



**GROWING AREA WX**

**Squaw Point, Stockton to Dice Head, Castine**

**ANNUAL REVIEW FOR 2009**

**Report Date: July 7, 2010**

**Robert Goodwin, Marine Resource Scientist 1  
Michael Loughlin, Marine Resource Specialist 1**

APPROVAL

Division Director:

\_\_\_\_\_ Date: \_\_\_\_\_  
Print name signature



## TABLE OF CONTENTS

Executive Summary .....	4
Growing Area Description .....	4
Current Classifications .....	4
Activity during Review Period .....	5
Current Management Plan(s) for Conditional Area(s).....	6
Water Quality Review and Discussion .....	6
Recommendations for Upward Classification .....	8
Shoreline Survey Activity .....	8
Aquaculture/Wet Storage Activity .....	8
Classification Changes .....	9
Summary.....	9
Recommendation for Future Work.....	9
References.....	9
Appendix A. Key to Water Quality Table Headers.....	11
Appendix B. Expansion of Prohibited Area 35, Fort Point, Stockton to Dice Head, Castine.....	12
Appendix C. Growing Area WX Data for 2009.....	13

## LIST OF TABLES

Table 1. Geomean and P90 Calculations for Growing Area WX .....	6
Table 2. Sample Count of Active Stations during 2009 Review Period .....	7

## LIST OF FIGURES

Figure 1. Growing Area WX showing active and inactive stations.....	3
Figure 2. Sample Station P90 Trends, 2007-2009.....	8





## Executive Summary

This report is an Annual Report of Growing Area WX, required under “Chapter IV, Section .01 Sanitary Survey, C(5) Annual Report” from the National Shellfish Sanitation Program (NSSP) “Guide for the Control of Molluscan Shellfish” (2007). A comprehensive sanitary survey was done in 2007 by the Maine Department of Marine Resources Public Health Division. The next triennial report is due in 2010 and the next sanitary survey is due in 2019.

Area WX is located in the northern portion of Penobscot Bay and straddles the Waldo-Hancock county line. It includes the tidal segment of the Penobscot River. All shoreline in Area WX is classified as prohibited. One classification change was made this year. The Pollution Area No. 35, Fort Point, Stockton to Morse Cove, Penobscot closure was expanded southwest to enclose station WX001.00 within the closure on January 13, 2009. Fort Point to Squaw Head was reclassified downward to prohibited because sample station WX001.0 was re-classified downward after it failed to meet approved standards. No water sample stations were added, removed, or re-activated and fourteen stations (WX000.50, WX001.00, WX002.00, WX003.00, WX004.00, WX005.00, WX006.00, WX007.00, WX0015.00, WX0017.00, WX0018.00, WX0019.00, WX021.00, WX023.50) were de-activated following the January 13, 2009 reclassification of WX shoreline to prohibited. Because of the long term prohibited classification of this area, as well as multiple wastewater treatment plant discharges and multiple long term water quality issues these 14 stations are no longer sampled. There is no aquaculture or wet storage activity in this growing area. Two licensed overboard discharges (OBDs) effecting Morse Cove were removed in 2009. Remediation of coal gasification waste in the Penobscot River, approximately 20 miles upriver, began during 2009.

## Growing Area Description

Growing Area WX is bounded on the west by Cape Jellison (Stockton) and Dice Head (Castine) on the east (Figure 1). The growing area encompasses 52.8 square miles. The area is bounded upland by the towns of Stockton, Prospect, Bucksport, Verona, Orland, Penobscot and Castine. Closures are based on wastewater treatment facilities within the area and on the margins in adjacent growing areas. Additional treatment facilities are located above the head of tide within the Penobscot River watershed. Several paper and manufacturing mills, treated and un-treated storm water discharges and residential licensed overboard discharges are also located along the Penobscot River and on Verona Island and Castine (Maine DEP 2009a). Several sample stations are affected by non-point pollution without identifiable sources. There are four marine pump-out stations in the growing area (Maine DEP 2009b). Densely developed sections of the area continue to exhibit poor water quality or remain potential pollution threats due to the presence of older, in-ground septic systems and overboard discharge systems.

## Current Classifications

At the end of 2009, shellfish growing area WX had areas classified as:

**Approved-** No shores or waters of the growing area are classified approved.

**Prohibited-** Area No. 35, Penobscot River (Stockton Springs, Prospect, Bucksport, Orland, Penobscot, Castine) (January 13, 2009). WW 82, WX 25, 26, 27, 28, 29, 31, 33, EA 1.



Stations WW 82 and EA 1 are boundary stations in the adjoining areas.

Please visit the DMR website to view legal notices:

[http://www.maine.gov/dmr/rm/public\\_health/closures/closedarea.htm#X](http://www.maine.gov/dmr/rm/public_health/closures/closedarea.htm#X)

### **Activity during Review Period**

In 2009, the following Maine Department of Environmental Protection (DEP) Permits were issued:

July 7, 2009- DEP issued a renewal for Elimination System permit #ME0023230 and Maine Waste Discharge License (WDL)#W006893-5O-E-R, to Penobscot Energy Recovery Company for treated process waste water and storm water runoff to the Penobscot River (EPA NPDES 2010).

September 6, 2009 – DEP issued a renewal and amendment for Elimination System Permit # ME0102296 and Maine Waste Discharge License (WDL) # W007706-5S-C-R to Old Town Water District. The amendment administratively modified the permit (EPA NPDES 2010).

April 23, 2009 – DEP issued a Elimination System permit #ME0001104 and Maine Waste Discharge License (WDL)#W002032-5Q-D-M to MDIFW Cobb State Fish Hatchery for discharge to Cold Stream (Penobscot tributary in Enfield) (EPA NPDES 2010).

February and March 2009 – DEP issued 5 renewals for Elimination System permits #ME0036528, #ME0036511, #ME0036544, #ME0036552, #ME0036536, and 5 renewed Maine Waste Discharge Licenses (WDL)#W008077-5R-C-R, W008076-5R-D-R, W008079-5R-D-R, W008075-5R-D-R, W008078-5R-D-R, to Great lakes Hydro America LLC for discharge of non-contact cooling water to the Penobscot River or its tributaries (EPA NPDES 2010).

In 2009, the following DEP Violations occurred:

March 2009; Penobscot River drainage- DEP identified and fined a residence in Eddington for violating OBD conditions (failure to maintain chlorine in unit). The owners agreed to inspect, maintain, and keep records on OBD chlorination unit (DEP MER 2010). This was a fecal contamination issue.

July 2009; Penobscot River drainage- DEP identified and fined a business in Orland for violating stormwater management law for building 1.3 acres of parking gravel parking lot without a permit. This was an erosion issue, fecal contamination was unlikely. The business agreed to comply with the terms of an after the fact permit (if approved) or restore pre-existing vegetative cover (DEP MER 2010).

September 2009; Penobscot River drainage- DEP identified and fined a business in Bangor for violating sediment control best management practices and sediment erosion. Following DEP involvement, erosion control measures were promptly installed and maintained and were functioning as required (DEP MER 2010). This was an erosion issue, fecal contamination was unlikely.



In 2009, the following changes in Licensed Overboard Discharges were noted:

December 31, 2009- DEP listed 25 Active OBDs in the waters of Area WX and upstream to Bradley in the Penobscot River. (Maine DEP2009a).

December 31, 2009- Two licensed overboard discharges (1590, 4089), both in Morse Cove, were removed and replaced with in ground systems (Maine DEP2009a).

### Current Management Plan(s) for Conditional Area(s)

There are no conditional areas in this growing area.

### Water Quality Review and Discussion

In 2006 the Maine Department of Marine Resources chose to switch to a fecal coliform method that was approved for use in the National Shellfish Sanitation Program (NSSP 2003) at the Interstate Shellfish Sanitation Conference in 2003. This method is the Membrane Filtration (MF) for Fecal Coliforms using mTEC agar. During the transition from MPN to MF, we will be accumulating MF data points. The geometric mean and the 90th percentile are calculated on 30 data points extending over a five year period. The statistical calculations will be a combination of MPN and MF data points. A more detailed explanation of this transition can be found in DMR's central files.

Table 1 lists all active and inactive stations in Growing Area WX; please refer to Appendix A for a key to interpreting the headers on the columns of Tables 1 and 2. Samples in area WX are collected by volunteers under the Systematic Random Sampling protocol. There were 7 active stations sampled during this review period. Stations EA001.00 and WW082.00 are boundary stations from adjoining areas; both boundary stations meet the approved standard. Wadsworth Cove stations (WX 31 & 33) as well as WX 27 & 29 have "approved" P90 scores but are being kept "prohibited" while determining if heavy metals issues noted in Bodaly et al. 2009 will allow an "approved" classification. Stockton station WX 0.5 has "approved" P90 scores but remains "prohibited" while determining if heavy metal concerns (Bodaly et al. 2009, Currie 2003) will allow an "approved" classification. Further metals testing of shellfish from these stations and toxicologist review will be necessary before changing the classification. Station EA 1 has approvable P90 score but is located in proximity to active OBDs.

**Table 1. Geomean and P90 Calculations for Growing Area WX**

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Approved_Std	Restricted_Std
WW082.00	A-boundary	30	20	5.6	0.49	84	24.6	36	199
WX000.50	P	30	14	4	0.46	240	16.2	39	225
WX001.00	P	30	14	7.6	0.57	240	41.9	39	225
WX002.00	P	30	14	9.1	0.64	460	61.4	39	225
WX003.00	P	30	14	8.6	0.57	93	46.3	39	225
WX004.00	P	30	14	8.6	0.67	1200	63.4	39	225
WX005.00	P	30	14	9.7	0.51	122	44.5	39	225
WX006.00	P	30	14	14	0.74	760	125	39	225
WX007.00	P	30	14	21	0.6	240	122	39	225
WX011.00	P	7	0	16	0.49	93	New	48	299



Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Approved_Std	Restricted_Std
WX015.00	P	30	14	22	0.74	1100	195	39	225
WX016.00	P	10	0	18	0.64	240	New	48	299
WX017.00	P	30	14	24	0.67	1100	172	39	225
WX018.00	P	30	14	13	0.58	240	73	39	225
WX019.00	P	30	14	14	0.6	220	82.2	39	225
WX021.00	P	30	14	20	0.73	1100	179	39	225
WX023.50	P	30	14	8.2	0.54	93	40.5	39	225
WX025.00	P	30	20	15	0.78	1200	150	36	199
WX026.00	P	30	20	12	0.57	118	64.7	36	199
WX027.00	P	29	19	6.2	0.52	88	29.1	36	201
WX028.00	P	30	20	6.8	0.59	150	40.1	36	199
WX029.00	P	30	20	4.8	0.49	140	21	36	199
WX031.00	P	30	20	5.3	0.49	93	23.1	36	199
WX032.00	P	17	2	5.6	0.41	43	New	46	279
WX033.00	P	30	20	5	0.53	200	24.5	36	199
EA001.00	A-boundary	30	19	2.5	0.16	9.1	4.2	36	203

Table 2 and Appendix C show the sampling effort for 2009. In 2009, all active sample sites except WX27 met the minimum six (6) sample criteria under NSSP (2007). Station WX27 was sampled 5 times because the area is prohibited and six samples are not required under NSSP (2007) criteria.

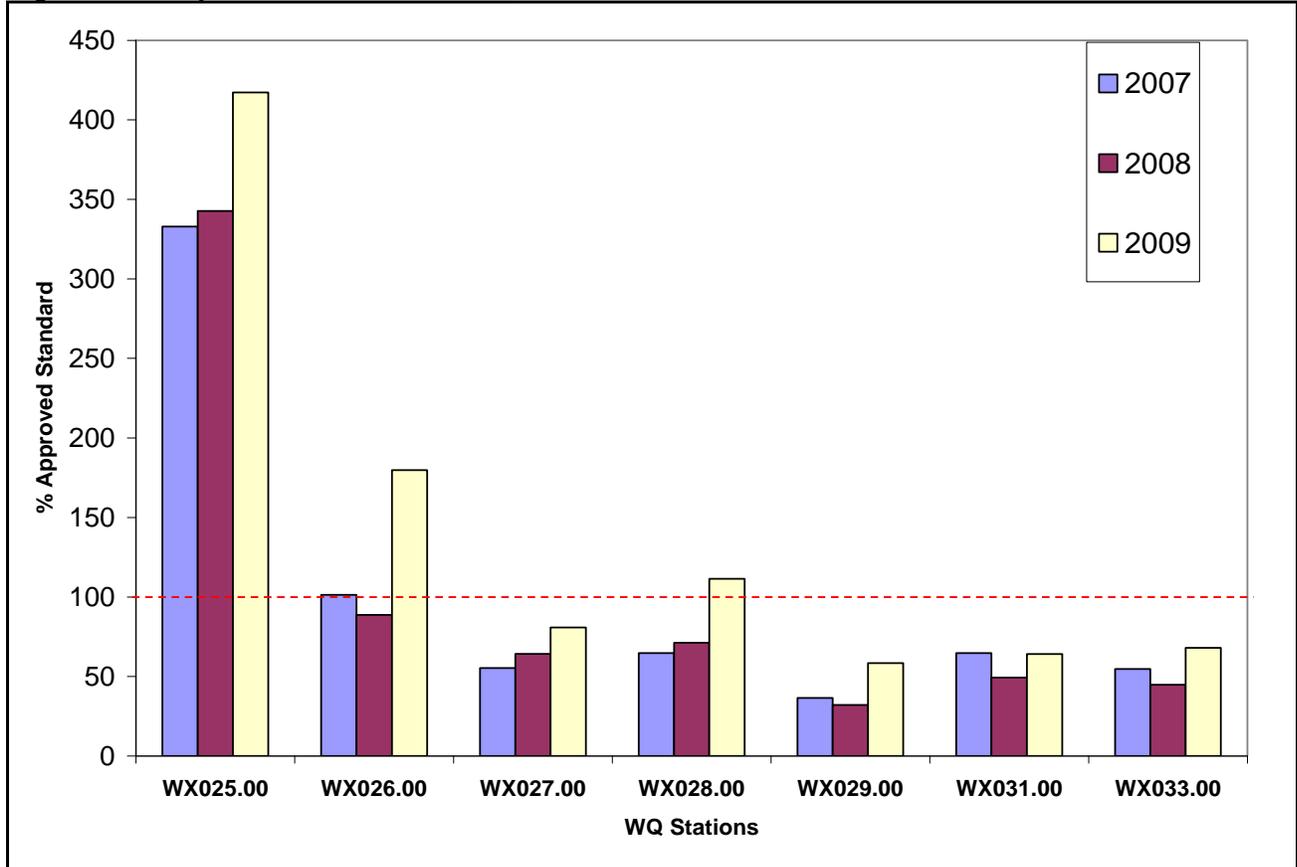
**Table 2. Sample Count of Active Stations during 2009 Review Period**

Station	Class	status	Strategy	Sample Count	COMMENTS
WX025.00	P	C	R	6	embedded in prohibited area
WX026.00	P	C	R	6	embedded in prohibited area
WX027.00	P	C	R	5	Reactivated 12-04. Embedded in prohibited area.
WX028.00	P	C	R	6	embedded in prohibited area
WX029.00	P	C	R	6	embedded in prohibited area
WX031.00	P	C	R	6	embedded in prohibited area
WX033.00	P	C	R	6	embedded in prohibited area

Sample station P90 trends are displayed in Figure 2. Generally, 2009 standard percentages have increased or remained level since 2007. The northern section of the growing area is most impacted by declining water quality and the overall increases in P90 scores suggests that the pollution impacts are wide spread and the Penobscot River is a big factor in the pollution loading. Those sample stations that exceed “100% of the standard” do not meet approved classification criteria based on water quality. Other stations impacted by known point sources may have water scores that meet approved criteria but require a closure to comply with the NSSP Model Ordinance (NSSP 2007).



Figure 2. Sample Station P90 Trends, 2007-2009.



### Recommendations for Upward Classification

There are no recommendations for upward classification this year.

### Shoreline Survey Activity

Growing Area WX was last surveyed in 2007. There was no shoreline survey activity in 2009. Streams were not sampled during the 2009 review period. Two licensed overboard discharges (1590, 4089) were removed and replaced with in ground systems. Other residential licensed overboard discharges are located along the Penobscot River, on Verona Island (1), Prospect (1), and Castine (3) (Maine DEP 2009a, Maine Office of GIS 2010).

Drive through surveys were completed on the same dates as random water sampling runs through the growing area. In 2009, drive through surveys on growing area WX were completed on the following dates: March 27<sup>th</sup>, May 6<sup>th</sup>, May 20<sup>th</sup>, June 3<sup>rd</sup>, August 10<sup>th</sup>, September 10<sup>th</sup> and October 8<sup>th</sup>. No changes in pollution sources were noted at the time of the drive through surveys

### Aquaculture/Wet Storage Activity

There is no aquaculture or wet storage activities in this growing area.



## Classification Changes

Sample station WX 1.0 no longer met approved criteria due to failing water quality. Prohibited Area No. 35, Fort Point, Stockton to Morse Cove, Penobscot was expanded southwest to enclose station WX1.0 within the closure (January 13, 2009). After reclassification this station and WX 0.5 were deactivated because the area is prohibited.

## Summary

Sampling in prohibited areas is not required under "The Model Ordinance" (NSSP 2007), therefore all DMR sampling in Area WX has been discontinued to accommodate staffing and resource constraints; current sampling is completed by volunteers or staff. All active stations have met the minimum number of samples required by the random sampling criteria for their classification. The water sampling protocol will remain the same in the 2010 sampling year. All seven sample stations had upward or unchanged standard percentage trends since 2007. Two licensed overboard discharges (1590, 4089) were removed and replaced with in ground systems. One sample station (WX 1.0) was re-classified downward, making all of the growing area prohibited. A classification change detailed in Appendix 2 was enacted. The Penobscot River continues to have an impact on the water quality in the growing area from meteorological events and pollution sources in the watershed. The effects of the coal gasification waste remediation on the bacterial environment of the sampling sites are unknown; however the area is already classified as prohibited. Stream sampling will take place for the 2010 triennial report. Currently there are no plans to survey any portion of this growing area in 2010.

## Recommendation for Future Work

Wadsworth Cove (stations WX 31 & 33) has passing P90 scores and if heavy metal concentrations in bivalve meats from this cove are acceptable the cove may warrant re-opening. The possibility of bivalve testing through the Maine DEP Surface Water Ambient Toxics Monitoring (SWAT) to determine heavy metal concentrations in the meat will be explored during 2010.

Morse Cove (stations WX 25 – 27) has had 2 OBDs removed and should see improved water quality scores. This cove has similar heavy metals concerns to Wadsworth Cove and SWAT testing of resource here will also be explored during 2010.

## References

Currie, G.N. 2003. Clam Tissue and Analysis Report, 9/5/03. Aroostook Testing and Consulting Laboratory, 675 Central Drive, Skyway Industrial Park, Presque Isle, Maine. 04769.

Bodaly, R.A., A.D. Kopec, J.W.M. Rudd, N.S. Fisher, C.G. Whipple. 2009. Penobscot River Mercury Study. Report to Judge John Woodcock, U.S. District Court (District of Maine). Bangor, Maine.

Maine DEP 2009a. Status of Licensed Discharges and Combined Overflow Abatement Program. Maine Department of Environmental Protection.

[http://www.maine.gov/dep/blwq/report/2009/licensed\\_discharges.pdf](http://www.maine.gov/dep/blwq/report/2009/licensed_discharges.pdf)



Maine DEP 2009b. Maine Pump-out Station and No Discharge Area Guide.  
<http://www.maine.gov/dep/blwq/topic/vessel/pumpout/pumpoutguide.pdf>

Maine DEP MER. 2010. DEP Monthly Enforcement Reports. <http://www.maine.gov/dep/oc/mcar/>

EPA NPDES. 2010. United States Environmental Protection Agency NPDES (National Pollution Discharge Elimination System) Permits in New England – Maine.  
<http://www.epa.gov/region01/npdes/index.html>

Maine DMR Aquaculture. 2010. Aquaculture Lease Inventory.  
<http://www.maine.gov/dmr/aquaculture/leaseinventory/index.htm>

Maine Office of GIS 2010.

NSSP 2003. National Shellfish Sanitation Program Model Ordinance, Guide for the Control of Molluscan Shellfish. 2003.

NSSP 2007. National Shellfish Sanitation Program Model Ordinance, Guide for the Control of Molluscan Shellfish. 2007.

True, J.N. 2008. Maine Combined Sewer Overflow 2007 Status Report. Document No.: DEPLW0899-2008. Maine Department of Environmental Protection. Division of Water Quality Management. Bureau of Land and Water Quality Management.  
[http://www.maine.gov/dep/blwq/doceng/CSO/2007\\_status\\_report.pdf](http://www.maine.gov/dep/blwq/doceng/CSO/2007_status_report.pdf)

True, J.N. 2009. Maine Combined Sewer Overflow 2008 Status Report. Document No.: DEPLW0972-2009. Maine Department of Environmental Protection. Division of Water Quality Management. Bureau of Land and Water Quality Management.  
[http://www.maine.gov/dep/blwq/doceng/CSO/2008\\_status\\_report.pdf](http://www.maine.gov/dep/blwq/doceng/CSO/2008_status_report.pdf)



## Appendix A. 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 or Geomean = 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 = 90<sup>th</sup> percentile

APPD\_STD = the 90<sup>th</sup> 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 90<sup>th</sup> percentile, at or below which the station would meet restricted criteria.

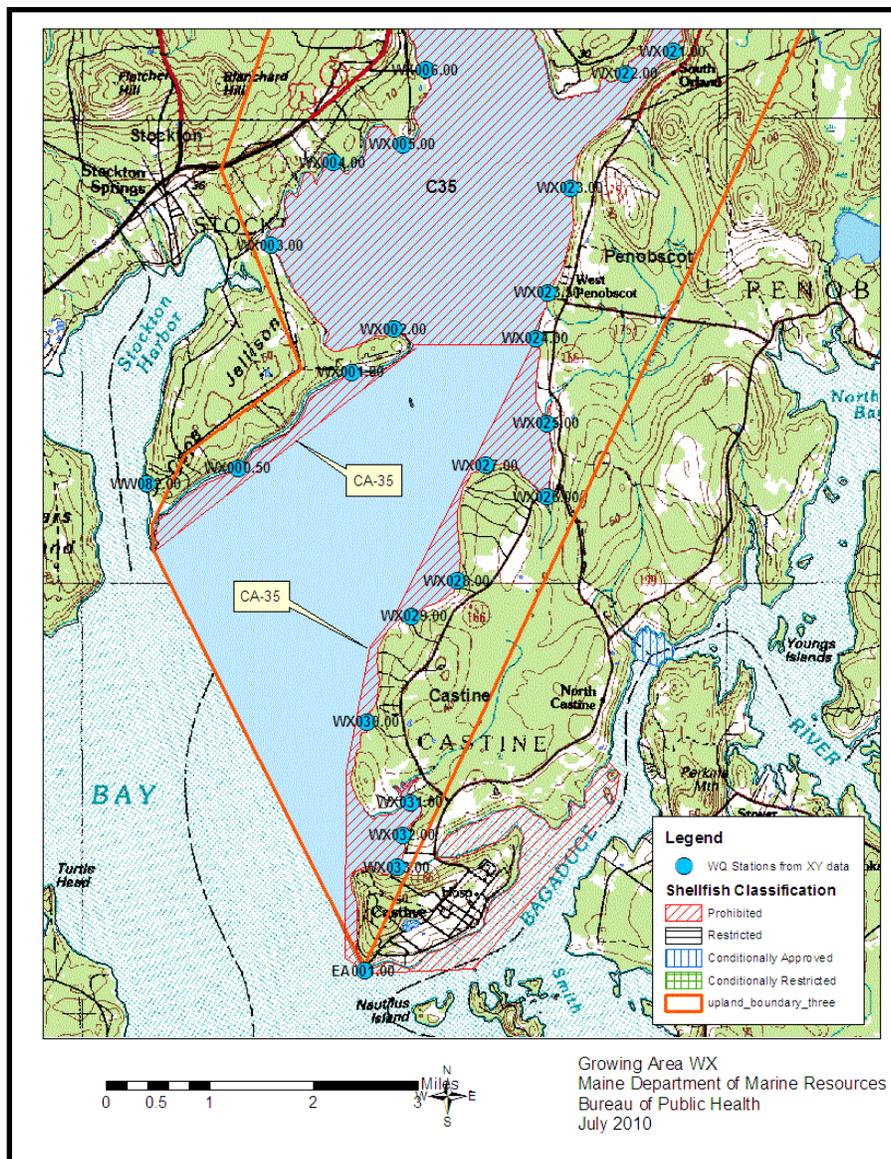


### Appendix B. Expansion of Prohibited Area 35, Fort Point, Stockton to Dice Head, Castine

Because sample station WX 1.0 no longer meets its present classification (Approved), Pollution Area No. 35 was expanded to the southwest to enclose the station. Sample site WX 0.5 became the margin station. The shore from Morse Cove to Dice Head, Castine was incorporated into the Area 35 regulation. It had been previously part of Area 36.

**Title of Rule:** EMERGENCY Rule: DMR Chapter 95.08 (E), Area No. 35, Penobscot River (Stockton Springs, Prospect, Bucksport, Orland, Penobscot, Castine).

Effective immediately, because of pollution, it shall be unlawful to dig, take or possess any clams, quahogs, oysters or mussels taken from the shores, flats and waters of the Penobscot River from its source to a line starting at Squaw Head, Stockton Springs; then going northeast to Fort Point; then due east to a red painted post located 0.2 mile west of the junctions of Routes 166 and 175 (at West Penobscot); then southwest to the western tip of Turner Point, Castine, then running south to the western tip of Perkins Point, then running south to the western tip of Blockhouse Point; then following the lowest tide mark to the southern tip of Dice Head.





**Appendix C. Growing Area WX Data for 2009**

Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
WX025.00	25-Mar-09	JF	E	NW	2	22	R	T	C	P	2
	04-May-09	BWW	E	SW	12	14	R	X	C	P	12
	01-Jun-09	BWW	HE	SW	9	20	R	P	C	P	50
	03-Aug-09	BWW	HE	CL	19	12	R	O	C	P	148
	08-Sep-09	CREW	F	W	15	25	R	O	C	P	7.3
	05-Oct-09	BWW	HE	W	14	25	R	W	C	P	8
WX026.00	25-Mar-09	JF	E	NW	2	16	R	T	C	P	6
	18-May-09	ERS	L	N	12	2	R	P	C	P	110
	01-Jun-09	BWW	HE	W	8	22	R	P	C	P	70
	03-Aug-09	BWW	HE	CL	18	13	R	O	C	P	118
	08-Sep-09	CREW	F	W	15	25	R	O	C	P	2
	05-Oct-09	BWW	HE	W	13	26	R	P	C	P	66
WX027.00	25-Mar-09	JF	E	NW	2	25	R	T	C	P	8
	04-May-09	BWW	E	SW	10	12	R	X	C	P	<2
	01-Jun-09	BWW	HE	W	8	24	R	P	C	P	70
	08-Sep-09	CREW	F	W	15	24	R	O	C	P	2
	05-Oct-09	BWW	HE	W	13	26	R	P	C	P	22
WX028.00	25-Mar-09	JF	E	NW	1	27	R	T	C	P	<2
	04-May-09	BWW	E	SW	9	15	R	X	C	P	<2
	01-Jun-09	BWW	H	SW	8	23	R	P	C	P	56
	03-Aug-09	BWW	H	CL	17	14	R	O	C	P	150
	08-Sep-09	CREW	F	W	15	26	R	O	C	P	<2
	05-Oct-09	BWW	H	W	14	26	R	P	C	P	<2
WX029.00	25-Mar-09	JF	E	NW	2	26	R	T	C	P	4
	04-May-09	BWW	E	SW	10	15	R	X	C	P	<2
	01-Jun-09	BWW	H	SW	9	25	R	P	C	P	44
	03-Aug-09	BWW	H	CL	18	13	R	O	C	P	140
	08-Sep-09	CREW	F	W	15	26	R	O	C	P	<2
	05-Oct-09	BWW	H	W	14	26	R	P	C	P	2
WX031.00	25-Mar-09	JF	E	NW	2	30	R	T	C	P	<2
	04-May-09	BWW	E	SW	11	27	R	X	C	P	<2
	01-Jun-09	BWW	H	SW	7	24	R	P	C	P	5.4
	03-Aug-09	BWW	H	CL	17	17	R	O	C	P	26
	08-Sep-09	CREW	F	W	17	26	R	O	C	P	<2
	05-Oct-09	BWW	H	SW	14	27	R	P	C	P	34
WX033.00	25-Mar-09	JF	E	NW	2	30	R	T	C	P	<2
	04-May-09	BWW	E	W	10	18	R	X	C	P	2
	01-Jun-09	BWW	H	W	8	26	R	P	C	P	34
	03-Aug-09	BWW	H	CL	17	17	R	O	C	P	24
	08-Sep-09	CREW	F	W	16	26	R	O	C	P	<2
	05-Oct-09	BWW	H	W	14	26	R	P	C	P	14