Maine Statewide Bacteria TMDL: 2013 Freshwater Addendum

Report #: DEPLW-1254

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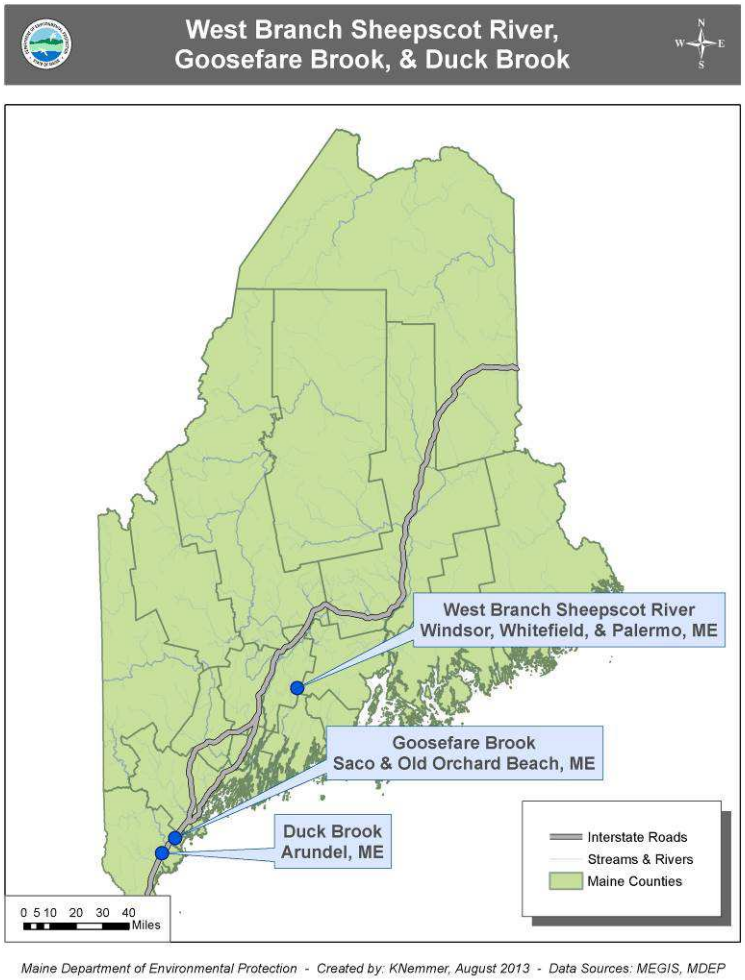

Prepared for:

US EPA New England, Region 1

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
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INTRODUCTION

This Addendum to the USEPA approved *2009 Maine Statewide Bacteria TMDL (Total Maximum Daily Loads) Report* (http://www.maine.gov/dep/water/monitoring/tmdl/tmdl2.html) contains the information to develop TMDLs for three streams listed for bacteria impairment. This report:

- Contains the watershed specific information necessary to add bacteria TMDLs to the existing 2009 TMDL Report
- References the basic background information and required TMDL elements from the 2009 TMDL Report
- Covers four 303D listed stream segments (Table 1) and are depicted in Figure 1

Table 1: Summary information for bacteria impaired streams (Maine DEP 2012 Integrated Water Quality Monitoring and Assessment Report Appendices).

Stream Segment	***Town***	***County***	***Segment ID***	***Assessment Unit (HUC 10)***	***Water Quality Class***
Duck Brook	Arundel	York	ME0106000301_622R03	0106000301	B
Goosefare Brook	Saco	York	ME0106000106_612R01 ME0106000106_612R01_01	0106000105	B
West Branch Sheepscot	Windsor	Kennebec	ME0105000305_528R02	0105000304	AA

These streams are listed for bacterial impairments on Maine's 303D list of impaired waters, which is included in Maine DEP's 2012 Integrated Water Quality Monitoring and Assessment Report. TMDLS are required under the US Clean Water Act for all impaired waters on the 303D list and these will be added to the existing 2009 Bacteria TMDLs.

The purpose of a TMDL is to calculate the amount of pollutant receiving water can assimilate without exceeding water quality standards or designated uses, listed in Table 2. These TMDLs set a goal of meeting bacteria water quality criteria for all sources in order to meet water quality standards throughout the affected waterbodies. Potential sources and pathways are listed below.

Maine DEP adopted the concentration-based TMDL approach because it is the most useful format for guiding both remediation and protection efforts in the impaired watersheds. A concentration target is readily understandable to the public, and allows interested citizens and/or watershed groups to determine easily whether any particular source is exceeding its allocation. Measured bacteria concentrations in each of the impaired watersheds are used to determine the percent reduction needed to attain water quality standards.

Table 2. Maine Water Quality Criteria for Classification of Fresh Surface Waters (38 MSRA §465)

FRESHWATERS	BACTERIA (*E. Coli*) NUMERIC CRITERIA
CLASS AA	**AS NATURALLY OCCURS**[1]
CLASS A	**AS NATURALLY OCCURS**[1]
CLASS B	Between May 15th and Sept. 30th- *E. coli* of human and domestic animal origin[2] shall not to exceed a geometric mean of 64/100mL or an instantaneous level of 236/100mL
CLASS C	Between May 15th and Sept. 30th- *E. coli* of human and domestic animal origin[2] shall not to exceed a geometric mean of 126/100mL or an instantaneous level of 236/100mL

1.Defined in 38 MRSA §466(2): "As naturally occurs" means conditions with essentially the same physical, chemical and biological characteristics as found in situations with similar habitats free of measurable effects of human activity." In practice, the Class GPA (Lakes) standard for '*E. coli* of human or domestic animal origin shall not exceed a geometric mean of 29/100mL or an instantaneous level of 194/100mL' may be used as a surrogate target if a freshwater's 'natural' bacteria levels are unknown.
2. This means that all *E. coli* of wildlife origin meet existing water quality standards.

This document provides (1) justification for the impaired listing status and need for the TMDL, (2) calculations for the percent reductions from existing data needed to meet the concentration-based target, and (3) details regarding sources of bacteria in the impaired watersheds. Table 3 is a stream specific summary of the relevant numbers and TMDL calculations developed in this report. For information regarding the regulatory requirements of TMDLs, Maine's water quality standards, waterbody assessment approach, target concentrations, loading allocations and source specific implementation recommendations please see the *2009 Maine Statewide Bacteria TMDL (Total Maximum Daily Loads) Report*.

Bacteria Pollutant Sources-

Humans- Sewers & Septic's

- Pets & Domestic animals
- Wildlife

Pathways-

- Illicit discharges
- Surface runoff through stormwater
- Subsurface drainage
- Direct deposit

Clockwise from upper left: sewer lines, humans and pets, domestic animals, residential runoff

Table 3. Synopsis of Streams Impaired by Bacteria Contamination [Maine 2012 Listing Category 5B] Maine Water Quality Criteria for Classification of Fresh Surface Waters (38 MSRA §465) and TMDL Calculations.

SEGMENT_ID	WATERBODY NAME	NPDES_ID	POLLUTANT_ID /CAUSE	TMDL_TYPE	LENGTH MILES	WATER CLASS	TMDL_END_POINT GEOMEAN:INSTANTEOUS	STREAM GEOMEAN	TMDL % REDUCTION
ME0106000301_622R03	**Duck Brook**		227 (E-coli)	NPS	8.6	Class B	64 /100 mL:236 /100 mL	123 /100 mL	48
ME0106000106_612R01	**Goosefare Brook**	MER041011	227 (E-coli)	NPS, PS	0.6	Class B	64 /100 mL:236 /100 mL	263 /100 mL	76
ME0106000106_612R01_01	**Goosefare Brook**	MER041011	227 (E-coli)	NPS, PS	5.54	Class B	64 /100 mL:236 /100 mL	263 /100 mL	76
ME0105000305_528R02	**West Branch Sheepscot**		227 (E-coli)	NPS	2.29	Class AA	As naturally occurs OR 29 /100 mL:194 /100 mL	57 /100 mL	49

PUBLIC PARTICIPATION

This draft was made available for a public review beginning in October 29, 2013 and lasting until December 4, 2013. A public hearing was scheduled for November 5, 2013 at 2:30 in DEP's Response Training Room, 4 Blossom Lane, Augusta. Notice of this hearing was placed in regional newspapers and stakeholders were notified via email. Email to stakeholders also contained notification of the public review draft and was distributed to the following interested parties and watershed stakeholder organizations:

- Sheepscot Valley Conservation Association
- York County Soil and Water Conservation District
- Kennebec County Soil and Water Conservation District
- Wells National Estuarine Research Reserve
- Maine Department of Marine Resources
- Maine Department of Transportation
- Maine Turnpike Authority
- Maine Healthy Beaches Program
- Conservation Law Foundation, Maine Office
- City of Saco
- Towns of China, Windsor, Whitefield, Arundel & Old Orchard Beach
- MS4 Area Stormwater Groups

The public hearing was held on November 5, 2013 and no stakeholders or members of the general public attended.

This is the notification message that was distributed:

> *PUBLIC NOTICE FOR COMMENTS ON BACTERIA TMDLs on 3 streams to be added to the USEPA approved 2009 Maine Statewide Bacteria TMDL (Total Maximum Daily Loads) Report (http://www.maine.gov/dep/water/monitoring/tmdl/tmdl2.html). In*

accordance with Section 303(d) of the Clean Water Act, and regulations in 40 CFR Part 130, the Maine Department of Environmental Protection has prepared the ***Maine Statewide Bacteria TMDL: 2013 Freshwater Addendum*** *report for waters that exceed Maine's water quality bacteria standards. This TMDL report contains recent monitoring results and the watershed specific information necessary to add bacteria TMDLs to the existing 2009 TMDL Report. Below is summary information for the streams from Maine DEP's 2012 Integrated Water Quality Monitoring and Assessment Report Appendices (303(d) list) (http://www.maine.gov/dep/water/monitoring/305b/).*

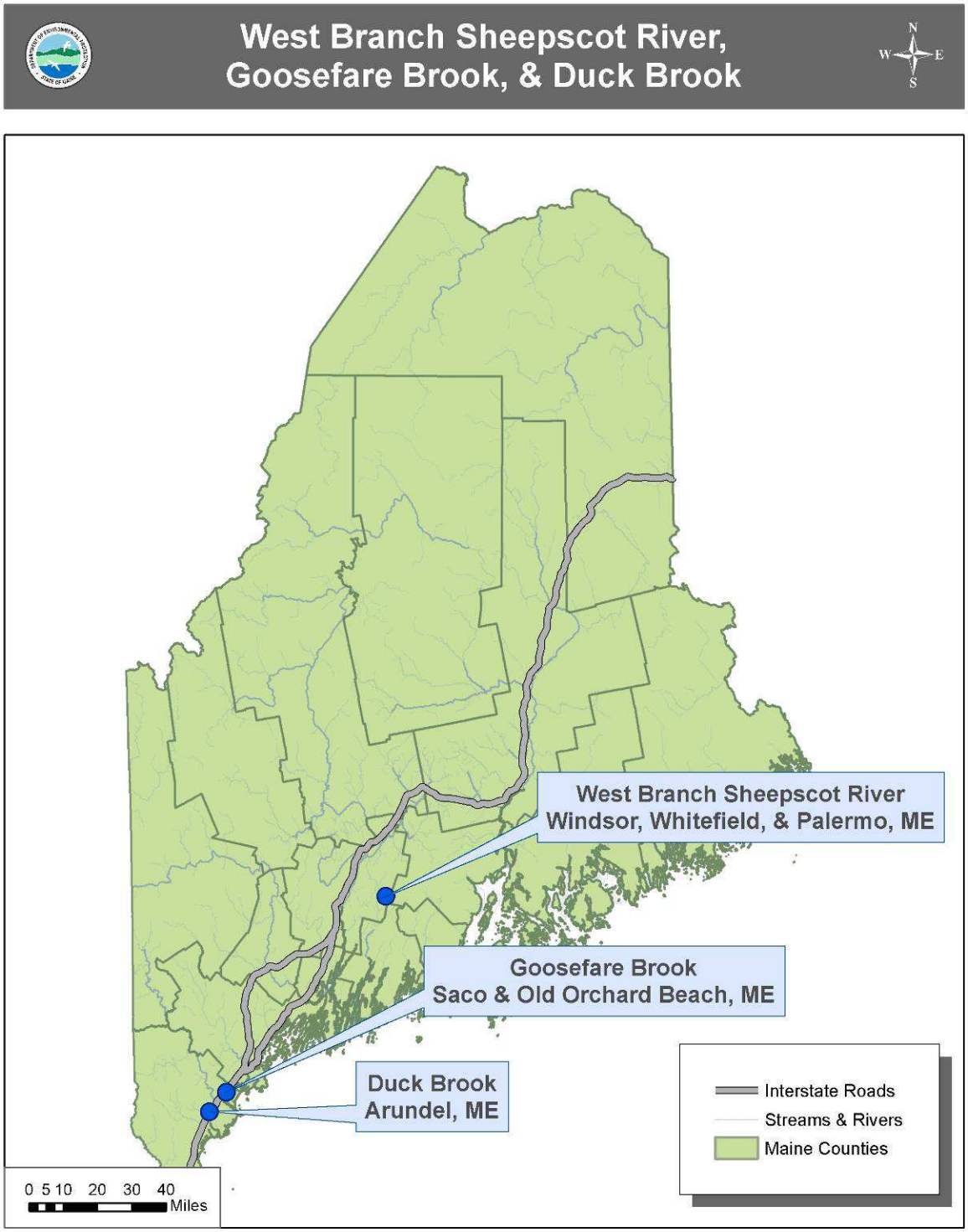
Streams	***Town***	***County***	***Segment ID***	***Stream Length miles***	***Water Quality Class***
Duck Brook	Arundel	York	ME0106000301_622R03	8.6	B
Goosefare Brook	Saco	York	ME0106000106_612R01 ME0106000106_612R01_01	6.0	B
West Branch Sheepscot	Windsor	Kennebec	ME0105000305_528R02	2.3	AA

This is the 30 day notice for public review of the report, which is posted at DEP's website: (http://www.maine.gov/dep/comment/index.html) and the comment period will end on December 4, 2013. Direct comments or questions to Melissa Evers, Maine DEP, State House Station #17, Augusta, ME 04333, phone 207-215-3879, or via email: melissa.evers@maine.gov.

A public hearing is scheduled for November 5, 2013 at 2:30 in DEP's Response Training Room, 4 Blossom Lane, Augusta (more information at http://www.maine.gov/dep/calendar.html).

All public comments and responses will be submitted to EPA as part of the final TMDL submittal documents and posted on DEP's web page 'TMDL approved by EPA' at http://www.maine.gov/dep/water/monitoring/tmdl/tmdl2.html .

Figure 1: Streams covered by this TMDL that are impaired by bacteria (Category 5-B of the Maine DEP 2014 Integrated Water Quality Monitoring and Assessment Report Appendices).



Maine Department of Environmental Protection - Created by: KNemmer, August 2013 - Data Sources: MEGIS, MDEP

BACTERIA TMDL SUMMARY

1. Duck Brook, Arundel

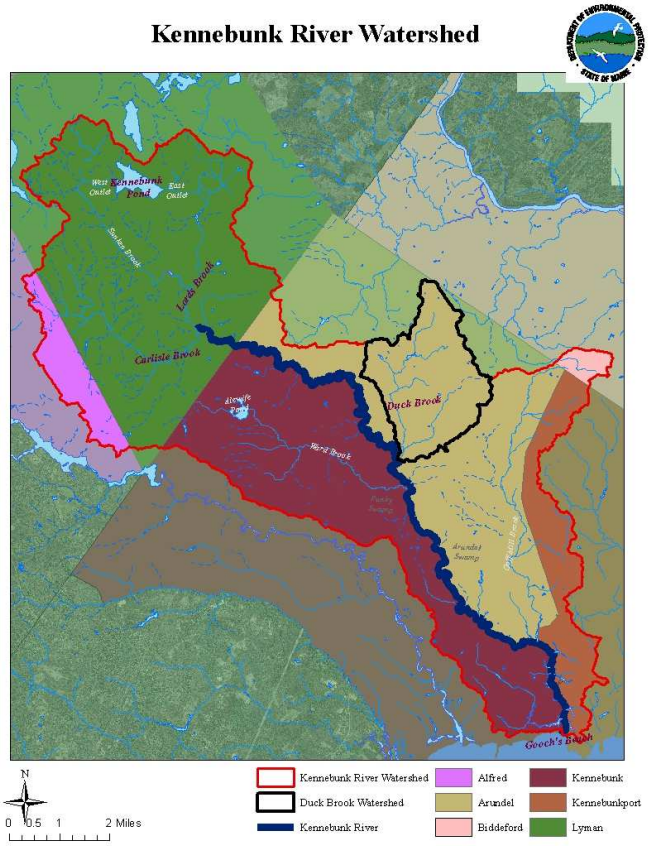


Figure 1.1: Map of the Kennebunk River & the Duck Brook watershed, with surrounding towns.

Waterbody Facts

- **Segment ID:** ME0106000301_622R03
- **Town:** Arundel, ME
- **County:** York
- **Impaired Segment Length:** 8.6 miles (& Tributaries)
- **Classification:** Class B
- **Direct Watershed: 6.64** mi^2
- **Major Drainage Basin:** Kennebunk River Watershed
- **Potential Sources:** Septic Systems, Agriculture, Pet Wastes, Wildlife

1.1 Background

Duck Brook is a Class B stream located in Arundel, a rural residential town close to the southern Maine coast. Duck Brook was first listed as impaired for *E. Coli* bacteria contamination in the Maine DEP *2012 Integrated Water Quality Monitoring and Assessment Report*. Duck Brook flows into the Kennebunk River, which then empties onto Gooch's Beach in Kennebunk (Figure 1.1). Both the Kennebunk River[1] and Gooch's Beach[2] have bacterial impairments and Duck Brook was identified as a potential contributor to the problem by the

[1]The Kennebunk River was first listed for "bacteria-only" impairment in Maine's 2004 305(b) report and remains on the 303 (d) list of impaired waters.

[2] Gooch's Beach has been closed during the summer on a number of occasions due to bacterial count exceedances.

Maine Healthy Beaches (MHB) program in 2008. DEP sampled Duck routinely in 2011 and 2012 to document the extent of bacterial contamination and narrow down the location of potential sources. Sampling results are presented in section 1.2 of this report.

Figure 1.2: Duck Brook near the mouth, by the Eastern Trail.

The Duck Brook watershed is dominated by forested lands and is defined by drainage divides resulting from natural topography. The watershed has 6.0% impervious surface nested within a land cover mosaic of: 8% developed residential area; 72% coniferous, deciduous, or mixed forest vegetation; 7% agriculture area as characterized by pastures, crops, or fields; 3% wetland cover; and 10% is classified as other with herbaceous plants and shrubs (Figure 1.3). These patterns of landuse indicate that bacterial sources are likely from failing residential septic or agriculture activities.

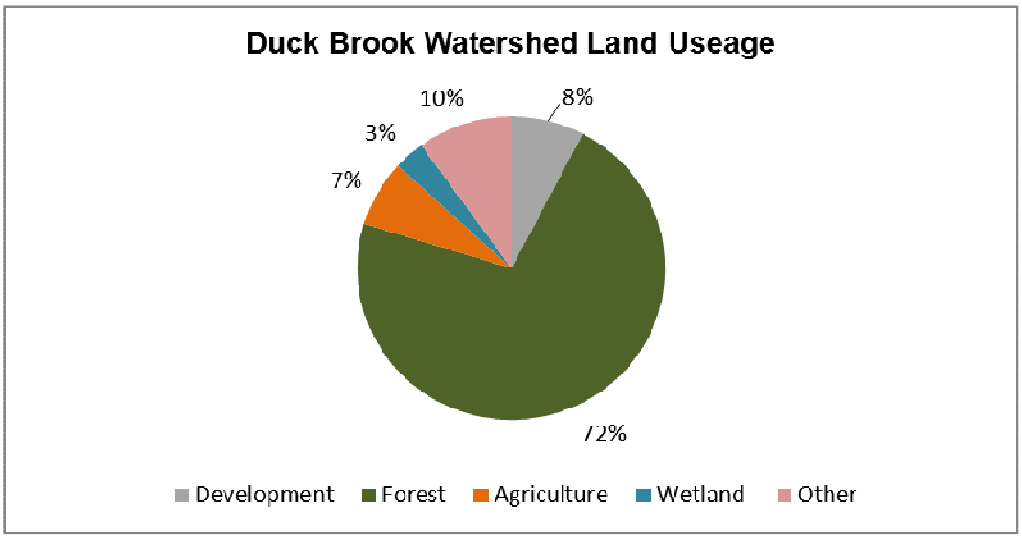


Figure 1.3: Forest and natural vegetation dominates the watershed.

1.2 Bacteria Data Summary & Percent Reduction Calculations

Data Summary

Bacteria data for the Duck Brook watershed were collected by Maine DEP staff working with Americorps and Volunteers with the Volunteer River Monitoring Program (VRMP) during 2011

and 2012. The sampling approach was designed to determine the distribution of bacteria within watershed's network of tributaries (Figure 1.5) and diagnose the location of pollutant sources. The mainstem and all major tributaries were sampled to estimate the relative bacteria loads within the watershed and detect potential hot spots of pollution. Samples were collected during both wet (storm flow) and dry (base flow) weather to characterize the natural variability of runoff conditions found over the season. A detailed description of the sampling approach, results summary and analysis can be found in the project reports in Appendix A.

The instantaneous bacteria standard for Duck Brook is 236/100mL per sample while the geometric mean standard is 64/100mL for combined samples. All sampling results are reported as the 'most probable number (MPN) per 100mL', which is prescribed by the IDEXX testing method used for the project. The sampling results presented in Table 1.1 and Figure 1.4 indicates the stream is impaired for bacteria with concentrations that exceed the geometric mean standard at many sites throughout the watershed. Samples collected during storm events can be used to detect sources of pollution, such as agriculture, while low flow conditions are better suited for detecting sources of pollution, from malfunctioning septics systems or leaking sewer lines. These principles are examined in Figure 1.4 which compares wet and dry samples for 2012 sites to indicate the origin of potential pollutant sources.

Figure 1.4: Comparison of 2012 wet and dry samples to indicate potential pollutant sources.

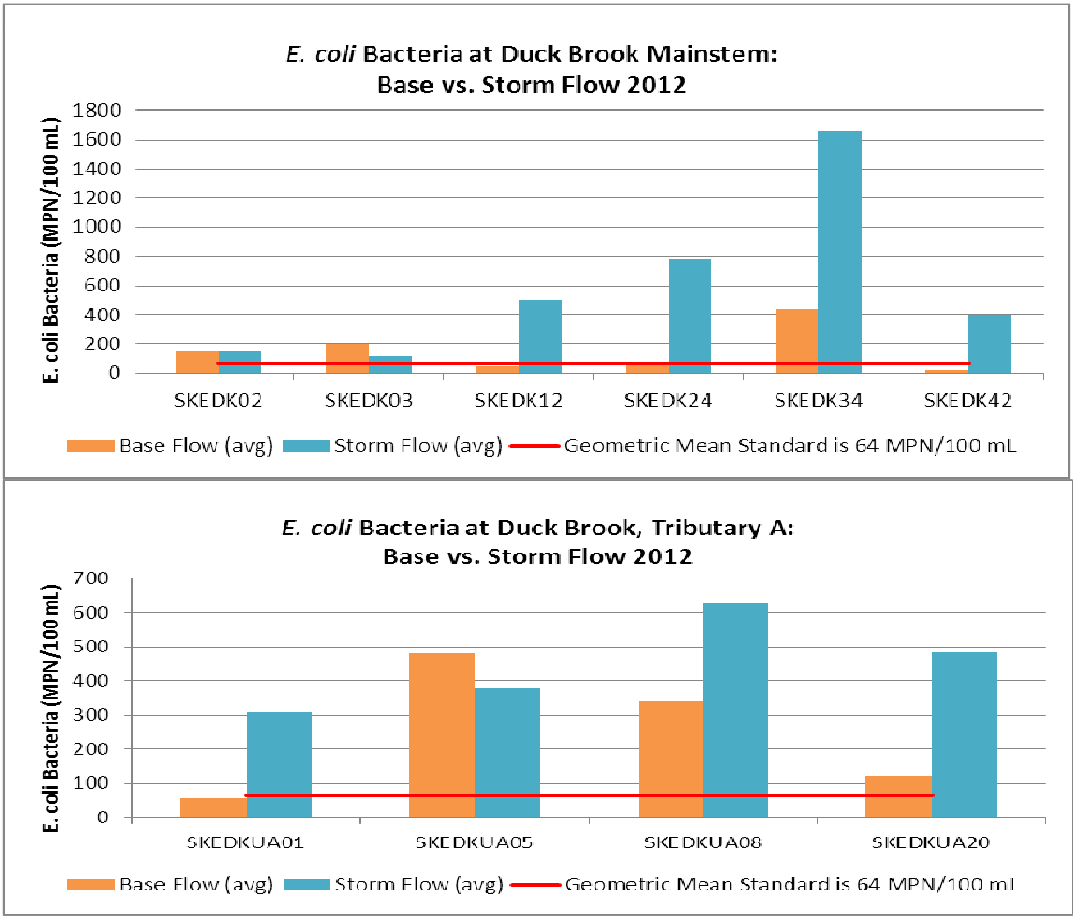


Figure 1.5: Duck Brook stream network, sampling site locations and 2102 results.

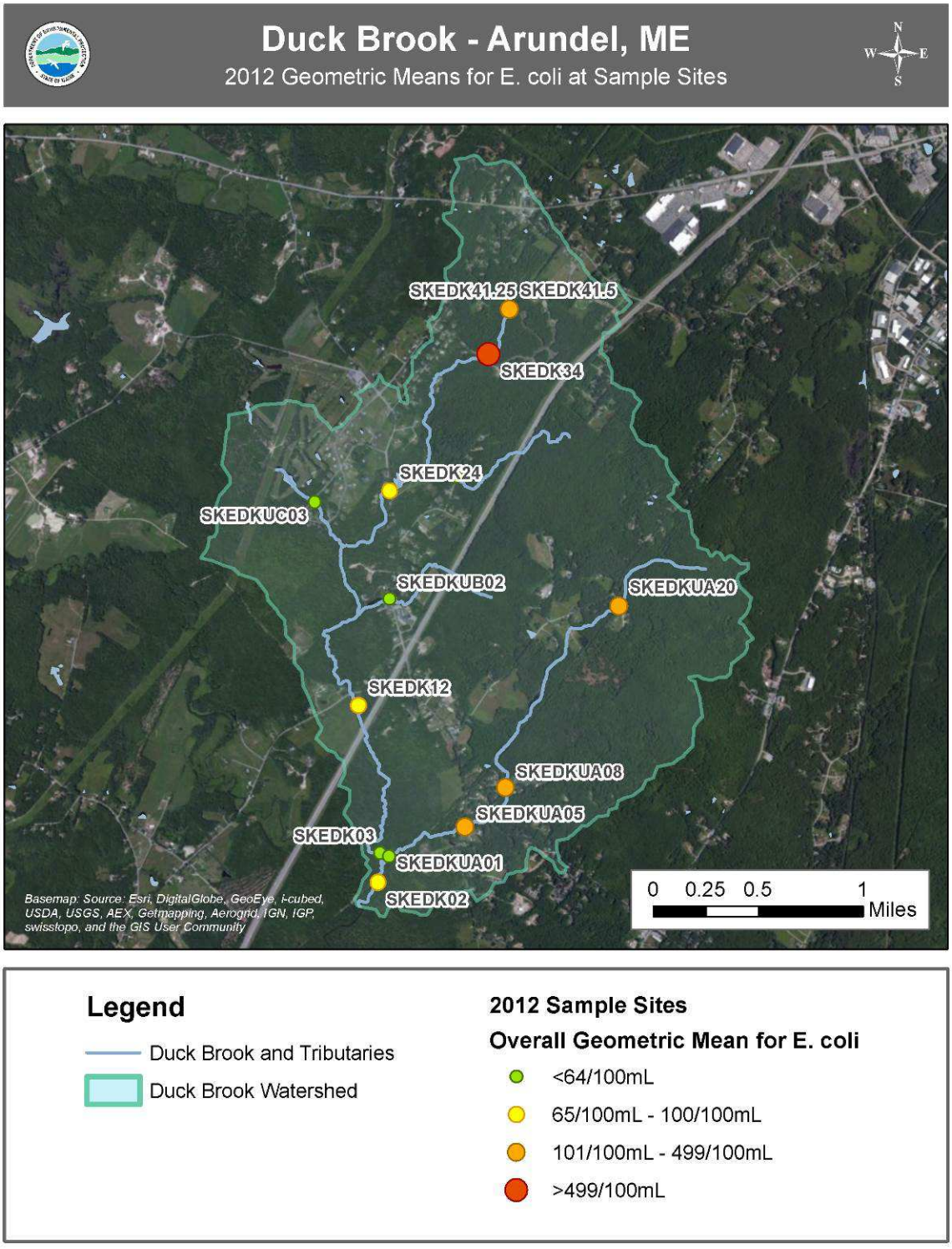


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Table 1.1: 2011 and 2012 sampling results for Duck Brook

Bacteria Results Summary of Duck Brook

2011	DUCK BROOK MAIN STEM					TRIBUTARIES							
MPN/100mL	Eastern Trail	Limerick Rd	Downing Rd	Limerick Rd	Bartlett Farms	Trib A	Trib A	Trib A	Trib A	Trib B	Trib C	Trib D	
	SKEDK02	SKEDK03	SKEDK12	SKEDK24	SKEDK34	SKEDKUA01	SKEDKUA05	SKEDKUA09	SKEDKUA20	SKEDKUB02	SKEDKUC03	SKEDKUD02	Overall
Flow & Date													
SF: May 18	138	-	236	-	-	236	308	291	135	161	53	27	
BF: June 16	124	143	236	517	-	59	65	36	84	59	33	76	
BF: July 12	130	102	130	161	1427	79	238	15	1046	326	236	66	
BF: August 4	169	76	36	39	345	121	155	24	579	105	32	41	
BF: August 31	140	68	80	102	131	96	162	115	269	126	46	313	
SF: September 8	1553	1733	2420	1203	228	2420	2420	2420	980	488	179	488	
													172
Geometric Mean	208	167	192	209	348	177	257	101	349	165	69	97	

2012	DUCK BROOK MAIN STEM						TRIBUTARIES							
MPN/100mL	Eastern Trail	Limerick Rd	Downing Rd	Limerick Rd	Bartlett Farms	Bartlett Farms	Trib A	Trib A	Trib A	Trib A	Trib B	Trib C	Trib D	
	SKEDK02	SKEDK03	SKEDK12	SKEDK24	SKEDK34	SKEDK42	SKEDKUA01	SKEDKUA05	SKEDKUA08	SKEDKUA20	SKEDKUB02	SKEDKUC03	SKEDKUD02	Overall
Flow & Date														
SF: May 17	55	91	-	68	488	-	75.4	57.3	60.5	22.6	10	-	-	
SF: June 13	366	249	-	-	-	-	816.0	260.0	1300.0	1046.0	-	-	-	
BF: June 19	-	-	23	44	461	15	-	-	-	-	66	22	51	
BF: July 5	435	727	-	-	-	-	99.0	488.0	1046.0	94.0	-	-	-	
BF: July 23	-	-	76	1	27	-	-	-	-	-	52	5	17	
SF: July 24	64	28	-	-	-	-	31.0	816.0	517.0	256.0	-	-	-	
SF: August 13	-	-	88	299	1300	63	-	-	-	-	140	113	210	
BF: August 14	111	46	-	-	-	-	114.0	921.0	214.0	179.0	-	-	-	
BF: August 21	-	-	26	115	816	23	-	-	-	-	71	68	29	
BF: August 27	13	9	-	-	-	-	10.0	365.0	10.0	70.0	-	-	-	
SF: August 29	112	-	-	-	2420	-	-	-	-	613.1	-	-	-	
SF: September 5	-	-	921	1986	2420	727	-	-	-	-	1046	64	2420	
BF: September 11	24	14	-	-	-	-	5.0	152.0	86.0	144.0	-	-	-	
														112
Geometric Mean	83	60	82	77	625	63	52	314	186	168	84	35	106	

SF= Storm Flow, BF= Base Flow, MPN=Most Probable Number

Exceeds Instantaneous Standard of 236/ 100mL

Meets Geometric Mean of 64/ 100mL
Slightly Exceeds Geometric Mean Criteria
Exceeds Geometric Mean Criteria
Extreme Exceedance Geometric Mean Criteria

TMDL Calculations

Bacteria concentrations are required to meet water quality standards for the entire sampling period, which means combining wet and dry samples. This TMDL estimates the bacteria reduction needed for the waterbody to comply with water quality standards by applying a simple percent load reductions calculation. These determinations are made for geometric mean values because it is unlikely that a stream would be listed for impairment based on a single maximum instantaneous sample. In general, TMDLs compute a single reduction for an impaired segment and the most downstream mainstem site has been is chosen for the purpose of calculating reductions. Choosing one site will simplify future compliance monitoring because the intensive sampling approach conducted during this project may not be feasible in the future. All data collected at the downstream Eastern Trail site during 2011 and 2012 were combined to calculate an overall geometric mean and used to compute the 48% reduction in bacteria concentration needed to achieve TMDL goals.

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REDUCTIONS TO ACHIEVE BACTERIA WATER QUALITY STANDARDS

- **TMDL GOAL-CLASS B STANDARD= 64/100ML GEOMETRIC MEAN**
- **2011 & 2012 DUCK BROOK SAMPLES= 123/100ML GEOMETRIC MEAN**
- **48 % IN REDUCTION BACTERIA LOADS TO ACHIEVE TMDL GOALS**

1.3 Recommended Future Strategies

Restoration of bacterially impaired streams begins with an assessment of the location and the extent of potential contamination throughout the watershed. This sampling project identified a number of locations where sanitary surveys or an evaluation of agricultural practices are the next step towards eliminating sources. A systematic investigation of contaminated sites will either reveal a direct human or domestic animal source that can be remediated or substantiate that bacterial contamination is solely from wildlife sources and natural processes. These approaches to eliminating bacterial sources are further described in the 2009 TMDL Report and recommendations for Duck Brook are also found in the Appendix A reports. Based on observations made during 2011 and 2012 here are some specific recommendations:

- Investigate private septic systems for malfunctions by conducting sanitary surveys in the upper reach of Duck Brook, upstream of the site labeled SKEDK34 on Figure 1.5 and on residences along Tributary A near the Eastern Trail.
- Assess the impact of domestic animal waste from properties with livestock. Survey drainage ditches in the Laura Lane neighborhood for potential runoff from horse pastures.

BACTERIA TMDL SUMMARY

2. Goosefare Brook, Saco

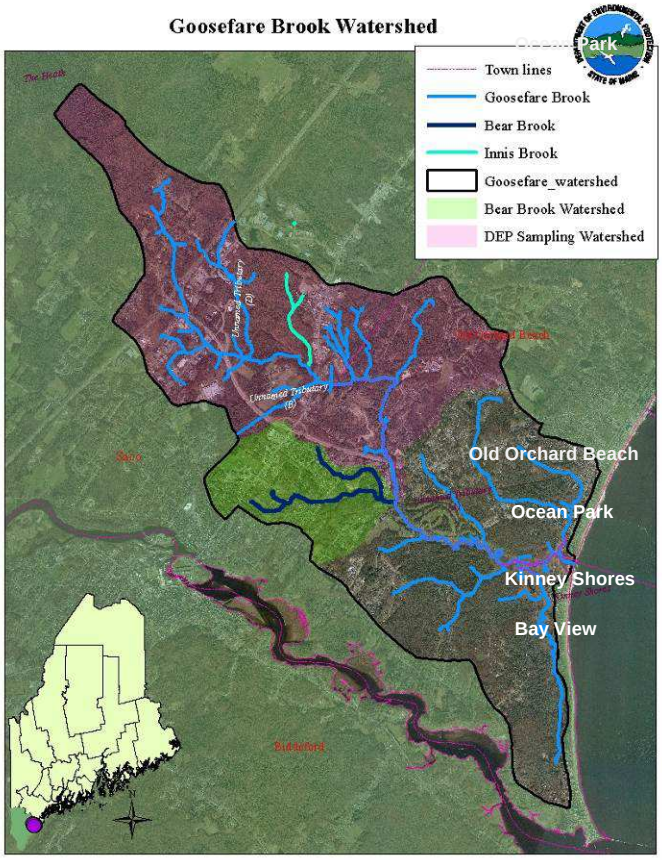


Figure 2.1: Map of the larger Goosefare Brook watershed, with coastal and beach connections.

Waterbody Facts

- **Segment ID:** ME0106000106_612R01 ME0106000106_612R01_01
- **Town:** Saco & Old Orchard Beach, ME
- **County:** York
- **Impaired Segment Length:** ME0106000106_612R01=0.6 miles ME0106000106_612R01_01= 5.54 miles
- **Classification:** Class B
- **Direct Watershed: 9.46** mi^2
- **Major Drainage Basin:** Saco Bay
- **Potential Sources:** Sanitary Systems- both Residential Septics and Municipal Sewerage, Agriculture, Pet Wastes, Wildlife

2.1 Background

Goosefare Brook is a Class B stream situated in the city of Saco with a small segment in the town of Old Orchard Beach in York County, Maine. Goosefare Brook was first listed as impaired for *E. Coli* bacteria contamination in the Maine DEP *2012 Integrated Water Quality Monitoring and Assessment Report*. Goosefare Brook originates in Saco Heath and flows directly to coastal waters with the potential to impact several adjacent beaches, including; Old Orchard Beach, Ocean Park, Kinney Shores and Bay View (Figure 2.1). The beaches of Ocean Park, Bay View and Kinney Shores have all had swimming advisories or closures in the past and the Maine Healthy Beaches (MHB) program has identified Goosefare Brook and its tributaries as a potential contributor to the problem. Bear Brook, in Figure 2.1, is a lower

tributary to Goosefare that is also impaired for bacteria, but was covered by the 2009 TMDL Report and therefore not included in this report. DEP sampled the upper freshwater portion of the watershed, identified in Figure 2.1 and 2.5, in 2011 and 2012 to document the extent of bacterial contamination and narrow down the location of potential sources. Sampling results are presented in section 2.2 of this report.

Figure 2.2: Goosefare Brook, site SGS15.

In 2012 the Goosefare Brook watershed was also included in the *Maine Impervious Cover Total Maximum Daily Load Assessment (TMDL) for Impaired Stream*. Goosefare was identified as having 17% impervious cover, from the combination of residential, commercial and highway development. This impervious surface is nested within a land cover mosaic of: 42% developed area, 45% mixed forest vegetation and 7% wetland cover (Figure 2.3 and 2.5). These patterns of landuse indicate that bacterial sources are likely from failing residential septic, leaky sewer pipes, illicit connections to storm drains or domestic animals.

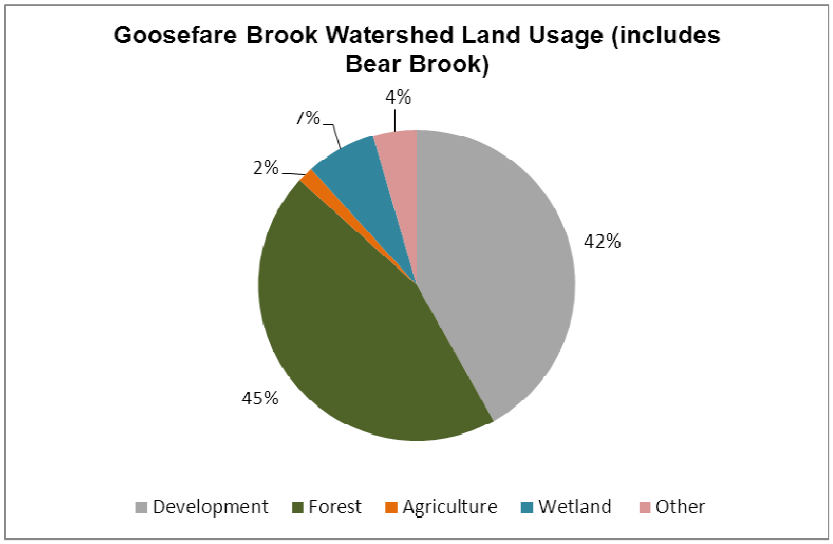


Figure 2.3: Forests and development dominate the watershed.

2.2 Bacteria Data Summary & Percent Reduction Calculations

Data Summary

Bacteria data for the Goosefare Brook watershed were collected by Maine DEP staff working with Americorps and Maine Healthy Beaches staff during 2011 and 2012. In 2011 the sampling approach was designed to: determine the distribution of bacteria within watershed's network

of tributaries (Figure 2.5), estimate the relative bacteria loads within the watershed and detect potential hot spots. In principle, source elimination should follow the flow of water, beginning in the upstream reaches, which then contribute clean water to downstream reaches. In 2012 DEP focused sampling in the upper portion of the watershed to narrow down the potential the location of pollutant sources discovered in 2011. Two tributaries that were found to meet water quality standards in 2011 were dropped from sampling in 2012. Samples were collected during both wet (storm flow) and dry (base flow) weather to characterize the natural variability of runoff conditions found over the season. A detailed description of the sampling approach, results summary and analysis can be found in the project reports in Appendix B.

The instantaneous bacteria standard for Goosefare Brook is 236/100mL per sample while the geometric mean standard is 64/100mL for combined samples. All sampling results are reported as the 'most probable number (MPN) per 100mL, which is prescribed by the IDEXX testing method used for the project. The sampling results presented in Table 2.1 and Figure 2.4 indicates the stream is impaired for bacteria with concentrations that exceed the geometric mean standard at most sites. Samples collected during storm events can be used to detect sources of pollution that wash off during a storm, while low flow conditions are better suited for detecting sources of pollution, from malfunctioning septics systems or leaking sewer lines. Figure 2.4 compares wet and dry samples for 2012 sites and shows high values during storm events and moderate exceedances during base flow. This likely indicates discharges from both human sewerage and some contributing nonpoint sources as well, such as domestic animals.

Figure 2.4: Comparison of 2012 wet and dry samples to indicate potential pollutant sources.

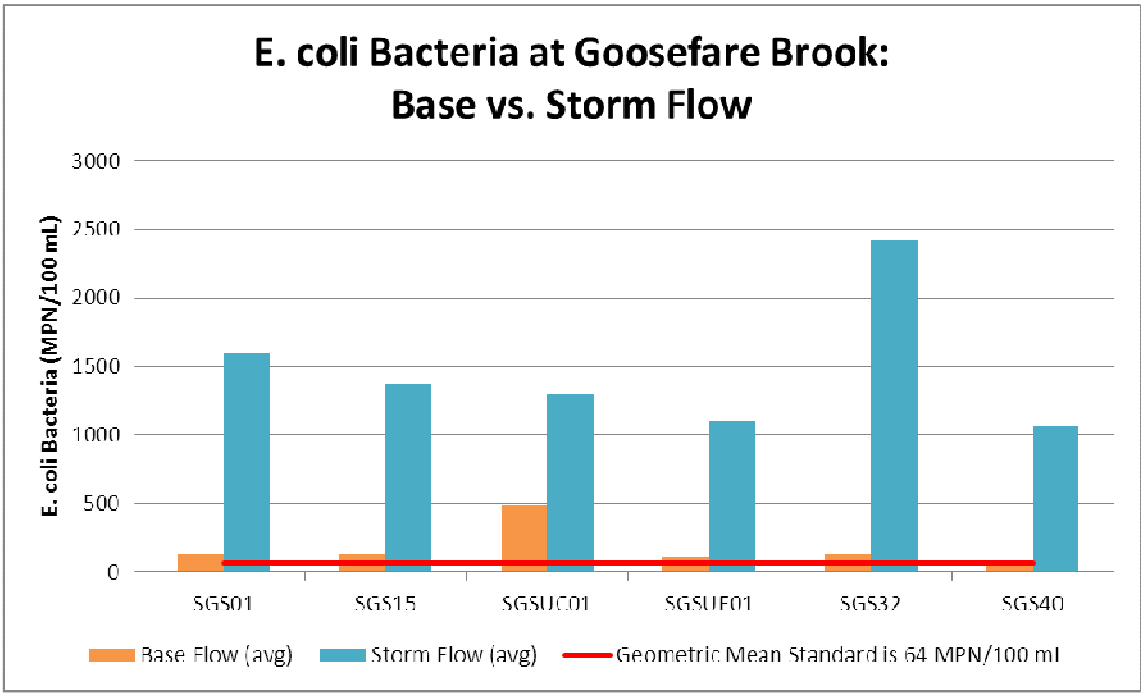
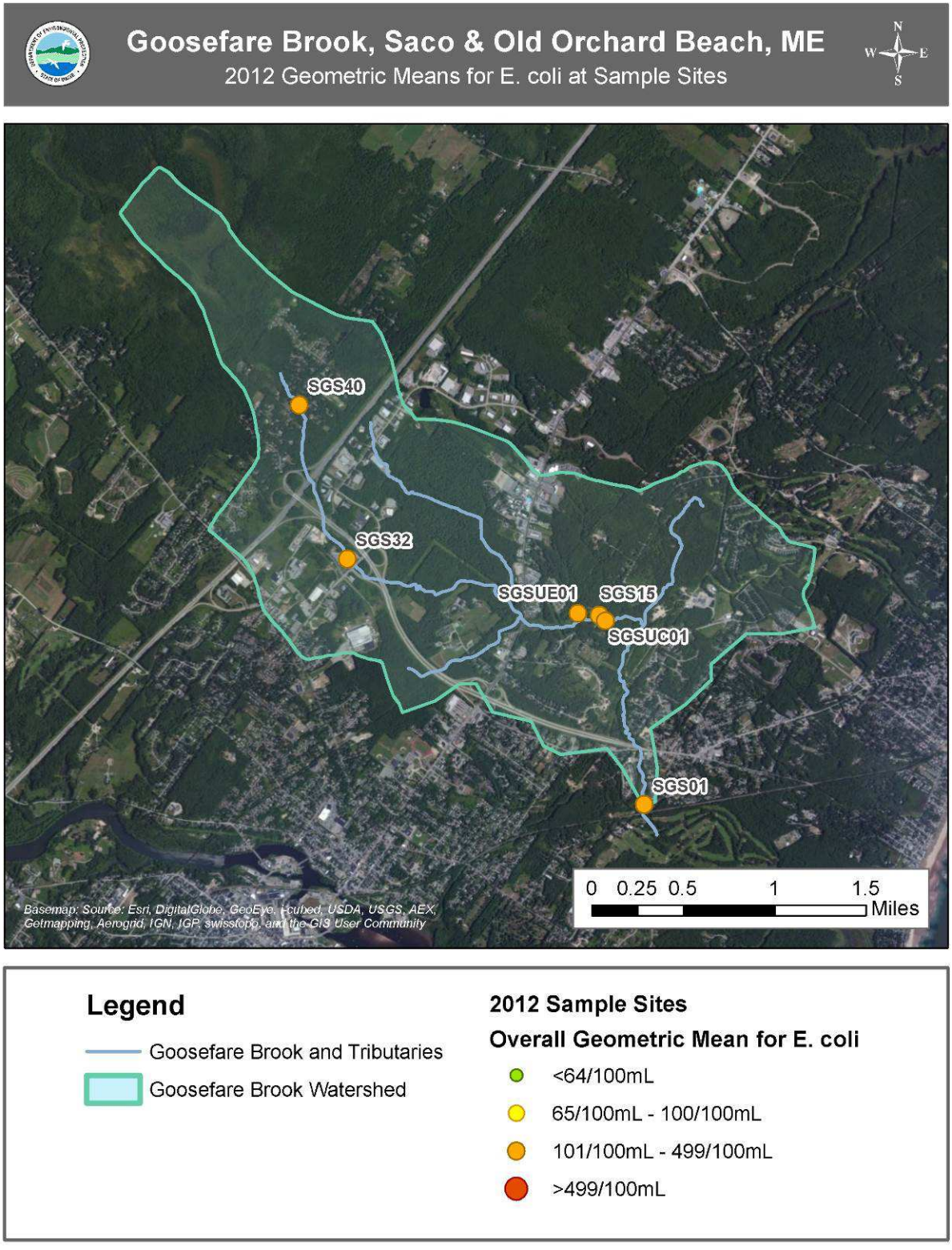


Figure 2.5: Goosefare Brook stream network, sampling site locations and 2012 results.



Maine Department of Environmental Protection - Created by: KNemmer, August 2013 - Data Sources: MEGIS, MDEP

Table 2.1: 2011 and 2012 sampling results for Goosefare Brook

Bacteria Results Summary of Goosefare Brook

2011	GOOSEFARE BROOK MAINSTEM					TRIBUTARIES					
MPN/100mL						Trib A	Trib A	Trib B	Trib	Trib	
	Old Orchard Rd	Ocean Park Rd	Ross Rd	Industrial Park Way	Jenkins Rd	Old Salt Rd	Old Orchard Rd	Moody Rd	Main St	Valley Rd	
	SGS01	SGS04	SGS15	SGS32	SGS40	SGSUA05	SGUA08	SGSUB04	SGSIB01	SGSTS	Overall
Flow & Date											
BF: May 24	99	103	-	121	44	-	-	-	-	-	
BF: May 31	-	-	-	-	-	-	179	185	29	11	
BF: June 9	101	79	138	50	921	-	228	38	28	13	
BF: June 27	236	248	291	135	124	435	192	135	-	-	
BF: July 11	866	236	141	173	126	133	179	2420	93	3	
BF: August 9	214	91	64	70	272	179	205	579	-	-	
BF: August 23	537	727	579	579	770	-	236	214	-	-	
											151
Geometric Mean	248	178	184	134	226	218	202	256	42	8	

2012	GOOSEFARE BROOK MAINSTEM					TRIBUTARIES		
MPN/100mL	Old Orchard Rd	Ocean Park Rd	Ross Rd	Industrial Park Way	Jenkins Rd	Trib C	Trib E	
	SGS01	SGS04	SGS15	SGS32	SGS40	SGSUC01	SGSUE01	Overall
Flow & Date								
BF: June 11	78	NS	84	36	30	107	52	
BF: July 9	122	NS	158	64	41	1733	179	
BF: August 7	131	NS	120	345	111	326	73	
BF: August 9	NS	NS	99	-	-	91	30	
BF: September 10	201	NS	192	72	59	179	261	
SF: September 19	2420	NS	2420	2420	1986	2420	1986	
								192
Geometric Mean	227		204	168	110	365	148	

SF= Storm Flow, BF= Base Flow, MPN=Most Probable Number

Exceeds Instantaneous Standard of 236/ 100mL

NS= Not Sampled during this Season

Meets Geometric Mean of 64/ 100mL

Slightly Exceeds Geometric Mean Criteria

Exceeds Geometric Mean Criteria

Extreme Exceedance Geometric Mean Criteria

TMDL Calculations

Bacteria concentrations are required to meet water quality standards for the entire sampling period, which means combining wet and dry samples. This TMDL estimates the bacteria reduction needed for the waterbody to comply with water quality standards by applying a simple percent load reductions calculation. These determinations are made for geometric mean values because it is unlikely that a stream would be listed for impairment based on a single maximum instantaneous sample. In general, TMDLs compute a single reduction for an impaired segment and the most downstream mainstem site has been is chosen for the purpose of calculating reductions. Choosing one site will simplify future compliance monitoring because the intensive sampling approach conducted during this project may not be feasible in the future. All data collected at the downstream Old Orchard Road crossing, site SGS01, during 2011 and 2012 were combined to calculate an overall geometric mean and used to compute the 76% reduction in bacteria concentration needed to achieve TMDL goals.

.

REDUCTIONS TO ACHIEVE BACTERIA WATER QUALITY STANDARDS

- **TMDL GOAL-CLASS B STANDARD= 64/100ML GEOMETRIC MEAN**
- **2011 & 2012 GOOSEFARE BROOK SAMPLES= 239/100ML GEOMETRIC MEAN**
- **73 % IN REDUCTION BACTERIA LOADS TO ACHIEVE TMDL GOALS**

2.3 Recommended Future Strategies

Restoration of bacterially impaired streams begins with an assessment of the location and extent of potential contamination throughout the watershed. This sampling project identified a number of locations where sanitary surveys are the next step towards eliminating sources. A systematic investigation of contaminated sites will either reveal a direct human or domestic animal source that can be remediated or substantiate that bacterial contamination is solely from wildlife sources and natural processes. These approaches to eliminating bacterial sources are further described in the 2009 TMDL Report and specific recommendations for Goosefare Brook are also found in Appendix B reports. Based on observations made during 2011 and 2012 listed below are some specific recommendations:

- *Establish an Illicit Discharge Detection and Elimination (IDDE) Program* for Goosefare Brook
    - In its MS4 Permit, the City of Saco has included goals toward development of an IDDE Program and the city has made progress towards this objective. An effective IDDE Program should include the following essential elements:
        - Storm sewer system map with locations of outfalls and waters receiving discharge
        - Determine the integrity of sewer and stormwater conveyances by examining them using current engineering evaluation techniques such as cameras, dyes or smoke testing
        - Include remedial procedures and necessary actions
        - A plan to detect and address illicit discharges, including illegal dumping
        - An education program that informs public employees, businesses, and the general public of the hazards associated with illegal discharge and improper waste disposal
- *Focused Investigation of the Watershed*
    - Goosefare Brook's watershed is relatively large, and could be subdivided into smaller watersheds to facilitate a thorough investigation of stream channels (mainstem and tributaries) which should include visual inspection of the water for color, odor, and obvious evidence of waste materials as well as to note any pipes, discharges, or unusual conditions.
    - Animal sources should be attributed to either domestic animals or to wildlife, especially in subwatersheds dominated by natural land cover.
- *Sanitary Surveys* for those portions of the watershed serviced by residential septic systems
    - Survey properties for malfunctioning septics in areas with known high bacteria counts, such as Ross Rd. and Jenkins Rd.

BACTERIA TMDL SUMMARY

3. West Branch Sheepscot River

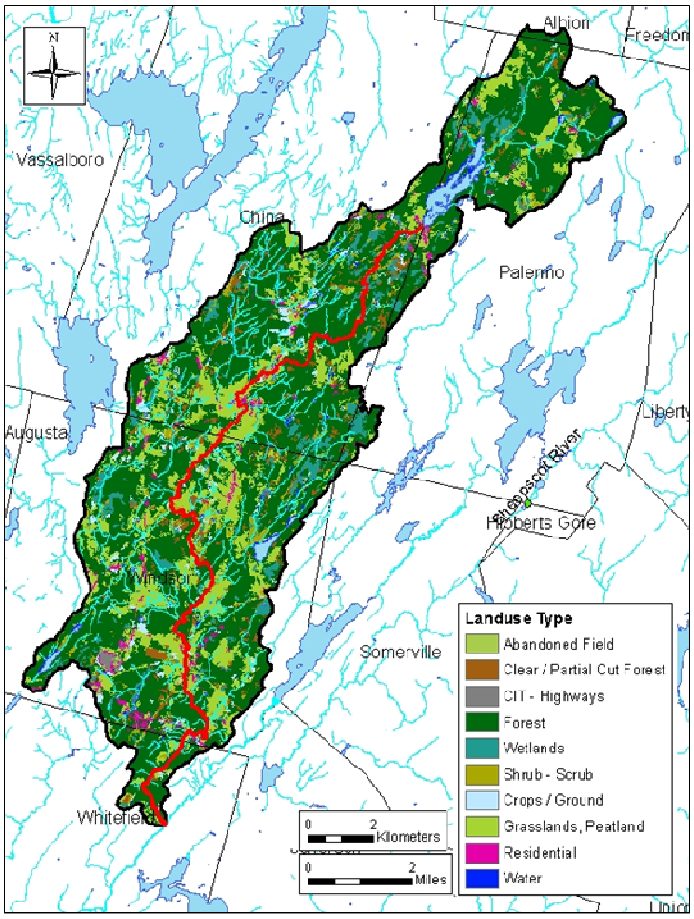


Figure 3.1: West Branch of the Sheepscot River

Waterbody Facts

- **Segment ID:** ME0105000305_528R02
- **Towns:** China, Palermo, Windsor, Somerville, & Whitefield, ME
- **Counties:** Kennebec, Waldo, & Lincoln
- **Impaired Segment Length:** 2.29 miles
- **Classification:** Class AA, B
- **Direct Watershed: 50.6** mi^2
- **Major Drainage Basin:** Central Coastal Watershed
- **Potential Sources:** Sanitary Systems- both Residential Septics and Municipal Sewerage, Agriculture, Pet Wastes, Wildlife

3.1 Background

The West Branch of the Sheepscot River is Class AA river that originates in China and flows through Palermo, Windsor, and Somerville before joining the mainstem of the Sheepscot in Whitefield. West Branch Sheepscot was listed as impaired for *E. Coli* bacteria contamination in the Maine DEP *2012 Integrated Water Quality Monitoring and Assessment Report* and the impaired segment flows from Rt.17 to the mouth. The West Branch Sheepscot River flows from the mouth of Branch Pond in Palermo, and then into the mainstem of the Sheepscot, which flows directly to the marine waters. The lower Sheepscot in Alna is also impaired for bacteria, but was covered by the 2009 TMDL Report and not included in this report. The Department of Marine Resources has closed shellfish harvest areas in the estuarine portion of

the Sheepscot, near the town of Wiscasset. It is unlikely that the impairments in the West Branch directly influence the marine receiving waters due to the distance and relatively small degree of bacterial exceedances.

Figure 3.2: SVCA Volunteer at West Branch Sheepscot.

The West Branch of the Sheepscot has been sampled for bacteria by volunteers with the Sheepscot Valley Conservation Association (SVCA) for the past 19 years. SVCA is the source of the data presented in this report. Sampling is conducted simply to determine compliance with water standards and results are presented in Section 3.2 of this report.

The West Branch Sheepscot watershed is dominated by forested lands and is defined by drainage divides resulting from natural topography. The watershed has a land cover mosaic of: 66% mixed forest vegetation, 21% agriculture, 11% wetland cover and 2% residential and road development (Figure 3.3). These patterns of landuse means that the bacterial sources are likely from domestic animals associated with agriculture, failing residential septic or wildlife. The West Branch watershed does have a few active dairy farms which are a potential source of bacteria.

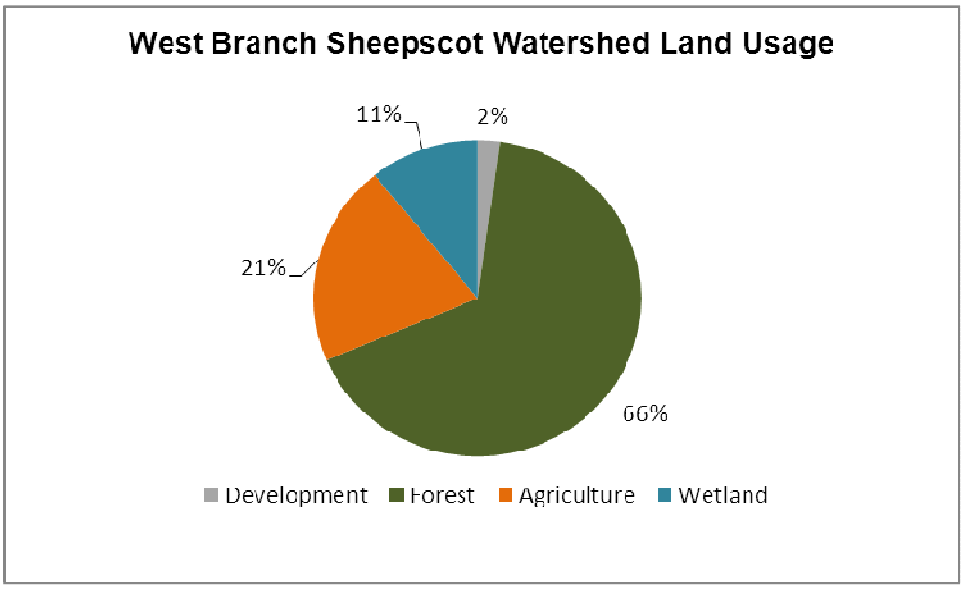


Figure 3.3: Forests and agriculture dominate the watershed.

3.2 Bacteria Data Summary & Percent Reduction Calculations

Data Summary

Figure 3.4: Below Maxcy's Mills Road, Windsor

Bacteria data for the West Branch Sheepscot watershed were collected by Volunteers with the SVCA from 1994 to 2012. Data is collected under a DEP approved Quality Assurance Project Plan which enables DEP to accept SVCA data for inclusion in databases and to use this information for impairment or 303(d) listing decisions. SVCA's monitoring makes no attempt to document the extent of bacterial contamination and narrow down the location of potential sources. Samples are collected on a set schedule with no distinction between wet (storm flow) or dry (base flow) sampling events, but over the course of the season both wet and dry conditions are usually encountered. Sampling locations and results are presented in Figure 3.5 and further descriptions can be found in the SVCA project report in Appendix C.

The bacteria standard for the West Branch Sheepscot is Class AA or 'as naturally occurs', which means the river should be consistent with bacteria levels found in waters free of measurable effects of human activity. There are no numeric criteria for monitoring results comparisons, but in practice the Class GPA (lakes) standard for *E. coli* may be used as a surrogate target if the 'natural' bacteria are unknown (Table 2). Therefore, for the purposes of this TMDL, the West Branch Sheepscot targets for bacteria of human and domestic animal origin should not exceed a geometric mean of 29/100mL or an instantaneous level of 194/100mL. The sampling results presented in Table 3.1 indicate the stream is impaired for bacteria with concentrations consistently exceeding the geometric mean standard at two sites.

Table 3.1: Annual geometric means for the West Branch Sheepscot River

Annual Geometric Means			
	WEST BRANCH OF THE SHEEPSCOT		
Number/100mL	Howe Rd, Whitefield	Rt 105, Windsor	Water St, Palermo
Geometric Means	WB001-F	WB002 F	WB005-F
Year			
2007	**43**	**37**	**13**
2008	**64**	**53**	**14**
2009	**49**	**55**	**6**
2010	**46**	**24**	**15**
2011	**36**	**102**	**10**
2012	**45**	**71**	**15**
Meets Geometric Mean of 29/ 100mL			
Slightly Exceeds Geometric Mean Criteria			
Exceeds Geometric Mean Criteria			
Extreme Exceedance Geometric Mean Criteria			
Exceeds Instantaneous Standard of 194/ 100mL			

The sampling results for 2012 in Table 3.2 and Figure 3.5 show the variability found for individual sampling events over the course of the season. The high values measured on June 5th were associated with a rain event, which confirms that bacteria are washed off during a runoff event. The middle sampling site has the highest geometric mean, which may be influenced by the two upstream tributaries that are also monitored by SVCA, identified as

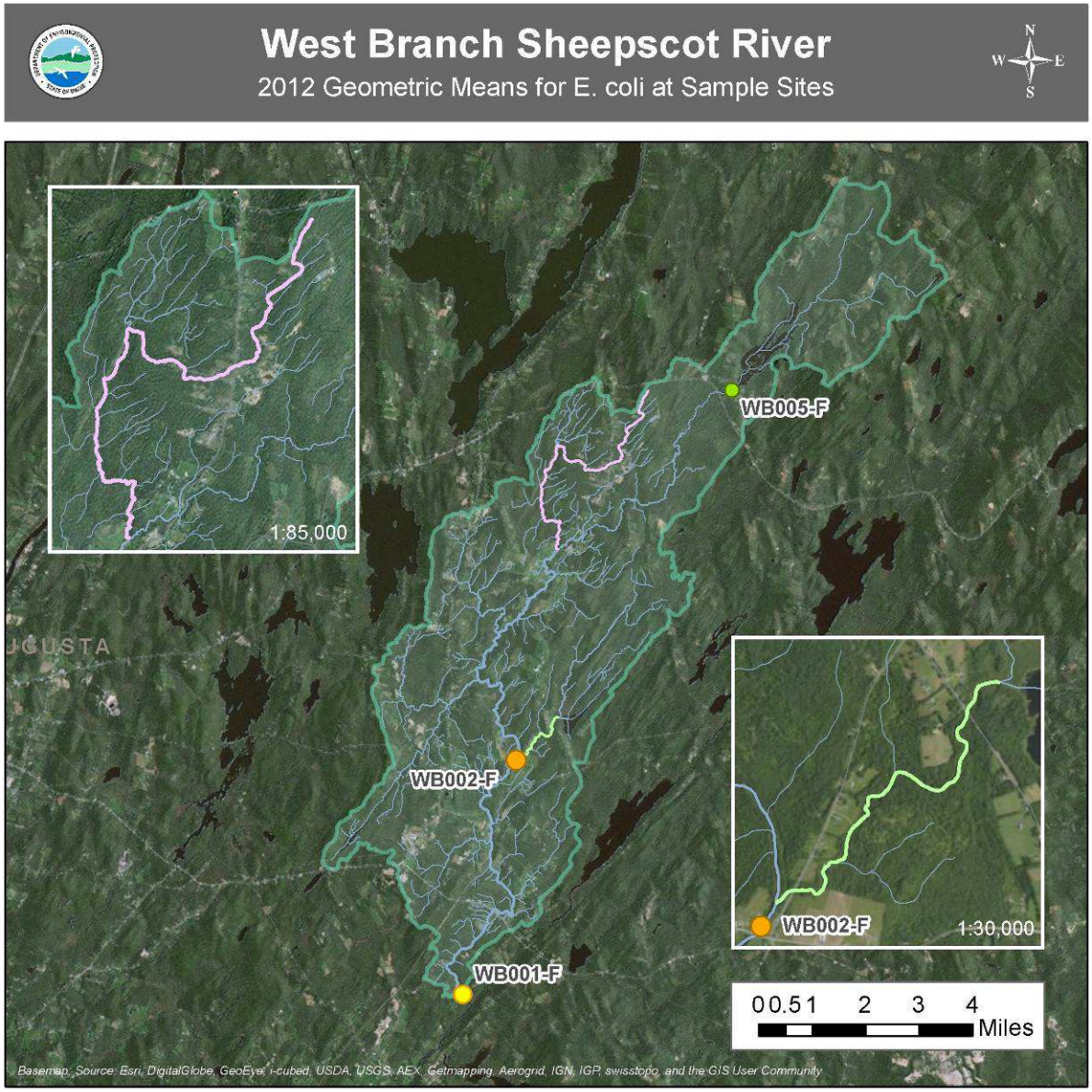
Meadow Brook and Choate Brook on Figure 3.5. SVCA's has consistently found elevated bacteria values on these small streams during the19 years of sampling and they contribute a bacteria load to the West Branch.

The observed bacteria values exceed Maine's surrogate water quality standards for Class AA, but they meet Class B at the downstream site and for all sites combined (Table 3.2). The observed values may actually meet the 'as naturally occurs' standard, but it is unknown how the bacteria load splits between wildlife and human or domestic animal sources. All bacteria derived from wildlife would be considered a natural source and not contribute to the nonattainment status.

Table 3.2: Sampling results for the West Branch Sheepscot River

Bacteria Results Summary for West Branch Sheepscot				
2012	WEST BRANCH OF THE SHEEPSCOT			
Number/100mL	Howe Rd, Whitefield	Rt 105, Windsor	Water St, Palermo	
	WB001-F	WB002 F	WB005-F	Overall
Date				
May 22	**34**	**64**	**2**	
June 5	**313**	**166**	**29**	
June19	**34**	**272**	**7**	
July 3	**73**	**172**	**5**	
July 17	**99**	**66**	**77**	
July 31	**22**	**38**	**35**	
August 14	**16**	**24**	**60**	
August 28	**101**	**61**	-	
September 11	**20**	**40**	**24**	
September 25	**18**	**44**	**6**	
				38
Geometric Mean	**45**	**71**	**15**	
Meets Geometric Mean of 29/ 100mL				
Slightly Exceeds Geometric Mean Criteria				
Exceeds Geometric Mean Criteria				
Extreme Exceedance Geometric Mean Criteria				
Exceeds Instantaneous Standard of 194/ 100mL				

Figure 3.5: West Branch Sheepscot River network, sampling site locations and 2012 results.



TMDL Calculations

This TMDL estimates the bacteria reduction needed for the waterbody to comply with water quality standards by applying a simple percent load reductions calculation. These determinations are made for geometric mean values because it is unlikely that a stream would be listed for impairment based on a single maximum instantaneous sample. In general, TMDLs compute a single reduction for an impaired segment and the two downstream sites that are in nonattainment were chosen for the purpose of calculating reductions. These sites have been consistently monitored in the past and are suitable to use for future compliance monitoring. All data collected at these sites during 2012 were combined to calculate an overall geometric mean and used to compute the 50% reduction in bacteria concentration needed to achieve TMDL goals.

REDUCTIONS TO ACHIEVE BACTERIA WATER QUALITY STANDARDS

- **TMDL GOAL-CLASS AA STANDARD= 29/100ML GEOMETRIC MEAN**
- **2012 WEST BRANCH SHEEPSCOT SAMPLES= 58/100ML GEOMETRIC MEAN**
- **50 % IN REDUCTION BACTERIA LOADS TO ACHIEVE TMDL GOALS**

3.3 Recommended Future Strategies

Restoration of bacterially impaired streams begins with an assessment of the location and extent of potential contamination throughout the watershed. The West Branch Sheepscot is a large watershed with sampling results over a long time period that should be considered in any future restoration planning effort. A systematic investigation of tributaries may reveal whether sources are the result of a direct human or domestic animal impact or substantiate that bacterial contamination is from wildlife sources and natural processes. Further approaches to eliminating bacterial sources are described in the 2009 TMDL Report. Here are specific recommendations to move beyond attainment monitoring and work to eliminate pollutant sources:

- *Focused Investigation of the Watershed*
    - The West Branch Sheepscot watershed is relatively large and should be subdivided into smaller watersheds to facilitate a thorough investigation of stream channels (mainstem and tributaries).

  - Conduct an intensive or diagnostic sampling strategy to narrow down the location of potential sources through an approach called 'bracket sampling' which focuses monitoring around known problem areas. Apply this strategy in upstream areas and move downstream systematically as sources are identified and eliminated.
    - Determine the location between the upstream site, WB005-F and WB002-F where bacteria levels begin to rise and investigate nearby properties for bacterial sources.
    - Sample in strategic locations within the Choate Brook and Meadow Brook watersheds to narrow down potential pollutant sources or determine bacteria are derived from natural sources.

- *Sanitary Surveys*
  - Survey properties for malfunctioning septics near areas with known high bacteria counts, such as the Rt. 105 sampling site.
- *Bacteria Source Tracking*
  - The relatively low bacteria values increase the likelihood that natural processes are a significant source of the observed values. Conduct a bacteria source tracking project to determine whether animal sources should be attributed to either domestic sources or to wildlife.
  - This entails developing a comprehensive project that includes a combination of monitoring plans, landuse analysis, and applying Microbial Source Tracking (MST) methods. There are a variety of MST methods available; biochemical (antibiotic resistance analysis), molecular (DNA pattern comparisons or fingerprinting), chemical (test water for presence human waste constituents), and immunological (antigenic determinants shed in human and animals fecal matter).

REFERENCES

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Appendix D: PUBLIC COMMENTS & RESPONSE FOR THE MAINE STATEWIDE BACTERIA TMDL: 2013 FRESHWATER ADDENDUM, AUGUST 2013 DRAFT

From: kb [kimbark.smith@myfairpoint.net]
Sent: Sunday, November 03, 2013 9:45 AM
To: Evers, Melissa
Cc: 'kb'
Subject: Goosefare Brook

Dear Ms. Evers,

As a resident of the Ocean Park section of Old Orchard Beach and a member of the Conservation Commission, I am very concerned about the pollution that has been identified by the testing results of Maine Beaches on the lower Goosefare Brook and the feeder Marshes located around Ocean Park as well as the management of the Tide Gate feeding our Marshes. The lack of higher salinity being seen in the Marshes is causing penetration of fresh water species and invasives.

With the hiring of the new Town Manager, the Town finally has an active campaign to try and locate the sources of pollution, although The Town knew that there were pollution issues in these feeder areas for years. While this is a positive development, I believe that the lower Goosefare should also be included the Restoration of Streams Impaired by NPS Bacteria project of the upper Goosefare and the whole of the Goosefare watershed should be added to the watch list . This issue is too important to be left to the vagaries of the politics of Town elections and the continual changing of priorities depending on the time of year.

Sincerely yours,
Kimbark G. Smith

DEP Response:

Dear Mr. Smith,

Thank you for your concern regarding pollution in Goosefare Brook and the Ocean Park sections of Old Orchard Beach, your observations are relevant to ongoing assessment efforts. This TMDL covers the freshwater segment of Goosefare Brook because this segment is on DEP's list of impaired waters, the303 D list. The lower Goosefare is tidal and falls under water quality standards designated for Maine's marine waters, which are different from the freshwater criteria and means using a different sampling approach to determine impairment status. Generally, the impairment designation is the precursor to any restoration work or TMDL assessment. At this time, DEP has not conducted any specific marine assessments that would support the impairment listing, but we may consider using Maine Healthy Beaches data for that purpose in the future. I would be glad to further discuss the process surrounding listing marine water as impaired at any time, so please call me at 207-215-3879.

Sincerely,

Melissa Evers
Environmental Specialist III
Maine Department of Environmental Protection

From: Deborah Guimont [debguimont@hotmail.com]
Sent: Monday, November 04, 2013 10:57 AM
To: Evers, Melissa
Subject: Goosefare Creek

I am writing to you in support of your expansion of pollution monitoring to the entire Goosefare Creek area. As a long time resident of Ocean Park, I know that water quality in the marsh is important to the entire community.

Sent from my iPad

DEP Response:

Dear Ms. Guimont,

Thank you for your support of this TMDL and concern regarding pollution monitoring in Goosefare Brook and the Ocean Park section of Old Orchard Beach.
Sincerely,

Melissa Evers
Environmental Specialist III
Maine Department of Environmental Protection

From: Marc Guimont [marcguimont@gwi.net]
Sent: Monday, November 04, 2013 11:08 AM
To: Evers, Melissa
Subject: Goosefare Creek

Ms. Evers,
The Goosefare estuary in Old Orchard Beach is critical to the environmental health of our Ocean Park community and our Town. I hope you will be able to identify the source/sources of the Goosefare Creek pollution and stop it.
Sincerely,
Marc Guimont, PE.

Sent from my iPad

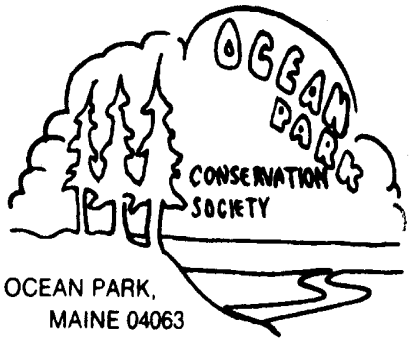
DEP Response:

Dear Mr. Guimont,

Thank you for your support of this TMDL and monitoring in Goosefare Brook. Even with the TMDL assessment completed, DEP will continue monitoring in the watershed to help identify and eliminate sources.

Sincerely,

Melissa Evers
Environmental Specialist III
Maine Department of Environmental Protection



November 20, 2013

Melissa Evers
Maine Department of Environmental Protection,
State House Station #17,
Augusta, ME 04333,
Telephone 207-215-3879
Email: melissa.evers@maine.gov

Re: COMMENTS ON BACTERIA TMDLs on 3 streams to be added to the USEPA approved 2009 Maine Statewide Bacteria TMDL (Total Maximum Daily Loads) Report (http://www.maine.gov/dep/water/monitoring/tmdl/tmdl2.html).

Greetings:

The Ocean Park Conservation Society is a non-profit, community organization founded in 1971 to foster, preserve, conserve and promote the natural physical beauty and setting of Ocean Park and its surroundings and to provide education in the ideals and goals of conservation.

We are now, and have been, very active in trying to help the Goosefare Brook and its problems for over forty years. We have commissioned and done several studies on the Goosefare, its tributaries, waters and marshes on our own and with Maine Healthy Beaches and the Maine State Department of Environmental Protection.

We are deeply concerned with the quality of our immediate environment and particularly the waters of the Goosefare which we share with Saco and which run along our shore.

We are very pleased to hear that the Maine State DEP intends to add the Goosefare Brook to the USEPA approved 2009 Maine Statewide Bacteria TMDL (Total Maximum Daily Loads) Report to plan for the clean-up and positive future of the Goosefare Brook and we enthusiastically support this addition, and fervently hope that it will be accepted.

Thank you,

John R. Bird, President

The Ocean Park Conservation Society

DEP Response:

Dear Mr. Bird,

Thank you for your support of this TMDL on Goosefare Brook and all your work to help address sources of pollution in the watershed. This TMDL is one step in the larger process to restore Goosefare Brook and protect the downstream receiving waters, such as the Ocean Park section of Old Orchard Beach.

Sincerely,

Melissa Evers
Environmental Specialist III
Maine Department of Environmental Protection

From: Mark Koenigs [mdkoenigspe@hotmail.com]
Sent: Wednesday, December 04, 2013 9:24 AM
To: Evers, Melissa
Cc: lmead@oobmaine.com; jhinderliter@oobmaine.com; John R. Bird; Kimbark Smith; Karen Brozek; Pat Holland; Jean Leclerc
Subject: Comments on Bacteria TMDLs Report

Importance: High

Attachments: OOB CC_Goosefare Brook listing support letter_12.4.13.pdf

Ms. Evers,

Please find attached the Old Orchard Beach Conservation Commission's comment letter regarding the BACTERIA TMDLs on 3 streams to be added to the USEPA approved 2009 Maine Statewide Bacteria TMDL (Total Maximum Daily Load) Report - 2013 Freshwater Addendum. Our comments are specific to the water quality of Goosefare Brook, it's watershed and receiving tidal waters. We support listing the entire Goosefare Brook on the watch list. We also support the current work by Old Orchard Beach to identify the sources or contributing sources of waste in the Goosefare watershed and the Saco's grant application to fund further identification of upper Goosefare sources.

Please confirm you have received the attached letter via email and that it will be included in the report comments and response section.

Thank you for your service and dedication to protecting our environment.

Regards,

Mark Koenigs
OOB Conservation Commission Secretary
(207) 286-4929

Old Orchard Beach Conservation Commission
1 Portland Avenue
Old Orchard Beach, ME 04064

December 4, 2013

via E-mail

Maine Department of Environmental Protection,
State House Station #17,
Augusta, ME 04333
Attn: Ms. Melissa Evers, Environmental Specialist

Subject: Goosefare Brook, Old Orchard Beach, Maine Report No.: DEPLW-1254, August 2013

Re: Comments to the 2013 Freshwater Addendum to 2009 Maine Statewide Bacteria TMDL Report

Dear Ms. Evers,

The Old Orchard Beach Conservation Commission is very concerned about the pollution of the Goosefare Brook that has been documented by various testing reports including the most recently referenced 2013 Freshwater Addendum to 2009 Maine Statewide Bacteria Total Maximum Daily Loads (TMDL) Report. The pollution as evidenced by the high bacterial levels found in the upper and lower Goosefare freshwater along with that of the Ocean Park wetlands and marshes must be addressed and monitored for improvement. The past extreme high levels of bacteria counts measured by Maine Healthy Beaches documents the persistent contamination that makes the Goosefare Brook tidal waters unhealthy for human recreational contact during the peak summer season.

The Old Orchard Beach Conservation Commission strongly supports the listing of the Goosefare Brook to the Maine Statewide Bacteria TMDL Report. Our report comment/question which requires a thorough response is as follows: When and how will the State of Maine, the communities of Saco, and Old Orchard Beach work together to improve the water quality of the Goosefare Brook watershed by jointly implementing a strategic and systematic sampling and testing program to identify the sources of pollution, and then eliminate them through improvements and remediation projects? The 2009 TMDL Report has identified the impairment. In 2014, it is time to find the sources causing the impairment and immediately start to repair Goosefare Brook.

Sincerely,

Mark Koenigs

Mark Koenigs, Secretary
Old Orchard Beach Conservation Commission

cc: Larry Mead, OOB Town Manager
Jeffrey Hinderliter, Town Planner
OOB Conservation Commission Members

DEP Response:

Dear Mr. Koenig,

Thank you for your support of this TMDL and concern regarding bacterial pollution in Goosefare Brook. The answer to your question on partnerships, strategic planning and remediation projects is the watershed planning project that is currently underway on Goosefare. In 2014 the city of Saco received a DEP 319 NPS Grant to spearhead this effort and has begun the challenging work of identifying problems along and appropriate solutions. The monitoring and planning efforts associated with this grant project are designed to lead to improvements in the watershed.

Sincerely,

Melissa Evers
Environmental Specialist III
Maine Department of Environmental Protection

From: Christine Rinehart [christine.rinehart@wright-pierce.com]
Sent: Monday, December 09, 2013 12:13 PM
To: Evers, Melissa
Cc: Ryan Wingard
Subject: RE: Bacteria TMDL Addendum

Melissa,

Thank you for giving me the opportunity to provide comment on the Maine Statewide Bacteria TMDL: 2013 Freshwater Addendum.

1. Introduction: Why is it that Goosefare Brook is being included in this Addendum when it is only preliminarily listed on the Draft DEP's 2012 Integrated Water Quality Monitoring and Assessment Report, and the Report lists it with a TMDL priority of 2015.

2. Table 2 (page 4): For Class B and C streams, the standard lists "E. coli of human and domestic animal origin…" with a footnote of "this means that all E. coli of wildlife origin meet existing water quality standards". How does the state determine if water is meeting the standard, for instance, how does the State differentiate between human and domestic animal vs. wildlife E. coli?

3. Section Public Participation (page 5): What is the date the draft was made available to the public?

4. Bacteria TMDL Summary Goosefare Brook (Section 2.2): The TMDL acknowledges that there are high E. coli readings during wet weather flows. How was the fact that Site SGS01 (site used to calculate the reductions) is also immediately downstream of the Bear Brook tributary, which is the receiving water of one of Saco's combined sewer overflows (CSOs) taken into consideration?

5. Bacteria TMDL Summary Goosefare Brook: Table 2.1 2011 and 2012 sampling results. The May 10, 2012 data point is outside of the State's standard, which applies between May 15 and September 30. Why is data collected outside of this range used in calculating the geometric mean?

6. Bacteria TMDL Summary Goosefare Brook: Table 2.1 2011 and 2012 sampling results. All of the data readings are abnormally high as compared to other readings. Was any consideration given to possible causes for such a spike in the results (other than this was a wet weather event). Could there been an issue with the way the sample was collected? What type of quality control was used?

7. Bacteria TMDL Summary Goosefare Brook (Section 2.3): The recommendations state "a systematic investigation of contaminated sites will either reveal a direct human or domestic animal source that can be remediated or substantiate that bacterial contamination is solely from wildlife sources and natural processes". What happens if the bacterial contamination is solely from wildlife sources or it is found that certain sample locations have high readings associated with wildlife sources?

Thanks,

Christine

DEP Response:

Dear Ms. Rinehart,

Thank you for reviewing the Goosefare TMDL.

1. *DEP had been monitoring Goosefare in conjunction with a Maine Healthy Beaches project to look at problems that may influence local beaches. Therefore the data was available to complete the TMDL and the TMDL assessment could potentially aid pending watershed planning efforts. TMDL priority rankings in the 303 D List of DEP's Integrated Report are used for planning purposes and may change due to other considerations, like assisting with a 319 grant project.*
2. *DEP takes a conservative approach when applying bacterial standards to monitoring results. All results are considered of human or domestic origin unless there is significant information that indicates wildlife as the origin. Streams with forested watersheds generally meet standards; we generally observe exceedances in human altered landscapes.*
3. *The first draft was publically available on October 29, 2013.*
4. *This TMDL covers the Goosefare watershed upstream of the confluence with Bear Brook, SGS01is above the confluence with Bear Brook.*
5. *Thank you for this observation; I have altered Table 2.1 on page 19 to exclude the May 10th date and recalculated the TMDL on page 20. I have also changed the West Branch Sheepscot data and TMDL to exclude early dates in 2012. Bacteria data is collected for reasons beyond compliance monitoring for meeting water quality standards. Reasons include determining the extent of contamination or screening a site to determine if a problem exists and this data provides information, even outside of the prescribed dates.*
6. *The readings presented in Table 2.1 are considered normal for a developed watershed, such as Goosefare. The other two watersheds in this report are much more forested and the bacteria numbers often correspond to a development spectrum. Samples were analyzed according to quality protocols, using duplicates and blanks to corroborate results.*
7. *Sites where bacteria exceedances are attributed to wildlife will be designated as complying with Maine's water quality standards.*

Sincerely,

Melissa Evers
Environmental Specialist III
Maine Department of Environmental Protection
