

SAN PEDRO CREEK WATERSHED STUDY

BACKGROUND

Linda Mar Beach in Pacifica, California, is one of the most popular surfing beaches in the San Francisco Bay Area. Despite its recreational importance, the beach is consistently listed among the most polluted beaches in California due to elevated levels of fecal indicator bacteria that often exceed public health standards for safe swimming. San Pedro Creek, which drains into Linda Mar Beach, has been identified as a major pathway for fecal pollution to travel down to the beach and into the Pacific Ocean.

To address these ongoing water quality concerns, the Linda Mar Water Quality Coalition was formed as a collaborative effort among environmental organizations, watershed groups, and members of the local surfing community. The coalition includes the Surfrider San Mateo County Chapter and their Blue Water Task Force (BWTF) program, Salted Roots, the San Pedro Creek Watershed Coalition, Cultivar Foundation, and the Pedro Point Surf Club. The coalition's primary goals are to identify sources of bacterial contamination in the San Pedro Creek Watershed, increase public awareness, and generate scientific data that can support effective remediation strategies to restore clean water in the creek and at Linda Mar Beach.

METHODS

The Coalition sampled 4 sites in San Pedro Creek weekly since July 2024, and analyzed those samples for the fecal indicator bacteria (FIB) enterococcus and *E. coli* using IDXX Quanti-Tray technology. The BWTF tested the ocean water in front of the creek weekly for enterococcus only. All samples were processed at the BWTF lab in Princeton, California.

To determine the exact species contributing fecal pollution (human or animal waste) in the creek, PCR (polymerase chain reaction) assays were also performed at creek sites to measure species-specific genetic markers present in the gut of warm-blooded animals - specifically human, dogs, avian, horses and ruminants (deer).

Samples for PCR analysis were collected 8 times from July 2025 through May 2026 in both dry and wet weather from the four established creek sites plus a control site located further upstream in Pedro Valley Park.

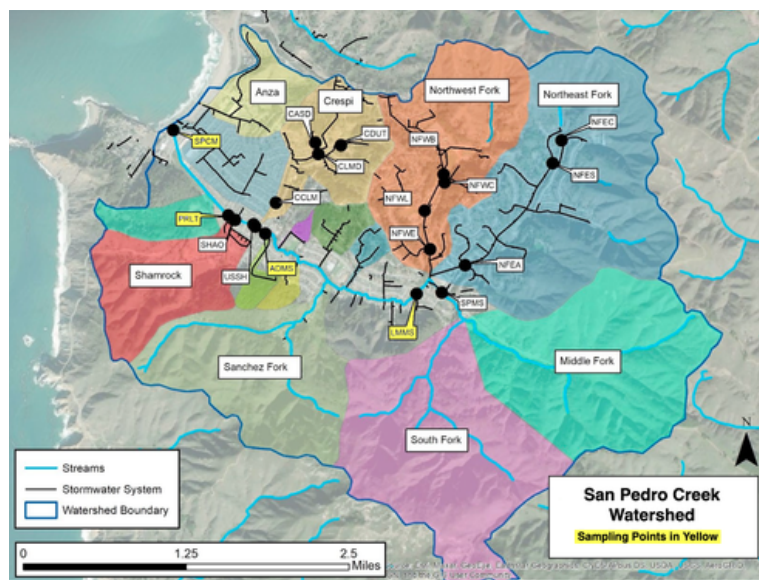


Figure 1. Map of the San Pedro Creek Watershed showing sampling locations (yellow points).

RESULTS

IDEXX Fecal Indicator Bacteria Testing

All creek sites showed consistent problems with fecal contamination with high bacteria rates in samples that exceed recreational health standards in 50% to 70% of samples collected. In 2025, Linda Mar Beach had a high bacteria rate of 72% and was featured on [Surfrider’s Beach Bacteria Hot Spot list](#). Measured bacteria levels were highest during winter rainstorms, although exceedances were also observed during dry summer periods as well. All results are available on [Surfrider’s BWTF website](#) and the [Coalition’s website](#).

PCR Source Tracking Results

40 samples were collected during 8 sampling events and 240 PCR assays were run. Samples were collected during dry weather in July, September, and May; and during wet weather from October through April. The results of the human fecal marker HF183 were the most significant of all markers measured showing consistently high levels greater than the human health risk threshold established by [Lowry et al., 2025](#), at the three sites closest to the beach (Figure 2).

The results from the horse marker were unreliable because they showed extremely high levels at the control site, upstream of potential sources. All other animal results were either below the detection limit of the test or were dwarfed by the magnitude of the human markers.

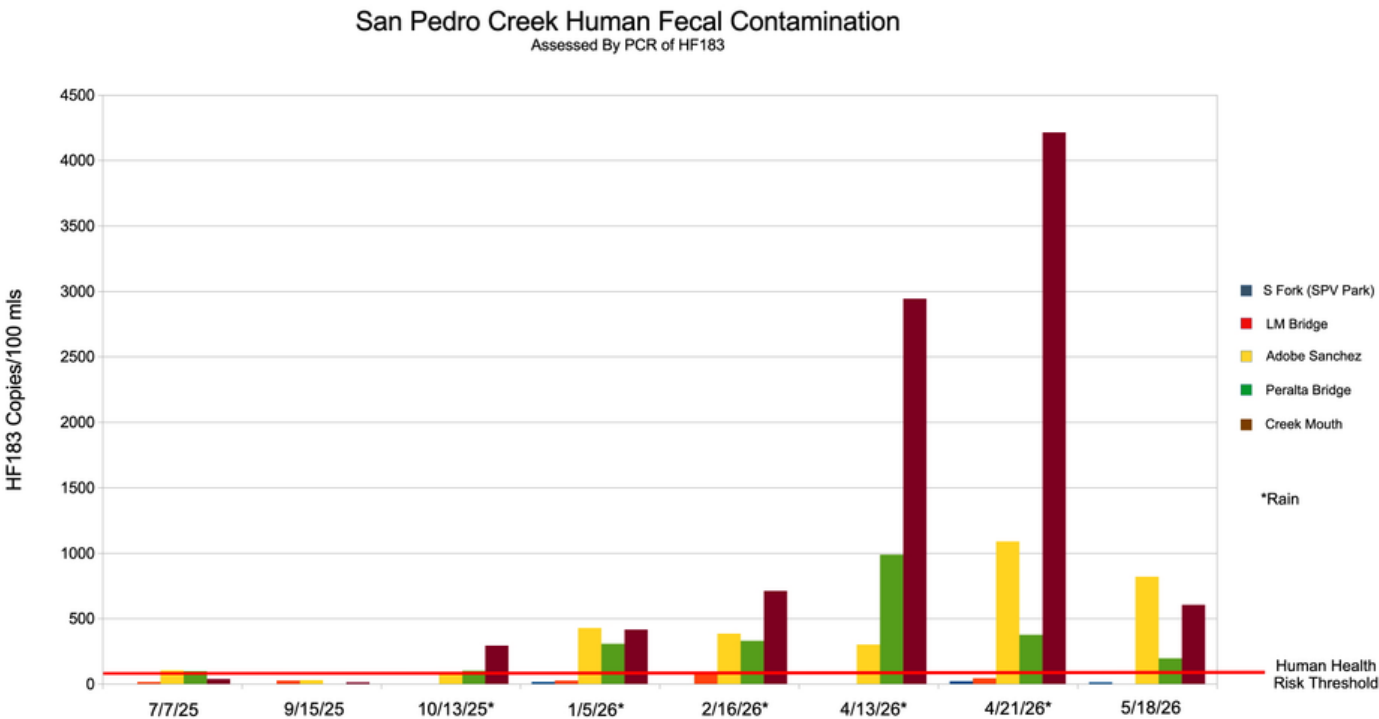


Figure 2. Human fecal contamination in San Pedro Creek, measured as HF183 marker concentrations (copies per 100 mL) at five sampling locations between July 2025 and May 2026. HF183 levels increased during spring 2026, with the highest concentrations observed at the creek mouth.

The highest HF183 levels were observed at the mouth of the creek, where concentrations reached 30 to 40 times the human health risk threshold. Elevated levels were also observed at Peralta Bridge and Adobe Sanchez, but not further upstream at Linda Mar Bridge or in the control site in Pedro Valley Park.

DISCUSSION

The spatial distribution of HF183 suggests higher levels of human-associated fecal contamination at downstream sites compared to upstream locations. The strongest signals occurred at the mouth of the creek and generally decreased moving upstream.

This pattern roughly corresponds with mapped areas of known sanitary sewer laterals built with Orangeburg pipes in the 1950s; however, additional targeted sampling at individual storm drain outfalls would be needed to confirm this relationship.

Elevated HF183 levels observed during late wet-season sampling may be influenced by environmental conditions such as groundwater saturation, which could increase infiltration and exfiltration from sewer systems into stormwater flows. Alternatively, lower creek flows during certain periods may reduce dilution of HF183 signals.

The levels of the human PCR marker did not correlate well with FIB levels measured in samples collected during the same sampling events. A similar pattern has been reported in the scientific literature. Our results indicate that while FIB exceedances are widespread, human-associated contamination, as indicated by HF183, is more spatially concentrated near the lower reaches of the creek.

Looking ahead, additional sampling is planned to better understand sources of contamination in the watershed. This includes targeted sampling at individual storm drain outfalls during the next rainy season, as well as sampling between storm events to better understand how HF183 levels respond to rainfall and changes in creek flow.



Volunteers collect and process water samples from San Pedro Creek and Linda Mar/Pacifica State Beach. Photo credit: Kathryn Wheeler

COMMUNITY OUTREACH AND EDUCATION

Outreach to surfers and beachgoers at Linda Mar Beach has occurred directly at the beach during events such as Earth Day Ecofest and other local surfing-related gatherings. The primary message shared with the public has been to avoid entering the water near the mouth of San Pedro Creek.

The coalition has also kept elected officials informed of monitoring results, including a presentation to the Pacifica City Council. Broader public awareness has been supported through coverage in Coastside News, local television news reports, and features in Surfrider Foundation national publications, including its annual Clean Water Report.



REFERENCES

Lowry, S. A., Steele, J. A., Griffith, J. F., Schiff, K. C., & Boehm, A. B. (2025). Simulated gastrointestinal risk from recreational exposure to Southern California stormwater and relationship to human-associated Bacteroidales marker HF183. Environmental Science: Processes & Impacts, 27(3), 718–728.

ACKNOWLEDGEMENTS

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LINDA MAR WATER QUALITY COALITION MEMBER ORGANIZATIONS

