



GROWING AREA WK
Harpswell Sound and Quahog Bay
Towns of Brunswick and Harpswell
ANNUAL REVIEW for 2009

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APPROVAL

Division Director:

Print name

Signature

Date



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Figure 1. Growing Area WK, with Active Water Stations

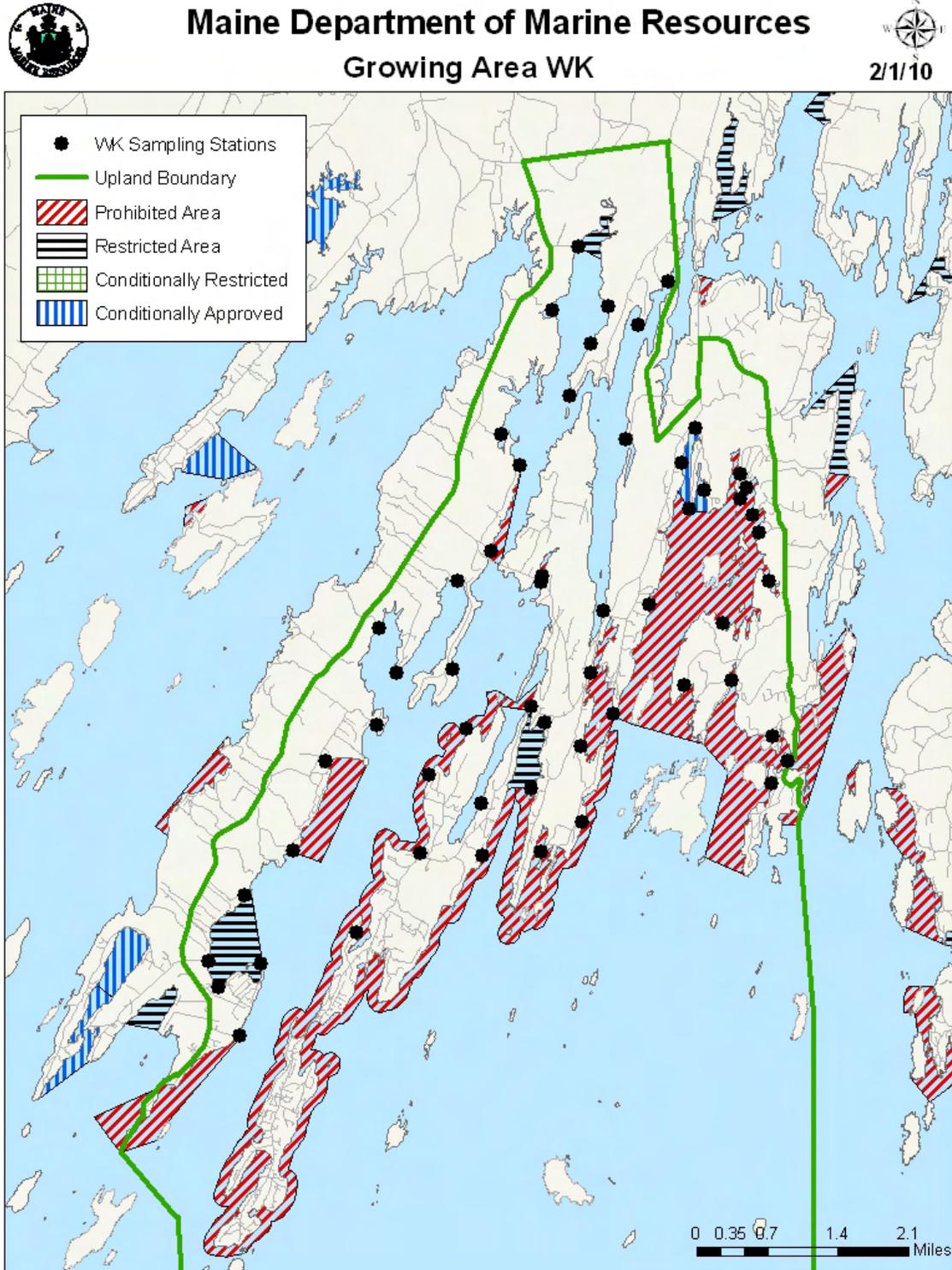


Figure 2. Growing Area WK- Upper Portion

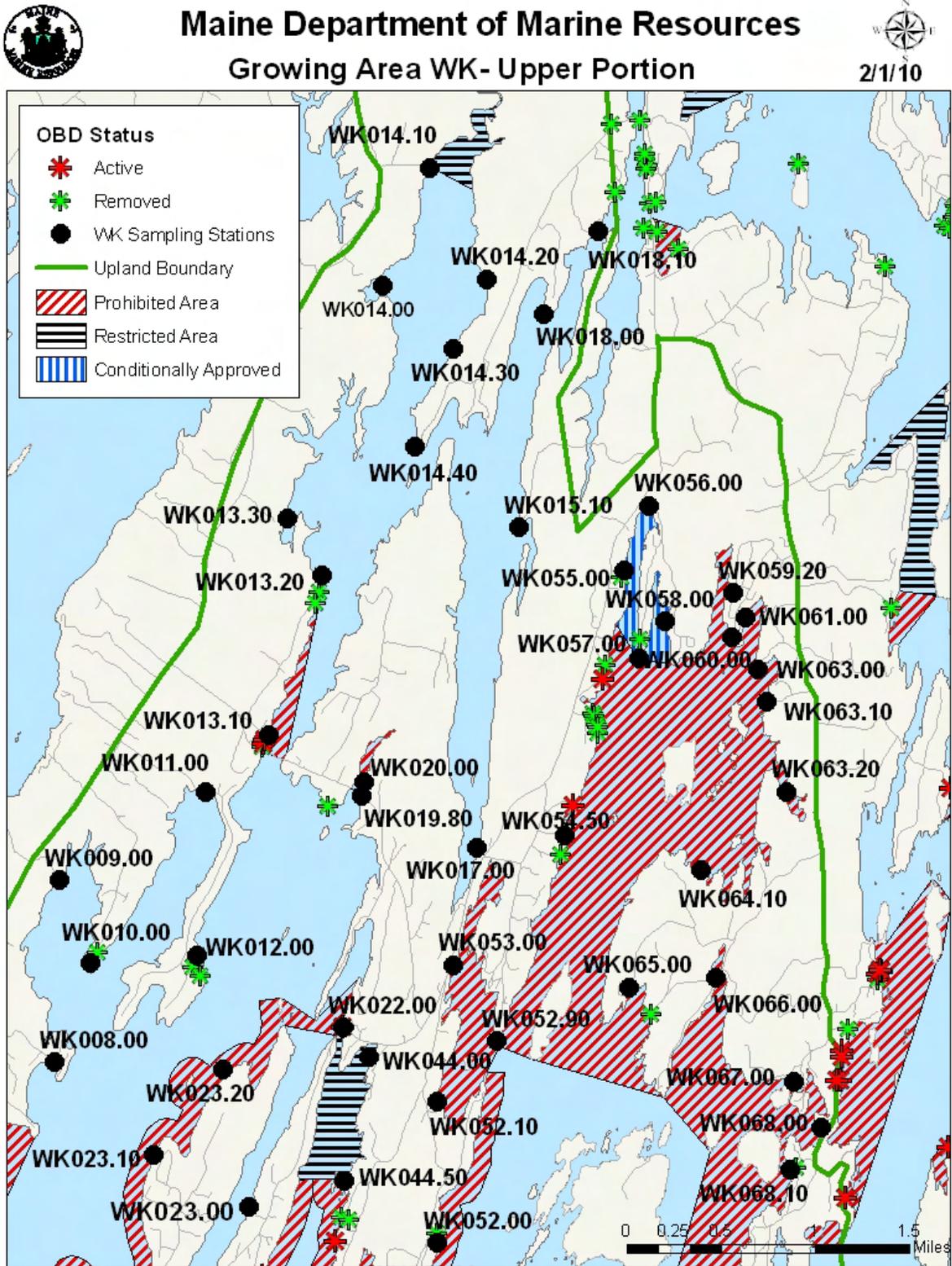
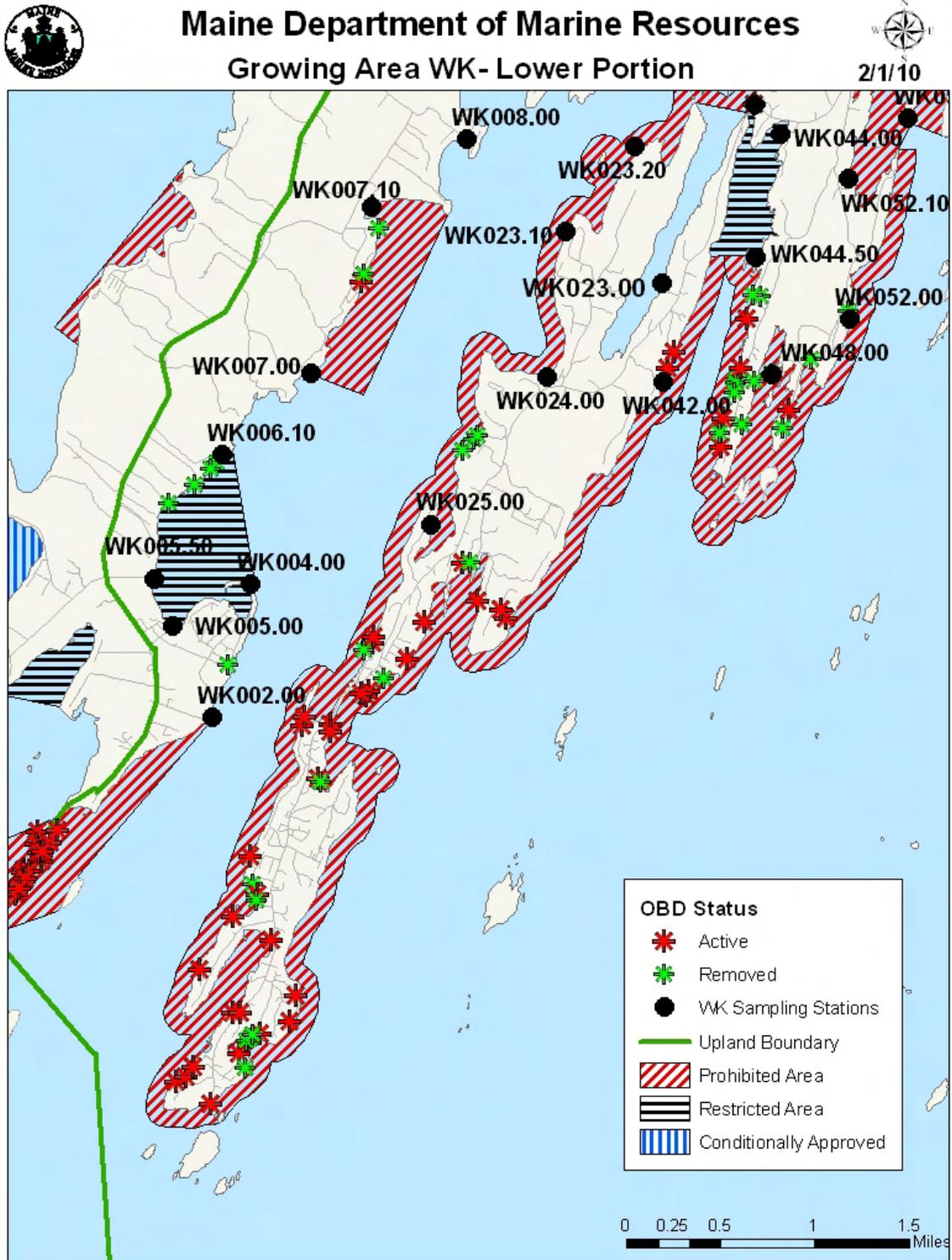


Figure 3. Growing Area WK- Lower Portion





Executive Summary

This is an annual report for growing area WK written in compliance with the requirements of the 2007 Model Ordinance and the National Shellfish Sanitation Program. The next triennial report is due in 2010; the next sanitary survey report will be written in 2017.

In 2009, seven new stations were created in growing area WK; two prohibited stations were deactivated due to a lack of shellfish resource in the area that they were monitoring. Change in pollution sources in area WK includes the removal of seven over board discharges (OBDs); all were located in the town of Harpswell.

As a result of this report, four areas are proposed for an upward classification change. These areas include Harpswell Cove (Brunswick), Mill Cove (Harpswell), Card Cove (Harpswell) and Brickyard Cove (Harpswell). All of these areas are proposed for an approved classification, based on water quality meeting the approved standard and the remediation of known pollution sources. No areas in WK required a downgrade in classification at the end of the current review year.

Growing Area Description

Growing Area WK is located in the towns of Brunswick and Harpswell in the Mid-Coast area of Maine (Figure 1). There is a vast amount of shoreline on three major peninsulas protruding into Casco Bay, as well as numerous islands. Harpswell Neck is the westernmost peninsula. The central peninsula is made up of the western side of Sebascodegan Island, Orrs Island and Bailey Island, with all of them connected to the mainland and each other by bridges. The eastern peninsula is the eastern side of Sebascodegan Island extending south to Cundys Harbor.

Major pollution sources in area WK include OBDs, malfunction of private, residential in-ground septic systems, and intermittent pollution from wildlife and domestic animals. There are no municipal treatment plants with discharges into the water of growing area WK. There are no farms on the shores of growing area WK. There are a total of 56 sampling stations that monitor water quality in growing area WK. Details on sample locations are presented in Figures 2 and 3.

Current Classifications

At the end of 2009, shellfish growing area WK currently has areas classified as:

Approved: total of 17 stations
Stover Point, Harpswell
Merriman, Mill and Widgeon Coves, Harpswell
Harpswell Cove, Harpswell and Brunswick
Long Reach, Harpswell



Conditionally Approved: total of 3 stations

Orrs Cove, Harpswell (WK 55 and 56, Marina/Season)
Mill Cove, Quahog Bay, Harpswell (WK 58 and WK 57 (P-boundary), Seasonal Variation in Water Quality)

Restricted: total of 2 stations

Inner Gun Point Cove, Harpswell (WK 44, non-point source pollution)
Stover Cove, Harpswell (WK 5, non-point source pollution)

Prohibited: total of 21 stations

Harpswell Sound, Harpswell and Brunswick (WK 2, 7.1, 13.1, 13.2, 20, 22, 24, 25, due to overboard discharges)
Card Cove, Harpswell (WK 52.1 and 53, malfunctioning septic)
Quahog Bay, Harpswell (WK 42, 48, 57, 61, 63, 64.1, 65, 66, 67, 68, 68.1, due non-point pollution and OBDs)

There are 13 stations that have less than 30 data points in their dataset, and therefore do not have a classification assigned to them.

Please visit the DMR website to view Legal Notices:

Pollution Area 17A, Upper Harpswell Neck and Long Reach (Brunswick to Harpswell)
Pollution Area 17B, Harpswell Neck (Harpswell)
Pollution Area No. 17C, Bailey Island, Orrs Island and nearby southwest Sebascodegan Island (Harpswell)
Pollution Area No. 18, Quahog Bay, Hen Cove, Ridley Cove (Harpswell).

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

Activity during Review Period

Area 17A

December 3, 2009: Upper Harpswell Neck and Long Reach (Brunswick to Harpswell), amendment reclassifies the lower portion of Harpswell Cove (Brunswick) from restricted to approved, due to the replacement of a malfunctioning septic system, and water quality returning to the approved standard. The upper portion of Harpswell Cove remains classified as restricted.

Area 17B

January 20, 2009: Harpswell Neck (Harpswell), amendment reclassifies several areas on Harpswell Neck from "Approved" and "Conditionally Approved" to "Prohibited," due to lack of a recent shoreline survey, and/or elevated scores during the open status, which fails to meet the requirements of a conditionally approved area.

September 29, 2009: Area No. 17-B, Harpswell Neck (Harpswell), amendment reclassifies the area around High Head (Harpswell) from prohibited to approved, due to the completion of a shoreline survey and the removal of two overboard discharges.



December 29, 2009: Harpswell Neck (Harpswell), amendment reclassifies Harpswell Harbor from prohibited to restricted, due to water quality meeting the restricted standard and the completion of a water quality review for the area. This amendment also reduces the size of the prohibited area in Harpswell Sound, due to water quality meeting the approved standard.

Area 17C

No classification changes in 2009.

Area 18

January 20, 2009: Quahog Bay, Hen Cove, Ridley Cove (Harpswell), this amendment reclassifies portions of Quahog Bay and Ridley Cove from “Conditionally Approved” and “Approved” to “Prohibited,” due to lack of a recent shoreline survey, and/or elevated scores during the open status, which fails to meet the requirements of a conditionally approved area.

January 30, 2009: Quahog Bay, Hen Cove, Ridley Cove (Harpswell), this amendment reclassifies Orrs Cove, Harpswell as conditionally approved following a recent review of the Conditional Area Management Plan and open status water quality data, and reclassifies the lower part of Mill Cove as conditionally approved, due to an updated shoreline survey.

September 23, 2009: Quahog Bay, Hen Cove, Ridley Cove (Harpswell), this amendment reclassifies the upper portion of Mill Cove (Harpswell) from Prohibited to Conditionally Approved based on season, due to the completion of a shoreline survey.

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

There are two management plans for three conditional areas in growing area WK:

- Orrs Cove Seasonal Marina Conditional Area; closed May through Nov 30
- Mill Cove (Quahog Bay) Seasonal Conditional Area; closed May through Sept 30

Copies of the management plans can be found in the central files.

Current Annual Review of Management Plan(s)

Orrs Cove Seasonal Marina Conditionally Approved Area

In 2009, the seasonal marina conditionally approved area at Great Island Boatyard in Orrs Cove, Harpswell, closed on May 1 and reopened on December 1. The area was visited on November 17, 2009 to confirm there were fewer than 10 boats with heads remaining in the water, and a review of the water quality showed that the area continued to meet approved standards for the open season. A complete management plan review can be found in Appendix A.



Mill Cove (Quahog Bay) Seasonal Conditionally Approved Area

In 2009, the seasonal conditional area closed on May 1 and reopened on October 1. The seasonal water quality was reviewed prior to reopening and water quality at Station WK 58 continued to meet approved standards for the open season. A complete management plan review can be found in Appendix B.

Water Quality Review and Discussion

Table 1 lists all active approved, restricted and prohibited stations in Growing Area WK, with their respective Geomean and P90 calculations for 2009. Please refer to Appendix C 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 versus 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. At the end of 2009, all approved and restricted stations met their NSSP classification standard. Several prohibited stations also met the approved classification standard, however, these will remain classified as prohibited due to their proximity to active over board discharges.

Table 1. Geomean and P90 Scores, Growing Area WK, 2004-2009

Station	Class	Count	MFCnt	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK002.00	P-boundary	30	20	2.6	0.22	14	5	36	199	4/21/2005
WK004.00	A	30	30	2.9	0.56	420	15.7	31	163	10/2/2006
WK005.00	R	30	30	5.7	0.69	1560	44.4	31	163	9/20/2006
WK005.50	New	4	4	1.9	0	1.9	1.9	31	163	9/21/2009
WK006.10	A	30	30	2.5	0.3	36	6.2	31	163	10/2/2006
WK007.00	A	30	26	2.3	0.16	8	3.8	32	176	3/15/2006
WK007.10	P	30	20	5.3	0.57	220	29.2	36	199	2/9/2005
WK008.00	A	30	20	3.6	0.55	180	19	36	199	4/21/2005
WK009.00	A	30	21	3.1	0.38	90	9.7	35	195	4/21/2005
WK010.00	A	30	21	3	0.41	280	10.3	35	195	4/21/2005
WK011.00	A	30	22	3.7	0.56	800	19.6	35	191	4/21/2005
WK012.00	A	30	20	2.6	0.17	6	4.4	36	199	4/21/2005
WK013.10	P	30	20	3	0.34	42	8.4	36	199	10/6/2004
WK013.20	P	30	20	2.9	0.36	82	8.8	36	199	4/21/2005
WK013.30	A	30	21	3.5	0.38	43	10.9	35	195	4/21/2005
WK014.00	A	30	21	4.8	0.54	200	24.5	35	195	4/21/2005
WK014.10	A	30	30	4.4	0.57	180	24.5	31	163	4/23/2007
WK014.20	A	30	30	3.5	0.44	104	13.1	31	163	4/9/2007
WK014.30	A	30	30	2.7	0.33	42	7.4	31	163	5/16/2007
WK014.40	New	24	21	2.2	0.18	14	3.9	32	175	6/21/2006



Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK015.10	A	30	21	2.4	0.18	13	4.2	35	195	4/21/2005
WK017.00	A	30	20	2.8	0.33	90	7.7	36	199	4/21/2005
WK018.00	A	30	22	3.4	0.57	1200	18.4	35	191	5/17/2005
WK018.10	A	30	20	3.2	0.44	150	12.3	36	199	5/17/2005
WK019.80	New	24	21	3	0.37	42	9.2	32	175	3/15/2006
WK020.00	P	30	21	4.7	0.55	240	24.8	35	195	5/12/2005
WK022.00	P	30	21	2.4	0.18	15	4.3	35	195	6/9/2005
WK023.00	A	30	27	3.7	0.37	40	11.4	32	173	4/12/2006
WK023.10	New	7	7	2.3	0.15	4	3.7	31	163	3/18/2009
WK023.20	New	7	7	2.2	0.18	6	3.9	31	163	3/18/2009
WK024.00	P	30	20	6.4	0.67	920	46.8	36	199	8/25/2005
WK025.00	P	30	20	4.6	0.58	460	26	36	199	5/12/2005
WK042.00	P	30	20	4.1	0.61	1440	25.3	36	199	5/12/2005
WK044.00	R	30	21	2.8	0.33	76	7.6	35	195	6/9/2005
WK044.50	New	25	20	2.7	0.34	33	7.7	33	184	2/7/2006
WK048.00	P	30	20	6	0.68	1200	45.5	36	199	5/12/2005
WK052.00	New	24	20	5.3	0.62	420	34.3	33	180	3/15/2006
WK052.10	P	30	30	4.5	0.46	94	17.7	31	163	11/15/2006
WK052.90	New	3	3	3	0.36	8	9.1	31	163	9/16/2009
WK053.00	P	30	28	5.1	0.6	240	30.7	31	169	6/20/2006
WK054.50	New	6	6	2.1	0.11	3.6	2.9	31	163	2/25/2009
WK059.20	New	22	22	3.2	0.34	28	8.9	31	163	10/22/2007
WK060.00	New	20	20	2.4	0.29	18	5.9	31	163	10/22/2007
WK061.00	P	30	20	9	0.68	240	67.1	36	199	6/29/2005
WK063.00	P	30	20	5.1	0.76	1700	48.6	36	199	6/29/2005
WK063.10	New	6	6	6.8	0.52	31	33.7	31	163	2/25/2009
WK063.20	New	6	6	1.9	0	1.9	1.9	31	163	3/30/2009
WK064.10	P	30	20	4	0.57	240	22.3	36	199	6/29/2005
WK065.00	P	30	20	9	0.89	1700	128.2	36	199	6/29/2005
WK066.00	P	30	20	5.1	0.61	460	32	36	199	6/29/2005
WK067.00	P	30	20	4.5	0.5	93	19.9	36	199	5/11/2005
WK068.00	P	30	20	10.4	0.89	1100	147.8	36	199	5/11/2005
WK068.10	P	30	20	2.9	0.37	93	8.9	36	199	11/29/2004

Tables 2 and 3 list all active conditionally approved stations in Growing Area WK, with their respective Geomean and P90 calculations for 2009; data reflects their respective open status for each conditional area. Both the Orrs Cove and Mill Cove conditionally approved stations met the NSSP approved standard while in the open status.

Table 2. Orrs Cove Seasonal Conditional Area, Open Status, Dec 1- Apr 30

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK055.00	CA	30	17	3.9	0.52	240	18.8	37	212	1/7/2004
WK056.00	CA	30	17	4.2	0.55	743	21.8	37	212	12/3/2003



Table 3. Mill Cove Seasonal Conditional Area, Open Status, Oct 1- Apr 30

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK057.00	P-boundary	30	21	2.7	0.35	93	8	35	195	4/27/2005
WK058.00	CA	30	21	2.5	0.3	76	6.3	35	195	1/31/2005

All approved, restricted and prohibited stations that were active at the beginning of the 2009 sampling season were sampled at least 6 times following the systematic random sampling. Some stations had additional sampling effort in the open status (extra samples), or targeted adverse conditions samples. All conditionally approved stations were sampled at least 6 times on the open status, and had at least one sample collected each month that the area was in the open status.

Table 4. WK Sampling Effort for 2009

Station	Class	Adverse		Extra		Random		Total	Comments
		Closed	Open	Closed	Open	Closed	Open		
WK001.00	P					6		6	
WK002.00	P					6		6	
WK004.00	CA						1	8	Reclassified from CA to P on 1.20.09; reclassified from P to A on 12.29.09
	P					7			
WK005.00	P					7		7	Reclassified from CA to P on 1.20.09; reclassified from P to R on 12.29.09
WK005.50	New			2		2		4	New station in 2009; Area reclassified from P to R on 12.29.09
WK006.10	CA						1	8	Reclassified from CA to P on 1.20.09; reclassified from P to A on 12.29.09
	P					7			
WK007.00	CA						1	8	Reclassified from CA to P on 1.20.09; reclassified from P to A on 12.29.09
	P					7			
WK007.10	P					6		6	
WK008.00	A	16					6	22	Flood Station
WK009.00	A						6	6	
WK010.00	A						6	6	
WK011.00	A						6	6	
WK012.00	A						1	6	Reclass from P to A 9/29/09
	P					5			
WK013.10	P					6		6	
WK013.20	P					6		6	
WK013.30	A						6	6	
WK014.00	A						5	7	
	R		1				1		



Station	Class	Adverse		Extra		Random		Total	Comments
		Closed	Open	Closed	Open	Closed	Open		
WK014.10	R	2	1		10		6	19	Accelerated sampling
WK014.20	R		1		10		6	17	Accelerated sampling
WK014.30	R		1		11		6	18	Accelerated sampling
WK014.40	New		1				6	7	
WK015.10	A						6	6	
WK017.00	A						6	6	
WK018.00	A	15					6	21	Flood Station
WK018.10	A						6	6	
WK019.80	New						6	6	
WK020.00	P					6		6	
WK022.00	P					6		6	
WK023.00	A						6	6	
WK023.10	New			1		6		7	
WK023.20	New			1		6		7	
WK024.00	P					6		6	
WK025.00	P					6		6	
WK042.00	P					6		6	
WK044.00	R						6	6	
WK044.50	New						6	6	
WK048.00	P					6		6	
WK052.00	New					6		6	
WK052.10	P	3		9		6		18	Accelerated sampling
WK052.90	New			1		2		3	New Station in 2009
WK053.00	P	2		9		6		17	Accelerated sampling
WK054.50	New			1		5		6	New Station in 2009
WK055.00	CA					4	6	10	Marina Conditional
WK056.00	CA					4	6	10	Marina Conditional
WK057.00	P	1				10		11	
WK058.00	CA	1		1		3	7	12	Conditional on season
WK059.20	New	3		10		6		19	Accelerated sampling
WK060.00	New	3		8		6		17	Accelerated sampling
WK061.00	P					6		6	
WK063.00	P					6		6	
WK063.10	New			1		5		6	New Station in 2009
WK063.20	New			1		5		6	New Station in 2009
WK064.10	P					6		6	
WK065.00	P					6		6	
WK066.00	P					6		6	
WK067.00	P					6		6	
WK068.00	P					6		6	
WK068.10	P					6		6	

Figures 4 and 5 show the P90 trends over the past three years, for all approved and conditionally approved stations in growing area WK, respectively; Figure 5 shows data



collected during the open status only. Trends for approved stations in Harpswell Cove (stations WK 14.1, 14.2 and 14.3) are shown in the Recommendation for Upward Classification section of this report. 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 2009 column on or above 100 percent does not meet the NSSP standard for classification.

At the end of 2009, all approved stations in WK were well below the approved standard (Figure 4). All stations, except WK 11 and 14, have shown declining trends (improving water quality) or no notable changes in water quality scores. Station WK 11 is located at the head of a marshy area; non-point pollution from wildlife, in combination with higher flow rates from the marsh due to higher than average rainfall amounts over the past several review years may be contributing to increasing scores over the past two years. Station WK 14 has shown a slight upward trend over the past three years; this station is located in the vicinity of a stream which should be sampled and evaluated in the next triennial evaluation of growing area WK. Station WK 23 has shown a significant improvement in water quality over the past 3 years; this station was located near a known pollution source (fecal waste from domestic geese that that were grazing in close proximity to this station). In 2007, this pollution source was removed and in 2008, station WK 23 was sampled on an accelerated schedule, showing a significant improvement in water quality; this station was reclassified from prohibited to approved in November 2008.



Figure 4. Area WK P90 Scores for Approved and Boundary Stations (expressed as the percent of the approved standard), 2007-2009

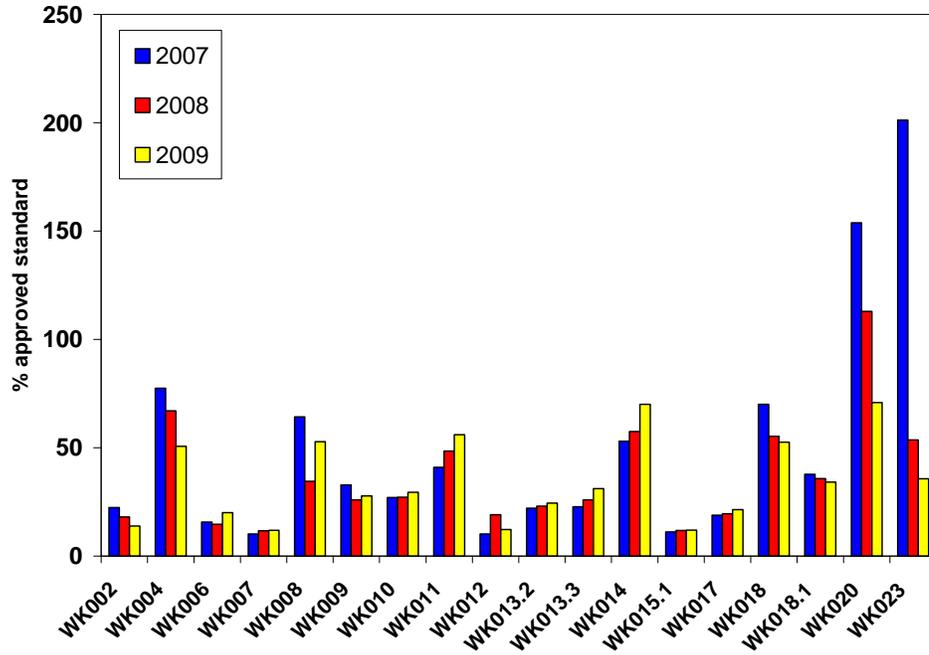
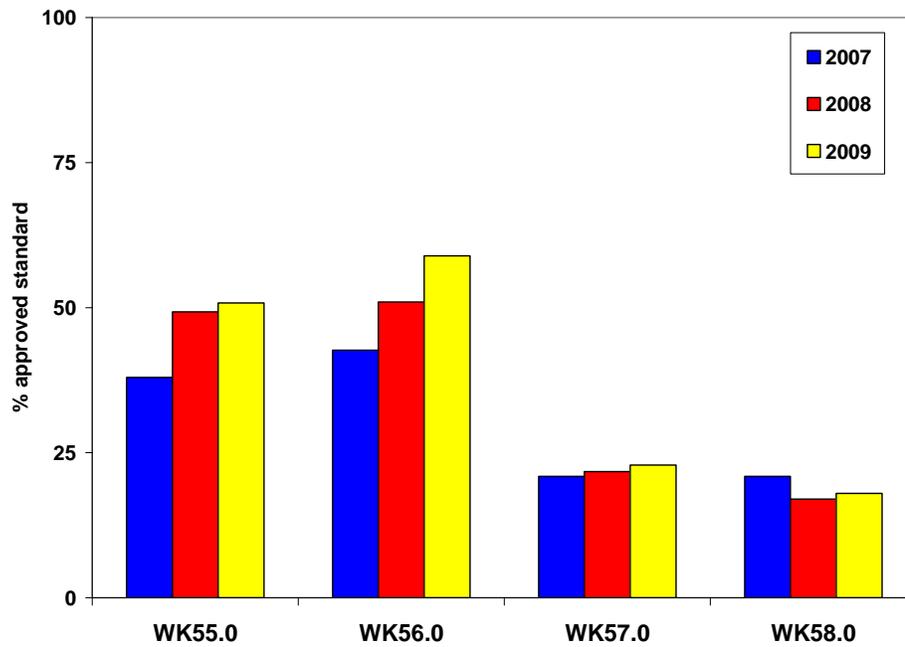


Figure 5. Area WK P90 Scores for Conditionally Approved Stations (expressed as the percent of the approved standard), Open Status, 2007-2009





Recommendations for Upward Classification

Harpswell Cove (Brunswick):

A large portion of Harpswell Cove (Brunswick and Harpswell) was reclassified from approved to prohibited in May 17, 2006, due to water quality not meeting the approved standard and an expired shoreline survey. In 2005, three consecutive elevated scores were observed at stations WK 14.2, causing the water quality in Harpswell Cove to violate the variability standard for approved classification. At the time that Harpswell Cove exceeded the approved standard at station WK 14.2, station WK 14.1, which previously monitored water quality at the head of the cove was a deactivated station. In June 2006, this station was re-activated and the DMR and the town of Brunswick resumed sample collection at this site. At the same time, a new station WK 14.3, located south of station WK 14.2, was created and sampling was initiated at this location in June 2006.

In 2007, a shoreline survey for Harpswell Cove was completed. Fifteen properties were evaluated by DEP and the Town of Brunswick. One malfunctioning septic system was noted at a property on the eastern shore of the cove; this property was the site of sample station WK 14.2. This residential property had an engineered and permitted septic system from 1980; the system consisted of a 1,000 gallon concrete septic tank and a cluster leach field with 13 chambers (Type B-5). A system blowout was observed on the southwest side of the leach field, which drains toward a field southeast of the house. It was also suspected that some contaminated groundwater may be leaking at the ledges of the field, which were located approximately 75 yards from the cove. The malfunction was repaired in Spring of 2008, and was confirmed to be properly functioning by the town CEO in May 2008. After the remediation effort was completed, the prohibited portion of the cove was reclassified to a restricted classification (Figure 6). At the request of the town of Brunswick, the stations which monitor the Brunswick side of Harpswell Cove (WK 14.1, 14.2 and 14.3) were approved for accelerated sample collection schedule, in order to collect a substantial number of samples after the malfunctioning system had been remediated and determine whether the area may be upgraded back to the approved classification.

In considering an upward classification upgrade for this area, a seasonal and rainfall analysis was completed. For this analysis, all data collected from 2004 to 2009 at stations WK 14.0, 14.1, 14.2 and 14.3 was considered. Station WK 14.0 is located on the Harpswell side of the cove, and is currently classified as approved; this station is being presented in this analysis for comparison with the water quality trends which are presented for the stations that monitor the restricted side of the cove. Tables 5 through 8 show results from all random, extra and adverse (excluding flood) samples collected between 2004 and October 2009; the data points are sorted by month and by cumulative rainfall amounts; scores which exceeded the variability standard are highlighted in yellow. In all tables presented in this section, 'Rain 3 Days' refers to cumulative rainfall occurring three days before sample was collected; 'Rain 4 Days' refers to cumulative rainfall 3 days prior, plus the day of collection. Geometric means and P90 scores calculated using the 30 most recent SRS and extra data points collected through the end of October, 2009 are presented in Table 11. Since 2004, station WK 14.0 has received 3 scores which exceeded the variability standard; however, the geometric mean and P90 at this station has never exceeded standard, and thus this station has retained its approved classification (Table 5). Using the 30 most recent SRS and extra data points through October 14, 2009, this



station has a geometric mean of 4.8, and a P90 score of 24.5. Station 14.1 was an inactive station prior to 2006; when Harpswell Cove was reclassified to prohibited, this station was re-activated. Since 2006, this station has received seven scores that exceed the P90 standard; these scores have occurred across a range of precipitation amounts (Table 6); all elevated scores occurred between June and September. Station WK 14.1 was the only Harpswell Cove station that showed a seasonal trend. The current geometric mean for this station is 4.4, and the P90 score is 24.5. Station WK 14.2 also has seven scores that exceed the P90 standard in its dataset; however only one slightly elevated scores (36 fcu/100ml) has been observed after the malfunctioning system has been replaced (Table 7). As of October 14, 2009, this station has a geometric mean of 3.5 and P90 score of 13.1. Station WK 14.3 has only two slightly elevated scores in its dataset (Table 8) and currently has a geometric mean of 2.7, and P90 score of 7.3.

Figure 6. Harpswell Cove, with Restricted Classification

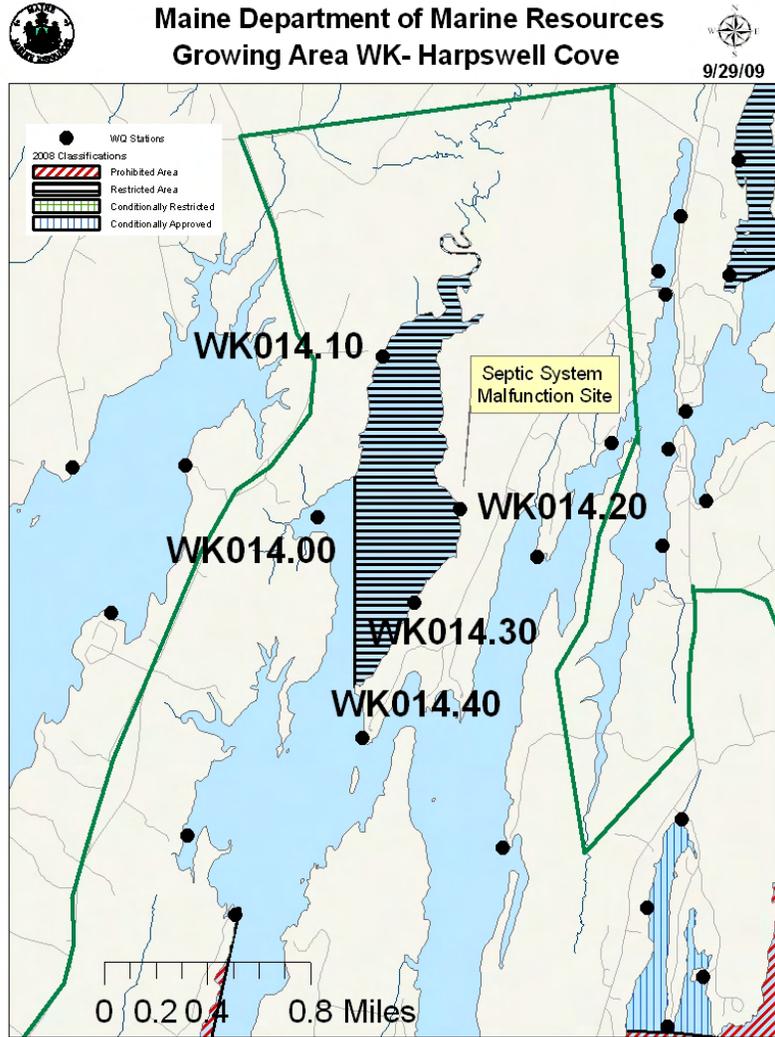




Table 5. Station WK 14.0 (approved station), Seasonal and Rainfall Assessment, 2004- October 2009

Rain 3 days	Rain 4 days	Date	Strategy	Salinity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0	0	16-Jun-04	R	30						2.9						
0	0	06-Oct-04	R	30										2.9		
0	0	13-Sep-05	R	30									3.6			
0	0	03-Nov-05	R	30											2.9	
0	0	22-Apr-08	R	26				1.9								
0	0	13-Apr-09	R	28				1.9								
0	0	08-Jun-09	R	21						1.9						
0	0	16-Sep-09	R	30									20			
0	0.01	28-Jun-05	R	22						23						
0	0.01	12-Apr-06	R	28				2.9								
0	0.03	14-Oct-08	R	30										2		
0	0.04	08-Sep-04	R	30									2.9			
0	0.26	20-Jun-06	R	27						2.9						
0	0.52	26-Nov-07	R	26											1.9	
0	1.66	20-Sep-06	R	30									200			
0.02	0.16	29-Nov-06	R	28											2	
0.03	0.03	25-Feb-08	R	30		1.9										
0.03	0.03	28-Oct-09	R	28										4		
0.05	0.05	09-Aug-06	R	29								3.6				
0.06	0.06	09-Apr-07	R	26				1.9								
0.11	0.11	16-Jun-08	R	30						4						
0.15	0.15	21-Jul-04	R	30							2.9					
0.17	0.17	05-Aug-08	R	28								4				
0.17	1.04	16-May-07	R	28					1.9							
0.2	0.33	11-Aug-04	R	31								2.9				
0.4	0.4	03-Aug-09	R	27								1.9				
0.43	0.43	25-Feb-09	R	30		1.9										
0.44	0.48	06-Jul-05	R	28							23					
0.51	0.51	28-Apr-04	R	30				2.9								
0.52	0.52	25-Jul-07	R	29							4					



Rain 3 days	Rain 4 days	Date	Strategy	Salinity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0.7	1.7	21-Apr-05	R	28				2.9								
0.71	0.71	17-Nov-08	R	28											4	
0.83	0.83	17-Aug-05	R	30								2.9				
1.01	1.01	12-Sep-07	R	28									86			
1.15	1.15	15-Jun-09	A	19						13						
1.45	2.45	04-Jun-07	R	28						15						
2.63	2.63	15-Nov-06	R	20											44	

Table 6. Station WK 14.1, Seasonal and Rainfall Assessment, 2004- October 2009

Rain 3 days	Rain 4 days	Date	Strategy	Salinity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0	0	12-Dec-06	R	24												5.5
0	0	23-Apr-07	R	22				2								
0	0	22-Apr-08	R	26				1.9								
0	0	27-Jan-09	E	30	1.9											
0	0	13-Apr-09	R	26				1.9								
0	0	08-Jun-09	R	29						1.9						
0	0	17-Aug-09	E	26								58				
0	0	16-Sep-09	R	30									22			
0	0.02	11-Feb-09	E	30		1.9										
0	0.03	14-Oct-08	R	30										2		
0	0.03	13-Jan-09	E	31	1.9											
0	0.2	10-Sep-08	E	22									64			
0	0.52	26-Nov-07	R	28											1.9	
0.01	0.01	08-Dec-08	E	29												1.9
0.02	0.02	27-Apr-09	E	27				1.9								
0.03	0.03	18-Sep-06	R	28									2			
0.03	0.03	25-Feb-08	R	30		1.9										
0.03	0.03	28-Oct-09	R	30										1.9		
0.10	0.10	14-Oct-09	E	30										2		
0.11	0.11	16-Jun-08	R	30						9.1						



Rain 3 days	Rain 4 days	Date	Strategy	Salinity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0.12	0.12	11-May-09	E	26					1.9							
0.16	0.42	02-Aug-04	R	31								2.9				
0.17	0.17	05-Aug-08	R	28								1.9				
0.17	1.04	16-May-07	R	27					3.6							
0.26	0.26	21-Jun-06	R	6						240						
0.28	0.28	01-Oct-09	E	32										1.9		
0.31	0.31	01-Dec-09	E	29												1.9
0.4	0.4	03-Aug-09	R	25								20				
0.43	0.43	25-Feb-09	R	26		1.9										
0.47	0.47	16-Aug-06	R	27								2.9				
0.52	0.52	25-Jul-07	R	29							4					
0.61	1.18	21-Jul-09	E	27							46					
0.71	0.71	17-Nov-08	R	26											10	
0.84	0.9	05-Sep-06	R	30									1.9			
0.93	1.22	28-Oct-08	E	26										11		
1.01	1.01	12-Sep-07	R	25									180			
1.09	1.37	31-Jul-06	R	28							9.1					
1.15	1.15	15-Jun-09	A	16						44						
1.45	2.45	04-Jun-07	R	26						44						

Table 7. WK 14.2, Seasonal and Rainfall Assessment, 2004- 2009

Rain 3 days	Rain 4 days	Date	Strategy	Salinity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0	0	12-Apr-04	R	28				2.9								
0	0	13-Sep-04	R	28									93			
0	0	06-Sep-05	R	30									240			
0	0	11-Apr-06	R	30				2.9								
0	0	12-Dec-06	R	31												2
0	0	18-Dec-06	R	28												2
0	0	22-Apr-08	R	24				1.9								
0	0	27-Jan-09	E	31	1.9											



Rain 3 days	Rain 4 days	Date	Strategy	Salinity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0	0	13-Apr-09	R	24				1.9								
0	0	08-Jun-09	R	30						1.9						
0	0	17-Aug-09	E	28								4				
0	0	16-Sep-09	R	30									13			
0	0.02	11-Feb-09	E	30		1.9										
0	0.03	14-Oct-08	R	32										20		
0	0.03	13-Jan-09	E	32	1.9											
0	0.16	10-May-05	R	10					3.6							
0	0.2	07-Jun-04	R	31						2.9						
0	0.2	10-Sep-08	E	26									36			
0	0.52	26-Nov-07	R	26											4	
0	0.92	03-May-04	R	28					9.1							
0.01	0.01	08-Dec-08	E	27												6
0.02	0.02	27-Apr-09	E	29				1.9								
0.03	0.03	18-Sep-06	R	30									1.9			
0.03	0.03	25-Feb-08	R	30		1.9										
0.03	0.03	28-Oct-09	R	30										1.9		
0.06	0.06	05-Jan-04	R	30	2.9											
0.06	0.06	09-Apr-07	R	16				2								
0.10	0.10	14-Oct-09	E	30										1.9		
0.11	0.11	16-Jun-08	R	30						8						
0.12	0.12	11-May-09	E	22					2							
0.17	0.17	05-Aug-08	R	28								1.9				
0.17	1.04	16-May-07	R	28					4							
0.19	0.21	07-Jun-05	R	26						3						
0.22	0.22	01-Nov-04	R	30											2.9	
0.28	0.28	01-Oct-09	E	31										1.9		
0.28	0.39	02-Aug-05	R	30								9.1				
0.31	0.31	01-Dec-09	E	30												1.9
0.4	0.4	03-Aug-09	R	28								1.9				
0.43	0.43	25-Feb-09	R	30		1.9										



Rain 3 days	Rain 4 days	Date	Strategy	Salinity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0.47	0.47	16-Aug-06	R	30								2.9				
0.52	0.52	12-Jul-05	R	30							1100					
0.52	0.52	25-Jul-07	R	30							1.9					
0.61	1.18	21-Jul-09	E	27							11					
0.71	0.71	17-Nov-08	R	22											16	
0.84	0.84	17-May-05	R	16					240							
0.84	0.9	05-Sep-06	R	30									1.9			
0.93	1.22	28-Oct-08	E	28										1.9		
1.01	1.01	12-Sep-07	R	28									104			
1.06	2.36	30-Aug-05	R	4								>1100				
1.15	1.15	15-Jun-09	A	28						1.9						
1.45	2.45	04-Jun-07	R	28						14						

Table 8. WK 14.3, Seasonal and Rainfall Assessment, 2004- October 2009

Rain 3 days	Rain 4 days	Date	Strategy	Salinity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0	0	12-Dec-06	R	31												1.9
0	0	22-Apr-08	R	26				1.9								
0	0	27-Jan-09	E	30	1.9											
0	0	18-Mar-09	E	25			2									
0	0	13-Apr-09	R	26				1.9								
0	0	08-Jun-09	R	29						1.9						
0	0	16-Sep-09	R	31									6			
0	0.02	11-Feb-09	E	30		1.9										
0	0.03	14-Oct-08	R	32										2		
0	0.03	13-Jan-09	E	32	1.9											12
0	0.2	10-Sep-08	E	25									42			
0	0.52	26-Nov-07	R	30											1.9	
0.01	0.01	08-Dec-08	E	27												
0.02	0.02	27-Apr-09	E	29				1.9								
0.03	0.03	18-Sep-06	R	30									1.9			



Rain 3 days	Rain 4 days	Date	Strategy	Salinity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0.03	0.03	25-Feb-08	R	32		1.9										
0.03	0.03	28-Oct-09	R	30										1.9		
0.06	0.06	09-Apr-07	R	28				1.9								
0.10	0.10	14-Oct-09	E	30										1.9		
0.11	0.11	16-Jun-08	R	30						1.9						
0.12	0.12	11-May-09	E	26					1.9							
0.17	0.17	05-Aug-08	R	30								2				
0.17	1.04	16-May-07	R	29					2							
0.26	0.26	21-Jun-06	R	26						23						
0.28	0.28	01-Oct-09	E	32										2		
0.31	0.31	01-Dec-09	E	30												1.9
0.4	0.4	03-Aug-09	R	28								1.9				
0.43	0.43	25-Feb-09	R	30		1.9										
0.47	0.47	16-Aug-06	R	30								2.9				
0.52	0.52	25-Jul-07	R	29							2					
0.61	1.18	21-Jul-09	E	28							12					
0.71	0.71	17-Nov-08	R	29											6	
0.84	0.9	05-Sep-06	R	30									1.9			
0.93	1.22	28-Oct-08	E	30										1.9		
1.01	1.01	12-Sep-07	R	30									42			
1.01	1.01	01-Aug-09	E	29								2				
1.09	1.37	31-Jul-06	R	29							2.9					
1.15	1.15	15-Jun-09	A	28						4						
1.45	2.45	04-Jun-07	R	30						9.1						



At the end of 2009, all restricted stations in Harpswell Cove met the geometric mean and P90 standard for approved classification using SRS and accelerated (extra) sample data (Table 9). An additional assessment was completed to determine the effect of precipitation (cumulative rainfall of 0.5 inches or more within 3 days of collection and on sample day, excluding flood events) on the geometric mean and P90 scores. For this assessment, all SRS, extra, and adverse data (excluding flood data) from samples specifically scheduled to target precipitation events were considered. For stations WK 14.1 and WK 14.3, all data points collected after rainfall events occurring between 2006 and 2009 were considered; for station WK 14.2, only data points collected after the malfunctioning septic system was repaired are considered (May 2008 through 2009). Stations WK 14.2 and 14.3 met both the geometric mean and P90 standard, while station WK 14.1 only met the geometric mean standard.

Table 9. Harpswell Cove Geometric Mean and P90 scores, SRS and Extra Data through 2009

Station	Class	Count	MFCOUNT	GM	SDV	MAX	P90	Appd Std	Restr Std
WK014.00	A	30	21	4.8	0.54	200	24.5	35	195
WK014.10	R	30	30	4.4	0.57	180	24.5	31	163
WK014.20	R	30	30	3.5	0.44	104	13.1	31	163
WK014.30	R	30	30	2.7	0.33	42	7.4	31	163

Table 10. Geomean and P90 Scores on data collected after cumulative rainfall >0.50 inches

Station	Class	Count	MFCOUNT	GM	SDV	MAX	P90	Appd Std	Restr Std
WK014.10	R	11	10	12.1	0.64	180	83.6	32	172
WK014.20	R	4	4	5	0.49	16	22.1	31	163
WK014.30	R	11	10	4.2	0.43	42	15.9	32	172

A tidal assessment was completed on all three restricted stations to determine if tidal stage (ebb vs. flood) affects the stations' geomean and P90 scores (Table 11). This assessment used all SRS and extra data points; for stations WK 14.1 and WK 14.3, data points collected between 2006 and 2009 were considered; for station WK 14.2, only data points collected after the malfunctioning septic system was repaired are considered (May 2008 through end of 2009). All three stations met the geometric mean standard for approved classification at both tidal stages; stations WK 14.2 and WK 14.3 met the P90 standard for approved classification at both tidal stages. Station WK 14.1 surpassed the P90 standard using data collected on an ebb tide. One potential explanation for this trend is an adverse affect of the stream, located at the head of the cove. The channel for this stream cuts a path through the flat and meanders near station 14.1. During lower tides, the fresh water accumulates in the channel. On flooding tides, it is likely that stream water in the channel inadequately mixes with the incoming seawater, and if the stream water has high fecal concentrations, it is likely to account for the higher coliform readings from seawater samples collected on flooding tides.

Table 11. Harpswell Cove Tidal Assessment

Station	Class	EBB TIDE							FLOOD TIDE						
		Count	GM	SDV	MAX	P90	Appd Std	Restr Std	Count	GM	SDV	MAX	P90	Appd Std	Restr Std
WK14.1	R	11	5.9	0.72	240	52.3	32	172	25	4.4	0.56	180	23.4	32	171
WK14.2	R	8	2.8	0.26	8	6.3	31	163	14	3.4	0.41	20	11.9	31	163
WK14.3	R	12	2.7	0.36	23	8.3	32	171	25	2.8	0.33	42	7.7	32	171



In order to further investigate whether this stream is contributing to higher fecal scores, a salinity assessment was completed (Table 12). Overall, average salinity values decreased from outer cove to inner cove, suggesting the greatest influence of fresh water at the head of Harpswell Cove. Station WK 14.1 showed the highest variability in its salinity values; variability decreased at stations further away from the mouth of the cove. Salinities at station WK 14.1 ranged from 6 to 32; there were 19 samples with salinities less than or equal to 27 and 20 samples with salinities of greater than 27. All of the scores exceeding the P90 standard occurred when the salinities were between 6 and 27; 3 of the elevated scores occurred when there was little or no rain prior to collection and 4 occurred after rainfall of greater than 1 inch. These results further support the influence of the stream on inner portion of Harpswell Cove. In the coming review year, a full assessment of the stream and the adjacent marshy area should be completed; until this assessment is completed, the head of the cove should remain classified as restricted. DMR will work with town of Brunswick and the BNAS staff to gain access to the property to collect stream samples and stream flow rates in 2010.

Table 12. Salinity Assessment for Harpswell Cove

Station	Average	SDV
WK0014.1	27.00	4.56
WK0014.0	27.86	2.94
WK0014.2	28.57	2.74
WK0014.3	29.21	1.79

Based on this assessment, it is recommended that the majority of Harpswell Cove is reclassified from restricted to approved. All areas located north and shoreward of station WK 14.1 should remain restricted, until a further assessment and sample collection can be completed on the stream located at the head of the cove. Station WK 14.1 should serve as the boundary station between the approved and restricted areas, and must meet the approved standard.

Mill Cove, Harpswell

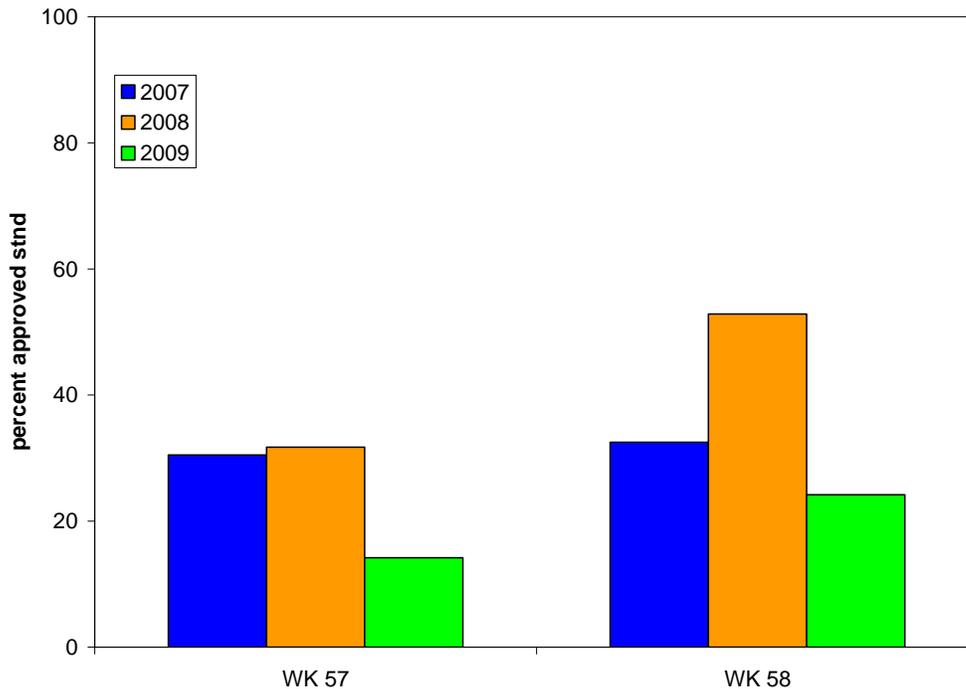
Mill Cove, Harpswell, is currently classified as conditionally approved based on season, with an open status from October 1 to April 30; it is being recommended to an upward classification of approved. The area was re-surveyed by DMR and the town of Harpswell Shellfish Warden in summer of 2009; no potential or actual pollution problems were noted at the time of survey. At the end of 2009, water quality has met the approved standard using year round data (Table 13); P90 trends show that water quality at this station has met the approved standards year round for the past three years (Figure 7).

Table 13. Mill Cove, Harpswell, Year Round Geometric Means and P90 Scores, 2006-2009

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK057.00	P	30	30	2.3	0.21	18	4.4	31	163	11/15/2006
WK058.00	CA	30	30	2.5	0.37	116	7.5	31	163	12/5/2006



Figure 7. Mill Cove P90 Trends, Year Round Data, 2007-2009



A further data assessment, considering seasonality and rainfall impact was completed for Mill Cove stations (Tables 14 and 15). All data (SRS, Extra, Adverse) collected between 2003 and 2009 was considered for this assessment; rainfall was calculated as cumulative total 3 days before sample collection, and cumulative total 3 days before collection plus day of collection (midnight to midnight); amounts are noted in Rain 3 day and Rain 4 day columns, respectively. Station WK 57 had 2 elevated scores in its data set since 2003; station WK 58 had three elevated scores in its dataset. Neither station showed a seasonal trend in high scores; neither station showed a consistent precipitation effect.

Two additional assessments were completed to determine the effect of precipitation (cumulative rainfall of >0.5 and >1.0 inches within 3 days of collection and on collection day) on the geometric mean and P90 scores. For this assessment, all SRS, extra, and adverse data from samples specifically scheduled to target precipitation events were considered; data collected during flood closures were not considered. Stations WK 57 and 58 met both the geometric mean and P90 standards when using data collected after cumulative precipitation of 0.5 inches or more (Table 16). Stations WK 57 and 58 also met both the geometric mean and P90 standards when using data collected after cumulative precipitation of 1.0 inches or more (Table 17). These results indicate that Mill Cove is not impacted by rainfall.

Based on these assessments, Mill Cove is recommended for a change in classification from conditionally approved based on season to approved (year round).



Table 14. WK 57, Seasonal and Rainfall Assessment, 2003-2009

Rain Range (inches)	Rain 3 day	Rain 4 day	Date	Salin	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	16-Apr-03	30	R					<3								
	0	0	03-Dec-03	32	R													<3
	0	0	07-Jan-04	32	R		<3											
	0	0	18-Nov-04	30	R												<3	
	0	0	31-Jan-05	30	R		<3											
	0	0	23-Mar-05	30	R				<3									
	0	0	11-Apr-07	31	R					<2								
	0	0	20-Aug-07	31	R										<2			
	0	0	24-Sep-07	32	R											<2		
	0	0	07-Jan-08	30	R		<2											
	0	0	16-Apr-08	28	R					<2								
	0	0	24-Nov-08	31	R												<2	
	0	0	12-Jan-09	31	R		<2											
	0	0	18-Mar-09	28	R				<2									
	0	0	13-Apr-09	32	R					<2								
	0	0	08-Jun-09	30	R								<2					
	0	0	15-Sep-09	31	R											<2		
	0	0.01	12-Apr-06	30	R						<3							
	0	0.01	12-Mar-08	29	R					<2								
	0	0.02	26-Mar-08	30	R					<2								
0	0.04	19-Nov-03	30	R													<3	
0	0.26	20-Jun-06	26	R	B							3.6						
0	0.52	16-Nov-05	30	R	P												<3	
0	1.66	20-Sep-06	30	R	PB										54			
0.01-0.5	0.01	0.01	07-Dec-05	31	R													<3
	0.01	0.02	12-Feb-07	32	R			<2										
	0.03	0.03	15-Oct-08	30	R											<2		
	0.03	0.03	02-Dec-09	29	R													<2
	0.04	0.04	03-Nov-09	30	R												2	
	0.05	0.05	09-Aug-06	30	R	BH									3.6			
0.05	0.05	05-Dec-06	30	R													<2	



Rain Range (inches)	Rain 3 day	Rain 4 day	Date	Salin	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	0.06	0.06	25-Jun-07	30	R							4							
	0.06	0.23	26-Mar-03	30	R	T			<3										
	0.08	0.08	27-Feb-06	30	R			<3											
	0.1	0.1	29-Sep-04	30	R										<3				
	0.11	0.11	16-Jun-08	30	R	P						<2							
	0.17	0.17	05-Aug-08	30	R										<2				
	0.3	0.3	12-Mar-07	30	R				2										
	0.34	0.34	13-Oct-04	30	R												<3		
	0.4	0.4	03-Aug-09	30	R									6					
	0.42	0.42	26-Apr-06	30	R						<3								
	0.43	0.43	25-Feb-09	30	R				<2										
0.45	0.45	16-Dec-09	30	R														<2	
0.51 – 1.0	0.51	0.51	07-Apr-04	30	R					<3									
	0.56	0.56	19-Nov-07	30	R												<2		
	0.64	0.64	19-Feb-08	30	R	Flood			<2										
	0.68	1.26	08-Dec-04	30	R	P													3.6
	0.69	0.69	24-Sep-03	30	R	P									3.6				
0.88	0.89	16-Jan-07	30	R		5.5													
1.01- 1.50	1.02	1.02	22-Oct-07	30	R												<2		
	1.11	1.11	15-Mar-06	30	R				<3										
>1.50	1.15	1.15	15-Jun-09	30	A	P						4							
	1.57	1.57	01-May-07	30	R						4								
	1.59	1.59	19-Dec-05	30	R														93
	1.6	3.48	29-Oct-03	30	R	P											3.6		
	1.67	2.62	27-Apr-05	30	R	P				7.3									
	1.78	1.78	17-Jan-06	30	R		<3												
2.63	2.63	15-Nov-06	30	R													18		



Table 15. WK 58, Seasonal and Rainfall Assessment, 2003-2009

Rain Range (inches)	Rain 3 day	Rain 4 day	Date	Salin	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	16-Apr-03	30	R					<3								
	0	0	03-Dec-03	32	R													<3
	0	0	07-Jan-04	32	R		<3											
	0	0	18-Nov-04	30	R												<3	
	0	0	31-Jan-05	30	R		<3											
	0	0	23-Mar-05	32	R				<3									
	0	0	11-Apr-07	31	R					<2								
	0	0	20-Aug-07	31	R									<2				
	0	0	24-Sep-07	32	R										<2			
	0	0	07-Jan-08	32	R		8											
	0	0	16-Apr-08	29	R					<2								
	0	0	24-Nov-08	31	R												2	
	0	0	18-Mar-09	28	R				<2									
	0	0	13-Apr-09	31	R					<2								
	0	0	08-Jun-09	30	R								<2					
	0	0	15-Sep-09	31	R										<2			
	0	0.01	12-Apr-06	28	R					<3								
	0	0.01	12-Mar-08	28	R				<2									
	0	0.02	26-Mar-08	30	R				<2									
	0	0.04	19-Nov-03	30	R												<3	
0	0.26	20-Jun-06	25	R								240						
0	0.52	16-Nov-05	20	R	P											<3		
0	1.66	20-Sep-06	30	R	P									4				
0.01-0.5	0.01	0.01	07-Dec-05	30	R													<3
	0.01	0.01	06-Jan-09	32	R		<2											
	0.01	0.02	12-Feb-07	32	R			<2										
	0.03	0.03	15-Oct-08	30	R											<2		
	0.03	0.03	02-Dec-09	28	R													<2
	0.04	0.04	03-Nov-09	30	R												<2	
	0.05	0.05	09-Aug-06	29	R									3.6				
	0.05	0.05	05-Dec-06	30	R													<2



Rain Range (inches)	Rain 3 day	Rain 4 day	Date	Salin	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	0.06	0.06	25-Jun-07	30	R							6						
	0.06	0.23	26-Mar-03	32	R	T			<3									
	0.1	0.1	29-Sep-04	31	R										3.6			
	0.11	0.11	16-Jun-08	28	R	P						116						
	0.16	0.16	11-May-05	30	R						<3							
	0.17	0.17	05-Aug-08	28	R									<2				
	0.3	0.3	12-Mar-07	29	R				<2									
	0.34	0.34	13-Oct-04	32	R											<3		
	0.4	0.4	03-Aug-09	26	R									12				
	0.43	0.43	25-Feb-09	32	R			<2										
	0.45	0.45	16-Dec-09	31	R													<2
0.51-1.0	0.51	0.51	07-Apr-04	31	R					<3								
	0.56	0.56	19-Nov-07	30	R												<2	
	0.61	0.61	20-Jul-09	24	E								2					
	0.64	0.64	19-Feb-08	21	R	Flood		<2										
	0.68	1.26	08-Dec-04	31	R	P												<3
	0.69	0.69	24-Sep-03	29	R	P									23			
	0.88	0.89	16-Jan-07	30	R		<2											
1.01-1.5	1.02	1.02	22-Oct-07	32	R											<2		
	1.11	1.11	15-Mar-06	32	R				<3									
>1.5	1.57	1.57	07-Feb-06	30	R	P		<3										
	1.57	1.57	01-May-07	22	R						<2							
	1.6	3.48	29-Oct-03	30	R	P										43		
	1.67	2.62	27-Apr-05	22	R	P				<3								
	1.78	1.78	17-Jan-06	32	R		<3											
	2.12	2.12	31-Mar-05	30	A	Flood			<3									
	2.63	2.63	15-Nov-06	15	R													76



Table 16. Mill Cove, Geometric Means and P90 Scores, Data Collected after >0.5 Inches of Cumulative Rainfall, 2003-2009

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK057.00	P-boundary	16	7	5.4	0.49	93	23.7	40	229	9/24/2003
WK058.00	CA	16	7	4.2	0.51	76	19.5	40	229	9/24/2003

Table 17. Mill Cove, Geometric Means and P90 Scores, Data Collected after >1.0 Inches of Cumulative Rainfall, 2003-2009

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK057.00	P-boundary	11	5	7	0.55	93	37.5	39	227	10/29/2003
WK058.00	CA	10	4	4.9	0.56	76	27.7	40	235	10/29/2003

Card Cove, Harpswell

The northern portion of Card Cove is being recommended for an upward classification change, from prohibited to approved. All of Card Cove was reclassified to prohibited in August 2007, after, two potential septic system malfunctions were identified in the southern end of Card Cove during the shoreline survey of this area. Both potential problems were inspected by the Harpswell Codes Enforcement officer (CEO). One system was found to be in working order by the CEO; the other problem was confirmed to be a septic malfunction. It was recommended that all of Card Cove be reclassified as prohibited; and the reclassification took place. Prior to this reclassification, the southern portion of Card Cove, monitored by station WK 52.1, was classified as conditionally approved based on season; the northern portion of the cove, monitored by station WK 53, was classified as approved. At the end of 2007, the station that monitored water quality at the northern end of Card Cove (WK 53) failed to meet the NSSP standard for approved classification.

In August 2008, a follow up survey was completed on the property with an identified septic malfunction. While the malfunction was not fixed, it was noted that the owner was no longer using the residence and a porta-potty was in place on the property. Water quality had shown improvement over the 2008 review year, and water quality stations in Card Cove were scheduled for accelerated sampling (every two weeks) for the 2009 sampling season. However, in 2009, water scores at station WK 52.1 showed elevated scores during the summer months. Another follow up survey was completed at the property in August 2009, and it was noted that the property with a malfunction was being used. It was also noted that the porta-potty was being used as a storage shed, and not being used for waste disposal for the property. The situation was immediately reported to codes and a "Do Not Occupy" order was placed on the property; the property owner was notified that further use of the property was unlawful. On the same day as the follow up survey, a land drainage and a small intermittent stream draining into Card Cove were sampled; run-off conditions were high. Both the stream and the land drainage showed elevated scores of 1,040 and >1,600 fcu/100 ml, respectively. These scores indicated that in addition to the malfunctioning septic system, other significant non-point pollution sources exist in the southern portion of Card Coves.

At the end of 2009, both stations in Card Cove (WK 52.1 and 53) were meeting the approved standard (Table 18). Water quality trends over the past three years show a steady improvement in water quality for these two stations (Figure 8). A further seasonal and precipitation



assessment was completed for the two stations, using all SRS, Extra and Adverse data (excluding flood samples) collected between 2003 and 2009 (Tables 19 and 20). Station WK 52.1 has shown multiple elevated scores among the different precipitation amounts and sample months; four elevated scores have occurred at this site in 2008 and 2009, after the septic system malfunction was identified and reported to the town codes enforcement officer. Station WK 53 had four elevated scores in its dataset, occurring at differing precipitation levels, ranging from 0.03 to 3.48 inches (cumulative, within three days plus the day of collection), and occurring between June and October. However, station WK 53 has shown only one high score over the past three review years (52 fcu/100 ml in June 2008). More recent samples, collected over the past two years and after precipitation amounts of >0.5 inches have all yielded scores below the variability standard.

Table 18. Card Cove, Geometric Means and P90 Scores, 2006-2009

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK052.10	P	30	28	5.1	0.6	240	30.7	31	169	6/20/2006
WK053.00	P	30	30	4.5	0.46	94	17.7	31	163	11/15/2006

Figure 8. Card Cove P90, Year Round Data, 2007-2009

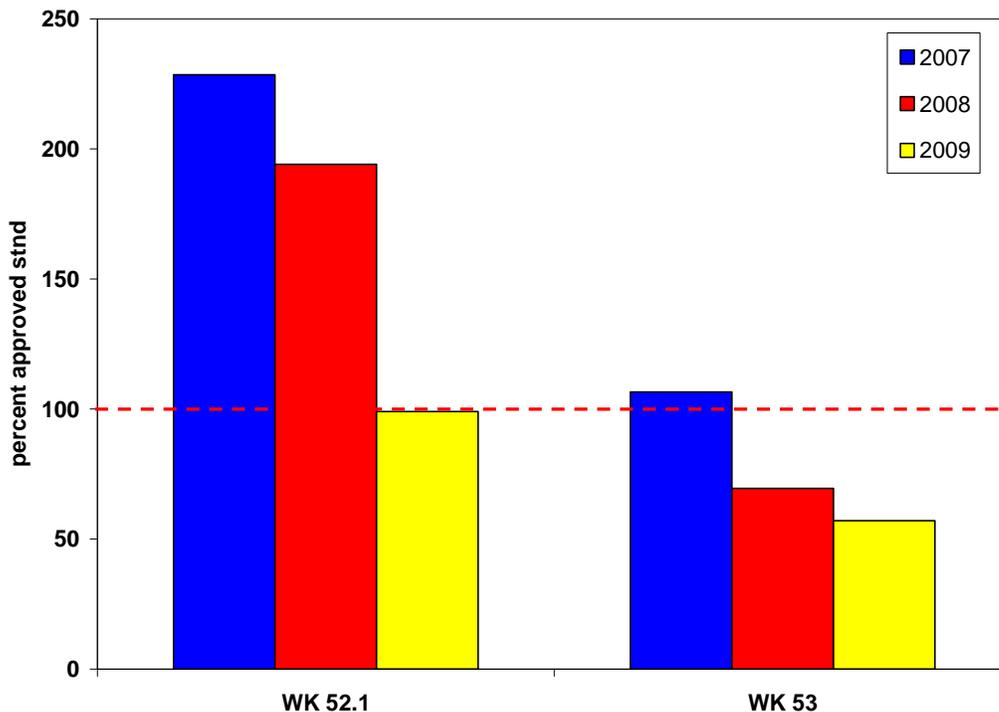




Table 19. WK 52.1, Seasonal and Rainfall Assessment

Rain 3 day	Rain 4 day	Date	Tide	Salin	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	16-Apr-03	H	25	R	N				<3								
0	0	03-Dec-03	HE	30	R													3.6
0	0	07-Jan-04	HE	32	R		3.6											
0	0	18-Nov-04	HF	30	R												<3	
0	0	31-Jan-05	HE	28	R		<3											
0	0	23-Mar-05	HE	30	R				<3									
0	0	23-Apr-07	F	24	R					4								
0	0	24-Nov-08	H	32	R												10	
0	0	18-Mar-09	F	28	R				<2									
0	0	15-Apr-09	F	32	R	N				<2								
0	0	04-Aug-09	E	27	R									<2				
0	0	18-Aug-09	E	28	E									94				
0	0	21-Sep-09	HE	31	R										29			
0	0.01	12-Apr-06	F	30	R					<3								
0	0.03	11-Jun-08	E	31	R	P						3.6						
0	0.04	19-Nov-03	E	30	R												<3	
0	0.05	09-Jun-09	E	28	R	P						2						
0	0.26	20-Jun-06	E	25	R							240						
0	0.52	16-Nov-05	E	7	R	P											9.1	
0	0.52	26-Nov-07	HE	32	R												10	
0	1.66	20-Sep-06	HF	26	R	P									1560			
0.01	0.01	07-Dec-05	F	30	R													<3
0.02	0.02	03-Mar-04	E	31	R				<3									
0.02	0.02	28-Apr-09	HE	25	E					<2								
0.03	0.03	04-Nov-09	HE	32	R												<2	
0.05	0.05	09-Aug-06	F	30	R									460				
0.05	0.05	05-Dec-06	HF	28	R													14
0.06	0.06	06-Mar-07	F	31	R				<2									
0.06	0.23	26-Mar-03	E	30	R				<3									
0.1	0.1	29-Sep-04	HF	30	R										43			



Rain 3 day	Rain 4 day	Date	Tide	Salin	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.1	0.1	14-Oct-09	E	32	E											15		
0.11	0.11	29-May-07	E	28	R						18							
0.11	0.11	12-May-09	E	30	E						<2							
0.16	0.16	11-May-05	H	30	R						<3							
0.26	0.26	15-Apr-08	E	28	R					<2								
0.27	0.5	02-Oct-06	E	28	R											18		
0.3	0.3	03-Mar-08	HE	30	R				<2									
0.34	0.34	13-Oct-04	HE	32	R											<3		
0.45	0.45	16-Dec-09	H	31	E													2
0.51	0.51	07-Apr-04	F	32	R					<3								
0.52	0.52	24-Jul-07	HE	30	R								20					
0.53	1.06	04-Apr-07	H	22	R					6								
0.55	0.55	30-Sep-09	E	30	E										9.1			
0.6	0.6	17-Sep-07	F	30	R										<2			
0.6	0.6	06-Oct-09	E	32	A											120		
0.61	0.61	20-Jul-09	E	26	E								8					
0.61	0.61	01-Sep-09	E	30	E										2			
0.68	1.26	08-Dec-04	HE	30	R	P												93
0.69	0.69	24-Sep-03	HE	31	R	P									23			
1.11	1.11	15-Mar-06	F	32	R				<3									
1.12	1.12	09-Jan-07	F	32	R		<2											
1.15	1.15	15-Jun-09	F	26	A	P						102						
1.22	1.22	29-Oct-08	E	30	R	P										<2		
1.57	1.57	07-Feb-06	E	28	R	P		3.6										
1.57	1.57	04-Aug-08	F	28	R	P								6				
1.6	3.48	29-Oct-03	F	28	R	P										460		
1.67	2.62	27-Apr-05	F	28	R	P				93								
1.78	1.78	17-Jan-06	HF	24	R		3											
1.79	2.33	24-Aug-09	H	29	A									35				
2.63	2.63	15-Nov-06	E	30	R												4	



Table 20. WK 53, Seasonal and Rainfall Assessment

Rain 3 Day	Rain 4 Day	Date	Tide	Salin	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	16-Apr-03	HF	30	R					<3								
0	0	03-Dec-03	HE	32	R													43
0	0	07-Jan-04	HE	30	R		<3											
0	0	18-Nov-04	HF	30	R												<3	
0	0	09-Feb-05	HE	30	R			3.6										
0	0	23-Mar-05	HE	30	R				<3									
0	0	23-Sep-08	E	31	R										<2			
0	0	24-Nov-08	H	32	R												<2	
0	0	18-Mar-09	F	28	R				<2									
0	0	15-Apr-09	F	31	R					<2								
0	0	04-Aug-09	E	27	R									4				
0	0	18-Aug-09	E	28	E									14				
0	0	16-Sep-09	LE	31	R										4			
0	0.01	12-Apr-06	F	28	R					<3								
0	0.03	11-Jun-08	HE	31	R	P						52						
0	0.04	19-Nov-03	E	32	R												<3	
0	0.05	09-Jun-09	E	28	R	P						<2						
0	0.26	20-Jun-06	E	26	R							240						
0	0.52	16-Nov-05	E	20	R	P											23	
0	0.52	26-Nov-07	HE	32	R												<2	
0	1.66	20-Sep-06	HF	30	R	P									75			
0.01	0.01	07-Dec-05	F	30	R													3.6
0.02	0.02	03-Mar-04	E	31	R				<3									
0.02	0.02	28-Apr-09	HE	26	E					<2								
0.03	0.03	04-Nov-09	HE	32	R												<2	
0.03	0.03	02-Dec-09	E	30	E													10
0.04	0.04	06-Feb-07	F	32	R			<2										
0.05	0.05	09-Aug-06	F	31	R									43				
0.06	0.23	26-Mar-03	E	30	R				3.6									
0.07	0.49	19-Jan-05	E	31	R		<3											



Rain 3 Day	Rain 4 Day	Date	Tide	Salin	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.1	0.1	29-Sep-04	HF	30	R										<3			
0.1	0.1	14-Oct-09	E	32	E											<2		
0.11	0.11	29-May-07	E	28	R						<2							
0.11	0.11	12-May-09	E	30	E						29							
0.26	0.26	15-Apr-08	HE	29	R					<2								
0.3	0.3	03-Mar-08	H	31	R	P			<2									
0.34	0.34	13-Oct-04	HE	32	R											3.6		
0.51	0.51	07-Apr-04	F	31	R					<3								
0.52	0.52	24-Jul-07	HE	30	R								20					
0.53	1.06	04-Apr-07	H	28	R					<2								
0.55	0.55	30-Sep-09	E	30	E										8			
0.6	0.6	17-Sep-07	F	31	R										<2			
0.6	0.6	06-Oct-09	E	30	A											4		
0.61	0.61	20-Jul-09	E	26	E								<2					
0.61	0.61	01-Sep-09	E	30	E										<2			
0.68	1.26	08-Dec-04	HE	29	R	P												<3
0.69	0.69	24-Sep-03	HE	30	R	P									23			
1.11	1.11	15-Mar-06	F	28	R				<3									
1.15	1.15	15-Jun-09	F	29	A	P						<2						
1.57	1.57	07-Feb-06	E	28	R	P		3.6										
1.57	1.57	04-Aug-08	F	28	R	P								6				
1.59	1.59	19-Dec-05	HE	32	R													3.6
1.6	3.48	29-Oct-03	F	21	R	P										460		
2.63	2.63	15-Nov-06	E	22	R												16	



An additional assessment was completed to determine the effect of precipitation (cumulative rainfall of 0.5 inches or more within 3 days of collection and on sample day, excluding flood events) on the geometric mean and P90 scores (Tables 21 and 22). For this assessment, all SRS, extra, and adverse data (excluding flood data) from samples specifically scheduled to target precipitation events were considered. Using data from 2003 through 2009, both stations met the geometric mean standard using data collected after >0.5 inches of cumulative rainfall; only station WK 53 met the geometric mean standard when using data collected after >1.0 inches of cumulative rainfall. Neither station met the P90 standard when considering all data collected over the past seven years (2003-2009). This assessment was repeated using a more limited dataset, restricted to more recent data collected over the past four years (2006-2009); the same rainfall parameters were used (Tables 23 and 24). Using a dataset restricted to more recent fecal scores, station WK 53 met both the geometric mean and the P90 standards; station WK 52.1 met the geometric mean standards for both rainfall amounts, but exceeded the P90 standard for both rainfall amounts.

Table 21. Geomean and P90 Scores on data collected after cumulative rainfall >0.50 inches, 2003 and 2009

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK052.10	P	25	16	13.6	0.79	1560	144.6	36	203	9/24/2003
WK053.00	P	20	12	6.4	0.64	460	43.4	37	208	9/24/2003

Table 22. Geomean and P90 Scores on data collected after cumulative rainfall >1.00 inches, 2003-2009

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK052.10	P	14	8	17.9	0.95	1560	315.3	37	211	10/29/2003
WK053.00	P	10	5	8.1	0.78	460	87.2	38	221	10/29/2003

Table 23. Geomean and P90 Scores on data collected after cumulative rainfall >0.50 inches, 2006-2009

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK052.10	P	19	16	10	0.76	1560	97.2	33	179	1/17/2006
WK053.00	P	14	12	4.6	0.49	75	20.4	33	177	2/7/2006

Table 24. Geomean and P90 Scores on data collected after cumulative rainfall >1.00 inches, 2006-2009

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK052.10	P	11	8	9.9	0.9	1560	148.5	35	192	1/17/2006
WK053.00	P	7	5	5.9	0.58	75	34.5	35	194	2/7/2006

A tidal assessment was completed for both Card Cove stations, in order to determine if tidal stage (ebb vs. flood) affects the stations' geomean and P90 scores (Table 25). This assessment used all SRS and extra data points collected from 2003 through 2009. Both stations met the geometric mean standard at both tidal stages; only station WK 53 met the P90 standard at both tidal stages. Station WK 52.1 met the P90 standard for ebb tide, but exceeded the standard for flood tide data.



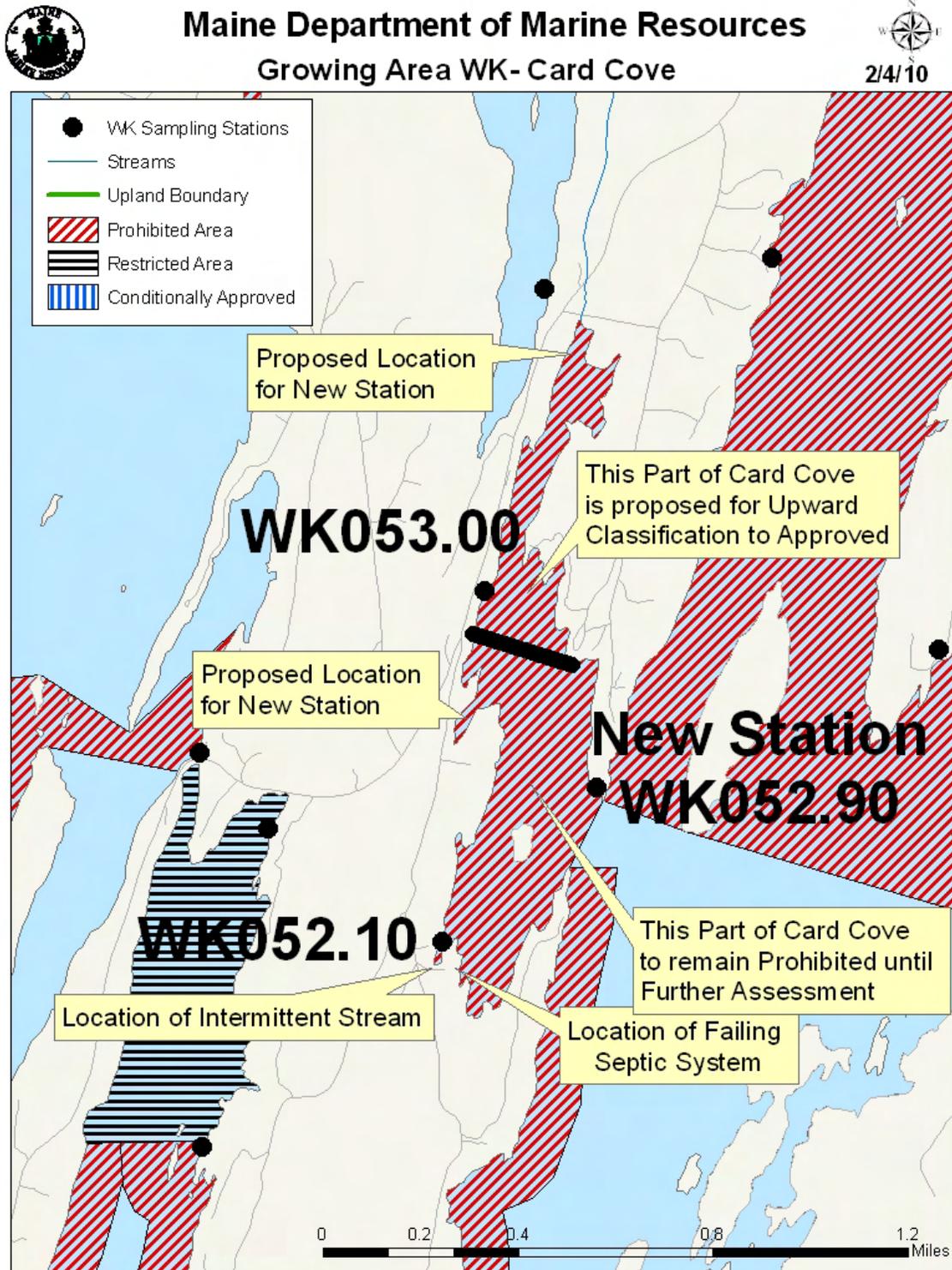
Table 25. Card Cove Tidal Assessment

Station	EBB TIDE							FLOOD TIDE						
	Count	GM	SDV	MAX	P90	Appd Std	Restr Std	Count	GM	SDV	MAX	P90	Appd Std	Restr Std
WK52.1	33	6.1	0.56	240	32.8	37	207	24	8.1	0.86	1560	105.5	38	221
WK53	34	5.4	0.26	240	26	37	213	18	4.7	0.67	460	35.3	38	221

Based on the these assessments, the northern portion of Card Cove, monitored by station WK 53 is recommended for an upgrade in classification, from prohibited to approved. Station WK 52.1 is not recommended for an upgrade at this time; additional data at this station should be collected throughout the 2010 field season, in order to assess if water quality in this portion of the coves improves following the “Do Not Occupy” order placed on the property with a septic system malfunction. Additional sample stations are also suggested for this cove (Figure 9).



Figure 9. Card Cove, Harpswell, with Proposed Classification Change





Brickyard Cove, Harpswell

Brickyard Cove is being proposed for an upgrade in classification from prohibited to approved. Brickyard Cove was downgraded from to prohibited classification in August 2006, due to failing water quality at stations WK 59. In 2007, all properties in the vicinity of the Brickyard shoreline were surveyed, and one septic malfunction was observed at a seasonal property. The property was reported to the Codes Enforcement Officer, and by August 2008, the malfunction was corrected. In 2009, the station in Brickyard Cove was approved for accelerated sample collection (every two week) to assess whether water quality was showing improvement following remediation of the pollution source.

In October 2007, it was noted that access to station WK 59 was hazardous, and a new station (WK 59.2) was created within 300 ft to the south of station WK 59; station WK 59 was deactivated. At the end of 2009, the new station WK 59.2 had 22 SRS and Extra data points in its dataset; however since the two stations (WK 59 and 59.2) were within 300 ft of each other, data from both stations is being considered in this proposal for an upward reclassification of Brickyard Cove. Additionally, in 2007 station WK 60 was reactivated to monitor water quality at the mouth of Brickyard Cove; data from this station is also being considered in this proposal for upward reclassification.

At the end of 2009, based on the last 30 SRS and extra data points (combination of 22 data points from WK 59.2 and 8 data points from station WK 59), the geometric mean for Brickyard Cove was 3.77 and the P90 score was 16.2. The geometric mean and P90 score for station WK 60, which monitors the mouth of Brickyard Cove, were 2.4 and 5.9, respectively; station WK 60 only had 20 data points in its dataset. A further seasonal and rainfall assessment was completed for stations WK 59 and 59.2 (Table 26), using all SRS, extra and Adverse data collected from 2003 to 2009. Station WK 59 had five elevated scores in its dataset; all occurred after at least 0.5 inches of cumulative precipitation (cumulative rainfall 3 days prior to sample collection plus on day of sample collection); station WK 59.2 had no elevated scores in its dataset.



Table 26. Rainfall and Seasonal Assessment for Brickyard Cove, WK 59 and 59.2

Station	Rain 3 Day	Rain 4 Day	Date	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WK059.00	0	0	17-Apr-03	R					<3								
	0	0	31-Jul-03	R	H							15					
	0	0	07-Jan-04	R		25											
	0	0	13-Sep-04	R										<3			
	0	0	18-Nov-04	R												<3	
	0	0	31-Jan-05	R		<3											
	0	0	23-Mar-05	R				5.1									
	0	0	20-Aug-07	R										<2			
	0	0.01	12-Apr-06	R						<3							
	0.01	0.01	07-Dec-05	R													<3
	0	0.04	19-Nov-03	R													<3
	0.04	0.04	28-Aug-03	R	H									9.1			
	0.05	0.05	09-Aug-06	R	H									<3			
	0.06	0.06	25-Jun-07	R								<2					
	0.08	0.08	27-Feb-06	R				<3									
	0.1	0.1	29-Sep-04	R										<3			
	0.16	0.16	11-May-05	R							43						
	0.01	0.18	29-Jun-05	R								3.6					
	0	0.2	07-Jun-04	R								<3					
	0	0.26	20-Jun-06	R								43					
	0.3	0.3	12-Mar-07	R					<2								
	0.34	0.34	13-Oct-04	R												3.6	
	0.51	0.51	07-Apr-04	R						<3							
	0	0.52	16-Nov-05	R	P												240
	0.53	0.53	18-Aug-04	R	P								23				
	0	0.64	05-Jun-03	R								460					
0.64	0.64	19-Feb-08	R	F			4										
0.88	0.89	16-Jan-07	R			<2											
0	0.92	03-May-04	R							<3							
1.02	1.02	22-Oct-07	R	W											<2		
1.11	1.11	15-Mar-06	R					<3									



Station	Rain 3 Day	Rain 4 Day	Date	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	1.2	1.2	12-Jul-04	R								23					
	0.68	1.26	08-Dec-04	R	P												20
	1.4	1.4	29-Nov-04	R	P											9.1	
	1.49	1.49	06-Jun-07	R							14						
	0	1.66	20-Sep-06	R	P									160			
	0.04	1.76	04-Sep-03	R	P									240			
	1.78	1.78	17-Jan-06	R		<3											
	2.63	2.63	15-Nov-06	R												44	
WK059.20	0	0	16-Apr-08	R					<2								
	0	0	24-Nov-08	R												6	
	0	0	13-Apr-09	R					<2								
	0	0	08-Jun-09	R							<2						
	0	0	18-Aug-09	E									4				
	0	0	15-Sep-09	R										14			
	0	0.02	26-Mar-08	R				<2									
	0.02	0.02	28-Apr-09	E					<2								
	0.03	0.03	15-Oct-08	R											6		
	0.03	0.03	23-Jun-09	E	F						2						
	0.03	0.03	02-Dec-09	E													<2
	0.04	0.04	03-Nov-09	R												<2	
	0.1	0.1	14-Oct-09	E											<2		
	0.11	0.11	16-Jun-08	R	P						2.7						
	0.11	0.11	12-May-09	E						<2							
	0.17	0.17	05-Aug-08	R									4				
	0.4	0.4	03-Aug-09	R									10				
	0.43	0.43	25-Feb-09	R			<2										
	0.45	0.45	16-Dec-09	E													<2
	0.55	0.55	30-Sep-09	E										6			
	0.6	0.6	06-Oct-09	A											8		
	0.61	0.61	20-Jul-09	E								28					
	0.61	0.61	01-Sep-09	E										2			
	1.02	1.02	22-Oct-07	R											<2		
	1.15	1.15	15-Jun-09	A	P						9.1						



Station	Rain 3 Day	Rain 4 Day	Date	Strat	Adv	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	3.19	3.19	17-Nov-09	A	F											<2	



A stream drains into the head of Brickyard Cove, and therefore water quality in Brickyard Cove may be intermittently impacted by non-point source pollution, especially after rainfall events when stream flow rates increase. In order to assess the impact to the growing area, stream samples were collected throughout the summer and fall, between July and November 2009. Results of the stream samples are presented in Table 27; flow conditions were estimated at time of sample collection. On November 3, stream velocity was measured with a flow meter, and stream discharge rate for the stream under 'high' flow conditions was calculated. On multiple instances, a stream sample was collected on the same day as a growing area sample WK 59.2, and for those dates, both the stream and the marine sample results are shown in Table 20. Based on the fecal coliform scores obtained from these stream samples, a dilution calculation was completed to determine the area of impact from this non-point source. In completing the calculation, the following information was included: 1) a mean fecal coliform concentration of 186 fcu/100 ml (mean of all stream samples); 2) a stream discharge rate of 764,257 gallons/day; and 3) mean depth of receiving water of 5 ft. Based on these numbers, a dilution zone of 6.2 acres is required.

In addition to collecting stream samples, an intermittent stream that drains approximately 100 ft south of station WK 59.2 was sampled on two dates in 2009. This is a small stream (flow rate of approximately 25 gallons/minute), that drains a small pond located off Brickyard Cove Rd. On April 27, 2009, this stream had a score of 2 fcu/100 ml (medium runoff conditions); on November 17, 2009 (collected during flood closure), the score was 40 fcu/100ml. No dilution closure is required for this stream at this time.

Table 27. Fecal Scores from Stream Draining into Brickyard Cove

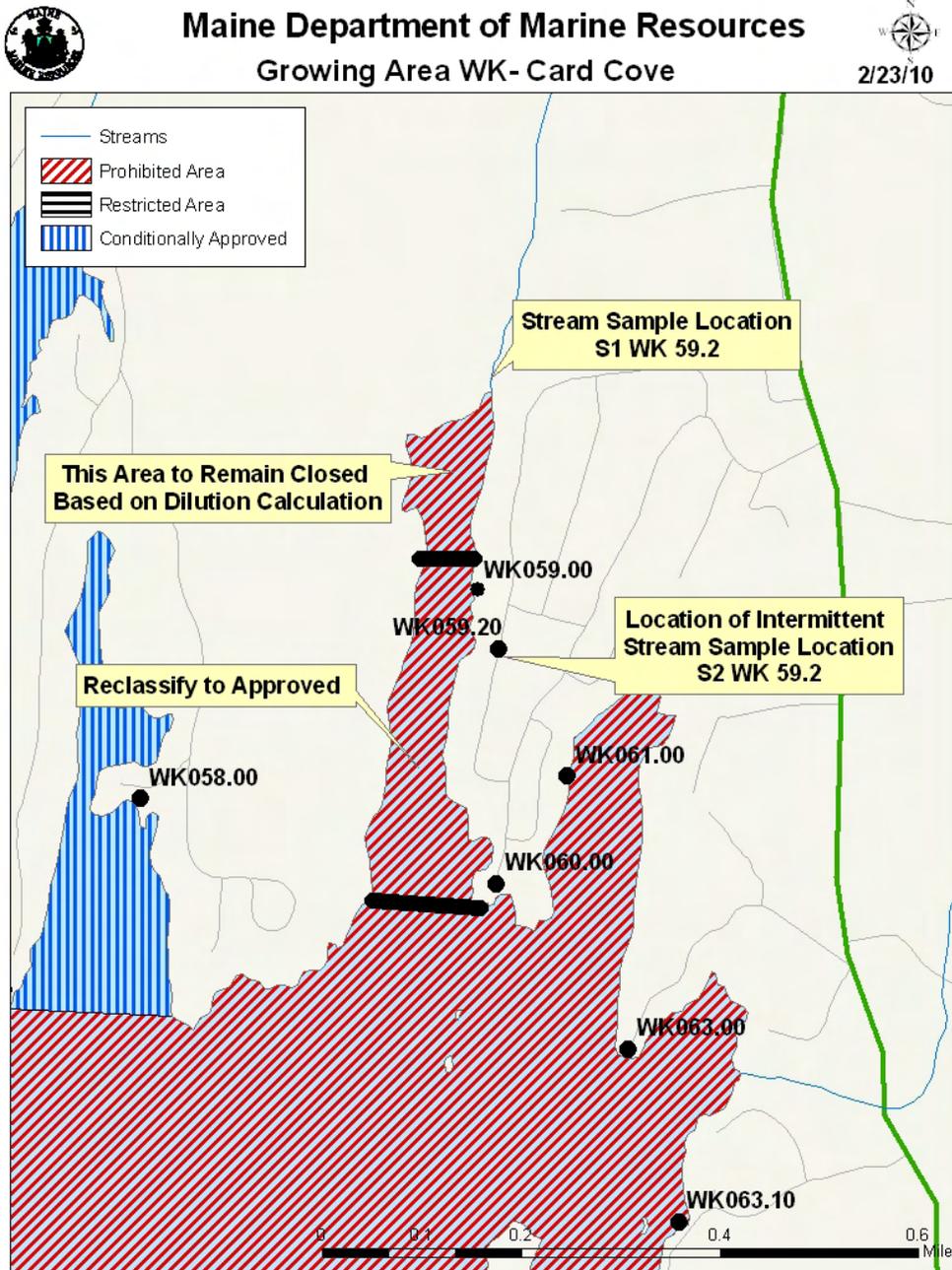
Date	Fecal Score (fcu/100ml)	Fecal Score @ WK 59.2	Flow Conditions/Rate	Notes
7/20/2009	42	28		
8/3/2009	29	10		
8/18/2009	200	4		
8/24/2009	1220	-	High	
9/1/2009	13	2		
9/15/2009	52	14		
9/30/2009	98	6		
10/14/2009	22	<2		
11/3/2009	2	<2		
11/17/09	<2		High/ 530 gallons/min	Collected during flood closure
Mean Score (excludes 11/17/09 sample)	186.4			

Based on this assessment, a portion of Brickyard Cove is recommended for an upgrade in classification, from prohibited to approved; the upper portion of the cove must remain closed in order to provide an adequate dilution area for stream that drains into the head of the cove. Since station WK 60, which will serve as the boundary station between the approved area and the Quahog Bay prohibited area (south of Brickyard Cove), had only 20 data points in its dataset at the end of the review year, this upward classification change should take place once station WK 60 has a full dataset (30 samples). This station is currently being sampled on an



accelerated schedule, and will have a full dataset by the end of May 2010. Prior to the upward classification being implemented, a mid-year data check should be completed for station WK 52.9 and 60 to ensure that both stations are still meeting the approved standard.

Figure 10. Brickyard Cove, with Proposed Upward Classification





Shoreline Survey Activity in 2009

On **August 24, 2009**, DMR and town of Harpswell Marine Warden surveyed 52 properties in Harpswell Mill Cove and Orrs Cove Area (maps 47 and 48). No actual problems were identified; the inground system on one property (older, seasonal camp) could not be located. The CEO has been asked to assist with locating and re-checking this older system. On the same date, a follow up survey was conducted in Card Cove, near station WK 52.1. It was noted that a property with a septic system malfunction and a "Do Not Occupy" order was being used; findings were reported to town CEO/LPI.

On **September, 17, 2009**, DMR and town of Harpswell Marine Warden surveyed 32 properties on High Head (Map 7), Harpswell. This area has been closed due to lack of sanitary survey work. No actual or potential problems were observed. At several properties, the systems could not be located, and DMR staff followed up with town records for clarification.

On **September 24, 2009**, DMR and town of Harpswell Marine Warden surveyed 20 properties in Orrs Cove (Harpswell), Maps 47 and 48. No actual or potential problems were noted. One property had an unidentified system and was reported to codes for follow up inspection; no evidence of breakout was observed on this property.

In addition to the shoreline survey activities described above, drive through surveys were conducted as part of the volunteer site certification sample collection runs, and on dates when new stations were established for area WK (February 9 and August 26, 2009).

Aquaculture/Wet Storage Activity

There are no aquaculture leases or wet storage sites in growing area WK.

Classification Changes

No downgrades in classification are required as a result of this annual review for growing area WK. Four upward classifications are proposed in this report: 1) Harpswell Cove is proposed for an upward classification change from restricted to approved; 2) Mill Cove is proposed for an upward classification change from conditionally approved based on season to approved; 3) the northern portion of Card Cove is being proposed for an upward classification change from prohibited to approved; and 4) Brickyard Cove is being proposed for an upward classification change from prohibited to approved.

Summary

At the end of 2009, all stations were meeting their NSSP classifications, and no downgrades were required. Generally, most approved station have shown improving water quality, or no notable changes over the past three review years. Water quality has shown improvement in



several restricted, prohibited and conditionally approved areas, and as a result of this annual review, four areas in WK are proposed for an upgrade in classification.

The following work is being recommended for 2010: 1) accelerated and adverse condition sampling at the Card Cove station WK 52.1; and 2) accelerated sampling of new station in Card Cove, Harpswell Harbor, Harpswell Sound/Dipper Cove and Quahog Bay. Recommended future survey work in area WK should include inspection of all properties on the shore of Quahog Bay. Additional sample stations should be established in the following areas: Card Cove and potentially in Quahog Bay.

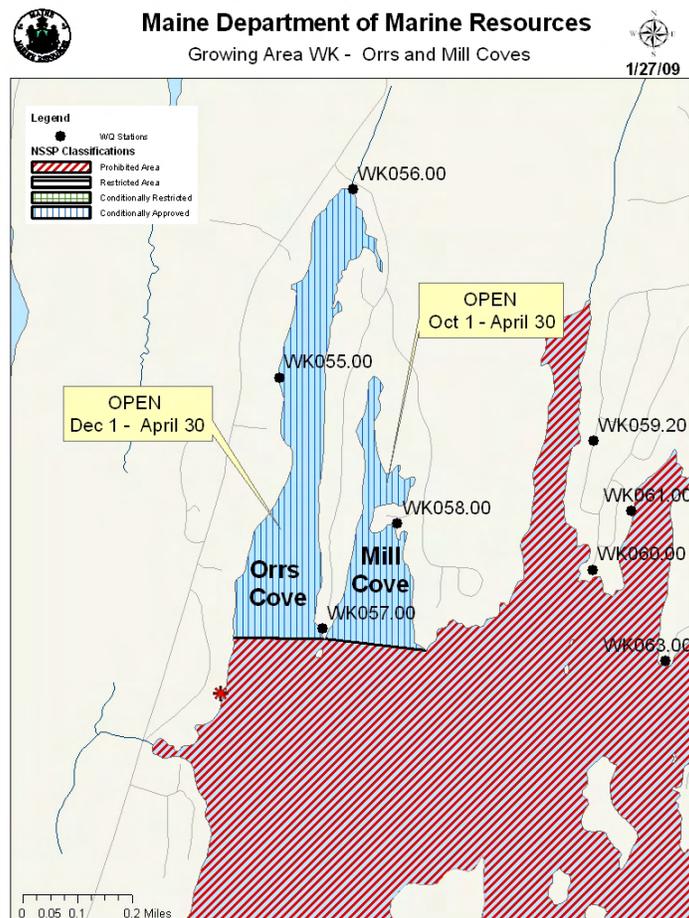


Appendix A. Review of Conditional Area Management Plan-Orrs Cove

Scope

Orrs Cove is conditionally approved based on the presence or absence of 10 or more boats with heads at the Great Island Boatyard, which may discharge into Orrs Cove. Orrs Cove is monitored by stations WK 55 and 56 and was classified conditionally approved in August 2002, after DMR evaluated the Orrs Cove data, made observations of the marina, and interviewed the marina owner with regard to annual marina usage. The marina owner was re-interviewed in December 2008; all information regarding marina use was updated and a dilution area calculation based on the updated information was completed. Currently, the marina operates between May 1st and October 31st, with peak season July through September. The current open status for Orrs Cove Conditionally Approved area is from December 1 through April 30.

Figure 1. Orrs Cove, Harpswell, with sampling stations





Compliance with management plan

In 2009, the seasonal conditional area closed on May 1 and reopened on December 1. Prior to reopening, the area was visited on November 10, 2008 to confirm there were fewer than 10 boats with heads remaining in the water, and a review of the water quality showed that the area continued to meet approved standards for the open season. 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

An annual data review is required prior to the area’s seasonal reopening on December 1st. The area also required site visits prior to the area reopening and closing, to confirm that the number of boats with heads present in the marina is less than 10. In 2009, the observations were completed on April 15 for closing status (one boat present) and November 17 for opening status (4 boats present).

Compliance with approved growing area criteria

The annual review of the water quality for all active stations meets approved standards during the open status time period as displayed in Table 1.

Table 3. Orrs Cove Conditional Area Geomean and P90-Open Status Dec 1 – Apr 30

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK055.00	CA	30	17	3.9	0.52	240	18.8	37	212	1/7/2004
WK056.00	CA	30	17	4.2	0.55	743	21.8	37	212	12/3/2003

Field inspection of critical pollution sources

The potential for pollution in Orrs Cove comes from boats with heads that are moored at the Great Island Boatyard. Visual observations are made of Orrs Cove at the end of April and in the in November to ensure that there are fewer than 10 boats with heads in the cove.

Water sampling compliance history

In 2009, each station in this conditional area was sampled 6 times in the open status.

Analysis-Recommendations

This area is properly classified, and no additional work is recommended for this area.

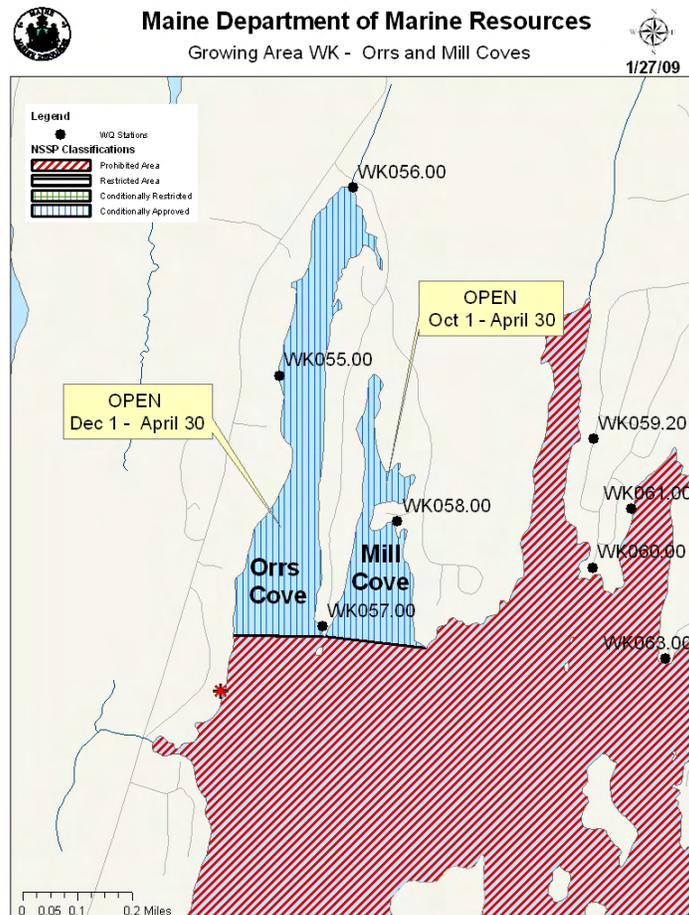


Appendix B. Annual Review of Management Plan- Mill Cove, Quahog Bay

Scope

Mill Cove in Quahog Bay is conditionally approved due to seasonal variability of water quality, possibly due to an increase in shore usage. Mill Cove is monitored by station WK 58 and was classified conditionally approved based on seasonal variation in water quality in 1998. DMR evaluated the data in these areas in December 1997, and made the assessment that there is greater variation in water quality during the summer months. The current open status for Mill Cove is October 1st through April 30th.

Figure 1. Mill Cove, Harpswell, with sampling stations



Compliance with management plan

In 2009, the seasonal conditional area closed on May 1 and reopened on October 1. The seasonal water quality was reviewed prior to reopening and water quality at Station WK 58 continued to meet approved standards for the open season. The seasonal closures are



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. An annual data review is required prior to the area’s seasonal reopening on October 1st.

Compliance with approved growing area criteria

In Mill Cove, conditionally approved station, WK 58, and boundary station WK 57 met approved standards during the open season of October 1 through April 30 (Table 1).

Table 1. Mill Cove Conditional Area Geomean and P90-Open Status Oct 1 – Apr 30

Station	Class	Count	MFCCount	GM	SDV	MAX	P90	Appd_Std	Restr_Std	Min_Date
WK057.00	P-boundary	30	21	2.7	0.35	93	8	35	195	4/27/2005
WK058.00	CA	30	21	2.5	0.3	76	6.3	35	195	1/31/2005

Field inspection of critical pollution sources

The potential for pollution in growing area WK comes from increased shore usage (swimming, walking pets, etc.) and the influx of summer residents to their seasonal homes. Visual observations are made throughout the year during the course of random sampling and shoreline surveying.

Water sampling compliance history

In 2009, station WK 58 was collected 7 times when in the open status; station WK 57 was collected 10 times (SRS).

Analysis-Recommendations

This area is being recommended for an upgrade in classification, from conditionally approved to approved. Please see the “Request for Upward Classification” section of this report for more details.



Appendix C. 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.



Appendix D. Growing Area WK 2009 Data

Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
WK002.00	3/3/2009	SCF	F	CL	2	30	R		C	P	<2
	4/15/2009	SCF	HF	CL	10	31	R		C	P	<2
	6/10/2009	GBR	HF	CL	13	28	R		C	P	<2
	8/5/2009	GBR	HE	CL	21	28	R		C	P	14
	9/21/2009	GBR	H	CL	17	31	R		C	P	<2
	10/28/2009	GBR	E	CL	10	31	R		C	P	<2
WK004.00	1/6/2009	SCF	L	CL	4	32	R		O	CA	<2
	2/11/2009	GBR	HE	CL	4	32	R		C	P	<2
	3/3/2009	SCF	F	CL	2	30	R		C	P	<2
	4/15/2009	SCF	HF	CL	9	32	R		C	P	<2
	6/10/2009	GBR	HF	CL	12	28	R		C	P	<2
	8/5/2009	GBR	HE	CL	18	29	R		C	P	2
	9/21/2009	GBR	H	CL	16	30	R		C	P	2
10/28/2009	GBR	E	CL	10	32	R		C	P	<2	
WK005.00	2/11/2009	GBR	E	CL	3	30	R	W	C	P	<2
	3/25/2009	MLP	HE	NE	3	28	R		C	P	<2
	4/15/2009	SCF	H	CL	10	31	R		C	P	<2
	6/10/2009	GBR	HF	CL	13	24	R		C	P	8
	8/5/2009	GBR	E	CL	19	29	R		C	P	20
	9/21/2009	GBR	H	CL	17	30	R		C	P	20
	10/28/2009	GBR	E	CL	8	26	R		C	P	36
WK005.50	9/21/2009	GBR	H	CL	17	30	R		C	P	<2
	10/28/2009	GBR	E	CL	9	32	R		C	P	<2
	12/2/2009	GBR	HE	SE	8	30	E		C	P	<2
	12/16/2009	GBR	HF	SE	-2	28	E		C	P	<2
WK006.10	1/6/2009	SCF	L	CL	4	32	R		O	CA	<2
	2/11/2009	GBR	E	CL	4	31	R		C	P	36
	3/25/2009	MLP	HE	CL	5	32	R		C	P	<2
	4/15/2009	SCF	H	NW	10	30	R		C	P	<2
	6/10/2009	GBR	HF	CL	12	28	R		C	P	<2
	8/5/2009	GBR	E	CL	22	28	R		C	P	<2
	9/21/2009	GBR	H	CL	17	31	R		C	P	2
	10/28/2009	GBR	E	CL	10	31	R		C	P	<2
WK007.00	1/6/2009	SCF	L	CL	4	32	R		O	CA	<2
	2/11/2009	GBR	E	CL	4	32	R	W	C	P	<2
	3/25/2009	MLP	H	E	4	32	R	W	C	P	<2
	4/15/2009	SCF	H	CL	10	31	R		C	P	<2
	6/10/2009	GBR	H	CL	12	28	R		C	P	<2
	8/5/2009	GBR	E	CL	21	28	R		C	P	2
	9/21/2009	GBR	H	CL	17	30	R		C	P	<2
	10/28/2009	GBR	E	CL	9	32	R		C	P	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
WK007.10	3/25/2009	MLP	H	NE	5	32	R		C	P	<2
	4/15/2009	SCF	H	CL	11	30	R		C	P	<2
	6/10/2009	GBR	H	CL	13	26	R		C	P	8
	8/5/2009	GBR	E	CL	22	26	R		C	P	10
	9/21/2009	GBR	HE	CL	18	30	R		C	P	<2
	10/28/2009	GBR	LE	CL	9	30	R		C	P	<2
WK008.00	3/3/2009	SCF	F	CL	2	31	R		O	A	<2
	4/15/2009	SCF	H	CL	10	30	R		O	A	<2
	6/10/2009	GBR	H	CL	12	28	R		O	A	<2
	8/5/2009	GBR	E	CL	23	28	R		O	A	134
	9/21/2009	GBR	HE	CL	18	31	R		O	A	<2
	10/28/2009	GBR	LE	CL	10	32	R		O	A	<2
WK009.00	3/25/2009	MLP	H	N	5	31	R		O	A	<2
	4/15/2009	SCF	HE	CL	11	30	R		O	A	<2
	6/10/2009	GBR	H	CL	14	28	R		O	A	2
	8/5/2009	GBR	E	CL	24	29	R		O	A	<2
	9/21/2009	GBR	HE	CL	17	30	R		O	A	3.6
	12/2/2009	GBR	HE	SE	5	28	R		O	A	<2
WK010.00	3/25/2009	MLP	H	N	5	32	R	W	O	A	<2
	4/15/2009	SCF	HE	CL	11	32	R		O	A	<2
	6/10/2009	GBR	HE	CL	13	30	R		O	A	<2
	8/5/2009	GBR	E	CL	24	28	R		O	A	4
	9/21/2009	GBR	HE	CL	17	31	R		O	A	<2
	10/28/2009	GBR	LE	CL	9	32	R		O	A	<2
WK011.00	3/18/2009	GBR	H	SW	8	25	R		O	A	<2
	4/15/2009	AB	HF	SW	16	30	R		O	A	<2
	6/9/2009	GBR	F	CL	14	30	R	P	O	A	<2
	8/4/2009	GBR	H	CL	21	29	R		O	A	13
	9/16/2009	GBR	H	CL	15	32	R		O	A	5.5
	11/4/2009	GBR	F	NW	6	32	R		O	A	2
WK012.00	3/18/2009	GBR	H	CL	3	28	R		C	P	2
	4/15/2009	AB	HF	SE	9	30	R		C	P	<2
	6/9/2009	GBR	F	CL	13	28	R	P	C	P	6
	8/4/2009	GBR	H	CL	21	28	R		C	P	2
	9/16/2009	GBR	H	CL	15	31	R		C	P	2
	11/4/2009	GBR	F	NW	8	32	R		C	P	<2
WK013.10	3/18/2009	GBR	HE	SW	4	30	R		C	P	<2
	4/15/2009	AB	H	SW	8	30	R		C	P	<2
	6/9/2009	GBR	HF	CL	13	30	R	P	C	P	<2
	8/4/2009	GBR	HE	CL	20	28	R		C	P	2
	9/16/2009	GBR	H	CL	15	31	R		C	P	27
	11/4/2009	GBR	F	NW	9	32	R		C	P	<2
WK013.20	3/18/2009	GBR	HE	SW	5	30	R		C	P	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	4/15/2009	AB	H	CL	7	30	R		C	P	<2
	6/9/2009	GBR	HF	CL	12	28	R	P	C	P	2
	8/4/2009	GBR	HE	CL	20	29	R		C	P	2
	9/16/2009	GBR	HE	CL	16	31	R		C	P	2
	11/4/2009	GBR	F	NW	9	31	R		C	P	<2
WK013.30	3/18/2009	GBR	HE	CL	4	28	R		O	A	<2
	4/15/2009	AB	H	CL	10	30	R		O	A	<2
	6/9/2009	GBR	HF	CL	13	28	R	P	O	A	<2
	8/4/2009	GBR	HE	CL	22	25	R		O	A	10
	9/16/2009	GBR	HE	CL	16	30	R		O	A	7.3
	11/4/2009	GBR	F	NW	7	30	R		O	A	<2
WK014.00	2/25/2009	DD	F	CL	-2	30	R		O	A	<2
	4/13/2009	MCMU	HF	W	9	28	R		O	A	<2
	6/8/2009	DD	HE	CL	17	21	R		O	A	<2
	8/3/2009	DD	E	CL	22	27	R		O	A	<2
	9/16/2009	DD	H	CL	14	30	R		O	R	20
	10/28/2009	DD	HE	W	8	28	R		O	A	4
WK014.10	1/13/2009	DD	F	SE	-5	31	E		O	R	<2
	1/27/2009	DD	H	CL	-3	30	E		O	R	<2
	2/11/2009	DD	F	CL	-3	30	E		O	R	<2
	2/25/2009	DD	F	CL	-1	26	R		O	R	<2
	4/13/2009	MCMU	HF	W	10	26	R		O	R	<2
	4/27/2009	DD	HF	CL	12	27	E	P	O	R	<2
	5/11/2009	MCMU	HF	NW	11	26	E		O	R	<2
	6/8/2009	DD	HE	CL	18	29	R		O	R	<2
	7/21/2009	DD	F	CL	18	27	E		O	R	46
	8/3/2009	DD	E	CL	22	25	R		O	R	20
	8/17/2009	DD	E	CL	25	26	E		O	R	58
	9/16/2009	DD	H	CL	15	30	R		O	R	22
	10/1/2009	DD	F	CL	14	32	E	P	O	R	<2
	10/14/2009	MCMU	E	NW	10	30	E	PW	O	R	2
10/28/2009	DD	HE	W	8	30	R		O	R	<2	
12/1/2009	DD	H	NW	4	29	E	P	O	R	<2	
WK014.20	1/13/2009	DD	HF	CL	-4	32	E		O	R	<2
	1/27/2009	DD	H	CL	-3	31	E		O	R	<2
	2/11/2009	DD	HF	CL	-5	30	E		O	R	<2
	2/25/2009	DD	E	CL	-2	30	R		O	R	<2
	4/13/2009	MCMU	H	W	9	24	R		O	R	<2
	4/27/2009	DD	HF	CL	9	29	E	P	O	R	<2
	5/11/2009	MCMU	F	NW	11	22	E		O	R	2
	6/8/2009	DD	H	CL	18	30	R		O	R	<2
	7/21/2009	DD	F	CL	19	27	E		O	R	11
8/3/2009	DD	E	CL	23	28	R		O	R	<2	



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	8/17/2009	DD	E	CL	24	28	E		O	R	4
	9/16/2009	DD	HF	CL	16	30	R		O	R	13
	10/1/2009	DD	F	CL	15	31	E	P	O	R	<2
	10/14/2009	MCMU	E	NW	10	30	E	P	O	R	<2
	10/28/2009	DD	HE	CL	8	30	R		O	R	<2
	12/1/2009	DD	HE	NW	4	30	E	P	O	R	<2
WK014.30	1/13/2009	DD	HF	SE	-4	32	E		O	R	<2
	1/27/2009	DD	H	CL	-2	30	E		O	R	<2
	2/11/2009	DD	F	CL	-2	30	E		O	R	<2
	2/25/2009	DD	E	CL	-1	30	R		O	R	<2
	3/18/2009	DD	F	SW	5	25	E		O	R	2
	4/13/2009	MCMU	HF	W	9	26	R		O	R	<2
	4/27/2009	DD	H	CL	10	29	E	P	O	R	<2
	5/11/2009	MCMU	F	NW	10	26	E		O	R	<2
	6/8/2009	DD	H	CL	17	29	R	W	O	R	<2
	7/21/2009	DD	F	CL	18	28	E		O	R	12
	8/3/2009	DD	E	CL	22	28	R		O	R	<2
	8/17/2009	DD	E	CL		28	E		O	R	2
	9/16/2009	DD	HF	SE	14	31	R		O	R	6
	10/1/2009	DD	F	CL	13	32	E	P	O	R	2
	10/14/2009	MCMU	E	NW	9	30	E	P	O	R	<2
10/28/2009	DD	HE	NW	9	30	R		O	R	<2	
12/1/2009	DD	HE	NW	5	30	E	P	O	R	<2	
WK014.40	2/25/2009	DD	E	CL	-2	30	R		O	A	<2
	4/13/2009	MCMU	H	W	8	28	R		O	A	<2
	6/8/2009	DD	H	CL	15	30	R		O	A	<2
	8/3/2009	DD	E	CL	22	29	R		O	A	<2
	9/16/2009	DD	HF	SE	15	31	R	W	O	A	<2
	10/28/2009	DD	HE	NW	9	31	R		O	A	<2
WK015.10	3/18/2009	GBR	F	SW	5	30	R		O	A	2
	6/9/2009	GBR	HF	CL	14	28	R	P	O	A	<2
	8/4/2009	GBR	HE	CL	22	29	R		O	A	<2
	9/16/2009	GBR	E	CL	17	31	R		O	A	2
	11/4/2009	GBR	F	NW	8	32	R		O	A	<2
WK017.00	3/18/2009	GBR	F	SW	6	28	R		O	A	<2
	4/15/2009	AB	HE	SW	14	30	R		O	A	<2
	6/9/2009	GBR	H	CL	15	28	R	P	O	A	6
	8/4/2009	GBR	HE	CL	23	28	R		O	A	<2
	9/16/2009	GBR	E	CL	17	30	R		O	A	<2
	11/4/2009	GBR	F	NW	6	30	R		O	A	<2
WK018.00	2/25/2009	DD	E	CL	-3	28	R		O	A	<2
	4/13/2009	MCMU	H	W	7	28	R		O	A	<2
	6/8/2009	DD	H	CL	16	30	R		O	A	2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	8/3/2009	DD	E	CL	22	30	R		O	A	2
	9/16/2009	DD	HF	SE	15	31	R		O	A	4
	10/28/2009	DD	HE	W	8	30	R		O	A	<2
WK018.10	2/25/2009	DD	E	CL	0	30	R		O	A	<2
	4/13/2009	MCMU	H	W	8	29	R		O	A	<2
	6/8/2009	DD	H	CL	16	30	R		O	A	2
	8/3/2009	DD	E	CL	22	30	R		O	A	<2
	9/16/2009	DD	HF	SE	14	31	R		O	A	<2
	10/28/2009	DD	H	CL	8	30	R		O	A	<2
	WK019.80	3/18/2009	GBR	HE	SW	5	28	R		O	A
4/15/2009		AB	HF	W	10	30	R		O	A	<2
6/9/2009		GBR	H	CL	12	28	R	P	O	A	2
8/4/2009		GBR	HE	CL	24	29	R		O	A	5.5
9/16/2009		GBR	E	CL	16	30	R		O	A	28
11/4/2009		GBR	HF	NW	9	32	R		O	A	<2
WK020.00	3/18/2009	GBR	HE		5	29	R		C	P	<2
	4/15/2009	AB	HF	W	11	30	R		C	P	<2
	6/9/2009	GBR	H	CL	13	29	R	P	C	P	6
	8/4/2009	GBR	E	CL	22	29	R		C	P	2
	9/16/2009	GBR	E	CL	16	30	R		C	P	10
	11/4/2009	GBR	HF	NW	8	32	R		C	P	<2
WK022.00	3/18/2009	GBR	HF	CL	4	28	R		C	P	<2
	4/15/2009	AB	HE	CL	7	30	R		C	P	<2
	6/9/2009	GBR	H	CL	13	28	R	P	C	P	<2
	8/4/2009	GBR	E	CL	21	29	R		C	P	<2
	9/16/2009	GBR	E	CL	16	31	R		C	P	2
	11/4/2009	GBR	HF	NW	7	32	R		C	P	2
WK023.00	3/18/2009	GBR	HF	CL	4	28	R		O	A	10
	4/15/2009	AB	HE	CL	9	30	R		O	A	<2
	6/9/2009	GBR	H	CL	12	28	R	P	O	A	2
	8/4/2009	GBR	E	CL	24	28	R		O	A	2
	9/16/2009	GBR	E	CL	17	31	R		O	A	<2
	11/4/2009	GBR	HF	NW	7	32	R		O	A	<2
WK023.10	3/18/2009	GBR	H	CL	3	30	R		C	P	<2
	4/15/2009	AB	HE	SW	9	30	R		C	P	<2
	6/10/2009	GBR	HE	CL	16	29	R		C	P	2
	7/20/2009	GBR	E		21	27	E		C	P	<2
	8/4/2009	GBR	E	CL	23	28	R		C	P	4
	9/16/2009	GBR	E	CL	15	31	R		C	P	4
	11/4/2009	GBR	HF	NW	8	32	R		C	P	<2
WK023.20	3/18/2009	GBR	H	CL	4	30	R		C	P	<2
	4/15/2009	AB	H	SW	8	30	R		C	P	<2
	6/10/2009	GBR	HE	CL	18	29	R		C	P	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	7/20/2009	GBR	E	CL	20	26	E		C	P	<2
	8/4/2009	GBR	E	CL	22	29	R		C	P	<2
	9/16/2009	GBR	E	CL	15	31	R		C	P	6
	11/4/2009	GBR	HF	NW	9	32	R		C	P	<2
WK024.00	4/15/2009	AB	HE	CL	8	30	R		C	P	<2
	6/9/2009	GBR	H	CL	14	30	R	P	C	P	<2
	8/4/2009	GBR	E	CL	20	28	R		C	P	4
	9/16/2009	GBR	E	CL	16	30	R		C	P	200
	11/4/2009	GBR	HF	NW	6	31	R		C	P	6
WK025.00	3/18/2009	GBR	HF	CL	4	28	R		C	P	<2
	4/15/2009	AB	HE	CL	7	30	R		C	P	<2
	6/9/2009	GBR	H	CL	12	28	R	P	C	P	<2
	8/4/2009	GBR	E	CL	20	28	R		C	P	<2
	9/16/2009	GBR	E	CL	17	31	R		C	P	<2
	11/4/2009	GBR	H	NW	9	32	R		C	P	<2
WK042.00	3/18/2009	GBR	H	CL	3	28	R		C	P	<2
	4/15/2009	AB	H	SW	9	30	R		C	P	<2
	6/9/2009	GBR	HE	CL	13	28	R	P	C	P	<2
	8/4/2009	GBR	E	CL	24	24	R		C	P	8
	9/16/2009	GBR	E	CL	16	30	R		C	P	<2
	11/4/2009	GBR	H	NW	10	30	R		C	P	<2
WK044.00	3/18/2009	GBR	HF	CL	4	26	R		O	R	<2
	4/15/2009	AB	H	W	9	30	R		O	R	<2
	6/9/2009	GBR	HE	CL	14	28	R	P	O	R	<2
	8/4/2009	GBR	E	CL	24	26	R		O	R	<2
	9/16/2009	GBR	E	CL	15	31	R		O	R	<2
	11/4/2009	GBR	H	NW	9	32	R		O	R	<2
WK044.50	3/18/2009	GBR	F	CL	5	28	R		O	R	<2
	4/15/2009	AB	HF	SW	8	30	R		O	R	<2
	6/9/2009	GBR	HE	CL	14	28	R	P	O	R	<2
	8/4/2009	GBR	E	CL	25	26	R		O	R	<2
	9/16/2009	GBR	E	CL	17	30	R		O	R	<2
	11/4/2009	GBR	H	NW	8	31	R		O	R	<2
WK048.00	3/18/2009	GBR	F	SW	5	26	R		C	P	<2
	4/15/2009	AB	F	SW	10	30	R		C	P	<2
	6/9/2009	GBR	HE	CL	14	26	R	P	C	P	14
	8/4/2009	GBR	E	CL	24	25	R		C	P	33
	9/16/2009	GBR	LE	CL	17	31	R		C	P	2
	11/4/2009	GBR	H	NW	9	32	R		C	P	<2
WK052.00	3/18/2009	GBR	F	SW	4	20	R		C	P	<2
	4/15/2009	AB	F	CL	9	28	R	N	C	P	<2
	6/9/2009	GBR	HE	CL	13	28	R	P	C	P	4
	8/4/2009	GBR	E	CL	22	26	R		C	P	11



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	9/16/2009	GBR	LE	CL	16	30	R		C	P	<2
	11/4/2009	GBR	HE	NW	9	32	R		C	P	<2
WK052.10	3/18/2009	GBR	F	CL	5	28	R		C	P	<2
	4/15/2009	AB	F	CL	10	32	R	N	C	P	<2
	4/28/2009	GBR	HE	CL	13	25	E		C	P	<2
	5/12/2009	GBR	E	CL	9	30	E		C	P	<2
	6/9/2009	GBR	E	CL	14	28	R	P	C	P	2
	7/20/2009	GBR	E		22	26	E		C	P	8
	8/4/2009	GBR	E	CL	24	27	R		C	P	<2
	8/18/2009	GBR	E	CL	25	28	E		C	P	94
	9/1/2009	GBR	E	CL	19	30	E		C	P	2
	9/21/2009	GBR	HE	CL	16	31	R		C	P	29
	9/30/2009	GBR	E	CL	16	30	E		C	P	9.1
	10/14/2009	GBR	E	CL	11	32	E		C	P	15
	11/4/2009	GBR	HE	NW	9	32	R		C	P	<2
12/16/2009	GBR	H	SE	1	31	E		C	P	2	
WK052.90	9/16/2009	GBR	LE	CL	17	30	R		C	P	8
	11/4/2009	GBR	HE	NW	9	32	R		C	P	<2
	12/16/2009	GBR	H	SE	3	30	E		C	P	<2
WK053.00	3/18/2009	GBR	F	SW	9	28	R		C	P	<2
	4/15/2009	AB	F	CL	10	31	R		C	P	<2
	4/28/2009	GBR	HE	CL	16	26	E		C	P	<2
	5/12/2009	GBR	E	CL	12	30	E		C	P	29
	6/9/2009	GBR	E	CL	14	28	R	P	C	P	<2
	7/20/2009	GBR	E		22	26	E		C	P	<2
	8/4/2009	GBR	E	CL	24	27	R		C	P	4
	8/18/2009	GBR	E	CL	25	28	E		C	P	14
	9/1/2009	GBR	E	CL	20	30	E		C	P	<2
	9/16/2009	GBR	LE	CL	17	31	R		C	P	4
	9/30/2009	GBR	E	CL	17	30	E		C	P	8
	10/14/2009	GBR	E	CL	12	32	E		C	P	<2
	11/4/2009	GBR	HE	NW	10	32	R		C	P	<2
12/2/2009	GBR	E	SE	8	30	E		C	P	10	
WK054.50	2/25/2009	GBR	HF	CL	1	32	R		C	P	<2
	4/28/2009	GBR	HE	CL	15	25	R		C	P	<2
	8/1/2009	GBR	L	CL	23	28	R		C	P	3.6
	9/15/2009	GBR	E		17	31	R		C	P	<2
	11/3/2009	GBR	F		9	30	R		C	P	<2
	12/16/2009	GBR	HE	SE	4	30	E		C	P	<2
WK055.00	1/6/2009	SCF	LF	CL	4	28	R		O	CA	<2
	2/25/2009	GBR	HF	CL	1	14	R		O	CA	<2
	3/18/2009	GBR	F	SW	8	20	R		O	CA	<2
	4/13/2009	GBR	F	NW	8	30	R		O	CA	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	6/8/2009	GBR	H	CL	18	30	R		C	CA	2
	8/3/2009	GBR	H	CL	22	24	R		C	CA	1560
	9/15/2009	GBR	E		18	30	R		C	CA	29
	11/3/2009	GBR	HF		9	28	R		C	CA	2
	12/2/2009	GBR	E	CL	8	30	R		O	CA	<2
	12/16/2009	GBR	HF	SE	3	28	R		O	CA	<2
WK056.00	2/25/2009	GBR	HF	CL	2	1	R		O	CA	<2
	3/18/2009	GBR	F	SW	3	1	R		O	CA	<2
	3/30/2009	MLP	HF	CL	4	28	R	P	O	CA	<2
	4/13/2009	GBR	F	NW	7	30	R		O	CA	<2
	6/8/2009	GBR	H	CL	17	30	R		C	CA	<2
	8/3/2009	GBR	H	CL	22	20	R		C	CA	28
	9/1/2009	GBR	H		18	30	R		C	CA	2
	11/3/2009	GBR	HF		9	30	R		C	CA	2
	12/2/2009	GBR	E	SE	7	18	R		O	CA	<2
12/16/2009	GBR	HF	SE	4	28	R		O	CA	14	
WK057.00	1/12/2009	EXT	E	CL	-1	31	R		C	P	<2
	2/25/2009	GBR	H	CL	1	18	R		C	P	<2
	3/18/2009	GBR	F	SW	4	28	R		C	P	<2
	4/13/2009	GBR	F	NW	6	32	R		C	P	<2
	6/8/2009	GBR	H	CL	16	30	R		C	P	<2
	8/3/2009	GBR	H	CL	21	26	R		C	P	6
	9/15/2009	GBR	E		17	31	R		C	P	<2
	11/3/2009	GBR	HF		9	30	R		C	P	2
	12/2/2009	GBR	E	SE	7	29	R		C	P	<2
	12/16/2009	GBR	H	SE	1	30	R		C	P	<2
WK058.00	1/6/2009	SCF	LF	CL	5	32	R		O	CA	<2
	2/25/2009	GBR	H	CL	2	32	R		O	CA	<2
	3/18/2009	GBR	F	SW	4	28	R		O	CA	<2
	4/13/2009	GBR	F	NW	6	31	R		O	CA	<2
	6/8/2009	GBR	H	CL	16	30	R		C	CA	<2
	7/20/2009	GBR	E		22	24	E		C	CA	2
	8/3/2009	GBR	H	CL	22	26	R		C	CA	12
	9/15/2009	GBR	E		18	31	R		C	CA	<2
	11/3/2009	GBR	HF		10	30	R		O	CA	<2
	12/2/2009	GBR	E	SE	7	28	R		O	CA	<2
	12/16/2009	GBR	H	SE	4	31	R		O	CA	<2
WK059.20	2/25/2009	GBR	H	CL	0	22	R		C	P	<2
	4/13/2009	GBR	HF	NW	7	30	R		C	P	<2
	4/28/2009	GBR	HE	CL	13	24	E		C	P	<2
	5/12/2009	GBR	E	CL	11	29	E		C	P	<2
	6/8/2009	GBR	HE	CL	19	30	R		C	P	<2
	7/20/2009	GBR	LE		22	22	E		C	P	28



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	8/3/2009	GBR	HE	CL	22	26	R		C	P	10
	8/18/2009	GBR	E	CL	27	27	E		C	P	4
	9/1/2009	GBR	E	CL	18	30	E		C	P	2
	9/15/2009	GBR	E		17	30	R		C	P	14
	9/30/2009	GBR	E	CL	17	29	E		C	P	6
	10/14/2009	GBR	E	CL	12	32	E		C	P	<2
	11/3/2009	GBR	HF		8	30	R		C	P	<2
	12/2/2009	GBR	E	CL	7	28	E		C	P	<2
	12/16/2009	GBR	H	SE	3	30	E		C	P	<2
WK060.00	2/25/2009	GBR	H	CL	0	31	R		C	P	<2
	4/13/2009	GBR	HF	NW	9	30	R		C	P	<2
	4/28/2009	GBR	HE	CL	14	24	E		C	P	<2
	5/12/2009	GBR	E	CL	13	30	E		C	P	<2
	6/8/2009	GBR	HE	CL	18	30	R		C	P	<2
	8/3/2009	GBR	HE	CL	24	26	R		C	P	16
	8/18/2009	GBR	E	CL	29	28	E		C	P	18
	9/1/2009	GBR	E	CL	21	30	E		C	P	<2
	9/15/2009	GBR	E		19	31	R		C	P	4
	9/30/2009	GBR	E	CL	17	30	E		C	P	<2
	10/14/2009	GBR	E	CL	12	32	E		C	P	<2
	11/1/2009	GBR	HE		10	30	R		C	P	<2
12/16/2009	GBR	H	CL	4	30	E		C	P	2	
WK061.00	2/25/2009	GBR	H	CL	0	30	R		C	P	<2
	4/13/2009	GBR	HF	NW	9	28	R		C	P	<2
	6/8/2009	GBR	HE	CL	18	30	R		C	P	104
	8/3/2009	GBR	HE	CL	22	26	R		C	P	15
	9/15/2009	GBR	E		19	30	R		C	P	24
	11/3/2009	GBR	HF		10	30	R		C	P	12
WK063.00	2/25/2009	GBR	H	CL	1	22	R		C	P	<2
	4/13/2009	GBR	HF	NW	7	29	R		C	P	<2
	6/8/2009	GBR	HE	CL	17	30	R		C	P	18
	8/3/2009	GBR	HE	CL	22	26	R		C	P	2
	9/15/2009	GBR	E		19	30	R		C	P	2
	11/3/2009	GBR	HF		11	30	R		C	P	<2
WK063.10	2/25/2009	GBR	HE	CL	0	30	R		C	P	<2
	4/28/2009	GBR	E	CL	15	24	R		C	P	18
	8/3/2009	GBR	HE	CL	20	25	R		C	P	3.6
	9/15/2009	GBR	E		17	30	R		C	P	14
	11/3/2009	GBR	H		10	30	R		C	P	<2
	12/16/2009	GBR	HE	SE	-1	30	E		C	P	31
WK063.20	3/30/2009	MLP	HF	CL	4	18	R	PW	C	P	<2
	4/28/2009	GBR	E	CL	14	25	R		C	P	<2
	8/3/2009	GBR	HE	CL	23	26	R		C	P	<2



Station	Date	Collector	Tide	Wind	Temp	Salin	Strat	Adv	Status	Class	MFCOL
	9/15/2009	GBR	E		17	30	R		C	P	<2
	11/3/2009	GBR	H		10	30	R		C	P	<2
	12/16/2009	GBR	HE	SE	-1	30	E		C	P	<2
WK064.10	2/25/2009	GBR	HE	CL	1	31	R		C	P	<2
	4/13/2009	GBR	HF	NW	6	28	R		C	P	<2
	6/8/2009	GBR	HE	CL	18	30	R		C	P	<2
	8/3/2009	GBR	HE	CL	23	26	R		C	P	28
	9/15/2009	GBR	E		17	31	R		C	P	36
	11/3/2009	GBR	H		9	30	R		C	P	<2
	WK065.00	2/25/2009	GBR	HE	CL	4	31	R		C	P
4/13/2009		GBR	HF	NW	8	30	R		C	P	<2
6/8/2009		GBR	HE	CL	18	28	R		C	P	<2
8/3/2009		GBR	E	CL	24	24	R		C	P	18
9/15/2009		GBR	E		19	30	R		C	P	<2
11/3/2009		GBR	H		10	30	R		C	P	600
WK066.00	2/25/2009	GBR	E	CL	4	31	R		C	P	<2
	4/13/2009	GBR	H	NW	9	32	R		C	P	<2
	6/8/2009	GBR	HE	CL	19	28	R		C	P	<2
	8/3/2009	GBR	E	CL	25	26	R		C	P	<2
	9/15/2009	GBR	E		18	30	R		C	P	6
	11/3/2009	GBR	H		11	30	R		C	P	54
WK067.00	2/25/2009	GBR	E	CL	3	32	R		C	P	<2
	4/13/2009	GBR	H	NW	8	28	R	W	C	P	<2
	6/8/2009	GBR	HE	CL	19	28	R		C	P	3.6
	8/3/2009	GBR	E	CL	22	24	R		C	P	4
	9/15/2009	GBR	E		18	30	R		C	P	8
	11/3/2009	GBR	H		10	30	R		C	P	<2
WK068.00	2/25/2009	GBR	E	CL	1	30	R		C	P	<2
	4/13/2009	GBR	H	NW	7	30	R		C	P	<2
	6/8/2009	GBR	E	CL	20	30	R	W	C	P	220
	8/3/2009	GBR	E	CL	23	24	R		C	P	4
	9/15/2009	GBR	E		19	30	R		C	P	4
	11/3/2009	GBR	HE		10	30	R		C	P	<2
WK068.10	2/25/2009	GBR	E	CL	3	33	R		C	P	<2
	4/13/2009	GBR	H	NW	6	29	R		C	P	<2
	6/8/2009	GBR	E	CL	16	30	R		C	P	<2
	8/3/2009	GBR	E	CL	23	24	R		C	P	<2
	9/15/2009	GBR	E		16	31	R		C	P	<2
	11/3/2009	GBR	HE		10	31	R		C	P	2

