GROWING AREA WJ

Freeport, Brunswick and Harpswell

Triennial Report for 2008-2010

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APPROVAL

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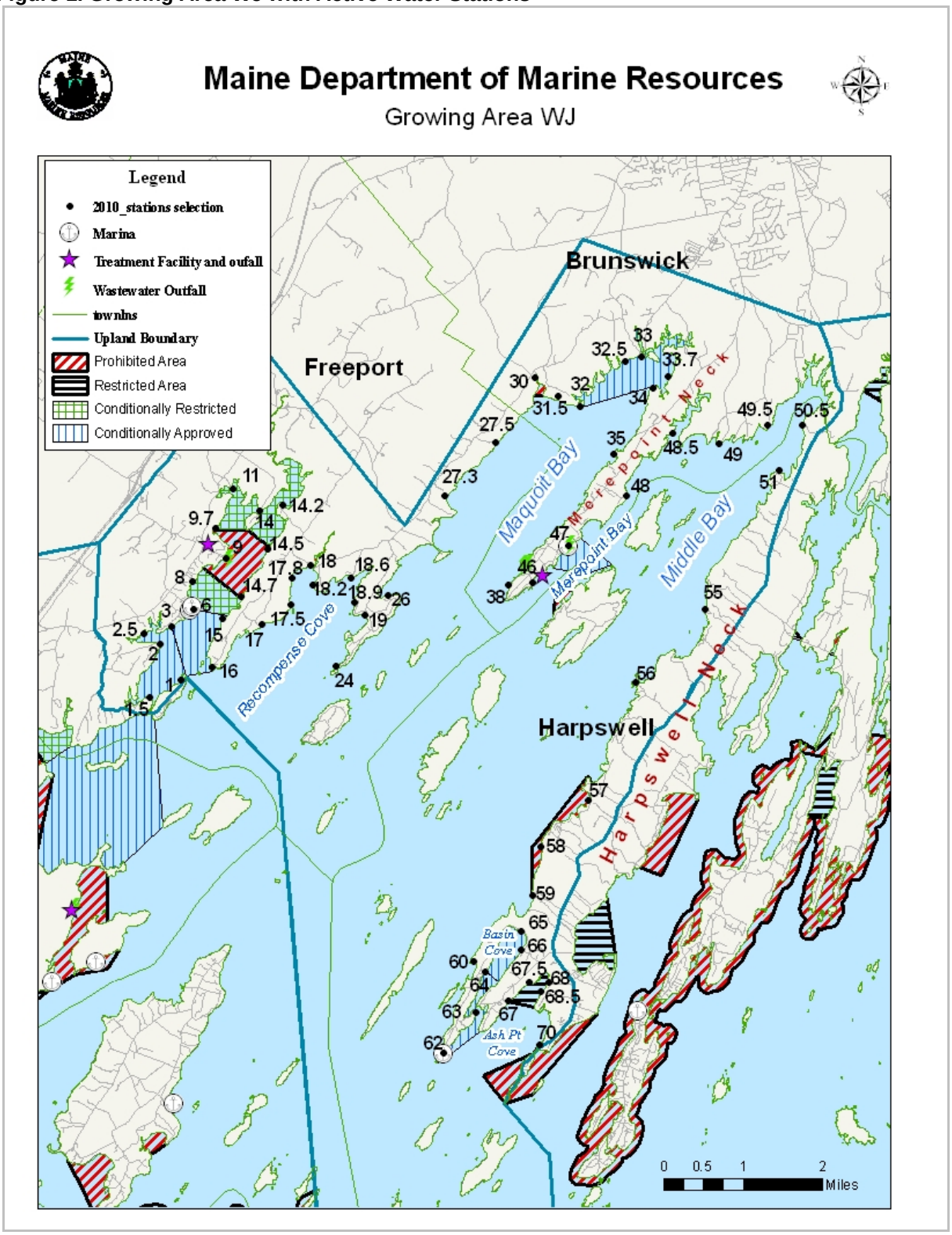
Figure 1. Growing Area WJ with Active Water Stations



Executive Summary

This is a triennial report for growing area WJ written in compliance with the requirements of the 2009 Model Ordinance and the National Shellfish Sanitation Program. The next sanitary survey report is due in 2019.

Growing Area WJ includes the area between Staples Point, Freeport and Potts Point at the end of South Harpswell Neck, Harpswell. There were no major changes in pollution sources nor any OBDs removed during this triennial review period. Sample stations WJ 29 and 36 were deactivated in May 2008. Station WJ 29 was not located on the boundary line of the Bunganuc Stream prohibited area and it did not monitor any known pollution source; water quality met approved standards at this station. Station WJ 36 was located just south of station WJ 35. Since both stations met the approved standard and do not monitor any known pollution sources; two stations were not needed in this area; therefore station WJ 36 was deactivated. Station WJ 9.5 was deactivated because it was in the prohibited area for the wastewater treatment plant in the Harraseeket River and not necessary. Station WJ 61 was deactivated because there is no resource in the area.

The following station changes occurred in 2009: in order to better monitor water quality in Maquoit Bay, sample station WJ 32.5 was reactivated and station WJ 33.7 was created. Stations WJ 2 and 15 in the Harraseeket River were reactivated to monitor water quality in Staples Cove and the boundary between the conditionally approved and conditionally restricted areas and pasture runoff on the eastern shore, respectively. Station WJ 1.5 was created to monitor water quality in Staples Cove. Station WJ 2.5 was created to monitor pasture runoff in Spar Cove in the Harraseeket River. Stations WJ 9.7, 14.5 and 14.7 were created in the Harraseeket River to monitor the boundary of the prohibited area for the wastewater treatment plant. Stations WJ 67.5 and 68.5 were created in Ash Point Cove, Harpswell to better monitor the head of the cove and to possibly serve as boundary stations for the prohibited area.

In 2009, there were two areas reclassified from restricted to approved, one area reclassified from prohibited to restricted, one area reclassified from prohibited to approved and one area reclassified from approved to prohibited. There were five closures due to malfunctions at the Freeport WWTP and one closure each from a gasoline spill, a sewer line break and a residential septic malfunction. Generally, there has been little change in water quality during the triennial reporting period, with most stations that are classified as approved and conditionally approved (open status) showing P90 calculations that are under 50 percent of the approved standard limit. Shoreline surveys were conducted on two Freeport islands, in the Ash Cove area and the vicinity of upper Middle Bay.

Growing Area Description

Growing Area WJ includes the shores, flats and waters of the towns of Freeport, Brunswick and Harpswell between Staples Point, at the mouth of the Harraseeket River, Freeport to Potts Point at the end of South Harpswell Neck, Harpswell (Figure 1). Freeport is the number one tourist destination in Maine (both natives and out-of-state visitors) with an average tourist population of

3.5 million annually (City-Data.com, 2008). Primary sources of employment in the WJ area are fishing, forestry, carpentry, hospitality services, administrative, office support, retail, health care, post secondary educators and educational services. Harpswell grows to a community of 8,000 during the summer season with a peak population of 10,000 during the summer holiday weekends. Coastal portions of the towns in area WJ are situated on the Harraseeket River, Recompense Cove, Brickyard Cove, Goose Cove, Maquoit Bay and Middle Bay.

The shoreline is typical of this part of Maine, with rockbound points and shoreline separating shallow coves and harbors. The muddy and gravel bottoms in these coves frequently provide excellent habitat for soft shell clams and mussels. Within Area WJ, the coves which support significant populations of soft shell clams are the Harraseeket River (an embayment), Recompense Cove, Brickyard Cove, Goose Cove, Maquoit Bay, Middle Bay, Middle Bay Cove, Wilson Cove, Curtis Cove and Peter Cove. Fresh water influence comes from upland streams; Concord Gully Brook, Frost Gully Brook, Kelsey Brook, Little River, Bunganuc Brook, Miller Creek, and other small seasonal brooks and streams.

Land use in the study area is dominated by year-round residential properties. Sections of dense shoreline development are punctuated by large tracts of undeveloped land. Some seasonal properties remain but many of the seasonal properties are being converted to year-round use throughout the area. The heaviest development is found in Freeport along the shores of the Harraseeket River, Frost Gully Brook and Concord Gully Brook. More residential neighborhoods are found at the head of Maquoit Bay and Middle Bay. The rest of the area is pastoral farmland with few residential homes, farms and conservation land parcels.

The major pollution sources in the growing area are the Freeport Sanitary District Wastewater Treatment Plant, four large farms (dairy, beef, alpaca), eight marinas and four licensed overboard discharges. There are seven limited purpose aquaculture (LPA) sites and two shellfish leases in growing area WJ.

Current Classification(s)

At the end of the 2010 review year, shellfish growing area WJ currently had stations classified as:

Approved (31 stations); WJ 16, 17, 17.5, 17.8, 18, 18.2, 18.6, 18.9, 19, 24, 26, 27.3, 27.5, 31.5, 32, 34, 35, 38, 46, 48, 48.5, 49, 49.5, 50.5, 51, 55, 56, 59, 60, 67 and 70.

Conditionally Approved

Harraseeket River, Freeport (7 stations; seasonal marina area and conditional on Freeport WWTP), WJ 1, 1.5, 2, 2.5, 3 (a boundary station shared by two conditional areas in Harraseeket River), 6 (boundary with CR area) and 15.

Maquoit Bay, Brunswick (3 stations; poor water quality), WJ 32.5, 33 and 33.7

Merepoint, Brunswick (1 station; seasonal marina area), WJ 47

Upper Basin Cove, Harpswell (3 stations; poor water quality), WJ 64 (a boundary station shared by two conditional areas in Upper Basin Cove), 65 and 66

Lower Basin Cove, Harpswell (3 stations; seasonal marina area), WJ 62, 63 and 64

Conditionally Restricted

Harraseeket River, Freeport (5 stations; poor water quality and conditional on Freeport WWTP), WJ 9.7, 11, 14, 14.2 and14.5)

Harraseeket River, Freeport (2 stations; poor water quality, conditional on Freeport WWTP and seasonal marina area), WJ 8 and 14.7

Restricted

Ash Point Cove, Harpswell (3 stations; poor water quality), WJ 67.5, 68 and 68.5

Prohibited

Harraseeket River, Freeport (1 station; Freeport WWTP outfall), WJ 9

Maquoit Bay, Brunswick (1 station; presence of an OBD), WJ 30

Middle Bay, Harpswell (2 stations; poor water quality), WJ 57 and 58

Please visit the DMR website to view legal notices:

http://www.maine.gov/dmr/rm/publichealth/closures/closedarea.htm#

Activity during Review Period

2008

The following legal notice amendments occurred during the 2008 review year:

Area No. 15, Freeport Area (Harraseeket River and Little River)

February 20, 2008: Area No. 15, Harraseeket River, Recompense Cove and Bustins Island (Freeport) was amended to close all of the conditional areas in the Harraseeket River, due to a sewage treatment plant malfunction.

March 12, 2008: Area No. 15, Harraseeket River, Recompense Cove and Bustins Island (Freeport) was amended to open all of the conditional areas in the Harraseeket River due to shellfish and water quality returning to approved standards.

July 2, 2008: Area No. 15, Harraseeket River, Recompense Cove and Bustins Island (Freeport) was amended to create a prohibited area around a grey water pipe and a suspected malfunctioning septic system on Indian Island in Recompense Cove.

August 7, 2008: Area No. 15, Harraseeket River, Recompense Cove and Bustins Island (Freeport) was amended to reclassify the shore around Indian Island and Bustins Island from prohibited to approved due to the removal of a grey water pipe.

August 8, 2008: Area No. 15, Harraseeket River and Recompense Cove (Freeport), was amended to close the Harraseeket River due to a malfunction at the local sewage treatment plant. Heavy rainfall caused excessive flow at the #3 unit and caused a loss of solids. Units #1 and #2 were opened to accept the added flow. All effluent was chlorinated and sludge blanket indicators were installed in the treatment units.

August 27, 2008: Area No. 15, Harraseeket River and Recompense Cove (Freeport) was amended to open the conditionally approved and conditionally restricted areas on the Harraseeket River due to shellfish and water quality returning to approved standards.

September 8, 2008: Area No. 15, Harraseeket River and Recompense Cove (Freeport) was amended to close the conditionally approved and conditionally restricted areas on the Harraseeket River due to a malfunction at the local sewage treatment plant. The plant wet well overflowed due to heavy rainfall and the Porter's Landing pump station failed on September 7. The overflow did not run into the river but a closure was implemented due to rainfall runoff and the potential for the overflow to reach the river.

September 24, 2008: Area No. 15, Harraseeket River and Recompense Cove (Freeport) was amended to open the conditionally approved and conditionally restricted areas on the Harraseeket River due to shellfish and water quality returning to approved standards after a malfunction at the local sewage treatment plant.

September 29, 2008: Area No. 15, Harraseeket River and Recompense Cove (Freeport) was amended to reclassify the middle Harraseeket River conditionally approved area as conditionally restricted due to water quality exceeding the approved criteria. It also reclassified Recompense Cove from restricted to approved due to water quality meeting approved criteria.

October 8, 2008: Area No. 15, Harraseeket River (Freeport) was amended to move the southern boundary line of the conditionally restricted area in the Harraseeket River to the next station meeting the approved classification standard and in order to allow easy recognition of the boundary line for enforcement purposes.

December 1, 2008: Area No. 15, Harraseeket River (Freeport) was amended to add the conditionally restricted area described in section A.3. to the marina seasonal closure; the area is in the closed status from May 1 through November 30.

December 2, 2008: Area No. 15, Harraseeket River (Freeport) was amended to reconcile the line boundary description between the conditionally approved areas in section B. with the line boundary description for the conditionally restricted area in section A. 3.

December 10, 2008: Area No. 15, Harraseeket River (Freeport) was amended to specify that the open period of the conditionally approved areas in sections B. and C. was from Monday

through Thursday 7am to 4pm (except holidays) due to an update in the emergency response plan between the department and the Freeport Sewer District.

Area No. 17-B, Harpswell Neck (Harpswell)

March 6, 2008: Area No. 17-B, Harpswell Neck (Harpswell) was amended to reclassify the prohibited area on the lower west side of Basin Point to approved for shellfish harvesting.

September 29, 2008: Area No. 17-B, Harpswell Neck (Harpswell) was amended to reclassify the prohibited area on the east side of Basin Point as conditionally approved with a closed season of April 15 to October 31. The amendment also reclassified upper Ash Point Cove as prohibited due to a malfunctioning septic system and an illegal grey water discharge. It also changed the classification in the rest of Ash Point Cove from conditionally approved to restricted due to elevated scores during the open status; it no longer meets the requirements of a conditionally approved area.

The following incidences were reported to the Department in 2008 and did not require action on behalf of the Department:

On March 20, 2008, DMR received a call from Freeport Dispatch that there was a sewage spill in progress at Mast Landing in Freeport. The Mast Landing drainage brook leads to the conditionally restricted eastern head of the Harraseeket River. The Freeport Sewer District inspected the property and arranged for an excavator to review the site on March 21, 2008. The investigation revealed that it was not a malfunctioning septic system, but a break in a private sewer line that goes from a home on Bow Street to the main sewer line. The pipe was repaired on March 27, 2008. No closure was necessary due to the break being ~0.5 miles from Mill Brook, with no direct route to the brook.

On May 12, 2008, the Freeport Sewer District reported a break in the outfall pipe (10 feet underground) at a house lot by the shore. There was no interruption in treatment of the wastewater and all effluent was disinfected. The break was fixed on May 13, 2008.

On July 31, 2008, the Freeport Sewer District reported that approximately 30-40 gallons of grey water was pumped to the first chlorine contact tank instead of the #1 digester due to a valve not being closed completely. Plant personnel cleaned the chlorine contact tank and put it back online. There was no environmental impact.

2009

The following legal notice amendments occurred during the 2009 review year:

Area No. 15, Freeport Area (Harraseeket River and Little River)

January 5, 2009: Area No. 15, Harraseeket River and Little River (Freeport) was amended to change the harvest dates in the conditionally approved areas (B. and C.) to Monday through Friday 7am to 6pm except for the 2009 holiday days listed in Sections B. and C.

January 7, 2009: Area No. 15, Harraseeket River and Little River (Freeport) was amended to change the harvest dates in the conditionally approved areas (B. and C.) to Monday through Friday 6am to 6pm except for the 2009 holiday days listed in Sections B. and C.

June 19, 2009: Area No. 15, Harraseeket River and Little River (Freeport) was amended to reclassify the Little River area and Recompense Cove (Freeport) from approved to prohibited due to documented pollution from surrounding farms.

November 24, 2009: Area No 15, Harraseeket River and Little River (Freeport) was amended to reclassify Recompense Cove (Freeport) from prohibited to approved, due to the removal of grazing animals and manure piles from the pastureland surrounding the cove.

Area No. 17-B, Harpswell Neck (Harpswell)

December 4, 2009: Area No. 17-B, Harpswell Neck (Harpswell) was amended to reclassify upper Ash Point Cove (Harpswell) from prohibited to restricted due to water quality meeting the restricted standard and a “do not occupy” order on a house with an identified septic system malfunction. The town Codes Enforcement officer confirmed that the property was no longer occupied. This amendment also reclassified lower Ash Point Cove (Harpswell) from restricted to approved due to water quality meeting the approved standard year round.

The following incidences were reported to the Department in 2009 and did not require action on the Department’s behalf:

On April 14, 2009, DMR received a call from the Freeport Sewer District regarding a possible fuel spill at a local gas station. DMR contacted the DMR Spill Response Coordinator and the DEP. The DEP responder contacted DMR and related that the investigation revealed that a few gallons of gas leaked from a fuel tank on the evening of April 13, 2009 and flowed into a storm drain which leads to the outfall to the Harraseeket River. The DEP reports that the fuel evaporated before it reached the Harraseeket River. No closure was necessary.

On August 21, 2009, DMR amended the Freeport Sewer District Emergency Response Plan to remove the requirement for the Freeport Sewage Treatment Plant to be manned in order for harvesting to occur in the conditionally approved areas in the Harraseeket River, due to upgrades in auxiliary power, SCADA systems at the plant and a requirement that the Freeport Sewer District send in regular reports on the operation of the SCADA system.

2010

The following legal notice amendments occurred during the 2010 review year:

Area No. 15, Freeport Area (Harraseeket River and Little River)

September 7, 2010: Area No. 15, Freeport Area (Harraseeket River and Little River) was amended to close the conditional area in the Harraseeket River due to a malfunction at the Freeport WWTP.

September 23, 2010: Area No. 15, Freeport Area (Harraseeket River and Little River) was amended to open the Freeport WWTP conditional areas in the Harraseeket River due to water and shellfish returning to approved standards.

Area No. 17-B, Harpswell Neck (Harpswell)

January 22, 2010: Area No. 17-B, Harpswell Neck (Harpswell) was amended to enlarge the prohibited area in Middle Bay to the next approved station due to water quality exceeding the approved criteria.

The following incidences were reported to the Department in 2010 and did not require action on behalf of the Department:

On September 7, 2010, the DMR, the Freeport shellfish warden and the Freeport WWTP superintendent/trustees were notified that the disinfection system began to function erratically on September 5. Plant personnel reacted immediately to the situation and made adjustments to the disinfection system to the best of their ability. The system completely malfunctioned at approximately 8 pm on September 6. Following several hours without much success, the plant superintendent was called in and was able to get the disinfection system working properly by 7 am on September 7.

Conditionally Managed Area(s) Activity

There are six conditionally managed areas in Growing Area WJ:

1) Harraseeket River, Freeport: WWTP Conditional Area: Stations WJ 1 (CA), 1.5 (CA), 2 (CA), 2.5 (CA), 3 (CA), 9.7 (CR), 11 (CR), 14 (CR), 14.2 (CR), 14.5 (CR) and 14.7 (CR).
2) Harraseeket River, Freeport: WWTP and Marina/Seasonal Conditional Area (closed status May 1 – November 30): Stations WJ 6 (CA), 8 (CR) and 15 (CA).
3) Maquoit Bay, Brunswick: Seasonal Conditional Area (closed status September 1 – March 30), Stations WJ 32.5, 33 and 33.7
4) Merepoint Neck, Brunswick: Marina/Seasonal Conditional Area: (closed status April 15 – October 31): station WJ 47.
5) Area No. 17-B, Lower Basin Cove, Harpswell: Marina/Seasonal Conditional Area (closed status May 1 - November 30): stations WJ 62, 63 and 64
6) Basin Cove, Harpswell; Seasonal Conditional Area: (closed status April 15 – October 31): stations WJ 64, 65 and 66

The management plans for the WJ conditional areas are in Appendices A through F. The Harraseeket River WWTP management plan requires reporting by the Freeport Sewer District; this plan was last updated on December 31, 2009.

Documentation of Pollution Sources

The following sections include information on pollution sources which do or may impact water quality in growing area WJ. The section includes information on new pollution sources, identified over the past three review years, as well as updated reviews of existing pollution

sources in this growing area. Pollution sources that are reviewed in this section include domestic waste, including both private inground systems and over board discharges (OBDs), marinas and mooring fields, stormwater and pollution from non-point sources (streams), farms and other agricultural activities, domestic animals and wildlife areas, and recreational areas.

Evaluation of New Pollution Sources

There were neither major changes in pollution sources nor OBDs removed in the WJ area during the review years, 2008-2010.

Re-Evaluation of Existing Pollution Sources

The following sections are a review of existing pollution sources in growing area WJ. Pollution problems associated with domestic waste, including OBDs, which were identified prior to the last triennial are evaluated in this section. Other pollution sources, including marinas and mooring fields, municipal wastewater treatment facilities, pollution associated with farms and agricultural activities, and farms which were present at the time of the last triennial review, are also reviewed.

Much of the shoreline in growing area WJ has had an updated shoreline survey completed in 2008. No surveys were conducted in 2009 and 2010. Actual and potential problems identified as part of this recent (2008) shoreline survey work are presented in Table 1; any remediation or enforcement action taken by the town and DMR to correct the problems and protect public health is noted in bold font in Table 1, along with the description of the problem. Updates to the status of the pollution (actual vs. potential, direct vs. indirect) based on remediation action are also noted in bold in the table. The pollution source maps (Figures 2, 3 and 4) show the locations of the OBDs, wastewater outfalls, NPDES (National Pollutant Discharge Elimination System) permitted outfalls and the actual/direct pollution sources (red flags) and actual/indirect – potential/indirect pollution sources (yellow flags).

Table 1. Actual and Potential Pollution Sources in Growing Area WJ

Town	Pollution ID	Actual / Potential	Direct / Indirect	Pollution Description	Survey Date
FREEPORT	PS 1	A	D	Freeport WWTP outfall	
	PS2	A	I	Cesspool overflow; **Remediated, Approved**	June 18, 2008
	PS 3	P	I	Illegal sink drain; **Remediated, Approved**	July 7, 2008
BRUNSWICK	PS 4	A	I	Horse farm drain pipe into gully; **Remediated, Approved**	August 25, 2008
	PS 5	P	I	Paul's Marina washwater waste disposal; **Satisfactory, Conditionally Approved**	Annually
	PS 6	P	I	Mere Point Colony Subsurface Wastewater System; **Satisfactory, Approved**	August 6, 2008
HARPSWELL	PS 7	A	I	Illegal grey water discharge; **Remediated, Conditionally Approved**	June 12, 2008
	PS 8	A	D	Malfunctioning septic; **Remediated, Conditionally Approved**	June 12, 2008
	PS 9	A	D	Septic mound breakout; **Remediated, Conditionally Approved**	June 12, 2008
	PS 10	A	I	Illegal sink drain; **Remediated, Conditionally Approved**	June 12, 2008
	PS 11	A	D	Illegal washing machine discharge into culvert; **Remediated, Conditionally Approved**	June 12, 2008
	PS 12	A	D	OBD 1406	
	PS 13	A	D	OBD 1693	
	PS 14	A	D	OBD 4895	

Figure 2. Growing Area WJ Pollution Source Map-Freeport

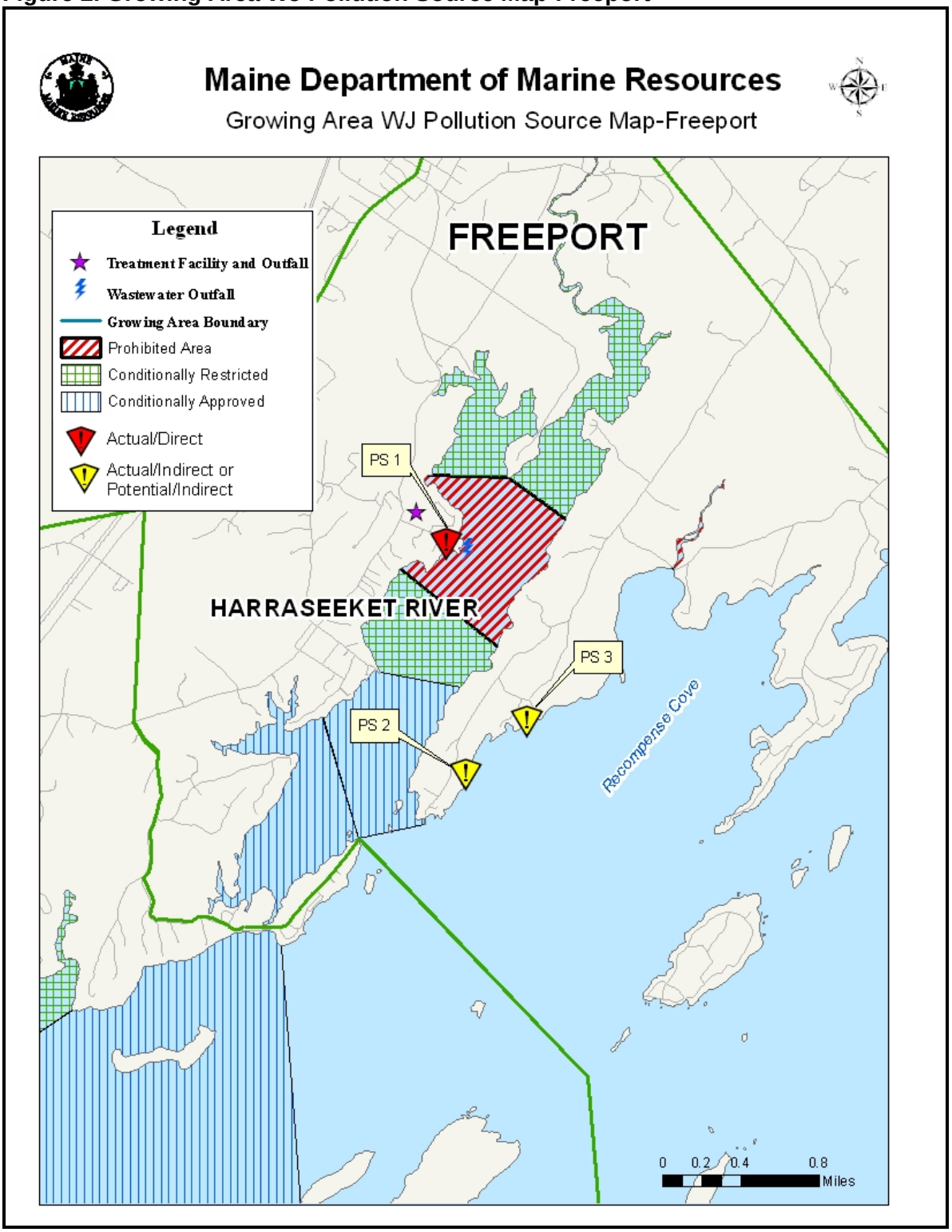


Figure 3. Growing Area WJ Pollution Source Map-Brunswick/Harpswell

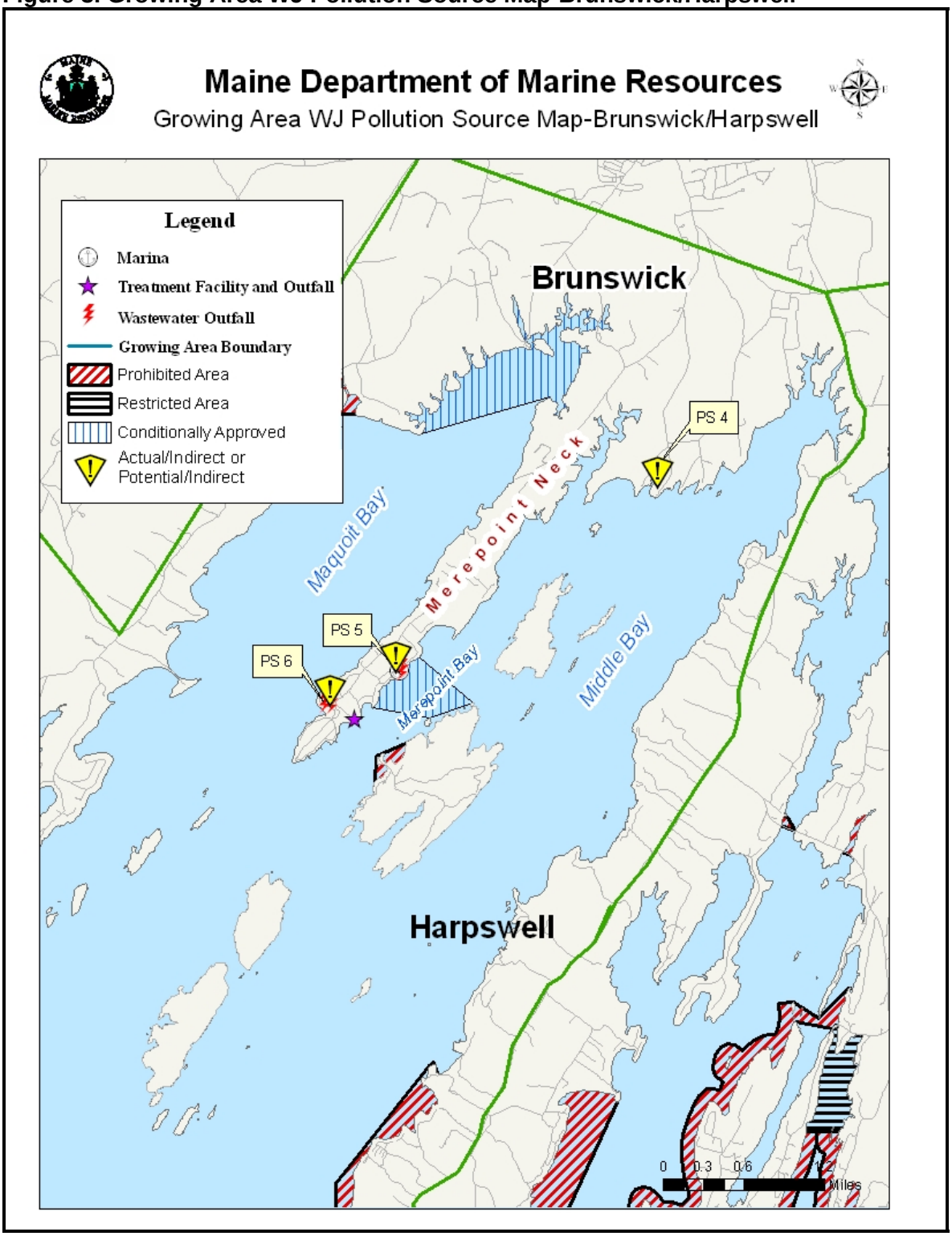
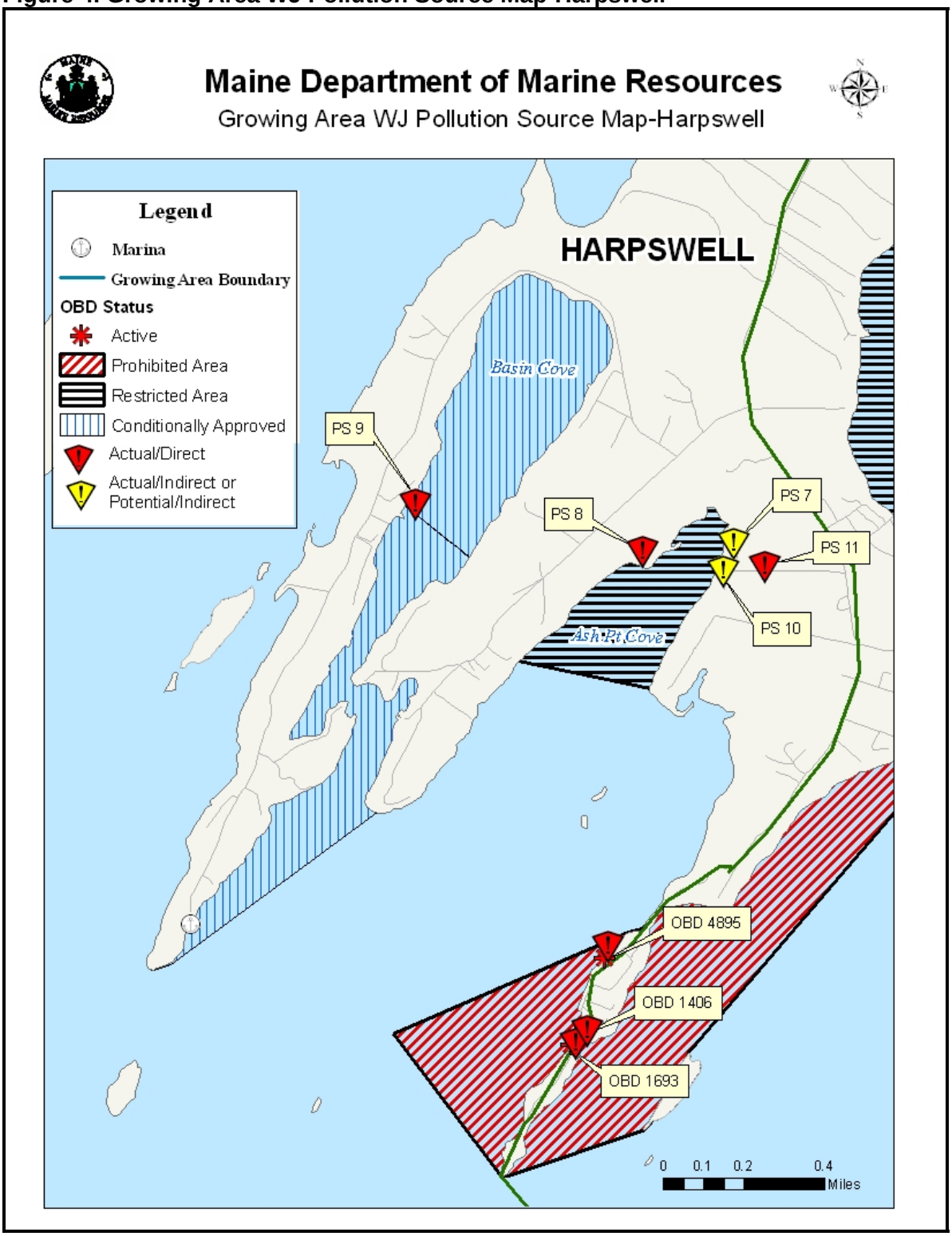


Figure 4. Growing Area WJ Pollution Source Map-Harpswell



Domestic Waste

An overboard discharge (OBD) is the discharge of wastewater from residential, commercial, and publicly owned facilities to Maine's streams, rivers lakes, and the ocean. Commercial and residential discharges of sanitary waste have been regulated since the mid-1970's when most direct discharges of untreated waste were banned. Between 1974 and 1987 most of the "straight pipes" were connected to publicly-owned treatment works or replaced with standard septic systems. Overboard discharge treatment systems were installed for those facilities that were unable to connect to publicly-owned treatment works or unable to install a septic system because of poor soil conditions or small lot sizes.

All overboard discharge systems include a process to clarify the wastewater and disinfect it prior to discharge. There are two general types of treatment systems; mechanical package plants and sand filters. Sand filter systems consist of a septic tank and a sand filter. In such systems, the wastewater is first directed to a holding tank where the wastewater solids are settled out and undergo partial microbial digestion. The partially treated wastewater then flows from the tank into a sand filter, consisting of distribution pipes, layers of stone and filter sand, and collection pipes within a plastic liner. The wastewater is biologically treated as it filters down through the sand, and is then collected and discharged to a disinfection unit. Mechanical package plants consist of a tank, where waste is mechanically broken up, mixed and aerated; mechanical systems require electric power, and must have an operating alarm on a separate electrical circuit that will activate if the treatment unit malfunctions due to a power failure. The aerated treated wastewater is held in a calm condition for a time, allowing for solids to settle and for the waste to be partially digested by naturally occurring bacteria. The clarified water from the tank is then pumped off the top into a disinfection unit. There are two types of disinfection units, UV and chlorinators (most common). In a chlorinator, the treated water contacts chlorine tablets and remains in a tank for at least 20 minutes where bacteria and other pathogens are killed. The treated and disinfected water is discharged from the disinfection unit to below the low water mark of the receiving waterbody (the ocean, a river, or a stream) via an outfall pipe.

OBDs are licensed and inspected by the Maine Department of Environmental Protection. At each inspection, DEP looks for tags on each treatment unit identifying the service contractor and the last date of service. If an OBD is not properly maintained, or if the OBD malfunctions, it has the potential to directly discharge untreated wastewater to the shore; therefore, preventative closures are implemented surrounding every OBD. The size of each closure is determined based on a dilution, using the permitted flow rate of the OBD (gallons per day, GPD), and the depth of the receiving water that each OBD discharges to; the fecal concentration used for this dilution calculation is $1.4X10^5$ Fecal Coliforms/100 ml. All current closures are of adequate size to protect public health. There are three licensed OBDs in growing area WJ (Table 2). All three active OBDs are located in the prohibited area on the eastern shore of Potts Harbor, Harpswell.

Table 2. Licensed OBDs in Growing Area WJ

OBD ID	Location	Receiving Waterbody	Flow (gpd)	Acres Needed For Closure	Current Prohibited Acreage
1406	Harpswell	Potts Harbor	360	2.25	
1693			300	1.92	
4895			300	1.92	
			TOTAL	**6.09**	**17,437.64**

Municipal WWTP

There is one treatment plant (Freeport WWTP) and one NPDES licensed subsurface waste disposal system (Merepoint Subsurface Waste Water Disposal System) in growing area WJ. The Freeport WWTP is a secondary treatment plant constructed in 1976, located on the western shore of the Harraseeket River estuary, approximately 1.5 miles (2.4 kilometers) upstream of the estuary's mouth on Casco Bay. The facility has a design flow of 750,000 gpd. The outfall is a single underground pipe extending out into the Harraseeket River estuary approximately 300 feet (91 meters) ending with three multiple port diffuser forks. There is approximately 10 feet (3 meters) of water over the diffusers at low tide. The plant is staffed Monday-Friday, 6am-5pm, and checked every morning for 1-2 hours on the weekends. Plant operators are on-call 24 hrs/day in the event of a problem or alarm at the plant. Alarms are triggered by loss of power, abnormally high flows, and changes in chlorine residual, and are tied into the police station dispatch. The police dispatcher notifies the plant operator on-call in the event of a failure. Storm water has been separated from the sewage collection system through pipe replacement over the years. There is still some infiltration from old clay pipes in town and from sump pumps. There are no combined sewer overflows as well as no bypass capability at the plant. There are ten pump stations in town with no overflow pipes. All pump stations have dual pumps, plus four stations have standby power. All pump stations have telemetry alarms for power failure and high water. The size of the prohibited, conditionally restricted, and conditionally approved areas in the Harraseeket River were determined by the 2004 Freeport Dye Study.

In December 1997, the Town of Brunswick submitted an application to the Department to install, operate and maintain a sub-surface wastewater disposal system serving 34 residential lots, 21 seasonal, 13 year-round, on the Merepoint Peninsula in the Town of Brunswick. Sanitary waste water is treated by nine (9) subsurface waste water disposal systems. Currently, the nine subsurface systems treat the sanitary waste water via 750- to 2,000-gallon septic tanks and nine individual leach fields. Effluent from the septic tanks is conveyed to the subsurface systems via 13 pump stations. In some systems, septic tank effluent is filtered via 32 sand filters and the filtrate is then conveyed to the pump station and leach field. The nine subsurface systems are collectively designed to accommodate a daily maximum total flow of 11,160 gallons. Four of the residential entities discharge to a common pump station which then discharges to a common 8,000-gallon holding tank. The tank is pumped out as needed, typically weekly, and its contents disposed of at the Brunswick Sewer District's Waste Water Treatment Plant. There are no known combined sewer overflow points in the system. Although the Merepoint disposal facility releases no wastewater directly into Maquoit Bay, its potential impact is significant.

Industrial Pollution

Commissioned in 1954, the U.S. Navy Fuel Depot operated throughout the Cold War to supply fuel to the Brunswick Naval Air Station. In 1991, the Navy determined that it would be more economical to truck in fuel from Searsport and, on March 31, 1992, officially shut down the facility. The 1995 Defense Authorization Act authorized the conveyance of the property to the Town of Harpswell which renamed it the George J. Mitchell Field. Mitchell Field is a 119.3-acre coastal site with deep-water pier and dock including 2,630 feet of shoreline on Middle Bay in Harpswell. The site is accessible by road from State Highway 123 (1410 Harpswell Neck Road). The property remains undeveloped and is listed with the Maine DEP as a Formerly Utilized Defense Site (FUD). The DEP Bureau of Remediation and Waste Management has the site listed under the programs; Uncontrolled Sites, Federal Facilities and Brownfields. The area is sandy bottomed with ledge and boulders interspersed in the intertidal zone. The Maine Department of Environmental Protection conducts heavy metals monitoring on mussels in the area (Figure 5).

Figure 5. DEP Sample Site at the Decommissioned U. S. Navy Fuel Depot

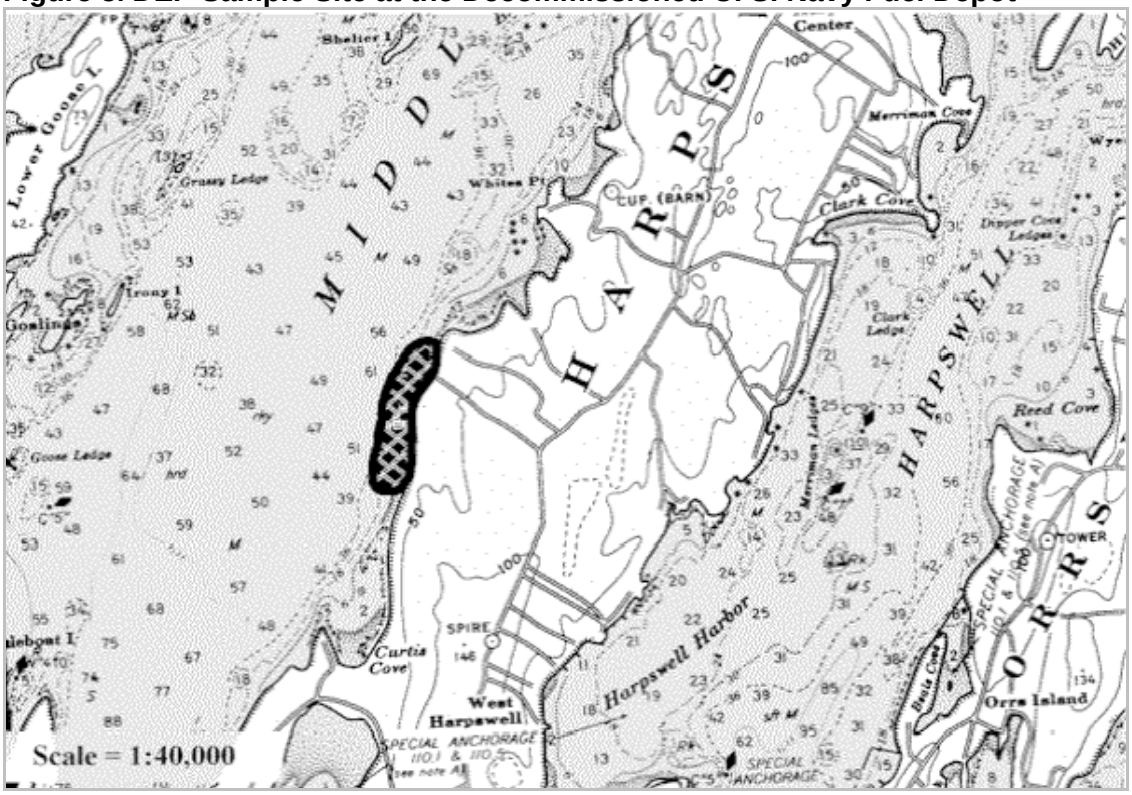


Chart courtesy of Maine DEP

Marinas

Under the NSSP, any shellfish growing area within the confines of a marina proper or mooring field is presumed to be contaminated for some period of time. Therefore, no growing area within the marina proper can be classified approved. The classifications available for marina

areas are conditionally approved, conditionally restricted and prohibited. The microbiological and chemical contamination associated with marinas and marina facilities may result in the contamination of shellfish and sediments in the adjacent areas. The NSSP has developed a set of evaluation criteria to be used in determining if the shellfish growing areas adjacent to marinas and mooring fields are affected by contamination associated with sewage.

The NSSP defines 'marinas' as an area that has 10 or more boats with heads. Each mooring field and marina in the growing area must be evaluated. Marina performance standards must be assessed annually utilizing the DMR developed evaluation form and a review of existing performance standards for those marinas that are in conditionally approved and conditionally restricted areas. The sanitary survey and triennial reviews require a marina inspection. A marina or mooring field that is in a conditional area must be inspected (and documented) prior to the area closing and opening to assure that the conditions of the management plan are met. Marina closure zone calculations are completed using the information from the inspection to input into a DMR model which was developed using the NSSP volumetric calculations.

The marina community in Maine only operates for a portion of the year due to adverse winter weather conditions. The management of marinas in Maine allows for shellfish growing areas to be available to harvesters for at least a portion of the year, to direct market harvest, by utilizing conditional area management plans.

There are two No Discharge Zones (NDZ) in Maine; Casco Bay and the Harraseeket River in Freeport. Casco Bay is administered by DEP and the Harraseeket River is administered by the Town of Freeport. The DEP has been authorized by the U.S. Fish and Wildlife Service to administer the Pump-out Grant Program, part of the recently re-authorized Clean Vessel Act. The purpose of the Clean Vessel Act is to reduce the pollution from recreational vessels by providing a safe and legal method for disposing of human waste. Improperly disposed waste from malfunctioning or non-existent marine sanitation devices (MSDs) often causes serious water quality problems throughout Maine. Through the Maine Coastal Pump-out Grant Program, DEP hopes to better: define the number of boats with installed MSDs, determine whether the average MSDs are operable and whether they are actually used; determine why they are not used; and eliminate the barriers to proper MSD use. The goals are to provide adequate holding tank pump-out locations along the entire coast, further improving accessibility to pump-out facilities by locating mobile pump-out vessels in strategic locations along the coast, and educating the boating public on the importance of responsible sanitary waste management. There are currently six pump out stations in area WJ; one of the six is a pump out boat which is operated by the Friends of Casco Bay.

Freeport

The Town of Freeport Coastal Waters Ordinance was updated on June 5, 2007, which states that all boaters granted a mooring assignment within Freeport must provide the following: A signed consent from the applicant attached to the application allowing the Harbormaster, at any time the boat is occupied, to board and inspect any tanks, valves, pumps and lines, including but not limited to, "Y" valves and electric systems such as Electra San, to insure such tanks, valves, systems, etc. are not set in a position that would allow the discharge of sanitary wastes into a Freeport anchorage.

The Freeport Harbormaster inspects all vessels that come into port and vessels while in port to assure that the No Discharge Zone is enforced. The harbormaster maintains a file on each mooring, listing the date of the last inspection and the name of the person who performed the inspection. Due to the efforts of the Freeport Harbormaster the marina conditional area in the Harraseeket River is provided as a security for the potential for contamination from fuel and oil contaminants which may result from the marina proper. The harbormaster provides any information requested by the department and contacts the department if there are any problems.

From an interview with the harbormaster on November 3, 2010, and the marina owners at Strout's Marina and Brewer's Marina on October 20, 2010, it was determined that the harbormaster manages all of the moorings and slips in the Harraseeket River. There are 365 moorings and 210 slips. According to the harbormaster, 100 boats on moorings have heads and 60 boats at the slips have heads. The marina calculation determined that 206 acres are needed to dilute the potential pollution from 160 boats with heads. Assuming that only 75% of the boats are being used at any given time, the closed area around the boats should be 155 acres. The conditionally approved area around the Freeport marinas is 251 acres and is closed when the boats are in the water from May 1 through November 30.

The Harraseeket Yacht Club (HYC) has an extensive float and dinghy tie system, a wharf and a clubhouse. HYC has one guest mooring that will not take a vessel larger than 30ft. Anchoring is not permitted and moorings can be obtained through Brewer's South Freeport Marine.

Brewers South Freeport Marine is a full service yacht yard. The marina features floating docks which provide water and electric to 110 seasonal slips. The 15 seasonal moorings and 8 average available transient slips are serviced by a courtesy launch. There is 14' of water at the docks at mean low water. There is a gas/diesel fuel dock and a sewage pump out available. There are on site heads and showers, laundry, ships store, sail loft and canvas shop. Brewer's is a full service repair facility for all types of boats. They are equipped with a travel lift, trailer and crane.

Strouts Point Wharf Company is in South Freeport. The company offers full repair services, marine travel lift, dock store/chandlery, overnight dockage, moorings and gas/diesel. The newly upgraded (post 2004) dock system is held in place with a special mooring system and is designed for year round use. The dock system is Maine's first year-round dock system. Freeport Town Wharf has limited docking space for day use. They do provide spaces for dinghy tie up for commercial fishermen.

<u>Brunswick</u>

From an interview with the marina owner on October 5, 2010, Paul's Marina, located on the east side of Merepoint Neck, provides moorings for a number of recreational and work boats during the summer months. Services provided by the marina include gasoline, marine hardware and supplies, parking, pump-out barge that is emptied by a septage truck, portapotties, snack bar, launching, and electricity and water to the dock. The marina operates from April 1 to October 1, with the peak usage from June 15 to September 15. They have 140 moorings and no slips.

They have dockage for dinghies and skiffs, but the depth of water near shore precludes having any large craft at the dock during low tide. Of the 140 boats on moorings, 56 of them, or 40%, have heads. The marina calculation determined that 81 acres is needed to dilute potential pollution from 56 boats with heads. Assuming that only 75% of the boats are being used at any given time, the closed area needs to be 61 acres. The conditionally approved area around the marina is 117 acres and is closed when the boats are in the water from April 15 through October 31.

Paul's Marina has a DEP experimental waste discharge permit for a subsurface discharge of treated boat wash water to groundwater which was issued in 2004 and renewed in 2009. The estimated daily volume of the discharge is 450 gallons per day (gpd) from mid-August until mid-November. The wash water receives treatment from an experimental treatment system consisting of two layers of filter fabric sandwiching a minimum 12" layer of coarsely ground limestone. The treatment system is built into the ground underneath the boat wash down area in a manner to completely capture all wash water. The wash water flows through the treatment system and discharges into the groundwater.

The discharge currently receives treatment through a collection system with hay bale filtration. The wash water is collected in the wash down area and flows through the hay bales to remove the particulates before being discharge to the ground. The proposed system incorporates elements that have been demonstrated by the DEP to remove 94-98% of the pollutants in typical boat wash water. As designed, the proposed system reduces pollutants in the wash water to below drinking water standards, therefore constitutes Best Practicable Treatment. Cleaning of engines or engine areas, or use of the collection and treatment system for uses other than originally intended, is prohibited. Engine washwater that may contain significant amounts of oils or fuels is captured separately and disposed of properly.

Harpswell

Dolphin Marina is located on the east side of Basin Point. From an interview with the owner on October 28, 2010, the marina operates from April 1 through November 30 with a peak season from June through September. They have 90 moorings and 15 slips, 75% of the boats have heads. The marina provides fuel and a portapotty on shore. There is no pump out facility, but boat owners are given information about calling for the Friends of Casco Bay pump out boat. The marina calculation determined that 105 acres are needed to dilute potential pollution from approximately 80 boats. Assuming that only 75% of the boats are being used at any given time, the closed area needs to be 79 acres. The area around the marina is 121 acres and is currently classified conditionally approved, closed from April 15 through October 30.

Stormwater

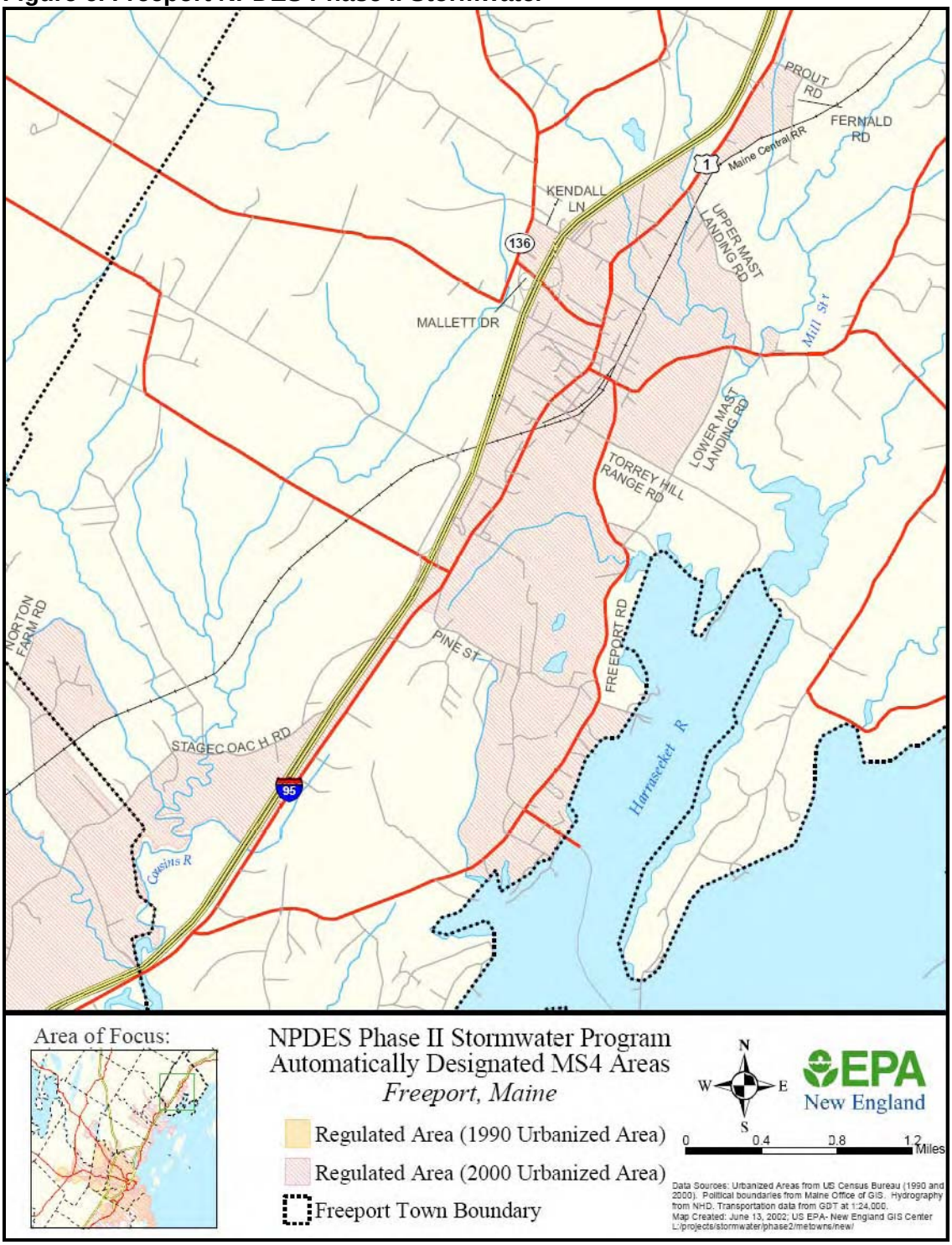
Stormwater runoff is generated from land surfaces and impervious areas including paved streets, parking lots, and building rooftops, during rainfall and snow melting events. This runoff can contain pollutants in quantities that can adversely affect water quality. Stormwater pollution is caused by the daily activities of people within the watershed. Rain and snowmelt water run off streets, lawns, farms, and construction and industrial sites and pick up fertilizers, dirt, pesticides,

oil and grease, and many other pollutants on the way to rivers, lakes, and coastal waters. Stormwater runoff is a contributor to coastal water pollution, often termed “nonpoint source pollution”. According to the EPA, because of impervious surfaces like pavement and rooftops, a typical town/city block generates more than five times more runoff than a woodland area of the same size.

The U.S. EPA promulgated Phase I of the stormwater management program in 1990 under the authority of the Clean Water Act. Under this program, permitting is required through the National Pollution Discharge Elimination System (NPDES) in order to regulate point sources that discharge pollutants into waters of the United States. The Phase I program covered three categories of discharges: (1) “medium” and “large” Municipal Separate Storm Sewer Systems MS4s) generally serving populations over 100,000, (2) construction activity disturbing 5 acres of land or greater and (3) ten categories of industrial activity.

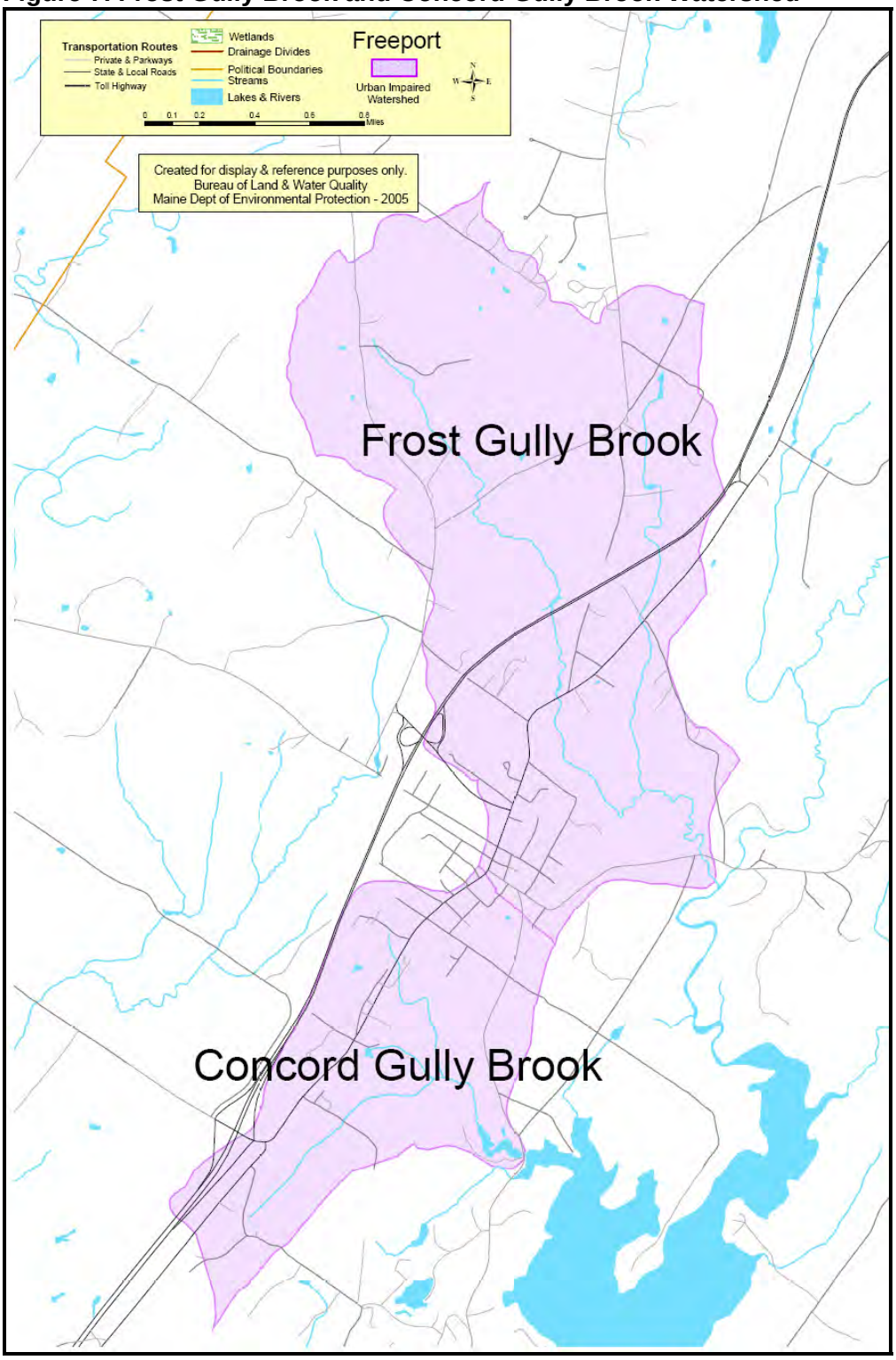
Phase II of the stormwater management program is the next step in the EPA’s effort to preserve, protect, and improve the Nation’s surface water resources from polluted stormwater runoff. The Phase II program expands the Phase I program to include all urbanized areas and smaller construction sites. Although it is a federal program, the Phase II Stormwater permit is issued and regulated by the Maine DEP (Chapter 500 and 502). Under the MS4 regulations, a municipality must implement the following six Minimum Control Measures: (1) Public education and outreach, (2) Public participation, (3) Illicit discharge detection and elimination, (4) Construction site stormwater runoff control, (5) Post-construction stormwater management, and (6) Pollution prevention/good housekeeping. The permit requires the Town to develop a draft Stormwater Management Plan by September 3, 2003 that will establish measurable goals for each of the Minimum Control Measures. The town will also need to document the implementation of the Plan, and provide annual reports to the Maine DEP. The only town within the WJ boundary that is designated “urbanized area” and formally regulated by the Phase II permit requirements is Freeport (Figure 6). Permit requirements are only enforceable in the regulated area but are encouraged throughout the entire town. Freeport also has two urban impaired stream watersheds; Concord Gully Brook and Frost Gully Brook both of which drain into the upper western branch of the Harraseeket River as illustrated in Figure 7.

Figure 6. Freeport NPDES Phase II Stormwater



Map courtesy of Town of Freeport

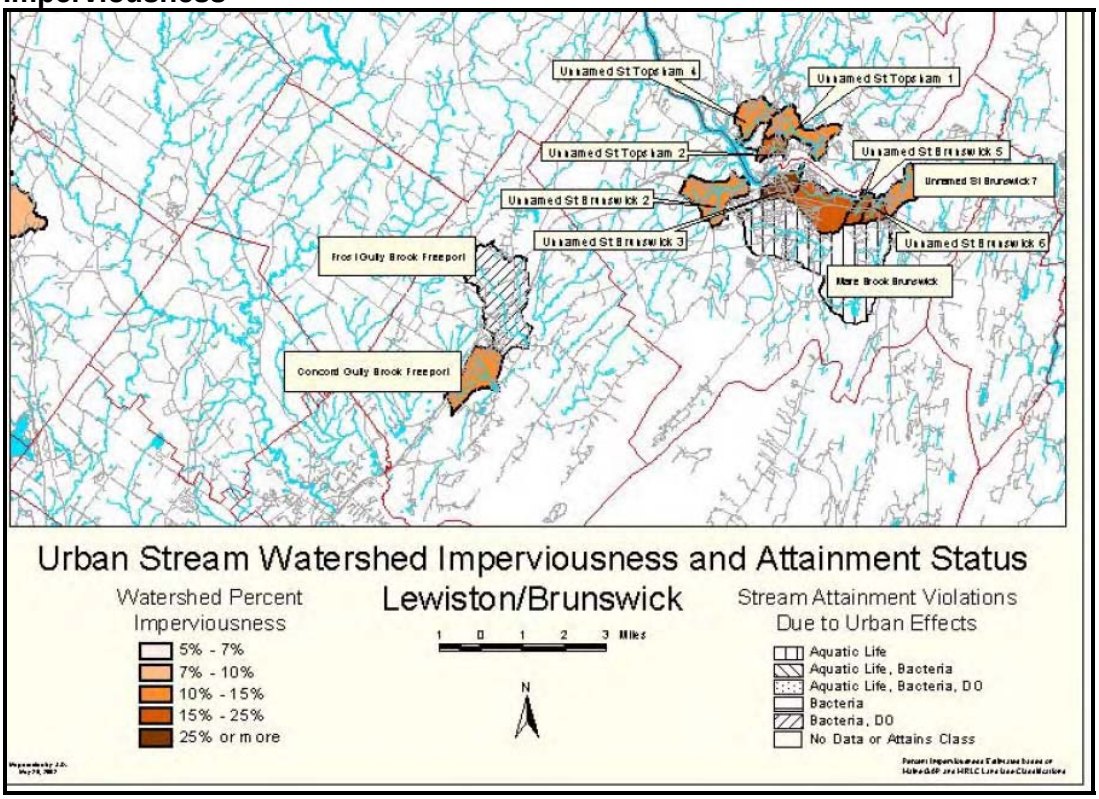
Figure 7. Frost Gully Brook and Concord Gully Brook Watershed



Map courtesy of Maine DEP

Maine DEP reports that there is a relationship between the percent impervious area of a watershed, and the water quality of the water body to which the watershed drains. “Imperviousness" refers to the area of roads, parking lots, sidewalks, rooftops, and other impermeable areas in the watershed. The percentage of the watershed that is imperious can be used as an indicator to measure the impact of land development on aquatic systems. Maine DEP has studied numerous streams in Maine in order to determine whether the effectiveness of the impervious cover is an indicator. In Maine, no streams with greater than 10% imperviousness that have been evaluated for attainment of aquatic life standards have met federal Clean Water Act standards and area considered “impaired”. Two means of identifying "at risk" streams are by using monitoring data, when available, and by using the imperviousness of the watershed as an indicator. In broad terms, a stream is considered at risk if it is not currently meeting standards, or is at risk of degradation based upon the percent of its watershed that is impervious. Growth in watersheds below 10% can be expected to result in detrimental impacts on streams as imperviousness approaches 10%, unless steps are taken to control the quantity and quality impacts from stormwater runoff. Figure 8 illustrates Concord Gully Brook’s imperviousness in the 10-15% range; above the 10% range which can be expected to have detrimental impacts on water quality from stormwater runoff. In the same figure, Frost Gully Brook violates attainment status due to urban effects with violations of bacteria and dissolved oxygen standards (Casco Bay Estuary Partnership’s State of the Bay report, 2010).

Figure 8. Frost Gully Brook and Concord Gully Brook, Freeport Attainment Status and Imperviousness



Map courtesy of DEP

The other two towns within the WJ boundary are Brunswick and Harpswell; these towns are not designated under the Phase II Stormwater permit or MS4 regulations. Harpswell has no stormwater collection system. According to Ferwerda et. al., the northern portion of the town of Harpswell's soil in WJ is comprised of a Dixfield – Colonel-Lyman-Brayton soil mix. The soil in the southern portion of Harpswell in area WJ is a mix of Lyman-Tunbridge-Dixfield. The mix in the northern part of Harpswell, which is similar to the Brunswick soil composition consists of very deep, moderate to poorly drained coarse loamy to coarse sandy soils with moderate permeability. Depth to bedrock is in the range of 10-20 inches and the slope ranges from 0 – 80 percent. The soil mix composition in the southern portion of Harpswell consists of deep (10-40 inches to bedrock), moderate to excessive drained soils. The slope range is 3-80 percent. Stormwater in these areas would percolate moderately to quickly depending on soil depth above the bedrock layer on steep slopes to the coastal waters. Brunswick has a stormwater collection system and there are two areas of concern within the WJ boundary; four catch basins in the Bunganuc Stream area (Figure 9.) and seven catch basins in the Wharton Point area of Maquoit Bay as illustrated in Figure 10.

Figure 9. Catch Basins in Bunganuc Area of Brunswick

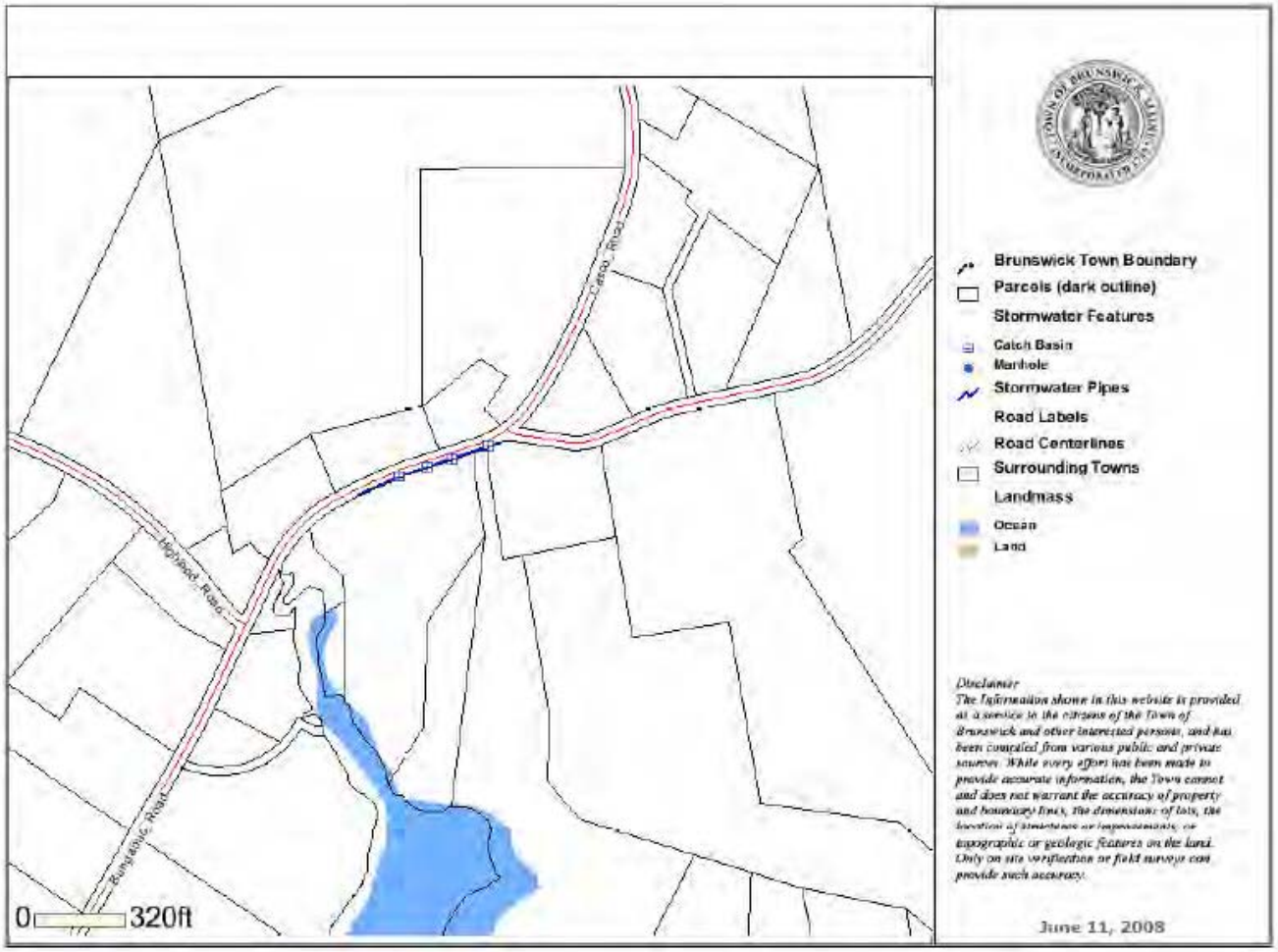


Figure 10. Catch Basins at Wharton Point Area of Maquoit Bay, Brunswick

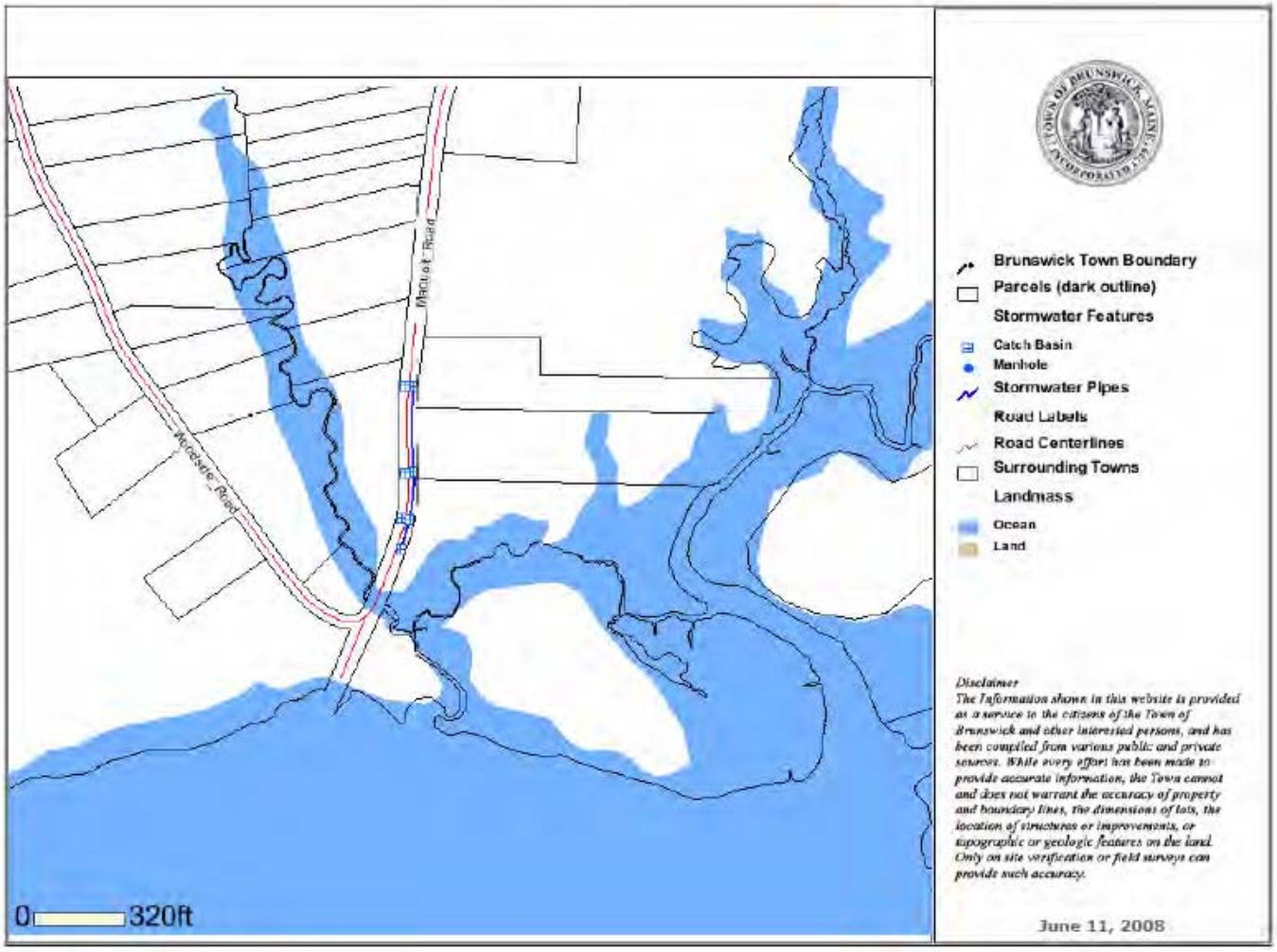


Figure 9 and 10 courtesy of Town of Brunswick

The Town of Brunswick's Public Works Engineer reports that the catch basins on Casco Road and on Maquoit Road were put in place to control stormwater runoff. Prior to installation, stormwater runoff was eroding the roads which are relatively flat with steep ditches on each side at the bottom of steep banks. Installing the catch basins and controlling the rate of flow in the area has improved the erosion problem. At both sites stormwater piping ends in the ditches along the road well away from the shore or any conduit to the shore. The installation has not increased any stormwater in the area but rather has been installed to control the rate of runoff. The catch basins are cleaned out every year in the late spring/early summer time period. Vacuum trucks are used and the material removed from the catch basins is taken to a landfill or the sewage treatment plant.

Non-Point Pollution Sources from Streams

Streams are a source of fresh water in growing area WJ in addition to snowmelt, overland runoff after rainfall and direct precipitation. Streams carry stormwater, snowmelt and groundwater into the coastal estuaries. Feces deposited on land can release pathogens into surface waters which are then carried to shellfish areas via runoff. Many freshwater streams empty into shellfish harvesting areas where fecal bacteria and viruses accumulate in sediments and can subsequently be re-suspended into the water column and therefore, filtered by the shellfish through respiration and feeding activities.

DMR collected stream samples from various sites on various dates from August 2008 through September 2010 in growing area WJ (Figure 11). Table 3 shows the fecal coliform results of the stream samples. The flow rates for streams were estimated on the day of collection.

Stream flows in 2009 (gallons per minute, gpm) were determined using a lightweight, portable flow meter. Stream flows during 2008 and 2010 were qualitatively determined (due to time and personnel constraints) as low, medium or high.

Stream stations S1WJ11, S2WJ11, S1WJ14.2, S2WJ14.2 and S3WJ14.2 (five individual streams) drain into waters classified as conditionally restricted at the head of the Harraseeket River (an embayment). This classification prohibits shellfish harvesting without a special MDMR permit. Stream stations S1WJ18 and S1AWJ18 (Little River) drain into Recompense Cove, an approved area on the east side of Wolf Neck peninsula. The stream is sampled at two locations separated by approximately 2000 yards. Stream station S1WJ30 (Bunganuc Creek) drains into Bunganuc Cove in upper Maquoit Bay.

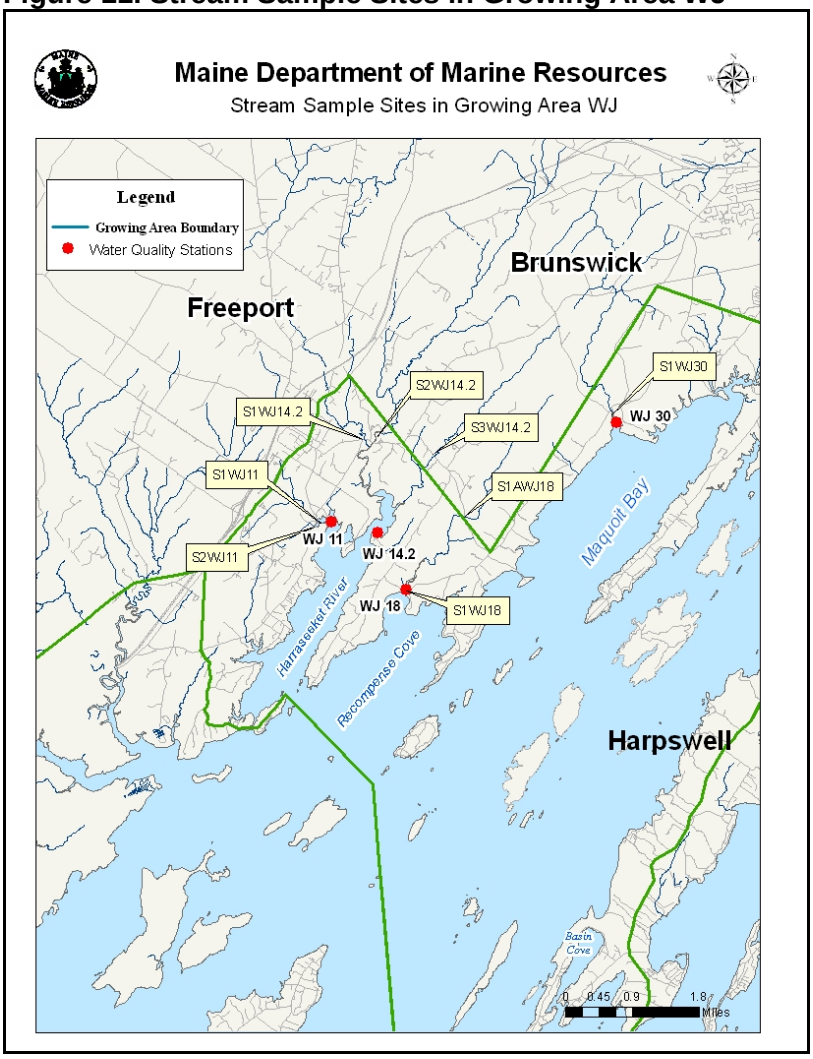
The lowest stream fecal score was <2 at station S1AWJ18 on April 8, 2009 and August 4, 2010. The stream flow was characterized as low due to no recent rainfall. The highest stream fecal score was >1600 at station S1WJ18 on August 12, 2008 and at stations S1WJ11, S2WJ11, S3WJ11 and S1WJ18 on July 14, 2010. The stream flows on these sampling dates were characterized as high. Rainfall data from the wunderground.com website indicated heavy rainfall during the morning hours on or a few days before the sampling days (1.6-2.5 in.). Although the fecal scores of the 12 samples (86%) collected on the three high stream flow dates (August 12, 2008, April 8, 2009 and July 14, 2010) were greater than the approved standard, the six low stream flow fecal scores were more inconsistent. For example, 20 out of 29 samples (69%) collected during low flow conditions had fecal scores that exceeded the approved standard. All the streams sampled flow through farmland with numerous agricultural activities and several hundred acres of pastures. Stream sampling must be intensified to determine the loading on the growing area WJ. Based on the limited sampling at these stations, it is hard to make a determination on what the actual direct impact is on water quality.

Table 3. Stream Sample Results Collected From August 2008 through September 2010 in Growing Area WJ

Sample Date	Sample Station	Location	FC/100ml	Stream Flow (gpm)
8/12/2008	S1WJ18	Recompense Cove Freeport	>1600	High
4/8/2009	S1WJ11	Harraseeket River Freeport	8	50
	S2WJ11		100	>200
	S1WJ14.2		8	
	S2WJ14.2		7.3	>500
	S3WJ14.2		1100	>200
	S1WJ18	Recompense Cove Freeport	2	10
	S1AWJ18		<2	1
6/15/2009	S1WJ18		700	>200
8/31/2009	S1WJ18		96	Moderate
9/1/2009	S1WJ18		12	
10/6/2009	S1WJ18		94	
10/14/2009	S1WJ18		8	
7/7/2010	S1WJ30	Maquoit Bay	18	Low
7/14/2010	S1WJ11	Harraseeket River Freeport	1040	High
	S2WJ11		106	
	S1WJ14.2		>1600	
	S2WJ14.2		>1600	
	S3WJ14.2		>1600	
	S1WJ18	Recompense Cove Freeport	1380	
	S1AWJ18		740	
	S1WJ30	Maquoit Bay	>1600	
8/4/2010	S1WJ11	Harraseeket River Freeport	2	Low
	S2WJ11		52	
	S1WJ14.2		64	
	S2WJ14.2		10	
	S3WJ14.2		74	
	S1WJ18	Recompense Cove Freeport	4	
	S1AWJ18		<2	
	S1WJ30	Maquoit Bay	92	
8/17/2010	S1WJ11	Harraseeket River Freeport	27	
	S2WJ11		60	
	S1WJ14.2		72	
	S2WJ14.2		35	
	S3WJ14.2		520	
	S1WJ18	Recompense Cove Freeport	10	
	S1AWJ18		64	

Sample Date	Sample Station	Location	FC/100ml	Stream Flow (gpm)
	S1WJ30	Maquoit Bay	35	
9/8/2010	S1WJ18	Recompense Cove Freeport	300	
9/29/2010	S1WJ11	Harraseeket River Freeport	42	
	S2WJ11		35	
	S1WJ14.2		100	
	S2WJ14.2		114	
	S3WJ14.2		320	
	S1WJ18	Recompense Cove Freeport	10	
	S1AWJ18		200	
	S1WJ30	Maquoit Bay	400	

Figure 11. Stream Sample Sites in Growing Area WJ



Agricultural Activities

As part of this triennial report, agricultural activities and waste (Table 4 and Figure 14) were noted but not fully evaluated; activities included animal farms, concentrations of animals at non-commercial farms, slaughterhouses, feed lots, educational facilities, individual property owners' pets, kennels, vegetable and fruit farms, and landscaping businesses**.** Growing area WJ has miles of pastoral farmland that is used for grazing, hay production and commercial vegetable and farms that provide landscape materials in the headwaters of the growing area.

The Wolf Neck Farm (Figures 12 and 13), located at the head of Recompense Cove, is a 626 acres educational facility and uses best management practices to prevent animal wastes from running off into the cove. The Wolf Neck Farm is one of 150 farms that lease fields to Pineland Farms, who coordinates the production of natural beef and provides educational opportunities. There are varying numbers of cows in the fields, changing weekly, and rotating through the various fields during the summer months. Cows are kept in the barn area on Burnett Road year round.

On August 9, 2010 DEP and Dept. of Agriculture toured the Wolf Neck Farm barnyards, pastures and manure storage facilities to determine if the best management practices (BMPs) that had been agreed upon in 2007 were being properly implemented. The fencing, both permanent and temporary, was installed appropriately and that the 100 head or so of cattle being pastured on the farm were being rotated frequently enough to maintain a dense growth of field vegetation on the pastures. The temporary watering tubs were located well, and are relocated regularly. Rotation of cattle for all three tenants occurs regularly.

The barnyard and manure storage area at the pole barn on the main farm, as well as the farm's plans for overwintering cattle this winter were discussed. The manure will be stored dry in the barn, not in the pit. The cattle will have use of the smaller concrete pad loafing area at the east end of the barn, adjacent to the manure pit, but not the concrete side yard to the south of the barn. The side yard will not be used until measures have been designed and implemented to capture and treat the runoff from this area. No significant amount of manure will be stored in the pit until a rock berm level lip spreader has been constructed across the contour at the end of the channel draining the pit. With an appropriately sized level spreader, the down gradient filter strip should attenuate much of the pollutant load from pit leachate and runoff. Management was encouraged to increase the rate of cattle rotation during the fall in order to have a dense crop of vegetation on all the pastures.

Figure 12. Aerial Photograph of Wolf Neck Farm

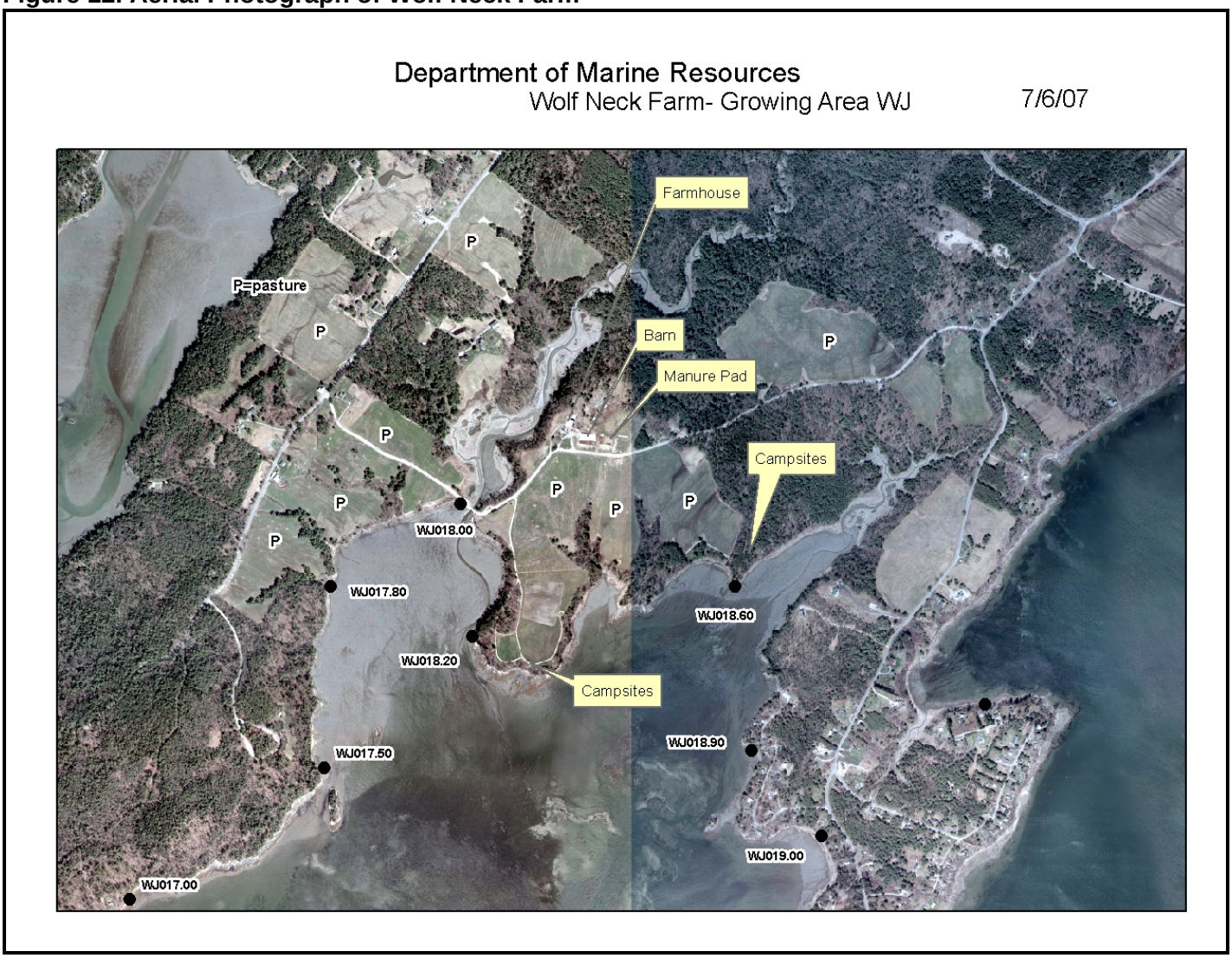
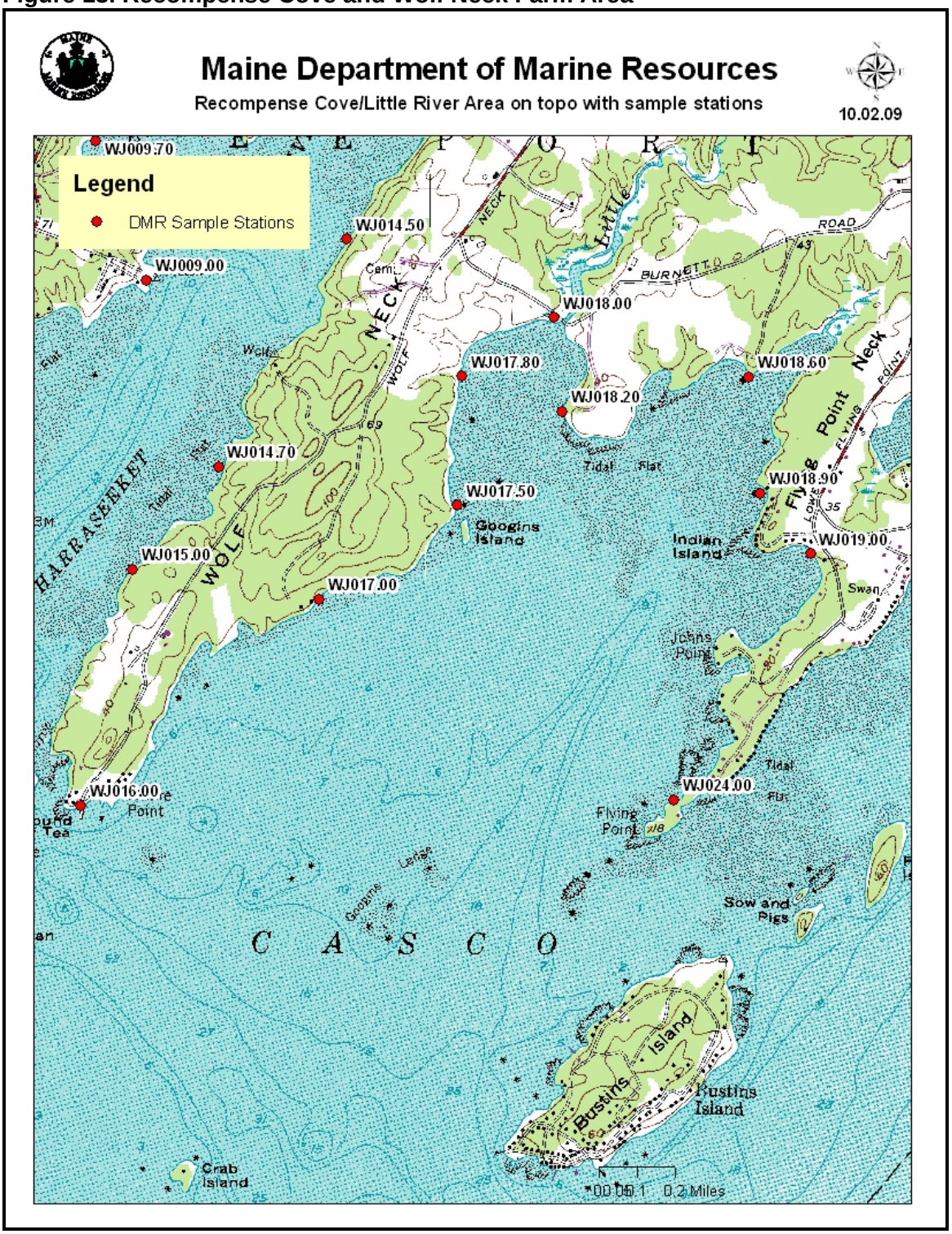


Figure 13. Recompense Cove and Wolf Neck Farm Area



Mitchell Ledge Farm is located about 2 miles from downtown Freeport and is one of Freeport's largest working farms raising Belted Galloway cattle. The farm is 185 acres of pasture and hay fields, woodlands and stream wetlands. Kelsey Brook flows through the farm. In addition to farming cattle, extensive timber management occurs on the property. Each year sustainable tree harvesting projects take place. The location and activities on the farm would make this a potential indirect source of pollution into the upper Harraseeket River.
http://www.mitchellledgefarm.com/about.htm

Tripping Gnome Farm, LLC was established in 2003 on a 30 acre parcel on Lupine Lane, Freeport. It is an alpaca farm with a herd of 60 alpacas in residence (June 23, 2008). The fenced paddocks are set back from Kelsey Brook (>300ft) and there is a natural buffer. Manure is in the fields stacked in multiple piles around the property. They are not sited in low lying areas or in wet spots on the property. The manure piles are on flat areas and appeared to meet the recommended set back requirements of the Maine Department of Agriculture for Perennial Waterbodies of 300' when the water feature is down slope. Kelsey Brook is the closest perennial stream to the farm and drains to the Upper Harraseeket River. There is an indirect potential for impact of the manure after heavy rainfall or times when there is high runoff due to rapid snow melt or sustained rainfall.
http://www.trippinggnomefarm.com/

Crystal Spring Farm comprises 322 acres of fields and forest located less than two miles from downtown Brunswick on both sides of Pleasant Hill Road. It is located in the drainage that terminates in Maquoit Bay. It was once a dairy farm and is now a community farm and Katahdin Hairsheep farm (since 2005). There are 2.5 miles of hiking and cross country ski trails on the property. In a May 2008 newsletter the Crystal Spring Farm reported that they had a very successful lambing season which yielded 76 lambs from 42 ewes. They do not use pesticides or herbicides on their pastures and utilize rotational grazing techniques. They also use their fields for hay production. The location of the farm would make this a potential indirect source of pollution into Maquoit Bay.

Domestic Animals and Wildlife Activity

The Mast Landing Sanctuary is a 167 acres bird and wildlife preserve located in Freeport, near Mill Stream; this facility is owned and managed by the Maine Audubon Society. The property has approximately 1500 feet of shore frontage at the head of the Harraseeket River. The facility is operated year-round, with peak visitor usage in June through September. This area is monitored by Station WJ 14.2. In Brunswick, migratory birds, resting over the winter months in Maquoit Bay, may have a seasonal impact on water quality at station WJ 33, which is classified conditionally approved and closed for harvesting from September 1 through March 31.

Domestic animals can be found at a number of locations in Growing Area WJ. There are two locations where horses and sheep are kept as pets. One property, located 500 feet from the head of Staples Cove in the Harraseeket River, has three horses. Water quality at the head of Staples Cove, monitored by station WJ 1, is classified as conditionally approved. Another property located north of station WJ 9.7, keeps six sheep, more than 100 feet from shore. The property and its drainage are near the boundary line of the prohibited and conditionally restricted areas.

December 10, 2008 - A drive through survey of Pleasant Hill Rd, Freeport to Highland Rd and Casco Rd, Brunswick revealed that hay fields have had manure spread on them. At this time there is snow melt and rainfall which is a concern for impact on Mill Stream and Kelsey Brook (Freeport) which drains to Pettingill Cove on the Harraseeket River. The hay fields with manure are also along the upper reaches of Bunganuc Brook which drains to Maquoit Bay (Brunswick).

April 13, 2009 - DMR attended a meeting with DEP, industry members and Wolfe's Neck Farm representatives to walk pastures and the farm. The walk revealed cows being pastured in "buffer" pastures, inadequate buffers between pastures and streams/pastures and shore, cows being able to be in streams no fenced outside of streams and large amounts of manure that was making its way into streams and adjacent shellfish waters.

August 11, 2009 – drive through survey of Recompense Cove, Little River, Spar Cove area of WJ in Freeport. DMR, DEP and the Dept. of Agriculture met with the Wolfe's Neck Farm manager, the Mitchell Farm operator, and a couple members of Wolfe's Neck Farm Board. DMR provided them an overview of the growing area program and answered a lot of questions about stream sampling and the recent history of Recompense Cove classification changes. Pineland will have all cattle removed in September. The Ag/Board/Farm wants to figure out what and how many animals they can have on the farm with less impact.

August 12, 2009 – A drive through survey and stream sampling of Harpswell Neck at Sunset Cove, Ash Point Cove and Basin Cove indicated the following: horse feces on Sunset Cove Road; a pastured area at 11 Basin Point Road, 64 Ash Point Road and 196 Ash Point Road (horse); 49 ducks on the low tide mud at sample station WJ68; two horses at 124 Rossmore Road (Maquoit Bay).

November 2, 2009 – The Executive Director of the Wolfe's Neck Farm Foundation notified the DMR that the spreading of the remaining manure would begin on November 3, 2009. The Department of Agriculture was present to review the setbacks for the three fields being spread with the contractor hired to do the spreading.

January 14, 2010 - Agency representatives from the Dept. of Agriculture (DAFSS), the Dept. of Environmental Protection (DEP and the DMR met with the Freeport Town Council and the Freeport Shellfish Committee to discuss the Best Farming Practices (BFP) developed by the DAFSS, DEP and Wolfe's Neck Farm. The BFP developed including a stocking rate of animal units per acre which should balance the use of shellfish harvesters by maintaining approved area standards and allowing the farm to stock animals.

May 13, 2010 - The Freeport Municipal Shellfish Warden reported to the Department that Wolfe's Neck Farm has introduced 8 cattle to the farm and are expecting up to 30.

September 8, 2010 – DMR conducted a drive through survey of Wolfs Neck Farm. There were approximately 30 heads of mature cattle on property, with several new born young. There were two clusters of cows (belted Galloways, about 10 to 12 per cluster) pastured on the shores of Recompense Cove. There was an additional 10 (approx) heads (with multiple young, hard to count), pastured by the barn that is adjacent to the education center (main building). No

manure piles were observed on property (outside). Buffer of grasses/sedges was in place along sensitive areas.

October 5, 2010 – DMR did a drive through of Wolfes Neck Farm. A total of 21 cows were present (two clusters; 12 cows and 9 cows) on pasture across from main building, on the shore of Recompense Cove. No manure piles in sight. Cows (with young) that were previously pastured by the barn that is adjacent to the education center have been removed from the property.

November 16, 2010 – DMR and the Freeport shellfish warden did a "boat- through" survey of the Harraseeket River and Recompense Cove areas. No changes in pollution issue were noted from shore (no new houses, construction, etc). They also did a drive through of farms in Freeport, with the following noted:

New Elm Farm, off Lambert Rd (closest station in WI 55.2, Whistler's Cove)- this farm is not near shore, but is by streams that will drain to shore. Vegetable farm utilizing manure on fields; no animals observed at time of survey, however, they occasionally pasture sheep at this location. Manure piles (for fertilizer) under tarps to lessen run-off after rain.

Mitchell Ledge Farm: located on Flying Point Rd. Belted Galloway cows. Drains towards WJ 14.2. Leases land all over Freeport for pasture.

On S. Freeport Road, there is a pasture for cow grazing, Mitchell Ledge farm leases this land. Field very wet, with 12-24 cows grazing. Drains towards station WJ 2.5. Dept of Ag and DEP assessed this pasture in 2009. Also, occasionally horses pastured across S. Freeport Rd- no drainages to shore.

Tripping Gnome Farm- on Flying Pt Rd. Alpacas (approx. 30 counted, but could be more). Manure pile by road (not covered). Drains towards WJ 14.2 (restricted area).

On Freeport/Brunswick town line (drains towards lower Maquoit Bay)- approx. 20 cows are pastured (Belted Galloways)- presumed to be owned by Mitchell Ledge farm. Cows not always pastured here.

There is a small hobby farm located on Bartol Island Rd. Very small- several geese, alpaca, and maybe sheep (not present at time of survey). Not considered to be a problem, no obvious drainages.

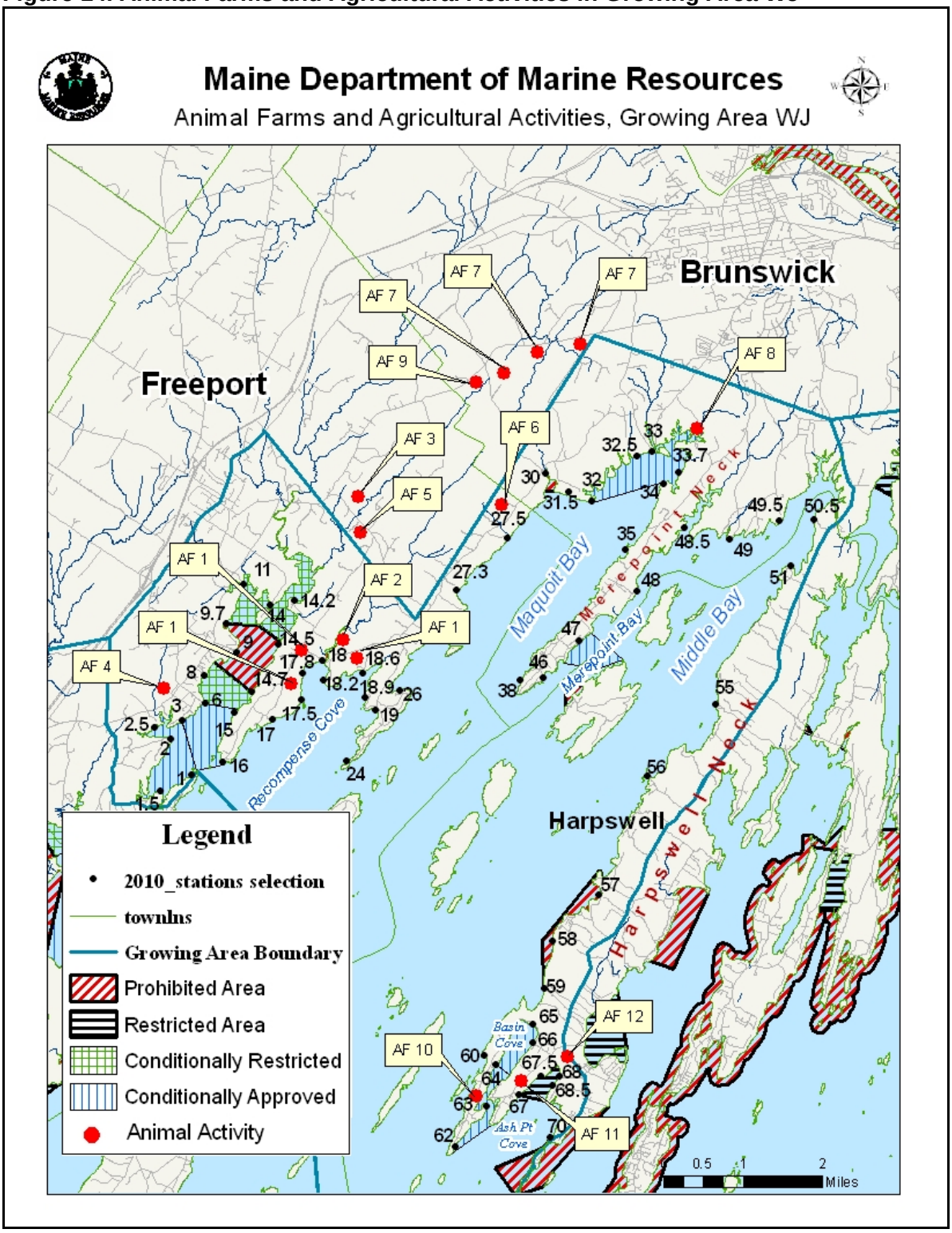
Occasionally, there are horses pastured on S. Freeport Rd- pretty far from shore, so should not be a problem. No obvious streams and drainages observed.

On Corner of Highlight/Pleasant hill Rd (Brunswick)- Minnott Farm, cow pastured and huge manure piles. Over a mile from shore, but if there are drainages and streams going through this property, this will drain into Little River and ultimately Recompense.

Table 4. Animal Farms and Agricultural Activities, Growing Area WJ, 2008-2010

Town	Pollution ID	Actual or Potential	Direct or Indirect	Pollution Description	Survey Date
Freeport	AF 1	P	I	Cows in pasture	April 13, 2009
				30 cows near Recompense shore	September 8, 2010
				21 cows near Recompense shore	October 5, 2010
	AF 2			Cows at Wolf Neck Farm	August 11, 2009
				10 cows at Wolf Neck Farm	September 8, 2010
	AF 3			Cows in pasture	November 16, 2010
	AF 4			12-24 cows in pasture	
	AF 5			30 alpacas, uncovered manure	
	AF 6			20 cows in pasture	
Brunswick	AF 7			Hayfields spread with manure	December 10, 2008
	AF 8			2 horses	August 12, 2009
	AF 9			Cows at Minnott Farm, uncovered manure	November 16, 2010
Harpswell	AF 10			Horse feces	August 12, 2009
	AF 11			1 horse	
	AF 12			49 ducks	

Figure 14. Animal Farms and Agricultural Activities in Growing Area WJ



Conservation/Recreation Areas

The concern for actual or potential pollution from recreational areas is because many of them allow dogs and some having bathroom facilities. In and of themselves, they aren't a pollution source but activities at the recreational areas may contribute to water quality problems by placing added pressure on the watershed. For instance, they may contribute to erosion (trails, building footbridges, etc.), dog waste not picked up may accumulate and wash off after rainfall, new trails may be put into areas that didn't have human activity before and they may put added pressure on wildlife to congregate in other places where we may see water quality decline, etc. The mere presence of humans/dogs doesn't necessarily mean there is an actual pollution source, but it is a potential pollution source.

Wolfe Neck State Park is located on the western side of Recompense Cove. This a day use park with picnic tables, bathrooms (in ground septic system), and wooded hiking trails. Pets are permitted on leash and waste pickup is requested on signs. The park is home for numerous deer and raccoons and other common Maine wildlife. This area is monitored by Station WJ 17.5. At the head of Recompense Cove, is the Wolfe Neck Farm campground, which has 115 camp sites and three cottages along the shore of the cove. The campground provides outhouses near the sites, and there is also a shower building with flush toilets and laundry facilities located on the Burnett Road. This building has an approved in ground septic system located more than 500 feet from shore. New sampling stations, WJ 18.2 and 18.6, are located along the campground shore.

The Freeport Land Trust purchased two conservation easements from Mitchell Ledge Farm to protect 130 acres of scenic pastures, hay fields, woodlands, streams and wetlands from future development or subdivision. The easements granted by the farm owners will also allow the Freeport Land Trust to create trails for public access through woods around farm fields and across Kelsey Brook, which runs through the property. The Land Trust has secured trail easements from abutting property owners that will soon, once the trail is created, make it possible to walk through the woods from Mitchell Ledge Farm to the Trust's Calderwood property on Maquoit Bay. One recommendation for the trail is to build four simple cedar bog bridges and a 3/16 foot simple deck bridge in order for the trail to cross Kelsey Brook.

Crystal Spring Farm was detailed in the agricultural section of this report. It has 2.5 miles of hiking and cross country ski trails on the property.

The Captain Alfred Skolfield Nature Preserve is an 11-acre preserve owned and maintained by the Brunswick – Topsham Land Trust and is located on Harpswell Neck between Middle Bay and Harpswell coves, just north of the Brunswick-Harpswell town line. The salt marsh and mudflats of Middle Bay Cove attract many resident and migrating waterfowl and several species of migrating shorebirds. This preserve also has trails for public use.

Skolfield Shores Preserve in Harpswell consists of 19 aces with 4,400 ft. of shorefront overlooking Middle Bay Cove, and has trails for public use. Two trail loops wind through forest habitat and provide views of the cove, the saltwater marsh separating Brunswick and Harpswell, and the fields of Merrucoonegan Farm; a side trail leads down to the shore. The Harpswell Heritage Land Trust reports that the Preserve contains valuable habitat for many Maine species

of birds, fish and trees. The U.S. Fish and Wildlife Service predicts that the preserve provides habitat for 40 of the 64 declining species of migratory birds, anadromous fish and federally endangered or threatened species in the Gulf of Maine including, horseshoe crab, northern harrier, short-eared owl, bald eagle, roseate tern, osprey, American black duck, sanderling and meadowlark. The marshland around the preserve is especially valuable as a feeding and staging area during migration for shore and wading birds. There is public access to marked trails but is only open from dusk to dawn. No motor vehicles or bicycles are allowed. Dogs are allowed on a leash.

The 17-acre Charles Norton Easement in Harpswell is part of a 20-acre mix of forest and wetland running from the Harpswell Neck Road to 360 feet of shorefront on Wilson's Cove on Middle Bay. A 3-acre developed area near the shore is not included in the easement. A one-half mile trail leads from the small parking lot next to the Harpswell Neck Road to a cliff at the shore of Wilson's Cove. The cliff offers a scenic outlook onto Middle Bay. There is public access for pedestrian use only from dawn to dusk. Dogs are allowed on a leash only.

The Birch Island South Preserve, Harpswell is a wooded 43 acre parcel, on the southern part of the island, was acquired by the Harpswell Heritage Land Trust in 1988. Largely an interior property, it has some 1000 feet of shore frontage along Duck Cove on the east and very limited shorefront on Merepoint Bay to the west, and shorefront on a small cove at the extreme southern end. The Preserve remains in a substantially undisturbed natural state and is an active nesting area for osprey and other sea and shore birds, and the habitat of diverse indigenous flora and fauna. Public access is limited to members of the Birch Island South Association and the Birch Island Corporation or with written permission from the Harpswell Heritage Land Trust. No dogs are allowed.

The Nature Conservancy owns and manages 143 acres of Upper Goose Island as wildlife habitat. The island is closed to the public from March 15th to August 15th to protect its value as a bird-nesting site.

The Whaleboat Island Easement is a 120-acre island that is relatively low and flat, with most of it at an elevation of less than 40 feet. The island is about 1.5 miles long, and only 500 feet wide at its narrowest point. The center region of the island is low field and shrub land while the two ends are forested with higher elevations and rockier soil. It is the largest undeveloped island in Casco Bay. The northern half is completely wooded with a great variety of flora and fauna. The property is owned by Maine Coast Heritage Trust with an easement for the northern half of the island for the Harpswell Heritage Land Trust. There is public access to the island.

About 3 miles off the coast of Harpswell is Eagle Island State Historic Site which receives about 6,000 visitors each season who tour the summer home of North Pole Explorer Admiral Robert Peary. The island is void of any mechanical devices. The island is open daily from June 15 through Labor Day. The island is equipped with a pier and a hiking trail.

Water Quality Review and Discussion

Table 5 lists all active approved, restricted and prohibited stations in Growing Area WJ, with their respective geomean, P90 calculations and approved/restricted standards for 2010. Please refer to Appendix G for a key to interpreting the headers on the columns of Table 5. These standards will fluctuate yearly as a result of the DMR transition from a most probable number (MPN) fecal coliform test method to a membrane filtration (MF) method and are dependent on the number of sample analyzed by MPN verses MF. The total number of data points used in the calculations is displayed in the Count column and includes both MPN and MF values. The number of data points analyzed by MF is displayed in the MFCNT column. This fluctuating standard will cease when all 30 data points have been analyzed by the MF method. All approved and restricted stations met their NSSP classification standard in 2010. Boundary stations with approved areas must meet the approved classification; in 2010, all boundary stations met the approved standard. Stations with less than 30 data points in their dataset are considered “New” and were not evaluated against the classification standard of the area in which they are located.

Table 5. Geometric Means and P90 Scores, Growing Area WJ

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ009.00	P	30	30	3.4	0.49	340	14.8	31	163	2/11/2008
WJ016.00	A	30	30	2.7	0.28	22	6.3	31	163	8/28/2007
WJ017.00	A	30	30	3.1	0.44	44	11.9	31	163	8/14/2007
WJ017.50	A	30	30	3.6	0.59	840	21	31	163	8/28/2007
WJ017.80	A	30	30	4.7	0.54	280	23.5	31	163	7/30/2007
WJ018.00	A	30	30	3.4	0.48	120	14.7	31	163	8/28/2007
WJ018.20	A	30	30	3.3	0.51	280	15.2	31	163	8/14/2007
WJ018.60	A	30	30	3.5	0.52	126	16.7	31	163	7/25/2007
WJ018.90	A	30	30	2.8	0.48	140	12	31	163	8/14/2007
WJ019.00	A	30	30	2.8	0.39	134	9.1	31	163	8/14/2007
WJ024.00	A	30	26	2.9	0.45	240	11.1	32	176	4/26/2006
WJ026.00	A	30	26	2.7	0.38	150	8.5	32	176	4/26/2006
WJ027.30	A	30	28	2.7	0.34	40	7.5	31	169	7/31/2006
WJ027.50	A	30	28	2.5	0.39	240	8.2	31	169	7/31/2006
WJ030.00	P	30	28	7.1	0.57	240	38.8	31	169	7/31/2006
WJ031.50	A	30	28	2.8	0.36	52	8.3	31	169	7/31/2006
WJ032.00	A	30	30	2.9	0.31	22	7.3	31	163	6/13/2007
WJ034.00	A	30	30	3.6	0.52	600	17	31	163	5/29/2007
WJ035.00	A	30	28	2.5	0.23	10	5	31	169	7/31/2006
WJ038.00	A	30	28	2	0.07	4	2.4	31	169	7/31/2006
WJ046.00	A	30	26	2	0.08	4	2.6	32	176	4/11/2006

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ048.00	A	30	26	2.3	0.16	8	3.7	32	176	4/11/2006
WJ048.50	A	30	28	2.6	0.31	22	6.6	31	169	6/21/2006
WJ049.00	A	30	27	3.1	0.49	154	13.7	32	173	6/21/2006
WJ049.50	A	30	26	2.3	0.18	9.1	4	32	176	4/11/2006
WJ050.50	A	30	26	2.2	0.15	9.1	3.5	32	176	4/11/2006
WJ051.00	A	30	26	3.9	0.42	64	14	32	176	4/11/2006
WJ055.00	A	30	27	2.3	0.19	9.1	4.2	32	173	6/21/2006
WJ056.00	A	30	27	3	0.35	24	8.8	32	173	6/21/2006
WJ057.00	P	30	26	2.9	0.4	100	9.5	32	176	4/11/2006
WJ058.00	P	30	26	6.7	0.73	580	58.2	32	176	4/11/2006
WJ059.00	A	30	26	4	0.63	440	26.6	32	176	4/11/2006
WJ060.00	A	30	26	2.6	0.34	35	7.3	32	176	4/11/2006
WJ067.00	A	30	30	2.9	0.35	52	8.4	31	163	5/2/2007
WJ067.50	New	22	22	3.3	0.55	160	17.1	31	163	9/30/2009
WJ068.00	R	30	30	6	0.72	1700	50.9	31	163	6/16/2008
WJ068.50	New	22	22	4.1	0.55	200	21.7	31	163	9/30/2009
WJ070.00	A	30	30	2.4	0.23	12	4.8	31	163	2/12/2007

In the Harraseeket River there are conditionally approved areas and conditionally restricted areas. The entire river is conditional on the proper functioning of the wastewater treatment plant (WWTP); a portion of the river is also conditional on the presence of a marina, and has a seasonal open and closed status. All stations located in the WWTP conditionally approved area, but outside the marina area, met approved standards when the river was in the open status; all stations located in the WWTP conditionally restricted area, but outside of the marina area, met restricted standards when in the open status (Table 6). Stations WJ 1.5, 2, 2.5, 9.7, and 14.5, are either new stations created in 2009 or reactivated stations and do not have 30 data points; therefore they were not evaluated against a classification standard.

Table 6. Harraseeket River WWTP Conditional Area, Open Status based on WWTP, 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ001.00	CA	30	30	2.5	0.28	30	5.8	31	163	5/7/2008
WJ001.50	CA	21	21	2.6	0.28	16	6.3	31	163	4/14/2009
WJ002.00	CA	21	21	2.1	0.14	8	3.3	31	163	4/14/2009
WJ002.50	CA	20	20	2.8	0.39	76	9.3	31	163	4/14/2009
WJ003.00	CA – Boundary	30	30	2.4	0.27	29	5.4	31	163	3/5/2007
WJ009.70	CR	21	21	2.6	0.29	22	6.5	31	163	4/14/2009
WJ011.00	CR	30	30	4.2	0.53	82	20.6	31	163	5/7/2008
WJ014.00	CR	30	30	3.2	0.46	92	12.6	31	163	5/7/2008
WJ014.20	CR	30	30	3.9	0.53	106	19.3	31	163	3/17/2008
WJ014.50	CR	21	21	2.9	0.4	92	9.7	31	163	4/14/2009

A portion of the lower Harraseeket river is classified as conditionally approved (WJ 3, 6 and 15) and conditionally restricted (WJ 8 and 14.7) based on the operations of the Freeport WWTP plant and on a marina season, with a closed status from May 1st through November 30th. These conditionally approved and conditionally restricted stations met the approved and restricted standards, respectively, in the open status (Table 7). Station WJ 3 is located on the boundary of the marina area and the year-round portion of the river. This station meets the approved standards using both the year-round data set in the open status (based on WWTP), and during the marina open season. Stations WJ 14.7 and 15 are new and reactivated stations, respectively, in 2009 and do not have 30 data points; therefore they were not evaluated against a classification standard.

Table 7. Harraseeket River WWTP and Marina Conditional Area, Open Status (December 1 - April 30), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ003.00	CA	30	21	2.6	0.21	12	4.9	35	195	3/3/2004
WJ006.00	CA	30	20	3.3	0.38	43	10.5	36	199	3/3/2004
WJ008.00	CR	30	21	2.4	0.18	9.1	4.2	35	195	4/25/2001
WJ014.70	CR - new	7	7	2	0.1	3.6	2.8	31	163	4/14/2009
WJ015.00	CA - reactivated	7	7	2.1	0.12	4	3	31	163	4/14/2009

Maquoit Bay, Brunswick has a seasonal conditionally approved area which is in the open status from April 1 through August 31. The area is monitored by station WJ 33 and new stations WJ 32.5 and 33.7. In 2010, station WJ 33 exceeded the approved standard during the open status (Table 8). The upper portion of the conditional area was downgraded to restricted on 10/12/2011. Stations WJ 32.5 and 33.7 do not have 30 data points in their dataset; therefore they were not evaluated against a classification standard.

Table 8. Maquoit Bay (Brunswick) Conditional Area, Open Status (April 1 - August 30), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ032.50	CA	13	8	6.4	0.52	52	31	36	206	5/10/2006
WJ033.00	CA	30	21	5.9	0.62	460	37.7	35	195	7/12/2005
WJ033.70	CA	7	7	4.7	0.41	18	16.7	31	163	8/17/2009

The marina conditionally approved area on the eastern shore of Merepoint Neck at Paul's Marina is monitored by sample station WJ 47. The conditionally approved area is in the open status from November 1 through April 14. In 2009, the area met approved standards in the open status (Table 9).

Table 9. Merepoint (Brunswick) Marina Conditional Area, Open Status (November 1 - April 14), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ047.00	CA	30	26	2.3	0.27	58	5.3	32	176	1/17/2006

The upper portion of Basin Cove, Harpswell is classified conditionally approved with an open season of December 1 through April 30. The area is monitored by stations WJ64, 65 and 66. All three stations meet approved standards for the open period (Table 10).

Table 10. Upper Basin Cove, Seasonal Conditional Area, Open Status (December 1 - April 30), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ064.00	CA	30	21	3.4	0.53	320	16.7	35	195	12/8/2004
WJ065.00	CA	30	21	2.9	0.36	43	8.6	35	195	12/8/2004
WJ066.00	CA	30	21	3.1	0.36	43	8.9	35	195	12/8/2004

The lower portion of Basin Cove and the eastern shore of Basin Point (Harpswell) is classified conditionally approved due to the presence of more then 10 boats with heads at Dolphin Marina. The area is monitored by stations WJ62 and 63, with WJ 64 serving as a boundary station between the upper and lower conditionally approved areas. The open season is from November 1 through April 14. Stations WJ62, 63 and 64 met approved standards during the open status (Table 11).

Table 11. Lower Basin Cove, Marina Seasonal Conditional Area, Open Status (November 1 - April 14), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ062.00	CA	30	21	2.5	0.22	12	4.9	35	195	1/19/2005
WJ063.00	CA	30	21	2.4	0.19	15	4.4	35	195	1/19/2005
WJ064.00	CA	30	19	3.4	0.52	320	16.4	36	203	4/7/2004

All approved, restricted and prohibited stations that were active at the beginning of 2010 were sampled at least 6 times in the open status following the systematic random sampling (SRS) schedule (Table 12) with the exception of the following stations, WJ 6, 8, 14.7, 15, 64, 65 and 66. These stations are conditional on a marina or other seasonal issue and are in the open status five months of the year and they were collected five times in the open status as required.. WWTP CA or CR stations were collected 12 times in the open status. At many stations, additional samples were collected under adverse conditions and some stations had additional sampling effort in the open status (extra samples). The classification (noted as Class) noted in Table 12 reflect classification at time of sample collection. The conditionally approved and conditionally restricted stations in the Harraseeket River were sampled monthly in the open status. Maquoit Bay is in the open status for five months and was sampled monthly in the open status. The Paul's Marina (Merepoint) seasonal area (station WJ 47) was sampled monthly in the open status. The Upper and Lower Basin Cove seasonal conditional areas were sampled monthly in the open status.

Table 12. WJ Samples Collected in 2010

		Adverse		Extra		Random			
Station	Class	Closed	Open	Closed	Open	Closed	Open	Total	Comments
WJ001.00	CA	1	1				12	14	

Station	Class	Adverse		Extra		Random		Total	Comments
		Closed	Open	Closed	Open	Closed	Open		
WJ001.50	CA		1				12	13	New station April 2009
WJ002.00	CA		1				12	13	Reactivated in April 2009
WJ002.50	CA		1				12	13	New station April 2009
WJ003.00	CA	1	2				11	14	
WJ006.00	CA	5				4	3	12	
	CR						2	2	
WJ008.00	CR	7				4	5	16	
WJ009.00	P					8		8	
WJ009.70	CR		5				12	17	New station April 2009
WJ011.00	CR		6				12	18	
WJ014.00	CR	1	6				12	19	
WJ014.20	CR	1	6				12	19	
WJ014.50	CR		5				12	17	New station April 2009
WJ014.70	CR	5				4	5	14	New station April 2009
WJ015.00	CA	6				4	5	15	Reactivated in April 2009
WJ016.00	A		1				11	12	
WJ017.00	A						6	6	
WJ017.50	A		2		1		6	9	
WJ017.80	A		3		1		6	10	
WJ018.00	A		5		1		6	12	
WJ018.20	A		4		1		6	11	
WJ018.60	A		2		1		6	9	
WJ018.90	A						6	6	
WJ019.00	A						6	6	
WJ024.00	A						6	6	
WJ026.00	A						6	6	
WJ027.30	A						6	6	
WJ027.50	A						6	6	
WJ030.00	P					6		6	
WJ031.50	A						6	6	
WJ032.00	A				3		6	9	
WJ032.50	CA			4		1	6	11	Reactivated in August 2009
WJ033.00	CA			2		1	6	9	
WJ033.70	CA			4		1	6	11	New station August 2009
WJ034.00	A				2		7	9	
WJ035.00	A						6	6	
WJ038.00	A						6	6	
WJ046.00	A						6	6	
WJ047.00	CA					6	6	12	
WJ048.00	A						6	6	
WJ048.50	A						6	6	
WJ049.00	A						6	6	
WJ049.50	A						6	6	

Station	Class	Adverse		Extra		Random		Total	Comments
		Closed	Open	Closed	Open	Closed	Open		
WJ050.50	A						6	6	
WJ051.00	A						6	6	
WJ055.00	A						6	6	
WJ056.00	A						6	6	
WJ057.00	P					6		6	
WJ058.00	P					6		6	
WJ059.00	A						6	6	
WJ060.00	A						6	6	
WJ062.00	CA			1		4	6	11	
WJ063.00	CA			1		4	6	11	
WJ064.00	CA	1				4	5	10	
WJ065.00	CA			1		4	5	10	
WJ066.00	CA			1		4	5	10	
WJ067.00	A		1				6	7	
WJ067.50	R		3		11		6	20	
WJ068.00	R	1	2		10		6	19	
WJ068.50	R		3		11		6	20	
WJ070.00	A						6	6	

Figures 15, 16, 17 and 18 show the P90 calculation trends over the past three years for all approved, conditionally approved and conditionally restricted stations, respectively, in area WJ; Figures 15 and 16 show data collected during the open status. During the transition from MPN to MF analysis method, the approved standard will decrease every year, until all samples have been analyzed by the MF method. In order to show the trend of the P90 value over the years, the calculated P90 scores are expressed as a percentage of the approved standard; any station showing the 2010 column on or above the 100 percent line does not meet the standard for approved classification. All approved stations, except WJ 17.5 and 17.8 are well within the approved standard. In 2009, stations WJ 17.5 and 17.8, located in Recompense Cove (Freeport), were impacted by manure piles on the shore draining into the cove after rainfall. Wolf Neck Farm management continues to improve their farming practices, resulting in lower P90 scores in 2010. All conditionally approved stations, except WJ 33 in Maquoit Bay (Brunswick) are well within the approved standard during the open status. Station WJ 33 improved from 2008 to 2009, however, exceeded the approved standard in 2010. An explanation for either the improvement or the degradation of the water quality is not known; a straight pipe north of the station was identified and remediated in 2006. The conditional area is currently closed to shellfish harvesting. The conditionally restricted stations in the Harraseeket River (Freeport) have shown an improvement in water quality with declining P90 calculation trends in the past two years. The reason why water quality is showing an improvement is not known but may be due, in part, to non-point source pollution education efforts in the surrounding area.

Figure 15. Area WJ P90 Calculations for Approved Stations WJ 16 - WJ 34 (expressed as the percent of the approved standard), 2008-2010

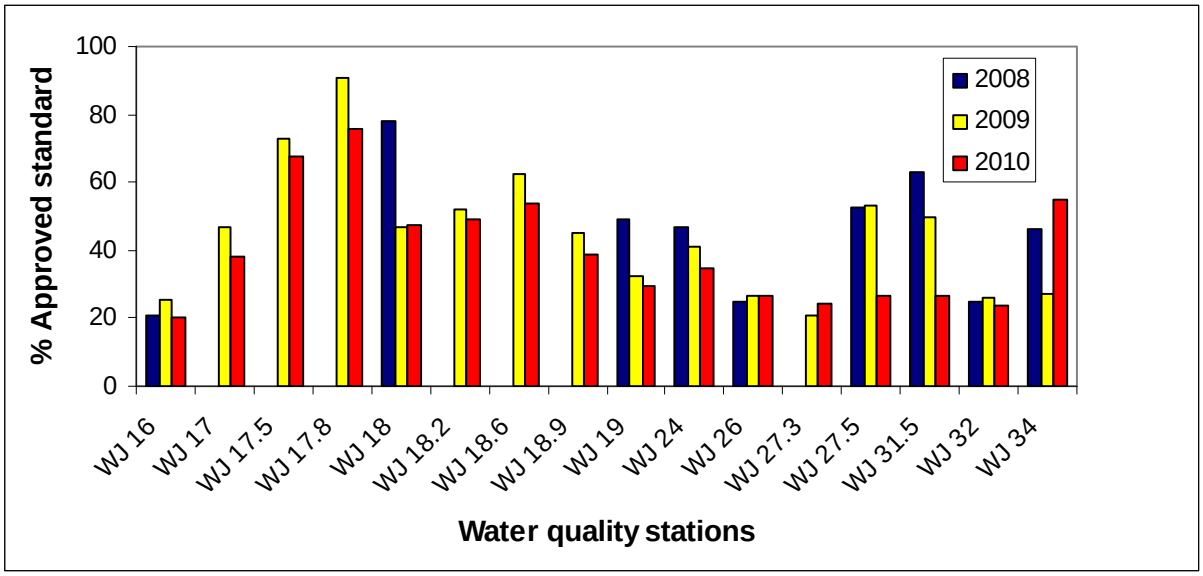


Figure 16. Area WJ P90 Calculations for Approved Stations WJ 35 - WJ 70 (expressed as the percent of the approved standard), 2008-2010

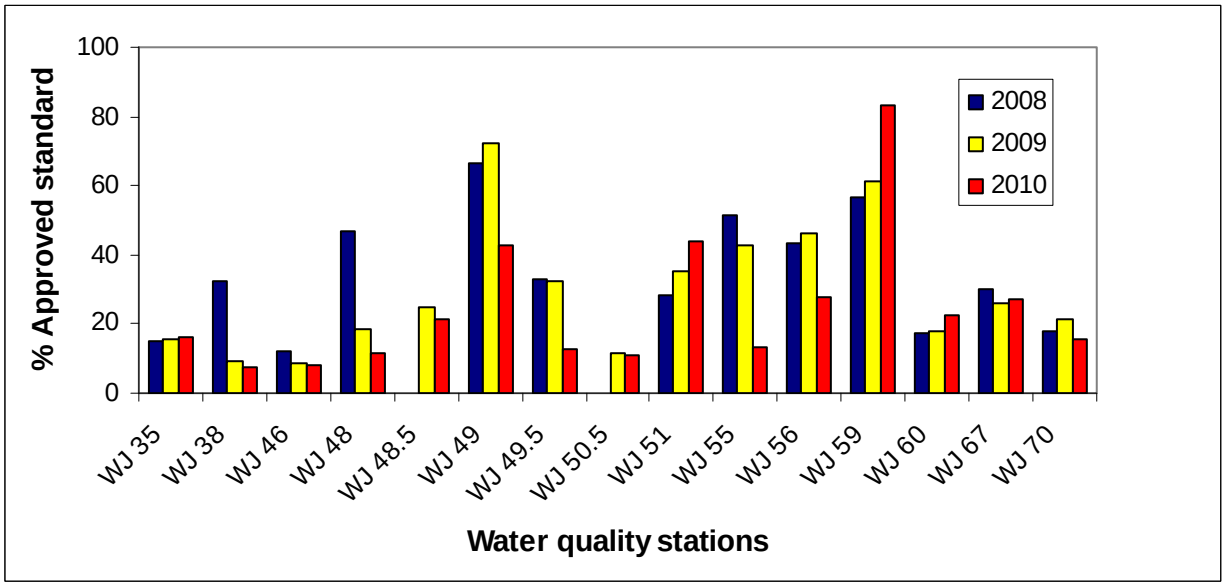


Figure 17. Area WJ P90 Calculations for Conditionally Approved Stations (expressed as the percent of the approved standard), Open Status, 2008-2010

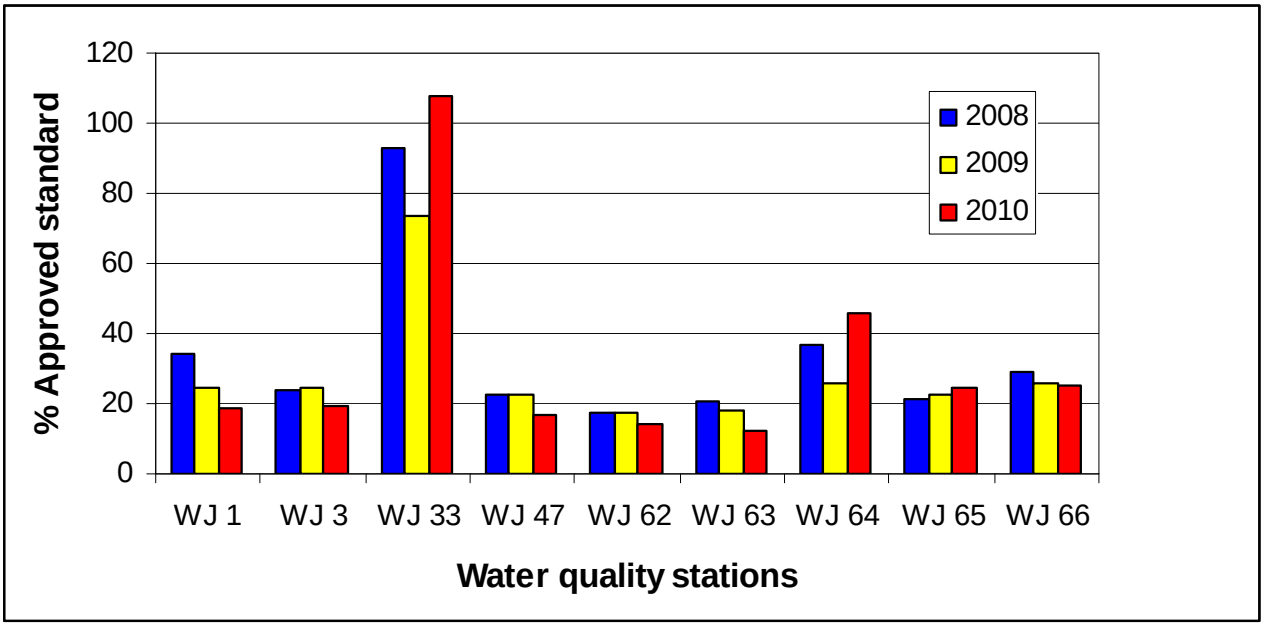
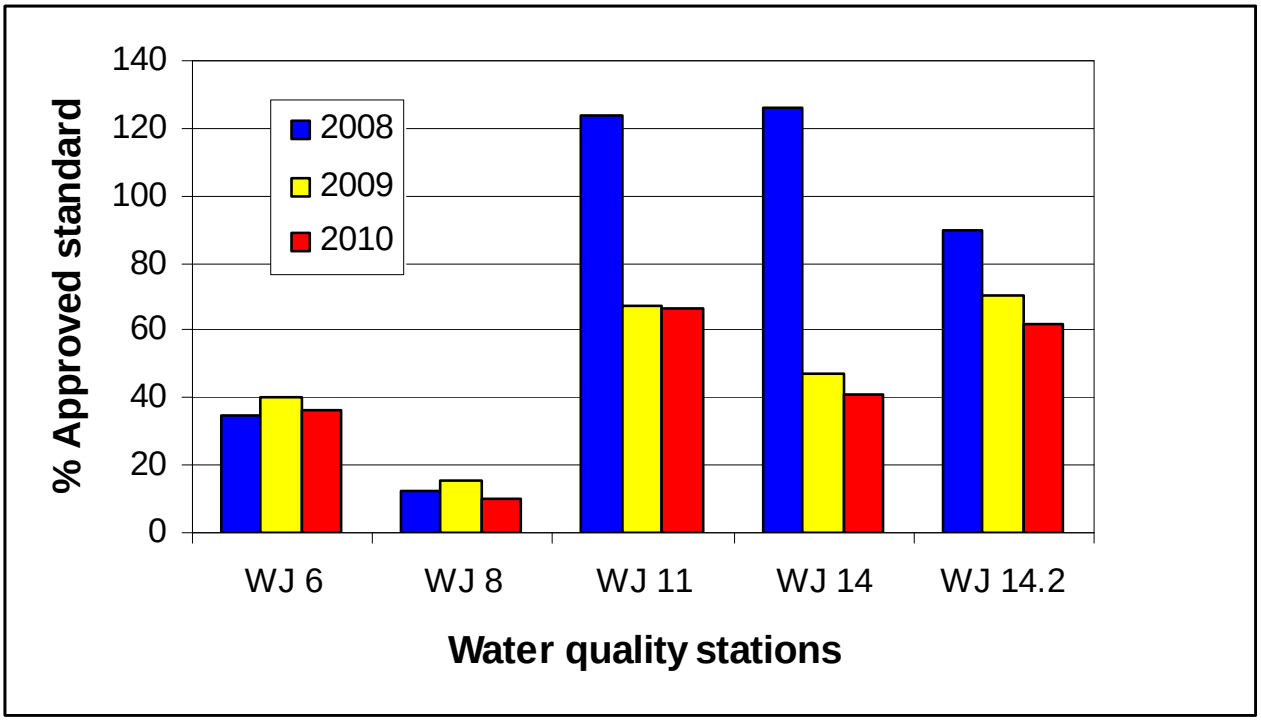


Figure 18. Area WJ P90 Calculations for Conditionally Restricted Stations (expressed as the percent of the approved standard), Open Status, 2008-2010



Upward Classification Changes

There were no upward classifications during 2010.

Shoreline Survey Activity during Review Period (2008-2010)

On **June 12 and 13, 2008** sanitary surveys were conducted by DMR staff in the Ash Cove area of Harpswell. A total of 45 properties were surveyed. Five properties had active or potential problems. The details are found in *Table 1. Actual and Potential Pollution Sources in Growing Area WJ*. All problems were reported to the LPI and were remediated.

On **June 18, 2008** DMR surveyed the property on Pumpkin Knob (Freeport). A cesspool overflow was reported to the LPI and remediated.

On **July 7, 2008** DMR surveyed the property on Bowman Island (Freeport). An illegal sink drain was reported to the LPI and was remediated.

On **August 6, 2008** DMR surveyed an experimental washwater waste disposal system overflow at Paul's Marina (Brunswick). Codes was notified. A non-issue due to no water impacting the cove.

On **August 6, 2008** DMR surveyed the Merepoint Colony Subsurface Wastewater System. Functioning properly.

On August 25, 2008 DMR surveyed a horse farm at the upper reaches of Middle Bay (Brunswick). A drain pipe from the barn drained into a gully approximately 100 meters from the shore. LPI was notified, remediated.

There were no shoreline surveys conducted in 2009 and 2010.

Aquaculture/Wet Storage Activity

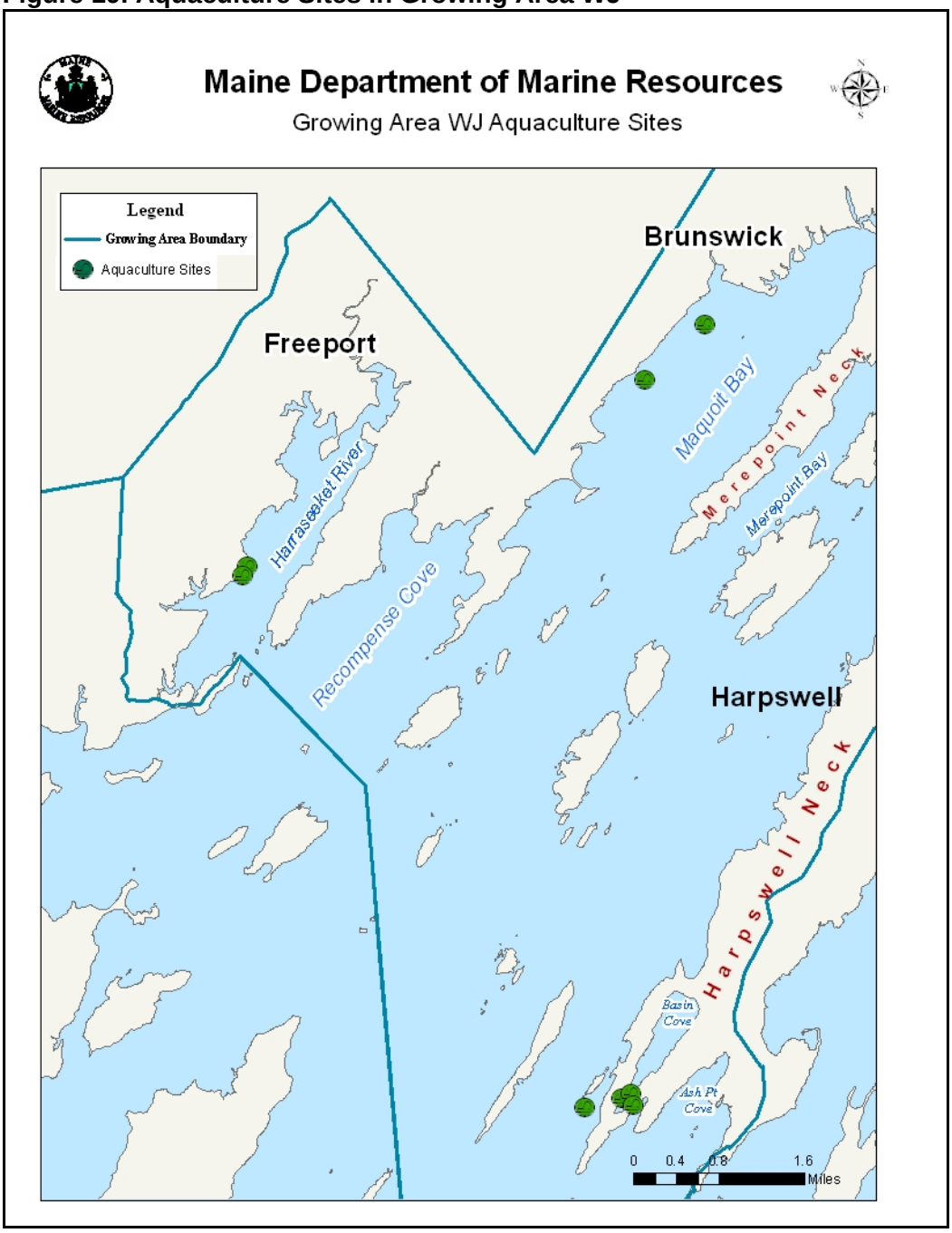
There are eight aquaculture sites in growing area WJ (Figure 19); two leases and six limited purpose aquaculture licenses (LPAs). In Hog Cove (Harpswell) there are three LPAs with a shellfish raft, trays and racks for American and European oysters. There is a similar LPA set up on the south side of Barnes Island (Harpswell). There are two shellfish leases in Maquoit Bay (Brunswick) for both bottom and suspended culture of all species of shellfish. There are two LPAs (both for American and European oysters) in the Harraseeket River; one LPA is for soft bags and the other one LPA is for upweller units.

Please visit the DMR website to view details on these leases and LPAs:
http://www.maine.gov/dmr/aquaculture/leaseinventory/index.htm

There are three wet storage permits; two at Lookout Point (Harpswell) and one in the Harraseeket River.

Please visit the DMR website to view details on these wet storage permits:
http://www.maine.gov/dmr/rm/public_health/wetstorage_bulktagging_permits.htm

Figure 19. Aquaculture Sites in Growing Area WJ



Recommendation for Future Work

Intensify stream sampling and flowmeter data collection.

Continue to improve communications with the WJ towns re the stormwater database.

Continue to monitor local farms and pastures in Freeport and maintain communication and collaboration with the farm managers.

Town requests for DMR to prioritize:

- West side of Orrs Island
- Laurel Cove, New Meadows River
- Ash Cove, Harpswell
- Stovers Cove, Harpswell
- Upper Maquoit Bay
- Harpswell Cove
- New Meadows Marina closure
- Bunganuc Creek, Brunswick
- Whistler's Cove, Cousins River
- Upper Harraseeket River, Freeport

References

DMR legal notices http://www.maine.gov/dmr/rm/publichealth/closures/closedarea.htm#

Mitchell Ledge Farm http://www.mitchellledgefarm.com/about.htm

Tripping Gnome Farm, LLC http://www.trippinggnomefarm.com/

Aquaculture sites in growing area WJ
http://www.maine.gov/dmr/aquaculture/leaseinventory/index.htm

Wet storage permits
http://www.maine.gov/dmr/rm/public_health/wetstorage_bulktagging_permits.htm

Stream sampling rainfall data
http://www.wunderground.com/history/airport/KIWI/2010/7/14/DailyHistory.html?req_city=NA&req_state=NA&req_statename=NAwunderground.com

Casco Bay Estuary Partnership's State of the Bay report, 2010

Appendix A. Annual Review of Management Plan- Harraseeket River Wastewater Treatment Plant Conditional Area

Scope

The Harraseeket River is classified conditionally approved and conditionally restricted based on the proper functioning of the Freeport Sewage Treatment Plant (hereinafter "The District" and "the Plant"). Insufficiently treated effluent from the plant outfall pipe, pump stations, or broken sewer lines along the river, or conduit (stream or ditch) to the river, may possibly contaminate shellfish in the river. Water quality in the conditionally approved and conditionally restricted areas is monitored by stations WJ 1, 1.5, 2, 2.5, 3, 6, 8, 9.7,11,14,14.2, 14.7, and 15, and must be sampled monthly in the open status. Stations WJ 3, 6, 8, 14.7 and 15 fall into the boundaries of a marina conditional area, and are in closed status from May 1 to November 30.

Compliance with Management Plan

September 7, 2010: Area No. 15, Freeport Area (Harraseeket River and Little River) was amended to close the conditional area in the Harraseeket River due to a malfunction at the Freeport WWTP.

Adequacy of Reporting and Cooperation of Involved Persons

In the event that a conditional area closure must be implemented, the management plan for this conditional area requires immediate reporting by the Freeport Sewer District. To date, the cooperation between all involved parties was excellent.

Compliance with Approved Growing Area Criteria

The conditionally approved and conditionally restricted stations met the appropriate standards for their classification during the open status in 2010 (Tables1 and 2).

Table 1. Harraseeket River WWTP Conditional Area, Open Status (year-round), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ001.00	CA	30	30	2.5	0.28	30	5.8	31	163	5/7/2008
WJ001.50	CA	21	21	2.6	0.28	16	6.3	31	163	4/14/2009
WJ002.00	CA	21	21	2.1	0.14	8	3.3	31	163	4/14/2009
WJ002.50	CA	20	20	2.8	0.39	76	9.3	31	163	4/14/2009
WJ003.00	CA – Boundary	30	30	2.4	0.27	29	5.4	31	163	3/5/2007
WJ009.70	CR	21	21	2.6	0.29	22	6.5	31	163	4/14/2009
WJ011.00	CR	30	30	4.2	0.53	82	20.6	31	163	5/7/2008
WJ014.00	CR	30	30	3.2	0.46	92	12.6	31	163	5/7/2008
WJ014.20	CR	30	30	3.9	0.53	106	19.3	31	163	3/17/2008
WJ014.50	CR	21	21	2.9	0.4	92	9.7	31	163	4/14/2009

Table 2. Harraseeket River WWTP and Marina Conditional Area, Open Status (December 1- April 30), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ003.00	CA	30	21	2.6	0.21	12	4.9	35	195	3/3/2004
WJ006.00	CA	30	20	3.3	0.38	43	10.5	36	199	3/3/2004
WJ008.00	CR	30	21	2.4	0.18	9.1	4.2	35	195	4/25/2001
WJ014.70	CR - new	7	7	2	0.1	3.6	2.8	31	163	4/14/2009
WJ015.00	CA - reactivated	7	7	2.1	0.12	4	3	31	163	4/14/2009

Field Inspection of Critical Pollution Sources

A potential for pollution in the Harraseeket River area comes from the improper functioning of the Freeport Wastewater Treatment Plant whose outfall pipe is located in the middle of the Harraseeket River. The plant is reviewed each year and continues to function properly.

Water Sampling Compliance History

The sampling effort for the WWTP conditional area in 2010 is reflected in Table 3. All stations that were active at the beginning of 2010 were sampled 12 times or monthly in the open status with the exception of the following stations, WJ 6, 8, 14.7, 15, 64, 65 and 66. All of these stations are also conditional on a marina or other seasonal issue and are in the open status five months of the year. The stations were collected five times in the open status as required.

Table 3. Harraseeket River Wastewater Treatment Plant Conditional Area Samples Collected in 2010

Station	Class	Adverse		Extra		Random		Total	Comments
		Closed	Open	Closed	Open	Closed	Open		
WJ001.00	CA	1	1				12	14	
WJ001.50	CA		1				12	13	New station April 2009
WJ002.00	CA		1				12	13	Reactivated in April 2009
WJ002.50	CA		1				12	13	New station April 2009
WJ003.00	CA	1	2				11	14	
WJ006.00	CA	5				4	3	12	Reclassified from CR to CA April 2010
	CR						2	2	
WJ008.00	CR	7				4	5	16	
WJ009.70	CR		5				12	17	New station April 2009

Station	Class	Adverse		Extra		Random		Total	Comments
		Closed	Open	Closed	Open	Closed	Open		
WJ011.00	CR		6				12	18	
WJ014.00	CR	1	6				12	19	
WJ014.20	CR	1	6				12	19	
WJ014.50	CR		5				12	17	New station April 2009
WJ014.70	CR	5				4	5	14	New station April 2009
WJ015.00	CA	6				4	5	15	Reactivated in April 2009

Analysis and Recommendations

DMR and Freeport Wastewater Treatment Plant Staff shall evaluate the Harraseeket River Management Plan on a triennial basis. At the time of the triennial review, the parties involved in the proper management of the Harraseeket River conditional area shall sign and date the management plan in order to indicate their acceptance of the conditions stated therein. If, during the annual management plan review, it is evident that the management plan or emergency response plan needs to be revisited between the department and the sewer district then the department will make an appointment with the district to meet and review and adjust the plan(s) accordingly. The management plan was evaluated and signed on 10/5/2010.

Appendix B. Annual Review of Management Plan- Harraseeket River Marina Seasonal Area, Area No. 15

Scope

A portion of Growing Area WJ, Harraseeket River, is classified as conditionally approved and conditionally restricted based in the presence of marinas in this section of the growing area; the areas are closed for shellfish harvesting from May 1 to November 30. Specifically, the classification is based on the presence or absence of 10 or more boats moored at the Harraseeket Yacht Club, Strout's Point Wharf, Brewer's Marine and South Freeport town docks, which may discharge waste into the Harraseeket River. Strouts Marina, Brewers Marina and the Freeport Yacht Club operate at the town docks. The Freeport harbormaster oversees all slips and mooring operations. The conditionally approved area, monitored by station WJ 6 (CR) was classified conditionally approved in August 2002. Station WJ 6 is the boundary station between the conditionally approved and conditionally restricted area and must meet approved standards during the open status. Station WJ 3 is on the boundary of the seasonal and WWTP conditional areas and therefore must meet the approved standard year round. Station WJ 15 is also part of this seasonal area and was reactivated in April 2009. DMR evaluated the Harraseeket River data, made observations of the marinas, and interviewed the marina owners with regard to usage in November 2010, and made the assessment that fewer than 10 boats are in the area from November 15 through May 1. Water quality meets approved standards from December 1 through April 30. In December 2008, a new seasonal restricted area, monitored by station WJ 8 and WJ 14.7, was implemented. This area has the same closed status period as the marina area. These marina conditional areas fall into the boundary of the WWTP conditional area; therefore they close anytime that there is a malfunction or bypass at the Freeport sewage treatment plant.

Compliance with Management Plan

In 2010, the seasonal conditional area closed on May 1 and reopened on December 1. The area was visited by DMR on November 3, 2010, and there were fewer than 10 boats with heads in the area. It was also visited on April 7, 2010 to confirm there were fewer than 10 boats with heads in the water. The seasonal closure is enforced by the DMR Marine Patrol and the local Shellfish Warden. Cooperation between the involved parties has been excellent.

Adequacy of Reporting and Cooperation of Involved Persons

This management plan requires seasonal checks on boat activity at the marina. These checks are performed prior to the reopening of the area and at the time of closure by DMR staff. No third party reporting is required by the management plan.

Compliance with Approved Growing Area Criteria

The annual review of the conditionally approved and conditionally restricted stations shows that water quality met approved or restricted standards during the open period (Table 1).

Table 1. Harraseeket River WWTP and Marina Conditional Area, Open Status (December 1- April 30), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ003.00	CA-Boundary	30	21	2.6	0.21	12	4.9	35	195	3/3/2004
WJ006.00	CA	30	20	3.3	0.38	43	10.5	36	199	3/3/2004
WJ008.00	CR	30	21	2.4	0.18	9.1	4.2	35	195	4/25/2001
WJ014.70	CR - new	7	7	2	0.1	3.6	2.8	31	163	4/14/2009
WJ015.00	CA - reactivated	7	7	2.1	0.12	4	3	31	163	4/14/2009

Field Inspection of Critical Pollution Sources

The potential for pollution in the South Freeport area comes from boats with heads that are moored in the river. Visual observations are made of the Harraseeket River by the middle of April and November to ensure that there are fewer than 10 boats with heads in South Freeport.

Water Sampling Compliance History

The sampling effort for the WWTP and marina conditional area in 2010 is reflected in Table 2. All conditionally approved and conditionally restricted stations that were active at the beginning of 2010 were sampled five times in the open status; this area is in the open status five months of the year.

Table 2. Harraseeket River WWTP and Marina Conditional Area Samples Collected in 2010

Station	Class	Adverse		Extra		Random		Total	Comments
		Closed	Open	Closed	Open	Closed	Open		
WJ003.00	CA	1	2				11	14	
WJ006.00	CA	5				4	3	12	Reclassified from CR to CA April 2010
	CR						2	2	
WJ008.00	CR	7				4	5	16	
WJ014.70	CR	5				4	5	14	New station April 2009
WJ015.00	CA	6				4	5	15	Reactivated in April 2009

Analysis and Recommendations

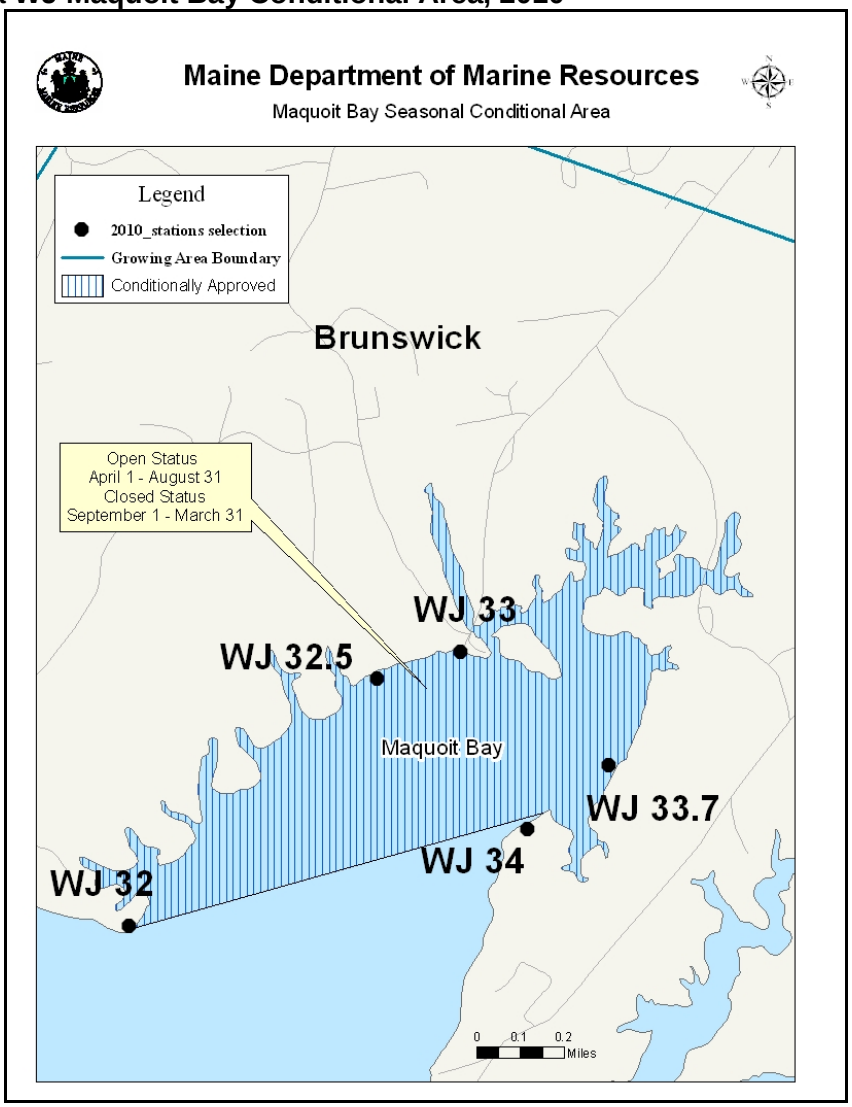
The Harraseeket River is, by town ordinance, a No Discharge Zone (NDZ). The NDZ is enforced by the town harbormaster. A reporting mechanism should be developed between the town harbormaster and the DMR, in order to obtain information regarding the number of inspections and level of compliance with the NDZ. The marinas must be evaluated and the management plan updated.

Appendix C. Annual Review of Management Plan- Maquoit Bay Seasonal Area, Area No. 16

Scope

Maquoit Bay is a conditionally approved area based on seasonal variation in water quality, with an open status from April 1 through August 31 (Figure 1). Maquoit Bay conditional area, monitored by stations, 32.5, 33 and 33.7, was reclassified from restricted to conditionally approved based on seasonal variation in water quality on July 10, 2007 with the remaining portion reclassified from conditionally approved to approved year round. In 2009, sample station WJ 32.5 was reactivated and 33.7 was created to better monitor water quality in Maquoit Bay.

Figure 1. Area WJ Maquoit Bay Conditional Area, 2010



Compliance with Management Plan

In 2010, Maquoit Bay opened as scheduled, on April 1, and closed on August 31. The seasonal closure is enforced by the DMR Marine Patrol and the local Shellfish Warden. Cooperation between the involved parties has been excellent.

Adequacy of Reporting and Cooperation of Involved Persons

This management plan does not require reporting by non DMR staff, but does require a data analysis prior to the reopening of the seasonal conditional area. In 2010, the data analysis was performed after the opening date; this management plan violation will be addressed in 2011 and corrected in the future.

Compliance with Approved Growing Area Criteria

The annual review of the water quality shows that station WJ 33 exceeded approved standards during the open status time period (Table 1). A downgrade of the conditionally approved status to restricted was in effect 10/12/2011. Stations WJ 32.5 and 33.7 have less than 30 data points in their datasets, and therefore were not evaluated against the classification standard. Stations WJ 32 and WJ 34 (Figure 1) are classified as approved and were not sampled as part of the conditional area status.

Table 1. Maquoit Bay (Brunswick) Conditional Area, Open Status (April 1 – August 31), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ032.00	A-boundary	30	21	3.5	0.38	43	10.9	35	195	6/7/2005
WJ032.50	CA	13	8	6.4	0.52	52	31	36	206	5/10/2006
WJ033.00	CA	30	21	5.9	0.62	460	37.7	35	195	7/12/2005
WJ033.70	CA	7	7	4.7	0.41	18	16.7	31	163	8/17/2009
WJ034.00	A-boundary	30	21	4.8	0.67	1100	34.7	35	195	7/12/2005

Field Inspection of Critical Pollution Sources

The potential for pollution in Maquoit Bay is non-point (wildlife-migratory birds) in origin during the fall and winter months. Visual observations are made throughout the year during the course of random sampling and shoreline surveying.

Water Sampling Compliance History

In 2010, sample station WJ 33 was sampled a total of seven times following SRS strategy, with six times in the open status.

Analysis and Recommendations

It is DMR policy to review water quality prior to reopening a seasonal area to ensure compliance with approved standards. The data analysis was performed after the opening which will be addressed in 2011 and in the future.

Appendix D. Annual Review of Management Plan- Merepoint Neck, Paul's Marina, Seasonal Conditional Area, Area No. 16

Scope

A portion of Growing Area WJ, Paul's Marina at Merepoint Neck, is classified as conditionally approved based on the presence or absence of 10 or more boats with heads at the marina, which may discharge into Middle Bay. Paul's Marina, monitored by station WJ 47, and was classified conditionally approved in January 1995. DMR evaluated the data, made observations of the marina, interviewed the marina owner with regard to usage in October 2010, and made the assessment that fewer than 10 boats are in the cove from October 15 through April 30. Water quality met approved standards from November 1 through April 14.

Compliance with Management Plan

In 2010, the seasonal conditional area closed on April 15 and reopened on November 1. The area was visited by DMR on October 5, 2010 and there were fewer than 10 boats with heads in the area. It was also visited on April 7, 2010 to confirm there were fewer than 10 boats with heads in the water.

Adequacy of Reporting and Cooperation of Involved Persons

This management plan requires seasonal checks on boat activity at the marina. These checks are performed prior to the reopening of the area and at the time of closure to ensure the proper open shellfish season. The seasonal closure is enforced by DMR Marine Patrol and the local Shellfish Warden. Cooperation between the involved parties has been excellent

Compliance with Approved Growing Area Criteria

At Paul's Marina, the conditionally approved station WJ 47 met approved standards during the open season. The geometric mean on the most recent 30 samples collected during the open season was 2.3 and the P90 score was 5.3, with an approved standard of 32.

Field inspection of critical pollution sources

The potential for pollution at Paul's Marina comes from boats with heads that are moored at the marina. Visual observations are made of the area at the end of October and prior to the closure on April 15 to ensure that there are fewer than 10 boats with heads in the area.

Water sampling compliance history

Station WJ 47 was collected six times when in the open status. It was sampled a total of 12 times in 2010.

Analysis-Recommendations

It is the DMR policy to observe marina areas before closing and reopening to ensure compliance with the management plan. Paul's Marina was observed October 5th for the

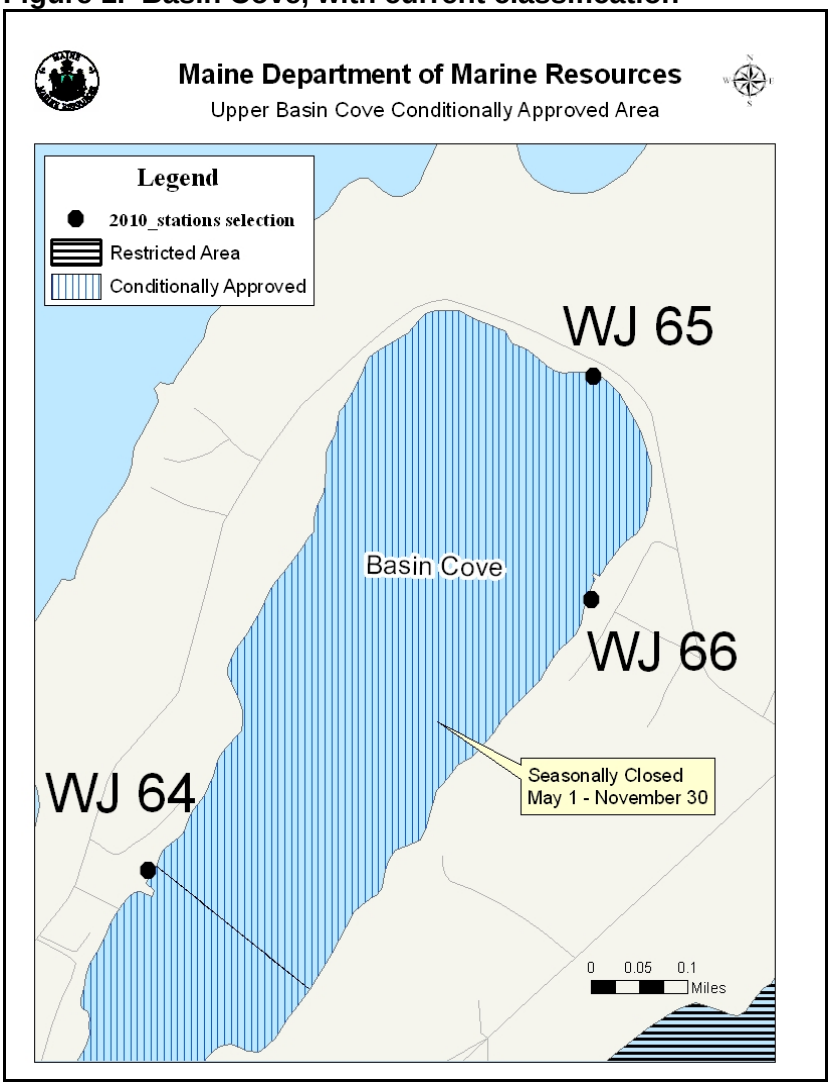
reopening on November 1. The area closed on April 15 and the inspection occurred on April 7th. No boats were present at the time of either seasonal inspection.

Appendix E. Annual Review of Management Plan- Basin Cove Seasonal Area

Scope

Basin Cove is located in at the northwest peninsula on Harpswell Neck, Harpswell in Growing Area WJ. Currently, upper Basin Cove is a conditionally approved area based on seasonal variation in water quality, with an open status from December 1 through April 30. Upper Basin Cove, monitored by Stations WJ 64, 65 and 66, was classified conditionally approved based on seasonal variation in water quality December 2000. On September 27, 2007, a review of the data in the open status revealed that the open season of October 1 through April 30 had to be shortened to December 1 though April 30 (Figure 1).

Figure 1. Basin Cove, with current classification



Compliance with Management Plan

In 2010, the seasonal conditional area closed on May 1 and reopened on December 1. The seasonal water quality was reviewed at stations WJ 64, 65 and 66 prior to re-opening and continues to meet approved standards for the open status.

Adequacy of Reporting and Cooperation of Involved Persons

This management plan does not require reporting, but does require a data analysis prior to the reopening of the seasonal conditional area on December 1st. The seasonal data check was performed on October 28, 2010. The seasonal closures are enforced by Maine Marine Patrol and the local shellfish warden. Cooperation between the involved parties has been excellent.

Compliance with Approved Growing Area Criteria

A portion of Basin Cove, Harpswell is classified conditionally approved with an open season of December 1 through April 30. The area is monitored by stations WJ64, 65 and 66. All three stations meet approved standards during open status (Table 1). A shoreline survey was conducted in the Basin Cove area in 2008 and no actual or potential pollution sources were identified.

Table 1. Upper Basin Cove, Seasonal Conditional Area, Open Status (December 1 – April 30), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ064.00	CA	30	21	3.4	0.53	320	16.7	35	195	12/8/2004
WJ065.00	CA	30	21	2.9	0.36	43	8.6	35	195	12/8/2004
WJ066.00	CA	30	21	3.1	0.36	43	8.9	35	195	12/8/2004

Water Sampling Compliance History

The Basin Cove seasonal conditional areas stations, WJ 64, 65 and 66, are in the open status five months of the year and were sampled 5 times in the open status as required. The total sample effort for 2010 includes monthly sampling (10 times total); in addition to the 5 times in the open status, they were sampled 4 times in the closed status and 1 time as 'extra' in the closed status (WJ 65 and 66).

Analysis and Recommendations

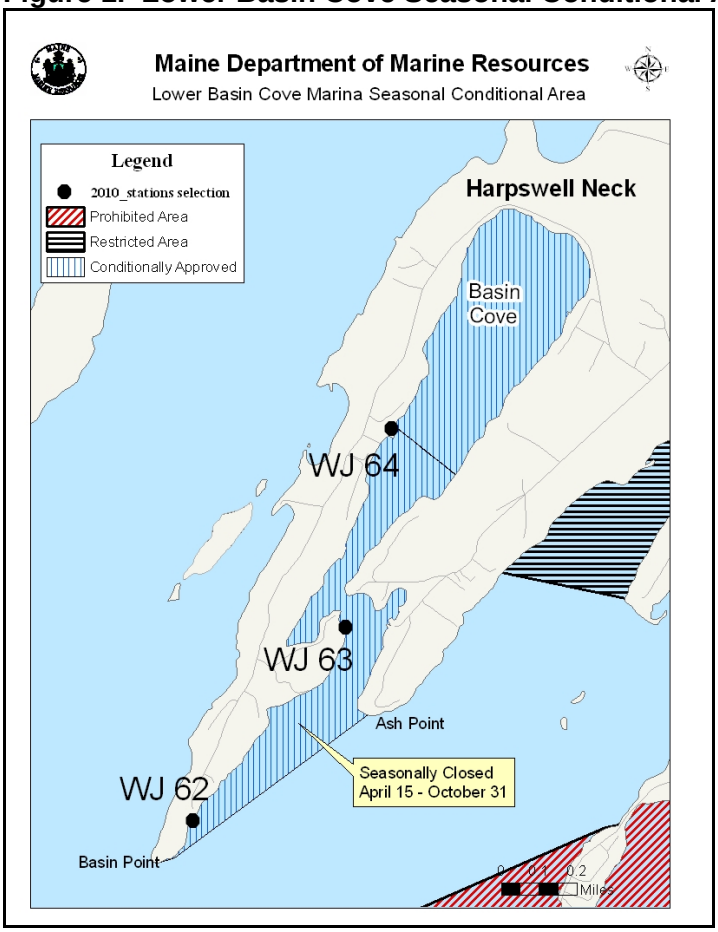
The recommendation is to review the compliance with the approved standard for the open status for stations WJ64, 65 and 66 prior to the seasonal opening on December 1st annually.

Appendix F. Annual Review of Management Plan- Lower Basin Cove Seasonal Marina Area

Scope

The Lower Basin Cove seasonal conditional area is located in Harpswell, Maine and is a new conditional area since the rule amendment on September 29, 2008. This seasonal conditional area is based on the presence of a marina, and is closed to shellfish harvest from April 15 through October 31, due to the presence of boats at the Dolphin Marina. Monitoring stations WJ 62, 63 and 64 are located within this conditional area, and monitor water quality both in the open and closed status. Typically, water quality data meets approved standards year-round; however the area is classified as conditionally approved because of the potential pollution from boats at the marina during the times of operation late spring through mid-fall. The marina seasonal area is located on the lower western side of Harpswell Neck and is described in section C. of the legal notice for Area No. 17-B (Figure 1).

Figure 1. Lower Basin Cove Seasonal Conditional Area - Marina



Compliance with management plan

Per management plan, in 2010, this conditional area closed to shellfish harvest on April 15th and reopened on November 1st. Prior to re-opening, a data check was completed to verify that the area was meeting NSSP approved water quality standards in the open status. DMR is also required to complete a visual check prior to the area seasonal closure and seasonal re-opening, to confirm the presence/absence of 10 or more boats with heads, which are capable of discharging waste to the conditional area. In 2010, a seasonal opening check was conducted on October 28, documenting fewer than 10 boats present at the time of this seasonal inspection. The pre-closure inspection was completed on April 12, 2010 which documented 1 boat in the water.

Adequacy of reporting and cooperation of involved persons

This management plan does not require reporting by non-DMR personnel. The seasonal closures are enforced by Maine Marine Patrol and the local shellfish warden. Cooperation between the involved parties has been excellent.

Compliance with approved growing area criteria

All stations in this conditional area met their NSSP standard during the open status (Table 1).

Table 1. Lower Basin Cove, Marina Seasonal Conditional Area, Open Status (November 1 – April 14), 2010

Station	Class	Count	MFCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WJ062.00	CA	30	21	2.5	0.22	12	4.9	35	195	1/19/2005
WJ063.00	CA	30	21	2.4	0.19	15	4.4	35	195	1/19/2005
WJ064.00	CA	30	19	3.4	0.52	320	16.4	36	203	4/7/2004

Water Sampling Compliance History

In 2010 the sampling effort for station WJ 62 was a total of 11 times with 6 in the open status, 4 in the closed status and one extra in closed status. Sample station WJ 63 was sampled a total of 11 times with 6 in the open status 4 in the closed status and one extra in closed status. Station WJ 64 was sampled a total of 10 times with 5 in the open status, 4 in the closed status and 1 adverse sample in the closed status.

Analysis and Recommendations

The recommendation is to review the compliance with the approved standard for the open status for stations WJ 62, 63 and 64 prior to the seasonal opening on November 1st annually to maintain compliance with the NSSP.

Appendix G. Key to Water Quality Table Headers

Station = water quality monitoring station

Class = classification assigned to the station; prohibited (P), restricted (R), conditionally restricted (CR), conditionally approved (CA) and approved (A).

Count = the number of samples evaluated for classification, must be a minimum of 30.

MFCNT = the number of samples evaluated with the MTec method (included in the total Count column)

Geo_Mean = means the antilog (base 10) of the arithmetic mean of the sample result logarithm (base 10).

SDV = standard deviation
Max = maximum score of the 30 data points in the count column

P90 = 90th percentile

APPD_STD = the 90th percentile, at or below which the station would meet approved criteria in the absence of pollution sources or poisonous and deleterious substances.

RESTR_STD = the 90th percentile, at or below which the station would meet restricted criteria.