Royal River Corridor Study
Yarmouth, Maine
Natural Resource Reconnaissance Surveys

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Introduction

As part of the Royal River Corridor Study, Stantec evaluated natural resources present within the 1.5-mile-long study area. The purpose was to help inform the Study Committee in terms of evaluating constraints on current and potential future changes to development activities and zoning ordinances along the river corridor.

As a first step in the study, natural resource information for the study area was compiled into a series of GIS datafiles by the Greater Portland Council of Governments for this project. Stantec reviewed and augmented this GIS information with literature reviews and searches of available databases, as well as through consultations with several state and federal natural resource agencies. Stantec then conducted a series of reconnaissance-level field surveys to confirm and map natural resources within the corridor, and evaluated protected natural resources in terms of regulatory constraints. Stantec's evaluation of aquatic habitat and fisheries also included a brief evaluation of the existing dams and associated fish passage structures.

This report presents the results of Stantec's investigations of natural resources, and is focused on the following resource topics:

- Aquatic habitats, Fisheries, and dam infrastructure
- Wetlands, Streams, and Natural communities
- Wildlife/rare species
- Soils and slopes

Each topic is discussed in a separate chapter with appropriate illustrations. Detailed maps showing wetland and natural community information are provided in Appendix A, and a summary table of applicable regulations is provided in Appendix B.

Executive Summary – Natural Resources

The Royal River corridor includes a broad spectrum of natural communities and habitats, ranging from a rich estuarine and salt marsh ecosystem to small freshwater perennial streams, from salt marshes to vernal pools. In the lower section of the river where it meets the Cousins River and Casco Bay, the Royal River corridor is characterized at low tide by a narrow brackish water river channel, extensive mudflats, fringing spartina salt marsh, and steep, forested slopes. With a 9-foot tidal range, this section of the river receives a significant influx of nutrients with each tide cycle, making it an attractive and productive environment for a wide range of species including wading birds, waterfowl, fish, shellfish, marine mammals, and humans.

Above head-of-tide, the river contains a variety of freshwater aquatic habitats between several sets of falls, which support a range of fish species. These habitats support a number of fish species, including several anadromous (live in the sea, breed in fresh water) and catadromous (live in fresh water, breed in the sea) species.

Four natural and man-made barriers within the river exist in the study area, including two dams and two natural falls. From the downstream extent of the study area at head-of-tide, these include the Lower Falls, the Bridge Street dam, the Upper Falls, and the East Elm Street dam. In terms of fish passage, the Lower Falls do not present a barrier to most fish species. Although the Upper Falls may themselves be a barrier, there is a side channel to the east of those falls that would allow passage around the falls. The two dams present a complete barrier to fish passage.

A concrete Denil fish passage exists at each dam, but these fish passage structures are flawed and do not appear to be providing adequate function. The structure and geometry of the bedrock underlying and adjacent to the two dams suggest that fish passage through the falls would be possible if the dams were removed.

Stantec identified over 20 freshwater and coastal wetlands within the study area, as well as a number of small perennial and intermittent streams and two potential vernal pools. Wetlands below the head of tide consist of

coastal wetlands including salt marsh, intertidal mudflats, and several small streams. Freshwater wetlands above East Main Street are dominantly floodplain wetlands and small perennial streams, although a large forested wetland was identified south of the Mill Stream apartments. No spring vernal pool surveys were conducted, and so the two vernal pools have not been confirmed as significant.

Many of the riparian zones adjacent to the river are relatively undeveloped, and are comprised of upland woods, shrub thickets, parkland, field, and wetlands. The steeply wooded slopes are dominated by red oak, red maple, white pine, sugar maple, white birch, and eastern hemlock, with little to no understory or herbaceous layer. There are a few narrow drainages along the slopes. Additional small wooded areas are located throughout the study area and contain similar vegetation. Upland wooded floodplain areas and shrub thickets adjacent to the river also contain significant amounts of invasive species such as black locust, common buckthorn, Morrow's honeysuckle, multiflora rose, Japanese knotweed, and oriental bittersweet. Soils and slopes along the river are dominantly clay-rich hydric soils that are form steep slopes and gullies and are subject to moderate erosion and slumping. Several landslides have occurred on both sides of the river downstream from the marina areas.

Although a wide variety of wildlife were observed and reported to utilize the river corridor and its habitats, no rare, threatened, or endangered species were identified in the study area through desktop research or inquiries with natural resource agencies.

Chapter 1: Aquatic Habitats and River Infrastructure

Stantec conducted a brief field evaluation of the Royal River aquatic habitats and dam-related infrastructure between East Elm Street and the mouth of Yarmouth Harbor at East Main Street. The purpose of the reconnaissance-level survey was to characterize riverine habitats, identify potential protected natural resources, and characterize fisheries and existing fish passage structures.

Survey Methods

The study area consisted of approximately 1.5 miles of river reach between the East Elm Street dam and the East Main Street bridge. Prior to conducting a field survey, Stantec reviewed existing aerial photography (Greater Portland Council of Government, 2006) and available published information concerning fish species reported to occur in the river. A two-day reconnaissance field survey was conducted in mid-September 2007 during relatively low-flow conditions. The presence and conditions of habitat, fish passage barriers, and performance of existing fish passage structures were observed.

Habitat Characterization

Four natural and man-made barriers exist along this section of river, including two dams and two natural falls. From the downstream extent of the study area at head-of-tide, these include the Lower Falls, the Bridge Street dam, the Upper Falls, and the East Elm Street dam. A variety of riverine habitats exist between the dams and falls. The following observations are listed in order of moving upstream from head of tide.

The head of tide is located under the East Main Street bridge at the base of the first set of falls. Downstream from the bridge the Royal River is an estuarine system with a fine silt and mud bottom, extensive mudflats exposed at low tide, and salt marsh fringing the harbor. The estuary supports a broad range of fish species, including shellfish, anadromous and catadromous fish species such as blueback herring (*Alosa aestivalis*), alewife (*A. pseudoharengus*), American shad (*A. sapidissima*), and American eel (*Anguilla rostrata*), and a strong recreational fishery including bluefish (*Pomatomus saltatrix*) and striped bass (*Morone saxatilis*).

The “Lower Falls” exist at the head of tide near East Main Street, adjacent to Grist Mill Park. Upstream fish access is possible at higher tides at this location. The bedrock outcrops that comprise the falls include a series of stepped and offset ledges that are oriented nearly perpendicular to the river flow direction, which appear to provide a series of resting pools and natural ramps suitable for a variety of fish species to use for passage during appropriate flow regimes.

Photo 1-1. Lower Falls at East Main Street, consisting of a series of stepped ledge outcrops suitable for fish passage.

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Between the Lower Falls and the Bridge Street dam, riverine habitat exists with various critical fish habitat types include riffles, runs, and pools. A variety of substrates are found in this section of the river, including fine silt and mud, fine sand and silt bars, gravel beds, and ledge. A series of offset ledge outcrops are found in the river immediately adjacent to the Sparhawk Mill and extending up to the Bridge Street dam, which result in a habitat and series of steps similar to that found within the Lower Falls.

Photo 1-2. River habitat between the Lower Falls and Sparhawk Mill includes riffles, runs, and pools.

The section of river below the Bridge Street dam is known as a good recreational fishery, with reported species including anadromous and catadromous fish species such as alewife *(Alosa pseudoharengus)*, blueback herring *(Alosa aestivalis)*, American shad *(A. sapidissima)*, and American eel *(Anguilla rostrata)*, as well as sea run brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*). Information from the Maine Department of Inland Fisheries and Wildlife (MDIFW) and the Maine Department of Marine Resources (MDMR) also indicates that the reach of the Royal River below and adjacent to the Sparhawk mill supports migratory (diadromous) fish and a population of sea-run (anadromous) trout. No significant fisheries habitat (i.e. wild brook trout, threatened or endangered fish species, etc.) were identified by MDIFW in the Royal River upstream of Route 88.

Photo 1-3. The Bridge Street dam was installed atop a series of stepped ledges, and serves as a complete barrier to fish passage.

The Bridge Street dam located just upriver from the Sparhawk Mill is a run-of-river concrete structure estimated to be four to six feet high, which was installed at the top of a series of ledge outcrops. The dam provides low-head water to the adjacent Sparhawk Mill through a metal penstock. The dam appears to serve as a barrier to all fish species. An old dock and woody debris are also blocking the outflow of this dam. Due to the similar structure and orientation of the bedrock in this section of river compared to Lower Falls, it is likely that fish passage through the falls at Bridge Street would be possible if the dam was removed.

The Bridge Street dam has an existing concrete Denil fish passage on the south side of the river. The fish passage has some flaws apparent that need to be addressed, including several broken and missing boards. Regular maintenance is required of these types of fish passages. It is also unclear whether appropriate flows are able to be maintained in this structure during all fish migration periods during the year. In addition, it is uncertain whether the fish passage outlet's location or flow is appropriate to serve as a significant attractant to fish species moving upstream.

Photo 1-4. The Denil fish pass at the Bridge Street dam.

Between the Bridge Street dam and the Upper Falls, a lentic system exists within the impoundment. The depth of the impoundment is uncertain, but could be expected to be between three feet and ten feet deep based on the dam height and the visible bottom under the Route 1 bridge.

Pooling in this section of the river supports beaver, waterfowl, wading birds, and other birds, and may support various fish species. Warm water fish species including smallmouth bass (*Micropterus salmoides*) are reported to be present in this section of the river. During low flows, however, increased water temperature and decreased dissolved oxygen may be lethal to coldwater species such as trout and salmon in this section of the river.

Upstream from the Bridge Street dam impoundment, a set of natural falls exist in the main channel, known as the Upper Falls. The Upper Falls consist of a series of stepped, offset ledge outcrops similar to those in the Lower Falls, as well as a series of riffles, runs, and pools between the ledge areas.

Photo 1-5. Above the Bridge Street dam, a quiet impoundment exists.

The geometry of the Upper Falls may prevent upstream fish passage under most flow conditions. A natural channel exists around the falls to the east, however, which will allow successful upstream movement of a variety of fish species under proper water flows.

Upstream of these falls a short stretch of lentic system occurs, with a more riverine section located just below the East Elm Street dam. Strong currents over armored bedrock meet pooling water approximately 300 ft downstream of the dam. A side bypass channel with masonry walls enters the river in this section. This channel takes off from the main river next to the Yarmouth Water District office upstream from the East Elm Street dam, and appears to be a head race for a previous mill operation.

The upstream-most dam at East Elm Street is a masonry dam estimated to be four to seven feet high built atop ledge outcrops. The dam is very porous with visible leaks observed and spillover occurrences, including leaks at a sluiceway gate with wood panels located at the south end of the dam adjacent to the spillway. The dam is a complete barrier to upstream fish movement. Downstream fish movement is also of concern at the East Elm Street dam. Fish following downstream currents may become impinged in dam holes where water is leaking.

Photo 1-6. The Upper Falls, adjacent to Royal River Park.

An existing concrete Denil fish passage at the south side of the dam has flaws which require maintenance. As with the Bridge Street fish pass, several of the wooden vanes were damaged or missing, and both the fish passage and dam have large woody debris entrained. In addition, it is unclear whether the Denil outlet location and flows are suitable to attract fish. A natural side channel of the River exists to the east; however, the dam blocks fish access from this direction.

Photo 1-7. The East Elm Street dam, with leaks visible between stones.

Photo 1-8. Denil fish pass at East Elm Street

Chapter 2: Wetlands and Natural Communities

Stantec conducted a reconnaissance-level wetland survey along a 1.5-mile corridor on both sides of the Royal River between the Water District office on East Elm Street and the mouth of Yarmouth Harbor at East Maine Street (hereafter referred to as the study area). The study area width extends 500 feet from either side of the river (see Figure 1). The purpose of the reconnaissance-level wetland survey was to identify any wetlands, streams, and other regulated natural resources that may affect potential future development within the study area. No formal wetland delineation was completed. Representative photographs were taken and are included here. Field notes were recorded and are available upon request.

Survey Methods

Prior to conducting the field survey, Stantec reviewed existing 0.5-foot resolution aerial photography (Greater Portland Council of Government, 2006), as well as National Wetland Inventory maps that were then overlaid onto the aerial photographs. In addition, MDIFW *Beginning With Habitat* map data, Federal Emergency Management Agency Flood Insurance Rate Maps, and the Town of Yarmouth Zoning Map (amended March 18, 1993) were also reviewed. The field survey was then conducted on September 19 and 20, 2007. Approximate locations of wetlands, streams, potential vernal pools, and drainages were sketched onto the aerial photographs and then digitized onto the final corridor study maps (provided in Appendix A).

Site Description

The study area consists of approximately 100 acres located between the Water District office on East Elm Street and the mouth of the Yarmouth Harbor at East Main Street. The study area is primarily developed by private residences, businesses, public facilities, and recreational land. Development along the Royal River dates back to the 1800's when a number of mills and dams were built along this section of the river. These mills provided services ranging from iron forging, brick manufacturing, textiles, and power generation. Some mill remnants are still in visible in the Royal River Park within the study area, and the Bridge Street Dam still produces power for the Sparhawk Mill. As a result of the development over the years, many of the land features have been disturbed and reconstructed.

The undeveloped areas within the study area are comprised of upland woods, shrub thickets, parkland, field, and wetlands. An unfragmented upland wooded area occurs in the southeastern portion of the study area adjacent to River View and Holy Cross cemeteries. The steeply wooded slopes are dominated by red oak (*Quercus rubra*), red maple (*Acer rubrum*), white pine (*Pinus strobus*), sugar maple (*A. saccharum*), white birch (*Betula papyrifera*), and eastern hemlock (*Tsuga canadensis*). There is little to no understory or herbaceous layer. There are a few narrow drainages along the slopes. Additional small wooded areas are located throughout the study area and contain similar vegetation. Of note are the upland wooded floodplain areas adjacent to the river that are dominated by black cherry (*Prunus* serotina), black locust (*Robinia pseudoacacia*),*[1] box-elder (*Acer negundo*), American elm (*Ulmus americana*), and black willow (*Salix nigra*) trees. Also present are common buckthorn (*Rhamnus cathartica*)* and Morrow's honeysuckle (*Lonicera morrowii*)* shrubs. The upland shrub thickets are dominated by Morrow's honeysuckle, common buckthorn, multiflora rose (*Rosa multiflora*),* staghorn sumac (*Rhus hirta*), Japanese knotweed (*Fallopia japonica*),* and oriental bittersweet (*Celastrus orbiculata*).* The Royal River Park contains some upland woods and shrub thickets, but it is generally dominated by mowed lawn areas. West of Grist Mill on the south side of the river is an upland field area owned and maintained by the Town of Yarmouth. The field is vegetated by upland grasses and forbes such as common milkweed (*Asclepias syriaca*), goldenrod (*Solidago* sp.), cow vetch (*Vicia cracca*), common evening-primrose (*Oenothera biennis*), Virginia creeper (*Parthenocissus quinquefolia*), purple loosestrife (*Lythrum salicaria*),* red fescue (*Festuca rubra*), and Kentucky bluegrass (*Poa pratensis*).

Wetland Descriptions

[1] *Denotes an invasive species, which is a species that has been introduced or is a non-native plant that aggressively colonizes or is detrimental to economic crops or native plant communities. Invasive Plant Survey Atlas. Maine Natural Areas Program, Department of Conservation. 2000.

Stantec identified over 20 freshwater and coastal wetlands within the study area, as well as a number of small perennial and intermittent streams and two potential vernal pools. Each is further described below.

Wetland 1 / Royal River
Cowardin Classification[2]
PUBHh - Palustrine, Unconsolidated Bottom, Permanently Flooded Impounded (Dam)
R3RBH – Riverine, Upper Perennial, Rock Bottom, Permanently Flooded
E2US3N – Estuarine, Intertidal, Unconsolidated Shore, Mud, Regularly Flooded-Tidal

The 1.5-mile reach of the Royal River that is located within the study area contains both freshwater and coastal waters. It is tidally influenced up to the falls at Grist Mill. Fishways for the Bridge Street and Elm Street Dam were built in 1974 and 1979, respectively, as part of an anadromous fish restoration program initiated by the Maine Department of Marine Resources. There are two sets of falls in the study area: Upper Falls, located east of the Elm Street Dam, and Lower Falls located at Grist Mill Park west of Route 88. The river is home to numerous anadromous fish species such as alewife, shad, America eel, sea run brook trout, and brown trout. There are also freshwater mussels present. Evidence of raccoon (*Procyon lotor*) and whitetail deer (*Odocoileus virginianus*) occur on the tracks along the river shores. MDIFW has mapped sections of the river from east of Interstate 295 to the mouth of the river as Significant Shorebird, Waterfowl, and Wading Bird Habitats. Downriver of the Sparhawk Mill is a popular spot for anglers, and several marinas are located on both sides of the river downstream of Lower Falls. Private residences and commercial businesses are adjacent to or are in close proximity to the river.

Above the Lower Falls the river banks are fairly vertical with some very steeply wooded slopes, while in other areas the banks are more gradual. Rocks and boulders characterize the shoreline around the falls. Below Lower Falls, the banks are vertical but give way to more gradual banks that contain coastal wetlands and tidal flats. The shores around the falls areas are rocky. Narrow fringes of emergent wetland also occur that are dominated by reed canarygrass (*Phalaris arundinacea*), purple loosestrife, and river bulrush (*Bolboschoenus fluviatilis*). These fringes are primarily located above Lower Falls.

Photo 2-1. East Elm Street Dam and impoundment above; looking northeast. Stantec, September 19, 2007.

[2] Cowardin, L.M., V. carter, F. C. Golet and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* U.S. Fish & Wildlife Service Publication Number FWS/OBS-79/31.

Photo 2-2. Royal River below Elm Street Dam; looking east. Stantec, September 19, 2007.

Photo 2-3. Impoundment above Bridge Street Dam, looking southeast at Sparhawk Mill. Stantec, September 20, 2007.

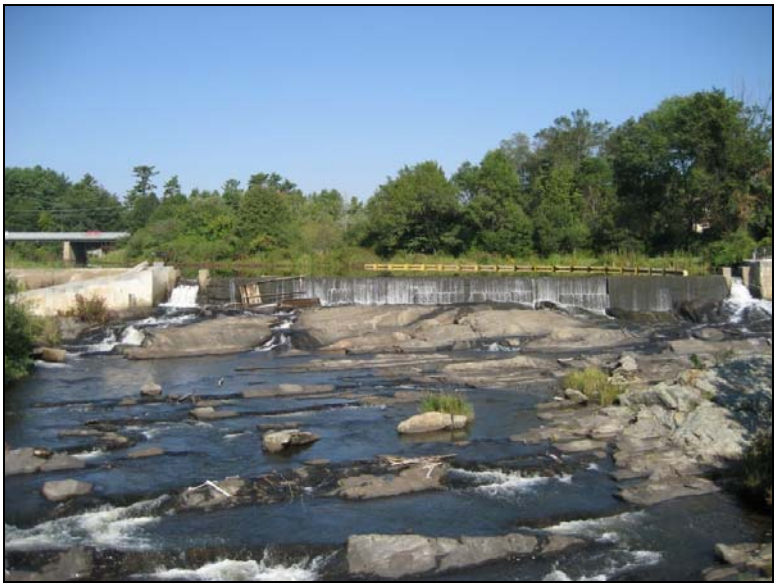

Photo 2-4. Bridge Street Dam, looking north. Stantec, September 20, 2007.

Photo 2-5. Looking upriver at Sparhawk Mill, to the northwest. River banks are gradual and rocky on this stretch of the river. Stantec, September 19, 2007.

Photo 2-6. Looking upriver from Grist Mill Park, to the north. River banks are steep along north side. Stantec, September 19, 2007.

Photo 2-7. Lower Falls west of Route 88; looking north from Grist Mill Park. Stantec, September 19, 2007.

Photo 2-8. Looking southeast down the river from the public boat ramp off Old Shipyard Road. The demarcation from freshwater to saltwater occurs below the Lower Falls at Grist Mill Park. Stantec, September 19, 2007.

Wetland 2 (W-2)
Cowardin Classification
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated

The wetland is a fairly small, isolated scrub-shrub wetland located at the southwestern end of the Royal River Park. It appears to be receiving groundwater discharge from the banks of the railroad that is located along the wetland's southern boundary. Dominant shrubs include red osier dogwood (*Cornus sericea*) and speckled alder (*Alnus incana*). Herbaceous species include jewelweed (*Impatiens capensis*), American willow-herb (*Epilobium ciliatum*), Canada goldenrod (*Solidago canadensis*), and swamp buttercup (*Ranunculus hispidus*). There are some scattered black willow trees present in the overstory. The area was saturated to the surface at the time of the visit. The construction of the rail road has disturbed this area and has likely altered the hydrology. It appears that the drainage from the wetland is channeled under the park and outlets to the river via a culvert.

Photo 2-9. Wetland 2. Scrub-shrub wetland on southwest end of the Royal River Park. Stantec, September 19, 2007.

Wetland 3 (W-3)
Cowardin Classification
PUBF/Hx – Palustrine, Unconsolidated Bottom, Semi-permanently Flooded to Permanently Flooded, Excavated

Wetland 3 is a very small isolated basin located southeast of Wetland 2. It is approximately 20 square feet in size and held approximately six inches of standing water at the time of the visit. It is surrounded by Morrow's honeysuckle, but there is no associated wetland vegetation. This wetland appears to be man-made, possibly a result of excavation activities. Stantec observed several green frogs (*Rana clamitans*) within the wetland. A springtime survey would need to be conducted to determine if the pool is being utilized by breeding amphibians.

Photo 2-10. Wetland 3. A very small isolated basin southeast of Wetland 2. Stantec, September 19, 2007.

Wetland 4 (W-4)
Cowardin Classification
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
PFO1E – Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Flooded

Wetland 4 appears to transition from a scrub-shrub to a forested wetland. It is located south of W-2 along the southwest boundary of the Royal River Park. Dominant trees in the overstory include gray birch (*Betula populifolia*), American elm, and black willow. Speckled alder dominates the shrub layer. Common herbaceous species include sensitive fern (*Onoclea sensibilis*), jewelweed, and American willow-herb. The area was inundated at the time of the visit, and remnants of a makeshift wooden bridge were observed. Similar to W-2, this wetland drains under the park and outlets into the river. Nearby within the shrub thicket are remnants of what appears to have been a building and a large pile of bricks. This may have been the site of a brick factory at one time.

Photo 2-11. Scrub-shrub and forested wetland located along the southwestern boundary of the Royal River Park with remnants of a wooden bridge in the foreground. Stantec, September 19, 2007.

Wetland 5 (W-5)
Cowardin Classification
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
PEM1E – Palustrine, Emergent, persistent, Seasonally Flooded/Saturated

Wetland 5 is primarily a scrub-shrub wetland located north of the Yarmouth Elementary School. The park walkway is adjacent to the wetland. Dominant shrubs include red osier dogwood and common buckthorn. Common herbaceous species include jewelweed, swamp buttercup, soft rush (*Juncus effusus*), Canada bluejoint (*Calamagrostis canadensis*), coltsfoot (*Tussilago farfara*), and broad-leaved cat-tail (*Typha latifolia*). A few black willow and American elm trees are present in the overstory. At the time of the site visit, Wetland 5 was saturated to the surface and contained areas of inundation. It receives flow from a culvert at the southern end and drains northward to the river via culverts under the walkway. The construction of the school and the introduction of the paths likely altered the hydrology in this area.

Photo 2-12. Wetland 5. Scrub-shrub wetland with some inundation. This portion of the wetland is adjacent to the walkway to the north; looking east. Stantec, September 20, 2007.

Photo 2-13. Wetland 5. Looking north at the small emergent portion of the wetland located between two areas of scrub shrub wetlands. Stantec, September 19, 2007.

Wetland 6 (W-6) / Stream 1 (S-1)
Cowardin Classification
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
R2SS3H – Riverine, Lower Perennial, Streambed, Cobble-Gravel, Permanently Flooded

The wetland is a narrow scrub-shrub fringe bordering the banks of a perennial stream. Speckled alder, red osier dogwood, willows (*Salix* spp.), and common buckthorn dominate the shrub layer. Common herbs include nodding beggar ticks (*Bidens cernua*), nodding sedge (*Carex gynandra*), and some sparse broad-leaved cat-tail. A few black willow and American elm are present in the overstory. The stream is approximately three to four feet wide, with vertical banks and a cobble-rocky streambed. At the time of the site visit, the stream contained a steady flow from an outfall culvert just off the east end of the elementary school ball field into the river via a culvert under the walkway. This stream was rerouted under the ball field a number of years ago.

Photo 2-14. Wetland 6 with perennial stream (S-1) looking west. Stantec, September 19, 2007.

Wetland 7 (W-7)
Cowardin Classification
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated.

The wetland is located east of Interstate 295, south of the river, and north of York Street. Dominant shrubs include speckled alder, red osier dogwood, and common buckthorn. The herbaceous layer is well vegetated by sedges (*Carex* spp.), sensitive fern, aster (*Aster* sp.), and broad-leaved cat-tail. Red maple and American elm are present along the edges of the wetland. At the time of the site visit, the area was flooded with water that was bright orange in color. The wetland drains to a small emergent, scrub-shrub fringe and the river via a culvert under the walkway.

Photo 2-15. Wetland 7. Scrub-shrub wetland looking southwest. Stantec, September 20, 2007.

Wetland 8 (W-8)
Cowardin Classification
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated.
PFO1E – Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Flooded.

Wetland 8 is located southwest of the Bridge Street Dam, just northeast of Yarmouth Falls Apartments. There is a paved walkway from the apartments that borders the wetland to the east which intersects with the main walkway. The wetland appears to be a scrub-shrub wetland transitioning into a forested wetland. Red maple trees dominate the overstory. Winterberry (*Ilex verticillata*) and common buckthorn are common in the understory. Dominant herbaceous species include sensitive fern, cinnamon fern (*Osmunda cinnamomea*), and jewelweed. At the time of the site visit, the area was saturated to the surface with some inundation. The wetland drains to the river via a culvert under the walkway.

Photo 2-16. Wetland 8. A scrub-shrub and forested wetland southwest of the Pathway along the river. Stantec, September 20, 2007.

Wetland 9 (W-9) / Stream 2 (S-2)
Cowardin Classification
PFO1E – Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Flooded
R2SS3/5H - Riverine, Lower Perennial, Streambed, Cobble-Gravel/Mud, Permanently Flooded

The wetland is located west of Bridge Street, just east of Wetland 8. It is predominantly forested and contains a perennial stream. Dominant trees in the overstory include gray birch and red maple. Common shrubs include speckled alder and willows. The herbaceous layer is dominated by sensitive fern. Purple loosestrife also occurs within the wetland. The stream is approximately 1.5 feet wide with a mix of cobble and mud substrate. It flows to the river via a culvert under the walkway.

Photo 2-17. Wetland 9 & Stream 2. Forested wetland west of Bridge Street on the south side of the river, looking southwest. Stantec, September 20, 2007.

Photo 2-18. Perennial stream associated with Wetland 9. The stream is shaded by dense vegetation. Stantec, September 20, 2007.

Wetland 10 (W-10)
Cowardin Classification
PFO1E – Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Flooded
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
PEM1E – Palustrine, Emergent, persistent, Seasonally Flooded/Saturated
R2SS3/5H – Riverine, Lower Perennial, Streambed, Cobble-Gravel/Mud, Permanently Flooded

Wetland 10 is fairly large and comprised of several wetland types, as well as a perennial stream. It is located east of Bridge Street and south of Millpoint Apartments, and extends eastward to Grist Mill Lane. There are very steep slopes along the southern boundary. The forested component of the wetland is dominated by maple trees in the overstory along with a few black willow and American hornbeam (*Carpinus caroliniana*) trees. Winterberry and common buckthorn are common in the understory. The herbaceous layer is well vegetated by sensitive fern, cinnamon fern, jewelweed, Jack-in-the-pulpit (*Arisaema triphyllum*), and fringed sedge (*Carex cf. crinita*).

The scrub-shrub portions of the wetland are dominated by speckled alder, winterberry, and common buckthorn. Herbaceous species within the scrub-shrub portion of the wetland are similar to those found in the forested portion. The scrub-shrub wetland located adjacent to Grist Mill Lane appears to be transitioning to a forested wetland. In this area of the wetland complex, a small flooded depression was observed. Based the watermarks on the surrounding vegetation, it appears that water pools here for long periods throughout the year and could potentially provide breeding habitat for vernal pool species. However, a springtime survey would be necessary to confirm this.

The emergent portion of the wetland complex is located adjacent to the river at the north end. Dominant herbaceous species include reed canarygrass, cinnamon fern, jewelweed, and purple loosestrife. The stream flows just inside the scrub-shrub portion, adjacent to the Millpoint parking lot, and flows northeast to the river. It had a steady flow at the time of the site visit. It is likely that the stream may have been impacted and the hydrology altered when the Millpoint Apartments were constructed.

Photo 2-19. Wetland 10. Emergent wetland adjacent to the river. Stantec, September 20, 2007.

Photo 2-20. Wetland 10. Perennial stream. Stantec, September 20, 2007.

Photo 2-21. Wetland 10. Forested wetland south of Millpoint Apartments. Stantec, September 20, 2007.

Photo 2-22. Wetland 10. Potential vernal pool within scrub-shrub wetland off Grist Mill Lane. Stantec, September 20, 2007.

Wetland 11
Cowardin Classification
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
R2SS5H – Riverine, Lower Perennial, Streambed, Cobble-Gravel/Mud, Permanently Flooded

Wetland 11 is located on the south side of Route 88 across from Lower Falls Landing. It is a narrow fringe scrub-shrub wetland associated with a perennial stream. Dominant species include speckled alder shrubs, American Elm saplings, and jewelweed in the herbaceous layer. The wetland and stream are located between steep banks. At the time of the site visit, the stream was approximately two to three feet wide. The stream flows northward under Route 88 via a culvert and is directed through a drainage ditch in the parking lot of Lower Falls Landing, where it is then directed to the river via a culvert under the parking area.

Photo 2-23. Wetland 11. Scrub-shrub wetland associated with a perennial stream, looking southwest. Stantec, September 20, 2007.

Photo 2-24. Wetland 11. Scrub-shrub wetland associated with a perennial stream; looking south. Stantec, September 20, 2007.

Photo 2-25. Drainage basin for Wetland 11, located on the north side of Route 88 in the Lower Falls Landing parking area. Stantec, September 20, 2007.

Wetland 12 (W-12)
Cowardin Classification
E2EM1P – Estuarine, Intertidal, Emergent, persistent, Irregularly Flooded
PFO1E – Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Flooded
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated

Wetland 12 is located adjacent to the south side of the river, north of River View and Holly Cross cemeteries. Yankee Marina and Boatyard is located to the west and the Yarmouth Sewer District Treatment plant to the east. There are very steep, wooded banks along the southern boundary of the wetland. The coastal wetland is a narrow fringe bordering the river and is dominated by smooth cordgrass (*Spartina alterniflora*), salt hay grass (*Spartina patens*), saltmarsh bulrush (*Bolboschoenus robustus*), seaside goldenrod (*Solidago sempervirens*), stiff leaf quackgrass (*Agropyron pungens*), and common reed (*Phragmites australis*). Adjacent to the coastal wetland is a scrub-shrub wetland fringe dominated by speckled alder and winterberry. Common herbaceous species include sensitive fern, cinnamon fern, swamp buttercup, drooping sedge (*Carex prasina*), and jewelweed. At one point, the scrub-shrub wetland broadens to include a small forested wetland dominated by red maple and balsam fir. A few narrow drainages were observed along the steep slopes.

Photo 2-26. Wetland 12. Coastal emergent wetland looking east downriver. Stantec, September 20, 2007.

Photo 2-27. Wetland 12. Scrub-shrub wetland adjacent to the coastal wetland; looking north. Stantec, September 20, 2007.

Photo 2-28. Narrow drainage along the steeply wooded slopes south of Wetland 12. Stantec, September 20, 2007.

Wetland 13 (W-13)
E2EM1P – Estuarine, Intertidal, Emergent, persistent, Irregularly Flooded

Wetland 13 is located on the north side of the river east of the Royal River Boat Yard. It is a large salt marsh dominated by narrow-leaved cat-tail (*Typha angustifolia*), common reed, smooth cordgrass, salt hay grass, and seaside goldenrod. The wetland contains a Spartina Saltmarsh as mapped by the Maine Natural Areas Program. This community is considered rare in Maine and is ranked by MNAP as S3 (i.e., on the order of 20-100 occurrences).

Photo 2-29. Wetland 13. Coastal emergent wetland (salt marsh) located east of Royal River Boatyard, looking south. Stantec, September 20, 2007.

Wetland 14 (W-14)
Cowardin Classification
PFO1E – Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Flooded

Wetland 14 is a small wetland area located in the woods northwest of Blueberry Cove. Red maple and balsam fir trees dominate the overstory. There is little to understory. The herbaceous layer is dominated by cinnamon fern.

Photo 2-30. Wetland 14. Small forested wetland northwest of Blueberry Cove Condominiums. Stantec, September 20, 2007.

Wetland 15 (W-15)
Cowardin Classification
E2EM1P – Estuarine, Intertidal, Emergent, persistent, Irregularly Flooded

Wetland 15 is located along the shore of a small cove on the north side of the river, southwest of Blueberry Cove. It is a narrow fringe of coastal emergent wetland dominated by smooth cordgrass, salt hay grass, saltmarsh bulrush, and seaside goldenrod.

Photo 2-31. Wetland 15. Coastal wetland fringe southwest of Blueberry Cove Condominiums. Stantec, September 20, 2007.

Wetland 16 (W-16)
Cowardin Classification
PUBFx – Palustrine, Unconsolidated Bottom, Semi-permanently Flooded, Excavated
PEMIEx – Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated, Excavated

Wetland 16 contains spoils from an historic dredging of the harbor. It is a highly disturbed area dominated by common reed, an invasive species. A portion of the area is mapped on the NWI Map as palustrine unconsolidated bottom. However, the very dense phragmites stand and the limited scope of the study prevented verification of this mapping. There have been a number of nesting red-winged blackbirds (*Agelaius phoeniceus*) sighted within the wetland, and splashing water has been heard coming from the center portions of the wetland. A photograph taken at a higher elevation reveals an area that contains vegetation other than common reed. It is likely that some areas within the wetland are flooded during the growing season.

Photo 2-32. Wetland 16, looking south. A large stand of common reed covers a relic spoils pile from harbor dredging that occurred circa 1970. Note the lighter green patches of vegetation; this may be the areas that are inundated during the growing season. Stantec, September 20, 2007.

Photo 2-33. Wetland 16, looking southeast from the public boat launch off Old Shipyard Road. Stantec, September 20, 2007.

Photo 2-34. Wetland 16, looking east at a pathway around the stand of common reed. Stantec, September 20, 2007.

Wetland 17 (W-17)
Cowardin Classification
PEM1E – Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated

Wetland 17 is located east of the public boat launch and west of Wetland 16. It is a narrow fringe of emergent vegetation dominated by common reed.

Photo 2-35. Wetland 17 is in the foreground to the left of the frame; Wetland 16 is in the background. Stantec, September 20, 2007.

Wetland 18 (W-18)
Cowardin Classification
PEM1E – Palustrine, Emergent, persistent, Seasonally Flooded/Saturated
PFO1E – Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Flooded

Wetland 18 is located east of Old Shipyard Road. It is primarily an emergent wetland with a narrow forested wetland fringe that broadens in the southeast corner. The wetland has been impounded by the parking area and exit road of the public boat launch. The wetland drains to the river via two metal culverts. Dominant herbaceous species include reed canarygrass, broad-leaved cat-tail, purple loosestrife, and sensitive fern. Speckled alder, common buckthorn shrubs, and red maple trees are common along the edges. Red maple and cinnamon fern dominate the larger forested area to the southeast. A narrow drainage channel between very step banks drains into the wetland from east.

Photo 2-36. Wetland 18. Emergent and forested wetland east of Old Shipyard Road; looking north. Stantec, September 20, 2007.

Wetland 19 (W-19)
Cowardin Classification
PSS1E – Palustrine, Scrub-shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
PEM1E – Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated

Wetland 19 is located adjacent to the north side of the river, downstream of Sparhawk Mill. It has a very narrow emergent fringe along the rocky shore. Reed canarygrass and purple loosestrife dominate the herbaceous layer. Dominant shrubs include speckled alder, red osier dogwood, and willow (*Salix* sp.). There are a few black willow trees present in the overstory. Several narrow drainage channels occur between steeply eroding banks that drain from Yankee Drive. One drainage empties into the eastern end of the wetland, and the other drains through an upland east of the wetland.

Photo 2-37. Wetland 19 located on the north side of the river east of the Sparhawk Mill. Stantec, September 20, 2007.

Photo 2-38. Wetland 19, a narrow drainage channel located between steeply eroding banks, draining from Yankee Drive to the north. Stantec, September 20, 2007.

Photo 2-39. Wetland 19 drainage. Stantec, September 20, 2007.

Wetland Identifier 20 (W-20)
Cowardin Classification
PEM1Eh – Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated, Diked/Impounded
PSS1Eh – Palustrine, Scrub-shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated, Diked/Impounded
[3]R2SS3/5H – Riverine, Lower Perennial, Streambed, Cobble-Gravel/Mud, Permanently Flooded

Wetland 20 is located on the north side of the river, east of Route 1 and south of the Down-East Village Motel & Restaurant. This wetland is densely vegetated and appears to be located at the base of steep slopes. Dominant shrubs include speckled alder, common buckthorn, and red osier dogwood. There are a few black willow trees in the overstory. Broad-leaved cat-tail dominates the emergent wetland, in addition to pickerelweed (*Pontederia cordata*). From the aerial photographs, there appears to be a stream along the southeast corner of the wetland. However, this stream was not field verified during this study.

Photo 2-40. Wetland 20, a scrub-shrub, emergent wetland located east of Route One and south of the Down-East Village Motel & Restaurant. Stantec, September 20, 2007.

Wetland 21 (W-21)
Cowardin Classification
PSS1E – Palustrine, Scrub-shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
PEM1E – Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated
R2SS3/5H - Riverine, Lower Perennial, Streambed, Cobble-Gravel/Mud, Permanently Flooded

Wetland 21 is located on the north side of the river, west of Route One and south of Royal River Center/Forest Falls Drive. A perennial stream is associated with the eastern boundary of this wetland. Dominant shrubs include speckled alder, red osier dogwood, and common buckthorn. There are a few black willow trees in the overstory. Common emergent vegetation includes broad-leaved cat-tail, purple loosestrife, wool-grass (*Scirpus cyperinus*), reed canary grass, river bulrush, pickerel weed, bur-reed (*Sparganium* sp.), three-way sedge (*Dulichium arundinaceum*), and spotted joe-pye weed (*Eupatorium maculatum*). The

[3] The stream was not verified and is based on aerial photo interpretation. A formal survey and/or delineation would be needed to verify the stream existence and morphology.

stream is approximately 4 to 5 feet wide and 8 to 10 inches deep. It drains from a cement box culvert behind the Seagrass Restaurant adjacent to the Yarmouth Post Office. The construction of Royal River Center to the north likely altered the hydrology of the stream.

Photo 2-41. Wetland 21, looking northwest from the south side of the river. Stantec, September 20, 2007.

Photo 2-42. Perennial stream associated with Wetland 21. Stantec, September 20, 2007.

Photo 2-43. Perennial stream associated with Wetland 21 and box culvert behind the Seagrass Restaurant. Stantec, September 19, 2007.

Wetland 22 (W-22)
Cowardin Classification
PSS1E – Palustrine, Scrub-shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
R2SS5Hb - Riverine, Lower Perennial, Streambed, Cobble-Gravel/Mud, Permanently Flooded

Wetland 22 is located west of Wetland 20 and south of Royal River Center/Forest Falls Drive. It is a scrub-shrub wetland associated with a perennial stream. A detention basin has been constructed above the wetland, which has likely impacted the wetland hydrology. Dominant shrubs include speckled alder, red osier dogwood, and Morrow's honeysuckle. There are some black willow trees present in the overstory, and the detention basin contains some broad-leave cat-tail. The stream, which has been impacted by beaver (*Castor canadensis*) activity, is approximately two feet wide and contained less than one inch of flow at the time of the site visit. The substrate was primarily mud.

Photo 2-44. Wetland 22, a scrub-shrub wetland located west of W-21 and south of Royal River Center. Stantec, September 19, 2007.

Photo 2-45. Wetland 22, perennial stream associated with W-22. It flows through dense vegetation and has been impacted by beaver activity. Stantec, September 19, 2007.

Wetland 23 (W-23)
Cowardin Classification
PSS1E – Palustrine, Scrub-Shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated
R2SS5H – Riverine, Lower Perennial, Streambed, Cobble-Gravel/Mud, Permanently Flooded

Wetland 23 is located at the western end of the study area, south of Melissa Drive. It is a scrub-shrub wetland that contains two perennial streams.

Photo 2-46. Wetland 23. A scrub-shrub wetland south of Melissa Drive. Stantec, September 19, 2007.

Photo 2-47. Wetland 23 and associated perennial stream. Stantec, September 19, 2007.

Wetland 24 (W-24)
Cowardin Classification
PFO1E - Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded/Saturated
R2SS4/5H – Riverine, Lower Perennial, Streambed, Sand/Mud, Permanently Flooded

Wetland 24 is located on the south side of Pleasant Street. It is a forested floodplain wetland occurring between steep slopes and is associated with a perennial stream. The overstory is dominated by American elm, green ash (*Fraxinus pennsylvanica*), and red maple. Dominant shrubs include European buckthorn and multiflora rose. Sensitive fern and swamp buttercup are common in the herbaceous layer. The wetland and stream extend beyond the study area to the south. The stream flows northerly under Pleasant Street and exits via a culvert below Pleasant Street. The stream flows for a short distance before it is directed under Route 88 and exits into the river on the north side of Route 88, east of Yarmouth Boat Sales.

Photo 2-50. Wetland 24, a forested floodplain wetland south of Pleasant Street that contains a perennial stream. Stantec, September 20, 2007.

Photo 2-51. Wetland 24, perennial stream associated with Wetland 24. Exiting north of Pleasant Street. Stantec, September 20, 2007.

Photo 2-52. Perennial stream associated with Wetland 24, exiting north of Route 88 to the river. Stantec, September 20, 2007.

Stream 1 (S-1) & Oxbow
Cowardin Classification
R2SS5/H – Riverine, Lower Perennial, Streambed, Cobble-Gravel, Permanently Flooded

Stream 1 is located at the west end of the study area on the south side of the river, east of the public works building and within an oxbow containing steep upland slopes. The stream does not have a well defined channel but is somewhat channelized with a muddy substrate. At its widest point, it is approximately one foot wide. It was flowing at the time of two separate visits and contained approximately 0.5 inch of flow. It appears to be draining from Wetland 2 to the southwest via an underground drain system and metal culvert. There is little to no vegetation associated with it. A regulatory agency review would be necessary to determine if it would be considered a Maine Department of Environmental Protection (MDEP) jurisdictional stream and a Corps-defined tributary to the river.

Photo 2-48. Potential stream draining from Wetland 2 via a drain system under Royal River Park. Stantec, September 19, 2007.

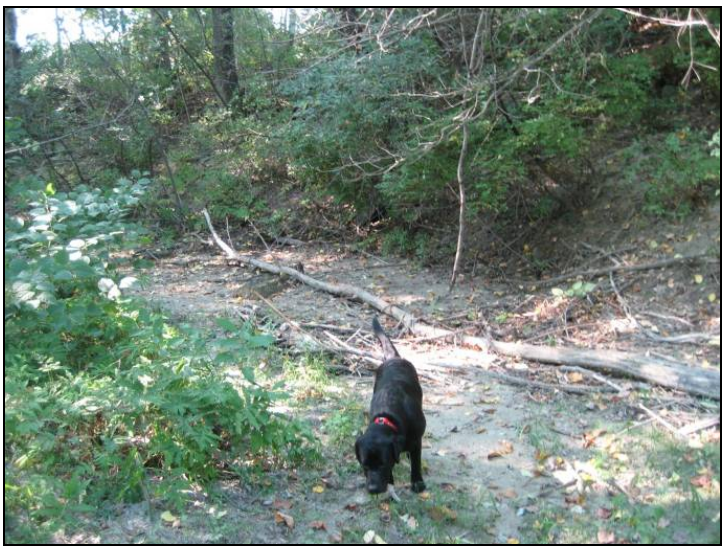

Photo 2-49. Ox-bow where potential stream is located; looking southeast. Stantec, September 19, 2007.

Federal and State Wetland Regulations

The MDEP and the U.S. Army Corps of Engineers (Corps) regulate the wetlands identified within the study area. Under the provisions of Section 404 of the Clean Water Act, the Corps regulates activities within waters of the United States, which include navigable waters and all their tributaries, adjacent wetlands, and other waters or wetlands where degradation or destruction could affect interstate or foreign commerce. The Corps also regulates work and the placement of structures in navigable waters of the United States under Sections 9 and 10 of the Rivers and Harbors Act of 1899. The Corps has issued a Programmatic General permit (PGP) for the State of Maine that merges the federal and state permit review process for many projects. In Maine, wetlands and waterbodies, as well as other protected natural resources, are regulated under M.R.S.A. 38 §§ 480A-480Z, the Natural Resources Protection Act (NRPA).

Projects that do not impact a wetland or projects that impact less than 4,300 square feet of wetland are usually exempt from the NRPA Tier permitting requirements. This exemption does not apply if the impact is: 1) in, on, or over a coastal wetland, great pond, river, stream, or brook; 2) within 25 feet of those resources, or is more than 25 feet and no erosion control is used; 3) in a shoreland zone or a wetland protected by the shoreland zone; 4) part of a wetland with more than 20,000 square feet of open water or emergent vegetation, except artificial impoundments; 5) in peatland; 6) part of a larger project; or 7) in Significant Wildlife Habitat. Typically, projects with cumulative impacts to freshwater wetlands between 4,300 and 15,000 square feet are eligible for review under the Tier 1 process. The Tier 2 review process applies to alterations that affect between 15,000 and 43,560 square feet (i.e., 1 acre) of freshwater wetlands. Cumulative freshwater wetlands impacts that exceed 1 acre typically require a Tier 3 review. Impacts to *Wetlands of Special Significance* (WSS), rivers, streams and brooks, great ponds, and Significant Wildlife Habitat typically require an Individual Permit. The following Table 1 provides a summary of any additional, applicable state and federal regulations for each wetland, as well as the determination of which wetlands are WSS.[4]

Note that there were several drainages observed within the study area. While they do not appear to be jurisdictional due to the lack of hydrophytic vegetation, regulatory agencies should be consulted to determine whether the drainages would be regulated prior to any proposed development. These drainages are noted on the Maps in Appendix A.

A summary of applicable regulations by resource category is provided in Appendix B.

[4] Wetlands that are not considered WSS and/or would not be affected by additional regulations not detailed above are not included in Table 1.

Table 1. WSS Descriptions and Additional State and Federal Regulations

Wetland #	WSS	WSS Descriptions and/or Additional Regulations
1	X	Wetlands within 25 feet of the river are considered WSS. A portion of the river has been mapped by MDIFW as containing Significant Shorebird, Waterfowl, and Wading Bird Habitat. Associated wetlands are therefore considered WSS. In addition, an MDEP Stormwater Permit or Site Location of Development Permit may be required if activities disturbs more than 20 acres. The Maine Bureau of Parks and Lands may be involved if a proposed activity occurs below the mean-low water mark of tidal portion of the river upstream to the farthest natural reach.
5	X	A portion of the wetland is located within the 100-year floodplain as mapped by the Federal Emergency Management Agency (FEMA) and would therefore be considered a WSS.
6	X	The wetland is located within 25 feet of a stream and likely within the 100-year floodplain as mapped by FEMA and would therefore be considered a WSS.
7	X	Portions of this wetland are located within the FEMA-mapped 100-year floodplain and would therefore be considered a WSS.
8	X	Portions of this wetland are located within the FEMA-mapped 100-year floodplain and would therefore be considered a WSS.
9	X	The wetland is located within 25 feet of a stream and within the 100-year floodplain as mapped by FEMA and would therefore be considered a WSS.
10	X	The wetland is located within 25 feet of a stream and likely within the 100-year floodplain as mapped by FEMA and would therefore be considered a WSS.
11	X	The wetland is located within 25 feet of a stream and would therefore be considered a WSS.
12	X	Wetland 12 is located within 25 feet of a stream and the FEMA-mapped 100-year flood zone, and is located adjacent to MDIFW-mapped Significant Tidal Wading Bird and Waterfowl habitat. Therefore, it would be considered a WSS.
13	X	Wetland 13 is considered a WSS because it is a coastal wetland, is located within the 100-year floodplain, and contains Significant Tidal Waterfowl and Wading Bird Habitat, as well as Shorebird Roosting Habitat. Although Waterfowl and Wading Bird Habitat includes a buffer, a Shorebird Roosting Area includes the intertidal area used for feeding, the roosting area, and a 250-foot buffer area. This buffer area is measured from the edge of the roosting area and includes nearby uplands. Any proposed activity in or adjacent to these habitats must comply with NRPA Chapters 310 and 335, Significant Wildlife Habitat. In addition, while the rare Spartina Saltmarsh within this wetland is not considered a WSS, projects permitted under Site Location of Development would consider it an Unusual Natural Area. The proposed project would therefore have to demonstrate no adverse effect on the preservation of the marsh.
15	X	This wetland is a WSS because it is a coastal wetland and located within the 100-year FEMA-mapped floodplain. It also contains Significant Wildlife Habitat for tidal waterfowl and wading birds. Activities within 75-feet of any coastal wetland require a permit.
16	X	This wetland is a WSS because it is a coastal wetland and located within the 100-year FEMA-mapped floodplain. It also contains Significant Wildlife Habitat for tidal waterfowl and wading birds. Activities within 75-feet of any coastal wetland require a permit.
17	X	This wetland is a WSS because it is a coastal wetland and is located within the 100-year floodplain as mapped by FEMA. In addition, it also contains Significant Wildlife Habitat for tidal waterfowl and wading birds. Activities within 75-feet of any coastal wetland require a permit.
18	X	This wetland is located within the FEMA-mapped 100-year floodplain and is therefore a WSS.
19	X	This wetland is located within the FEMA-mapped 100-year floodplain and within 25 feet of a river; and is therefore a WSS.
20	X	This wetland is located within the FEMA-mapped 100-year floodplain and within 25 feet of a river; and is therefore a WSS.
21	X	This wetland is located within the FEMA-mapped 100-year floodplain and within 25 feet of a river; and is therefore a WSS.
22	X	This wetland is located within the FEMA-mapped 100-year floodplain and within 25 feet of a river; and is therefore a WSS.
23	X	This wetland is located within the FEMA-mapped 100-year floodplain and within 25 feet of a river; and is therefore a WSS.
24	X	This wetland is located within 25 feet of a river and is therefore a WSS.

Chapter 3 – Wildlife and Rare Species

Stantec conducted brief reviews of available reports and databases concerning wildlife and rare species occurrences within the Study Area. In addition, Stantec contacted natural resource agencies including the MDIFW and the Maine Natural Areas Program (MNAP) for additional information. No detailed wildlife field surveys were conducted as part of the study.

Above Route 88 and within the corridor study area, no rare, threatened or endangered species were identified from our research or reported by agencies. Several potential vernal pools were identified during the wetland reconnaissance, but additional field surveys during spring breeding periods would be required to determine whether these pools would be considered Significant Vernal Pools by MDIFW.

MDIFW has indicated the presence of diadromous fish habitat below the Bridge Street dam specifically for alewife, blueback herring, American shad, and sea-run trout. Additional information about observed fisheries habitats and reported freshwater species is described above in Chapter 1.

Within the tidal sections of the river below Lower Falls, the MNAP has identified the extensive spartina salt marsh along the river as an important natural area. In addition MDIFW has identified significant portions of the estuary as State Significant Wildlife Habitat (SWH), including wading bird and waterfowl habitat (WBWH) along most of the undeveloped north and south shores, and a shorebird roosting area downstream from the Royal River Boatyard.

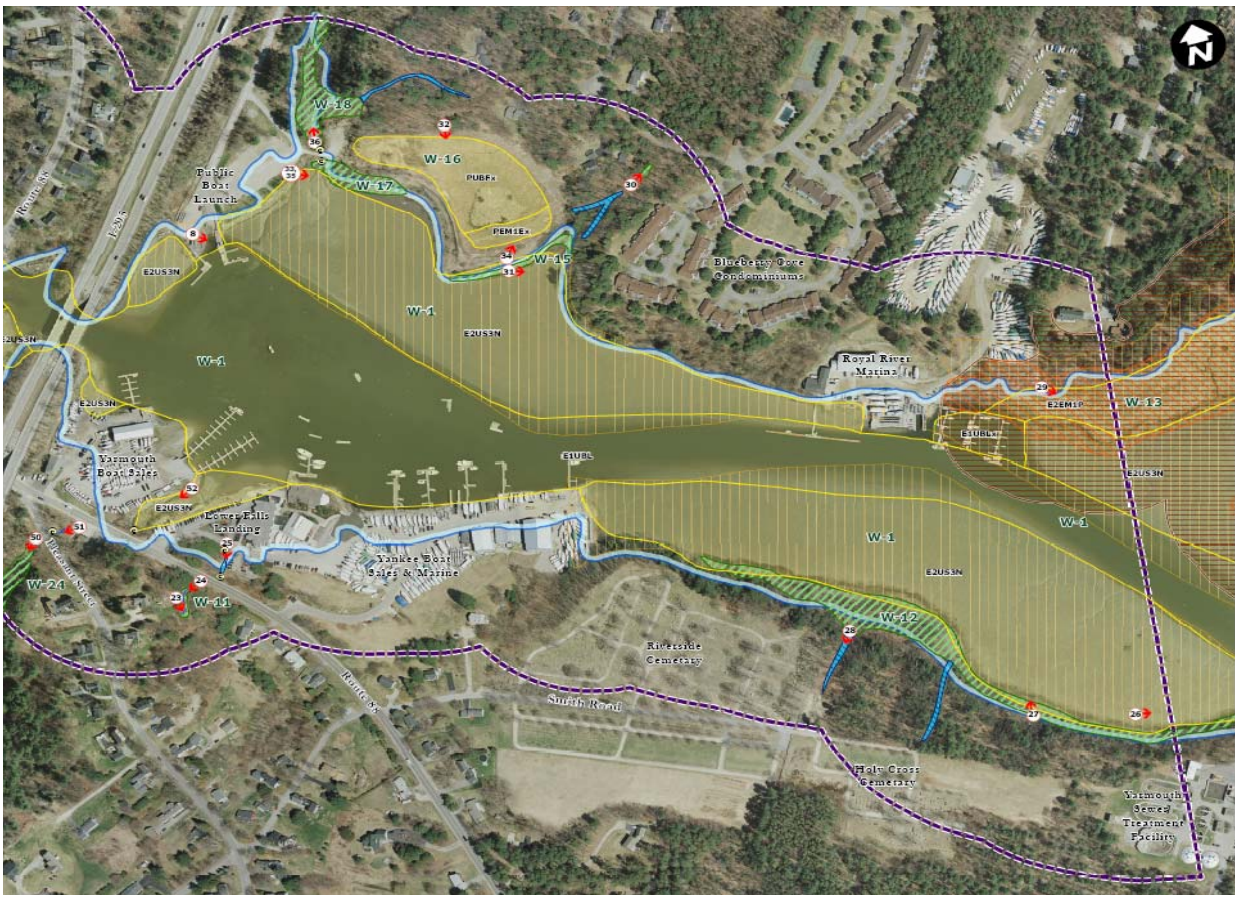

Photo 3-1. Royal River estuary Significant Wildlife Habitat areas. Wading Bird and waterfowl Habitat shown in vertical yellow stripes; Shorebird Roosting Areas in horizontal brown stripes; and spartina salt marsh shown in diagonal orange stripes.

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The Royal River estuary also falls within an area identified by the National Marine Fisheries Service (NMFS) as providing Federal Essential Fish Habitat (EFH) for 16 species of fish at various life stages. The table below shows the EFH designations and species for the Royal River estuary as reported on the NMFS website for EFH designations at http://www.nero.noaa.gov/hcd/me2.html.

Summary of Essential Fish Habitat (EFH) Designations

Name of Estuary/ Bay/ River: Casco Bay, Maine

10' x 10' latitude and longitude squares included in this bay or estuary or river (southeast corner boundaries): 4340/7010; 4340/7010; 4350/7000; 4340/7000; 4350/6950; 4340/6950

Species	Eggs	Larvae	Juveniles	Adults	Spawning Adults
Atlantic salmon *(Salmo salar)*			F,M,S	F,M,S	
Atlantic cod *(Gadus morhua)*	S	S	S	S	
pollock *(Pollachius virens)*			M,S		
whiting *(Merluccius bilinearis)*			M,S	M,S	
red hake *(Urophycis chuss)*			S	S	
white hake *(Urophycis tenuis)*			M,S	M,S	
winter flounder *(Pleuronectes americanus)*	M,S	M,S	M,S	M,S	M,S
yellowtail flounder *(Pleuronectes ferruginea)*	S	S	S	S	
windowpane flounder *(Scopthalmus aquosus)*	M,S	M,S	M,S	M,S	M,S
American plaice *(Hippoglossoides platessoides)*	S	S	M,S	S	S
ocean pout *(Macrozoarces americanus)*	S	S	S	S	S
Atlantic halibut *(Hippoglossus hippoglossus)*	S	S	S	S	S
Atlantic sea scallop *(Placopecten magellanicus)*	S	S	S	S	S
Atlantic sea herring *(Clupea harengus)*		M,S	M,S	S	
bluefish *(Pomatomus saltatrix)*			M,S	M,S	
Atlantic mackerel *(Scomber scombrus)*			M,S	M,S	

S = The EFH designation for this species includes the seawater salinity zone of this bay or estuary (salinity > or = 25.0%).
M = The EFH designation for this species includes the mixing water/ brackish salinity zone of this bay or estuary (0.5% < salinity < 25.0%).
F = The EFH designation for this species includes the tidal freshwater salinity zone of this bay or estuary (0.0% < or = salinity < or = 0.5%).

Chapter 4 – Surficial Materials, Soils, and Slopes

Surficial materials and soils in the study area were determined from the USDA Soil Conservation Service Soil Map (1974) for Cumberland County, and the Maine Geological Survey Surficial Materials map for Yarmouth. Surficial materials along the river corridor consist of a small area of stream gravels (primarily on the south side of the river) and Presumpscot formation clays that dominate most of the riparian zone.

The Presumpscot formation consists of blueish-gray marine clays, which are post-glacial estuarine deposits found throughout coastal Maine. This formation locally can be up to 200 feet thick, but in Yarmouth is typically from 30 to 60 feet thick. This formation has very low permeability, is overlain by wetland soils, forms moderate to steep slopes and gullies, and is subject to slumps and landslides throughout the region. The Presumpscot clays were historically used for making bricks in Maine, and presumably in Yarmouth as well as evidenced by the local name of Brickyard Hollow.

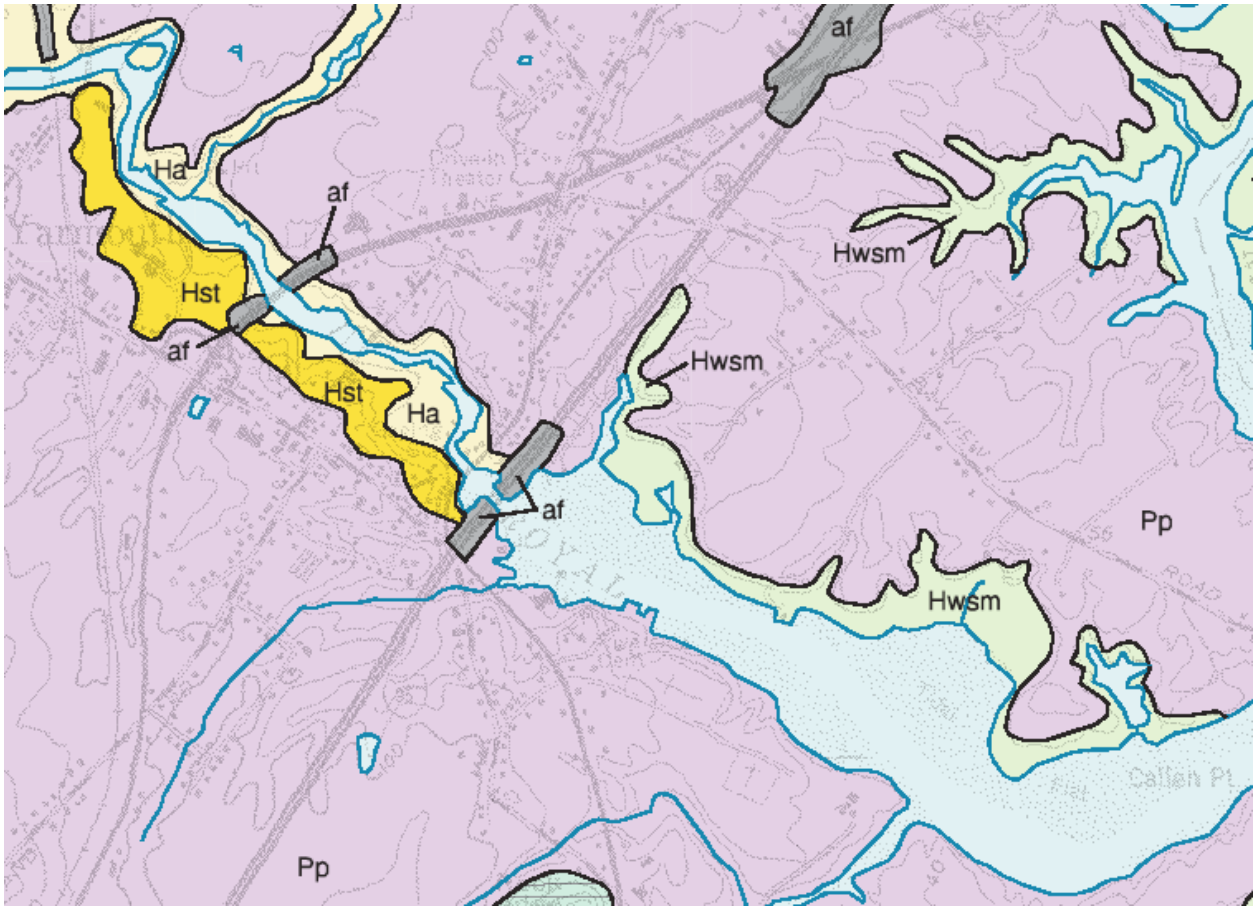


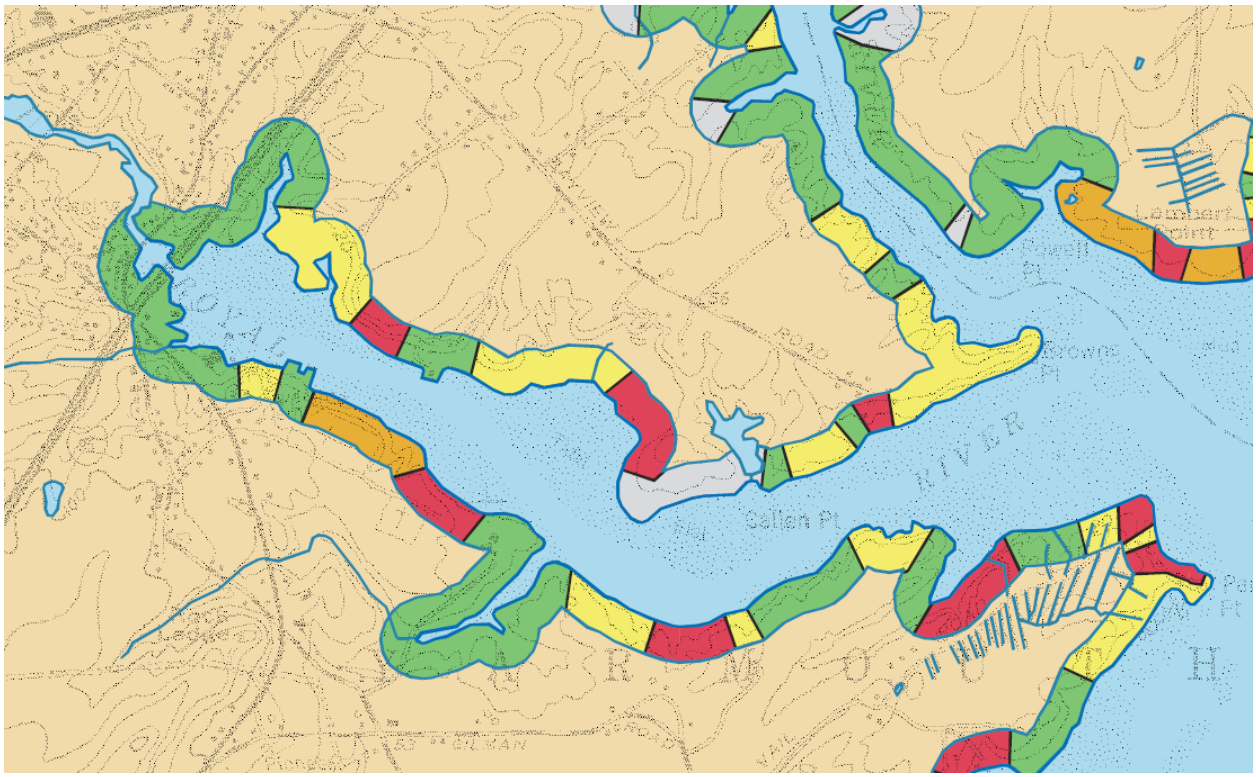
Figure 4-1. Surficial materials map for study area. Stream gravels shown in yellow, alluvium in light yellow, and Presumpscot formation clays in purpose. Source: Greater Portland Council of Governments, USDA SCS Soil Map.

The dominant soils within the study area are thin Scantic series soils derived from the underlying Presumpscot formation clays. Scantic soils are hydric (i.e., wetland) soils that remain wet throughout the year and exhibit moderate to low permeability, low runoff, and moderate slopes.

As mentioned above, slumps and landslides are common within the Presumpscot Formation, particularly along coastal and estuarine settings around Casco Bay. Several steep and unstable slopes of Presumpscot Formation have been mapped by the Maine Geological Survey along the Royal River within the study area, most noticeably within the estuarine section of the river.

Particularly steep slopes are also found along the north side of the river below Yankee Drive upstream from East Main Street to the Sparhawk Mill.

Several landslides have occurred within the past five years along the estuarine sections of the river, particularly near the confluence with the Cousins River. These areas include slumps below the Holy Cross Cemetery, the Blueberry Cove condominiums, at the Bayview Preserve, Larrabee's Landing, Royall Point, and Brown's Point.



Landslide Site - Location of known or interpreted coastal landslide. Includes historically recorded landslides and slides interpreted from air photos.

Landslide Risk Area - Earth features indicate conditions that may be suitable for a landslide to occur. Features often include a steep or arcuate scarp, slump blocks, sediment lobes, or uneven land surfaces. Bluff sediments are usually muddy and twenty feet or more in thickness.

Potential Landslide Area - Shoreline with a sedimentary coastal bluff twenty or more feet high. These bluff areas have not had field investigations that are necessary to evaluate the risk of a landslide. However, some similar high coastal bluffs have experienced landslides.

Low Coastal Bluff - Shoreline with a sedimentary coastal bluff that has less than twenty feet of relief immediately adjacent to the shoreline. Some bluffs over twenty feet in height are included in this map unit if the bluff face is not steep. In general, low coastal bluffs are not at risk of failing in the form of a landslide.

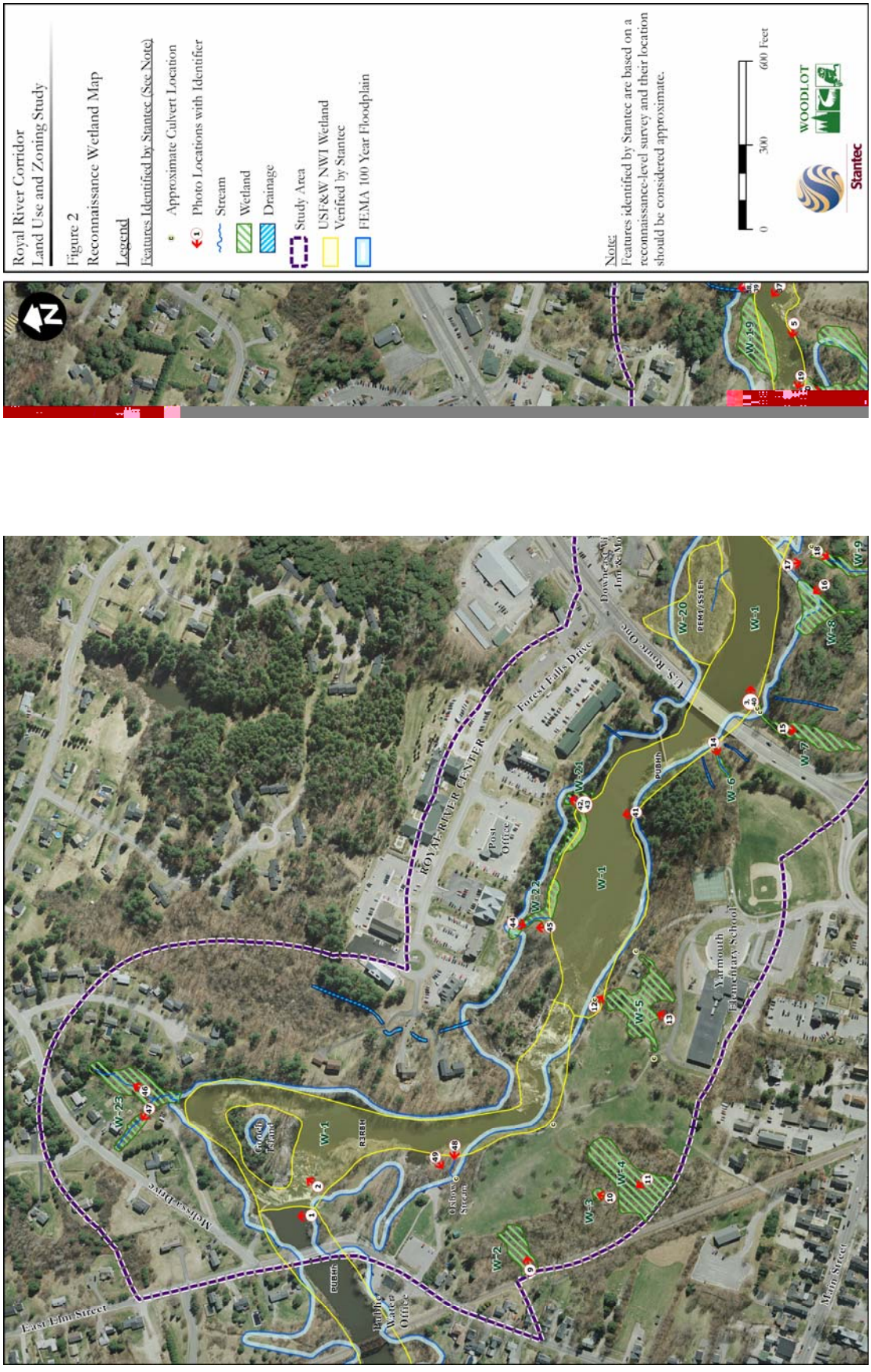
Coastal Landslide Hazards Map
Yarmouth Quadrangle, Maine

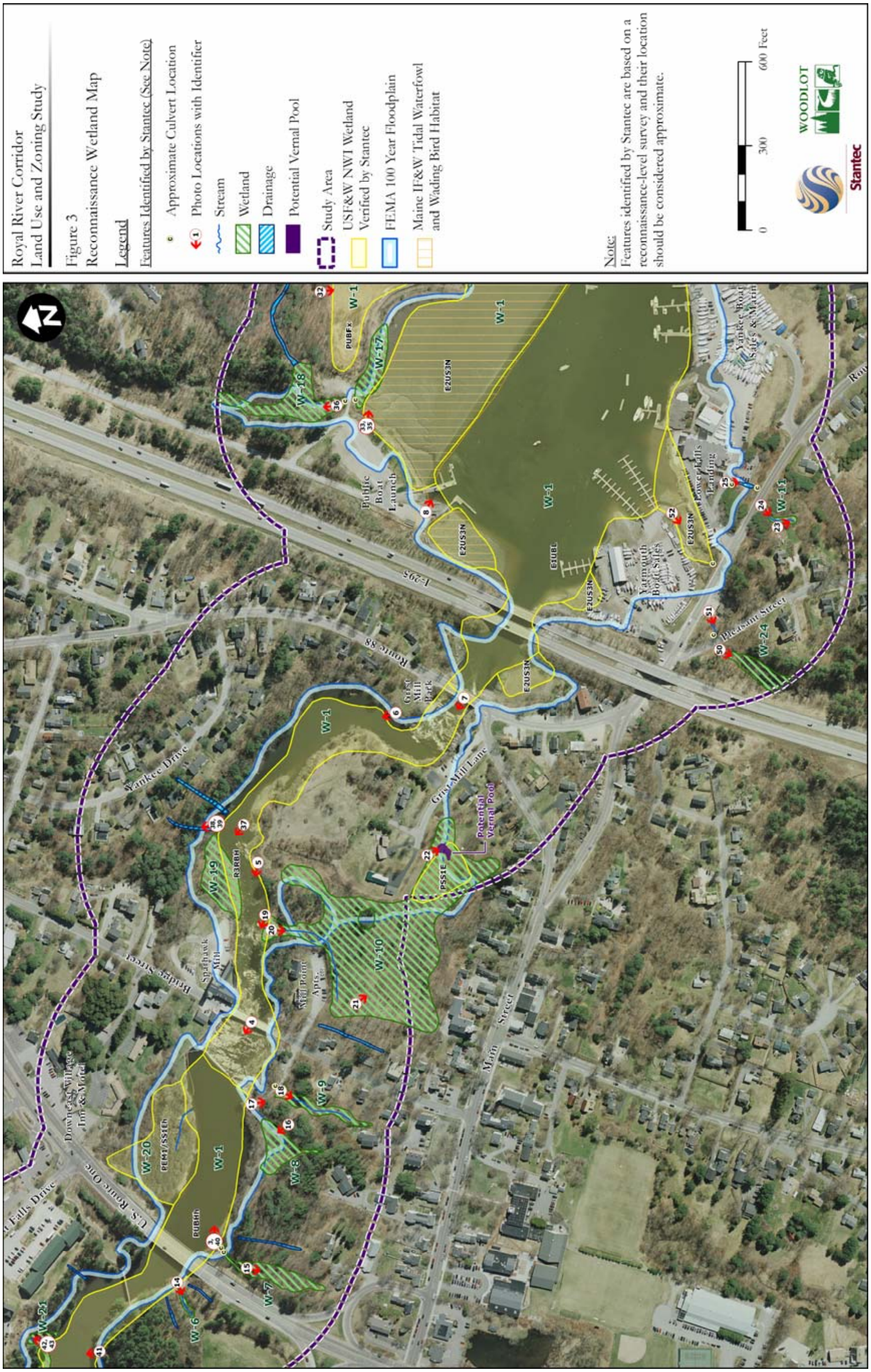
Maine Geological Survey
Open File Report No. 01-552
2001

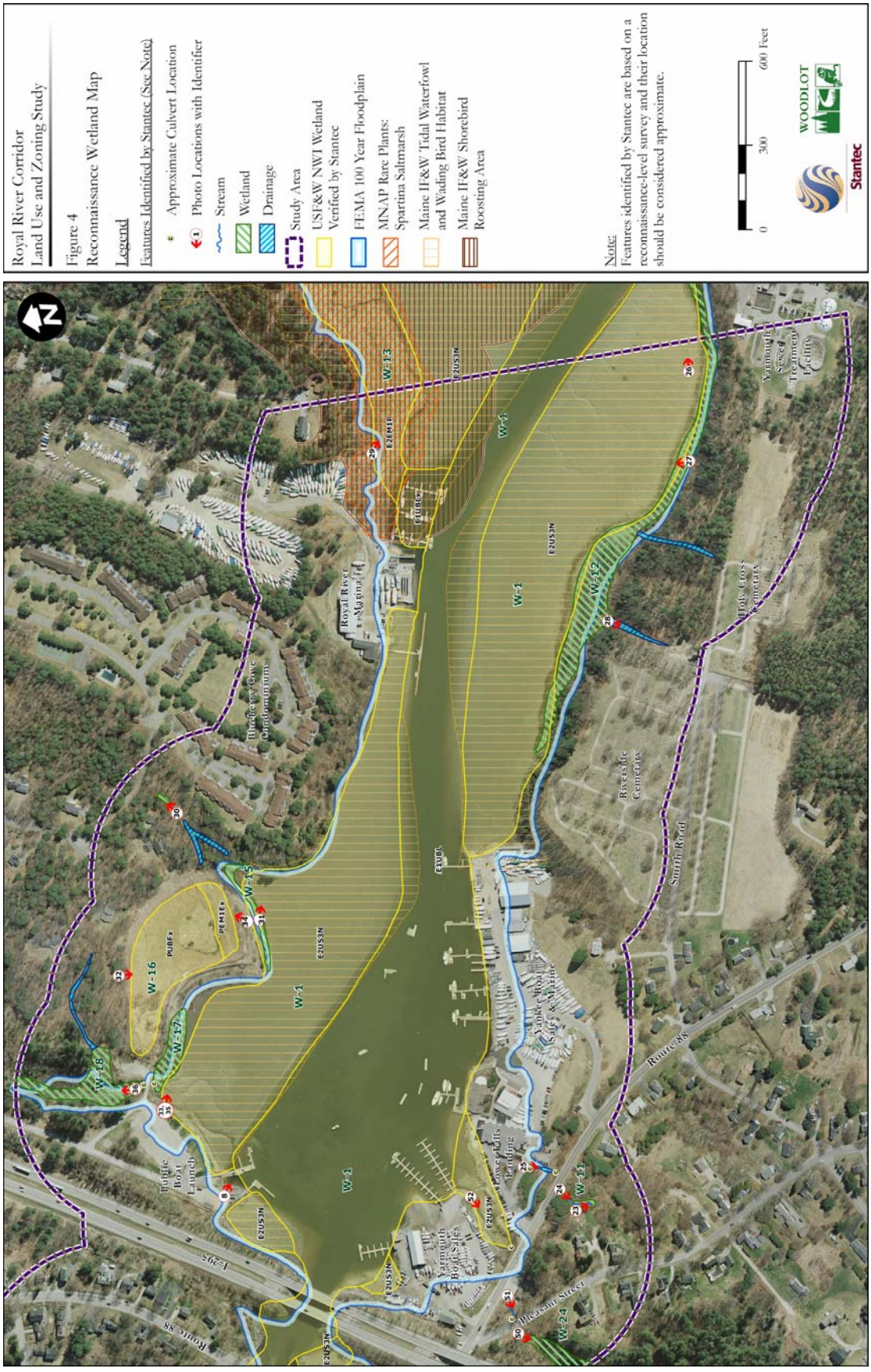
http://www.state.me.us/doc/nrimc/mgs/pubs/online/landslides/landslide-yarmouth.pdf

Appendix A

Wetland and Natural Community Maps


Royal River Corridor
Land Use and Zoning Study
Figure 2
Reconnaissance Wetland Map
Legend
Features Identified by Stantec (See Note)
Approximate Culvert Location
Photo Locations with Identifier
Stream
Wetland
Drainage
Study Area
USF&W NWI Wetland
Verified by Stantec
FEMA 100 Year Floodplain
Note:
Features identified by Stantec are based on a reconnaissance-level survey and their location should be considered approximate.
0
300
600 Feet
WOODLOT
Stantec
ROYAL RIVER CENTER
Forest Falls Drive
U.S. Route One
Post Office
Yarmouth Elementary School
Main Street
East Elm Street
Mill Pass Drive
Public Works Office
Grove Street
Grove Island
W-1
W-2
W-3
W-4
W-5
W-6
W-7
W-8
W-9
W-19
W-20
W-21
W-22
W-23
PUBLIC
PRIVATE


Royal River Corridor
Land Use and Zoning Study
Figure 3
Reconnaissance Wetland Map
Legend
Features Identified by Stantec (See Note)
Approximate Culvert Location
Photo Locations with Identifier
Stream
Wetland
Drainage
Potential Vernal Pool
Study Area
USF&W NWI Wetland
Verified by Stantec
FEMA 100 Year Floodplain
Maine IF&W Tidal Waterfowl
and Wading Bird Habitat
Note:
Features identified by Stantec are based on a reconnaissance-level survey and their location should be considered approximate.
0 300 600 Feet
WOODLOT
Stantec
I-295
Route 88
Public Boat Launch
Grist Mill Park
Grist Mill Lane
Potential Vernal Pool
Yankee Drive
Bridge Street
Main Street
Pleasant Street
U.S. Route One
Sparhawk Mill
Mill Point Apts.
Yarmouth Boat Sales
Lower Falls Landing
W-1
W-6
W-7
W-8
W-9
W-10
W-11
W-17
W-18
W-19
W-20
W-21
W-24


Royal River Corridor
Land Use and Zoning Study
Figure 4
Reconnaissance Wetland Map
Legend
Features Identified by Stantec (See Note)
Approximate Culvert Location
Photo Locations with Identifier
Stream
Wetland
Drainage
Study Area
USF&W NWI Wetland Verified by Stantec
FEMA 100 Year Floodplain
MNAP Rare Plants: Spartina Salmarsh
Maine IF&W Tidal Waterfowl and Wading Bird Habitat
Maine IF&W Shorebird Roosting Area
Note:
Features identified by Stantec are based on a reconnaissance-level survey and their location should be considered approximate.
0
300
600 Feet
WOODLOT
Stantec
N
W-1
W-4
W-11
W-12
W-13
W-15
W-16
W-17
W-18
W-24
E2US3N
E2EM1P
E2UBL
PEM1Ex
PUBFx
Royal River Marina
Bridgewater Condominiums
Yarmouth Sewer Treatment Facility
Riverside Cemetery
Holy Cross Cemetery
Smith Road
Route 88
Yankee Boat Sales & Marine
Public Boat Launch
Yarmouth Boat Sales
Lower Falls Landing
Pleasant Street
I-295
Route 88

Appendix B

Applicable Natural Resource Regulations

YARMOUTH ROYAL RIVER ZONING STUDY

Regulatory Review as of 8/1/2008

		Municipal		Federal			State	
Resource category	**Description and location**	**Zoning Ordinances - Shoreland Overlay District**	**Zoning Ordinances - Resource Protection**	**Clean Water Act Ch. 404**	**Section 10 River & Harbors Act**	**USFWS ESA**	**MEDEP Model Shoreland Zoning**	**MEDEP NRPA and Site law**
Wetlands								
River	Royal River above Route 88	Any activity within 250 feet of the river is subject to the Town Shoreland Zoning Ordinance. Town does not regulate wetlands outside the SOD, but defers to the state and federal agencies for permitting requirements. All principal structures along the Cousins River, the Royal River, and Pratt's Brook shall be set back 100 feet from the normal high-water line, and shall be screened from the river by existing vegetation, if any. Existing vegetation shall be maintained in conformance with the clearing of vegetation section of this district. This provision does not apply to structures related to hydro power facilities or to structures located within the WOC I District.	Any activity activity within 75 feet of the river is subject to the Town Resource Protection Ordinance.	Impacts to river would require Individual Permit, mitigation. Corps does not regulate activities in uplands or buffers.	Impacts to river would require individual permit, mitigation. Corps does not regulate activities in uplands or buffers.	No RTE species noted	Wetlands within 25 feet of the river are considered WSS. A portion of the estuary has been mapped by MDIFW as containing Significant Shorebird, Waterfowl, and Wading Bird Habitat. Associated wetlands are therefore considered WSS.	Impacts to WSS, rivers, or SWH require Individual Permit, and likely mitigation. An MDEP Stormwater Permit or Site Location of Development Permit may be required if activities disturb more than 20 acres. Discharges to river require NPDES permit.
Streams	Lot 048-004, Lots 045-32 to 40, Lot 011-001-016, Royal River Park (Lot 042-015), Y.E.S. (Lot 038-005), Downeast Village (Lot 038-024), Lot 038-31, Millpoint property (Lot 033-008),	The Stream Protection Subdistrict includes all land areas, as shown on the Official Zoning Map, within 75 feet, horizontal distance, of the normal high-water line of a stream, exclusive of those areas within 250 feet, horizontal distance, of the normal high-water line of a river or saltwater body, or within 250 feet, horizontal distance, of the upland edge of a freshwater or coastal wetland as shown on the official zoning map. Where such stream and its associated shoreland area are located within 250 feet, horizontal distance, of the above water bodies or wetlands, that land area shall be regulated under the terms of the districts associated with that water body or wetland. All new principal and accessory structures shall be set back at least 75 feet from the normal high-water line of water bodies, or the upland edge of a wetland, except that in the Industrial and Commercial Districts the setback from the normal high-water line shall be at least 100 feet, and in the Water Oriented Commercial I District (WOC I) the setback shall conform to the requirements of that district.	Not addressed specifically - see Stream Protection subdistrict	Will need to determine if Oxbow stream near RRP pavilion is considered a tributary of river or a wetland	N/A	No RTE species noted	Streams and wetlands within 25 feet of a stream are considered WSS.	Impacts to WSS, rivers, or SWH require Individual Permit, and likely mitigation. An MDEP Stormwater Permit or Site Location of Development Permit may be required if activities disturb more than 20 acres.
Estuary	Royal River below Route 88 falls	Any activity within 250 feet of the river is subject to the Town Shoreland Zoning Ordinance. Town does not regulate wetlands outside the SOD, but defers to the state and federal agencies for permitting requirements.	Any activity activity within 75 feet of the river is subject to the Town Resource Protection Ordinance.	Impacts to river would require individual permit, mitigation. EFH assessment required for any activity within estuarine habitats	Impacts to river or activities within estuarine habitats would require individual permit, mitigation	No RTE species noted	Coastal wetland, contains Significant Wildlife Habitat for tidal waterfowl and wading birds. Activities within 75-feet of any coastal wetland require a permit.	Coastal wetland, contains Significant Wildlife Habitat for tidal waterfowl and wading birds. Activities within 75-feet of any coastal wetland require a permit.
Forested wetlands	Royal River Park (Lot 042-015),Y.E.S. (Lot 038-005), Lot 038-010, Lot 038-011, Lot 038-031, Millpoint property (Lot 033-008), Lot 038-018, Sparhawk Mill (Lot 033-066), Downeast Village (Lot 038-024)	AA. Wetland buffers and setback requirements: A buffer consisting of natural vegetation 25' wide shall be left undisturbed between wetlands and all areas cleared for development, including, but not limited to, lawns, gardens, landscaped plant beds, driveways, parking lots, buildings, and other structures. A setback of 50' shall be maintained between wetlands and any structures. Provided, however, that the Planning Board may reduce or waive the buffer requirement for good cause and upon a showing that the reduction or waiver will not cause or lead to unreasonable adverse impact to the health, function or value of the wetland resource. 2. Applicability: The requirements of this section apply only in newly created major subdivisions (as defined in Chapter 601).	RP includes areas of 2 or more contiguous acres supporting wetland vegetationand hydric soils that are not part of a coastal wetland or connected wo a water body during normal high water.	Minor impacts eligible for Programmatic General Permit	N/A	No RTE species noted	All portions of forested wetlands located within the 100-year floodplain as mapped by the Federal Emergency Management Agency (FEMA) or within 25 feet of a stream or river, would be considered WSS.	Wetlands within 25 feet of the river are considered WSS. Portions of wetlands within the FEMA 100-year floodplain are considered WSS.
Floodplain wetlands	Sparhawk Mill, Grist Mill lane	SOD applies to all land areas within 250 feet, horizontal distance, of the normal high-water line of any river or salt water body; within 250 feet, horizontal distances of the upland edge of a coastal or fresh water wetland as shown on the official zoning map; and within 75 feet, horizontal distance, of the normal high-water line of streams as shown on the official zoning map. This district also applies to all lands within the Resource Protection District (RPD), and any structure built on, over, or abutting a dock, wharf or pier, or other structure extending beyond the normal high-water line of a water body or within a wetland.	RP includes areas within the 100 year flood plain of the Royal River as shown on FEMA maps, or all lands within 100 horizontal feet of the normal high water mark of the Royal River, whichever is more inclusive. RP includes 100 year flood plains adjacent to all other coastal waters, as shown on FEMA maps.	Minor impacts eligible for Programmatic General Permit	N/A	No RTE species noted	All portions of wetlands located within the 100-year floodplain as mapped by the Federal Emergency Management Agency (FEMA) would be considered a WSS.	Wetlands within 25 feet of the river are considered WSS. Portions of wetlands within the FEMA 100-year floodplain are considered WSS.
Vernal pools	Grist Mill Lane (Lot 033-014)	Not regulated	Not regulated	Corps requires up to 750-foot buffer for significant vernal pool. Will require field check in spring to determine status.	N/A	No RTE species noted	If significant vernal pool, will require 250-foot buffer for upland area.	If significant vernal pool, will require 250-foot buffer for upland area.Will require field check in spring to determine status.
Drainages	Many on both sides of river corridor. These do not appear to be jurisdictional streams due to the lack of hydrophytic vegetation, but regulatory agencies should be consulted to determine whether the drainages would be regulated prior to any proposed development.	Not regulated	Not regulated	Not regulated unless determined to be a wetland or stream	N/A	No RTE species noted	Not regulated unless determined to be a stream	Not regulated unless determined to be a stream
FEMA Floodzone	FEMA 100-year floodplain shown reflects Zone A designation for most sections, and thus requiring flood insurance.	Land which is located within the 100 year FEMA flood plain is considered Land Not Suitable for Development, and cannot be included in the calculations of lot area for the purpose of meeting the requirements of the Minimum Lot Size or net residential acreageunless the subdivider shows proof that the property in question lies at least two (2) feet above the 100 year flood level. No more than 50 percent of the required minimum percentage open space shall include any of the following areas: roads, steep slopes in excess of 20%, rock outcroppings, flood plains.	RP includes areas within the 100 year flood plain of the Royal River as shown on FEMA maps, or all lands within 100 horizontal feet of the normal high water mark of the Royal River, whichever is more inclusive. RP includes 100 year flood plains adjacent to all other coastal waters, as shown on FEMA maps.	Corps does not regulate activities in uplands or buffers.	N/A	N/A	RP includes floodplains along rivers, defined by the FEMA 100 year floodplain. This district shall also include FEMA 100 year floodplains adjacent to tidal waters.	
Soils	Presumscot fm. marine clays throughout study area	Principal structure setbacks measured from top of a coastal bluff identified by MGS as "highly unstable" or "unstable".	RP includes land areas along Rivers subjet to severe bank erosion, undercutting, mass movement, such as steep coastal bluffs.	N/A	N/A	N/A	Principal structure setbacks measured from top of a coastal bluff identified by MGS as "highly unstable" or "unstable".	
Slopes	Coastal bluffs	Principal structure setbacks measured from top of a coastal bluff identified by MGS as "highly unstable" or "unstable".	RP includes areas of two or more contiguous acres with sustained slopes of 20% or greater located within the SOD as illustrated on the Official Zoning Map.	Corps does not regulate activities in uplands or buffers.	N/A	N/A	Principal structure setbacks measured from top of a coastal bluff identified by MGS as "highly unstable" or "unstable".	

YARMOUTH ROYAL RIVER ZONING STUDY

Regulatory Review as of 8/1/2008

		Municipal		Federal			State	
Resource category	**Description and location**	**Zoning Ordinances - Shoreland Overlay District**	**Zoning Ordinances - Resource Protection**	**Clean Water Act Ch. 404**	**Section 10 River & Harbors Act**	**USFWS ESA**	**MEDEP Model Shoreland Zoning**	**MEDEP NRPA and Site law**
Wildlife and Habitats								
Rare species	No rare species identified within the study area by IF&W or USFWS	Not regulated	Not regulated	USFWS will review any 404 permit application	N/A	No RTE species noted		
Fisheries, freshwater and diadromous	Royal River above Route 88 supports alewife (Alosa pseudoharengus), shad (A. sapidissima), America eel (Anguilla rostrata), sea run brook trout (Salvelinus fontinalis), smallmouth bass ( ) and brown trout (Salmo trutta). No significant fisheries habitat (i.e. wild brook trout, threatened or endangered fish species, etc.) identified by IF&W in the Royal River upstream of Route 88	Not regulated	Not regulated	USFWS and NOAA/NMFS will review any 404 permit application. EFH assessment will be required.	N/A	No RTE species noted	Not regulated	River not identified by IF&W as significant fisheries habitat. However, presence of diadromous fish may influence actions that affect water quality or riverine habitats.
Fisheries, marine	Royal River estuary below Route 88 is considered Essential Fish Habitat (EFH) for 16 species including Atlantic salmon (Salmo salar), Atlantic cod (Gadus morhua), pollock (Pollachius virens), whiting (Merluccius bilinearis), red hake (Urophycis chuss), white hake (Urophycis tenuis), witch flounder (Glyptocephalus cynoglossus), winter flounder (Pleuronectes americanus), yellowtail flounder (Pleuronectes ferruginea), windowpane flounder (Scopthalmus aquosus), American plaice (Hippoglossoides platessoides), ocean pout (Macrozoarces americanus), Atlantic halibut (Hippoglossus hippoglossus), Atlantic sea herring (Clupea harengus), bluefish (Pomatomus saltatrix), Atlantic mackerel (Scomber scombrus)	Not regulated	Not regulated	USFWS and NOAA/NMFS will review any 404 permit application. EFH assessment will be required.	N/A	No RTE species noted	Not regulated	Not regulated
Natural Communities	Maine NAP identified spartina salt marsh	Not regulated	Not regulated	Corps does not regulate activities in uplands or buffers.	N/A	No RTE species noted	Not regulated	Projects permitted under Site Law would consider spartina salt mash and Unusual Natural area, would have to demonstrate no adverse effect on the marsh.
Significant Wildlife Habitat - Shorebird Roosting and Feeding areas	Royal River estuary below Route 88 is considered Significant Wildlife Habitat.	Not addressed - refer to RP	Defined to include areas within 250 feet of upland edge of wetlands and salt marshes rated "moderate" or "high" value waterfowl and wading bird habitat.	Corps does not regulate activities in uplands or buffers.	N/A	No RTE species noted	Not addressed - refer to RP	**Permit required for:** • Dredging, bulldozing, removing or displacing soil, sand, vegetation or other materials; Draining or otherwise dewatering the habitat; Filling; or Any construction, repair or alteration of any permanent structure. **Vegetative cutting restricted:** The habitat area is NOT a no-build zone. The standards in the NRPA require that all activities "avoid and minimize impacts". If it is determined that there is no practicable alternative to the activity outside the habitat area, a permit can be issued for the activity as long as the NRPA standards are met.
Vegetation		Selective cutting of vegetation allowed within 75-foot buffer; must retain a well distributed stand of trees, no cleared opening >250 sq. ft, selective cutting on a point system. Pruning on bottom 1/3 of tree is allowed. Existing vegetation within the 75-foot buffer under three feet in height shall not be cut or removed, except to provide a permitted footpath		Corps does not regulate activities in uplands or buffers.	N/A	N/A	Selective cutting of vegetation allowed within 75-foot buffer; must retain a well distributed stand of trees, no cleared opening >250 sq. ft, selective cutting on a point system. Pruning on bottom 1/3 of tree is allowed. Existing vegetation within the 75-foot buffer under three feet in height shall not be cut or removed, except to provide a permitted footpath	Shorebird feeding area: cutting or removal of vegetation is prohibited except for: • Cutting or removal that meets the same vegetative screening standards that apply under Shoreland Zoning within 75 feet of a coastal wetland These standards are applied to the entire 100-foot feeding area buffer. Shorebird Roosting area . Cutting or removal of vegetation is prohibited except as described below. All cutting or removal must be done in consultation with DIF&W. • Removal of a safety hazard. • Cutting to allow a meandering footpath no more than 6 feet wide that does not create a cleared line of sight to the water.