



GROWING AREA EF
Blue Hill Bay
Towns of Brooklin, Blue Hill and Sedgwick
ANNUAL REVIEW for 2009
Report Date: August 11, 2010

Erick Schaefer

APPROVAL

Division Director:

_____ Date: _____
Print name signature



TABLE OF CONTENTS

Executive Summary5
 Growing Area Description5
 Current Classification(s).....5
 Activity during Review Period6
 Current Management Plan(s) for Conditional Area(s).....7
 Current Annual Review of Management Plan(s).....7
 Water Quality Review and Discussion7
 Recommendations for Upward Classification 13
 Shoreline Survey Activity25
 Aquaculture/Wet Storage Activity26
 Classification Changes28
 Summary.....28
 Recommendation for Future Work.....29
 References.....29
 Appendix A. Annual Review of Conditional Area Management Plan – Blue Hill Harbor.....30
 Appendix B. Key to Water Quality Table Headers33
 Appendix C. Growing Area EF 2009 Data34

LIST OF TABLES

Table 1. Geomean and P90 Scores, Growing Area EF7
 Table 2. Area EF Conditionally Approved and Conditionally Restricted Stations, Open Status, most recent 30 samples..... 8
 Table 3. EF Samples Collected in 2009.....9
 Table 4. Blue Hill Salt Pond P90 scores, Year Round Data 14
 Table 5. Station EF 9.7, Seasonal and Rainfall Assessment..... 16
 Table 6. EF 10 Seasonality and Rainfall Assessment 17
 Table 7. EF 10.5 Seasonality and Rainfall Assessment 19
 Table 8. EF 11 Seasonality and Rainfall assessment.....20
 Table 9. Salt Pond Stream 484 Data21
 Table 10. EF 11.3 Seasonal Rainfall Assessment.....23
 Table 11. Salt Pond Stream Data24
 Table 12. Blue Hill Salt Pond, Proposed Open Status Results, 1998-2009.....24

LIST OF FIGURES

Figure 1. Growing Area EF, with Active Water Stations4
 Figure 2. Area EF P90 Trends for Approved Stations (expressed as the percent of the approved standard)..... 11
 Figure 3. Area EF P90 Trends for Restricted Stations (expressed as the percent of the restricted standard)..... 12
 Figure 4. Area EF P90 Trends for Conditional Stations (expressed as the percent of the approved standard)..... 12



Figure 5. Area EF P90 Trends for Conditionally Restricted Stations (expressed as the percent of the restricted standard) 13

Figure 6. Blue Hill Salt Pond Pollution Area No. 39 A4, with Current Classifications 14

Figure 7. Blue Hill Salt Pond P90 Trend, Year Round 15

Figure 8. Blue Hill Salt Pond Streams 22

Figure 9. Proposed Seasonal Conditionally Approved Area in Blue Hill Salt Pond 25

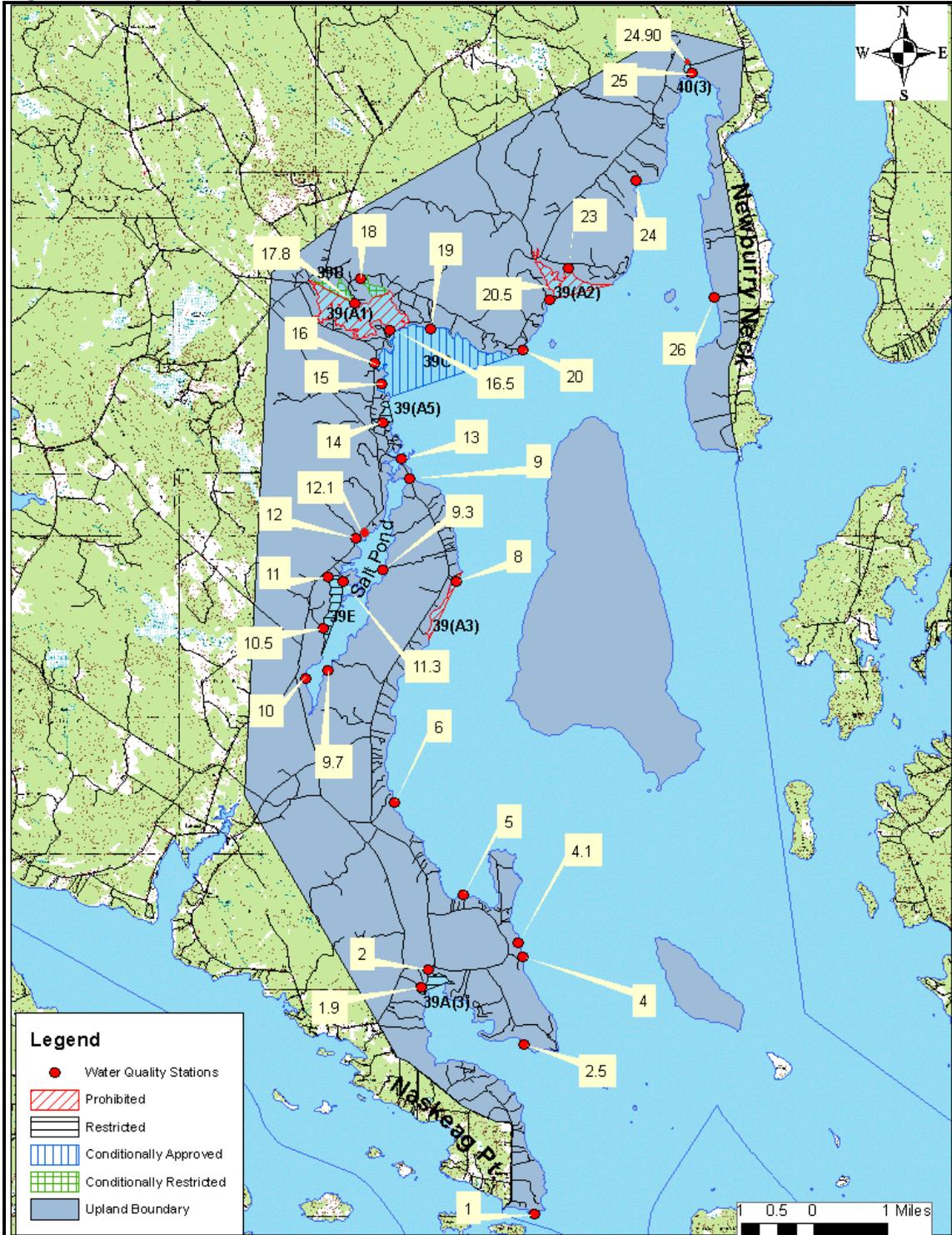
Figure 10 Long Island Aquaculture 26

Figure 11. Long Island Aquaculture 27

Figure 12. Blue Hill Salt Pond Aquaculture Sites 28



Figure 1. Growing Area EF, with Active Water Stations





Executive Summary

This is an annual report for growing area EF, Blue Hill Bay, written in compliance with the requirements of the 2007 Model Ordinance and the National Shellfish Sanitation Program. Sections of the growing area have been classified as prohibited based on clusters of residential licensed overboard discharges (OBDs) in Blue Hill Harbor (Blue Hill) and Curtis Cove (East Blue Hill) and a waste water treatment plant in the town of Blue Hill. Several areas showing non-point pollution without identifiable point sources are classified as restricted. There is also one conditionally approved and one conditionally restricted area located in Blue Hill Harbor based on the operation of the local waste water treatment plant (WWTP). During the 2009 review year, no stations were added or deactivated. The next triennial report is due in 2011; the next sanitary survey report is due in 2019

As a result of this annual review, two areas are being recommended for reclassification: the southwest portion of the Blue Hill Salt Pond is being recommended for an upgrade from restricted to conditionally approved based on season and the south end of the Blue Hill Salt Pond should be downgraded from approved to conditionally approved based on season, due to elevated water quality scores during the summer and fall months.

Growing Area Description

Growing area EF extends from the southern tip of Naskeag Point, in Brooklin to the southern tip of Newbury Neck, Surry in western Hancock County (Figure 1). The area includes the western portion of Blue Hill Bay, including all of Blue Hill Harbor, the Salt Pond, and Morgan Bay. It includes the shoreline in the towns of Brooklin, Sedgwick, Blue Hill, and Surry.

Pollution sources in growing area EF include a municipal WWTP located in Blue Hill, along with 11 active OBDs. There are three small private agriculture areas adjacent to the shores of this growing area. One is a small organic farm located at the southern end of the Salt Pond the other is a horse pasture located in the upland boundary area near Bragdon Brook which drains into the outer portion of Blue Hill Harbor, and the third one was a single horse pasture that is no longer active.

There is one yacht club and sailing school with facilities for fuel, ice, a pumpout boat, three guest moorings and approximately 75 seasonal moorings located in the inner portion of Blue Hill Harbor. In the town of Blue Hill, in the inner harbor, there are numerous private moorings and East Blue Hill and South Blue Hill also have mooring fields. Numerous other anchorages and private mooring areas were noted throughout the growing area which serves local lobster boats and private pleasure craft. There are two boat yards in this growing area one in Blue Hill Harbor and one in East Blue Hill. Area EF has four licensed shellfish aquaculture lease sites. Three of these sites are commercial suspended culture for mussels, oysters, scallops and surf clams while the fourth is a private site for oysters using tray racks.

Current Classification(s)

Shellfish growing area EF currently has areas classified as:



Approved:

14 sample sites (EF 2.5, 4, 4.1, 5, 6, 9, 9.3, 9.7, 10, 12, 13, 24, 25, and 26)

Conditionally Approved:

Area No. 39(C) Blue Hill Harbor, based on operation of Blue Hill WWTP; 5 sample sites (EF 15, 16, 16.5, 19, 20)

Conditionally Restricted:

Area No. 39(B) Blue Hill Harbor, based on operation of Blue Hill WWTP; 2 sample sites (EF17.8, 18)

Restricted:

Area No. 39 (A4) Blue Hill Salt Pond (non point pollution); 3 sample sites (EF 10.5, 11, 11.3)
Area No. 39 (A5) Bragdon Brook, Blue Hill (non point pollution); 1 sample sites (EF 14)
Area No. 39 (A3) Herrick Bay, Brooklin (non point pollution); 2 sample sites (EF1.9, 2)
Area No. 40 (A3) Morgan Bay Surry (non point pollution); 1 sample site (EF 24.9 new in 2008)

Prohibited:

Area No. 39 (A1) Blue Hill Harbor, Blue Hill (WWTP outfall)
Area No. 39 (A2) McHeard and Curtis Coves (OBD's), East Blue Hill; 2 sample sites (EF 20.5, 23)
Area No. 39 (A3) Sand Point, Blue Hill (OBD); 1 sample site (EF 8)

New Stations, with less than 30 samples (not evaluated for classification)

4 sample sites: EF 1, 12.1, 20.5 and 24.9

Please visit the DMR website to view legal notices:

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

Activity during Review Period

There were no classification changes or OBD removals in 2009.

- **Pollution Source Sampling:** No pollution source sampling was conducted but 14 extra samples were taken at EF 24.9 and EF 25.
- **WWTP Review:** On January 7, 2009 conducted annual review of WWTP in Blue Hill with plant operator



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

There is one conditionally managed area in Growing area EF.

Area No. 39(C), Blue Hill Harbor, Blue Hill: Conditionally Approved based on WWTP function. The following stations are associated with this classification: EF 15, 16, 16.5, 17.8, 18, 19, 20

The management plan for the EF conditional area can be found in DMR's central files. The Blue Hill WWTP conditional area management plan (CAMP) requires reporting by the plant operator; this plan was last updated on August 22, 2008.

Current Annual Review of Management Plan(s)

For the 2009 review period there were no bypasses at the Blue Hill WWTP and the conditional area remained open all year. The WWTP conditionally approved area met the requirements set forth in the CAMP. The P90 for all involved water quality stations during the open status met the approved standard and each station was sampled monthly in the open status. The complete annual review can be found in Appendix A.

Water Quality Review and Discussion

Table 1 lists all active approved, restricted and prohibited stations in growing area EF, with their respective Geomean and P90 calculations for 2009. Please refer to Appendix B for a key to interpreting the headers on the columns of Table 1. The approved and restricted standards for each station are also displayed in Table 1. 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. A more detailed explanation of this transition can be found in central files.

All approved stations met their NSSP classification standard in 2009. Station EF 25 and EF 10, highlighted in yellow exceed 90% of the approved standard and will be. Stations EF 1.9, 2, 10.5, 11 and 11.3, highlighted in blue, now meet the approved standard; stations 10 has shown an increasing P90 and as of the August 10, 2010 now exceeds the standard for approved and is being reclassified to restricted. EF 1.9, 2 and 14 has shown high variability year round and will remain classified as restricted until an in depth data analysis can be completed.

Table 1. Geomean and P90 Scores, Growing Area EF

Station	Class	Count	MFCOUNT	GM	SDV	MAX	P90	Appd_Std	Restr_Std
EF001.00	New	18	18	2.5	0.3	18	6.2	31	163
EF001.90	R	30	20	6	0.59	142	34.6	36	199
EF002.00	R	30	20	6.4	0.57	110	34.8	36	199



Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std
EF002.50	A	30	22	2.4	0.28	66	5.7	35	191
EF004.00	A	30	20	3	0.35	93	8.7	36	199
EF004.10	A	30	20	2.9	0.4	86	9.7	36	199
EF005.00	A	30	20	3.1	0.37	80	9.4	36	199
EF006.00	A	30	20	2.7	0.28	43	6.3	36	199
EF008.00	P	30	20	3.1	0.33	43	8.5	36	199
EF009.00	A	30	21	2.3	0.17	14	3.9	35	195
EF009.30	A	30	21	3	0.32	33	8	35	195
EF009.70	A	30	21	3.4	0.43	108	12.2	35	195
EF010.00	A	30	22	5.3	0.61	140	32.5	35	191
EF010.50	R	30	20	5.4	0.54	75	27	36	199
EF011.00	R	30	20	5.3	0.5	62	23.8	36	199
EF011.30	R	30	20	4.6	0.45	75	17.8	36	199
EF012.00	A	30	24	4.3	0.56	210	23	33	184
EF012.10	New	22	22	3.7	0.52	106	18	31	163
EF013.00	A	30	20	2.9	0.35	58	8.4	36	199
EF014.00	R	30	20	4.8	0.6	760	28.8	36	199
EF020.50	New	24	22	3.3	0.47	116	13.5	32	171
EF023.00	P	30	20	5.5	0.68	460	41.2	36	199
EF024.00	A	30	20	4.5	0.51	93	20.7	36	199
EF024.90	New	18	18	12.9	0.65	320	91.3	31	163
EF025.00	A	30	26	5.3	0.6	340	31.8	32	176
EF026.00	A	30	20	4.4	0.54	240	22	36	199

Table 2 lists all conditionally approved and conditionally restricted stations in area EF with their respective Geomean and P90 calculations for 2009. Data for conditional-stations reflects only the open status. All conditional stations met their current NSSP standard during the open status.

Table 2. Area EF Conditionally Approved and Conditionally Restricted Stations, Open Status, most recent 30 samples

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std
EF015.00	CA	30	30	3	0.4	70	10	31	163
EF016.00	CA	30	30	2.8	0.38	80	8.9	31	163
EF016.50	CA	30	30	2.9	0.46	120	11.3	31	163
EF017.80	CR	30	30	4.2	0.57	180	22.5	31	163
EF018.00	CR	30	30	6	0.64	520	40.7	31	163
EF019.00	CA	30	30	2.5	0.33	50	7	31	163
EF020.00	CA	30	30	2.5	0.38	148	8	31	163

All stations that were active at the beginning of 2009 were sampled at least 6 times following the systematic random sampling (SRS) schedule (Table 3 and Appendix C). At some stations,



additional samples were collected under adverse conditions and others were sampled extra times to help build the data set.

Table 3. EF Samples Collected in 2009

Station	Adverse	Extra	Random		Sample Total
	Closed	Open	Closed	Open	
EF001.00				6	6
EF001.90				6	6
EF002.00				6	6
EF002.50				6	6
EF004.00				6	6
EF004.10				6	6
EF005.00				6	6
EF006.00				6	6
EF008.00			6		6
EF009.00	3			6	9
EF009.30	3	1		6	10
EF009.70		1		6	7
EF010.00	12	1		6	19
EF010.50				6	6
EF011.00				6	6
EF011.30				6	6
EF012.00				6	6
EF012.10				6	6
EF013.00				6	6
EF014.00				6	6
EF015.00		1		12	13
EF016.00		1		11	12
EF016.50		1		11	12
EF017.80		1		12	13
EF018.00		1		11	12
EF019.00		1		12	13
EF020.00		1		12	13
EF020.50				6	6
EF023.00			6		6
EF024.00	3			6	9
EF024.90		7		6	13
EF025.00		7		6	13
EF026.00				6	6

Figure 2 shows the P90 trends over the past three years for approved stations. Figure 3 shows the P90 trends over the past three years for restricted stations; Figures 4 and 5 shows open status data only for the conditionally approved and conditionally restricted stations. During the transition from MPN to MF analysis method, the approved standard will decrease every year,



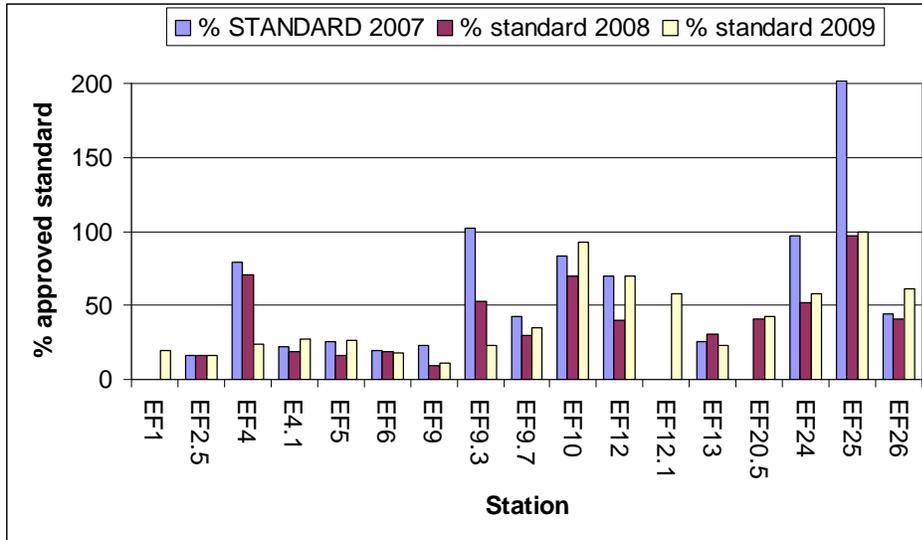
until all samples have been analyzed by the MF method. In order to show the trend of the P90 value over the years, the calculated P90 scores are expressed as a percentage of the approved standard (for approved and conditionally approved in the open status); any station showing the 2009 column on or above the 100 percent line does not meet the standard for approved classification. The trends in P90 values over the years for restricted stations are calculated P90 scores that are expressed as a percentage of the restricted standard; any station showing the 2009 column on or above the 100 percent line does not meet the standard for restricted classification.

Two stations, EF 10 and 25 are over 90% of the approved standard. EF 25 which is located in Upper Morgan Bay south of the Emerton Brook drainage, EF 24.9 which is located at the head of Morgan Bay and Emerton Stream, will undergo accelerated sampling during the 2010 season to help determine if this upward trend will continue (Figure 2). A shoreline survey conducted in 2008 by DMR and the DEP found no identifiable issues in the area near EF 25. An assessment of station EF 25 shows that it should remain classified approved and it along with station 24.9 should undergo accelerated sampling to help build data to see if it is impacted seasonally.

The area around EF 10 (southwestern end of the Blue Hill Salt Pond) was also surveyed in 2008 by DMR with no pollution sources identified. Both areas are suspected of being impacted from non-point runoff from the surrounding upland areas. Data analysis of EF 10 shows it to be intermittently impacted in the months of July through September. All other approved stations are well within the NSSP standard for approved harvest.



Figure 2. Area EF P90 Trends for Approved Stations (expressed as the percent of the approved standard)



All restricted stations in growing area EF meet the standard for approved classification based on 2009 end of year data. Herrick Bay, Brooklin which includes stations EF 1.9 and EF 2 has shown variability in sample scores and will stay restricted. Station EF 14 located near Bragdon Brook, outer Blue Hill Harbor will stay restricted because of the high variability and if this station shows a consistent trend over the 2010 sampling season it will be recommended for upward classification change at that time. Stations 10.5 and 11 are located in the Blue Hill Salt Pond and will be recommended for reclassification to conditionally approved based on seasonality. EF 10 as of this final report date of August 12, 2010 now exceeds the standard for approved harvest and will be reclassified to restricted based on seasonality.



Figure 3. Area EF P90 Trends for Restricted Stations (expressed as the percent of the restricted standard)

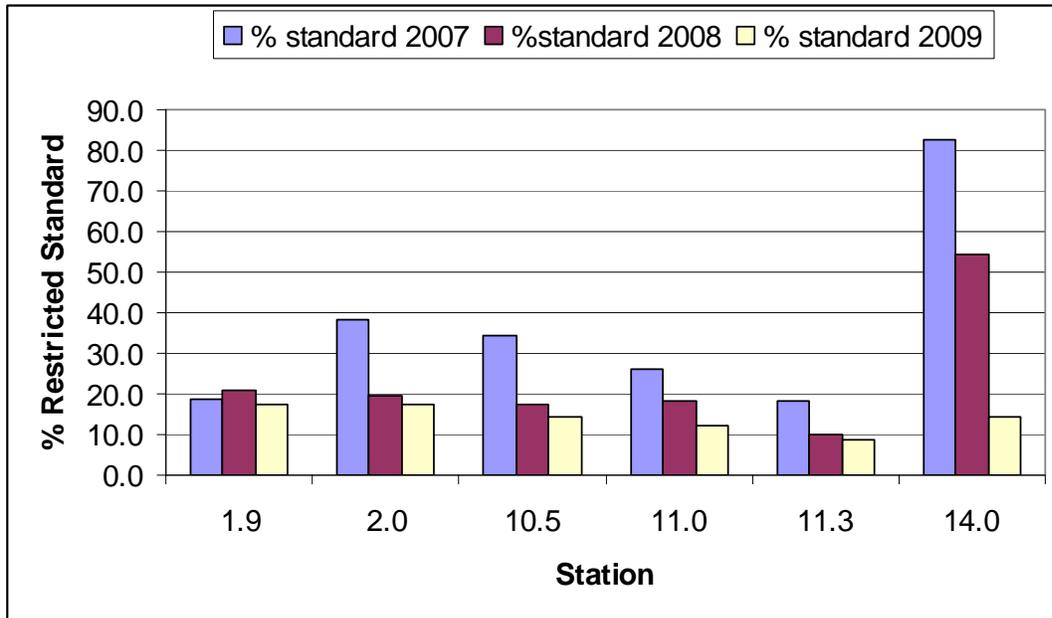


Figure 4 shows the P90 trends for the conditionally approved stations for area EF during their open status as a percent of the approved standard. All of these stations meet the NSSP standard for their classification.

Figure 4. Area EF P90 Trends for Conditional Stations (expressed as the percent of the approved standard)

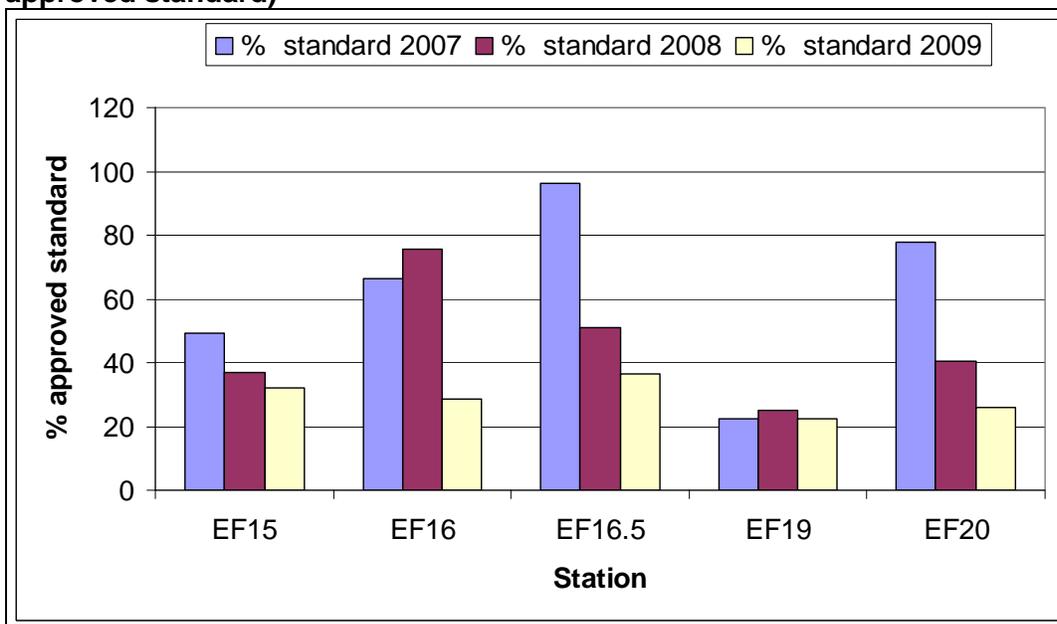
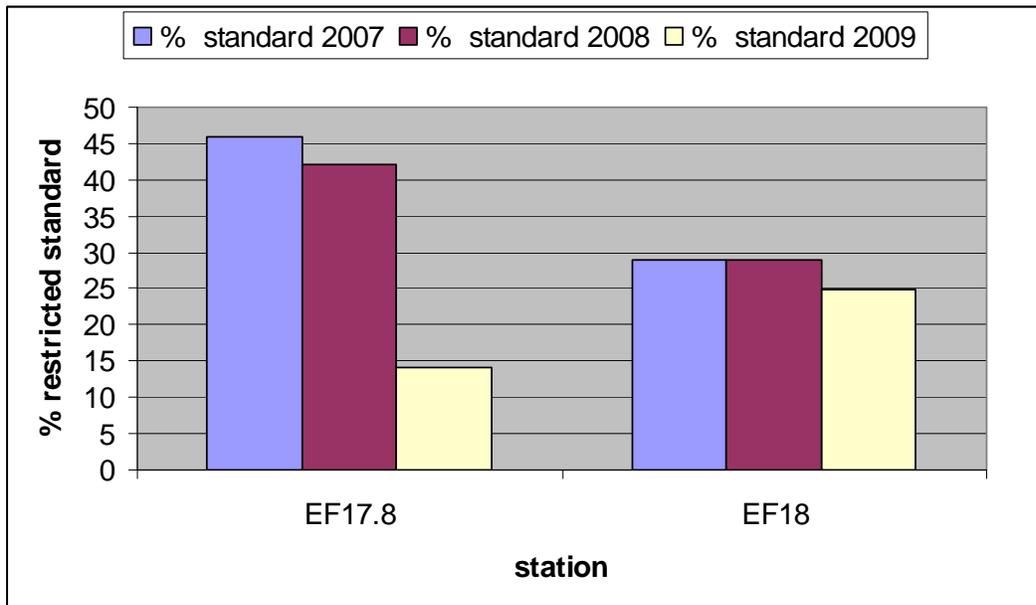




Figure 5 shows the P90 trends for the conditionally restricted stations for area EF during their open status as a percent of the restricted standard. All of these stations meet the NSSP standard for their classification.

Figure 5. Area EF P90 Trends for Conditionally Restricted Stations (expressed as the percent of the restricted standard)



Recommendations for Upward Classification

Blue Hill Salt Pond

The southwest end of the Blue Hill Salt Pond which is monitored by stations EF 9.7, 10, 10.5, 11 and 11.3, is currently classified as restricted and approved, with stations EF 9.7 and 10 being in the approved area and stations EF 10.5, 11 and 11.3 in the restricted area (Figure 6). The area was surveyed during 2008 as part of a complete sanitary survey and no actual or potential pollution problems were identified. A year end data review concluded that this area currently meets the standard for approved classification (Table 4); however a detailed review of individual data points suggests that this area has shown an intermittent seasonal water quality impact, and is therefore being recommended for a reclassification to conditionally approved based on season, with an open status from November 1st through April 30th.



Figure 6. Blue Hill Salt Pond Pollution Area No. 39 A4, with Current Classifications



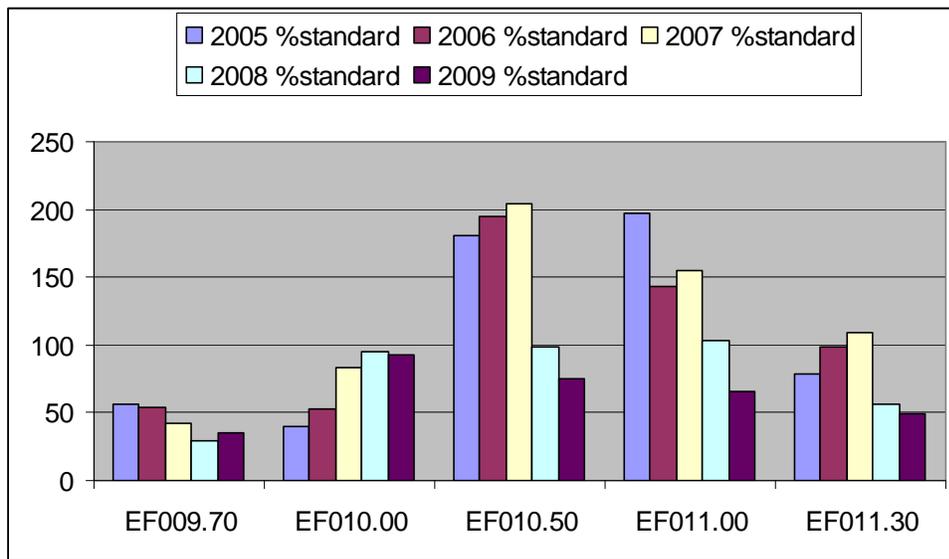
Table 4. Blue Hill Salt Pond P90 scores, Year Round Data

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
EF009.70	A	30	21	3.4	0.43	108	12.2	35	195	5/23/2005
EF010.00	A	30	22	5.3	0.61	140	32.5	35	191	7/13/2005
EF010.50	R	30	20	5.4	0.54	75	27	36	199	11/30/2004
EF011.00	R	30	20	5.3	0.5	62	23.8	36	199	7/13/2005
EF011.30	R	30	20	4.6	0.45	75	17.8	36	199	6/15/2005



An assessment of the P90 trends over the past five review years shows station EF 9.7 staying consistently below 50% of the approved standard (Figure 7). Sample station EF 10, which is located in the approved portion of the Blue Hill Salt Pond, has shown an increase in scores from 2005 to 2008 and a slight decrease in scores in 2009. This station is being recommended for a reclassification for conditionally approved based on season. Stations EF 10.5, 11 and 11.3 have shown similar trends with last two years showing a marked improvement in water quality. The reason for this improvement is not known.

Figure 7. Blue Hill Salt Pond P90 Trend, Year Round



Tables 5, 6, 7, 8 and 10 show individual scores for stations EF 9.7, 10, 10.5, 11 and 11.3, sorted by season and cumulative rainfall amounts (cumulative over three day prior sample collection) for the period of 2002-2009; samples collected during emergency flood closures were excluded from these tables. Samples collected on May 23, 2005 occurred after extreme coastal rainfall, and under the current DMR flood protocol, would have resulted in an emergency flood closure for the area; therefore, the results obtained from these samples should not be considered for determining the open status for the Salt Pond. Individual scores exceeding the variability standard are highlighted in yellow; individual scores exceeding the geometric mean standard are highlighted in gray. Overall, all three station showed multiple elevated scores, occurring across a range of precipitation. Elevated scores were most frequent during the months of July and September, indicating a seasonal impact in this portion of the Salt Pond.

Station EF 9.7 currently meets the approved standard, and has met the approved standard for the past 5 years (Table 5). It has three elevated scores (those exceeding the approved variability standard) in its dataset, occurring in July and September. Two of the elevated scores occurred in July 2002 and 2003. Since 2003, six samples have been collected during the months of July. The results for all of these samples were below the variability standard, suggesting that the seasonal pollution source that was present in 2002 and 2003 was no longer a public health concern. A more recent sanitary survey has confirmed that there are no actual or potential pollution sources in the vicinity of this station. This station received one elevated



score after 1.9 inches of cumulative rainfall. To assess the impact of rainfall on this station, geometric means and P90 scores were recalculated, using only data points collected after 0.5 inches of cumulative rainfall. Using this dataset, the geomean was 4.9 and the P90 score was 25.3; these results indicate that this station is appropriately classified as approved.

Table 5. Station EF 9.7, Seasonal and Rainfall Assessment

3 day rain total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	4/8/02	R	26				2.9								
	9/11/02	R	30									7.3			
	5/21/03	R	28					2.9							
	7/19/04	R	30							3					
	9/14/04	R	28									3.6			
	7/13/05	R	28							2.9					
	9/12/05	R	30									3.6			
	10/31/05	R	18										3.2		
	3/20/06	R	15			2.9									
	7/17/06	R	26							2.9					
	3/19/08	R	15			1.9									
	4/16/08	R	16				1.9								
	11/5/08	R	27											2	
	3/23/09	R	7			1.9									
	8/5/09	R	24								6				
9/8/03	R	30									3.6				
2/25/02	R	25		2.9											
0.03	10/30/07	R	32										1.9		
0.04	10/20/04	R	18										9.1		
0.05	7/10/07	R	30							1.9					
0.08	4/6/05	R	28				2.9								
0.1	4/3/06	R	15				2.9								
0.18	7/23/03	R	28							240					
0.2	9/11/06	R	30									8			
0.2	7/29/08	R	30							16					
0.21	9/16/08	R	30									2			
0.22	8/17/05	R	28								2.9				
0.25	5/22/06	R	23					2.9							
0.28	7/24/02	R	30							150					
0.3	6/24/08	R	30						1.9						
0.36	7/7/09	R	28							1.9					
0.4	4/7/03	R	10				2.9								
0.48	5/2/07	R	15					1.9							
0.48	6/1/09	E	26						1.9						
0.65	10/23/06	R	25										1.9		
0.73	10/28/02	R	20										3.6		



3 day rain total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.8	4/30/03	R	18				2.9								
0.85	4/6/04	R	10				2.9								
0.92	5/15/02	R	8					3.6							
1.03	5/11/09	R	25					1.9							
1.05	9/10/07	R	32									12			
1.08	5/4/04	R	10					43							
1.32	5/24/04	R	20					9.1							
1.45	1/8/07	R	24	1.9											
1.49	11/16/09	R	30											1.9	
1.53	10/27/03	R	28										2.9		
1.55	6/6/07	R	30						2						
1.9	9/28/09	R	28									108			
3.32-FLOOD	5/23/05	R	15					43							

Station EF 10 is currently classified as approved, but is within 10 percent of the approved standard limit. Since 2002, this station has received 5 scores over the approved variability standard. Four out of five elevated scores occurred at a cumulative precipitation of greater than 1 inch, and all of the high scores occurred between May and September. These trends suggest that this area is intermittently impacted by rainfall, over a particular season. Therefore, this area should be reclassified from Approved to Conditionally Approved based on season.

Table 6. EF 10 Seasonality and Rainfall Assessment

3 day total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
0	4/8/02	R	21				2.9									
	9/11/02	R	30									2.9				
	5/21/03	R	26					2.9								
	9/2/03	R	32									2.9				
	7/19/04	R	27							9.1						
	9/14/04	R	26									2.9				
	7/13/05	R	26							2.9						
	8/10/05	R	30								2.9					
	9/12/05	R	30										2.9			
	10/31/05	R	23											3.6		
	3/28/06	R	27			2.9										
	7/17/06	R	10								93					
	3/19/08	R	15			1.9										
	4/16/08	R	20				1.9									
	6/9/08	R	30							16						
	11/5/08	R	29												1.9	
	3/23/09	R	14			1.9										
8/5/09	R	26									2					



3 day total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	9/8/03	R	30									3			
	2/25/02	R	10		3.6										
0.03	10/30/07	R	30										1.9		
0.05	7/9/07	R	27							2					
0.08	4/6/05	R	15				2.9								
0.1	4/3/06	R	23				2.9								
0.1	7/6/04	R	27							2.9					
0.2	9/11/06	R	30									1.9			
0.2	7/29/08	R	30							14					
0.21	9/16/08	R	28									1.9			
0.25	5/22/06	R	25					2.9							
0.28	7/24/02	R	30							3.6					
0.36	7/7/09	R	12							27					
0.4	4/7/03	R	5				2.9								
0.48	5/2/07	R	10					1.9							
0.48	6/1/09	E	28						1.9						
0.65	10/23/06	R	2										24		
0.73	10/28/02	R	18										23		
0.8	4/30/03	R	24				2.9								
0.85	4/6/04	R	24				2.9								
0.92	5/15/02	R	25					2.9							
1.03	5/11/09	R	20					2							
1.05	9/10/07	R	29									90			
1.24	11/30/04	R	2											3.6	
1.3	8/8/07	E	28								74				
1.32	5/24/04	R	2					150							
1.45	1/8/07	R	2	1.9											
1.49	11/16/09	R	20											14	
1.53	10/27/03	R	25										23		
1.55	6/6/07	R	22						3.6						
1.9	9/28/09	R	28									140			
3.32-FLOOD	5/23/05	R	2					93							

Station EF 10.5 is currently classified as restricted. A review of the individual scores over the last eight years showed that this station has six scores that have surpassed the variability standard. Three of these scores occurred during the month of July (in 2003, 2004, and 2006), one occurred in September (2007) and one in October (2003). One marginally elevated score occurred in January 2007. The elevated scores occurred across a range of precipitation events. This area is being recommended for a reclassification from restricted to conditionally approved based on season.



Table 7. EF 10.5 Seasonality and Rainfall Assessment

3 day total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	4/8/02	R	28				2.9								
	9/11/02	R	30									43			
	12/11/02	R	27												2.9
	5/21/03	R	25					2.9							
	7/19/04	R	28							240					
	9/14/04	R	26									3.6			
	7/13/05	R	26							2.9					
	8/10/05	R	29								2.9				
	9/12/05	R	29									2.9			
	10/31/05	R	26										2.9		
	7/17/06	R	24							75					
	3/19/08	R	2			1.9									
	4/16/08	R	28				1.9								
	6/9/08	R	30						1.9						
	11/5/08	R	30											2	
	3/23/09	R	5			1.9									
	8/5/09	R	0								28				
	9/23/09	R	6									4			
	9/8/03	R	30									3.6			
	2/25/02	R	7		2.9										
	10/8/03	R	30										3.2		
0.03	10/30/07	R	30										1.9		
0.05	8/4/05	A	20								23				
0.05	7/9/07	R	30							1.9					
0.1	4/3/06	R	23				2.9								
0.1	7/6/04	R	27							2.9					
0.14	1/23/06	R	20	2.9											
0.18	7/23/03	R	23							1100					
0.2	9/11/06	R	23									1.9			
0.2	7/29/08	R	28							18					
0.21	9/16/08	R	10									20			
0.25	5/22/06	R	28					2.9							
0.28	7/24/02	R	28							43					
0.36	7/7/09	R	12							29					
0.4	4/7/03	R	22				2.9								
0.48	5/2/07	R	10					1.9							
0.65	10/23/06	R	5										14		
0.73	10/28/02	R	28										43		
0.8	4/30/03	R	26				2.9								
0.85	4/6/04	R	27				2.9								
0.92	5/15/02	R	27					2.9							
1.03	5/11/09	R	25					1.9							



3 day total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.05	9/10/07	R	20									70			
1.24	11/30/04	R	22											3.6	
1.32	5/24/04	R	14					43							
1.45	1/8/07	R	15	44											
1.49	11/16/09	R	24											4	
1.53	10/27/03	R	30									460			
1.55	6/6/07	R	22						4						
3.32-FLOOD	5/23/05	R	16					43							

Station EF 11 is currently classified as restricted. A review of the individual scores for this stations showed that this area had six elevated scores in its dataset. Similar to station EF 10.5, this station had elevated scores occurring across a range of precipitation amounts, however, the scores showed an intermittent seasonal impact between the months of June and October. This area is being recommended for a reclassification from Restricted to Conditionally Approved based on season. This station is located at the mouth of a perennial fresh water stream (Sample Site 484, Figure 8); multiple samples collected at this station had a salinity of 0, indicating a significant impact from fresh water. Historical steam samples (2000 to 2009) collected at the mouth of this stream are presented in Table 9; the scores indicate that elevated fecal scores have occurred at this stream in the summer months. This area has shown clean stream scores during the proposed open status of November 1 through April 30; therefore, no closure around the mouth of this stream in necessary at this time.

Table 8. EF 11 Seasonality and Rainfall assessment

3 day total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	4/8/02	R	0				2.9								
	9/11/02	R	22									75			
	5/21/03	R	0					23							
	7/19/04	R	18							43					
	9/14/04	R	14									23			
	7/13/05	R	2							43					
	8/10/05	R	27								9.1				
	9/12/05	R	29									6.6			
	10/31/05	R	12										3.6		
	1/4/06	R	0	2.9											
	7/17/06	R	3							23					
	4/16/08	R	6				1.9								
	6/9/08	R	29						2						
	11/5/08	R	24											1.9	
	3/23/09	R	6			2									
	8/5/09	R	0								20				
	9/23/09	R	8									2			
	9/8/03	R	30									3.6			
	2/25/08	R	0		1.9										
	2/25/02	R	2		2.9										



3 day total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.03	10/30/07	R	4										38		
0.05	8/4/05	R	25								3.2				
0.05	7/9/07	R	28							2					
0.1	4/3/06	R	0				2.9								
0.1	7/6/04	R	27							3.6					
0.14	1/23/06	R	0	2.9											
0.18	7/23/03	R	8							93					
0.2	9/11/06	R	24									4			
0.2	7/29/08	R	28							16					
0.21	9/16/08	R	5									42			
0.25	4/10/00	R	2				2.9								
0.25	5/22/06	R	22					2.9							
0.28	7/24/02	R	22							24.2					
0.36	7/7/09	R	0							1.9					
0.4	4/7/03	R	0				2.9								
0.48	5/2/07	R	0					1.9							
0.65	10/23/06	R	0										24		
0.73	10/28/02	R	26										2.9		
0.8	4/30/03	R	7				2.9								
0.85	4/6/04	R	18				2.9								
0.92	5/15/02	R	10					23							
1.03	5/11/09	R	8					1.9							
1.05	9/10/07	R	18									62			
1.24	11/30/04	R	0											2.9	
1.32	5/24/04	R	0					29							
1.45	1/8/07	R	5	2											
1.49	11/16/09	R	10											6	
1.53	10/27/03	R	7										460		
1.55	6/6/07	R	15						6						
3.32-FLOOD	5/23/05	R	0					150							

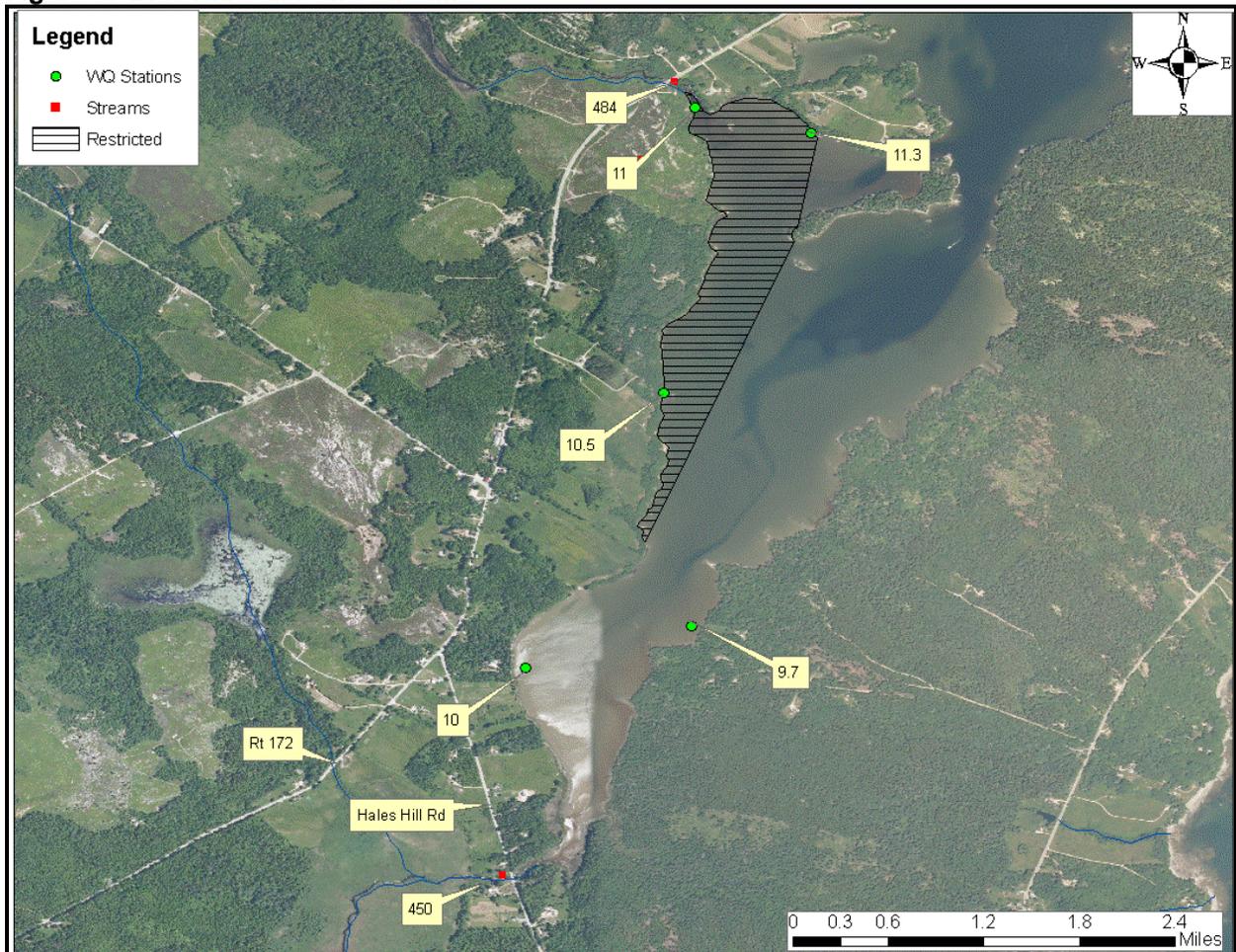
Table 9. Salt Pond Stream 484 Data

Stream ID	Date	Col score	GPM
EF00484.00	7-Jun-00	150	999
EF00484.00	13-Jun-00	23	900
EF00484.00	9-Aug-00	460	999
EF00484.00	13-Jun-01	43	500
EF00484.00	12-Nov-02	9.1	999
EF00484.00	8-Oct-03	23	300



Stream ID	Date	Col score	GPM
EF00484.00	15-Jun-04	2.9	1000
EF00484.00	15-Jun-05	93	1000
EF00484.00	21-Dec-05	3.6	350
EF00484.00	28-Jul-08	48	3636

Figure 8. Blue Hill Salt Pond Streams



Station EF 11.3 is currently serving as a boundary station between the approved and restricted areas of the Blue Hill Salt Pond; this station currently meets the approved classification. Over the past eight years, this station has received four elevated scores. These scores occurred over a range of precipitation events, but show a seasonal impact, and therefore, is being recommended for a reclassification from restricted to conditionally approved based on season.



Table 10. EF 11.3 Seasonal Rainfall Assessment

3 day total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	4/8/02	R	7				2.9								
	9/11/02	R	30									43			
	5/21/03	R	18					9.1							
	7/19/04	R	28							9.1					
	9/14/04	R	28									3.6			
	6/28/05	R	8						2.9						
	7/13/05	R	15							7.3					
	9/12/05	R	29									2.9			
	10/31/05	R	4										2.9		
	1/4/06	R	0	3.6											
	7/17/06	R	7							75					
	3/19/08	R	8			1.9									
	4/16/08	R	6				1.9								
	6/9/08	R	30						1.9						
	11/5/08	R	25											1.9	
	3/23/09	R	26			1.9									
	8/5/09	R	0								48				
	9/23/09	R	8									4			
	9/8/03	R	30									2.9			
	2/25/02	R	6		2.9										
0.03	10/30/07	R	0										29		
0.05	7/9/07	R	28							1.9					
0.1	4/3/06	R	28				2.9								
0.1	7/6/04	R	29							2.9					
0.14	1/23/06	R	22	2.9											
0.18	7/23/03	R	15							514					
0.2	9/11/06	R	27									4			
0.2	7/29/08	R	29							2					
0.21	9/16/08	R	23									4			
0.25	5/22/06	R	28					2.9							
0.28	7/24/02	R	30							3.6					
0.36	7/7/09	R	0							16					
0.4	4/7/03	R	15				2.9								
0.48	5/2/07	R	22					1.9							
0.65	10/23/06	R	0										16		
0.73	10/28/02	R	23										3.6		
0.8	4/30/03	R	25				2.9								
0.85	4/6/04	R	26				2.9								
0.92	5/15/02	R	15					23							
1.01	6/15/05	R	22						7.3						
1.03	5/11/09	R	26					1.9							
1.05	9/10/07	R	32									20			



3 day total	Date	Strat	Salin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.24	11/30/04	R	0											3.6	
1.32	5/24/04	R	22					23							
1.45	1/8/07	R	15	1.9											
1.49	11/16/09	R	25											4	
1.53	10/27/03	R	6										75		
1.55	6/6/07	R	15						10						
3.32- FLOOD	5/23/05	R	20					150							

There is a perennial stream that drains into the southernmost portion of Blue Hill Salt Pond, south of stations EF 10 and 9.7 (Stream 450 on Figure 8). This stream has been sampled over the past ten years, and results are presented in Table 11. Results show that this stream has had elevated water quality scores over the summer months. Samples collected during the proposed open status period have had clean results and no closure around the mouth of this stream is recommended at this time.

Table 11. Salt Pond Stream Data

Stream ID	Date	Col score	GPM
EF00450.00	7-Jun-00	460	900
EF00450.00	13-Jun-00	93	800
EF00450.00	9-Aug-00	23	500
EF00450.00	13-Jun-01	240	100
EF00450.00	12-Nov-02	9.1	999
EF00450.00	8-Oct-03	23	150
EF00450.00	15-Jun-04	2.9	350
EF00450.00	21-Dec-05	2.9	150
EF00450.00	28-Jul-08	54	2298

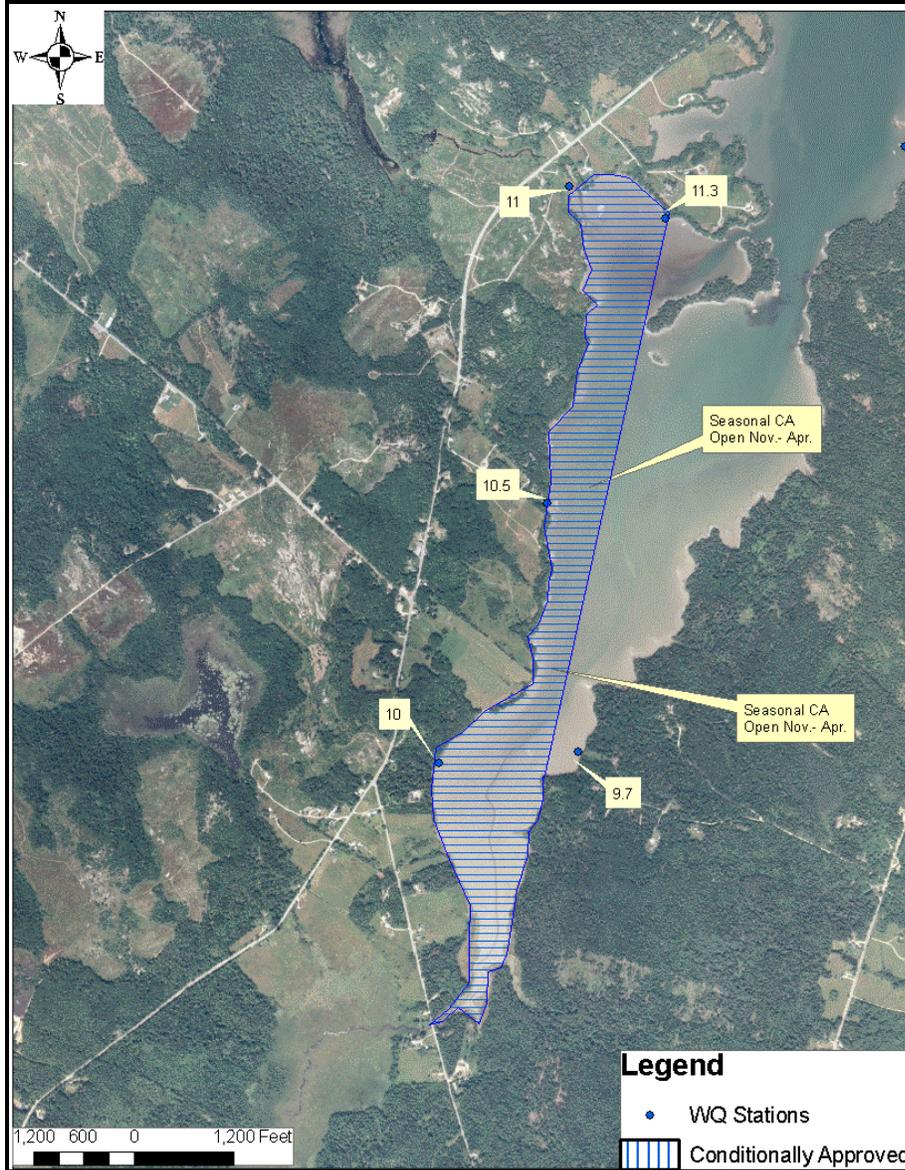
Based on these assessments, a portion of Blue Hill Salt Pond is being recommended for a conditionally approved classification, based on seasonality, with an open status from November 1 to April 30 (Figure 9). Using a dataset covering this open status, this area currently meets the approved standard. However, the results are based on less than 30 datapoints. Additional (extra) samples should be collected during the open status in 2010 and 2011. Furthermore, extra samples should be collected in the closed status in 2011 and if the water scores continue to improve and show clean scores during the summer and fall months, this area can be re-evaluated for an upgrade in classification to approved year round.

Table 12. Blue Hill Salt Pond, Proposed Open Status Results, 1998-2009

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
EF010.00	A	24	6	3.3	0.23	14	6.5	43	257	3/16/1998
EF010.50	R	18	6	3.5	0.36	44	10.4	42	244	11/20/2000
EF011.00	R	27	6	3.3	0.27	43	7.6	44	261	3/16/1998
EF011.30	R	19	6	2.7	0.1	4	3.8	42	247	11/20/2000



Figure 9. Proposed Seasonal Conditionally Approved Area in Blue Hill Salt Pond



Shoreline Survey Activity

A drive through survey was conducted on November 19, 2009. It was noted that a sewer line in Blue Hill is in the process of being extended south and east along the Route 172 and Route 176 intersection near Trade Winds Market. No other changes in pollution sources were noted.



Aquaculture/Wet Storage Activity

Area EF has four licensed shellfish aquaculture lease sites. Three of these sites are commercial suspended culture for mussels, oysters, scallops and surf clams while the fourth is a private site for oysters using tray racks. The three commercial sites are shown below in Figures 10 through 12.

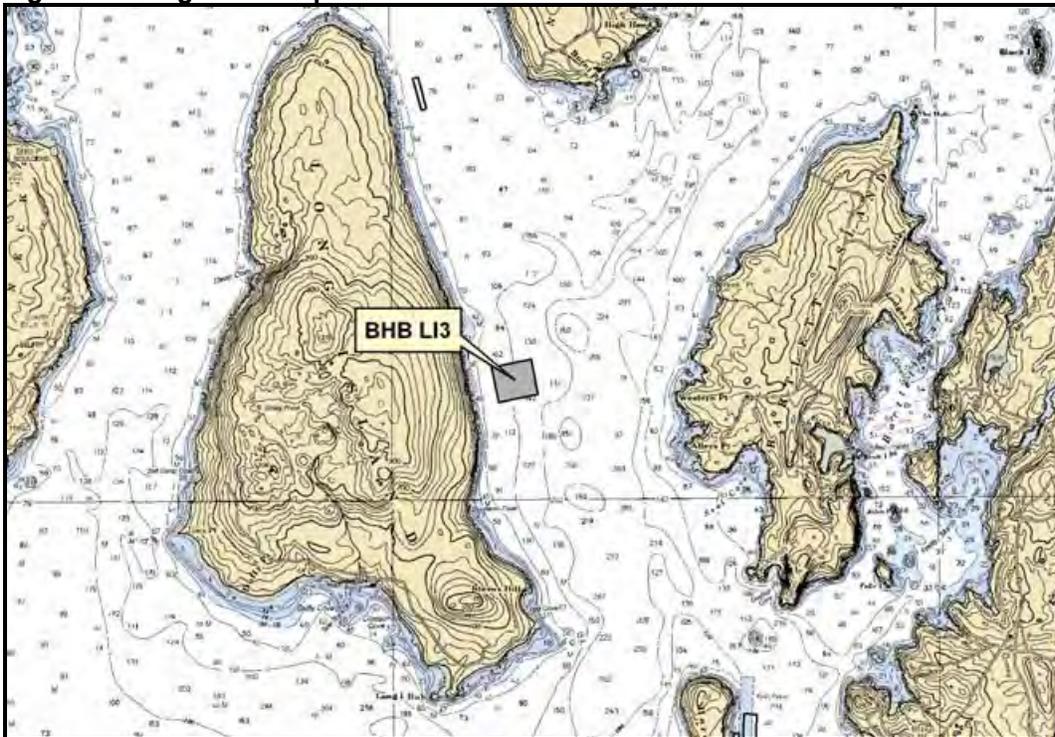
Location: East of Long Island Blue Hill Bay Blue Hill Hancock County

Acreage: 51.42

Species Cultivated: mussel blue sea (*Mytilus edulis*)

Cultivation Technique(s): Suspended

Figure 10 Long Island Aquaculture



Location: East of Long Island Blue Hill Bay Blue Hill Hancock County

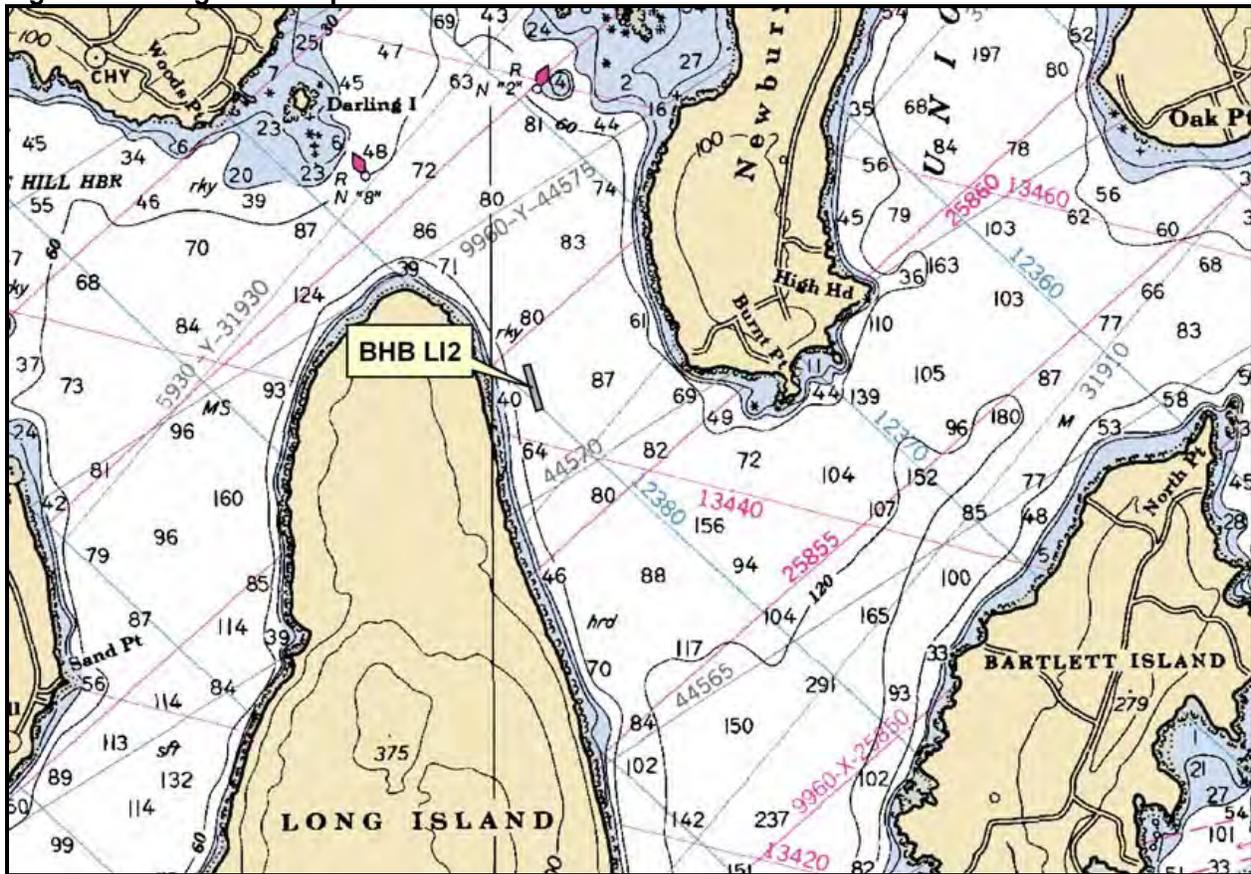
Acreage: 6

Species Cultivated: mussel blue sea (*Mytilus edulis*)

Cultivation Technique(s): Suspended



Figure 11. Long Island Aquaculture



Location: Blue Hill Salt Pond Blue Hill Bay Blue Hill Hancock County

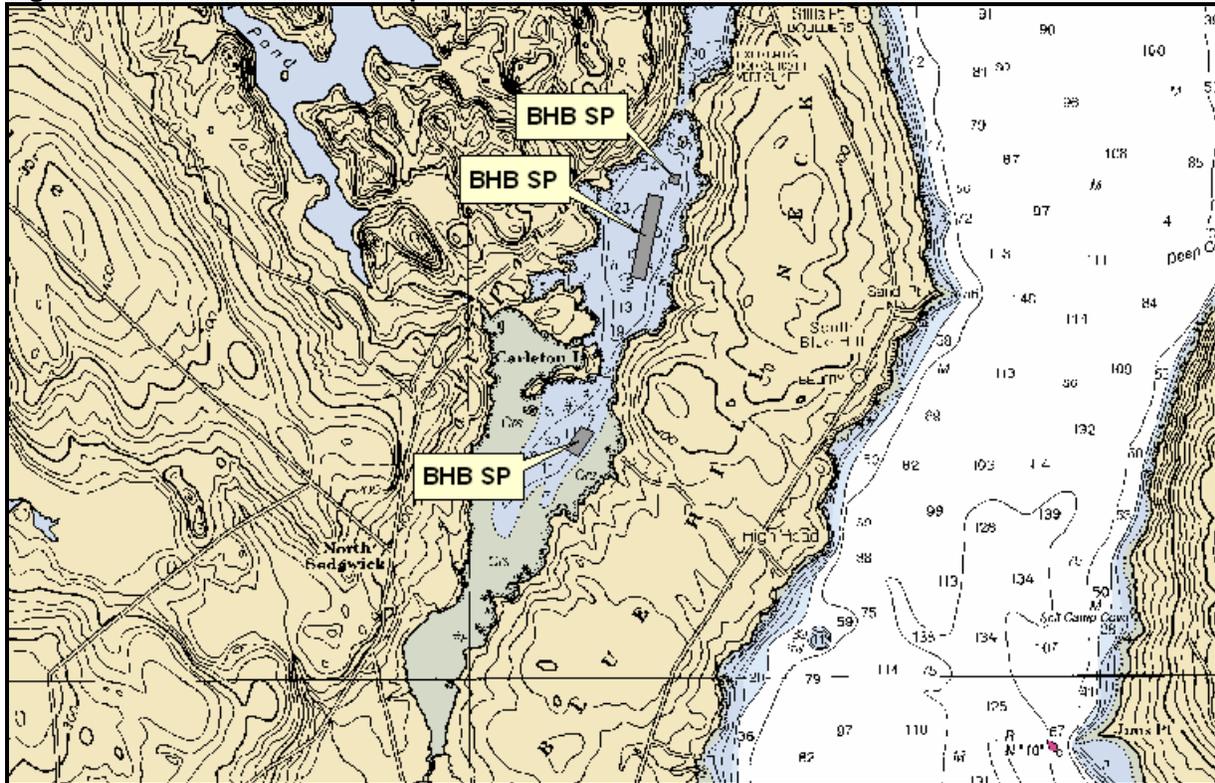
Acreage: 19

Species Cultivated: oyster eastern / american (*Crassostrea virginica*) - oyster european flat (*Ostrea edulis*) - mussel blue sea - (*Mytilus edulis*) - scallop sea (*Placopecten magellanicus*) - clam surf / hen (*Spisula solidissima*) - kelp fingered / horsetail (*Laminaria digitata*) - kelp hollow-stemmed / oarweed (*Laminaria longicuris*) - kelp sugar (*Laminaria saccharina*) - kelp winged (*Alaria esculenta*) - dulse (*Palmaria palmata*) - nori/laver (*Porphyra*) - sea lettuce (*Ulva lactuca*)

Cultivation Technique(s): Suspended



Figure 12. Blue Hill Salt Pond Aquaculture Sites



Classification Changes

At the end of the 2009 review year, all EF stations were meeting their NSSP standard. One station EF 10 was at 90% of the standard and a data assessment found it to be seasonally impacted. The area is being recommended for a downgrade in classification from approved to conditionally approved based on seasonality. As a result of this annual review, one area is being proposed for an upgrade in classification: the southwest portion of Blue Hill Salt Pond, Sedgwick is being recommended for an upgrade from restricted to conditionally approved with an open status from November 1st - April 30th.

Summary

Water quality for this growing area has remained consistent with only a few stations showing an upward trend (decreasing water quality) and most stations remaining steady or improving. All approved stations met their NSSP classification standard in 2009. Station EF 25 and EF 10, are the two approved stations that showed an upward trend and EF 10 is being recommended for reclassification to conditionally approved based on seasonality. Even though EF 14 has shown improving water quality and now meets the approved standard it has shown high variability year round and will remain classified restricted until further assessment shows that it is consistently clean.



Recommendation for Future Work

During the 2010 sampling season, a stream study will be conducted at the head of Morgan Bay (Emerton Stream) to gather more stream data to better assess the possible impacts to the receiving waters. Stations EF 25 and EF 24.9 located at the head of Morgan Bay, Surry will be put on an accelerated sampling schedule to help build data to help conduct a seasonal data analysis for this area. No other survey work is scheduled for this area in 2010.

References

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

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

Blue Hill WWTP interview with operator Dave Dietrich conducted on 1/7/10

Maine Office of GIS 2010.



Appendix A. Annual Review of Conditional Area Management Plan – Blue Hill Harbor

Scope

The Blue Hill Harbor area is classified conditionally approved and conditionally restricted based on the proper functioning of the Blue Hill Wastewater Treatment Facility. The areas on both sides of Peters Point, Blue Hill including Peters Cove are classified conditionally restricted. The area south of a line running from Sculpin Point to Parker Point is classified conditionally approved.

Compliance with management plan

There were no malfunctions at the Blue Hill Wastewater Treatment Plant in 2009.

Adequacy of reporting and cooperation of involved persons

A review of WWTP and DMR records show management plan violations have been reported by the municipal treatment plant staff to the Department of Marine Resources public health laboratory staff within acceptable time limits and with adequate detail to initiate action. For the year 2009, there were no reported bypasses at the Blue Hill WWTP. The effectiveness of this management plan is excellent due to the close working relationship between the treatment plant staff, local law enforcement agencies and the Maine Department of Marine Resources Water Quality Laboratory, Lamoine. The timetable of events, details of noncompliance issues, estimates of repair intervals and updates of the plant’s treatment effectiveness reporting fall within management plan compliance limits. Maine Marine Patrol officers have alerted local shellfish harvesters to any regulation changes. Legal closure of the area is automatically enacted immediately at the time of notification, with written regulation amendment dependent on administrative staffing and violation event timing (regular work hours, nighttime hours, weekends, and holidays). (See MOU documents included in Conditional Area Management Plan). No anecdotal evidence (failing water testing criteria, shoreline survey, and reported illness) suggests that a public health risk exists when the treatment plant is operating correctly.

Compliance with approved growing area criteria

All stations within the conditional area met conditionally approved and conditionally restricted standards in the open status (Table 1).

Table 1. Water Quality Report for Conditional Area Stations in EF for 2009, Open Status

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std
EF015.00	CA	30	30	3	0.4	70	10	31	163
EF016.00	CA	30	30	2.8	0.38	80	8.9	31	163
EF016.50	CA	30	30	2.9	0.46	120	11.3	31	163
EF017.80	CR	30	30	4.2	0.57	180	22.5	31	163
EF018.00	CR	30	30	6	0.64	520	40.7	31	163
EF019.00	CA	30	30	2.5	0.33	50	7	31	163
EF020.00	CA	30	30	2.5	0.38	148	8	31	163



Field inspection of critical pollution sources

The pollution source influencing the conditional area is the outfall pipe from the Blue Hill Wastewater Treatment Facility. The status of the outfall pipe, to include the volume or composition of the plant effluent, has not changed during this review period. Annual sewage treatment plant and licensed overboard discharge operation standards are reviewed by the Maine Department of Environmental Protection. There is an ongoing cooperative review of the treatment plant operation by the Department of Marine Resources and Maine Department of Environmental Protection (DEP) based on annual inspection documents, site visit and DEP inspector interviews.

Water sampling compliance history

Conditional area sampling was conducted monthly during open status (Table 2). Monitoring stations are part of a monthly scheduled conditional area sampling run. Samples from stations EF15, 16, 16.5, 17.80, 18, 19, and 20 are taken two weeks after a treatment facility noncompliance event along with 3 shellfish samples from the conditional areas near station 15, 19 and 20 to determine if it may be reopened. All conditionally approved and conditionally restricted stations were sampled monthly during the open status. Station 15 was sampled twice in March to help build data since it was only added to the run in 2007. Station 16, 16.5 and 18 were missed in January because of ice and was only able to be sampled once in February because of ice so they were sampled twice in March. Station 17.8, 19 and 20 were sampled twice in March to get more data.

Table 2. Sample Count for 2009

Station	Strategy	Status	Class	Sample Count	Total
EF015.00	E	O	CA	1	13
	R	O	CA	12	
EF016.00	R	O	CA	12	12
EF016.50	R	O	CA	12	12
EF017.80	E	O	CR	1	13
	R	O	CR	12	
EF018.00	R	O	CR	12	12
EF019.00	E	O	CA	1	13
	R	O	CA	12	
EF020.00	E	O	CA	1	13
	R	O	CA	12	



Analysis-recommendations

No recommendations for changes to the current management plan or conditional area classification status are needed at this time.



Appendix B. 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.

Min-Date= this is the earliest date for the data set



Appendix C. Growing Area EF 2009 Data

Station	Date	Strategy	Status	Class	Adversity	Temp	Salinity	Tide	Wind	Col Score
EF001.00	3/24/2009	R	O	A		2	30	E	N	<2
	5/12/2009	R	O	A		10	29	HF	S	<2
	7/8/2009	R	O	A	P	8	29	E	E	5.4
	8/11/2009	R	O	A	P	16	29	H	NW	2
	9/22/2009	R	O	A	O	11	32	HF	S	13
	11/17/2009	R	O	A	O	6	30	E	W	<2
EF001.90	3/23/2009	R	O	R		0	27	E	NW	<2
	5/11/2009	R	O	R	P	7	28	H	CL	<2
	7/7/2009	R	O	R	P	15	18	F	SE	16
	8/5/2009	R	O	R	O	17	16	F	SE	31
	9/23/2009	R	O	R	O	16	30	F	SE	<2
	11/16/2009	R	O	R	P	9	30	H	NW	5.4
EF002.00	3/23/2009	R	O	R		0	28	E	NW	<2
	5/11/2009	R	O	R	P	7	25	HF	CL	2
	7/7/2009	R	O	R	P	15	24	F	SE	9.1
	8/5/2009	R	O	R	O	17	9	F	SE	40
	9/23/2009	R	O	R	O	16	30	F	SE	<2
	11/16/2009	R	O	R	P	9	30	H	NW	2
EF002.50	3/23/2009	R	O	A		-1	32	E	NW	<2
	5/11/2009	R	O	A	P	6	30	HF	CL	<2
	7/7/2009	R	O	A	P	14	29	F	SE	<2
	8/5/2009	R	O	A	O	16	30	F	SE	2
	9/23/2009	R	O	A	O	14	30	F	SE	<2
	11/16/2009	R	O	A	P	8	30	H	NW	<2
EF004.00	3/23/2009	R	O	A		0	31	E	NW	<2
	5/11/2009	R	O	A	P	6	28	HF	CL	<2
	7/7/2009	R	O	A	P	14	29	F	SE	2
	8/5/2009	R	O	A	O	16	30	F	SE	4
	9/23/2009	R	O	A	O	13	30	LF	SE	2
	11/16/2009	R	O	A	P	9	31	H	NW	<2
EF004.10	3/23/2009	R	O	A		1	31	E	NW	<2
	5/11/2009	R	O	A	P	7	28	HF	CL	<2
	7/7/2009	R	O	A	P	14	29	F	SE	2
	8/5/2009	R	O	A	O	16	29	F	SE	<2
	9/23/2009	R	O	A	O	13	32	LF	SE	<2
	11/16/2009	R	O	A	P	9	28	H	NW	86
EF005.00	3/23/2009	R	O	A		-1	30	E	NW	<2
	5/11/2009	R	O	A	P	6	29	HF	CL	2
	7/7/2009	R	O	A	P	14	26	F	SE	11
	8/5/2009	R	O	A	O	16	30	F	SE	2
	9/23/2009	R	O	A	O	14	31	LF	SE	<2
	11/16/2009	R	O	A	P	9	30	H	NW	80
EF006.00	3/23/2009	R	O	A		0	30	E	NW	<2
	5/11/2009	R	O	A	P	6	28	HF	CL	<2
	7/7/2009	R	O	A	P	14	25	F	SE	2



Station	Date	Strategy	Status	Class	Adversity	Temp	Salinity	Tide	Wind	Col Score
	8/5/2009	R	O	A	O	16	28	F	SE	<2
	9/23/2009	R	O	A	O	14	30	LF	SE	2
	11/16/2009	R	O	A	P	9	30	HE	NW	<2
EF008.00	3/23/2009	R	C	P		0	31	E	NW	<2
	5/11/2009	R	C	P	P	5	30	F	CL	<2
	7/7/2009	R	C	P	P	15	28	HF	SE	2
	8/5/2009	R	C	P	O	16	28	F	SE	<2
	9/23/2009	R	C	P	O	13	30	LF	SE	10
	11/16/2009	R	C	P	P	8	30	HE	NW	8
	EF009.00	3/23/2009	R	O	A	W	-1	32	E	NW
5/11/2009		R	O	A	P	5	30	F	NW	4
7/7/2009		R	O	A	P	12	27	HF	SE	14
8/5/2009		R	O	A	O	16	28	F	SE	<2
9/23/2009		R	O	A	O	14	30	LF	SE	<2
10/28/2009		A	C	A	F	6	30	E	NE	<2
10/29/2009		A	C	A	F	6	30	E	E	<2
10/30/2009		A	C	A	F	7	30	E	S	<2
11/16/2009	R	O	A	P	9	30	HE	NW	2	
EF009.30	3/24/2009	R	O	A		3	28	E	N	<2
	5/11/2009	R	O	A	P	6	27	F	NW	<2
	6/1/2009	E	O	A	P	11	26	E	W	<2
	7/7/2009	R	O	A	P	15	26	F	SE	2
	8/5/2009	R	O	A	O	17	24	F	SE	5.5
	9/23/2009	R	O	A	O	14	30	L	SE	2
	10/28/2009	A	C	A	F	5	28	E	NE	<2
	10/29/2009	A	C	A	F	6	28	E	E	2
	10/30/2009	A	C	A	F	7	26	E	S	<2
	11/16/2009	R	O	A	P	9	18	HF	NW	4
EF009.70	3/23/2009	R	O	A		-2	7	HE	NW	<2
	5/11/2009	R	O	A	P	8	25	H	CL	<2
	6/1/2009	E	O	A	P	10	26	E	W	<2
	7/7/2009	R	O	A	P	15	28	F	SE	<2
	8/5/2009	R	O	A	O	20	24	HF	SE	6
	9/28/2009	R	O	A	P	15	28	H	SW	108
	11/16/2009	R	O	A	P	9	30	HF	NW	<2
EF010.00	3/23/2009	R	O	A		-1	14	E	NW	<2
	4/27/2009	A	C	A	F	8	22	HF	SW	<2
	5/11/2009	R	O	A	P	7	20	HF	CL	2
	6/1/2009	E	O	A	P	11	28	E	W	<2
	6/15/2009	A	C	A	F	15	21	E	CL	6
	6/16/2009	A	C	A	F	15	15	E	SW	14
	6/17/2009	A	O	A	F	16	26	HE	SW	<2
	6/23/2009	A	C	A	F	13	8	H	NE	18
	6/24/2009	A	C	A	F	14	10	HF	NE	6
	6/25/2009	A	C	A	F	15	22	H	S	20
	7/7/2009	R	O	A	P	14	12	F	SE	27
	8/5/2009	R	O	A	O	20	26	HF	SE	2



Station	Date	Strategy	Status	Class	Adversity	Temp	Salinity	Tide	Wind	Col Score
	8/27/2009	A	C	A	F	17	25	E	NW	4
	8/28/2009	A	C	A	F	14	12	E	CL	14
	8/29/2009	A	C	A	F	11	24	F	SE	<2
	9/1/2009	A	C	A	F	14	6	F	CL	31
	9/2/2009	A	C	A	F	15	21	F	CL	2
	9/28/2009	R	O	A	P	15	28	H	SW	140
	11/16/2009	R	O	A	P	10	20	F	NW	14
EF010.50	3/23/2009	R	O	R		-1	5	E	NW	<2
	5/11/2009	R	O	R	P	10	25	HF	W	<2
	7/7/2009	R	O	R	P	14	12	F	SE	29
	8/5/2009	R	O	R	O	19	0	F	SE	28
	9/23/2009	R	O	R	O	15	6	L	SE	4
	11/16/2009	R	O	R	P	9	24	F	NW	4
EF011.00	3/23/2009	R	O	R		-1	6	E	NW	2
	5/11/2009	R	O	R	P	10	8	HF	W	<2
	7/7/2009	R	O	R	P	14	0	F	SE	<2
	8/5/2009	R	O	R	O	20	0	F	SE	20
	9/23/2009	R	O	R	O	15	8	L	SE	2
	11/16/2009	R	O	R	P	9	10	F	NW	6
EF011.30	3/23/2009	R	O	R		0	26	E	NW	<2
	5/11/2009	R	O	R	P	9	26	HF	CL	<2
	7/7/2009	R	O	R	P	15	0	F	SE	16
	8/5/2009	R	O	R	O	20	0	F	SE	48
	9/23/2009	R	O	R	O	15	8	LF	SE	4
	11/16/2009	R	O	R	P	9	25	F	NW	4
EF012.00	3/23/2009	R	O	A		1	22	E	NW	<2
	5/11/2009	R	O	A	P	9	26	HF	CL	<2
	7/7/2009	R	O	A	P	14	18	F	SE	30
	8/5/2009	R	O	A	O	20	6	F	SE	128
	9/23/2009	R	O	A	O	15	30	LF	SE	6
	11/16/2009	R	O	A	P	9	28	F	NW	2
EF012.10	3/23/2009	R	O	A		1	30	E	NW	<2
	5/11/2009	R	O	A	P	8	28	HF	CL	<2
	7/7/2009	R	O	A	P	14	25	F	SE	33
	8/5/2009	R	O	A	O	20	14	F	SE	106
	9/23/2009	R	O	A	O	15	30	LF	SE	<2
	11/16/2009	R	O	A	P	9	28	F	NW	2
EF013.00	3/23/2009	R	O	A		-2	30	E	NW	<2
	5/11/2009	R	O	A	P	5	28	F	NW	<2
	7/7/2009	R	O	A	P	13	26	HF	SE	<2
	8/5/2009	R	O	A	O	16	28	F	SE	10
	9/23/2009	R	O	A	O	14	30	LF	SE	<2
	11/16/2009	R	O	A	P	8	29	HE	NW	2
EF014.00	3/23/2009	R	O	R		0	17	E	NW	<2
	5/11/2009	R	O	R	P	5	30	F	NW	<2
	7/7/2009	R	O	R	P	15	0	H	SE	38
	8/5/2009	R	O	R	O	18	24	F	SE	5.5



Station	Date	Strategy	Status	Class	Adversity	Temp	Salinity	Tide	Wind	Col Score
	9/23/2009	R	O	R	O	14	31	LF	SE	<2
	11/16/2009	R	O	R	P	9	24	HE	NW	6
EF015.00	1/5/2009	R	O	CA		2	30	LF	CL	<2
	2/25/2009	R	O	CA		0	29	HE	CL	<2
	3/9/2009	R	O	CA		1	28	HF	N	22
	3/18/2009	E	O	CA	T	0	28	F	SW	<2
	4/6/2009	R	O	CA	P	4	26	HE	CL	<2
	5/4/2009	R	O	CA		9	30	HE	SW	<2
	6/1/2009	R	O	CA	P	10	26	E	W	<2
	7/7/2009	R	O	CA	P	14	26	HF	SE	25
	8/3/2009	R	O	CA	P	18	27	F	CL	7.3
	9/9/2009	R	O	CA	O	16	30	H	N	2
	10/5/2009	R	O	CA	P	11	30	F	NW	10
	11/2/2009	R	O	CA	O	7	30	HF	NW	2
12/1/2009	R	O	CA	P	5	31	HE	CL	<2	
EF016.00	2/25/2009	R	O	CA		-2	30	HE	CL	<2
	3/9/2009	R	O	CA		0	10	HF	N	<2
	3/18/2009	E	O	CA	T	0	28	F	SW	<2
	4/6/2009	R	O	CA	P	4	28	HE	CL	<2
	5/4/2009	R	O	CA		9	28	HE	SW	<2
	6/1/2009	R	O	CA	P	10	29	E	W	<2
	7/7/2009	R	O	CA	P	14	26	HF	SE	20
	8/3/2009	R	O	CA	P	19	27	F	CL	7.3
	9/9/2009	R	O	CA	O	15	30	H	N	<2
	10/5/2009	R	O	CA	P	12	29	F	NW	10
	11/2/2009	R	O	CA	O	7	26	HF	NW	<2
	12/1/2009	R	O	CA	P	5	31	HE	W	<2
EF016.50	2/25/2009	R	O	CA		0	30	HE	CL	<2
	3/9/2009	R	O	CA		0	22	HF	N	<2
	3/18/2009	E	O	CA	T	0	29	LF	SW	<2
	4/6/2009	R	O	CA	P	4	30	HE	CL	<2
	5/4/2009	R	O	CA		9	28	HE	SW	<2
	6/1/2009	R	O	CA	P	10	29	E	W	<2
	7/7/2009	R	O	CA	P	15	20	HF	SE	120
	8/3/2009	R	O	CA	P	17	27	F	CL	6
	9/9/2009	R	O	CA	O	16	30	HF	N	<2
	10/5/2009	R	O	CA	P	12	30	F	NW	2
	11/2/2009	R	O	CA	O	7	28	HF	NW	<2
	12/1/2009	R	O	CA	P	5	31	HE	W	2
EF017.80	1/5/2009	R	O	CR		2	30	LF	CL	<2
	2/25/2009	R	O	CR		-1	28	HE	CL	<2
	3/9/2009	R	O	CR		0	5	HF	N	2
	3/18/2009	E	O	CR	T	0	7	F	SW	<2
	4/6/2009	R	O	CR	P	4	25	HE	CL	<2
	5/4/2009	R	O	CR		9	30	HE	SW	<2
	6/1/2009	R	O	CR	P	10	28	E	W	18
	7/7/2009	R	O	CR	P	15	26	H	SE	6



Station	Date	Strategy	Status	Class	Adversity	Temp	Salinity	Tide	Wind	Col Score
	8/3/2009	R	O	CR	P	16	22	F	CL	62
	9/9/2009	R	O	CR	O	15	30	HF	N	2
	10/5/2009	R	O	CR	P	12	27	F	NW	46
	11/2/2009	R	O	CR	O	7	30	F	NW	<2
	12/1/2009	R	O	CR	P	4	30	HE	W	<2
EF018.00	2/25/2009	R	O	CR		-1	0	HE	CL	2
	3/9/2009	R	O	CR		0	6	HF	N	9
	3/18/2009	E	O	CR	T	-1	0	F	SW	<2
	4/6/2009	R	O	CR	P	4	9	HE	CL	2
	5/4/2009	R	O	CR		9	20	HE	SW	<2
	6/1/2009	R	O	CR	P	10	25	E	W	2
	7/7/2009	R	O	CR	P	16	8	H	SE	27
	8/3/2009	R	O	CR	P	16	26	F	CL	5.5
	9/9/2009	R	O	CR	O	15	28	HF	N	<2
	10/5/2009	R	O	CR	P	11	0	F	CL	66
	11/2/2009	R	O	CR	O	8	22	F	NW	6
12/1/2009	R	O	CR	P	6	29	HE	CL	<2	
EF019.00	1/5/2009	R	O	CA		3	30	LF	CL	<2
	2/2/2009	R	O	CA		0	30	F	CL	<2
	2/25/2009	E	O	CA		0	30	E	CL	<2
	3/9/2009	R	O	CA		0	31	F	N	<2
	4/6/2009	R	O	CA	P	4	24	HE	CL	2
	5/4/2009	R	O	CA		9	30	HE	SW	18
	6/1/2009	R	O	CA	P	10	29	E	W	<2
	7/7/2009	R	O	CA	P	14	24	H	SE	6
	8/3/2009	R	O	CA	P	16	27	F	CL	2
	9/9/2009	R	O	CA	O	14	30	HF	N	<2
	10/5/2009	R	O	CA	P	11	30	F	CL	4
	11/2/2009	R	O	CA	O	7	30	F	NW	<2
	12/1/2009	R	O	CA	P	5	31	HE	W	<2
EF020.00	1/5/2009	R	O	CA		3	30	LF	CL	<2
	2/2/2009	R	O	CA		0	30	F	CL	<2
	2/25/2009	E	O	CA		0	30	E	CL	<2
	3/9/2009	R	O	CA		0	32	F	N	<2
	4/6/2009	R	O	CA	P	4	26	HE	CL	<2
	5/4/2009	R	O	CA		9	29	HE	SW	5.4
	6/1/2009	R	O	CA	P	10	29	E	W	<2
	7/7/2009	R	O	CA	P	14	24	H	SE	10
	8/3/2009	R	O	CA	P	16	26	F	CL	<2
	9/9/2009	R	O	CA	O	14	30	HF	NE	<2
	10/5/2009	R	O	CA	P	11	30	F	CL	4
	11/2/2009	R	O	CA	O	7	30	F	NW	<2
	12/1/2009	R	O	CA	P	5	31	H	CL	<2
EF020.50	3/23/2009	R	O	A		-1	28	HE	NW	<2
	5/11/2009	R	O	A	P	6	28	F	CL	<2
	7/7/2009	R	O	A	P	14	24	HE	SE	8
	8/5/2009	R	O	A	O	18	22	HF	SE	26



Station	Date	Strategy	Status	Class	Adversity	Temp	Salinity	Tide	Wind	Col Score
	9/23/2009	R	O	A	O	14	31	L	SE	<2
	11/16/2009	R	O	A	P	8	30	E	NW	<2
EF023.00	3/23/2009	R	C	P		-1	31	HE	NW	<2
	5/11/2009	R	C	P	P	6	29	F	CL	<2
	7/7/2009	R	C	P	P	14	24	HE	SE	20
	8/5/2009	R	C	P	O	18	22	HF	SE	9.1
	9/23/2009	R	C	P	O	13	30	L	SE	3.6
	11/16/2009	R	C	P	P	8	32	E	NW	<2
	EF024.00	3/23/2009	R	O	A		-1	30	HE	NW
5/11/2009		R	O	A	P	6	29	F	CL	<2
7/7/2009		R	O	A	P	14	24	HE	SE	10
8/5/2009		R	O	A	O	18	22	HF	SE	18
9/23/2009		R	O	A	O	14	29	L	SE	12
10/28/2009		A	C	A	F	5	30	E	NE	<2
10/29/2009		A	C	A	F	5	30	E	NE	<2
10/30/2009		A	C	A	F	6	26	E	S	<2
11/16/2009	R	O	A	P	8	30	E	NW	<2	
EF024.90	3/23/2009	R	O	R		-1	26	HE	NW	<2
	4/6/2009	E	O	R	P	4	23	H	CL	<2
	5/11/2009	R	O	R	P	6	26	F	CL	<2
	6/1/2009	E	O	R	P	10	20	E	W	18
	7/7/2009	R	O	R	P	15	10	HE	SE	44
	8/5/2009	R	O	R	O	20	14	H	SE	320
	9/23/2009	R	O	R	O	15	30	F	SE	<2
	10/5/2009	E	O	R	P	12	30	F	NW	14
	10/28/2009	E	O	R	P	4	18	E	SE	25
	11/16/2009	R	O	R	P	9	10	E	NW	18
	11/30/2009	E	O	R	P	5	22	E	SW	6
	12/7/2009	E	O	R	S	6	23	F	CL	2
	12/14/2009	E	O	R	P	5	14	HE	NW	25
EF025.00	3/23/2009	R	O	R		-2	25	H	NW	<2
	4/6/2009	E	O	R	P	4	28	H	CL	<2
	5/11/2009	R	O	A	P	6	30	F	CL	<2
	6/1/2009	E	O	A	P	10	26	E	W	4
	7/7/2009	R	O	A	P	15	13	HE	SE	11
	8/5/2009	R	O	A	O	20	25	H	SE	9.1
	9/23/2009	R	O	A	O	15	31	F	SE	340
	10/5/2009	E	O	A	P	12	28	F	NW	26
	10/28/2009	E	O	A	P	4	23	E	SE	16
	11/16/2009	R	O	A	P	9	30	E	NW	<2
	11/30/2009	E	O	A	P	5	21	E	SW	<2
	12/7/2009	E	O	A	S	6	28	F	CL	18
12/14/2009	E	O	A	P	4	30	HE	NW	<2	
EF026.00	3/23/2009	R	O	A		-2	30	H	NW	<2
	5/11/2009	R	O	A	P	7	28	F	CL	<2
	7/7/2009	R	O	A	P	14	26	HE	SE	74
	8/5/2009	R	O	A	O	18	27	H	SE	<2



Station	Date	Strategy	Status	Class	Adversity	Temp	Salinity	Tide	Wind	Col Score
	9/23/2009	R	O	A	O	14	31	LE	SE	<2
	11/16/2009	R	O	A	P	8	28	E	NW	11