Although determining site suitability for restoration is subjective and greatly dependant upon the budgets and objectives of the organizations interested in restoration, the following site/restoration issues observed along Spruce Creek are worth noting.

Sites SC-001 and SC-004 (Impacts associated with an agricultural area and farm road through stream)

These sites include agricultural areas with farm roads that are directly impacting the shoreline bank and waterbody substrate. Habitat degradation issues include alteration of channel substrate (i.e., rock placed in channel to harden crossing), impediment to natural stream flow, diminished shoreline banks, lack of riparian vegetation, ruts/gullies in farm road, sediment loading, inadequate buffer, and the areas are located adjacent to potential sources of nutrient load and pollution (i.e., adjacent to agricultural fields).

Costs associated with restoration of these sites are expected to be relatively low (< \$5,000) assuming that passive buffer restoration is implemented, and there are no obvious limitations to restoration. However, costs could exceed \$25,000 to restore the entire buffer if an aggressive planting program were undertaken, to restore a 250-foot wide forested buffer and depending on the on the type of road crossing installed.

Restoration recommendations for these sites include:

- Remove hardened crossing in stream;
- Regrade and restore shoreline banks;
- Stabilize and replant banks;
- Replace crossing with bridge if needed; and,
- Widen stream buffer to a minimum of 25 feet, as wide as the landowner will allow.

Sites SC-010 and SC-017 (Impacts associated with road crossing)

These sites were associated with road crossings over Spruce Creek. In general, habitat degradation associated with road crossings includes hardened un-natural shorelines, impediments to natural flow due to abutments, lack of vegetation on shoreline banks and in the riparian buffer, and impaired aesthetic quality. There was also potential for runoff of sediment and pollutants from the impervious roadway surfaces.

Conceptual costs to restore bridge sites are likely to be very high (> \$100,000) and factors to consider in the costs associated with restoring the site include the need for the following: engineering surveys and hydrologic investigations prior to removal of hard structures on banks; bio-engineering stabilization of banks; traffic control; and major site grading, fill removal, removal of hard structures, erosion control, and planting. Some challenges associated with restoration of bridge sites include limited access, potential need to restrict public access on roadways during restoration, and limitations of planting and grading due to right-of-way restrictions on vegetation adjacent to road corridors.

However, for many road crossings some restoration benefit could be achieved at a low (< \$5,000) to moderate (> \$10,000 to < \$25,000) cost, depending on site size, by improving vegetation in riparian areas, stabilizing eroding shoreline banks, and/or, or installing silt fence or other structures to redirect flow off roadways away from stream corridors.

Restoration recommendations for these sites include:

- Remove hard structures along shoreline banks and stabilize banks using bioengineering techniques;
- Stabilize areas of erosion on shoreline banks;
- Remove areas of sediment deposition;
- Redirect runoff from roadways to ensure sediment/pollutants are filtered through detention basins; and,
- Plant trees/shrubs to improve the buffer.

Site SC-039A (Impacts associated with a dam/impoundment)

This site appears to be an old, field stone road that is now acting as a partial dam, impounding freshwater behind it. Habitat degradation issues include alteration of former tidal inlet (i.e., rock placed in inlet to harden crossing), impediment to natural tidal exchange, lack of vegetation on shoreline banks and in the riparian buffer, and the site is located adjacent to potential sources of nutrient load (i.e., home under construction, adjacent to large mowed lawns).

Costs associated with this site would be moderate to high (> \$25,000 to < \$50,000), including consideration of the cost for the removal of the obstruction, removal of fill that has accumulated in and behind the dam, and construction access. Potential challenges to restoration include determining the historical significance, if any, of the structure, and contending with sensitive landowners. There is room for at least partial buffer restoration in the area surrounding the dam and impoundment.

Restoration recommendations for this site, assuming no historical significance, include:

- Remove field stones to restore tidal flushing;
- Regrade and restore shoreline banks;
- Stop mowing and allow natural revegetation of buffer as wide as the landowner will allow; and,
- Plant herbs and shrubs to enhance and speed restoration of the buffer.

Common Sources or Indicators of Degradation

Overall the most common problem observed along Spruce Creek was the lack of adequate riparian buffer, and the most common cause (or source) of this problem was land clearing for agricultural uses in the northern half of the study area, and land clearing for residential and commercial development in the southern half of the study area. Other common reasons for the lack of adequate buffer include road right-of-ways and residential and commercial development. Addressing the causes of land clearing would help to improve the long-term health of Spruce

Creek. In addition, costs associated with improving buffer coverage can be minor and may simply involve educating and working with landowners to remove a portion of the riparian area from active use. Based on documented trends in land clearing in the nearby Presumpscot Watershed, if left unchecked the trend in forest loss adjacent to waterbodies is likely to continue throughout developed areas of Maine (CBEP 1996). As such, measures to promote high-quality habitat along Spruce Creek should include the following:

- Land preservation;
- Work with existing landowners to minimize activities that degrade buffers;
- Initiate community activities and landowner outreach programs that assist landowners with improving buffer conditions; and,
- Enforcement of rules and regulations imposed to restrict activities that degrade buffers.

Docks and Piers

Another commonly encountered source of degradation in Spruce Creek was shoreline docks. Fifty-six (56) docks were identified, most of which occur in the southernmost mile of the study area (Figure 4) within the unrestricted tidal portion of Spruce Creek. Figure 4 illustrates the locations of the docks. Although docks represent an unnatural modification of the shoreline, only 34 of the 56 docks were identified as potential restoration sites due to the opportunity and need for improvement. Docks were evaluated for a number of criteria, including placement site (rock versus marsh), adequate height above marsh vegetation to allow vegetation to grow unimpeded, and aesthetics. A dock that was located on rock, impacted no marsh vegetation, and was aesthetically relatively benign was recorded but not assumed to be a site in need of restoration. In contrast, a dock identified as having restoration need may have been setting on or just above marsh vegetation, no longer in use and deteriorating, or unnecessarily long.

Recent Spruce Creek Association Activity

The Towns of Eliot and Kittery, and the SCA were awarded a Section 319 Non-Point Source Pollution Grant from the Maine Department of Environmental Protection (ME DEP) in summer 2005 to recognize and locate non-point sources of pollution that may be contributing to degraded water quality in the Spruce Creek watershed. The survey was conducted June 4, 2005, by over 50 volunteers after receiving training from the Wells National Estuarine Research Reserve (SCA 2005).

SCA attended a public hearing on October 24, 2005, after which the Kittery Town Council voted to conduct one-year flushing demonstration project in Spruce Creek. On November 6, 2005, SCA oversaw the removal of six flashboards and two sills by Black River Divers from the Route 1 culvert. The goal of this demonstration project is to improve water quality and restore a more productive and healthy habitat upstream of the Route 1 culvert (SCA 2005). This project corresponds to site SC-017 in the HRI, and the data form has been updated to reflect these changes.

3.2.2 Royal River

Description of Waterbody and Surrounding Area

Restoration inventory surveys were conducted along approximately 31 miles of the Royal River. The survey covered approximately 62.8 miles (331,584 linear feet) of shoreline along both banks and the perimeter shoreline of the estuary. The survey area extended from Danville Road in the Town of Auburn, southeast through the towns of New Gloucester, Gray, and North Yarmouth, to the mouth of the Royal River estuary in the Town of Yarmouth (Figure 2).

The character of the Royal River and the land that surrounds it varied along its length. The extreme northern section from the start at the Danville Road to Cobbs Bridge Road had an elevation drop of approximately 50 feet over a river length of about 3.6 miles. This section had a mix of pools, runs, and riffles, with long stretches of rapids in areas. The river averaged about 50 feet wide throughout this stretch. The bottom substrate was commonly rock and cobble in swift moving and shallow sections, and was silt and sand in slow moving and deep sections. The banks of the river generally were moderately steep, and bordered by upland forest for most of its length.

The rest of the Royal River below Cobbs Bridge Road to the head of tide in Yarmouth had an elevation drop of 80 feet over a river section of about 19.3 miles. The section was mostly pools and runs, and the river ranged from about 50 to 100 feet wide. The river generally was over 4 feet deep, and the bottom substrate was silt and sand.

Beginning at Interstate 95 in Yarmouth and ending at the mouth of the estuary in Casco Bay, the river was tidally influenced, and ranged from 500 to 1,500 feet wide. Most of this last portion was bordered by fringe salt marsh, with adjacent steep upland banks.

As discussed above, the Royal River had a diverse assemblage of riffles, runs and pools and the channel bottom materials range from silt to large cobble. Overall, embeddedness ranged from moderate to high, but aside from specific documented potential problem areas, embeddedness was attributed to natural conditions of the waterbody, particularly since the local surficial geology in the area had a high component of sands and clays. In general, embeddedness was lower in the northern half, and higher in the southern portion of the river. The banks were relatively steep and stable throughout, except in areas modified by human activities and identified as potential restoration sites. Some bank erosion, fallen trees, woody debris jams, beaver dams and impoundments, were observed throughout the waterbody. However, unless otherwise noted (i.e., identified as a location in need of restoration), these features were determined to be naturally occurring features and an integral part of a typical dynamic stream system.

Significant direct alterations to the channel include the following: two waterbody obstructions (i.e., dams) located at the Sparhawk Mill site and due south of the Town of Yarmouth Royal River Park; bridge abutments/culverts associated with 16 primary/secondary road crossings; and, bridge abutments associated with six railroad crossings. The course of the river roughly parallels one to two railroad corridors for much of its length. Specifically, the river is located between 25

and 1,000 feet of the railroad rights-of-way for roughly 75% of the length of the river (18.5 miles) between the start of the study at the Danville Road and Mill Road in North Yarmouth. These features have altered the velocity and flow of water in the Royal River from its natural condition, have impaired the natural shoreline bank, and have impeded the natural migration of the river channel. In addition, roads and other forms of development produce runoff of pollutants into the waterbody.

Summary of Field Evaluations

One hundred and seven (107) potential restoration sites were identified for Royal River (Figure 6 A, B and C). A list of all sites and site summary reports for each site are provided in Volume II, Appendix B. All 13 sources of degradation were documented along Royal River and 255 individual examples of these were observed (Table 3). The most common sources of environmental degradation were unstable/eroding banks, which was observed at 46 sites (43% of all Royal River sites) and land use activity as a potential source of nutrients/pollution, which was observed at 39 sites (36% of all Royal River sites).

Approximately 40,953 linear feet of habitat (12.4% of the linear distance of the shoreline) along Royal River was in some state of environmental degradation. Sixty-eight (68) of the 107 restoration sites identified along the Royal River (64%) were in need of some buffer restoration. Usually one or more additional degraded condition was also present within sites identified for buffer restoration, such as low bank stability and erosion, potential sediment or nutrient loading, and lack of or impaired riparian vegetation.

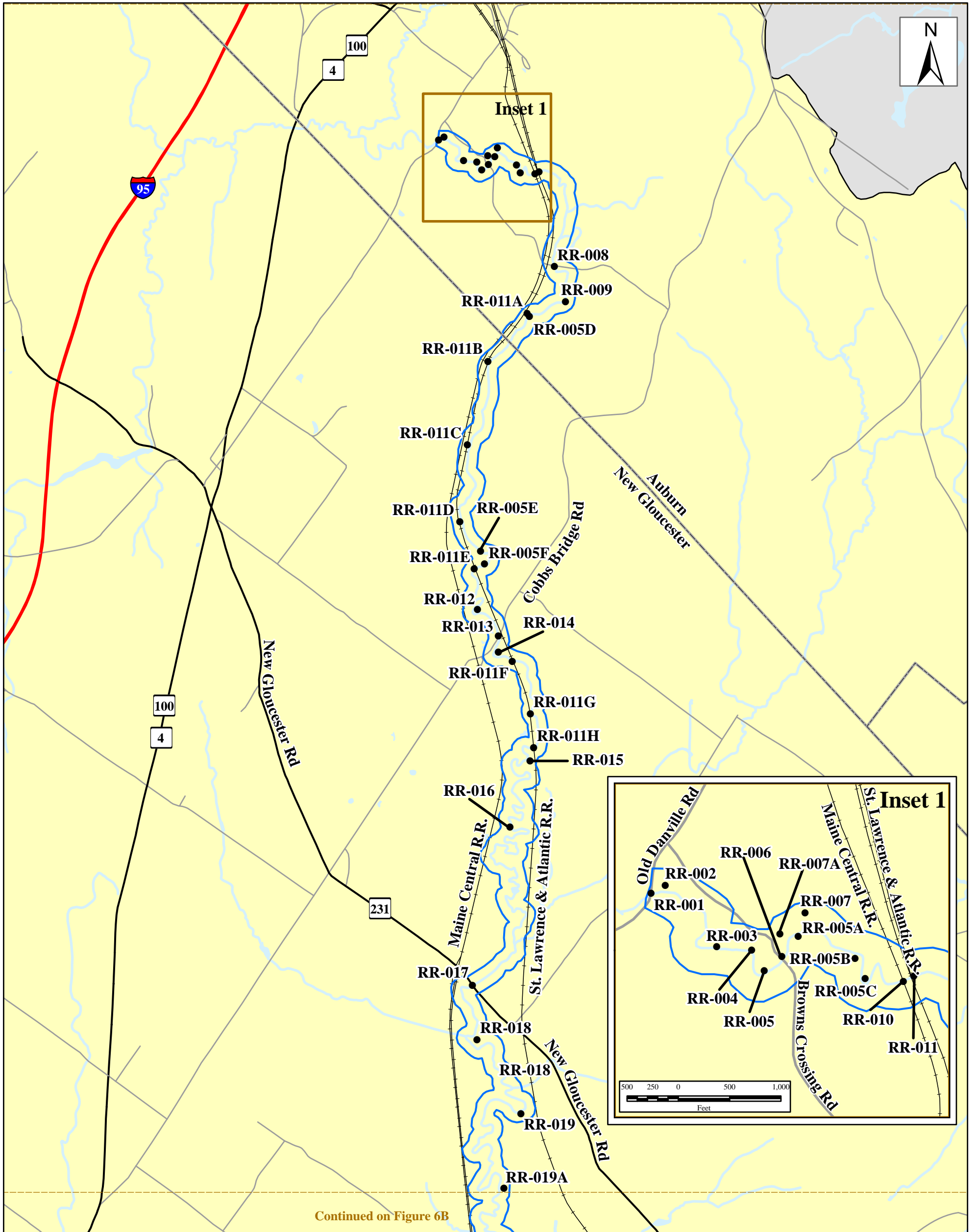
Notable Sites or Issues

Degradation scores of restoration sites along the Royal River (i.e., degree of environmental degradation at each site) ranged from 0.10 to 5.50, and 10 sites (9% of all sites) had degradations scores greater than 3.0 (Table 5). Based on the range of conditions observed in the study area, moderately degraded sites were considered to be those sites with a degradation score of greater than 3.0. Although there are numerous sites along the Royal River in need of restoration, the number of sites that were at least moderately degraded (degradation scores ≥ 3.0 or higher) was relatively low.

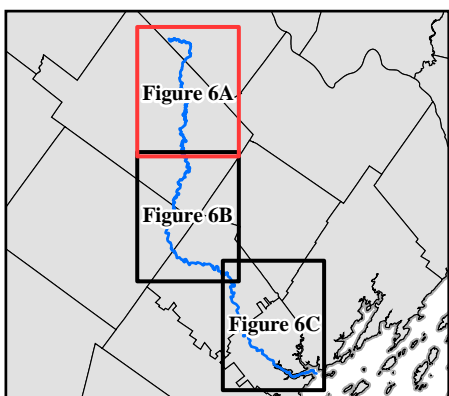
Each of the 107 sites identified during this survey is deserving of further evaluation to determine suitability for restoration, and although determining site suitability for restoration is subjective and greatly dependant upon the budgets and objectives of the organizations interested restoration, the following site/restoration issues observed along the Royal River are worth noting.

Site RR-007 (Impacts associated with brick making facility.)

Site RR-007 is a brick fabrication facility located along Brown's Crossing Road in Auburn. Numerous examples of environmental degradation were documented at the site, including lack of buffer, direct discharge of surface drainage into the river, poor water quality of a tributary that drained the site, sediment loading, obstructions to growth of shoreline vegetation, and potential sources of nutrient/pollution input into Royal River.



Continued on Figure 6B



Figures

Data provided by Maine Office of GIS



Legend

- | | | | |
|--|--------------------------|--|---------------|
| | Royal River Watershed | | Town Boundary |
| | Ponds, Lakes, & Rivers | | Interstate |
| | 250 Foot Buffer | | Local Road |
| | Habitat Restoration Site | | Primary Road |
| | | | Railroad |

Figure 6A. Restoration Sites Identified in the Royal River Study Area.

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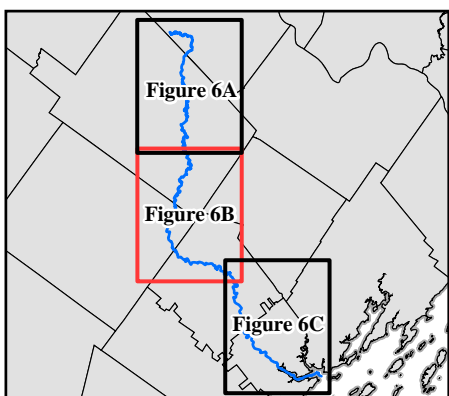
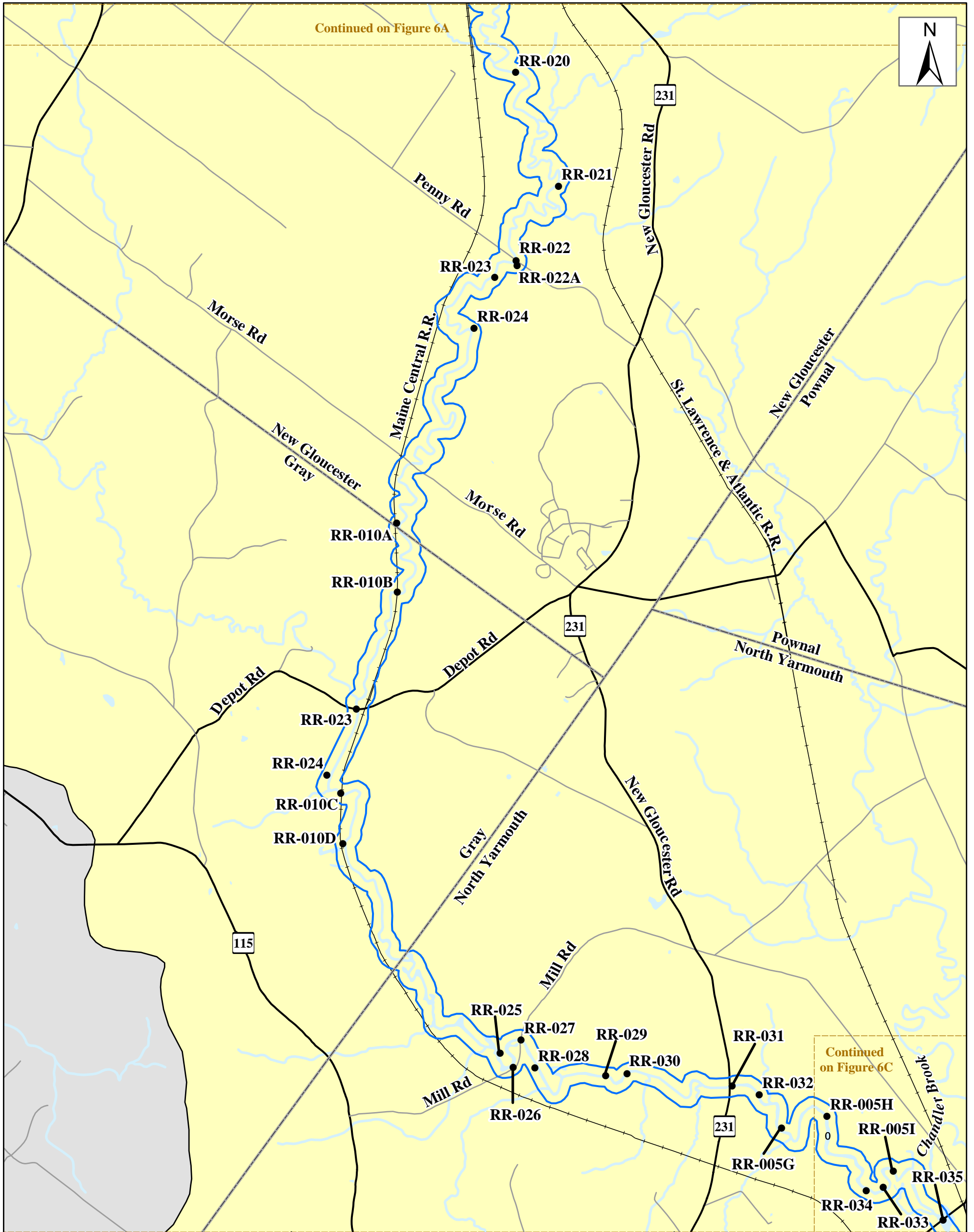


Prepared By:



Date:

08/05



Figures

Data provided by Maine Office of GIS



Legend

- | | |
|--------------------------|---------------|
| Royal River Watershed | Town Boundary |
| Ponds, Lakes, & Rivers | Interstate |
| 250 Foot Buffer | Local Road |
| Habitat Restoration Site | Primary Road |
| | Railroad |

Figure 6B. Restoration Sites Identified in the Royal River Study Area.

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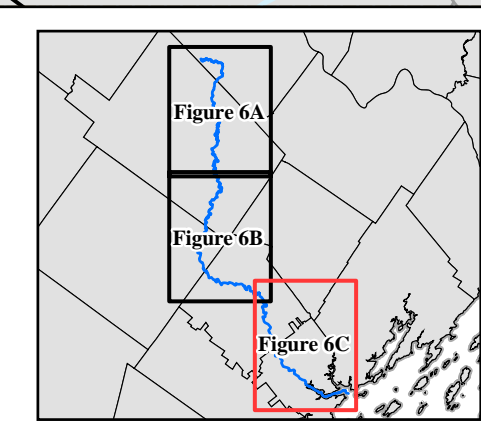
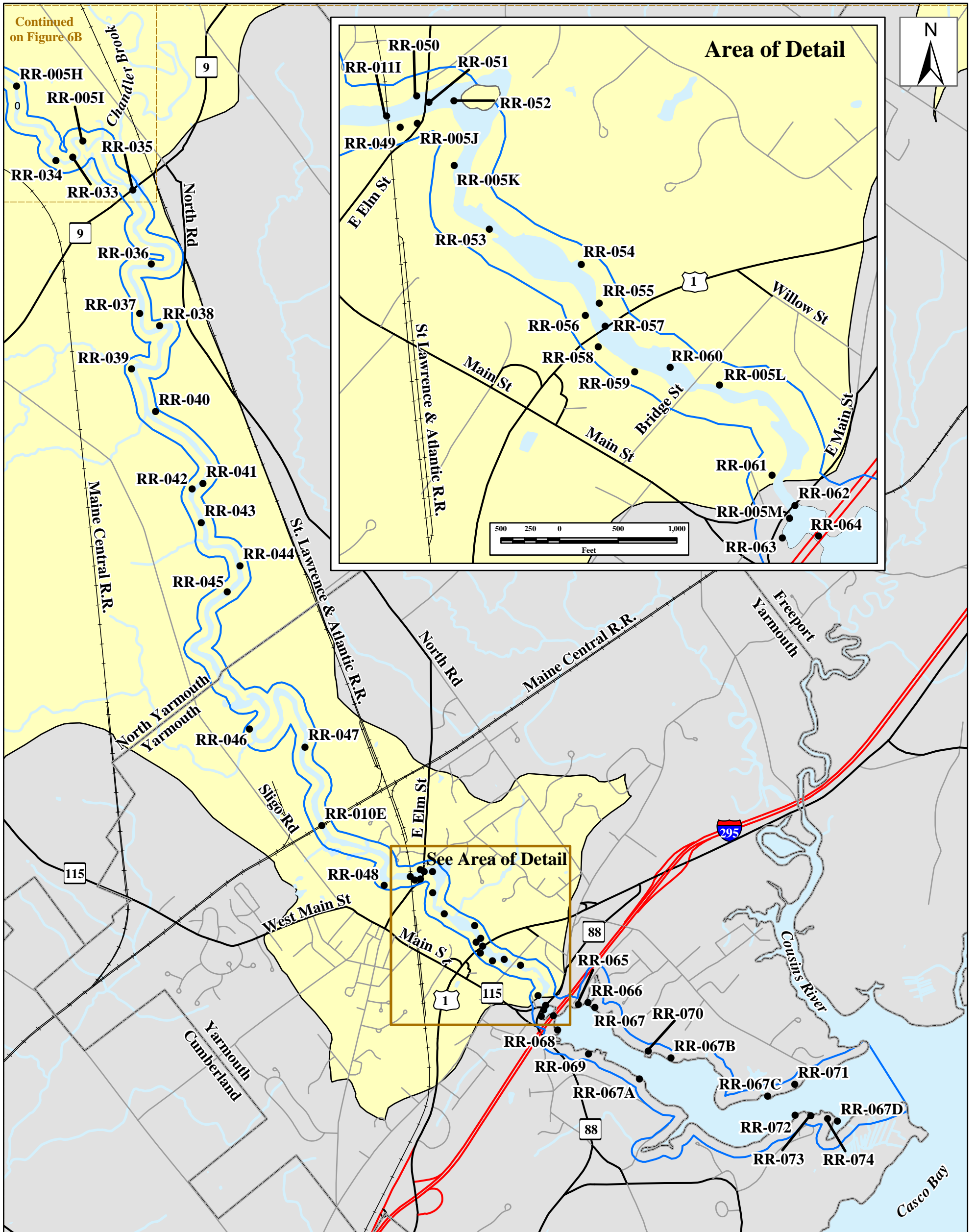


Prepared By:



Date:

08/05



Figures

Data provided by Maine Office of GIS



Legend

- | | | | |
|--|--------------------------|--|---------------|
| | Royal River Watershed | | Town Boundary |
| | Ponds, Lakes, & Rivers | | Interstate |
| | 250 Foot Buffer | | Local Road |
| | Habitat Restoration Site | | Primary Road |
| | | | Railroad |

Figure 6C. Restoration Sites Identified in the Royal River Study Area.

Prepared For:



Prepared By:



Date:

08/05

Table 6. Royal River Restoration Sites with a Degradation Score of Greater than 3.0.

Site ID	Size (linear feet)	# of Indicators of Degradation	Degradation Score ¹	Primary Issues
RR-007	400	6	5.5	Impacts associated with brick making facility.
RR-052	100	6	3.1	Impacts associated with dam site.
RR-053	3500	7	3.25	Impacts associated with public park.
RR-060	500	7	4.25	Impacts associated with dam site.
RR-062	175	8	3.4	Impacts associated with road crossing.
RR-064	250	7	3.9	Impacts associated with road crossing.
RR-065	700	7	4.3	Impacts associated with boat launch/marina.
RR-068	600	6	3.95	Impacts associated with boat launch/marina.
RR-069	1800	8	4.3	Impacts associated with boat launch/marina.
RR-070	600	6	4.05	Impacts associated with boat launch/marina.

¹ Higher score indicates a higher level of habitat degradation.

Costs and effort associated with restoration efforts are expected to be high (> \$50,000 to < \$100,000) depending on the source and nature of the problems. However, conditions could be significantly improved at a moderate cost (> \$10,000 to < \$25,000) and effort. Significant improvements could be achieved at a reasonable cost, including strategic grading of the site to prevent direct surface flow into the river and to funnel drainage into a settling area before surface water is discharged into the creek, use of silt fence to reduce sedimentation, plantings of herbaceous plants and shrubs to stabilize banks, and allowing areas of buffer to naturally regenerate.

Specific restoration recommendations for this site include:

- Stabilize areas of erosion/slumping on shoreline banks and install sediment/erosion control devices;
- Regrade the ground surface to prevent direct discharge of surface water into the river;
- Create or improve detention ponds;
- Discontinue active use of buffer areas and replant to a minimum of 25 feet, and up to as wide as the landowner will allow;
- Conduct water quality sampling to evaluate water input into Royal River from the brick site; and,
- Remove concentrated areas of brick disposal along shoreline bank and in buffer.

Sites RR-052 and RR-060 (Impacts associated with a dam site)

These sites were likely associated with old mills that were located along the Royal River. The upstream dam (RR-052) is located adjacent to the Yarmouth Town Park. The downstream dam is the Sparhawk Mill Dam, located in a developed area along Mill Street in Yarmouth. Both dams have fish access structures (i.e., fish ladder). However, the dams still pose a significant impediment to natural water flow and present an obstruction to fish passage. Other habitat degradation at the sites included lack of adequate buffer and riparian vegetation in some areas,

hard structures that have replaced former shoreline banks within the footprint of the dam and in areas of the shoreline, accumulated trash and woody debris at the entrance to the fish ladders, and impaired aesthetic quality of the sites.

Restoration costs for replacing the dams are expected to be very high (> \$100,000) compared to most of the restoration projects in the watershed. Dam replacement costs would require major construction activities, considerable survey and engineering work, and fill/structural removal and disposal, as a starting point. However, there are opportunities at both dam sites for restoration at a lower level (> \$5,000 to < \$10,000) that would have beneficial effects in the watershed, such as maintaining the fish ladder, especially during fish migration, and enhancing the buffer habitat around the dams. Challenges to restoration may include access issues, landowner cooperation, and funding.

Restoration recommendations include:

- Increase maintenance on fish ladders, especially during fish migration;
- Dam removal;
- Stabilize shoreline bank, particularly areas of significant erosion;
- Restore vegetation on shoreline bank; and,
- Plant trees/shrubs to enhance buffer.

Site RR-053 (Impacts associated with a public park)

The Town of Yarmouth Royal River Park covers approximately 3,500 linear feet of shoreline along the Royal River. Numerous problems were documented throughout the area and included the following: inadequate buffer due to mowing/maintenance of the parkland; eroding shorelines, particularly at unstable boat/canoe launch areas; sediment loading from bank erosion; impaired shoreline vegetation due to riprap on banks; and, scattered patches of invasive Japanese knotweed (*Polygonum cuspidatum*).

Costs to restore problem areas would be expected to be moderate (> \$10,000 to < \$25,000) if an aggressive planting program were undertaken, primarily due to the large area of buffer that would need to be restored, and costs associated with the removal of riprap and bank stabilization measures that would be needed to restore the shoreline banks to a more natural/stable condition. However, significant restoration benefit could be achieved at a low (< \$5,000) to low-moderate (> \$5,000 to < \$10,000) cost, simply by minor plantings to improve vegetation in riparian areas, stabilizing eroding shoreline banks, and/or, discontinuing active management (i.e., mowing/cutting/vegetation removal) in portions of buffer areas.

Restoration recommendations for this site include:

- Remove hard structures along shoreline banks and stabilize banks using plantings or bioengineering techniques;
- Stabilize areas of erosion on shoreline banks;
- Stabilize canoe/boat launch sites;
- Plant trees/shrubs to improve the buffer.

Sites RR-062 and RR-064 (Impacts associated with road crossing)

These sites were associated with hardened road crossings over the Royal River. The upstream road crossing site is the Elm Street Bridge (RR-062) is a cement bridge that constricts the natural flow of the river. The downstream road crossing site is the Route 95 Bridge (RR-064), which has northbound and southbound bridge segments. In general, habitat degradation associated with road crossings includes hardened un-natural shorelines, impediments and/or constrictions to natural flow due to abutments, lack of vegetation on shoreline banks and in the riparian buffer, and impaired aesthetic quality. There was also potential for runoff of sediment and pollutants from the impervious roadway surfaces.

Conceptual costs to restore bridge sites are likely to be very high (> \$500,000 per site) and factors to consider in the costs associated with restoring each site include the need for the following: engineering surveys and hydrologic investigations prior to removal of hard structures on banks; bio-engineering stabilization of banks; traffic control; and major site grading, fill removal, removal of hard structures, erosion control, and planting. Some challenges associated with restoration of bridge sites include limited access, potential need to restrict public access on roadways during restoration, and limitations of planting and grading due to right-of-way restrictions on vegetation adjacent to road corridors.

However, some restoration benefit for many road crossings could be achieved at a low (< \$5,000) to low-moderate (> \$5,000 to < \$10,000) cost, depending on level of effort, by improving vegetation in riparian areas, stabilizing eroding shoreline banks, and/or, or installing silt fence or other structures to redirect flow off roadways away from stream corridors.

Restoration recommendations for these sites include:

- Stabilize areas of erosion on shoreline banks using plantings or bioengineering techniques;
- Redirect runoff from roadways to ensure sediment/pollutants are filtered through detention basins;
- Plant trees/shrubs to improve the buffer; and,
- Control the invasive species Japanese knotweed.

Sites RR-065, RR-068, RR-069 and RR-070 (Impacts associated with boat launches/marinas)

These four sites are located primarily in the southernmost portion of the Royal River study area, to the southeast of Interstate 95. Major restoration issues associated with these sites include impediments to natural water flow (i.e., docks, rip-rap), unstable banks, lack of riparian vegetation due to rip-rap, impaired aesthetic quality, inadequate buffer, and potential for input of pollutants into the river, particularly from fueling areas at marinas.

Conceptual costs to fully restore sites are likely to be very high (> \$500,000), and were viewed as not realistic considering the demand for these services and the value of property in the area.

However, significant restoration benefit could be achieved at these sites at a low (< \$5,000) to low-moderate (> \$5,000 to < \$10,000) cost, depending on site size, by increasing the structural diversity of vegetation and buffers in riparian areas, stabilizing eroding shoreline banks, and/or, removing rip-rap in areas most likely to support *Spartina* species, and discontinuing active management (i.e., mowing/cutting/ vegetation removal) in buffer areas.

Restoration recommendations for these sites include:

- Stabilize areas of erosion on shoreline banks using bioengineering techniques;
- Ensure fuel/pollutant containment structures are in place and functioning;
- Limit cutting and mowing to designated areas and allow full buffer development in other areas;
- Replant salt marsh vegetation in intertidal areas;
- Plant trees/shrubs to improve the buffer; and,
- Control invasive species.

Common Sources or Indicators of Degradation

Overall the two most prevalent problems observed along the Royal River were the lack of adequate riparian buffer and low bank stability/erosion. The source, or cause, of these problems are related: land clearing for agricultural uses, residential development, and road right-of-ways creates unstable river banks, and it is difficult to establish a high quality vegetated riparian buffer on land that is unstable/eroding. Addressing the causes of land clearing and low bank stability would help to improve the long-term water quality and shoreline habitat of the Royal River. In addition, costs associated with improving buffer conditions can be relatively minor, and can start with educating and working with landowners to remove a portion of the riparian area from active use. Based on documented trends in land clearing in the nearby Presumpscot Watershed, if left unchecked the trend in forest loss adjacent to waterbodies is likely to continue throughout developed areas of Maine (CBEP 1996). As such, measures to promote high-quality habitat along the Royal River should include the following:

- Land preservation;
- Work with existing landowners to minimize activities that degrade buffers and contribute to bank instability;
- Initiate community activities and landowner outreach programs that assist landowners with improving buffer conditions and stabilizing eroding areas; and,
- Enforcement of rules and regulations imposed to restrict activities that degrade buffers.

Recent Friends of the Royal River Activity

The Royal River Youth Conservation Corps (RRYCC), working in conjunction with the FRR and the Maine Soil and Water Conservation District, worked throughout the Royal watershed in summer 2005 to reduce non-point sources of pollution (Nichols 2005). Of particular interest, RRYCC worked on three sites in Yarmouth along the mainstem of the Royal River: Yarmouth Public Town Landing (RR-065), the Royal River Park (RR-053), and the Grist Mill (RR-062). At the Royal River Park site, RRYCC planted highbush blueberry bushes along with other

plantings, stabilized eroding paved pathways, created infiltration steps to filter runoff prior to entering the waterbody, and placed mulch to stabilize loose soils. At the Grist Mill site, RRYCC placed mulch, planted shrubs in the buffer zone, and created a gravel trail in place of an eroding dirt walkway. At the Yarmouth Public Town Landing, the group stabilized culverts, removed purple loosestrife, and transplanted native vegetation along the shoreline. The data forms for these projects have been updated to reflect these changes.

FRR was also awarded a Section 319 Non-Point Source Pollution Grant from the ME DEP in summer 2005 to conduct an inventory of potential non-point sources of pollution in the Moose Brook watershed in Auburn. Moose Brook is a tributary of the Royal River that joins the river just upstream of the start point for this survey, at Danville Road.

3.2.3 Lower Kennebec River Estuary

Description of Waterbody and Surrounding Area

Restoration inventory surveys were conducted along approximately 13 miles of the main channel of the Kennebec River. The survey covered approximately 380,160 linear feet (72 miles) of shoreline along both banks of the Lower Kennebec River and the perimeter of the estuary, the lower segment of the Back River that passes between Arrowsic and Georgetown, and several connected bays, ponds, coves, and rivers (Figure 3). The survey area extended from the Route 1 Bridge crossing of the Kennebec River south to the Gulf of Maine, and included portions of the towns of Bath, Phippsburg, Woolwich, Arrowsic, and Georgetown.

The entire area of the Lower Kennebec River surveyed is tidally influenced, and is fairly homogenous from north to south. The river is essentially at sea level below Route 1, with water depths changing with the tides and depending on the volume of water flowing downstream. There are many bays, coves, and inlets that branch off of that main channel, which offer shallow water habitat and mudflat at low tide, and provide refuge and foraging opportunities for fish and birds. Expansive salt marshes grow in protected areas off of the main channel, and fringing salt marshes line the perimeter of the estuary.

The Lower Kennebec River ranges in width and depth as the river runs south from Route 1 to the Gulf of Maine. The river is approximately 34 feet deep in the main thread of the channel near the Route 1 Bridge crossing, and about 2,100 feet wide. The river narrows and deepens slightly as it runs south between Bath and Arrowsic; it narrows sharply (750 feet wide), and ranges between 70 and 100 feet, between Arrowsic and Phippsburg where river turns sharply to the east. This narrower character continues about 10,000 feet downstream to the river's narrowest point between Arrowsic and Phippsburg (660 feet wide), where the river becomes as deep as 114 feet. From this point, the river widens to between 1800–2600 feet, and depths in the 60- to 80-foot range. South of Arrowsic, the river widens (2,600 to 5,300 feet wide) and becomes shallower, with depths in the 40-foot range, where the Back River merges with Kennebec River, between Phippsburg and Georgetown. The river narrows to 1,300 feet by Long Island, and finally widens to about 3030 feet wide, with depths in the main thread of the channel ranging from 30–65 feet, at the mouth of the river at the Gulf of Maine.

Shallow tidal coves, inlets, and bays, with water depths ranging from 0–9 feet, branch off of the main channel of the Kennebec River, and allow the water to slow and sediments to settle out. Tidal mudflats border expansive salt marshes in the intertidal zone of these coves, inlets, and bays.

At the northern end of the portion of the Back River in the study area, the river is more than 1000 feet wide. The river narrows to 300–450 feet in the central portion, and widens again to approximately 1800 feet before joining the Kennebec River. The main thread of the channel is approximately 200-feet wide, with depths ranging between 8 and 17 feet. Outside of the main thread of the channel are shallow tidal flats with water depths ranging from 0–9 feet, which border expansive salt marsh and narrow fringing salt marsh habitat along the entire length of the Back River in the project area.

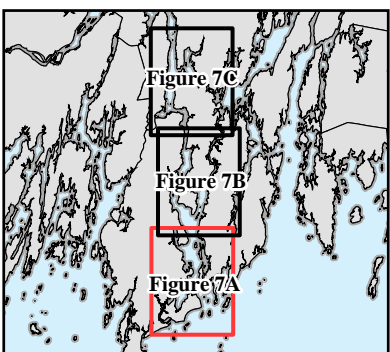
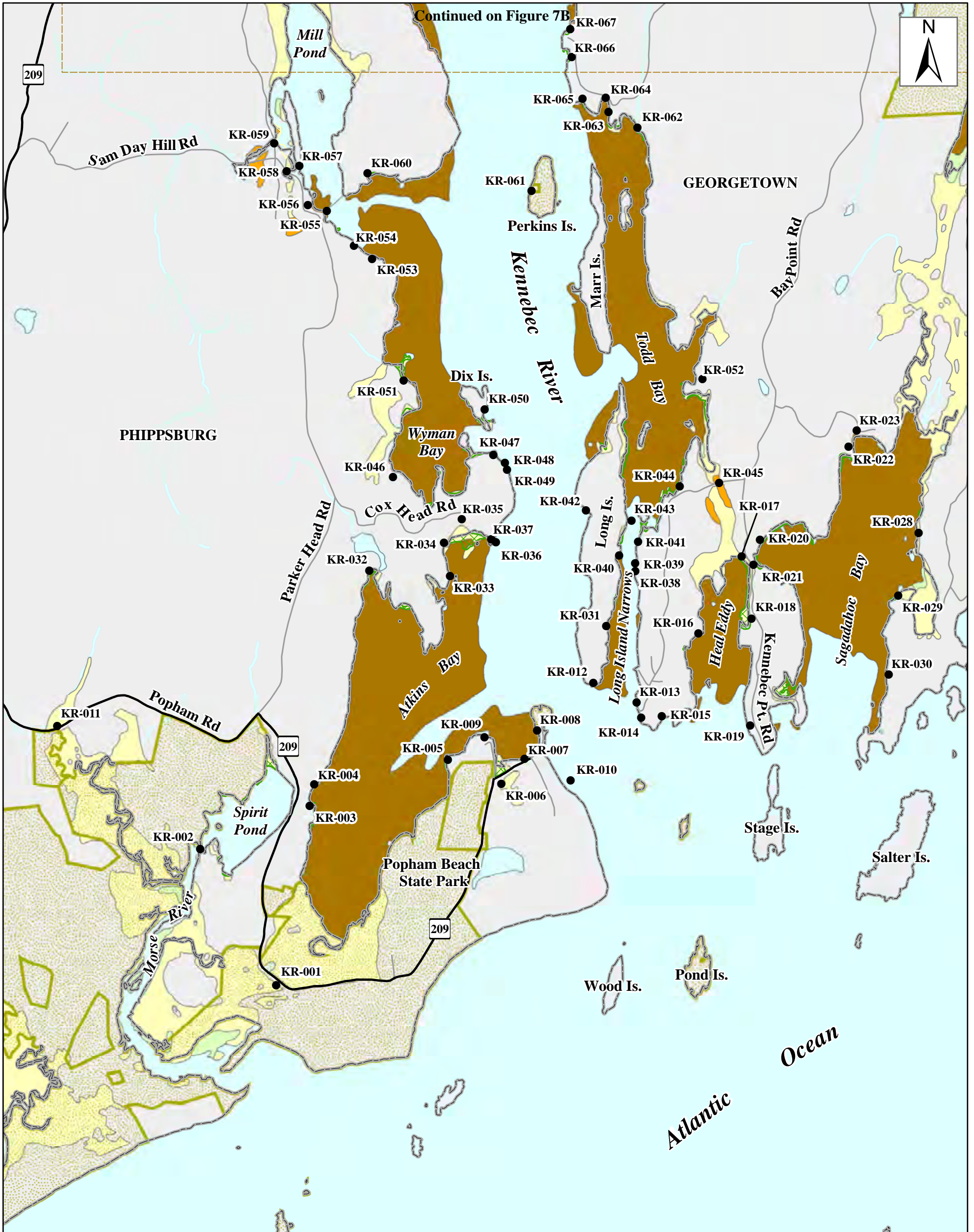
Land use along the Kennebec River is predominantly low to medium density residential, mixed with forested areas. The study area becomes more heavily developed moving from south to north, with the exception of three small, heavily developed coastal communities. These areas are likely popular with summer residents and vacationers, although there are many homes that appear to be year-round dwellings. There is some light commercial development, and a major industrial development, Bath Iron Works, forms the northwestern border of the study area, adjacent to the Route 1 Bridge.

Significant direct alteration to the main channel includes the Route 1 Bridge crossing and adjacent railroad crossing, and the Bath Iron Works site (KR-121). The Bath Iron Works site has an almost entirely hardened shoreline, with docks/piers and a dry dock structure built on or into the channel. Additionally, Route 127 crosses the waterbody in four locations, between Woolwich and Arrowsic, between Arrowsic and Georgetown, and twice in Georgetown, and bridge abutments and supports directly alter the channel in these locations. The road crossings have contributed to degradation of the buffer and runoff of pollutants from the road surface into the waterbody. The impervious surface and development at the Bath Iron Works site has impaired the natural shoreline bank and likely contributes to increased runoff of pollutants into the waterbody.

Summary of Field Evaluations

One hundred thirty-three (133) potential restoration sites were identified in the Lower Kennebec River Estuary (Figure 7A, B and C). A list of all sites and site summary reports for each site are provided in Volume II, Appendix B. All but one of 13 sources of degradation were found in the Lower Kennebec River Estuary, and 251 individual examples of these were observed (Table 3). No ATV/off-road vehicle damage or farm equipment issues were identified during the survey. Of the field indicators of degraded conditions, all but one (i.e., evidence of repeated flooding/severe flooding) was present in the Lower Kennebec River Estuary.

The most common source of environmental degradation was land clearing, which was observed at 96 sites (72%) (Table 3). The most common field indicator of degradation was the lack of adequate buffer (i.e., forested buffer \geq 250 feet), which was noted at 111 (83%) of the restoration



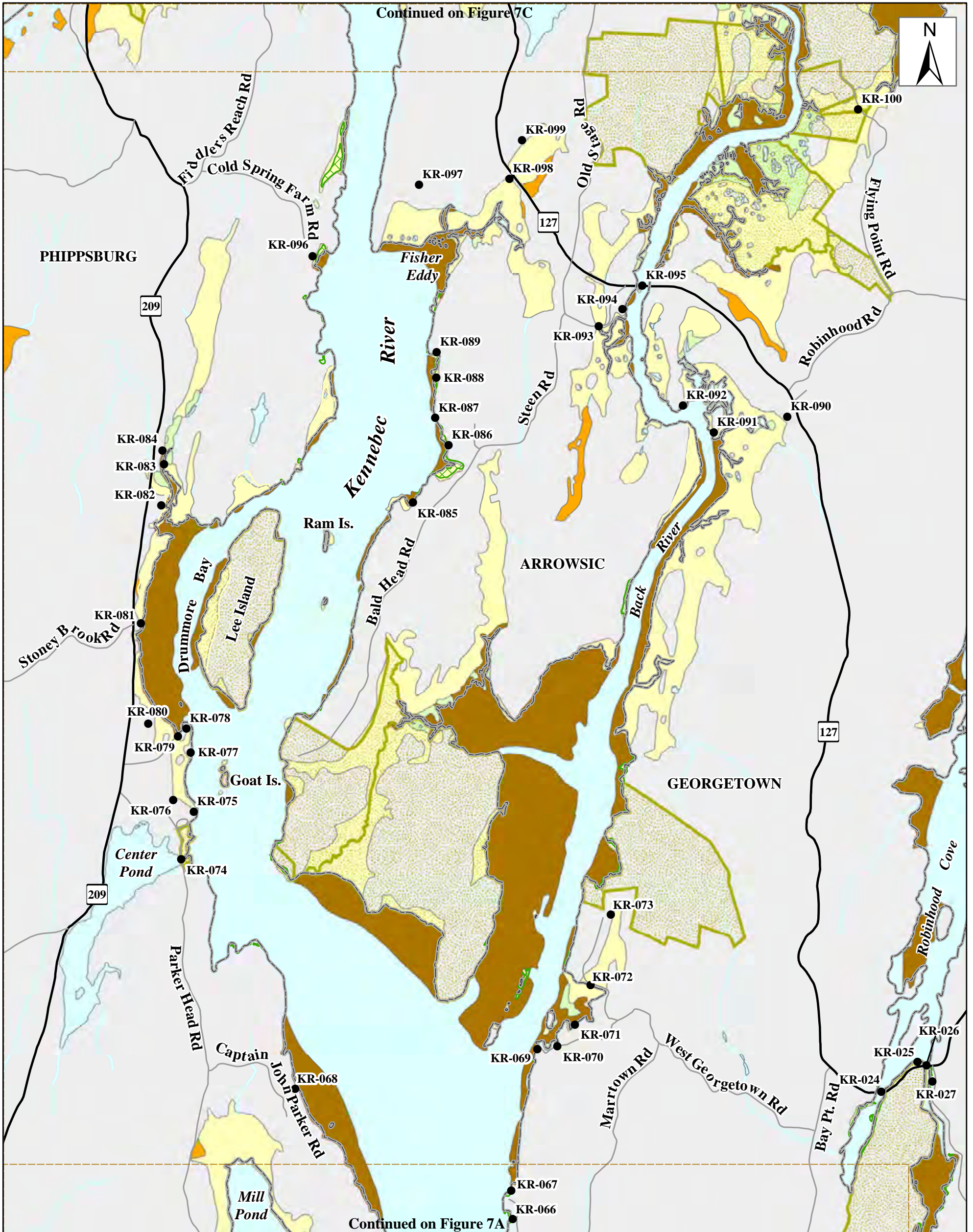
Legend			
●	Habitat Restoration Site *	—	Primary Road
—	Town Boundary	++++	Railroad
—	Interstate	—	Water Features
—	Local Road	—	Conservation Land
Estuarine Types ♦			
■	E2US3N	■	E2EM1N
■	E2EM1P	■	Fringe Salt Marsh *
■	E2EM1P6	■	Salt Marsh not included in NWI *

Figure 7A.
Restoration Sites Identified in the Lower Kennebec River Estuary Study Area.

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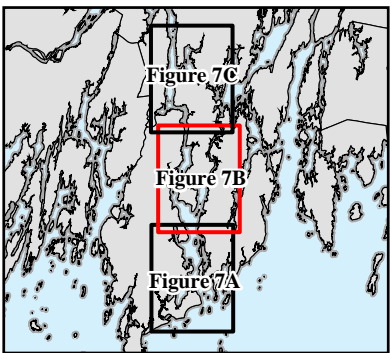
Prepared By: Date: 12/05

Source: Data provided by Maine Office of GIS
♦ Digital data layer provided by U.S. Fish & Wildlife Service, National Wetlands Inventory
* Digital data layer generated by NEA



Continued on Figure 7C

Continued on Figure 7A



Legend			
●	Habitat Restoration Site *	—	Primary Road
—	Town Boundary	++++	Railroad
—	Interstate	—	Water Features
—	Local Road	■	Conservation Land
Estuarine Types ↓			
■	E2US3N	■	E2EM1N
■	E2EM1P	■	Fringe Salt Marsh *
■	E2EM1P6	■	Salt Marsh not included in NWI *

Figure 7B.
Restoration Sites Identified in the Lower Kennebec River Estuary Study Area.

Prepared For:



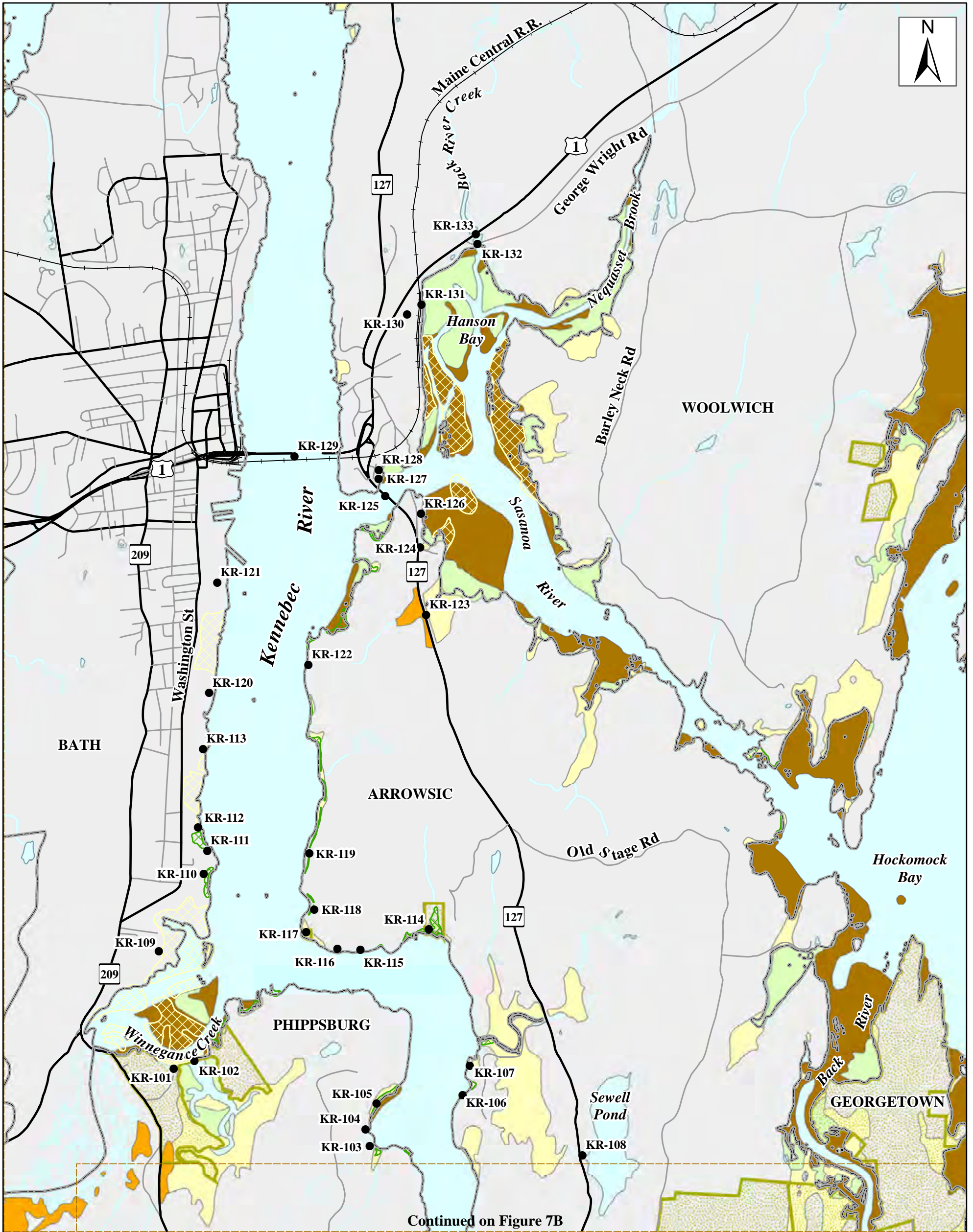
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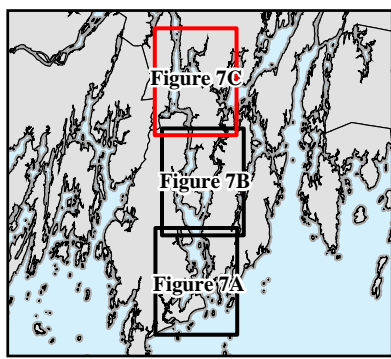
Date:

12/05

Source: Data provided by Maine Office of GIS
 ♦ Digital data layer provided by U.S. Fish & Wildlife Service, National Wetlands Inventory
 * Digital data layer generated by NEA



Continued on Figure 7B



Legend			
●	Habitat Restoration Site *	—	Primary Road
—	Town Boundary	+++++	Railroad
—	Interstate	—	Water Features
—	Local Road	▨	Conservation Land
Estuarine Types †			
■	E2US3N	■	E2EM1N
■	E2EM1P	▨	Fringe Salt Marsh *
■	E2EM1P6	▨	Salt Marsh not included in NWI *

Figure 7C.
Restoration Sites Identified in the Lower Kennebec River Estuary Study Area.

Prepared For:

Prepared By: Date: 12/05

Source: Data provided by Maine Office of GIS
 † Digital data layer provided by U.S. Fish & Wildlife Service, National Wetlands Inventory
 * Digital data layer generated by NEA

sites in the Lower Kennebec River Estuary (Table 4). Also, a large number of sites (85 out of 133, or 64%) in the study area had adjacent sources of potential high nutrient input or pollution.

Approximately 50,855 linear feet of habitat (13.4% of the linear distance of the shoreline) in the Lower Kennebec River Estuary was in some state of environmental degradation.

Notable Sites or Issues

Degradation scores of restoration sites in the Lower Kennebec River Estuary (i.e., degree of environmental degradation at each site) ranged from 0.20 to 4.7 and only three sites (2% of all sites) had degradations scores greater than 3.0 (Table 7). Based on the range of conditions observed in the study area, moderately degraded sites were considered to be those sites with a degradation score of greater than 3.0. Although there are numerous sites in the Lower Kennebec River Estuary in need of restoration, the number of sites that were at least moderately degraded (degradation scores \geq 3.0 or higher) was very low.

Each of the 133 sites identified during this survey is deserving of further evaluation to determine suitability for restoration, and although determining site suitability for restoration is subjective and greatly dependant upon the budgets and objectives of the organizations interested in restoration, the following site/restoration issues observed in the Lower Kennebec River Estuary are worth noting.

Table 7. Lower Kennebec River Estuary Restoration Sites with a Degradation Score of Greater than 3.0.

Site ID	Size (linear feet)	# of Indicators of Degradation	Degradation Score¹	Primary Issues
KR-052	340	5	3.0	Impacts associated with a quarry site.
KR-074	375	6	3.8	Impacts associated with a culvert.
KR-121	5200	6	4.7	Impacts associated with a large industrial facility.

¹ Higher score indicates a higher level of habitat degradation.

Site KR-121 (Impacts associated with a large industrial facility)

The Bath Iron Works site covers approximately 5,200 linear feet of shoreline along the Kennebec River. The main industrial parts of this site are entirely paved, and offer no real opportunity for habitat for wildlife. However, there is a 1,400-foot long area of salt marsh at the southern extent of the site. Environmental degradation at this site includes expansive docks, piers, and a dry dock facility, that run parallel to, or extend into the channel; complete cover of impervious surfaces; land use activities that are potential pollution sources; direct discharge of surface drainage into the river via two wastewater outfalls; and, lack of vegetation in the buffer zone around salt marshes at the southern end of the site.

Costs and effort associated with restoration efforts are expected to be very high > \$100,000. Factors to consider in the costs associated with restoring this site include constructing a stormwater management system, if it is determined to be lacking; dealing with access issues for construction/restoration activities on an extremely active and politically sensitive site; and, implementing and maintaining effective buffer enhancement measures around salt marsh areas. Challenges to restoration may include limited land availability for creating a stormwater management system, and limited space available for buffer enhancement.

Restoration recommendations include:

- Identifying stormwater management needs on site, if any;
- Establishing a stormwater management system for filtering stormwater runoff prior to discharging into the river; and,
- Planting trees/shrubs to enhance buffer around salt marsh.

Site KR-074 (Impacts associated with a culvert)

This site is a culverted road crossing that provides an outlet from Center Pond into the Kennebec River. The major issue at this site is that the culvert and fish ladder are set too high to allow tidal exchange during all but the extreme high tides, if at all. The pond behind the culvert may be freshwater, since the pond does not appear to experience any tidal exchange. Habitat degradation associated with this site includes obstructions to fish passage, hardened un-natural shorelines, impediments to natural tidal exchange, wetland loss, potential for runoff of sediment and pollutants from the impervious roadway surfaces, and impaired aesthetic quality.

Costs to restore this site are likely to be very high (> \$100,000) because of the complexities of working in an active transportation corridor and the amount of structural changes that would be required. Factors to consider in the costs associated with restoring the site include the need for the following: engineering surveys and hydrologic investigations prior to removal of hard structures on banks; bio-engineering stabilization of banks; traffic control; major and minor site grading; removal of obstructions, hard structures, and fill; and, erosion control. Some challenges associated with restoration include limited access, potential need to restrict public access on roadways during restoration, and obtaining approval of the landowners on the lake that is impounded behind the culvert.

Restoration recommendations for these sites include:

- Replace culvert at the appropriate elevation and size for the volume of flow;
- Remove hard structures along shoreline banks; and,
- Stabilize banks using bioengineering techniques.

Other site locations with culverts that appeared to be an issue included:

KR-006	KR-045	KR-058	KR-059
KR-072	KR-079	KR-093	KR-098
KR-100	KR-123	KR-132	KR-133

Site KR-052 (Impacts associated with a quarry site)

Site KR-052 appears to be a quarry located on the eastern banks of the Kennebec River in Georgetown. This site was not visited during field surveys, but was identified on an aerial photograph as a potential site. Based on a review of the aerial photograph, this site appears to have environmental degradation including lack of buffer, direct discharge/runoff of surface drainage into the river, direct impacts to the waterbody where equipment is driven to the edge of the waterbody, sediment loading, and potential sources of nutrient/pollution input into the Kennebec River.

Costs and effort associated with restoration efforts are expected to be moderate to high (> \$25,000 to < \$50,000) depending on the actual source and nature of the problems. More investigation is required to completely evaluate the restoration needs and potential at this site.

Generally, restoration recommendations for this site include:

- Stabilize areas of erosion/slumping on shoreline banks and install sediment/erosion control devices;
- Regrade the ground surface to prevent direct discharge of surface water into the river;
- Create or improve detention ponds for filtering runoff; and,
- Discontinue active use of buffer areas and replant to a minimum of 25 feet, and up to as wide as the landowner will allow.

Common Sources or Indicators of Degradation

By far the most common problem observed in the Lower Kennebec River Estuary was the lack of adequate riparian buffer. The most common cause (or source) of this problem was land clearing for residential uses, such as for maintained lawns and viewsheds. Addressing the causes of land clearing would help to improve the long-term health of the Lower Kennebec River Estuary. In addition, costs associated with improving buffer coverage can be minor and may simply involve educating and working with landowners to remove a portion of the riparian area from active use. Based on documented trends in land clearing in the nearby Presumpscot Watershed, if left unchecked the trend in forest loss adjacent to waterbodies is likely to continue throughout developed areas of Maine (CBEP 1996). As such, measures to promote high-quality habitat in the Lower Kennebec River Estuary should include the following:

- Land preservation;
- Work with existing landowners to minimize activities that degrade buffers;
- Initiate community activities and landowner outreach programs that assist landowners with improving buffer conditions; and,
- Enforcement of rules and regulations imposed to restrict activities that degrade buffers.

Fringing Salt Marshes

As specified in Section 1.1, the secondary objective for the Lower Kennebec River Estuary was to identify fringing salt marshes in the study area. One hundred seventy one (171) fringing salt

marsh parcels were identified and mapped during the HRI. In addition, 16 salt marsh areas were identified and mapped that were not included on the National Wetlands Inventory mapping of wetlands in the area. These fringing salt marsh and salt marsh areas can be seen on the Lower Kennebec River Estuary figures in Appendix C. These figures have been printed at a scale at which the small fringing salt marsh polygons can be seen. Also, a table with the geographic coordinates of the approximate center of the fringing salt marsh and newly identified salt marsh polygons has been included at the end of Appendix C.

4.0 RECOMMENDATIONS

4.1 WATERSHED SPECIFIC RECOMMENDATIONS

Specific recommendations for each waterbody are provided below. Also, Table 8 provides a summary of the HRI results by waterbody.

4.1.1 Recommendations for Spruce Creek

Restoration of some portion of a structurally diverse vegetated buffer adjacent to Spruce Creek has the potential to greatly improve habitat conditions and water quality. Accordingly, one recommendation is to focus on educating the public and adjacent landowners on the value of a high quality vegetated riparian buffer in terms of habitat, water quality improvement, and soil stabilization. By teaching landowner's of the impacts on the waterbody, on an individual and collective scale, of an action as simple as mowing or not mowing to the top of the banks, landowners may be willing to take an active role in improving the buffer conditions on their property. Road crossings, another area of minor potential improvement in terms of habitat, are not areas where complete buffer restoration is feasible. However planting some low growing shrubs may provide additional stabilization, aid in erosion control, and increase habitat value without losing the views and aesthetic qualities that these bridges provide.

Common reed (*Phragmites australis*) presently is a minor problem in Spruce Creek, but should be addressed as soon as possible so that it does not become a more significant issue. Japanese knotweed also is present near the high density commercially developed areas along Route 1. The earlier that control, or preferably eradication, of these invasive species is performed, the better the potential for limiting future domination by these species.

4.1.2 Recommendations for Royal River

Similar to Spruce Creek, the most frequently observed degraded condition along the Royal River was an inadequate vegetated buffer. Accordingly, there is the potential for substantial water quality and habitat improvements in the watershed through landowner enacted buffer enhancement and restoration, following a public education program, as recommended for Spruce Creek. Riparian buffers at marinas in the estuarine portion of the river could easily be improved by limiting mowing to designated "use" areas, and allowing natural revegetation of designated "non-use" areas. Additionally, planting desirable herbaceous plants and low growing shrubs would enhance buffer habitat for wildlife without compromising the view and aesthetic value of the coastal areas.

The two dams on the Royal River are significant alterations to natural flow, and additional studies are recommended to explore the cost and benefit of breaching these dams. Although fish ladders are in place at both dams, additional maintenance of these structures is recommended, especially during high fish migration periods.

Non-point sources of degradation in the watershed are contributing to reduced water quality and impaired habitat. Sites such as the Morin Brick Company can have substantial negative impacts

Table 8. Summary of Restoration Inventory by Waterbody.

	Spruce Creek	Royal River	Lower Kennebec River Estuary
Total number of degraded sites per waterbody	90	107	133
Percent of shoreline in need of restoration	19.7%	12.4%	13.4%
Percent of sites per waterbody with degradation scores > 3.0	6%	9%	2%
Percent of sites per waterbody with inadequate buffer	76%	64%	83%
Most common sources of riparian buffer degradation	Land clearing associated with agricultural and residential development	Eroding banks / Land clearing: both associated with agricultural and residential land uses, and poorly maintained right-of-ways	Land clearing associated with residential development

on the river. FRR is already aware of and actively pursuing means of identifying and reducing non-point source pollution, and improving overall water quality in the river. It is recommended that the degraded buffer, erosion, and pollutant loading issues at the Morin Brick Company site be addressed immediately, before any further insults on the river can be incurred.

Also a critical focus on the Royal River is the control and eradication of invasive species. Both Japanese knotweed and common reed are present in the watershed. Currently Japanese knotweed is limited to a handful of small stands. However if left untreated, it could replace native vegetation on the river banks, resulting in reduced habitat value for wildlife, and lost scenic value of the river. Common reed is present in the estuary in several areas. To prevent continued spread in the Royal River estuary, and possibly transfer of viable seeds to other areas outside of this watershed, it is recommended that common reed be treated with an herbicide or mechanically removed to minimize further spreading and loss of salt marsh habitat.

4.1.3 Recommendations for Lower Kennebec River Estuary

In the Lower Kennebec River Estuary study area, the greatest area of potential improvement is restoration of a structurally diverse, vegetated riparian buffer around the entire perimeter of the estuary. As with both the Spruce Creek and Royal River study areas, there are substantial opportunities, with the assistance of landowners on the estuary, to enhance the buffer zone through natural revegetation or planting of as wide a buffer zone as the landowner will allow.

The first step in restoring the buffer is educating the landowners living adjacent to waterbody, and to salt marshes and fringing salt marshes, of the value of a high quality vegetated riparian buffer in terms of habitat, water quality improvement, and soil stabilization.

Buffer improvements, coupled with directed restoration action focused on major industrial and commercial properties, such as the Bath Iron Works site and the quarry site in Georgetown, would have substantial improvements in the watershed. The second recommendation for the Kennebec study area, therefore, is to focus attention on improving habitat conditions at the Bath Iron Works and quarry sites.

Additionally, culvert improvements and restoration of full tidal flow at the 13 impaired culvert locations identified in the study area have the potential to restore natural hydrologic conditions to large areas of salt marsh. Although the issues, in terms of overtly degraded conditions or propagation of invasive species, are fairly minor at this point, impaired hydrologic conditions at these sites has the potential to result in long-term changes in the composition and structure of the salt marsh communities upstream.

4.2 GENERAL WATERSHED RECOMMENDATIONS

Notable widespread issues identified during this survey include the following:

4.2.1 Inadequate Riparian Buffers

As documented in this report, the lack of adequate riparian buffers is the most common restoration need in the three study areas, and therefore this is where the greatest opportunity for improvement exists, particularly in areas where inadequate buffers abut large agricultural areas, and residential areas. Significant improvements could be achieved even through passive methods such as allowing natural regrowth of woody vegetation within openings that occur within the 250-foot buffer. Costs associated with improving buffer coverage can be minor and may simply involve working with landowners to remove a portion of the riparian area from active use.

4.2.2 Invasive Species

Invasive species such as Japanese knotweed and common reed are present in both the Spruce Creek and Royal River study areas, but are not dominant in any portions. Numerous management options are available, however, the tradeoffs between cost, likelihood of success, and potential impacts to desirable species as a result of management activities must be carefully considered when selecting a management strategy. The species composition, extent of coverage, change in the extent of coverage over time, and an assessment of any negative impacts to other communities and wildlife from the invasive species, should be carefully evaluated prior to implementing management strategies, particularly those strategies that may broadly affect other species and communities. Restoration options may include removal of root stock, burning, cutting, herbicide application, and/or the use of biological controls.

4.2.3 Erosion, Undercutting and Root Exposure

These issues are present at various locations in all three study areas, but the most significant occurrences are in the Royal River study area. In general, it is difficult to evaluate if erosion observed is occurring at a rate that is above that which occurs “naturally”, especially when this study involves assessment at only a single point in time. Most likely, land development and land clearing in the watershed resulted in somewhat higher pulses of runoff and flow in the river, resulting in increased rate of undercutting and channel migration. However, a more intensive, watershed-scale study would be required to make determinations about natural versus unnatural causes of bank instability.

4.2.4 Undersized or Elevated Culverts

In the Lower Kennebec River Estuary study area, undersized or elevated culverts are an issue on many of the smaller secondary roads crossing salt marshes and tributaries. Undersized culverts that restrict flow, or culverts that are set too high, can result in the creation of freshwater impoundments and prevent the normal, twice daily tidal exchange that recharges salinity levels and water quality, changing community composition and structure behind the culverts over time. Without frequent tidal flushing, impacts to salt marsh sediments can also create opportunities for invasive species such as common reed to take hold. Although common reed was only identified in two locations in the Kennebec study area, there is potential for additional problems on the vast, expansive salt marshes in the area.

4.2.5 Summary of Waterbody Issues and Opportunities

Overall, the sites identified in this inventory were not substantially degraded. Most sites had degradation scores below 5.0, or even below 2.0, out of a possible score of 14.0. However, the number of sites identified, albeit with fairly low-level degradation issues, indicate that there is a great potential for numerous small changes in the watershed that would result in substantial improvements in water quality, habitat and ecosystem health.

One caveat, before providing overall recommendations based on the results of this HRI, is that the specific goals of a particular “restorer” may vary widely. For example, a town may want to concentrate on restoration projects at public access points, and an ATV club may want to concentrate on sites with ATV issues. Considering that, the “best” or “recommended” restoration sites may depend on who is doing the restoration. However, the database accompanying this report will allow the user to query the restoration site inventory based on a number of factors to identify those sites that meet the potential restorers criteria.

Some overall recommendations include the following:

- Focus on those few sites that are the most severely degraded (i.e., the highest degradation scores). These sites would potentially provide the greatest opportunity for restoration at a single site.

- Address the most common sources of degradation. Overwhelmingly, the most common source of degradation was land cleared, resulting in loss of undisturbed vegetated riparian buffer zone. Other common sources of degradation depended on the watershed, but included land use activity that is a potential nutrient/pollution source and problematic docks/piers/jetties.
- Educate the public and adjacent landowners of the importance of maintaining undisturbed vegetated riparian buffers. The buffer issue in particular may be attacked on a broad scale, throughout the watershed, via education, rather than on a case by case basis. Most of the potential restoration sites occur on privately owned land, and by raising public awareness of the value of maintaining intact vegetated buffers, there could be significant improvements without major expensive restoration projects.
- Address invasive species issues now, while they are relatively small in scale in the watersheds. The two invasive plant species of concern are common reed and Japanese knotweed. Of particular interest are two moderate sized, homogenous patches of common reed in the estuarine portion of the Royal River watershed, and several smaller patches. Also, Japanese knotweed is frequently found along roadsides and stream banks, and will spread rapidly and out-compete native species if left unchecked. It is recommended that invasive species issues be addressed now, while they are relatively small problems, which can mostly be addressed with hand tools or manually applied herbicide.
- Continue the work already initiated by local interest groups to improve water quality and habitat conditions in these areas. Active local groups and partnerships with local and state agency personnel foster local pride in achieving improvements in their watershed and encourage continued restoration activities with potential for broad positive changes.
- Identify potential restoration sites in other areas and watersheds. Watershed-scale restoration efforts and information transfer could lead to improvements on a regional basis, through education and raising awareness. The ultimate goal would be to bring about substantial improvements in the value of fish and wildlife habitat in the region.

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RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-001

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2719

Y Coordinate (Latitude): 44.01494

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



No Map



No Picture



Description of Site:

Old Danville Road crossing. Bridge is constricting stream flow thus causing turbulence. Bridge support concrete is worn in some places. Although banks near bridge have been reinforced with rock bundles, cement, and/or rock, some portions appear unstable. Site also includes the generally stable nearby boat launch and rope swing area (20-feet long by 2 to 3-

Description of Surrounding Land Use and Habitats:

Agriculture, commercial, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize banks of road. Plant herbs and shrubs enhance and speed restoration especially within the southeast quadrant. Stabilize path to water to minimize erosion.

Sources of Degradation (13 possible): Impervious surface, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 5

Total Degradation Score (higher score indicates a higher level of degradation): 2.10

Likely Project Cost: Low-Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, hard structure stabilization, and mobilization/demobilization.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-002

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2714

Y Coordinate (Latitude): 44.01516

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Very steep, actively eroding bank on opposite shore from RR-001. Site is ~30-feet tall and 50 to 75-feet wide, and consists of silt and sand, with exceptionally loose material across the lower 20-foot swath. Trees on the adjacent bank are severely undercut. Bank damage does not appear to be due to river flood stage. Observe substantial downstream deposition of sand

Description of Surrounding Land Use and Habitats:

Agriculture, commercial, low-density residential.

Description of Restoration Recommendations for the Site:

Pull back/excavate bank slope into adjacent field, stabilize bank and plant herbs and shrubs.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.75

Likely Project Cost: Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil/fill removal, biostabilization/erosion sediment control, minor grading, construction access, and mobilization/demobilization.

Description of Challenges to Restoration:

Fill removal may be costly due to steep slopes and site access.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-003

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2694

Y Coordinate (Latitude): 44.01353

Waterbody: Royal River

Size of Restoration Area (linear feet) 250

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow, low quality buffer. Existing shrubs and herbs are good, however more plantings are desirable.

Description of Surrounding Land Use and Habitats:

Agriculture, commercial, low-density residential.

Description of Restoration Recommendations for the Site:

Enhance buffer with natural revegetation with native species, or plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.35

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-004

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2681

Y Coordinate (Latitude): 44.01344

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer of herbs to top of bank, then mowed lawn. No overstory vegetation. Eroding bank (10-foot high by 100-foot wide), vegetated in part with Japanese knotweed.

Description of Surrounding Land Use and Habitats:

Agriculture, commercial, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize banks. Enhance buffer with natural revegetation with native species, or plant herbs and shrubs enhance and speed restoration. Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species, Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.30

Likely Project Cost: Low-Moderate
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, invasive species control, biostabilization/erosion sediment control, and construction access.

Description of Challenges to Restoration:

Access along river may be challenging. Approximately 100-feet of river bank needing stabilization. May require multiple treatments to fully eradicate Japanese knotweed.

Restoration Type: Buffer, Invasive Species Removal, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-005

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2676

Y Coordinate (Latitude): 44.0129

Waterbody: Royal River

Size of Restoration Area (linear feet) 10

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand, approximately 75 x 10 feet.

Description of Surrounding Land Use and Habitats:

Forested, commercial.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.30

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-005A

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2664

Y Coordinate (Latitude): 44.01384

Waterbody: Royal River

Size of Restoration Area (linear feet) 10

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



No Map



No Picture



Description of Site:

Japanese knotweed stand, approximately 10 x 6 feet.

Description of Surrounding Land Use and Habitats:

Forested, commercial.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.10

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require long term management and multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-005B

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2642

Y Coordinate (Latitude): 44.01327

Waterbody: Royal River

Size of Restoration Area (linear feet) 75

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand, approximately 75 x 10 feet.

Description of Surrounding Land Use and Habitats:

Forested, commercial.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.30

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-005C

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2638

Y Coordinate (Latitude): 44.01273

Waterbody: Royal River

Size of Restoration Area (linear feet) 40

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand, approximately 40 x 10 feet.

Description of Surrounding Land Use and Habitats:

Forested, commercial.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.20

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-005D

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2627

Y Coordinate (Latitude): 44.00262

Waterbody: Royal River

Size of Restoration Area (linear feet) 20

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand, approximately 20 x 6 feet.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.20

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-005E

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2672

Y Coordinate (Latitude): 43.98601

Waterbody: Royal River

Size of Restoration Area (linear feet) 50

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand, approximately 50 x 10 feet. Tributary with high turbidity dumping into river.

Description of Surrounding Land Use and Habitats:

Forested, agricultural.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Drainage issue, Invasive plant species

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.75

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews. Results of investigation of water turbidity may impact cost.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate. Identifying source of turbidity.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Investigate source of turbidity in tributary.

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-005F

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2668

Y Coordinate (Latitude): 43.98513

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Trash/debris/old cars dumped on one side of the bank. Japanese knotweed along 75 foot section, and bank erosion along 25 foot section of other bank.

Description of Surrounding Land Use and Habitats:

Forested, agricultural.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed. Remove trash/debris/old cars and stabilize eroding bank.

Sources of Degradation (13 possible): Fill/debris/trash, Invasive plant species, Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 0.65

Likely Project Cost: Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, long term management and control of invasive species. Heavy equipment required.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate. Heavy equipment may be needed to remove cars. Potential hazardous material (i.e., oil and gas) removal.

Restoration Type: Invasive Species Removal, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-005G

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2352

Y Coordinate (Latitude): 43.86182

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed approximately 100 x 20 feet.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.50

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-005H

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2308

Y Coordinate (Latitude): 43.86267

Waterbody: Royal River

Size of Restoration Area (linear feet) 40

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand 40 x 15 feet.

Description of Surrounding Land Use and Habitats:

Forested, agricultural.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.25

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-0051

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2243

Y Coordinate (Latitude): 43.85887

Waterbody: Royal River

Size of Restoration Area (linear feet) 75

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand, approximately 10 x 75 feet.

Description of Surrounding Land Use and Habitats:

Agricultural, forested.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Agricultural Field, Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-005J

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1904

Y Coordinate (Latitude): 43.8072

Waterbody: Royal River

Size of Restoration Area (linear feet) 60

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand, approximately 10 x 60 feet located on north side of East Elm Street, Yarmouth.

Description of Surrounding Land Use and Habitats:

Commercial, medium-density residential.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.25

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government, Nonprofit, Public

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-005K

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1892

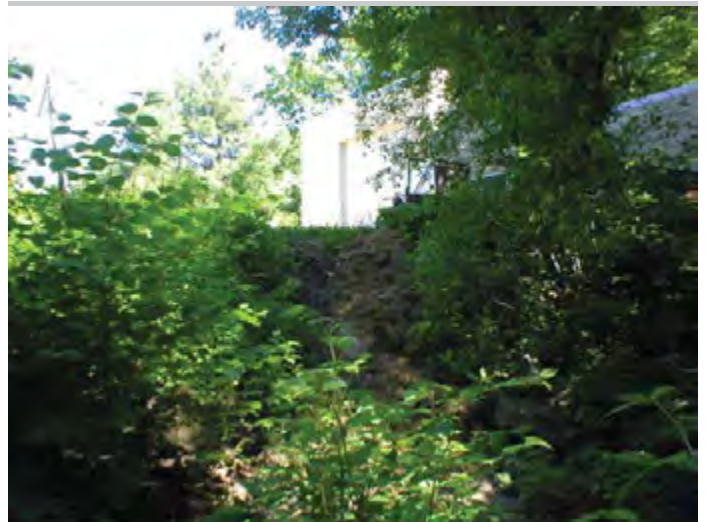
Y Coordinate (Latitude): 43.80624

Waterbody: Royal River

Size of Restoration Area (linear feet) 40

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand on west bank of the Royal River, approximately 15 x 40 feet. Dumped lawn clippings and debris impeding natural vegetation growth behind town park maintenance buildings.

Description of Surrounding Land Use and Habitats:

Public park, medium-density residential.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed. Find alternative location for dumping of lawn waste.

Sources of Degradation (13 possible): Fill/debris/trash, Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.50

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-005L

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1806

Y Coordinate (Latitude): 43.8012

Waterbody: Royal River

Size of Restoration Area (linear feet) 60

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand, approximately 6 x 60 feet. Lack of adequate buffer between dirt parking lot and river.

Description of Surrounding Land Use and Habitats:

Commercial, medium-density residential.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed. Enhance buffer with natural revegetation with native species, or plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Invasive plant species, Land cleared

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 1.20

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate. Room for only minor buffer restoration.

Restoration Type: Buffer, Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-005M

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1783

Y Coordinate (Latitude): 43.7981

Waterbody: Royal River

Size of Restoration Area (linear feet) 75

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Japanese knotweed stand along road edge, approximately 75 x 15 feet. Lack of adequate buffer (herb/ shrub) along southeast side of road way.

Description of Surrounding Land Use and Habitats:

Medium-density commercial, residential.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed. Plant herbs and shrubs enhance and speed restoration along roadside.

Sources of Degradation (13 possible): Invasive plant species, Land cleared

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.65

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate. Room for only minor buffer restoration. Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-006

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.267

Y Coordinate (Latitude): 44.01328

Waterbody: Royal River

Size of Restoration Area (linear feet) 80

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Browning Crossing Road bridge. Majority of stream flow on east side. Constriction is not a real issue. At high flow, water would flow on both sides of central cement block. Banks are generally stable with some rip-rap rocks placed. Some erosion on west side banks.

Description of Surrounding Land Use and Habitats:

Forested, commercial.

Description of Restoration Recommendations for the Site:

Minor stabilization of banks.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.30

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, and mobilization/demobilization.

Description of Challenges to Restoration:

No obvious limitations.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-007

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2661

Y Coordinate (Latitude): 44.01448

Waterbody: Royal River

Size of Restoration Area (linear feet) 400

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Morin Brick Company property consists of a mix of stable and eroded bank areas. Stable banks consist of placed stone and/or discarded brick. Unstable areas generally have denuded vegetation, loose soil and erosion, undercut banks, sediment loading in water, and turbid water inputs. Native vegetation impaired in most areas.

Description of Surrounding Land Use and Habitats:

Commercial, forested.

Description of Restoration Recommendations for the Site:

Stabilize eroding areas. Increase buffer zone to as wide as landowner will allow, plant herbs, shrubs and/or trees for additional habitat and stabilization. Create a settling basin for runoff to settle out contaminants prior to entering river.

Sources of Degradation (13 possible): Land cleared, Land use activity a potential contaminant source, Unstable bank

Number of Degradation Indicators Observed (13 possible): 6

Total Degradation Score (higher score indicates a higher level of degradation): 5.50

Likely Project Cost: High

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/ landscaping, biostabilization/erosion control, minor grading, modify areas of runoff, construct storm water mgmt device, construction access, mob/demob, maintenance, hydrologic/engineering desgin, and topo surveys.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Tributary that is believed to drain Morin Brick Company property enters Royal River about 300 feet downstream of the most significantly impacted area. Water is extremely turbid.

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-007A

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2671

Y Coordinate (Latitude): 44.0139

Waterbody: Royal River

Size of Restoration Area (linear feet) 150

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Severely eroding bank and substantial tree loss. Bare soil on banks with minimal buffer between river and Morin Brick Company parking area.

Description of Surrounding Land Use and Habitats:

Commercial, forested.

Description of Restoration Recommendations for the Site:

Stabilize banks. Increase buffer zone to as wide as landowner will allow, plant herbs, shrubs and/or trees for additional habitat and stabilization.

Sources of Degradation (13 possible): Impervious surface, Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 2.00

Likely Project Cost: Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, minor/major grading, construction access, and mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-008

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2604

Y Coordinate (Latitude): 44.00615

Waterbody: Royal River

Size of Restoration Area (linear feet) 94

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Bridge road crossing with associated rock support structure. Orientation of bridge has redirected the stream flow into an unnatural direction, thus causing a localized constriction and downstream erosion bank area. The bridge itself is unused and in poor condition.

Description of Surrounding Land Use and Habitats:

Commercial, forested.

Description of Restoration Recommendations for the Site:

Option 1: Stabilize banks around the bridge, plant additional vegetation. Option 2: Repair/replace/remove bridge and realign river.

Sources of Degradation (13 possible): Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 5

Total Degradation Score (higher score indicates a higher level of degradation): 2.50

Likely Project Cost: Low-Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, hard structure stabilization, minor grading, impervious surface removal, and mobilization/demobilization. Bridge removal/realignment costs would be higher.

Description of Challenges to Restoration:

No obvious limitations.

Restoration Type: Structural

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-009

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2592

Y Coordinate (Latitude): 44.00369

Waterbody: Royal River

Size of Restoration Area (linear feet) 195

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Active gravel pit adjacent to river. Narrow buffer vegetated to top of slope, then gravel pit operations. Steep slope (approx. 45-degree), and 25-feet high. Some minor erosion noted on outside bend in channel, which may be partially due to natural causes.

Description of Surrounding Land Use and Habitats:

Forested, commercial.

Description of Restoration Recommendations for the Site:

Stabilize banks and increase width of buffer as wide as landowner will allow. May require pulling back banks to properly stabilize. Plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 1.10

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, and mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

If banks are not stabilized, river bank erosion will eventually undermine areas of gravel pit operations and increase sediment load in river.

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-010

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2624

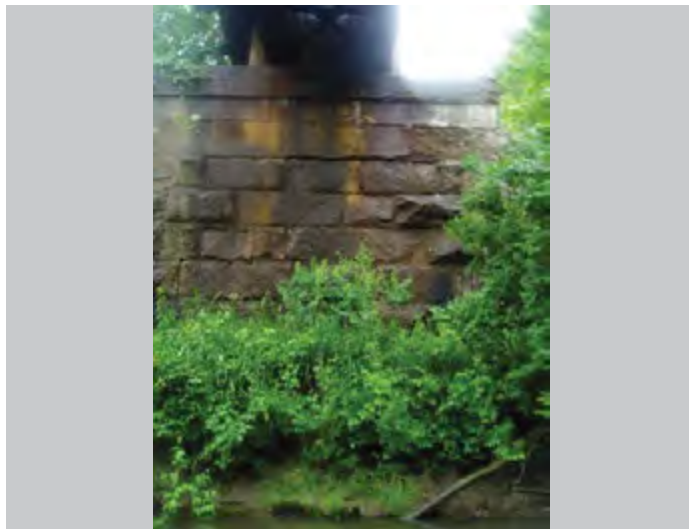
Y Coordinate (Latitude): 44.01267

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad bridge crossing. Banks stable, no erosion; banks held in place with placed, cut stone. Banks well vegetated with herbs, shrubs, and trees, except for maintained ROW. Not a constriction.

Description of Surrounding Land Use and Habitats:

Forested, commercial.

Description of Restoration Recommendations for the Site:

Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow. Install fabric liner under railroad tracks catch debris from railroad.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost consideration include: maintenance.

Description of Challenges to Restoration:

Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-010A

Site Location: State: ME, County: Cumberland, Town: Gray

X Coordinate (Longitude): -70.2736

Y Coordinate (Latitude): 43.90411

Waterbody: Royal River

Size of Restoration Area (linear feet) 300

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Rock culvert at railroad tracks has minor erosion noted around top and sides of culvert. Railroad bed may eventually need stabilization. Buffer is high quality but narrow (60 feet); maintained within 20 feet of railroad line.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Stabilize eroding areas. Enhance buffer with natural revegetation with native species, or plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Culvert issue, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 0.65

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/landscaping, biostabilization/erosion control measures, minor grading.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. Access may be an issue. Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-010B

Site Location: State: ME, County: Cumberland, Town: Gray

X Coordinate (Longitude): -70.2734

Y Coordinate (Latitude): 43.89923

Waterbody: Royal River

Size of Restoration Area (linear feet) 150

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad bridge crossing. Fabric liner under railroad tracks catch debris from railroad. Minor erosion, lack of vegetation under bridge. Bridge foundations have some minor effect on flow. Maintained buffer along railroad ROW.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Stabilize erosion. Plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.45

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/ landscaping, biostabilization/ erosion control measure, minor grading, mobilization/demobilization.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. Access may be an issue. Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-010C

Site Location: State: ME, County: Cumberland, Town: Gray

X Coordinate (Longitude): -70.2787

Y Coordinate (Latitude): 43.88495

Waterbody: Royal River

Size of Restoration Area (linear feet) 150

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad bridge crossing. Some sediment accumulating under bridge; foundation is constricting flow slightly. Banks held in place with stone wall. Otherwise, banks well vegetated and stable.

Description of Surrounding Land Use and Habitats:

Forested, agriculture.

Description of Restoration Recommendations for the Site:

Option 1: Address sediment loading issue. Install fabric liner under railroad tracks catch debris from railroad. Redistribute sediment where built-up. Option 2: Widen bridge opening to restore more natural channel.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 1.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: mobilization/demobilization, maintenance. Bridge widening would be substantially more expensive.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. Access may be an issue. Room for only minor buffer restoration due to active ROW.

Restoration Type: In-stream, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-010D

Site Location: State: ME, County: Cumberland, Town: Gray

X Coordinate (Longitude): -70.2784

Y Coordinate (Latitude): 43.88139

Waterbody: Royal River

Size of Restoration Area (linear feet) 700

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Eroding shoreline adjacent to railroad tracks. Erosion cutting toward railroad tracks and bank may eventually need significant stabilization. Narrow, maintained buffer between railroad tracks and river.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Stabilize erosion. Plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.50

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: Planting/landscaping, soil stabilization erosion control, minor grading, construction access, mobilization/demobilization.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. Access may be an issue. Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-011

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.2620

Y Coordinate (Latitude): 44.01282

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad bridge crossing. Banks stable, no erosion; banks held in place with placed, cut stone. Banks well vegetated with herbs, shrubs, and trees, except for maintained ROW. Not a constriction.

Description of Surrounding Land Use and Habitats:

Forested, commercial.

Description of Restoration Recommendations for the Site:

Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow. Install fabric liner under railroad tracks catch debris from railroad.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost consideration include: maintenance.

Description of Challenges to Restoration:

Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-011A

Site Location: State: ME, County: Androscoggin, Town: Auburn

X Coordinate (Longitude): -70.263

Y Coordinate (Latitude): 44.00283

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad Right-of-way (ROW) maintained through cutting back of vegetation. Banks stable, not eroding. Lack of buffer is only issue. Shrubs and herbs, few trees.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.35

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost consideration include: maintenance.

Description of Challenges to Restoration:

Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-011B

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2667

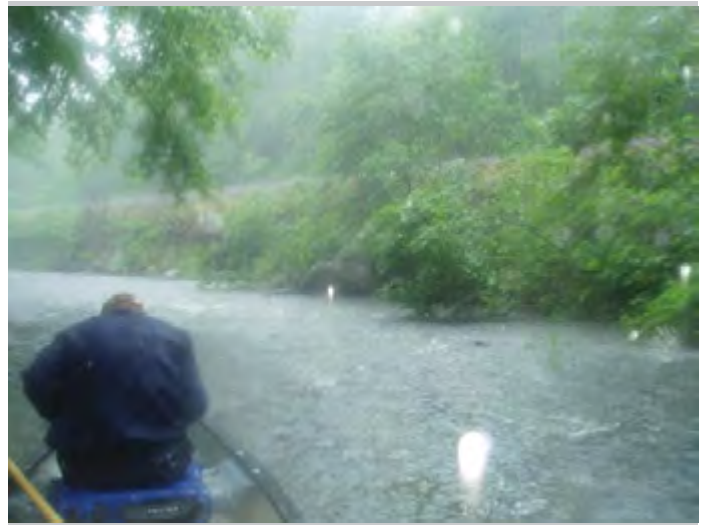
Y Coordinate (Latitude): 43.99939

Waterbody: Royal River

Size of Restoration Area (linear feet) 225

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad ROW maintained through cutting back of vegetation. Banks steep, but stable, not eroding. Lack of buffer is only issue.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.60

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost consideration include: maintenance.

Description of Challenges to Restoration:

Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-011C

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2686

Y Coordinate (Latitude): 43.99348

Waterbody: Royal River

Size of Restoration Area (linear feet) 500

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad ROW maintained through cutting back of vegetation. Banks stable, not eroding. Placed, cut rock walls stabilize railroad bed, but also impede vegetation growth. Shrub and herb growth dense, despite cutting.

Description of Surrounding Land Use and Habitats:

Forested, agricultural.

Description of Restoration Recommendations for the Site:

Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 2.25

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost consideration include: maintenance.

Description of Challenges to Restoration:

Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-011D

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2692

Y Coordinate (Latitude): 43.98807

Waterbody: Royal River

Size of Restoration Area (linear feet) 750

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad ROW maintained through cutting back of vegetation. Banks stable, not eroding. Well vegetated with shrubs and herbs.

Description of Surrounding Land Use and Habitats:

Forested, low density agricultural.

Description of Restoration Recommendations for the Site:

Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.45

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost consideration include: maintenance.

Description of Challenges to Restoration:

Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-011E

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2677

Y Coordinate (Latitude): 43.98477

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad bridge crossing. ROW maintained through cutting back of vegetation. Banks stable, not eroding. Sediment deposition under bridge, with herbs revegetating in places. Banks stabilized with placed, cut rock.

Description of Surrounding Land Use and Habitats:

Forested, agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize deposited sediment. Plant herbs and shrubs enhance and speed restoration. Install fabric liner under railroad tracks catch debris from railroad.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 5

Total Degradation Score (higher score indicates a higher level of degradation): 1.60

Likely Project Cost: Low-Moderate COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil stabilization erosion control, minor grading, construction access, and mobilization/demobilization.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. Access may be an issue. Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer, In-stream, Shoreline Bank

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-011F

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2639

Y Coordinate (Latitude): 43.97826

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad bridge crossing. ROW maintained through cutting back of vegetation. Sediment accumulation under bridge. Banks stable, placed, cut rock wall foundation.

Description of Surrounding Land Use and Habitats:

Forested, agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize deposited sediment, plant herbs and shrubs to enhance restoration. Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow. Install fabric liner under railroad tracks catch debris.

Sources of Degradation (13 possible): Land cleared, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 5

Total Degradation Score (higher score indicates a higher level of degradation): 1.70

Likely Project Cost: Low-Moderate
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/landscaping, soil stabilization erosion control, minor grading, construction access, and mobilization/demobilization.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. Access may be an issue. Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer, In-stream, Shoreline Bank

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-011G

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2621

Y Coordinate (Latitude): 43.97459

Waterbody: Royal River

Size of Restoration Area (linear feet) 300

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad ROW maintained through cutting back of vegetation. Banks stable, not eroding. Narrow buffer (less than 10 feet) of herbs and shrubs.

Description of Surrounding Land Use and Habitats:

Forested, agricultural.

Description of Restoration Recommendations for the Site:

Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.60

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost consideration include: maintenance.

Description of Challenges to Restoration:

Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-011H

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2617

Y Coordinate (Latitude): 43.97222

Waterbody: Royal River

Size of Restoration Area (linear feet) 75

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad bridge crossing. ROW maintained through cutting back of vegetation. Banks stable, not eroding, with placed, cut rock foundation. Sediment deposition under bridge. Slight constriction of waterflow.

Description of Surrounding Land Use and Habitats:

Forested, agricultural.

Description of Restoration Recommendations for the Site:

Stabilize deposited sediment. Plant herbs and shrubs enhance restoration. Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow. Install fabric liner under railroad tracks catch debris.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 5

Total Degradation Score (higher score indicates a higher level of degradation): 1.00

Likely Project Cost: Low-Moderate
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/landscaping, soil stabilization/erosion control measures, minor grading, construction access, and mobilization/demobilization.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. Access may be an issue. Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer, In-stream, Shoreline Bank

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-0111

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1914

Y Coordinate (Latitude): 43.80737

Waterbody: Royal River

Size of Restoration Area (linear feet) 150

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Railroad bridge crossing. ROW maintained through cutting back of vegetation. Placed, cut rock foundation.

Description of Surrounding Land Use and Habitats:

Forested, agricultural.

Description of Restoration Recommendations for the Site:

Minimize mowing and cutting and allow natural revegetation of buffer as wide as railroad company will allow. Install fabric liner under railroad tracks catch debris from railroad.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.15

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost consideration include: maintenance.

Description of Challenges to Restoration:

Room for only minor buffer restoration due to active ROW.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry, Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-012

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2674

Y Coordinate (Latitude): 43.98189

Waterbody: Royal River

Size of Restoration Area (linear feet) 640

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Buffer issue. Lack of shrubs and trees along river banks. Old pole leaning toward river.

Description of Surrounding Land Use and Habitats:

Forested, agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Restore/improve habitat with addition of shrubs and trees.

Sources of Degradation (13 possible): Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.95

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping and mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner. Access may be an issue due to location between two railroad corridors.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-013

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2653

Y Coordinate (Latitude): 43.98004

Waterbody: Royal River

Size of Restoration Area (linear feet) 173

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Cobbs Bridge Rd crossing. Cement bridge is a slight constriction of river. Banks are stable, not eroding. Buffer predominately herbs.

Description of Surrounding Land Use and Habitats:

Forested, agriculture, low-density residential

Description of Restoration Recommendations for the Site:

Restore/improve habitat with addition of shrubs and trees.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad)

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 0.80

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping and mobilization/demobilization.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-014

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2653

Y Coordinate (Latitude): 43.97893

Waterbody: Royal River

Size of Restoration Area (linear feet) 1000

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Appears to be a fallow farm, situated between the river and railroad. Vegetation comprised of milkweed and other early successional species.

Description of Surrounding Land Use and Habitats:

Forested, agriculture, low-density residential

Description of Restoration Recommendations for the Site:

Restore/improve habitat with addition of shrubs and trees.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.75

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping and mobilization/demobilization.

Description of Challenges to Restoration:

Access may be an issue due to location between river and railroad line.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s):

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-015

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2620

Y Coordinate (Latitude): 43.97126

Waterbody: Royal River

Size of Restoration Area (linear feet) 1828

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Buffer issue. Buffer comprised of herbs with few shrubs, eroding in places, but not necessarily unnaturally.

Description of Surrounding Land Use and Habitats:

Agriculture, forested.

Description of Restoration Recommendations for the Site:

Restore/improve habitat with addition of shrubs and trees.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.85

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping and mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-016

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2639

Y Coordinate (Latitude): 43.96659

Waterbody: Royal River

Size of Restoration Area (linear feet) 4000

Date of Field Assessment: 7/9/2005

Date of Last File Update: 8/12/2005



Description of Site:

Tree farm with no real shrub/tree buffer - herbs only. Base of banks are stabilized with coir/coconut fiber matting on outside bank corners for approximately 700-feet in length.

Description of Surrounding Land Use and Habitats:

Forested, agriculture

Description of Restoration Recommendations for the Site:

Restore/improve habitat with addition of shrubs and trees.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.75

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping and mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-017

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2673

Y Coordinate (Latitude): 43.9554

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Highway 231/Intervale Rd crossing. Banks are generally stable and vegetated. Area under bridge is also stable with rip-rap on banks. Bridge causes a slight localized constriction and increased stream flow. Japanese-knotweed present at the top-of-bank adjacent to the road.

Description of Surrounding Land Use and Habitats:

Forested, agriculture.

Description of Restoration Recommendations for the Site:

Spot treat with herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Invasive plant species, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 0.85

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, and possible long-term maintenance. Affected area is small and easily accessible by hand crews.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-018

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2668

Y Coordinate (Latitude): 43.95155

Waterbody: Royal River

Size of Restoration Area (linear feet) 4000

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer of herbs, shrubs, and few trees, then agriculture. Steep banks (approx. 75% slope) are marginally vegetated leaving exposed ground, erosion, and slumping areas.

Description of Surrounding Land Use and Habitats:

Forested, agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Increase buffer zone to a minimum of 25 feet throughout farm, plant shrubs and/ or trees for additional habitat and stabilization.

Sources of Degradation (13 possible): Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 1.30

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-019

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2639

Y Coordinate (Latitude): 43.94864

Waterbody: Royal River

Size of Restoration Area (linear feet) 500

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Inadequate buffer. Steep banks (approx. 50 to 75% slopes) have marginal vegetation with few trees, thus leaving exposed ground and slumping areas.

Description of Surrounding Land Use and Habitats:

Agriculture, forested.

Description of Restoration Recommendations for the Site:

Increase buffer zone to a minimum of 25 feet throughout farm, plant shrubs and/ or trees for additional habitat and stabilization.

Sources of Degradation (13 possible): Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.80

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil stabilization erosion control, and mobilization/demobilization. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s):

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-019A

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2624

Y Coordinate (Latitude): 43.94638

Waterbody: Royal River

Size of Restoration Area (linear feet) 800

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Minor erosion of shoreline. Some sediment loading has occurred as a result. Area has an inadequate buffer mostly of dense herbs.

Description of Surrounding Land Use and Habitats:

Forested, agriculture.

Description of Restoration Recommendations for the Site:

Stabilize erosion. Increase buffer zone to a minimum of 25 feet throughout farm, plant shrubs and/ or trees for additional habitat and stabilization.

Sources of Degradation (13 possible): Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 1.25

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/landscaping, soil stabilization/erosion control, minor grading, mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-020

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2639

Y Coordinate (Latitude): 43.94114

Waterbody: Royal River

Size of Restoration Area (linear feet) 75

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Pipeline right-of-way. Mostly dense vegetation cover of herbs only. Some minor exposed ground and erosion near water's edge, possibly due to animal trails. Banks approximately 5-foot high with slopes of about 25 to 50%.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Stabilize exposed areas and enhance buffer zone with shrub plantings.

Sources of Degradation (13 possible): Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.80

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping.

Description of Challenges to Restoration:

Access may be an issue.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-021

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2627

Y Coordinate (Latitude): 43.93603

Waterbody: Royal River

Size of Restoration Area (linear feet) 1140

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer (10 feet) of herbs, shrubs, and few trees, then open field. Bank slopes are steep, ranging from approximately 50 to 70%.

Description of Surrounding Land Use and Habitats:

Forested, open field.

Description of Restoration Recommendations for the Site:

Increase buffer zone to a minimum of 25 feet and plant shrubs and/ or trees for additional habitat and stabilization.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-022

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2583

Y Coordinate (Latitude): 43.92804

Waterbody: Royal River

Size of Restoration Area (linear feet) 75

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Penny Road crossing. Area under bridge stabilized with rip-rap, causing minor constriction of flow. Banks stable, not eroding, well vegetated with herbs, shrubs. Some loose dirt beneath bridge.

Description of Surrounding Land Use and Habitats:

Agriculture, forested, low-density residential

Description of Restoration Recommendations for the Site:

Enhance buffer area with additional shrubs and trees, especially in southwest quadrant/ edge of field.

Sources of Degradation (13 possible): Impervious surface, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 0.80

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-022A

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2624

Y Coordinate (Latitude): 43.92276

Waterbody: Royal River

Size of Restoration Area (linear feet) 1700

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Inadequate buffer. Stable bank but mostly herb and shrubs. Rip-rap on shoreline impeding some vegetation growth.

Description of Surrounding Land Use and Habitats:

Agriculture, residential.

Description of Restoration Recommendations for the Site:

Option 1: allow natural revegetation to widen buffer. Option 2: remove buffer, stabilize banks naturally with stabilization methods, plantings.

Sources of Degradation (13 possible): Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.95

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/landscaping. Riprap removal would result in substantially higher costs.

Description of Challenges to Restoration:

Use of heavy equipment would be required for major restoration.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-023

Site Location: State: ME, County: Cumberland, Town: New Gloucester

X Coordinate (Longitude): -70.2644

Y Coordinate (Latitude): 43.92154

Waterbody: Royal River

Size of Restoration Area (linear feet) 140

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Depot Road crossing. Bridge foundation consists of cement and placed, cut stone. Erosion source - loose sand/dirt at top-of-slope under bridge and nearby. Trails causing minor potential erosion problem.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential, agriculture.

Description of Restoration Recommendations for the Site:

Stabilize loose soils. Enhance buffer by planting herbs and shrubs.

Sources of Degradation (13 possible): Impervious surface, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 6

Total Degradation Score (higher score indicates a higher level of degradation): 1.30

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil stabilization erosion control, trash/debris removal, and mobilization/demobilization.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-024

Site Location: State: ME, County: Cumberland, Town: Gray

X Coordinate (Longitude): -70.2800

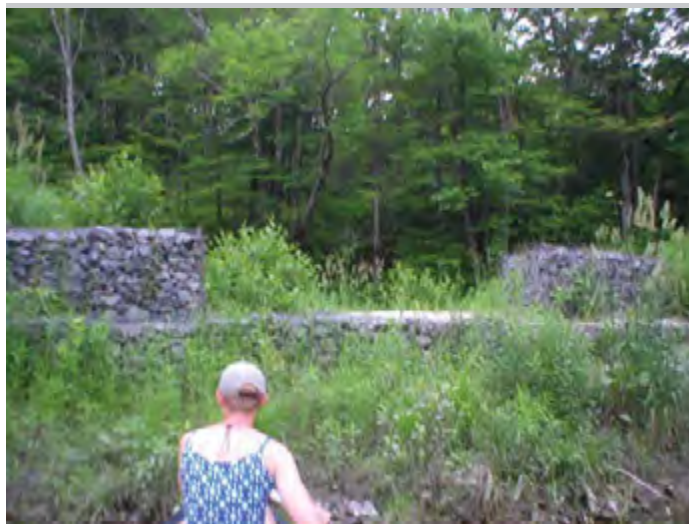
Y Coordinate (Latitude): 43.88622

Waterbody: Royal River

Size of Restoration Area (linear feet) 20

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Wire rock bundles forming retaining wall (20-feet long by 2-feet wide). Cement holding tank behind wall (unknown purpose).

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Determine purpose of tank and retaining wall, and remove if feasible.

Sources of Degradation (13 possible): Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 1.25

Likely Project Cost: Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil/fill removal, soil stabilization erosion control, minor grading, construction access, trash/debris removal, and mobilization/demobilization.

Description of Challenges to Restoration:

Access may be an issue.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-025

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2627

Y Coordinate (Latitude): 43.86679

Waterbody: Royal River

Size of Restoration Area (linear feet) 800

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer (approximately 10 feet) of herbs and shrubs, few trees. Brick fill and trash/debris used to stabilize banks. Steep slopes about 10 feet high.

Description of Surrounding Land Use and Habitats:

Forested, agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Option 1: enhance buffer with trees and widen. Remove trash and any real potential contaminants. Option 2: remove brick fill/ debris and stabilize banks with natural materials and vegetation. Remove non-brick trash plus buffer enhancement.

Sources of Degradation (13 possible): Fill/debris/trash, Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.70

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/landscaping, trash/debris removal, mobilization/demobilization. Major debris removal would result in substantially higher costs.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-026

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2614

Y Coordinate (Latitude): 43.86581

Waterbody: Royal River

Size of Restoration Area (linear feet) 300

Date of Field Assessment: 6/26/2005

Date of Last File Update: 8/12/2005



Description of Site:

Mill Road runs adjacent to river. Banks are high (~ 20-feet), steep (~ 75%), eroding, slumping, and have bare ground areas.

Description of Surrounding Land Use and Habitats:

Residential, agriculture.

Description of Restoration Recommendations for the Site:

Stabilize road bank to prevent undercutting of road over time. Plant with herbs, shrubs, and trees to revegetate and stabilize.

Sources of Degradation (13 possible): Impervious surface, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.25

Likely Project Cost: Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, and mobilization/demobilization.

Description of Challenges to Restoration:

May require hard stabilization (rip-rap).

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-027

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2607

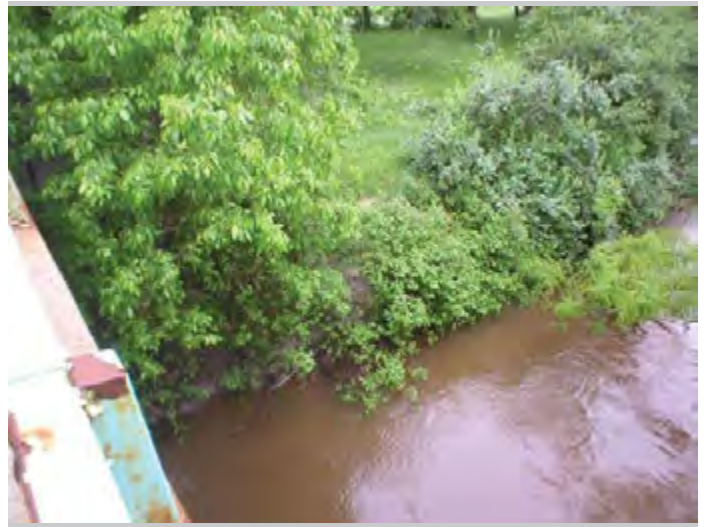
Y Coordinate (Latitude): 43.86775

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Mill Road bridge crossing. Most of buffer intact, comprised of herbs, shrubs, and trees. Some signs of erosion associated with mowed lawn to the south side of river / west of bridge.

Description of Surrounding Land Use and Habitats:

Low-density residential, agriculture, forested.

Description of Restoration Recommendations for the Site:

Stabilize erosion. Increase width of buffer to maximum extent possible and revegetate with herbs, shrubs, and trees.

Sources of Degradation (13 possible): Impervious surface, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 0.70

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, and mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-028

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2593

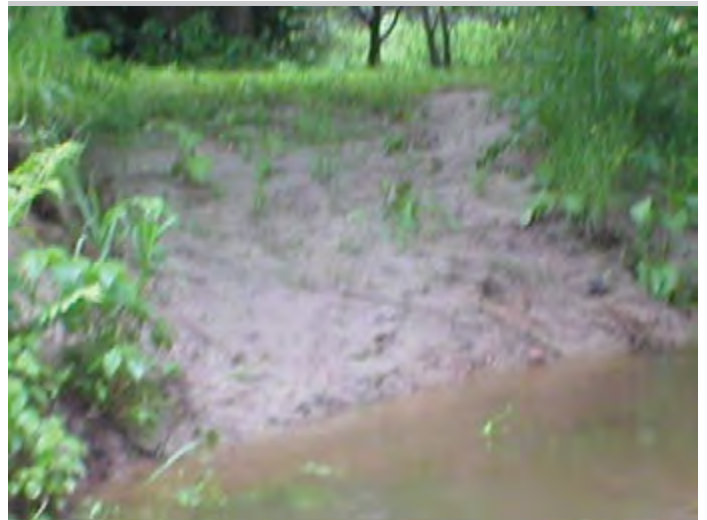
Y Coordinate (Latitude): 43.86579

Waterbody: Royal River

Size of Restoration Area (linear feet) 1400

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer of herbs, with few shrubs or trees, then mowed field. Access point to river is mowed lawn with dirt access road. Most of banks have steep slopes, with substantial erosion in places. Rubber hose leads from parcel into river. Some yard debris, erosion, and bare ground areas.

Description of Surrounding Land Use and Habitats:

Residential, agriculture, forested.

Description of Restoration Recommendations for the Site:

Stabilize banks, widen buffer, plant shrubs and trees. Determine purpose of rubber hose and remove if feasible.

Sources of Degradation (13 possible): Fill/debris/trash, Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.85

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil stabilization erosion control, and mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer, In-stream, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-029

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2524

Y Coordinate (Latitude): 43.86532

Waterbody: Royal River

Size of Restoration Area (linear feet) 171

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Pipeline right-of-way, approximately 100-feet wide and maintained. Only herbaceous vegetation, no shrubs or trees. Some minor bank erosion noted.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Enhance buffer with the addition of shrubs along the banks and as wide as possible. Natural revegetation an option by limiting pipeline mowing along shoreline.

Sources of Degradation (13 possible): Right-of-way (highway, utility, railroad)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.85

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, construction access, mobilization/demobilization, and maintenance. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Access may be an issue.

Restoration Type: Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-030

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2503

Y Coordinate (Latitude): 43.86549

Waterbody: Royal River

Size of Restoration Area (linear feet) 425

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Powerline right-of-way. Buffer is comprised of herbaceous vegetation with some shrubs. Active major and minor erosion, which is impacting a power line structure in one area.

Description of Surrounding Land Use and Habitats:

Forested, open field areas with pipeline right-of-way.

Description of Restoration Recommendations for the Site:

Stabilize banks. Ensure power line structure foundation integrity. Revegetate buffer area by adding shrubs, particularly along the shoreline.

Sources of Degradation (13 possible): ATV/off-road vehicle damage/farm equipment, Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.45

Likely Project Cost: Moderate-High
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, hard structure stabilization, soil stabilization erosion control, construction access, and mobilization/demobilization.

Description of Challenges to Restoration:

Stabilization of power pole may be costly due to lack of access and equipment requirements.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-031

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2401

Y Coordinate (Latitude): 43.86473

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Hardened road crossing/bridge at New Gloucester Road and Route 231. Concrete foundations have replaced/hardened shoreline. Inadequate buffer on north side, mostly herbs and evidence of erosion in bare areas.

Description of Surrounding Land Use and Habitats:

Agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Improve shrub component in buffer, stabilize eroding areas through plantings and minor grading, redirect road surface runoff.

Sources of Degradation (13 possible): Impervious surface, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.95

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, mob/demob. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-032

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2375

Y Coordinate (Latitude): 43.86413

Waterbody: Royal River

Size of Restoration Area (linear feet) 700

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Public park, boat launch. Inadequate buffer of mostly herbaceous with bare areas used as a boat launch within 25 ft of water. Narrow tree line and open mowed areas beyond 25 feet. Storm water wetland detention areas nearby have rip-rap and culverts. Sediment loading in basin and throughout area (likely from an upstream source).

Description of Surrounding Land Use and Habitats:

Forested, agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Regrade and stabilize banks with plantings. Increase buffer width by eliminating mowing. Sediment removal to re-open access to boat launch. Stabilize boat access points to minimize future erosion. Identify upstream sediment source and eliminate.

Sources of Degradation (13 possible): Culvert issue, Land cleared, Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.55

Likely Project Cost: Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Costs include: plantings, natural regeneration, and some sediment removal. Costs could be much higher depending on the source of the sediment loading and nature of improvements to boat launch site.

Description of Challenges to Restoration:

Must address sediment source or redeposition will occur. Plantings may be compromised by continued use of site as a boat/canoe access point. Restoration must address recreational uses of this area.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Cofferdam is exposed under deposited sediment in detention basin.

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-033

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2252

Y Coordinate (Latitude): 43.85774

Waterbody: Royal River

Size of Restoration Area (linear feet) 1000

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Mowed fields with narrow buffer (0-20 ft) of herbs, shrubs, and scattered trees to top of slope, then buffer widths varier. Some signs of erosion of slopes/banks, banks 10-15 feet with slope of 45 degrees. Some erosion causing over-hanging banks.

Description of Surrounding Land Use and Habitats:

Agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize banks, enhance and widen buffer by allowing natural revegetation or plant to speed restoration process.

Sources of Degradation (13 possible): Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.85

Likely Project Cost: Low-Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, and soil stabilization erosion control.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-034

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2269

Y Coordinate (Latitude): 43.85748

Waterbody: Royal River

Size of Restoration Area (linear feet) 25

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Walking trail has created erosion problem. Trail is too close to river.

Description of Surrounding Land Use and Habitats:

Forested agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Raise and lengthen bridge to minimize foot traffic on bank, plant to reintroduce vegetation and stabilize bank.

Sources of Degradation (13 possible): Land use activity a potential contaminant source,
Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.80

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, construction access, construct recreational facilities/access, and mobilization/demobilization. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

No obvious limitations.

Restoration Type: Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Potential trail improvement project for Friends of the Royal River.

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-035

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2194

Y Coordinate (Latitude): 43.85547

Waterbody: Royal River

Size of Restoration Area (linear feet) 165

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

North Yarmouth Memorial Highway road crossing. Hardened cement bridge base and 2 supports. Floating logs and debris have formed a blockage on one side of bridge.

Description of Surrounding Land Use and Habitats:

Residential, commercial, agriculture.

Description of Restoration Recommendations for the Site:

Enhance vegetation in buffer zone, stabilize downstream erosion, remove blockage of bridge opening.

Sources of Degradation (13 possible): Impervious surface, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.10

Likely Project Cost: Low-Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil stabilization/erosion control, trash/debris removal, mobilization/demobilization.

Description of Challenges to Restoration:

No obvious limitations.

Restoration Type: Buffer, In-stream

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-036

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2175

Y Coordinate (Latitude): 43.85027

Waterbody: Royal River

Size of Restoration Area (linear feet) 125

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Old trail is a minor source of erosion due to unstable banks. Bridge crossing intermittent stream has eroding banks. Steep slopes >45 degrees are bare in many places.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize banks. Enhance buffer by planting herbs and shrubs.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.30

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, construction access, and mobilization/demobilization. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

No obvious limitations.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Potential trail improvement project for Friends of the Royal River.

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-037

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2185

Y Coordinate (Latitude): 43.84677

Waterbody: Royal River

Size of Restoration Area (linear feet) 200

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer (40 feet) of herbs, shrubs, and trees, then agriculture. No evidence of erosion.

Description of Surrounding Land Use and Habitats:

Agriculture, low-density residential.

Description of Restoration Recommendations for the Site:

Increase buffer width. Enhance buffer with natural revegetation with native species, or plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Room for substantial buffer restoration.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-038

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2166

Y Coordinate (Latitude): 43.84595

Waterbody: Royal River

Size of Restoration Area (linear feet) 1000

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer (0-25 feet), then agricultural fields. Field grasses, not open filled fields.

Description of Surrounding Land Use and Habitats:

Agriculture, open field.

Description of Restoration Recommendations for the Site:

Increase buffer width. Enhance buffer with natural revegetation with native species, or plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.50

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Room for substantial buffer restoration.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-039

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2192

Y Coordinate (Latitude): 43.84287

Waterbody: Royal River

Size of Restoration Area (linear feet) 25

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Viewing deck over looking Royal River. Nice buffer of herbs, trees, some shrubs.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential.

Description of Restoration Recommendations for the Site:

Enhance buffer by planting shrubs to the right (north) of the deck.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.20

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-040

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2168

Y Coordinate (Latitude): 43.83989

Waterbody: Royal River

Size of Restoration Area (linear feet) 1000

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer (15-20 feet) vegetated with herbs, shrubs and trees to top of bank (approximately 15 - 20 feet high). Then agriculture field begins.

Description of Surrounding Land Use and Habitats:

Agriculture, forested.

Description of Restoration Recommendations for the Site:

Increase buffer width.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.30

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Success depends on cooperation of landowner. Room for substantial buffer restoration.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-041

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2121

Y Coordinate (Latitude): 43.83486

Waterbody: Royal River

Size of Restoration Area (linear feet) 90

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Campsite and canoe access point. Bank erosion evident next to fire pit, some bare ground. Chairs and canoe impeding on plant growth.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize bank at edge of site to minimize erosion. Move canoe to upland to minimize impact in riparian zone.

Sources of Degradation (13 possible): Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.50

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil stabilization erosion control, and mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-042

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2132

Y Coordinate (Latitude): 43.83447

Waterbody: Royal River

Size of Restoration Area (linear feet) 200

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Small cottage with deck built on top of banks. Signs of erosion of banks in front and upstream of cottage probably from foot traffic. Slopes steep (75 degrees), and not well vegetated (herbs and few shrubs). Hemlock overstory with mosses and low, sparse herbs. Downstream are rope swings with bare ground underneath, potential erosion source.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize banks with additional herbs and shrubs. Limit access to river specific areas.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.00

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, and biostabilization/erosion sediment control.

Description of Challenges to Restoration:

Access may be an issue. Success depends on cooperation of landowner.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-043

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2122

Y Coordinate (Latitude): 43.83208

Waterbody: Royal River

Size of Restoration Area (linear feet) 160

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Eroding bank (approximately 25 feet wide) associated with access to river from old, apparently unused shack. Buffer intact with herbs, shrubs and trees.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize bank with erosion matting and plant herbs, shrubs and/ or trees for additional habitat and stabilization.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.50

Likely Project Cost: Low-Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, and biostabilization/erosion sediment control, minor grading, mobilization/demobilization. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

Access may be an issue.

Restoration Type: Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-044

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2084

Y Coordinate (Latitude): 43.8291

Waterbody: Royal River

Size of Restoration Area (linear feet) 25

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Water line right-of-way, Caldwell Boston water marker. Some bare ground, minor erosion occurring on both sides of river. Steep slopes (>45 deg) with herbaceous cover.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Stabilize banks and enhance vegetation with shrubs and trees.

Sources of Degradation (13 possible): Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.70

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, and mobilization/demobilization. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

Access may be an issue

Restoration Type: Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-045

Site Location: State: ME, County: Cumberland, Town: North Yarmouth

X Coordinate (Longitude): -70.2096

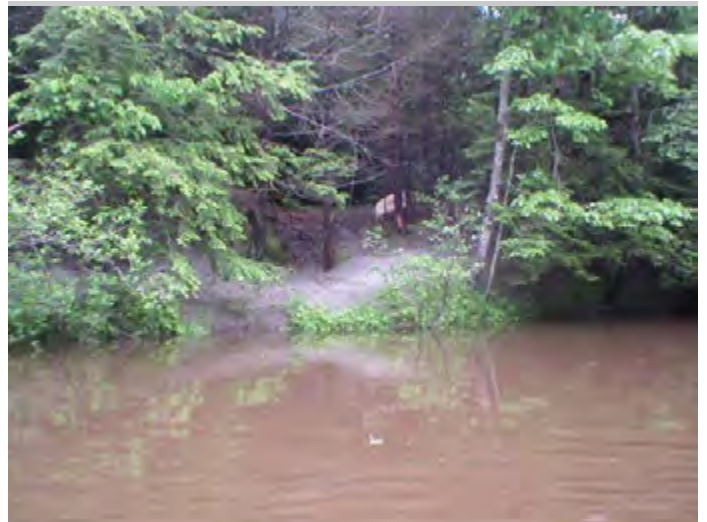
Y Coordinate (Latitude): 43.82724

Waterbody: Royal River

Size of Restoration Area (linear feet) 25

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Appears to be an old canoe access point (approx 25 feet wide). Bare sandy soils, with some erosion potential.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Stabilize bank with erosion matting, adjust grade accordingly. Plant herbs, shrubs and/ or trees for additional habitat and stabilization.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.70

Likely Project Cost: Low-Moderate
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/landscaping, biostabilization/erosion sediment control, soil stabilization, mobilization/demobilization. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

Access may be an issue.

Restoration Type: Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-046

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.2072

Y Coordinate (Latitude): 43.81758

Waterbody: Royal River

Size of Restoration Area (linear feet) 125

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

No real buffer; one of the worst residential sites. Mowed lawn to top of bank, some bare ground on bank and sparse herbs. Bank not steep 2 feet high, then sloping upwards towards house. All mowed.

Description of Surrounding Land Use and Habitats:

Low-density residential, forested.

Description of Restoration Recommendations for the Site:

Stabilize banks by halting mowing and allow natural revegetation to the maximum extent possible. Limit access to a narrower area. Enhance buffer with natural revegetation with native species, or plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.50

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, and mobilization/demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-047

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.2018

Y Coordinate (Latitude): 43.81639

Waterbody: Royal River

Size of Restoration Area (linear feet) 75

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Powerline right-of-way. Maintained with herb and shrub cover. Few shrubs on west bank; some bare ground with minor erosion potential.

Description of Surrounding Land Use and Habitats:

Forested.

Description of Restoration Recommendations for the Site:

Stabilize erosion. Enhance buffer by planting herbs and shrubs.

Sources of Degradation (13 possible): Right-of-way (highway, utility, railroad)

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.50

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, and biostabilization/erosion sediment control, mobilization/demobilization. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

Access may be an issue.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-048

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1939

Y Coordinate (Latitude): 43.80672

Waterbody: Royal River

Size of Restoration Area (linear feet) 350

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer (approx 5 feet) comprised of shrubs and herbs or only herbs, then mowed lawn. Some bare ground with minor erosion potential.

Description of Surrounding Land Use and Habitats:

Forested, medium-density residential.

Description of Restoration Recommendations for the Site:

Stabilize erosion. Enhance and widen buffer by planting herbs and shrubs.

Sources of Degradation (13 possible): Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.70

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, and biostabilization/erosion sediment control, mobilization/demobilization. Proposed restoration easily achieved using hand crews. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

No obvious limitations.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-049

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.191

Y Coordinate (Latitude): 43.80711

Waterbody: Royal River

Size of Restoration Area (linear feet) 200

Date of Field Assessment: 6/17/2005

Date of Last File Update: 8/12/2005



Description of Site:

Boat launch at Yarmouth Water District. No real buffer, mowed lawn to top of bank. Hardined shoreline. Lots of sand on asphalt parking lot may wash into river.

Description of Surrounding Land Use and Habitats:

Commercial, medium-density residential.

Description of Restoration Recommendations for the Site:

Stop mowing and allow natural revegetation of buffer as wide as the Water District will allow. Plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Fill/debris/trash, Impervious surface, Land cleared, Land use activity a potential contaminant source

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.85

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Room for only minor buffer restoration.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Site appears to be temporary storage of fire hydrants. Check that these have been removed.

Land Ownership: Nonprofit, Public

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-050

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1904

Y Coordinate (Latitude): 43.80785

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Narrow buffer (6 feet) of herbs and low shrubs, then mowed lawn.

Description of Surrounding Land Use and Habitats:

Medium-density residential, commercial.

Description of Restoration Recommendations for the Site:

Stop mowing and allow natural revegetation of buffer as wide as landowner will allow. Plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 1.00

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Success depends on cooperation of landowner. Room for at least partial buffer restoration.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-051

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1901

Y Coordinate (Latitude): 43.80771

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

East Elm St bridge. Concrete on rock ledge and concrete footings, with riprap banks. Slight constriction of river. Buffer, where present, is comprised of shrubs and herbs. Road containments reach river directly via openings in roadway at sides of bridge.

Description of Surrounding Land Use and Habitats:

Medium-density residential, commercial.

Description of Restoration Recommendations for the Site:

Minimize direct runoff from bridge into river when replacing bridge.

Sources of Degradation (13 possible): Impervious surface, Land use activity a potential contaminant source, Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.40

Likely Project Cost: High

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: hard structure stabilization, remove /modify areas of concentrated runoff, construct storm water management device, construction access, mobilization/demobilization, and engineering designs.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. No real room for buffer restoration.

Restoration Type: Structural

Restoration Habitat Type: In-Stream

Additional Comments:

Bridge looks like it may be due to be replaced - rebar is exposed in many places.

Land Ownership: Local Government, Public

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-052

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1892

Y Coordinate (Latitude): 43.80774

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Dam near East Elm St, adjacent to Yarmouth Town Park. Buffer of herbs, shrubs, trees. Fish ladder intact, but tree limbs may be blocking lower entrance and debris is accumulated at top of fish ladder, and may impede fish passage.

Description of Surrounding Land Use and Habitats:

Medium-density residential, commercial.

Description of Restoration Recommendations for the Site:

Option 1: clear out fish ladder to restore movement/migration of fish, and conduct annual maintenance, plus frequent maintenance during fish migration. Option 2: complete dam removal.

Sources of Degradation (13 possible): Dam/obstruction, Fill/debris/trash, Impervious surface, Land cleared

Number of Degradation Indicators Observed (13 possible): 6

Total Degradation Score (higher score indicates a higher level of degradation): 3.10

Likely Project Cost: Low-Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: trash/debris removal, and maintenance. Dam removal costs would be substantially higher (>\$100,000).

Description of Challenges to Restoration:

No obvious limitations.

Restoration Type: Anadromous Fish Passage, In-stream

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Public

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-053

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1891

Y Coordinate (Latitude): 43.80658

Waterbody: Royal River

Size of Restoration Area (linear feet) 3500

Date of Field Assessment: 6/23/2005

Date of Last File Update: 12/23/2005



Description of Site:

Royal River Park. Rip-rap hardened shoreline, culverts with ranges of erosion. Narrow buffer but high quality, mowed lawns. Erosion on several walkways near river. Historic mill structures. Japanese knotweed patches.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential, commercial, open space.

Description of Restoration Recommendations for the Site:

Erosion control, bank stabilization. Enhance and widen buffer by planting shrubs. Herbicide or mechanical removal of Japanese knotweed.

Sources of Degradation (13 possible): Culvert issue, Invasive plant species, Land cleared, Land use activity a potential contaminant source, Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 7

Total Degradation Score (higher score indicates a higher level of degradation): 3.25

Likely Project Cost: Moderate

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to <
\$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, invasive species control, biostabilization/erosion sediment control, soil stabilization erosion control, construction access, construct recreational facilities/access, mob/demob, and maintenance.

Description of Challenges to Restoration:

May required multiple treatments to fully eradicate Japanese knotweed.

Restoration Type: Buffer, Invasive Species Removal, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

The entire Royal River Park parcel (#42-51) is considered as one site. The site location extends from East Elm St south along the west side of the Royal River, behind William H. Rowe School, to U.S. Route 1.

Land Ownership: Local Government, Public

Funding Source(s): Unknown

Project Status: Implementation (i.e., construction, modification of activity)

Contact(s):

Henry Nichols, P.O.Box 90, Yarmouth, ME 04096
phone: (207) 847-9399
email: royal@maine.rr.com

If Applicable:

Start Date of Implementation: 6/1/2005

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Name of Lead Agency: Other

Primary Contact for Project: Soil and Water Conservation District, , ,
phone: (207) 856-2777

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-054

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1851

Y Coordinate (Latitude): 43.80397

Waterbody: Royal River

Size of Restoration Area (linear feet) 25

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Box culvert that drains catch basins from parking lots at commercial/business complex. Note soap suds in water. Eroding banks, likely scoured during high velocity flow through culvert. Fill/debris present in channel.

Description of Surrounding Land Use and Habitats:

Commercial, forested.

Description of Restoration Recommendations for the Site:

Design and build stormwater treatment device for filtering runoff prior to entering river. Remove all fill/ debris. Stabilize banks to minimize erosion.

Sources of Degradation (13 possible): Culvert issue, Fill/debris/trash, Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.90

Likely Project Cost: Moderate-High

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: soil/fill removal, soil stabilization erosion control, construct storm water management, mob/demob, maintenance, and engineering designs. Heavy equipment required.

Description of Challenges to Restoration:

Access may be an issue due to steep slopes.

Restoration Type: Outfall Source

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Dumpster in parking lot leaking and staining asphalt, located near a catch basin above culvert of interest.

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-055

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1845

Y Coordinate (Latitude): 43.80307

Waterbody: Royal River

Size of Restoration Area (linear feet) 60

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Foot bridge over Royal River. Not constricting. Banks lack solid vegetation layer, bare ground in places. Access point in southwest corner bare, potential erosion. Riprap swale next to bridge.

Description of Surrounding Land Use and Habitats:

Commercial, medium density residential.

Description of Restoration Recommendations for the Site:

Stabilize banks and minimize access points. Enhance the buffer by planting herbs and shrubs.

Sources of Degradation (13 possible): Land cleared, Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.70

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, and mob/demob.

Description of Challenges to Restoration:

Use of buffer area to access water may limit restoration potential.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government, Public

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-056

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1849

Y Coordinate (Latitude): 43.80278

Waterbody: Royal River

Size of Restoration Area (linear feet) 20

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Large box culvert (4 x 4 feet) with in fenced enclosure; water of unknown origin. Water flow approximately 50 gallons/min. Filters over cobble/gravel, then under bridge and into river.

Description of Surrounding Land Use and Habitats:

Commercial, forested.

Description of Restoration Recommendations for the Site:

Identify source of water and determine whether restoration is needed.

Sources of Degradation (13 possible): Culvert issue

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.60

Likely Project Cost:

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to <
\$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Unknown.

Description of Challenges to Restoration:

Unknown.

Restoration Type: Outfall Source

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government, Public

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-057

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1843

Y Coordinate (Latitude): 43.80253

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Route 1 bridge crossing. Not constricting flow. Banks stable, minimal erosion. Walking trail under bridge on southwest side has some minor erosion. Buffer of herbs, shrubs, and trees.

Description of Surrounding Land Use and Habitats:

Commercial, forested.

Description of Restoration Recommendations for the Site:

Stabilize erosion under bridge.

Sources of Degradation (13 possible): Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.50

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: biostabilization/erosion sediment control, and mobilization/demobilization. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

No obvious limitations.

Restoration Type: Buffer

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: State Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-058

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1845

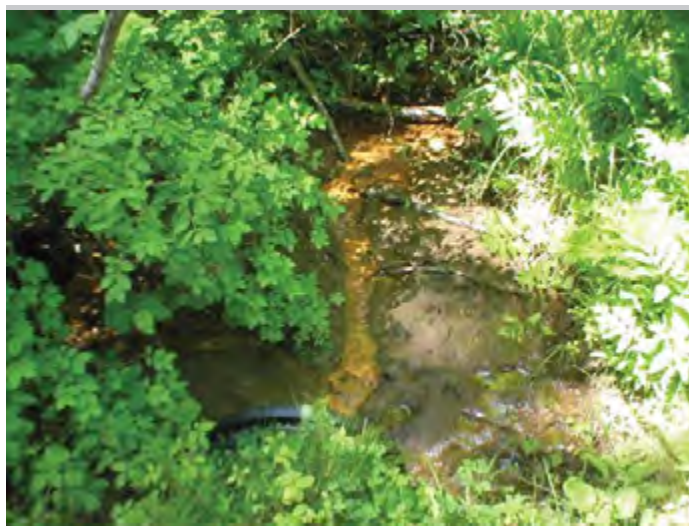
Y Coordinate (Latitude): 43.80205

Waterbody: Royal River

Size of Restoration Area (linear feet) 20

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Iron leachate from unknown source. Runoff from direction of Route 1.

Description of Surrounding Land Use and Habitats:

Commercial, forested.

Description of Restoration Recommendations for the Site:

Identify source of iron leachate and remove/treat as necessary.

Sources of Degradation (13 possible): Land use activity a potential contaminant source,
Unknown

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 1.00

Likely Project Cost:

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Unknown. Could be expensive to remove and treat.

Description of Challenges to Restoration:

Unknown.

Restoration Type: Outfall Source, Unknown

Restoration Habitat Type: Forested Wetland, Unknown

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-059

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1833

Y Coordinate (Latitude): 43.80148

Waterbody: Royal River

Size of Restoration Area (linear feet) 10

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Access point to river (15 x 6 feet wide). Eroding banks with bare ground. Loose silty soil. Sparse herb cover on path.

Description of Surrounding Land Use and Habitats:

Medium-density residential, commercial, forested

Description of Restoration Recommendations for the Site:

Stabilize access point and minimize bank erosion. Limit access to current area to avoid continued widening of path.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 0.70

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: biostabilization/erosion sediment control, and mobilization/demobilization. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

Use of buffer area to access water may limit restoration potential.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-060

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1822

Y Coordinate (Latitude): 43.8016

Waterbody: Royal River

Size of Restoration Area (linear feet) 500

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Sparhawk Mill dam with fish ladder. Cement dam with drainage pipe on east side, fish ladder on west side. Debris accumulated at top entrance to fish ladder. No water over dam currently, 8 foot drop to rock ledge. Sediment accumulated behind dam. Buffer of mowed lawn on east side.

Description of Surrounding Land Use and Habitats:

Commercial, medium-density residential.

Description of Restoration Recommendations for the Site:

Option 1: buffer improvement, clear out fish ladder to restore movement/migration of fish, and conduct annual maintenance, plus frequent maintenance during fish migration. Option 2: buffer improvement plus complete dam removal.

Sources of Degradation (13 possible): Dam/obstruction, Land cleared, Land use activity a potential contaminant source, Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 7

Total Degradation Score (higher score indicates a higher level of degradation): 4.25

Likely Project Cost: Low-Moderate
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/landscaping, trash/debris removal, and maintenance. Dam removal costs would be substantially higher (>\$100,000).

Description of Challenges to Restoration:

Success depends on cooperation of mill owner who is still utilizing water for power generation.

Restoration Type: Anadromous Fish Passage, Buffer, In-stream, Shoreline Bank

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Water is still being used for power generation.

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-061

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1788

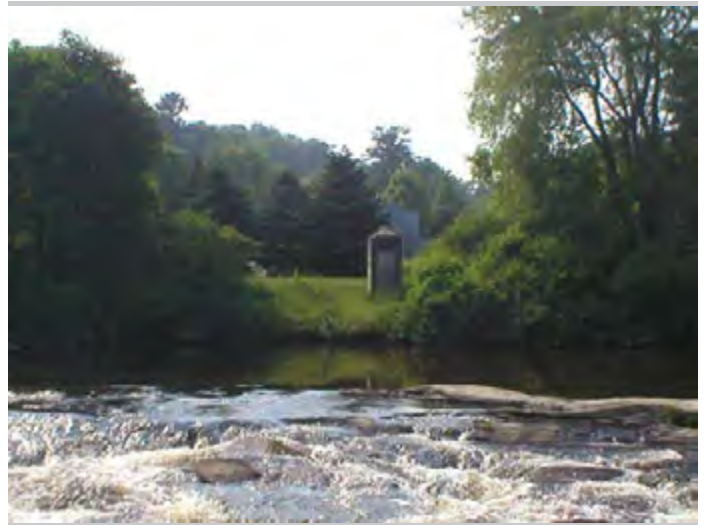
Y Coordinate (Latitude): 43.79911

Waterbody: Royal River

Size of Restoration Area (linear feet) 12

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Buffer issue. Narrow, 12' wide mowed lawn section to edge of river.

Description of Surrounding Land Use and Habitats:

Medium-density residential, commercial, forested

Description of Restoration Recommendations for the Site:

Stop mowing and allow natural revegetation of buffer as wide as landowner will allow. Plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Land cleared

Number of Degradation Indicators Observed (13 possible): 2

Total Degradation Score (higher score indicates a higher level of degradation): 1.00

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations: planting/landscaping. Passive revegetation of buffer is an option.

Description of Challenges to Restoration:

Success depends on cooperation of landowner.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-062

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1781

Y Coordinate (Latitude): 43.79841

Waterbody: Royal River

Size of Restoration Area (linear feet) 175

Date of Field Assessment: 6/23/2005

Date of Last File Update: 12/23/2005



Description of Site:

East Main St bridge. Old Grist Mill Site in buffer zone north of bridge, with some erosion issues. Riprap and cut, placed rock wall banks, cement bridge. Constriction of river. Some bare ground on banks on downstream sides, potential erosion. Culverts from road drain directly into river. Japanese knotweed along southeast bank.

Description of Surrounding Land Use and Habitats:

Medium-density residential, commercial.

Description of Restoration Recommendations for the Site:

Option 1: Stabilize banks and enhance with plantings. Herbicide or mechanical removal of Japanese knotweed. Option 2: Replace and widen bridge opening to remove constriction.

Sources of Degradation (13 possible): Culvert issue, Invasive plant species, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 8

Total Degradation Score (higher score indicates a higher level of degradation): 3.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to <
\$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, invasive species control, biostabilization/erosion sediment control, mob/demob, and engineering designs. Bridge replacement and stone/riprap removal costs would be substantially higher.

Description of Challenges to Restoration:

Limited space to widen bridge or improve habitat. Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. May required multiple treatments to fully eradicate Japanese knotweed.

Restoration Type: Buffer, In-stream, Invasive Species Removal

Restoration Habitat Type: In-Stream, Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

Henry Nichols, P.O.Box 90, Yarmouth, ME 04096
phone: (207) 847-9399
email: royal@maine.rr.com

If Applicable:

Start Date of Implementation: 6/1/2005

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Name of Lead Agency: Other

Primary Contact for Project: Soil and Water Conservation District, , ,
phone: (207) 856-2777

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-063

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1785

Y Coordinate (Latitude): 43.79765

Waterbody: Royal River

Size of Restoration Area (linear feet) 80

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Lack of buffer. Hardened shoreline, with mowed lawn to edge of riprap, then cultivated shrubs and trees.

Description of Surrounding Land Use and Habitats:

Moderate-density residential, commercial.

Description of Restoration Recommendations for the Site:

Remove riprap, stabilize shoreline with bioengineering and plant shrubs and/ or trees for additional habitat and stabilization. Enhance buffer by replacing mowed lawn with native herbs and shrubs.

Sources of Degradation (13 possible): Land cleared, Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.35

Likely Project Cost: Moderate-High
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, minor/major grading, removal of obstruction (dams, culverts), mobilization/demobilization. Heavy equipment required.

Description of Challenges to Restoration:

Success depends on cooperation of landowner. Homeowner has small lawn, willingness not likely.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-064

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1773

Y Coordinate (Latitude): 43.79771

Waterbody: Royal River

Size of Restoration Area (linear feet) 250

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Route 95 bridge crossing. Riprap banks are stable, not eroding. Constriction of river. Vegetated with some herbs, shrubs, some trees. Culverts drain over steep, cement swale.

Description of Surrounding Land Use and Habitats:

Residential, commercial.

Description of Restoration Recommendations for the Site:

Enhance banks by planting shrubs and herbs.

Sources of Degradation (13 possible): Culvert issue, Drainage issue, Impervious surface, Land use activity a potential contaminant source, Right-of-way (highway, utility, railroad), Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 7

Total Degradation Score (higher score indicates a higher level of degradation): 3.90

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping.

Description of Challenges to Restoration:

Restoration may be difficult due to challenges associated with active transportation corridor and utility/infrastructure. Access may be an issue.

Restoration Type: Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Bridge reconstruction not viewed as realistic.

Land Ownership: State Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-065

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1749

Y Coordinate (Latitude): 43.7985

Waterbody: Royal River

Size of Restoration Area (linear feet) 700

Date of Field Assessment: 6/23/2005

Date of Last File Update: 12/23/2005



Description of Site:

Yarmouth Public Boat Launch. Shoreline almost entirely riprap with some sparse vegetation, mowed lawn from top of slope. In places lawn is compromised by vehicle parking. Paved and gravel parking areas. Japanese knotweed. Active marina with docks.

Description of Surrounding Land Use and Habitats:

Comercial, forested.

Description of Restoration Recommendations for the Site:

Stabilize eroding banks. Stop mowing and allow natural revegetation of buffer as wide as landowner will allow. Plant herbs and shrubs enhance buffer. Herbicide or mechanical removal of Japanese knotweed. Control or minimize chemical contamination.

Sources of Degradation (13 possible): Culvert issue, Dock/pier/jetty that extends out into channel, Impervious surface, Invasive plant species, Land cleared, Land use activity a potential contaminant source, Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 7

Total Degradation Score (higher score indicates a higher level of degradation): 4.30

Likely Project Cost: Low-Moderate
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, invasive species control, soil stabilization erosion control, mobilization/demobilization, and maintenance.

Description of Challenges to Restoration:

Success depends on cooperation of landowner. Room for only minor buffer restoration.

Restoration Type: Buffer, Invasive Species Removal

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

Henry Nichols, P.O.Box 90, Yarmouth, ME 04096
phone: (207) 847-9399
email: royal@maine.rr.com

If Applicable:

Start Date of Implementation: 6/1/2005

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Name of Lead Agency: Other

Primary Contact for Project: Soil and Water Conservation District, , ,
phone: (207) 856-2777

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-066

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.174

Y Coordinate (Latitude): 43.79867

Waterbody: Royal River

Size of Restoration Area (linear feet) 50

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Three culverts that drain under gravel access road. Culverts of corugated metal all have rusted at the bottom. Slight erosion issue. Salt marsh in front of culverts is gone. Drain over cobble/gravel to water.

Description of Surrounding Land Use and Habitats:

Forested, commercial.

Description of Restoration Recommendations for the Site:

Replace culverts before they become totally compromised. Shorten culvert length so as not to be such an eyesore. Stabilize banks.

Sources of Degradation (13 possible): Culvert issue, Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.60

Likely Project Cost: Low-Moderate
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: soil stabilization/erosion control and removal of obstruction (dams, culverts).

Description of Challenges to Restoration:

No obvious limitations.

Restoration Type: Outfall Source

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-067

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1733

Y Coordinate (Latitude): 43.79833

Waterbody: Royal River

Size of Restoration Area (linear feet) 300

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Phragmites stand, approximately 100 x 40 feet.

Description of Surrounding Land Use and Habitats:

Commercial, low-density residential, forested.

Description of Restoration Recommendations for the Site:

Spot-treat Phragmites with herbicide.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.90

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, mobilization/demobilization, and maintenance.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Fringing Salt Marsh

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-067A

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1688

Y Coordinate (Latitude): 43.79332

Waterbody: Royal River

Size of Restoration Area (linear feet) 150

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Two Phragmites stands in close proximity, approximately 150 x 30 feet and 60 x 12 feet.

Description of Surrounding Land Use and Habitats:

Forested, near cemetery.

Description of Restoration Recommendations for the Site:

Spot-treat Phragmites with herbicide.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.60

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, mobilization/demobilization, and maintenance.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Fringing Salt Marsh

Additional Comments:

Land Ownership: Local Government

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-067B

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1658

Y Coordinate (Latitude): 43.79482

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Phragmites stand, approximately 100 x 40 feet. Located adjacent to Royal River Boatyard Marina (RR-070).

Description of Surrounding Land Use and Habitats:

Commercial, forested.

Description of Restoration Recommendations for the Site:

Spot-treat Phragmites with herbicide.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, mobilization/demobilization, and maintenance.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Fringing Salt Marsh

Additional Comments:

Land Ownership: Unknown

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-067C

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1564

Y Coordinate (Latitude): 43.79224

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Three Phragmites stands in close proximity, approximately 30 x 50 feet, 40 x 40 feet and 30 x 80 feet.

Description of Surrounding Land Use and Habitats:

Salt marsh, low-density residential.

Description of Restoration Recommendations for the Site:

Spot-treat Phragmites with herbicide.

Sources of Degradation (13 possible): Invasive plant species

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.60

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: invasive species control, mobilization/demobilization, and maintenance.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: Fringing Salt Marsh

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-067D

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1496

Y Coordinate (Latitude): 43.79055

Waterbody: Royal River

Size of Restoration Area (linear feet) 50

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Phragmites stand approximately 15 x 50 feet. Old hay road with two corrugate metal culverts, set too high for tidal exchange and blocked with vegetation and silt. Behind hay road and Phrag is what appears to be a man-made berm with spotty patches of Phragmites (5-10% cover) across the area (approx. 500 x 200 feet).

Description of Surrounding Land Use and Habitats:

Salt marsh, forested, low-density residential.

Description of Restoration Recommendations for the Site:

Remove berm and culverts to restore tidal exchange to former salt marsh. Spot-treat Phragmites with herbicide.

Sources of Degradation (13 possible): Culvert issue, Drainage issue, Invasive plant species

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 2.40

Likely Project Cost: Moderate-High

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to <
\$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations: invasive species control, soil/fill removal, soil stabilization erosion control, minor grading, major grading, construction access, removal of obstructions (dams, culverts), mobilization/demobilization, and maintenance.

Description of Challenges to Restoration:

May require multiple treatments to fully eradicate. Access may be an issue.

Restoration Type: Invasive Species Removal

Restoration Habitat Type: In-Stream, Salt Marsh

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-068

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1769

Y Coordinate (Latitude): 43.79669

Waterbody: Royal River

Size of Restoration Area (linear feet) 600

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Yarmouth Marina and Boat Yard. Gravel parking areas. Docks with many boats. Parts of shoreline are riprap and parts vegetated with herbs. Some hardened shoreline (bulkhead). Shoreline appears stable, not eroding. Some paved areas.

Description of Surrounding Land Use and Habitats:

Commercial.

Description of Restoration Recommendations for the Site:

Stop mowing and allow natural revegetation of buffer as wide as landowner will allow. Plant herbs and shrubs enhance and speed restoration. Designate areas for access and buffer areas. Control or minimize chemical contamination.

Sources of Degradation (13 possible): Dock/pier/jetty that extends out into channel, Impervious surface, Land cleared, Land use activity a potential contaminant source, Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 6

Total Degradation Score (higher score indicates a higher level of degradation): 3.95

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping and mobilization/ demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner. Room for only minor buffer restoration.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-069

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1738

Y Coordinate (Latitude): 43.79504

Waterbody: Royal River

Size of Restoration Area (linear feet) 1800

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Lower Falls Landing Marina. Docks with lots of boats and moorings. Shoreline eroding in places, natural and riprap shorelines. Smell of gas and paint. Mowed lawn to top of bank. Then maintained herbs and scattered shrubs on shoreline where vegetation is present.

Description of Surrounding Land Use and Habitats:

Commercial.

Description of Restoration Recommendations for the Site:

Stop mowing in buffer and allow natural revegetation of buffer as wide as landowner will allow. Plant shrubs to enhance buffer. Designate areas for access and non-access. Stabilize erosion. Control or minimize chemical contamination.

Sources of Degradation (13 possible): Dock/pier/jetty that extends out into channel, Fill/debris/trash, Impervious surface, Land cleared, Land use activity a potential contaminant source, Rip-rap (or other artificial hard structure), Unstable bank

Number of Degradation Indicators Observed (13 possible): 8

Total Degradation Score (higher score indicates a higher level of degradation): 4.30

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to <
\$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, biostabilization/erosion sediment control, mobilization/demobilization, and maintenance.

Description of Challenges to Restoration:

Success depends on cooperation of landowner. Room for only minor buffer restoration.

Restoration Type: Buffer, In-stream, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-070

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1680

Y Coordinate (Latitude): 43.79529

Waterbody: Royal River

Size of Restoration Area (linear feet) 600

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Royal River Boatyard Marina. Docks, boats, gas tank filling station. Gravel parking areas, rip-rap shoreline, some paved areas. Maintained buffer with herbs only. Banks stable, not eroding.

Description of Surrounding Land Use and Habitats:

Commercial, moderate-density residential.

Description of Restoration Recommendations for the Site:

Stop mowing in buffer and allow natural revegetation of buffer as wide as landowner will allow. Plant shrubs to enhance buffer. Designate access and non-access areas. Control or minimize chemical contamination.

Sources of Degradation (13 possible): Dock/pier/jetty that extends out into channel, Impervious surface, Land cleared, Land use activity a potential contaminant source, Rip-rap (or other artificial hard structure)

Number of Degradation Indicators Observed (13 possible): 6

Total Degradation Score (higher score indicates a higher level of degradation): 4.05

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping and mobilization/ demobilization.

Description of Challenges to Restoration:

Success depends on cooperation of landowner. Room for only minor buffer restoration.

Restoration Type: Buffer, In-stream

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-071

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1538

Y Coordinate (Latitude): 43.79308

Waterbody: Royal River

Size of Restoration Area (linear feet) 100

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Slumping shoreline. Vegetated with forested buffer to top of slope, then mowed lawn. Large chunks of bank eroding away.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential

Description of Restoration Recommendations for the Site:

Stabilize banks. Enhance buffer with natural revegetation with native species, or plant herbs and shrubs enhance and speed restoration.

Sources of Degradation (13 possible): Land cleared, Unstable bank

Number of Degradation Indicators Observed (13 possible): 3

Total Degradation Score (higher score indicates a higher level of degradation): 1.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: planting/landscaping, biostabilization/erosion sediment control, mobilization/demobilization.

Description of Challenges to Restoration:

Access may be an issue due to steep slopes.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-072

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1537

Y Coordinate (Latitude): 43.79093

Waterbody: Royal River

Size of Restoration Area (linear feet) 125

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Bank erosion. Turbid water due to erosion of loose sediment.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize banks and plant exposed areas with herbs, shrubs, and trees for additional habitat and stabilization.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 4

Total Degradation Score (higher score indicates a higher level of degradation): 1.70

Likely Project Cost: Low-Moderate
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil stabilization erosion control, construction access, and mobilization/demobilization.

Description of Challenges to Restoration:

Access may be an issue due to steep slopes.

Restoration Type: Buffer

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Unknown source of erosion, may be natural.

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT
Habitat Restoration Inventory

Site ID: RR-073

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1522

Y Coordinate (Latitude): 43.79091

Waterbody: Royal River

Size of Restoration Area (linear feet) 75

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Path to access beach area has washed out. Appears that steps have been buried by debris.

Description of Surrounding Land Use and Habitats:

Forested, low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize erosion. Cut/build steps to access beach area.

Sources of Degradation (13 possible): Unstable bank

Number of Degradation Indicators Observed (13 possible): 1

Total Degradation Score (higher score indicates a higher level of degradation): 0.40

Likely Project Cost: Low

COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000,
Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: soil stabilization erosion control, minor grading, construction access, and construct recreational facilities/access. Proposed restoration easily achieved using hand crews.

Description of Challenges to Restoration:

Access may be an issue.

Restoration Type: Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Business/Industry

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.

RESTORATION SITE SUMMARY REPORT

Habitat Restoration Inventory

Site ID: RR-074

Site Location: State: ME, County: Cumberland, Town: Yarmouth

X Coordinate (Longitude): -70.1505

Y Coordinate (Latitude): 43.7907

Waterbody: Royal River

Size of Restoration Area (linear feet) 150

Date of Field Assessment: 6/23/2005

Date of Last File Update: 8/12/2005



Description of Site:

Severe erosion of banks. Large chunks of lawn have been undercut and fallen in. Mowed lawn to top of banks, then steep slope to river. Banks well vegetated with herbs, shrubs, trees, except where erosion has occurred.

Description of Surrounding Land Use and Habitats:

Low-density residential.

Description of Restoration Recommendations for the Site:

Stabilize banks. Stop mowing to top of bank and plant shrubs to stabilize and prevent additional erosion.

Sources of Degradation (13 possible): Land cleared, Land use activity a potential contaminant source, Unstable bank

Number of Degradation Indicators Observed (13 possible): 5

Total Degradation Score (higher score indicates a higher level of degradation): 2.30

Likely Project Cost: Low-Moderate
COSTS: Low = < \$5,000, Low - Moderate = > \$5,000 to < \$10,000, Moderate = > \$10,000 to < \$25,000, Moderate - High = > \$25,000 to < \$50,000, High = > \$50,000 to < \$100,000, Very High = > \$100,000

Description of Factors Affecting Restoration Cost:

Cost considerations include: plantings/landscaping, soil stabilization erosion control, and construction access.

Description of Challenges to Restoration:

Access may be an issue.

Restoration Type: Buffer, Shoreline Bank

Restoration Habitat Type: Riparian Zone (non-wetland)

Additional Comments:

Land Ownership: Private/Resident

Funding Source(s): Unknown

Project Status: Identified as a Potential Site

Contact(s):

If Applicable:

Start Date of Implementation:

End Date of Implementation:

Size of Area Restored (linear feet): 0

Monitoring Start Date:

Date ALL Project Activities (construction and monitoring) Completed:

Date of Project Termination:

Reason for Termination:

Information used to identify a potential restoration sites is based on a review of background materials and a rapid field assessment of the site. The information is provided to assist in identifying potential restoration opportunities and to identify some of the costs and challenges that may be associated with a site. Further evaluation of the site will be necessary before the Project Status of a site can move from Potential Site to Planning/Implementation.