



## GROWING AREA WV

St George, Spruce Head, South Thomaston, and Owls Head

Sanitary Survey Report  
2009-2020  
Final  
Geoffrey Shook, Scientist I  
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Sanitary Survey Officer signature: 

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**Executive Summary**

This Sanitary Survey report is for Growing Area WV in Knox County. It is written in compliance with the requirements of the 2019 Model Ordinance and the National Shellfish Sanitation Program. One area in Growing Area WV is being reviewed for a possible classification change. The northern end of the Long Cove (St. George) conditionally approved area will downgrade by having additional closure months added to the management plan. The southern portion of the Long Cove conditional area meets year-round approved standards and is recommended for upgrade to Approved. In 2020, Wheeler Bay (Spruce Head) was downgraded to conditionally approved based on one inch of rain in 24 hours. Waterman Beach (South Thomaston) was downgraded to Restricted. One water quality station was deactivated during the review year, WV 52 and one new investigative station was established, WV 51.2. Shoreline survey was conducted in 2013 and 2019. A total of 760 properties were visited during shoreline survey operations. There were five actual problems found that resulted in problem forms. An LPI confirmed the problem at two properties and a homeowner stated intention to fix the system at one property. Most outstanding problems are in currently Prohibited areas. It was determined that three nearshore outhouses on Hewett Island were not a current public health concern, so no prohibited area was created. Access was denied at eight properties. Water quality has remained generally consistent throughout the Growing Area despite a decline in water quality in three small areas. Triennial reports were written in 2011, 2014, 2017. The next Sanitary Survey is due in 2032 and the next triennial is due in 2023.



## Description of Growing Area

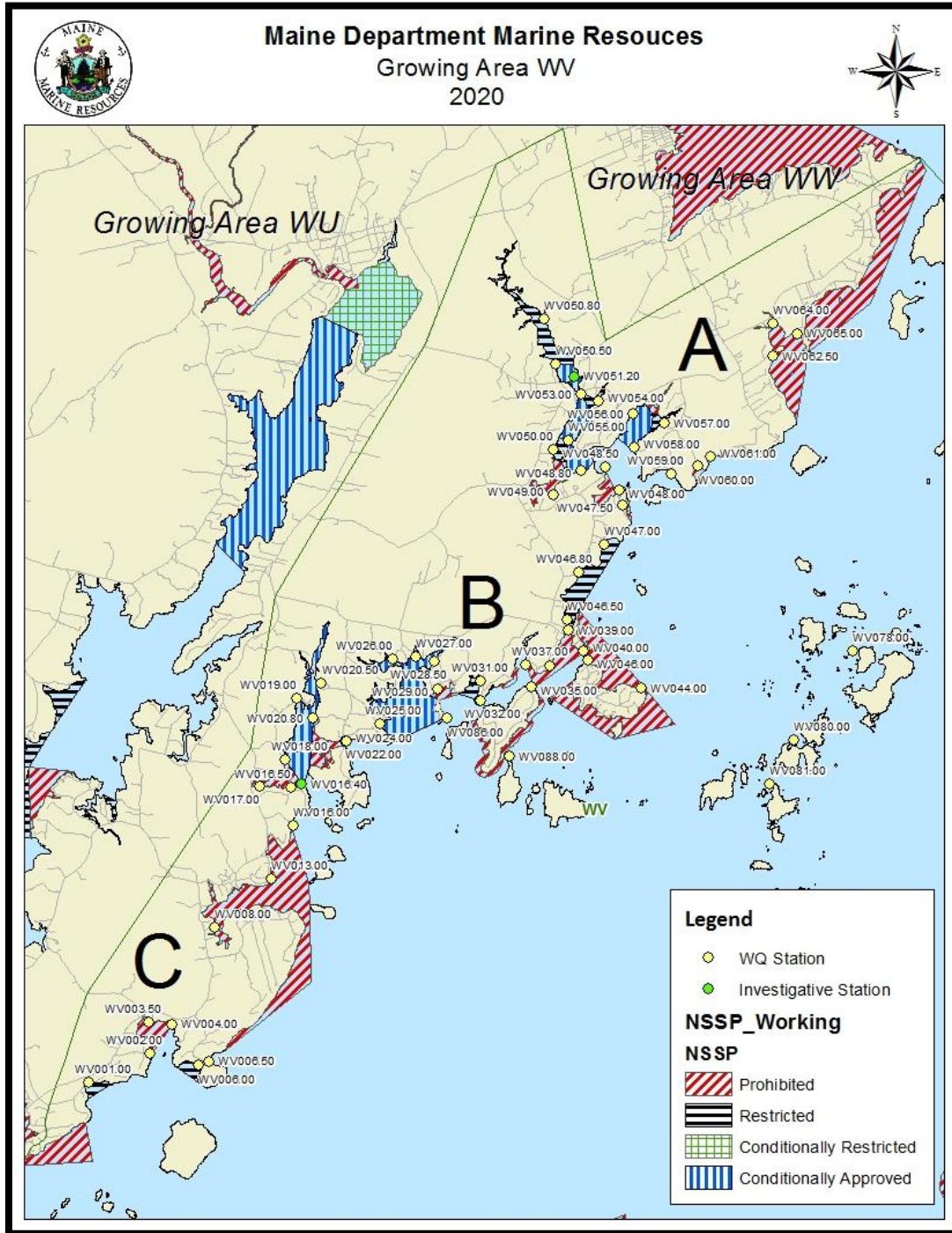
Shellfish Growing Area WV covers approximately 155 square miles from Marshall Point, Port Clyde to the northern tip of Owls Head (Figure 1). The growing area includes portions of the towns of St George, South Thomaston, and Owls Head. The town of St George includes the villages of Port Clyde, Clark Island, Martinsville, and Tenants Harbor. According to the Maine City-Town Census Data from 2018, the town of St George had a year-round population of 2,584, the town of South Thomaston, which includes the village of Spruce Head had a year round population of 1,622 and the town of Owls Head had a year round population is 1,607. All the towns in shellfish growing area WV are small and residential, with the population of each increasing during the summer months. There are no large industries, marinas, or large tourist areas in this growing area. The main sources of income for this growing area include lobstering, construction and self-employment businesses such as carpentry businesses and artist galleries. While there are no actual marinas in shellfish growing area WV, there are mooring areas that are used by the many local lobster boats. Cruising boats also frequent some of these areas during the summer months, with Tenants Harbor being the most popular mooring area used by cruising boats. There are no sewage treatment facilities in this growing area. The closest sewage treatment facilities to this growing area are in the towns of Thomaston (growing area WU) and Rockland (growing area WW). The treatment plant outfalls from Thomaston and Rockland enter into water bodies away from the shores and waters of shellfish Growing Area WV. Freshwater input into the Growing Area is primarily from the Weskeag River in South Thomaston as well as numerous other smaller brooks and streams from local ponds. There are 28 active licensed overboard discharges (OBDs) in WV. No OBDs were removed in 2020.

There were 47 aquaculture LPAs and 14 aquaculture lease areas in Growing Area WV during the review year. Species being cultured include American oysters, sea scallops, blue mussels, Northern Quahogs, Soft clams, and several species of kelp.

Below is the map with growing area boundaries and active water quality stations. Closures within the growing area can be found in legal notices in DMR central files on the DMR website.



Figure 1. Growing Area WV Overview Map with Active Water Quality Stations





## **History of Growing Area Classification**

Reclassification addendums to the sanitary survey report are in the DMR central files.

## **Pollution Sources Survey**

### **Summary of Sources and Location**

The growing area shoreline is divided into two-mile segments that are identified using unique Growing Area Shoreline Survey Identification (GASSID) numbers. All properties and potential pollution sources within 250 feet of the shoreline are identified and inspected. The inspection includes a property description, physical address, location of the septic system and any other relevant potential or actual pollution sources. A GPS point to identify the source location(s) and the data are entered electronically in the field and stored in DMR central files.





Figure 2. Growing Area WV, Inset Map A

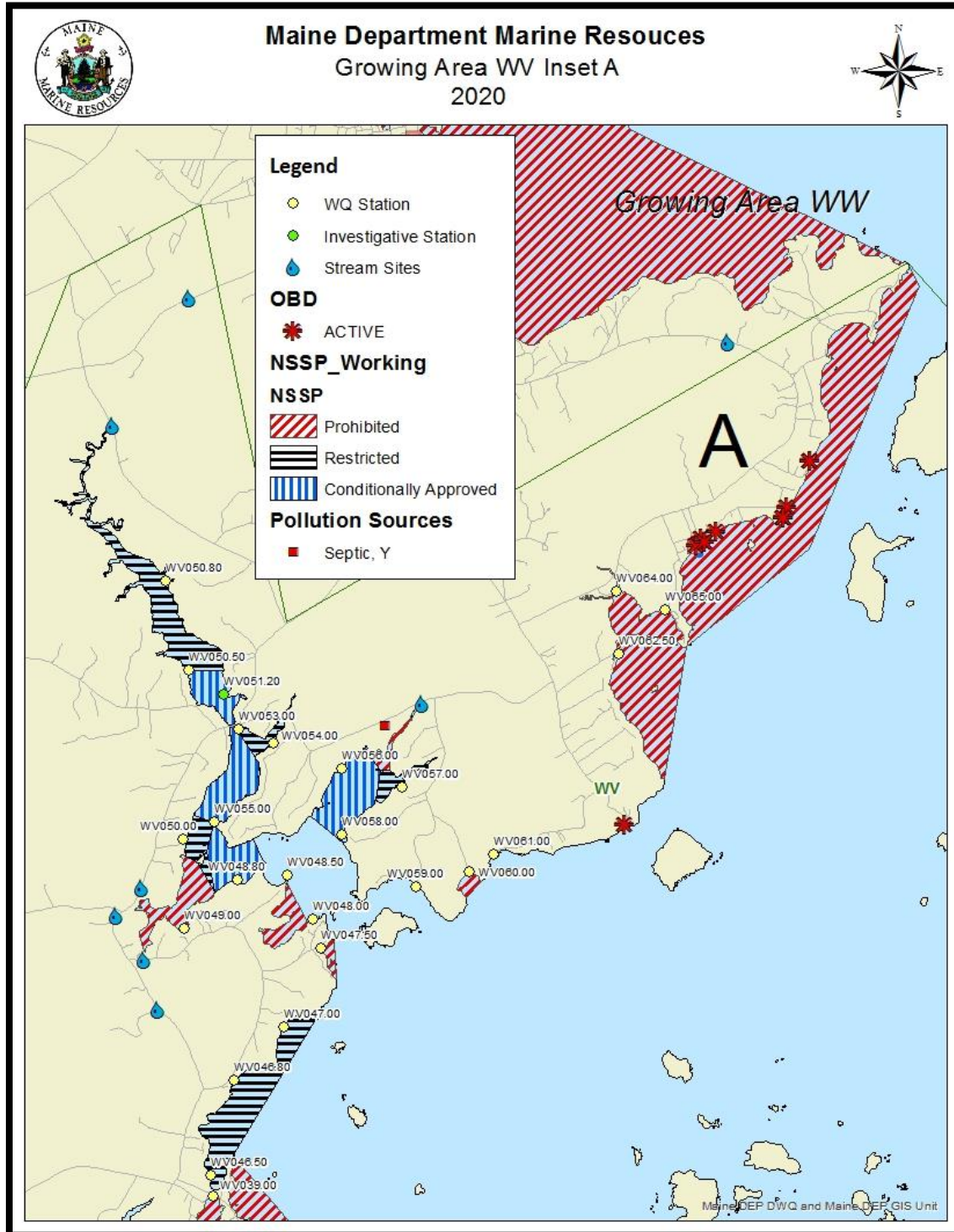




Figure 3. Growing Area WV, Inset Map B

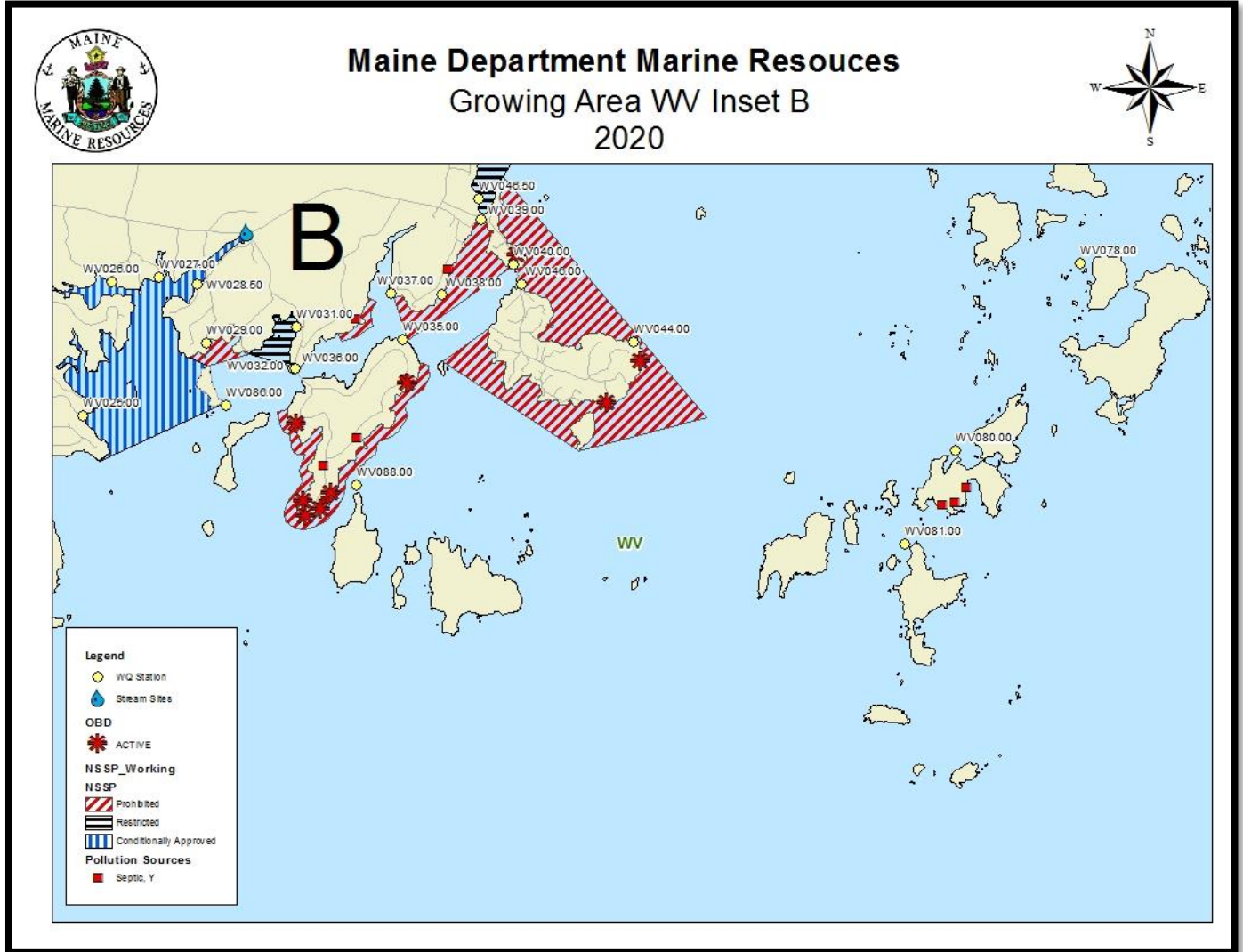
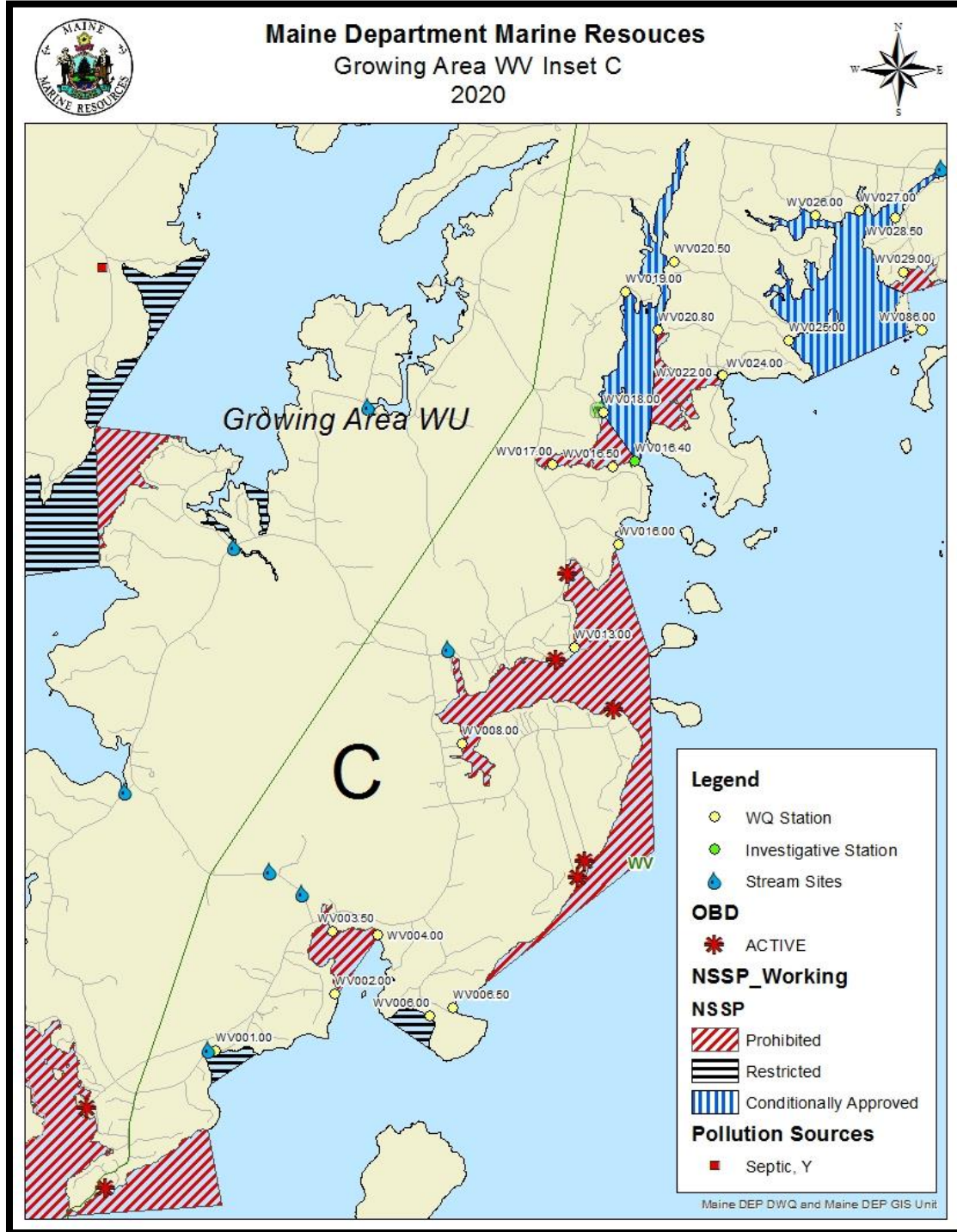






Figure 4. Growing Area WV, Inset Map C





## State and Federal Licensed Waste Discharge Permits

### Overboard Discharges (OBDs)

There are 27 overboard discharges (OBDs) that discharge treated effluent into the waters of Growing Area WV. Most of the active OBDs are located around Owls Head, Spruce Head, Rackliff Island and Tenants Harbor. There were 24 OBDs reported removed during the 12-year review period. The most recent OBD removal was in 2019. No OBDs were removed during the 2020 review year.

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

OBDs are licensed and inspected by the Maine Department of Environmental Protection. At each inspection, DEP looks for tags on each treatment unit identifying the service contractor and the last date of service. If an OBD is not properly maintained, or if the OBD malfunctions, it has the potential to directly discharge untreated wastewater to the shore; therefore, preventative closures are implemented surrounding every OBD located in growing area EI (Table 1). The size of each closure is determined based on a dilution, using the permitted flow rate of the OBD (in gallons per day, GPD), and the depth of the receiving water that each OBD discharges to; the fecal concentration used for this dilution calculation is  $1.4 \times 10^5$  FC /100 ml. Single OBD systems associated with more than one residence will have multiple permit IDs. All current closures are of adequate size to protect public health.



Table 1. Growing Area WV Overboard Discharges (OBDs).

Growing Area	DEP ID	Town	Flow	Status	Receiving Waters	Required Closure (Acres)	Actual Closure Area
P14	3174	St George	300	Active	Atlantic Ocean	0.26	>525
P16	3326	St George	300	Active	Atlantic Ocean	0.31	>145
P1	4110	Owls Head	2700	Active	Fishermans Is. Passage	8.29	>640
P1	6391	Owls Head	360	Active	Muscle Ridge Channel	1.58	>54
P1	1408	Owls Head	300	Active	Muscle Ridge Channel	0.92	>640
	1255	Owls Head	300	Active		0.92	
	3067	Owls Head	300	Active		0.29	
	1416	Owls Head	300	Active		0.92	
	1900	Owls Head	800	Active		1.23	
P7	2240	South Thomaston	630	Active		0.48	>380
	7627	South Thomaston	300	Active		0.46	
P1	1066	Owls Head	800	Active	Owls Head bay	1.23	>640
	9195	Owls Head	180	Active		0.55	
	9197	Owls Head	270	Active		0.82	
	9198	Owls Head	300	Active		0.92	
	9210	Owls Head	350	Active		1.1	
	9212	Owls Head	270	Active		0.82	
P7	223	South Thomaston	400	Active	Penobscot Bay	0.77	>380
P11	4215	St George	320	Active	Rackliff Bay	0.7	>80



Growing Area	DEP ID	Town	Flow	Status	Receiving Waters	Required Closure (Acres)	Actual Closure Area
	3147		300	Active	Rackliff Bay	0.58	
	4576		300	Active	Rackliff Bay	0.61	
	4300		360	Active	Rackliff Bay	0.5	
	4802		300	Active	Seal Harbor	0.92	
	6043		315	Active	Seal Harbor	1.21	
P14	2800	St George	300	Active	Tenants Harbor	0.46	>525
	2707		300	Active	Tenants Harbor	0.92	
	2209		300	Active	Tenants Harbor	0.26	

**National Pollutant Discharge Elimination System (NPDES)**

There are no large municipal treatment facilities in Shellfish Growing Area WV. The closest municipal treatment facility to this growing area is located in the town of Rockland in shellfish growing area WW. This facility is more than three miles away from the boundary of growing area WV. There is a small, community treatment facility in Owls Head that services the Crescent Beach Association.

Table 2. NPDES Permitted Discharges

Pollution Area (Section)	Permit ID	Type	Facility	Waterbody
WVP1	ME0036781	POTW-Minor	Crescent Beach Association	Tidewaters of Owls Head

Since 2017 the WWTP inspection reports have been available in DMR central files. There is one small wastewater facility (WWTF/WWTP) in Growing Area WV. The facility is in Owls Head and services the Crescent Beach Association. The Prohibited area surrounding the discharge is larger in area than the required calculated dilution zone for effluent.

**Crescent Beach Association**

The Crescent Beach Association is a condominium complex on Bellevue Ave in Owls Head. The community is made up of ten-units each with two apartments as well as two single-family dwellings. The



are no commercial or industrial services connected to the system. The treatment system is licensed to discharge up to 2,700 gallons per day (GPD) of secondary treated sanitary wastewater year-round into the tidewaters of Owls Head, Maine. Based on a fecal concentration of 140,000 cfu/100ml for secondary treated wastewater and a mean receiving depth of eight feet it is required that a 10.4 acre area be classified as Prohibited for proper dilution. Due to the presence of overboard discharges (OBDs) the total Prohibited area is approximately 700 acres. There is sufficient area for the proper dilution of all active discharges.

The Crescent Beach Association owns and operates the sanitary wastewater collection and treatment system. The residences and treatment system are occupied intermittently and seasonally such that little to no wastewater flows are conveyed to the treatment system between October and April of each year. Therefore, effluent monitoring is not required between October 1 and April 30 of each year.

Crescent Beach Association provides a secondary level of wastewater treatment via a sand filtration system. Raw wastewater is conveyed by gravity to a 3,000-gallon septic tank for primary settling of solids. The permittee indicated the septic tank is pumped once every three years to prevent excessive solids accumulation. Septic tank supernatant flows to an adjacent tank (primary effluent chamber) and is then pumped via a two-inch diameter polyvinyl chloride (PVC) force main to an outlet distribution box and four 4-inch diameter PVC distribution pipes. Wastewater is distributed to a 32-foot wide by 40-foot long (1,280 square foot) sand-filter bed, designed to provide a secondary level of treatment through biological decomposition and physical filtration. Wastewater flows down through the filter media and is collected in a four-inch diameter, perforated PVC collection pipe. Filtered wastewater is conveyed to a chamber containing a wastewater disinfection tablet feed system for seasonal (May through September) disinfection using chlorine tablets. Final effluent flows to a secondary effluent chamber from which effluent samples shall be collected for compliance demonstration purposes. Final effluent is conveyed for discharge to the Atlantic Ocean at Owls Head via a four-inch diameter outfall pipe that extends out into the receiving water approximately 300 feet to a depth of approximately three feet below the water surface at mean low water.

**Table 3.** Growing Area WV, WWTF Dilution Calculation

	<b>Crescent Beach Association</b>
FC/100ml	140,000
Discharge Rate (gallons/day)	2,700
Mean water depth (ft)	8
ml to dilute to 14 FC/100ml	1.02E+09
Ft <sup>3</sup> to dilute to 14 FC/100ml	3.61E+06
ACRES	10.4

## Residential

All residential pollution sources are reported to the local plumbing inspector (LPI). Once the system has been documented as being fixed, staff members from DMR can re-assess the water quality data and shoreline survey information to determine if the area is safe for shellfish harvest. Table 4 shows all new and pre-existing pollution sources in area WV that are considered discharges into the Growing Area and effect water quality.



**Table 4.** Growing Area WV Residential Pollution Sources

Pollution Area	Location ID	Date Surveyed	Direct or Indirect	Problem	Description	Town
WVP19	WV035-208	2013	Direct	Y	Outhouse < 10ft from shore, pit style in quarry rock/grout. Needs to be relocated if still in use.	Knox County
WVP19	WV035-209	2013	Direct	Y	Outhouse < 10ft from shore, built over quarry grout. Needs relocation.	Knox County
WVP19	WV035-211	2013	Direct	Y	Outhouse has partially exposed pit, could fill with rainwater and overflow. Pit should be better enclosed.	Knox County

### Industrial Pollution

There are no major industrial pollution sites in Growing Area WV such as chemical plants, steel mills, shipyards or, refineries. None of the businesses or industries were identified as pollution sources during survey operations.

In Sprucehead, Tenants Harbor, and Owls Head there are several lobster buying stations. Nearby the lobster buying stations there are often mooring areas for the many lobster boats that fish these waters. The mooring areas are illustrated on the maps in Figures 4 and 5. All of the mooring areas are located in areas classified as Prohibited.

### Marinas

The marina community in Maine only operates for a portion of the year due to adverse winter weather conditions. The management of marinas in Maine allows for shellfish growing areas to be available to harvesters, for at least a portion of the year, to direct market harvest by utilizing conditional area management plans. There are no marina conditional plans in Growing Area WV.

Tenants Harbor has a marine facility, managed by Lyman Morse of Thomaston, that serves the cruising boats that come to the harbor. The facility provides fuel, water, and limited dock space (up to 10 boats). It also has four moorings available for rent. The facility has an onshore toilet and shower available for use by dock customers. A portable pump out system is also available that utilizes a holding tank with alarm.

Just south of the Lyman Morse facility is the Cod End restaurant, which has a fuel dock and 20 moorings available for cruising boats. Although Tenants Harbor is considered a “no discharge” harbor, it is not strictly enforced. It was reported in 2014 that the restaurant was closed and the shoreside facilities would no longer be available. The moorings are still available for rent. This area is closed due to a combination of licensed overboard discharges, pollution sources in the inner harbor and summer boating traffic.

A marina calculation was done for Tenants Harbor to assure that the closure zone was large enough to protect public health. Based on a volume of 40 cruising boats (Lyman Morse and Cod End combined) each containing a minimum of two people, in a water depth of 18 feet, the required closure size is 51.5 acres. Tenants Harbor is currently in a closure zone of 621.4 acres.



In Sprucehead, Tenants Harbor, and Owls Head, there are several lobster buying stations. Nearby the lobster buying stations there are often mooring areas for the many lobster boats that fish these waters. These stations and associated mooring fields are often in Prohibited areas. Mooring fields with potentially more than 10 boats with heads are in Prohibited areas.

## Storm water

Storm water runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated (US EPA 2009). Thus, storm water pollution is caused by the daily activities of people within the watershed. Currently, polluted storm water is the largest source of water quality problems in the United States.

The primary method to control storm water discharges is the use of best management practices (BMPs). In addition, most major storm water discharges are considered point sources and require coverage under a NPDES permit. In 1990, under authority of the Clean Water Act, the U.S. EPA promulgated Phase I of its storm water management program, requiring permitting through the National Pollution Discharge Elimination System (NPDES). The Phase I program covered three categories of discharges: (1) “medium” and “large” Municipal Separate Storm Sewer Systems (MS4s) generally serving populations over 100,000, (2) construction activity disturbing five acres of land or greater, and (3) ten categories of industrial activity. In 1999, US EPA issued Phase II of the storm water management program, expanding the Phase I program to include all urbanized areas and smaller construction sites.

Although it is a federal program, EPA has delegated its authority to the Maine DEP to administer the Phase II Small MS4 General Permit. Under the Small MS4 GP, each municipality must implement the following six Minimum Control Measures: (1) Public education and outreach, (2) Public participation, (3) Illicit discharge detection and elimination, (4) Construction site storm water runoff control, (5) Post-construction storm water management, and (6) Pollution prevention/good housekeeping. The permit requires each city or town to develop a draft Storm Water Management Plan that establishes measurable goals for each of the Minimum Control Measures. The City or Town must document the implementation of the Plan, and provide annual reports to the Maine DEP.

There are no structural stormwater management systems in shellfish growing area WV. Stormwater in this area would either percolate through the soil, with rates depending on soil type and depth above the bedrock layer; or flow overland directly into streams, gullies, and coastal waters. Any pollution associated with stormwater drainage in areas where no structural facilities exist is monitored by growing area WV water quality monitoring stations, as well as by collecting samples from selected streams.

The Town of Owls Head has a small municipal airport. The Knox County Regional Airport property borders on a drainage to Ballyhac Cove on the Weskeag River. The airport came under public scrutiny due to their plans to enlarge their aircraft parking area. Residents and environmentalists alike were concerned that an increase in the airport’s capacity would allow an increased amount of airport by-product contaminants such as de-icing fluid, to reach the drainages that flow into the Weskeag River. Knox County Regional Airport follows guideline standards outlined in the EPA and DEP Spill Prevention Encounter Measures Control Plan. They have a groundwater well monitoring plan in place for monitoring five wells around the property. De-icing fluid was one contaminant that was specifically



addressed in the Airport's license agreement. The fluid use is restricted to inside the airplane hangars and on one location of the parking area where control measures are in place to contain any spill immediately. De-icing fluid is only allowed to be used under extreme weather conditions.

### Non-Point Pollution Sources

Non-point source (NPS) pollution is water pollution affecting a water body from diffuse sources, such as polluted runoff from agricultural areas draining into a river, significant rainfall, high river flows or astronomical high tides. Nonpoint source pollution can be contrasted with point source pollution, where discharges occur to a body of water at a sole location, such as discharges from a chemical factory, urban runoff from a roadway storm drain or from ships at sea. NPS may derive from various sources with no specific solution to rectify the problem, making it difficult to regulate. Freshwater streams, drainage from rainstorm runoff and tidal creeks are a major source of non-point discharge into Growing Area WV. A total of 209 valid stream samples were taken from freshwater streams during the review period (Table 5, Figures 2-4). Streams associated with consistently high scores are monitored to determine if they affect the water quality of growing area waters.

**Table 5** Stream Samples in Growing Area WV 2010-2020; Scores > 163 cfu/100ml are highlighted in red.

Location ID	Sample Date	Pollution Type	Raw Score
WV002-35	4/27/2010	Stream	20
WV002-35	6/2/2010	Stream	80
WV002-35	6/7/2010	Stream	200
WV002-35	7/6/2010	Stream	16
WV002-35	8/2/2010	Stream	29
WV002-35	8/17/2010	Stream	1.9
WV032-37	11/1/2010	Stream	8
WV028-75	9/28/2014	Stream	6
WV021-73	9/28/2014	Stream	102
WV032-37	9/28/2014	Stream	150
WV022-133	9/28/2014	Stream	4.7
WV027-74	9/28/2014	Stream	2
WV021-120	9/28/2014	Stream	100
WV024-1	10/1/2014	Stream	220
WV002-48	10/1/2014	Stream	56
WV002-35	10/1/2014	Stream	27
WV026-255	10/20/2014	Stream	116
WV026-256	10/20/2014	Stream	120
WV028-75	10/20/2014	Stream	38
WV027-74	10/20/2014	Stream	116



Location ID	Sample Date	Pollution Type	Raw Score
WV032-37	10/20/2014	Stream	94
WV029-76	10/20/2014	Stream	4
WV029-121	10/20/2014	Stream	134
WV026-36	10/20/2014	Stream	84
WV024-1	10/20/2014	Stream	260
WV021-120	10/22/2014	Stream	100
WV002-35	10/22/2014	Stream	40
WV002-48	10/22/2014	Stream	420
WV021-73	10/22/2014	Stream	98
WV001-33	10/22/2014	Stream	38
WV022-133	10/22/2014	Stream	150
WV029-121	11/12/2014	Stream	25
WV029-76	11/12/2014	Stream	2
WV026-256	11/12/2014	Stream	84
WV026-255	11/12/2014	Stream	24
WV026-36	11/12/2014	Stream	15
WV011-53	4/8/2015	Stream	2
WV010-9	6/23/2015	Stream	68
WV011-53	6/23/2015	Stream	440
WV015-237	6/23/2015	Stream	92
WV015-237	8/6/2015	Stream	46
WV011-53	8/6/2015	Stream	14
WV010-9	8/6/2015	Stream	44
WV015-237	8/26/2015	Stream	36
WV011-53	8/26/2015	Stream	7.3
WV026-36	4/13/2016	Stream	2
WV021-73	4/13/2016	Stream	2
WV029-76	4/13/2016	Stream	1.9
WV028-75	4/13/2016	Stream	6
WV011-53	4/13/2016	Stream	2
WV027-74	4/13/2016	Stream	1.9
WV026-255	4/13/2016	Stream	1.9
WV021-120	4/13/2016	Stream	2
WV029-121	4/13/2016	Stream	14
WV015-237	4/14/2016	Stream	1.9
WV002-35	4/14/2016	Stream	1.9
WV010-9	4/14/2016	Stream	4
WV001-33	4/14/2016	Stream	1.9



Location ID	Sample Date	Pollution Type	Raw Score
WV010-9	4/26/2016	Stream	20
WV011-53	4/26/2016	Stream	2
WV021-120	5/26/2016	Stream	1.9
WV028-75	5/26/2016	Stream	150
WV021-73	5/26/2016	Stream	108
WV022-133	5/26/2016	Stream	46
WV029-121	5/26/2016	Stream	8
WV027-74	5/26/2016	Stream	12
WV029-76	5/26/2016	Stream	2
WV011-53	6/23/2016	Stream	160
WV010-9	6/23/2016	Stream	8
WV002-35	9/5/2016	Stream	15
WV010-9	9/5/2016	Stream	400
WV001-33	9/5/2016	Stream	29
WV021-120	9/12/2016	Stream	640
WV021-73	9/12/2016	Stream	112
WV028-75	9/12/2016	Stream	320
WV027-74	9/12/2016	Stream	22
WV022-133	9/12/2016	Stream	280
WV002-35	10/17/2016	Stream	8
WV011-53	10/17/2016	Stream	6
WV015-237	10/17/2016	Stream	420
WV010-9	10/18/2016	Stream	31
WV026-36	11/29/2016	Stream	160
WV029-76	11/29/2016	Stream	6
WV027-74	11/29/2016	Stream	8
WV029-121	11/29/2016	Stream	40
WV028-75	11/29/2016	Stream	8
WV021-120	11/29/2016	Stream	44
WV022-133	11/29/2016	Stream	20
WV021-73	11/29/2016	Stream	12
WV002-49	9/6/2017	Stream	240
WV002-35	10/11/2017	Stream	24
WV002-49	10/11/2017	Stream	280
WV028-75	10/25/2017	Stream	1440
WV011-53	10/25/2017	Stream	118
WV002-35	10/26/2017	Stream	920
WV002-49	10/26/2017	Stream	180





Location ID	Sample Date	Pollution Type	Raw Score
WV011-53	11/29/2017	Stream	13
WV021-120	11/29/2017	Stream	560
WV015-237	11/29/2017	Stream	18
WV021-73	11/29/2017	Stream	7.3
WV010-9	11/29/2017	Stream	10
WV028-75	11/29/2017	Stream	54
WV002-49	11/29/2017	Stream	36
WV002-35	11/29/2017	Stream	16
WV022-133	11/29/2017	Stream	28
WV028-75	4/17/2018	Stream	64
WV026-36	4/17/2018	Stream	74
WV022-133	4/17/2018	Stream	15
WV016-246	4/17/2018	Stream	40
WV015-237	4/17/2018	Stream	11
WV021-73	4/17/2018	Stream	25
WV001-33	4/17/2018	Stream	24
WV009-11	4/17/2018	Stream	9.1
WV002-35	4/17/2018	Stream	42
WV011-53	4/17/2018	Stream	64
WV021-120	4/17/2018	Stream	1150
WV002-48	4/17/2018	Stream	18
WV027-75	4/17/2018	Stream	88
WV032-38	4/17/2018	Stream	25
WV010-9	4/27/2018	Stream	80
WV010-9	6/12/2018	Stream	22
WV002-35	6/12/2018	Stream	128
WV015-237	9/17/2018	Stream	70
WV010-9	9/17/2018	Stream	42
WV021-73	9/17/2018	Stream	220
WV009-11	9/17/2018	Stream	58
WV011-53	9/17/2018	Stream	68
WV001-33	9/17/2018	Stream	300
WV022-133	9/17/2018	Stream	440
WV002-35	9/17/2018	Stream	106
WV016-246	9/17/2018	Stream	160
WV032-38	9/17/2018	Stream	2
WV028-75	9/17/2018	Stream	68
WV002-48	10/16/2018	Stream	160



Location ID	Sample Date	Pollution Type	Raw Score
WV022-133	10/16/2018	Stream	240
WV015-237	10/16/2018	Stream	80
WV001-33	10/16/2018	Stream	100
WV010-9	10/16/2018	Stream	38
WV032-38	10/16/2018	Stream	102
WV011-53	10/16/2018	Stream	13
WV016-246	10/16/2018	Stream	240
WV021-73	10/16/2018	Stream	27
WV002-35	10/16/2018	Stream	100
WV028-75	10/16/2018	Stream	84
WV028-75	8/7/2019	Stream	66
WV022-133	8/7/2019	Stream	240
WV001-33	8/7/2019	Stream	180
WV002-35	8/7/2019	Stream	54
WV011-53	8/7/2019	Stream	22
WV022-133	10/7/2019	Stream	74
WV021-73	10/7/2019	Stream	84
WV028-75	10/7/2019	Stream	36
WV027-74	10/7/2019	Stream	20
WV009-11	10/7/2019	Stream	35
WV001-33	10/7/2019	Stream	35
WV002-35	10/7/2019	Stream	35
WV002-48	10/7/2019	Stream	72
WV028-75	10/16/2019	Stream	5.5
WV021-73	10/16/2019	Stream	64
WV002-35	10/16/2019	Stream	10
WV029-76	10/16/2019	Stream	25
WV032-37	10/16/2019	Stream	10
WV027-74	10/16/2019	Stream	1.9
WV002-48	10/16/2019	Stream	62
WV009-11	10/16/2019	Stream	2
WV022-133	10/16/2019	Stream	40
WV001-33	10/16/2019	Stream	98
WV015-237	10/16/2019	Stream	1.9
WV011-53	10/16/2019	Stream	56
WV029-76	10/30/2019	Stream	2
WV029-121	10/30/2019	Stream	25
WV001-33	10/30/2019	Stream	15



Location ID	Sample Date	Pollution Type	Raw Score
WV021-73	10/30/2019	Stream	8
WV011-53	10/30/2019	Stream	34.5
WV009-11	10/30/2019	Stream	1.9
WV028-75	10/30/2019	Stream	44
WV002-35	10/30/2019	Stream	18
WV022-133	10/30/2019	Stream	20
WV015-237	10/30/2019	Stream	34.5
WV002-48	10/30/2019	Stream	25
WV027-74	10/30/2019	Stream	15
WV021-73	8/19/2020	Stream	116
WV021-73	9/16/2020	Stream	21.8
WV001-33	9/16/2020	Stream	240
WV015-237	9/16/2020	Stream	74
WV022-133	9/16/2020	Stream	380
WV021-73	10/19/2020	Stream	92
WV022-133	10/19/2020	Stream	78
WV015-237	10/19/2020	Stream	82
WV001-33	10/29/2020	Stream	146
WV021-73	11/23/2020	Stream	20
WV001-33	11/23/2020	Stream	92
WV022-133	11/23/2020	Stream	20
WV015-237	11/23/2020	Stream	20

### Agricultural Activities

There are no large-scale agriculture activities in Growing Area WV. The majority of the animal farms in Shellfish Growing Area WV are small backyard paddocks consisting of a few horses, cows, or sheep. Farm sites have been observed in Mosquito Harbor and in Wheeler Bay on the same property that sample station WV29 is collected. This farm site has a long, wet pasture area that partially floods during extreme high tides. The area is classified as Prohibited. A farm site in Sharkeyville Creek was observed to have cows. This area is also classified as Prohibited. Shoreline survey in 2013 and 2015 did not find any agricultural problems impacting water quality.

Pollution from small agriculture operations can be introduced into the growing area as nonpoint source pollution transported by runoff from large rainfall or snowmelt events. Smaller farms are encouraged to follow best management practices to help avoid effects animal waste and agricultural pollutants can have on water quality.



## Wildlife Activity

There is a large conservation area in the upper Weskeag River. The Ralf Waldo Tyler Wildlife Management Area is a large marsh consisting of 618 acres that is owned and managed by the Maine Department of Inland Fisheries and Wildlife (IF&W). There are also several other wetland and marsh areas that feed into the growing area. The salt marshes and mudflats of the area provide valuable habitat to a variety of wildlife. Maine Inland Fish and Wildlife surveys indicate that migratory waterfowl numbers begin to increase in the early autumn months, and typically peak in late fall or early winter. Although large numbers of birds can, in theory, pose a threat the growing area water quality, such occurrences are very difficult to document.

## Recreation Areas (parks, beaches, trails campgrounds, etc.)

Owls Head Light State Park and Birch Point State Park are both located in Shellfish Growing Area WV. The Owls Head Light State Park is located at the northern tip of the growing area in the town of Owls Head. This park consists of small hiking trails, beaches, and a lighthouse that are open to the public. The park is open for daytime use only. State maintained outhouses are located nearby the public parking areas. The shores around the park are classified as prohibited due to an active licensed overboard discharge at the lighthouse.

Birch Point State Park is also located in the town of Owls Head. The park consists of small trails along the shore and a sandy beach and is open for daytime use only. State maintained outhouses are located near the public parking areas. The park has become a popular spot for people to walk their dogs. A sign at the entrance to the beach area states that dogs must be on a leash and dog owners must clean up after their dogs. The park does not have a full-time park ranger on duty, and there is no enforcement of the dog activity at the beach.

The Lobster Buoy Campground is a small campground and RV park on Waterman's Beach in South Thomaston. There are approximately 40 spaces available for rent. Shower, toilet, and pump-out facilities are offered. The area is currently classified as Restricted. The water quality station in this area has only one count above 31 cfu/100ml in its last 30 samples.

## Hydrographic and Meteorological Assessment

### Tides

Coastal Maine experiences a mixed, semi-diurnal tide, with diurnal inequalities that are more pronounced on spring tides. Some areas with extensive saltwater marshes and large tidal ranges could potentially be contributors to fecal contamination. The National Oceanic and Atmospheric Administration data for a station at Eastport indicate a mean tidal range of 18.35 ft. and a station in Penobscot Bay indicates a mean tidal range of 9.85 ft. The mean tidal range for most of Maine is nine



feet to 13 feet. Unlike areas with small diurnal tides, this extreme volume exchange results in significant bacterial dilutions. Currents in the area are predominantly driven by the tides.

### **Rainfall**

The mean annual precipitation for Growing Area WV is 49 inches per year. The precipitation is not evenly distributed throughout the year. The wettest months are generally April and November while August is typically the driest month. Much of the precipitation in the winter comes as snow and may affect runoff rates in spring upon melting. Flood closures are implemented when areas receive greater than two inches of rainfall in a twenty-four-hour period. Rainfall is monitored by numerous rain gauges located along the entire Maine coast and reported primarily through the Weather Underground website. Some areas of Maine have documented fecal influences resulting from rainfall of greater than one inch in a twenty-four-hour period. These areas are considered rainfall conditional areas and are Conditionally Approved based on the one-inch closure trigger. There is one Rainfall Conditional Area in Growing Area WV. Wheeler Bay, WVCA1, closes whenever rainfall exceeds 1" in a 24-hour period.

### **Winds**

Migratory weather systems cause winds that frequently change in strength and direction. Gulf of Maine winds are generally westerly, but often take on a northerly component in winter and a southerly one in summer. Strongest winds are generated by lows and cold fronts in fall and winter and by fronts and thunderstorms during spring and summer. Extreme winds are usually associated with a hurricane or severe nor'easter and can reach 125 knots. In Maine, wind is not a contributor to fecal pollution because marine currents are primarily influenced by the size and duration of the normal tidal cycle.

### **River Discharge**

The Weskeag River is the only river system located along the immediate shores of this growing area. Although the Weskeag is called a river, much of the area flats out at low tide. The aerial photo in Figure 5 illustrates the lower portion of the Weskeag River at low tide. The mouth of the river is shown in the lower left corner and the bridge over the river is in the upper right corner of the image. The bridge is located in the town center and in the area of greatest development on the river. The area around the harbor is classified as Restricted with other parts of the river classified as Conditionally Approved based on season.

The upper Weskeag River is shown in Figure 6 (low tide). The bridge can be seen in the lower left corner and a portion of the Ralf Waldo Tyler Wildlife Management Area is visible in the upper right corner. This area is classified as Restricted due to non-point source pollution.

At low tide, the waters of the Weskeag River drain out leaving a very narrow channel. During flood tides, the area is replenished with ocean waters. Pollution impact along the river comes from dwellings with septic malfunctions, farms bordering on streams entering the river and wildlife. The Weskeag River drains into ocean waters in the area west of the Muscle Ridge Islands. Stations at the mouth of the river include station WV48 and WV59. Both of these stations currently have P90 scores that meet approved standards.





Figure 5. Lower Weskeag River





**Figure 6.** Upper Weskeag River



### Hydrographic Influence

Area WV is subject to a semidiurnal tidal cycle with two high tides and two low tides per day. In Tenants Harbor, which is located in the middle of the study area, the elevation of the mean high tide is 9.3 feet and the mean spring tide is 10.6 feet. Water movement along the immediate shore in this section of the coast is largely tidal.

The Weskeag River is a small tidal river in the growing area. It has an extensive tidal marsh area. A local volunteer organization, under the guidance of MEDEP, has been collecting data since 2015 on brackish and freshwater areas in the upper river to help determine its potential impact on other parts of the growing area. Samples were collected at nine sites from the mid to upper river. A variety of parameters were recorded but data showed low dissolved oxygen at some sites and high bacteria counts at freshwater sites above the head of the tide. The entire report is available on the MEDEP volunteer rivers and streams monitoring site.



## Water Quality Studies

### Map of Sampling Stations

Sampling locations can be seen in Figure 1.

Most marine fecal pollution of Maine waters comes from non-point sources. DMR uses Systematic Random Sampling (SRS) to monitor this influence and uses a pre-established schedule at an adequate frequency to capture all meteorological, hydrographic and/or other pollution events that trigger non-point pollution contribution. Using SRS will detect intermittent and unfavorable change in water quality and the program accepts the estimated 90<sup>th</sup> percentile (P90) as the standard to measure variance of a data set.

There are currently 60 active water quality sampling sites in Growing Area WV and two investigative stations which do not have enough data to calculate a P90 and are not used for active monitoring. It is recognized that access, icing, and safety considerations prevent some stations from being sampled on scheduled dates.

All stations in Growing Area WV meet their current NSSP classification standard. One Conditionally Approved station in the upper portion of Long Cove, WV20.5, did not meet Approved standards during its open season so the closed season had to be extended in 2020. Conditionally Approved stations in the southern portion of the cove, WV18, WV19, WV20.8, met the Approved standard year-round and the area was evaluated for an upgrade to Approved in 2020.

### Water Quality Discussion and Classification Determination

P90s for all active stations with a minimum of 30 samples were calculated and all stations. All stations currently meet their classification standard. The percent changed in P90 from 2019 to 2020 was calculated and 41 stations, or 69%, showed a decrease in calculated P90 score. Of the 18 stations that saw an increase in calculated P90 score, 17 had scores that were either still low or did not threaten the station's current classification. Station WV20.5 did not meet the Approved standard during its open period, so an additional three months was added to the closed period in 2020. Only one site, WV16.5, in Seavey Cove currently shows more degraded water quality with a calculated P90 of 149 cfu/100 ml but, water quality at this site does seem to be slowly improving as the P90 declined from 308 cfu/100ml in 2019. Overall water quality in WV seems to be improving overall or remaining consistent.

**Table 6.** P90 Calculations for Active stations with a classification of Approved, Prohibited, or Restricted

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WV002.00	A	30	2.1	0.15	8	3.3	2/23/2016
WV006.50	A	30	3	0.38	44	9.5	2/23/2016
WV016.00	A	30	2.6	0.43	106	9.7	5/2/2016
WV032.00	A	30	3.2	0.36	35	9.4	2/24/2016
WV035.00	A	30	3	0.36	26	9.1	2/24/2016
WV036.00	A	30	3.6	0.48	300	15.4	2/24/2016
WV037.00	A	30	2.8	0.36	78	8.2	2/24/2016



Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WV046.80	A	30	3.4	0.55	640	17.7	2/24/2016
WV047.00	A	30	3.1	0.58	1700	17.3	2/24/2016
WV048.00	A	30	3.1	0.32	24	8.2	6/7/2016
WV048.50	A	30	2.4	0.27	25	5.5	7/19/2016
WV059.00	A	30	2.9	0.41	60	10	4/26/2016
WV078.00	A	30	1.9	0.05	4	2.3	7/20/2016
WV080.00	A	30	2.3	0.27	34	5.3	7/20/2016
WV081.00	A	30	2	0.09	5.5	2.6	7/20/2016
WV086.00	A	30	2.4	0.27	22	5.4	7/20/2016
WV088.00	A	30	2.5	0.21	12	4.7	8/3/2016
WV003.50	P	30	6.5	0.75	1700	61.1	2/23/2016
WV004.00	P	30	4.4	0.55	260	23.3	2/23/2016
WV008.00	P	30	5.2	0.49	90	22.7	2/23/2016
WV013.00	P	30	2.9	0.36	40	8.6	2/23/2016
WV016.50	P	30	10.1	0.91	1700	148.7	2/23/2016
WV017.00	P	30	4	0.52	160	18.9	2/23/2016
WV022.00	P	30	5.9	0.74	1700	53.6	2/23/2016
WV024.00	P	30	3.7	0.63	1700	24.2	2/23/2016
WV029.00	P	30	6.7	0.58	820	37.4	2/24/2016
WV038.00	P	30	3.9	0.54	160	19.9	2/24/2016
WV039.00	P	30	3.7	0.47	60	15.1	2/24/2016
WV040.00	P	30	3	0.42	58	10.6	2/24/2016
WV044.00	P	30	2.5	0.31	35	6.4	2/24/2016
WV046.00	P	30	2.2	0.27	36	5.1	2/24/2016
WV046.50	P	30	5.2	0.67	580	38.2	2/24/2016
WV047.50	P	30	5.3	0.61	520	32.7	2/24/2016
WV049.00	P	30	7.7	0.5	86	34.5	4/26/2016
WV060.00	P	30	6.2	0.68	1560	46.4	6/7/2016
WV061.00	P	30	2.3	0.24	20	4.8	4/26/2016
WV062.50	P	30	3.3	0.4	100	11	4/26/2016
WV064.00	P	30	6.2	0.62	320	39.5	4/26/2016
WV065.00	P	30	3	0.4	38	10	4/26/2016
WV001.00	R	30	4.7	0.68	880	35.4	2/23/2016
WV006.00	R	30	5.1	0.7	920	41.7	2/23/2016
WV031.00	R	30	4.4	0.42	48	15.5	2/24/2016
WV050.00	R	30	6.4	0.68	1700	47.9	7/5/2016
WV050.80	R	30	5.8	0.59	220	33.9	4/26/2016
WV053.00	R	30	3.4	0.4	50	11.3	10/11/2017
WV054.00	R	30	5.9	0.54	86	29.3	6/7/2016





Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WV057.00	R	30	6.9	0.54	180	34.5	6/7/2016

**Emergency Closures:** The reports summarizing emergency closures such as flood and biotoxin closures for the entire state are in the DMR central files.

**Reclassifications:**

Reclassification addendums to the sanitary survey report are in the DMR central files.

## CAMP Reviews, Inspection Reports, and Performance Standards

### Annual Review of Weskeag River Seasonal Conditional Area

**Scope**

The Weskeag River is located in South Thomaston. There are three areas in the river classified as Conditionally Approved based on season with an open status of September 1<sup>st</sup> – April 30<sup>th</sup>. Water quality in these areas are monitored by stations WV 48.8, 50.5, 53, 55, 56 and 58. The seasonal management area on the river is made up of three separate smaller areas with the same management in place. The areas are located:

CA2. Upper Weskeag River (South Thomaston): south of a line beginning at a red painted post located on the shore approximately 64 yards east of the northern end of Mill Pond Lane, then running east to the opposite shore; AND west of a line beginning on the southern shore of an unnamed cove approximately 98 yards west of Hayden Point Road, then running northwest to the shore on the east end of the Spruce Head Road Causeway; AND north of a line beginning at the shore at the end of Scotts Terrace, running east to the northwest tip of Hayden Point (closed May 1st through August 31st).

CA3. Lower Weskeag River (South Thomaston): north and east of a line beginning at a red painted post located on the shore of an unnamed point of land approximately 209 yards northwest of the end of Red Oak Lane running northwest to the easternmost shore of Combs Island then running northeast to a point of land approximately 98 yards west of Hayden Point Road; AND west of a line beginning at the northernmost point of land approximately 300 yards west of Bassick Road, South Thomaston, running north to a red painted post on the southern shore of Hayden Point (closed May 1st through August 31st).

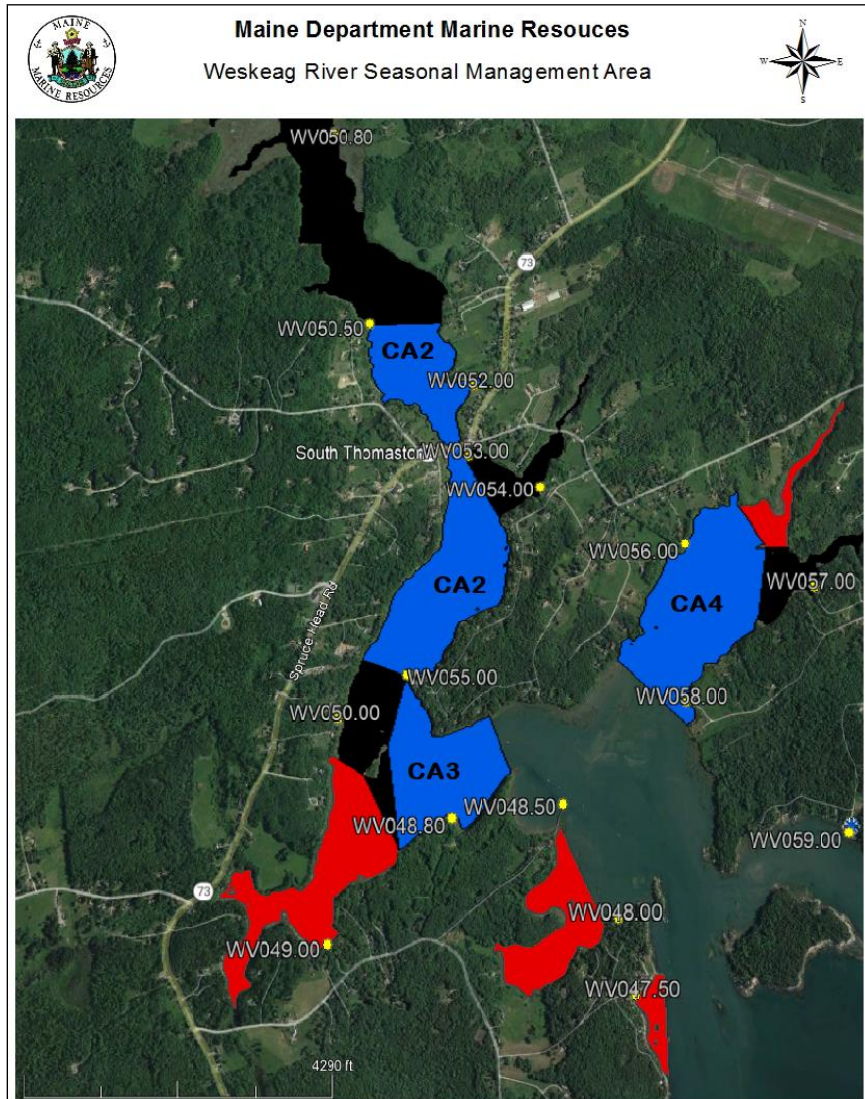
CA4. Ballyhac Cove (South Thomaston/Owls Head) northeast of a line beginning at the southernmost point of land at the end of Maker Cove Rd (Owls Head) running northwest to a red painted post on the opposite shore; AND west of a line beginning at a red painted post located on the south shore of Ballyhac Cove, approximately 300 yards southwest of Journeys End Lane (Owls Head), then running northeast to a red painted post located on the eastern tip of an unnamed island; AND southwest of a line beginning at a red painted post on the north shore of Ballyhac Cove approximately 200 yards west of the mouth of the northernmost tributary running southeast





to a red painted post located on the eastern tip of an unnamed island (closed May 1st through August 31st).

Figure 7. Weskeag River Seasonal Conditional area



**Compliance with the Conditional Area Management Plan (CAMP):**

This area is Conditionally Approved and is open from September 1 to April 30 based on water quality meeting the approved standard during this time period and decreased boating activity in the Harbor. The area remains in compliance.

**Adequacy of reporting and cooperation of involved persons:**

The management plan for this conditional area does not require reporting. The local shellfish warden notifies DMR of any emergency situations.



### Compliance with approved growing area criteria:

WV 48.8, 50.5, 55, 56 and 58 monitor the area and meet Approved criteria based on geometric means and P90 values during the OPEN period (Table 1). Stations WV 49, 50, 53 and 50.80 serve as boundary stations.

**Table 7.** 2020 P90 scores, Weskeag River Seasonal Conditional Area

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WV048.80	CA	30	4.1	0.5	150	18.3	3/30/2016
WV050.50	CA	30	5.9	0.51	102	27.2	3/30/2016
WV055.00	CA	30	3.9	0.48	74	16.3	4/26/2016
WV056.00	CA	30	4.9	0.5	108	22.3	4/26/2016
WV058.00	CA	30	3.6	0.54	460	18.1	4/26/2016

### Water Sampling Compliance History:

Conditional area sampling was done during both the open and adverse (closed) periods. The monitoring stations were part of random scheduled sampling runs. All stations were sampled a minimum of six times while in the open status.

### Analysis-Recommendations

The Weskeag River Conditional Approved area continues to meet standards during the open status and remains in compliance with the CAMP. It is recommended that regular water quality sampling continue. Tides may also have an impact on this area and tidal conditions in this area should continue to be considered.

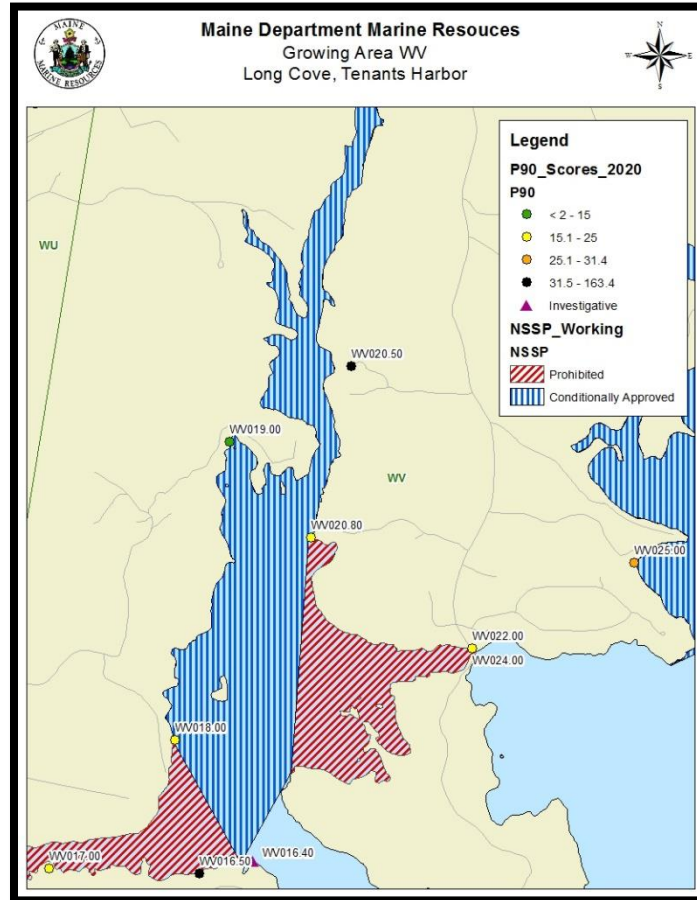
### Annual Review of Long Cove Seasonal Conditional Area

#### Scope

Long Cove (CA5) is located in St. George. The area is classified as Conditionally Approved based on season with an open status of September 1– May 31. It is closed from June 1- August 31. The



Figure 8. Current management zones for Long Cove



**Compliance with the Conditional Area Management Plan (CAMP):**

This area is Conditionally Approved and is open from September 1 to May 31 based on water quality meeting the approved standard during this time period.

**Adequacy of reporting and cooperation of involved persons:**

The management plan for this conditional area does not require reporting. The local shellfish warden notifies DMR of any emergency situations.

**Compliance with approved growing area criteria:**

Stations WV18, 19, 20.5 and 20.8 monitor this area. Station WV20.5, in the northern portion of the cove, does not meet the Approved standard during the open period.

**Table 8.** 2020 P90 scores, Long Cove Seasonal Conditional Area

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WV018.00	CA	30	3	0.57	1060	16.4	9/29/2015
WV019.00	CA	30	3.3	0.45	54	12.8	10/6/2014
WV020.50	CA	30	6	0.83	1700	69.4	5/11/2015
WV020.80	CA	30	3.7	0.51	128	16.8	9/29/2015

**Water Sampling Compliance History:**

Conditional area sampling was done during both the open and adverse (closed) periods. The monitoring stations were part of random scheduled sampling runs. All stations were sampled a minimum of six times while in the open status.

**Analysis-Recommendations**

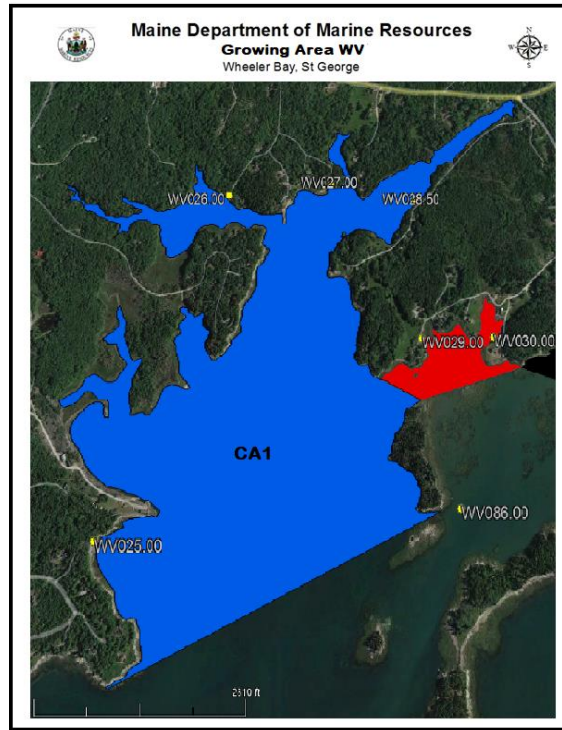
Water quality in the southern portion of Long Cove improved and is recommended for upgrade to Approved in 2021. Water quality was degraded in the northern portion of the cove and prior to the writing of this report in 2021 was reclassified to extend the seasonal closure to include September through November. With consideration of the 2021 reclassification addendum, the Long Cove Conditionally Approved area continues to meet the standards for seasonal harvest during the open status and remains in compliance with the CAMP.

**Annual Review of Wheeler Bay Rainfall Conditional Area****Scope**

Wheeler Bay is in St. George and is Conditionally Approved based on rainfall and will close when rainfall meets or exceeds 1" in a 24-hour period. The area is west of a line drawn southeast from the south tip of Elwell Point to the north tip of Calf island; AND north of a line beginning at the southern tip of Clark Point running northeast to the southern tip of Calf Island.



Figure 9. Wheeler Bay, St. George 1” rainfall Conditionally Approved Area



**Compliance with the Conditional Area Management Plan (CAMP):**

This area is Conditionally Approved and is closed when rainfall meets or exceeds 1” in a 24-hour period and is based on meeting the approved standard during this time period. The area remains in compliance.

**Adequacy of reporting and cooperation of involved persons:**

The management plan for this conditional area does not require reporting. The local shellfish warden notifies DMR of any emergency situations.

**Compliance with approved growing area criteria:**

Stations WV25, 26, 27 and 28.5 monitor this area. Station WV 86 serves as a boundary station.

Table 9. 2020 P90 scores WV CA1. Wheeler Bay, 1” rainfall conditional area

Station	Class	Count	GM	SDV	MAX	P90	Min_Date
WV025.00	CA	30	3.5	0.68	1700	27.1	8/11/2015
WV026.00	CA	30	3.6	0.32	18	9.6	8/12/2015
WV027.00	CA	30	3	0.35	36	8.6	8/12/2015
WV028.50	CA	30	3.1	0.35	42	9.1	8/12/2015



### Water Sampling Compliance History:

Conditional area sampling was done during both the open and adverse (closed) periods. The monitoring stations were part of random scheduled sampling runs. All stations were sampled a minimum of six times while in the open status.

### Analysis-Recommendations

The Wheeler Bay Rainfall Conditionally Approved area continues to meet the Approved standard for harvest during the open status and remains in compliance with the CAMP. Recommend continued water quality sampling with annual P90 score assessments to determine whether or not the rainfall conditional area is still required.

### Recommendation for Future Work

The Weskeag River is currently a patchwork of different classifications. The area should continue to be assessed to determine if a more unified classification is possible. The Restricted and Prohibited areas should continue to be assessed for environmental conditions to determine if these areas can be classified as Conditionally Approved. Extreme high tide events should also continue to be examined to determine the degree of tidal influence on the area.

The Long Cove Conditional Area meets the year-round Approved standard in the southern portion of the cove is being recommended for upgrade to Approved. The northern portion of the cove continues to show degraded water quality and will need to have the closed season extended so that the area meets the Approved standard while in the open status (as was completed by a reclassification addendum in 2021).

**Table 10.** Count table of samples collected in Growing Area WV during the 2020 season

Active Stations		Strategy	Status				
		Adverse	Investigative	Random		Samples	
Station	Class	Closed	X	Closed	Open	Collected	Required
WV001.00	R				6	6	6
WV002.00	A				6	6	6
WV003.50	P			6		6	6
WV004.00	P			6		6	6
WV006.00	R				6	6	6
WV006.50	A				6	6	6
WV008.00	P			6		6	6
WV013.00	P			6		6	6
WV016.00	A				6	6	6
WV016.40	X		6			6	6
WV016.50	P			6		6	6





Active Stations		Strategy	Status				
		Adverse	Investigative	Random		Samples	
Station	Class	Closed	X	Closed	Open	Collected	Required
WV017.00	P			6		6	6
WV018.00	CA	3			6	9	6
WV019.00	CA	3			6	9	6
WV020.50	CA	3			6	9	6
WV020.80	CA	3			6	9	6
WV022.00	P			6		6	6
WV024.00	P			6		6	6
WV025.00	CA				2	7	6
	R				5		
WV026.00	A				5	6	6
	CA				1		
WV027.00	A				5	6	6
	CA				1		
WV028.50	CA				1	6	6
	R				5		
WV029.00	P			6		6	6
WV031.00	R				6	6	6
WV032.00	A				6	6	6
WV035.00	A				6	6	6
WV036.00	A				6	6	6
WV037.00	A				6	6	6
WV038.00	P			6		6	6
WV039.00	P			6		6	6
WV040.00	P			6		6	6
WV044.00	P			6		6	6
WV046.00	P			6		6	6
WV046.50	P			6		6	6
WV046.80	A				6	6	6
WV047.00	A				6	6	6
WV047.50	P			6		6	6
WV048.00	A				6	6	6
WV048.50	A				6	6	6
WV048.80	CA	4			6	10	6
WV049.00	P			6		6	6



Active Stations		Strategy	Status				
		Adverse	Investigative	Random		Samples	
Station	Class	Closed	X	Closed	Open	Collected	Required
WV050.00	R				6	6	6
WV050.50	CA	1			5	6	6
WV050.80	R				6	6	6
WV051.20	X		7			7	6
WV053.00	R				7	7	6
WV054.00	R				6	6	6
WV055.00	CA	4			6	10	6
WV056.00	CA	4			6	10	6
WV057.00	R				6	6	6
WV058.00	CA	4			6	10	6
WV059.00	A				6	6	6
WV060.00	P			6		6	6
WV061.00	P			6		6	6
WV062.50	P			6		6	6
WV064.00	P			6		6	6
WV065.00	P			6		6	6
WV078.00	A				6	6	6
WV080.00	A				6	6	6
WV081.00	A				6	6	6
WV086.00	A				6	6	6
WV088.00	A				6	6	6

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## Appendix A.

### Key to Water Quality Table Headers

Station = water quality monitoring station

Class = classification assigned to the station; Prohibited (P), Restricted (R), Conditionally Restricted (CR), Conditionally Approved (CA) and Approved (A).

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

GM = 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, Approved standard is 31, Restricted standard is 163

Min\_Date = oldest date sampled included in the calculations.

X = investigative station