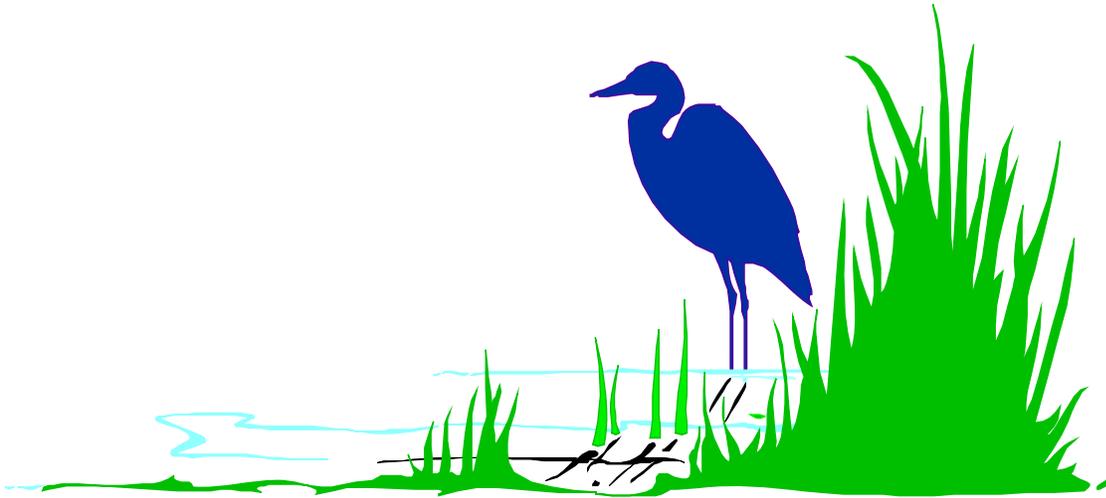


Fecal Coliform Monitoring in the Hoodspout Area 2003-2006



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Introduction:

The town of Hoodspport is a small, unincorporated community on Hood Canal. Many of the people living, working or vacationing in the Hoodspport area have been drawn there by the natural resources of Hood Canal. Shellfish is one of the natural resources the area possesses. Area beaches, both privately owned and accessed by the public, support abundant natural growth of shellfish. In addition, the harvesting of shellfish in this area is important to members of the Skokomish tribe for cultural, social and economic reasons.

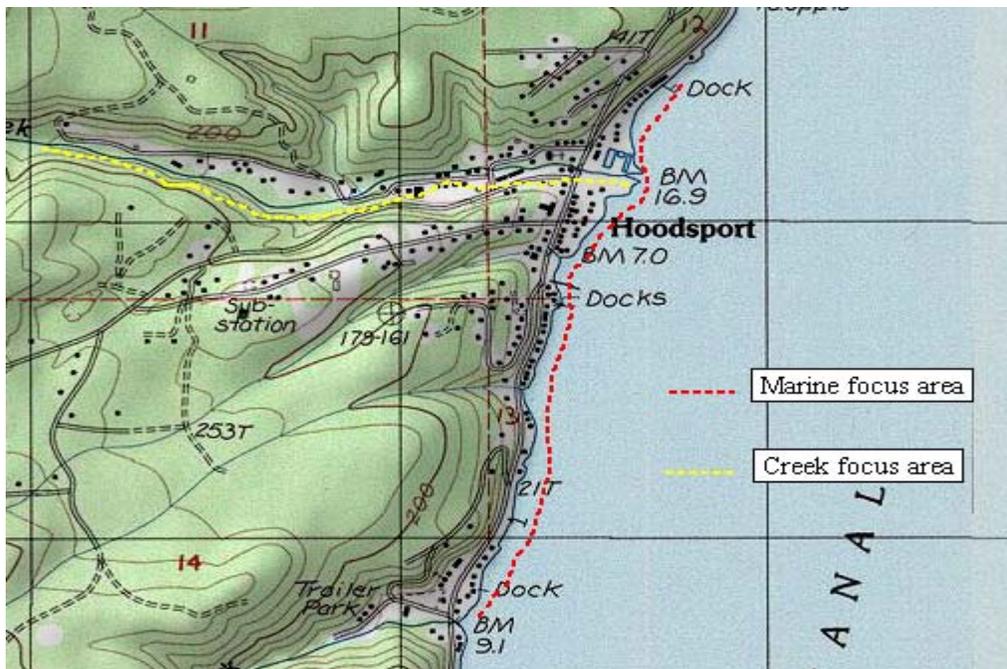
The marine shoreline along much of the Hoodspport area cannot be utilized for shellfishing. Washington State Department of Health Shellfish Program (DOH) closed the area in the early 1980's and it has remained closed since due to the dense development of the shoreline, small lot size and numerous suspect septic systems located near the shoreline (DOH Shoreline Survey of Hoodspport, 1997). All sewage in this area is treated by individual or small community septic systems, and stormwater runoff is culverted to the creek or marine waters.

Mason County government has sought to improve water quality in the area for many years. As a part of that effort the Mason County Water Quality Program conducted regular fecal coliform sampling of marine and fresh water in the Hoodspport area from 2003-2006. This report summarizes the sampling results in order to provide information about water quality conditions in the area.

Study Design:

The study had two focus areas. The first area was approximately 1.1 mile of marine shoreline along US Highway 101 between the 23400 block and the 24500 block. The second focus area was lower Finch Creek from the point at which it enters the residential area along Finch Creek Road to the mouth of the creek. See Figure 1.

Figure 1. Beach and Creek Focus Areas



The shoreline was investigated for sources of fecal coliform pollution. Four categories of marine pollution sources were investigated: residential, stormwater, commercial and Finch Creek sources. Culverted stormwater runoff, beach seeps, bulkhead seeps, and mouths of creeks were all potential sample sites. Finch Creek was segmented to investigate the culverts, major and minor, that discharge to the creek. Other sample points were added to monitor the effects of non-culverted runoff to the creek.

The stations were sampled approximately monthly for fecal coliform. No special storm event sampling was done. Random variations in weather conditions before sampling was desirable in order to avoid bias. To ensure that the weather conditions were randomized the sampling was scheduled ahead of time, without consulting weather forecasts. The tidal conditions also varied, but the tidal stage was usually low in order to maximize the amount of beach that could be monitored for seeps. No flow measurements were taken.

Methods:

The WRIA 16 Surface Water Quality Monitoring Strategy- Appendix A QAPP section 3.2 Field Procedures was followed when collecting samples. Fecal coliform bacteria was cultured and enumerated from the samples using a multiple tube fermentation method (Standard Methods for the Examination of Water and Wastewater, 20th Edition, Method 9221 E).

Results:

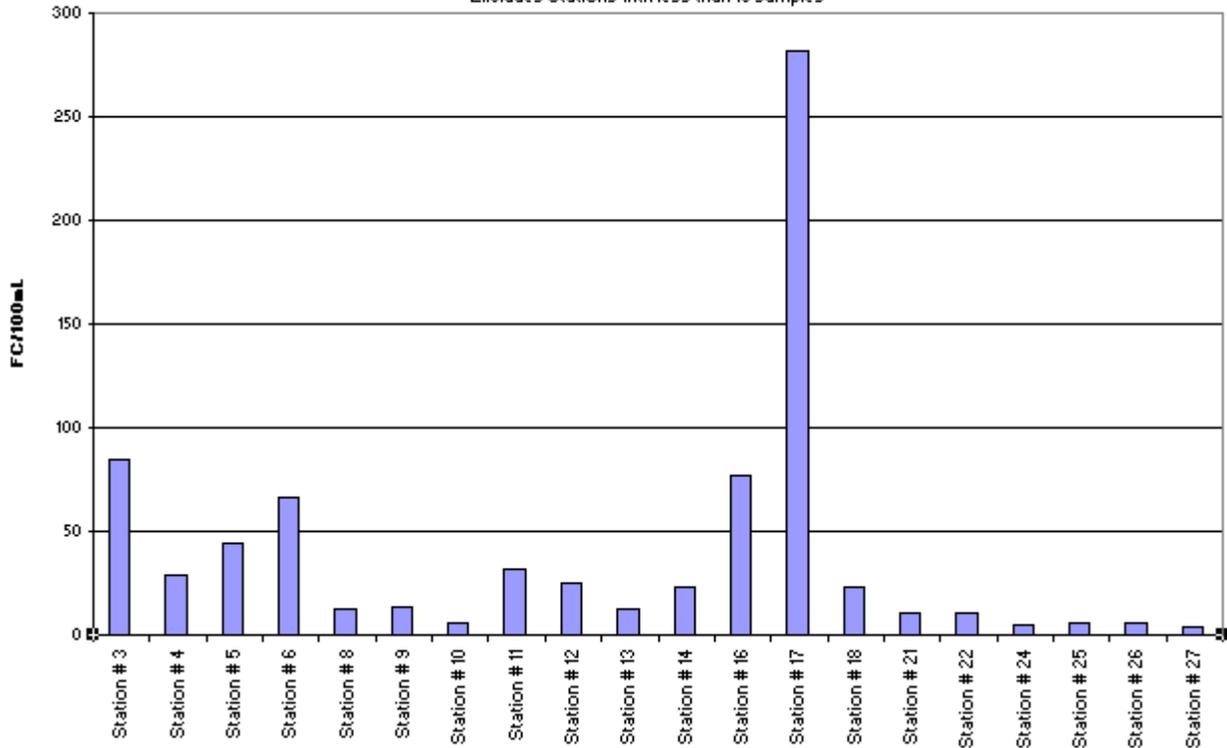
For each sample station the geometric mean, plus the individual results were evaluated to determine whether water quality met state standards. State standards are set in Water Quality Standard Chapter 173-201A WAC. For freshwater the geometric mean of fecal coliform organisms should be less than 50 FC/ 100 mL and no more than 10% of sample results can be over 100 FC/100 mL. See Table 1 and Appendix A for sample results. The stations with the worst water quality were stations 3, 6, 16 and 17. These stations failed to meet the standards for geometric mean as well as the 10% standard. Stations 3,4,5,6,8,9,11,12,13,14,16,17 and 18 failed to meet the standard of no more than 10% of sample results over 100 FC/100 mL. Stations 1, 2,7, 15, 20 and 23 were sampled less than 10 times. The scarcity of sample results from those stations indicates that they are only occasionally flowing. Their contributions to fecal coliform loading is probably limited, so in spite of some high sample results these stations were not evaluated.

Discussion:

In order to better understand sources of pollution, stations that exceed the fecal coliform standards were placed in one of four categories: residential; residential area stormwater; commercial area stormwater and Finch creek. Stations were assigned to one of these categories based on observation of likely sources of fecal coliform contamination.

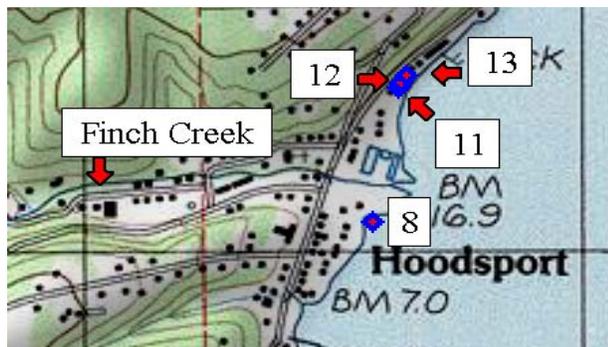
Table 1.
Geometric Means for Hoodspout Data

Excludes Stations with less than 10 samples



Stations 11,12, and 13 are residential source stations with poor water quality. Station 8 should probably also be included in this group, although it is located in a commercial area the primary influence on the sampling station are residential . See Figure 2.

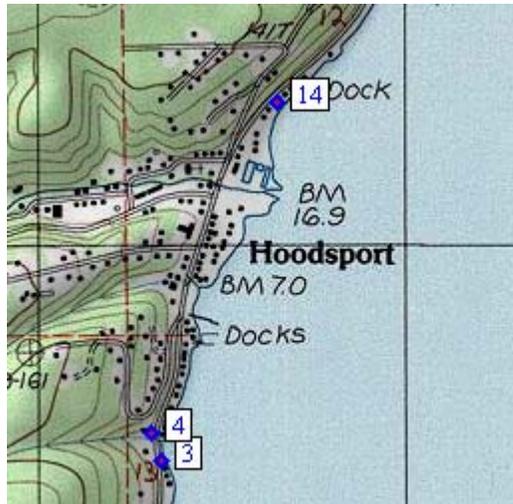
Figure 2. Residential Sources



The primary sources of fecal contaminants from these stations are likely to be residential septic, pet waste and wildlife waste from the area immediately surrounding the sample station.

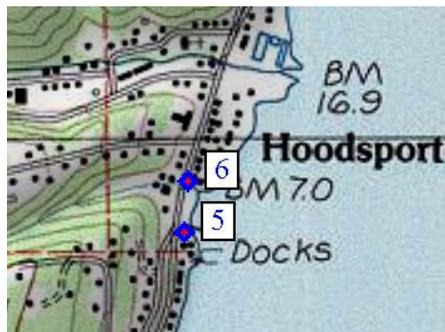
Stations 3, 4 and 14 are residential stormwater source stations with poor water quality. See Figure 3. The primary sources of fecal contaminants from these stations is likely to be pet waste and wildlife waste that has been flush into the stormwater drainage system from the surrounding area. Residential septic may also be a contribute.

Figure 3. Residential Stormwater Sources



Stations 5 and 6 are commercial stormwater source stations with poor water quality. See Figure 4. These stations drain to the beach from the commercial development on the shoreline just south of Lake Cushman Rd. Pet and wildlife waste would be likely sources of contamination draining to these stations. Commercial septic systems could also contribute. The lack of natural treatment due to large amounts of impervious surface may also add to the fecal coliform loading.

Figure 4. Commercial Stormwater Sources



Stations 9, 16, 17 and 18 are Finch creek stations with poor water quality. See Figure 5. Finch creek meets water quality standards in the residential area along much of Finch Creek Rd., but water quality degrades in the last couple hundred feet as the creek enters the mixed use commercial/residential area.

Figure 5. Finch Creek Sources

