PUBLIC EDUCATION & OUTREACH

BEHAVIOR CHANGE CAMPAIGN EVALUATION & REPORT

PET WASTE CAMPAIGN

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PUBLICATION INFORMATION

The Pet Waste Campaign final report can be on the City's webpage for the campaign.

Link: https://www.mercerisland.gov/parksrec/page/why-all-flags-pet-waste-campaign

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1.0   EXECUTIVE SUMMARY

The City of Mercer Island (City) launched the Pet Waste Campaign in the Spring of 2022. The purpose of the campaign was to educate residents about the harmful effects abandoned pet waste has on stormwater and receiving water. There were three sites of study for the campaign, SE 53rd open space, Wildwood, and the Sculpture Park. The sites span across the island and are frequently used by dog owners. Data for the campaign was collected by counting abandoned pet waste piles, before and after educational signs. The control data was collected at each site for three separate events. Flags were placed next to abandoned piles for easy identification. The purpose of the signs was to determine if the behavior of dog owners changed when flags and educational signs were placed at those locations. The measure of change could be noticed in the number of abandoned pet waste piles left at the sites. The target behavior for the Pet Waste campaign is to change the scooping behavior of dog owners through targeted education and outreach. The evaluation results indicate that there was change in behavior of dog owners after the signs and flags were posted, but as time when on, the change was not sustained. In the second phase of the Pet Waste Campaign which aimed to examine if changes were sustained a year later, the results indicated the behavior of dog owners did not change. Recommended changes for a more effective campaign include leaving signs and flags posted for a longer time as well as incorporating interactions with dog owners that frequent the locations.

2.0   BEHAVIOR CHANGE CAMPAIGN

The behavior change campaign was a two phased program to evaluate the change in dog owners' behavior on abandoned pet waste at various parks around Mercer Island.

2.1   Behavior Change Campaign Background

The behavior change campaign strategy developed by identifying pet waste as a stormwater pollutant the City considered to be of great concern in Lake Washington. Mercer Island has many steep slopes, parks, and impervious surfaces in which stormwater runoff drains from and into Lake Washington. The stormwater is untreated and with over 300 outfalls on the island, stormwater pollution is a great concern. The Pet Waste campaign was an approach to convey to residents and dog owners how contaminated stormwater drains directly to the shoreline untreated, which can present negative environmental impacts. By developing the behavior change campaign to target dog owners, the changes in behavior could reduce the amount of nutrients from abandoned pet waste from washing into Lake Washington.

City staff in the Natural Resources and Stormwater departments coordinated to develop and implement the pet waste campaign. Maintenance staff from both departments observed parks on the island with high traffic of dog owners. Through those observations, three sites were selected for the campaign. The first site was Sculpture Park located in the Town Center with many commercial and residential properties. The Town Center has the highest concentration of housing and shops on the island, which results with high foot traffic at the park. SE 53rd Open Space was the second location chosen as an area of study. This site is an open space area with many trails frequented by pet-owners. Wildwood Park, an off-leash area, was the third location heavily used by pet- owners.

The campaign was developed into two phases. The first phase consisted of counting pet waste before and after flags and educational signs were placed at the three locations. The second phase, which consisted of counting abandoned pet waste took place a year later to determine if behavior change was sustained. Community-Based Social Marketing was conducted by creating a webpage on the City's website to provide context for the behavior change campaign as well as resources for dog owners. Throughout the campaign the City used their Instagram page to provide updates to residents and dog owners.
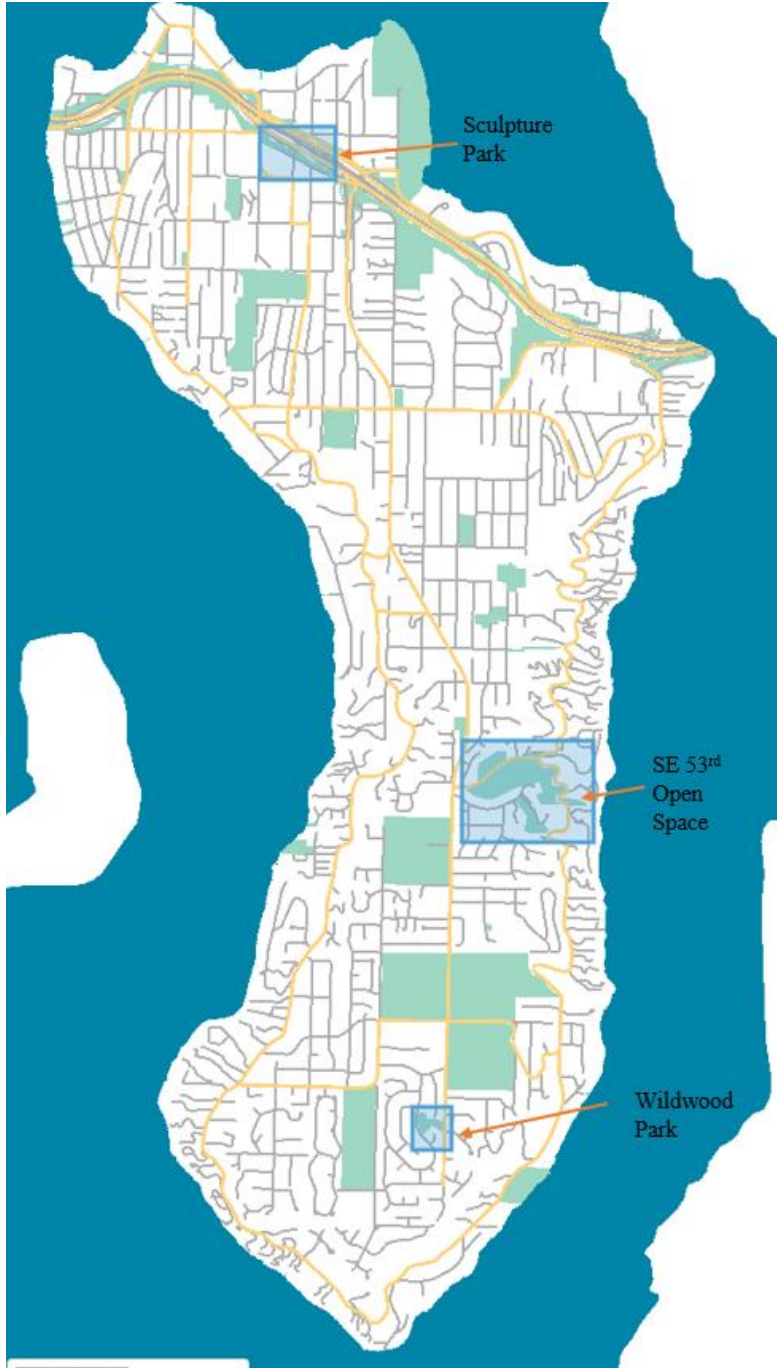
FIGURE 2-1 AREA(S) WHERE THE CAMPAIGN WAS IMPLEMENTED

2.2   Target Audience

The Pet Waste Campaign was designed to target dog owners that live on Mercer Island. There are 2,152 licensed dogs within Mercer Island Lake Washington watershed. Research has shown that between 17% and 40% of dog owners do not pick up after their dogs on every walk [1,2,3]. Mercer Island Lake Washington watershed, this results in an estimated 850 to 2,190 pounds of uncollected dog waste daily on

Mercer Island. Dog waste contains nutrients such as nitrogen and phosphorus[4] which can enter receiving waterbodies and feed the growth of aquatic plants. When aquatic plants decay, oxygen is used up, limiting a valuable resource fish and other aquatic life need to survive. E. coli, Giardia, and worms can all be found in dog waste and when not disposed of, can be transmitted to people and pets[5,6].

2.3   Behavior Change Campaign Strategy

The Pet Waste behavior change campaign was launched to address these concerns. The focus of this campaign was to conduct a public outreach campaign paired with a behavior change program to address the impacts of dog waste on water quality. The strategy to implement the campaign initially began with choosing sites frequented by dog owners to reach our target audience. A control sample count was taken to provide baseline data before educational material was made available. Once control data was collected, behavior change campaign materials were made available. Material came in the form of flyers, social media posts (Instagram), and City's website to provide educational and best practices for dog owners on the island. The campaign investigated the impacts of the pet waste outreach campaign of the behavior of dog owners.

3.0   EVALUATION PLAN OVERVIEW

This section focuses on the evaluation that was conducted to measure changes in understanding and adoption of the targeted behaviors.

3.1   Evaluation Goals and Description

The goals of the Pet Waste campaign were to conduct a target education and outreach campaign to change dog owners' waste scooping behavior and evaluate if efforts led to measurable changes and impact of pet waste bacteria on water quality. The campaign was conducted in two phases, the first to establish campaign and behavior change study with the three objectives below, and the second phase to determine if behavior change was sustained one year later. The targeted behavior of the study was to educate dog owners of the impacts of pet waste on stormwater and the environment and thus lead to the decrease of abandoned pet waste at the three sites of study.

This campaign was divided into three objectives:

Objective 1. Bacteria Sampling and Microbial Source: Tracing by conducting water quality sampling at the three sites of focus to analyze for fecal coliform and E. coli. Water samples were collected once from a creek at Wildwood Park, a catch basin at the Sculpture Park, and a creek by the trail in SE 53rd Open Space before and after the outreach campaign. Samples were promptly delivered to AmTest in Kirkland, WA.
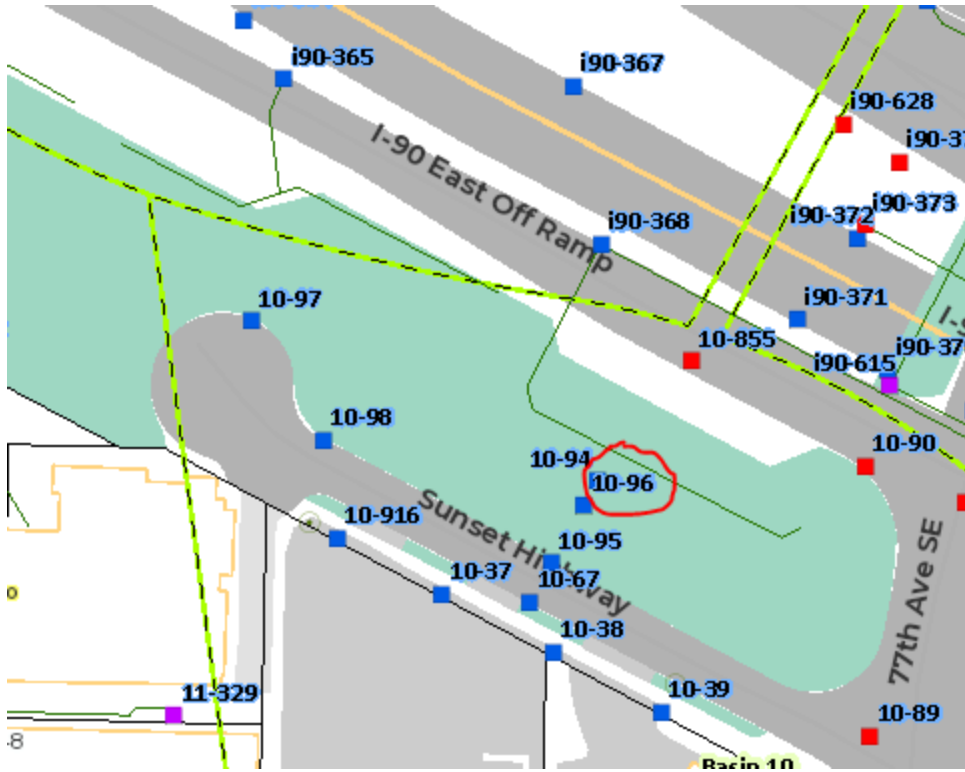
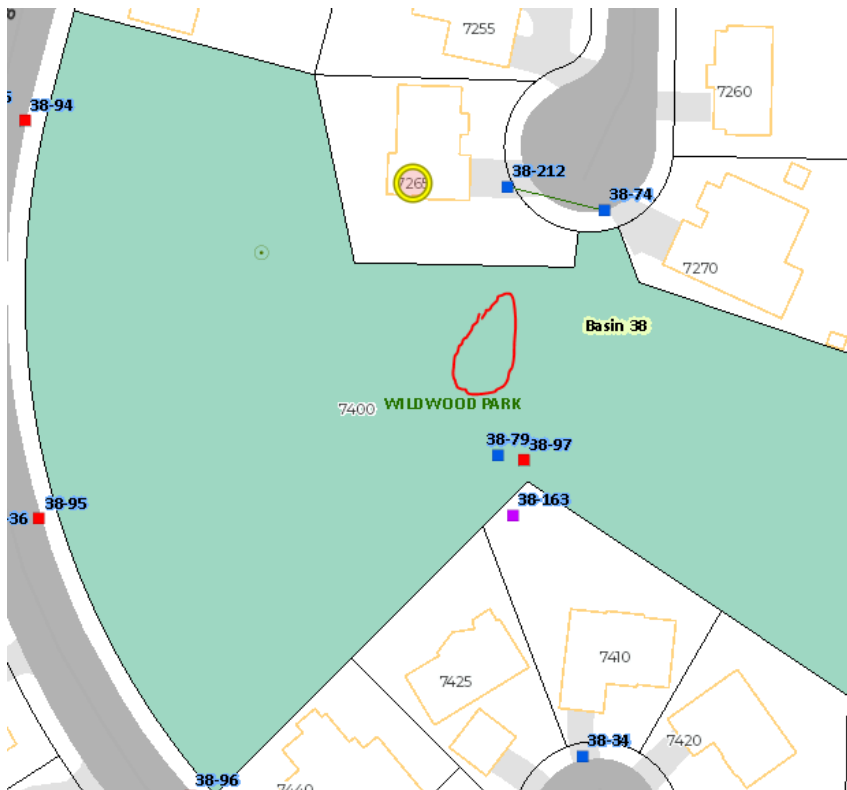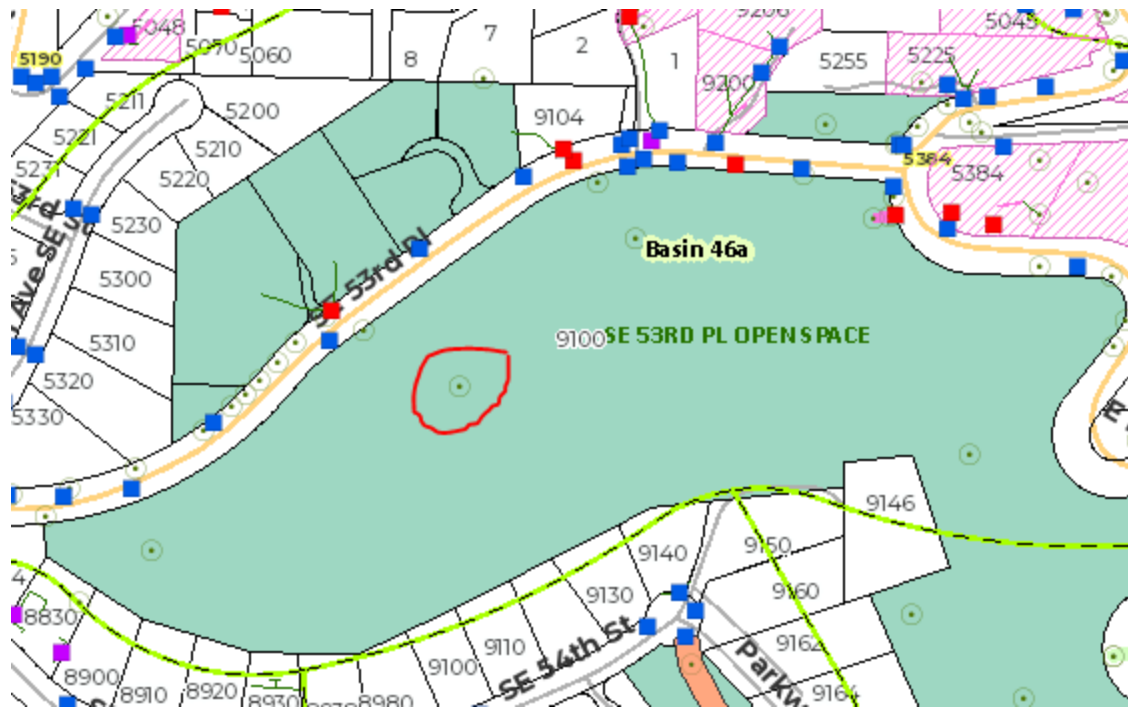**FIGURE 3-1: SCULPTURE PARK SAMPLING LOCATION**

FIGURE 3-1.2: WILDWOOD PARK SAMPLING LOCATION

FIGURE 3-1.3: SE 53rd OPEN SPACE SAMPLING LOCATION

Objective 2. Abandoned Dog waste Frequency Monitoring: Count the number of abandoned pet waste piles before, during, and after outreach efforts to determine effectiveness of education and outreach efforts of dog owners' behavior. Abandoned pet waste monitoring was conducted for three weeks prior to flagging and education & outreach efforts. Monitoring continued for 3 weeks after the campaign to determine the effectiveness of efforts. In Wildwood park, due to heavily wooded sections, only the grassy, open field was monitored. The trial of SE 53rd Open Space was monitored, as well as the entire Sculpture Park.

Objective 3. Education and Outreach: Conduct targeted education and outreach campaign was conducted over a three-month period. Campaign outreach efforts included marking abandoned pet piles with bright flags and descriptive signage, webpage, social media engagement, press/media coverage and city outreach booths.

Flagging:

The main component of the education and outreach phase consisted of placing bright orange survey flags at each park of abandoned dog waste as well as informative signage explaining the presence of the flags. The purpose of flagging was to provide a visual representation of the amount of abandoned pet waste and raise awareness about the cumulative impact the waste can have on the environment. Flags were left in place for three weeks for maximum visibility in the target audience. Flags were removed after the three-week period and pet waste monitoring continued afterwards for another three weeks to observe sustained changes in dog owners' behavior.

Social Media & Press Coverage:

Throughout the outreach period social media posts were published through the City of Mercer Island Instagram account. Mercer Island Reporter reported on the Pet Waste Campaign furthering outreach.

<u>*Booth Outreach:*</u>

At the annual Summer Celebration event on Mercer Island, the City hosted a booth with maps and informational flyers on the behavior change campaign. A "poop" toss game for youth was hosted at the booth for educational and outreach purposes.

4.0   EVALUATION METHODS

Data collection for the Pet Waste campaign consisted of water quality sampling prior to outreach efforts and counting abandoned pet waste at the three areas of study pre-, during, and post outreach efforts for Phase1. The second phase of the campaign consisted of determining if behavior change of dog owners were sustained a year later by counting abandoned pet waste. In this section, the data and methods will be examined to evaluate changes in the target audiences understanding and adoption of the target behavior of dog owners.

4.1   Data Overview

Phase 1

<u>*Objective 1: Bacteria Sampling and Microbial Source Tracing:*</u>

During water quality sampling, two sets of samples were collected from each of the sites of study. The first set, fecal strep was not detected, but there was a large number of Enterococci, which is the first step in confirming for Fecal Strep. After further analysis, fecal strep was not detected in the samples as was noted by AmTest staff. Water sampling was only conducted prior to outreach due to lack of flow and water sources at the sampling sites post-campaign.

TABLE 4-1 BACTERIA MONITORING: SCULPTURE PARK

Parameter	Result	Units
Total Coliform	170000	CFU/100 ml
Escherichia coli	<1000	CFU/100 ml

TABLE 4-2 BACTERIA MONITORING: WILDWOOD PARK

| Parameter	Result	Units
Total Coliform	8000	CFU/100 ml
Escherichia coli	60	CFU/100 ml

TABLE 4-3 BACTERIA MONITORING: SE 53RD OPEN SPACE

Parameter	Result	Units
Total Coliform	8000	CFU/100 ml
Escherichia coli	60	CFU/100 ml

Objective 2: Abandoned Dog waste Frequency Monitoring:

Prior to the outreach component of the campaign, the frequency of abandoned dog waste averaged 14 abandoned dog waste piles per week across the three study areas. The total number of abandoned dog waste piles observed at each park was 87 at Sculpture Park, 15 at SE 53rd Open Space, and 27 at Wildwood Park during the three-week pre-outreach monitoring period. All three areas had a decline in the number of abandoned dog waste piles during and after the outreach campaign. The table below shows the average number of abandoned dog waste piles before and after the outreach campaign.

TABLE 4-4: ABANDONED DOG WASTE MONITORING

Location	Before	After
Sculpture Park	29	18
Wildwood Park	5	3
SE 53rd Open Space	9	3
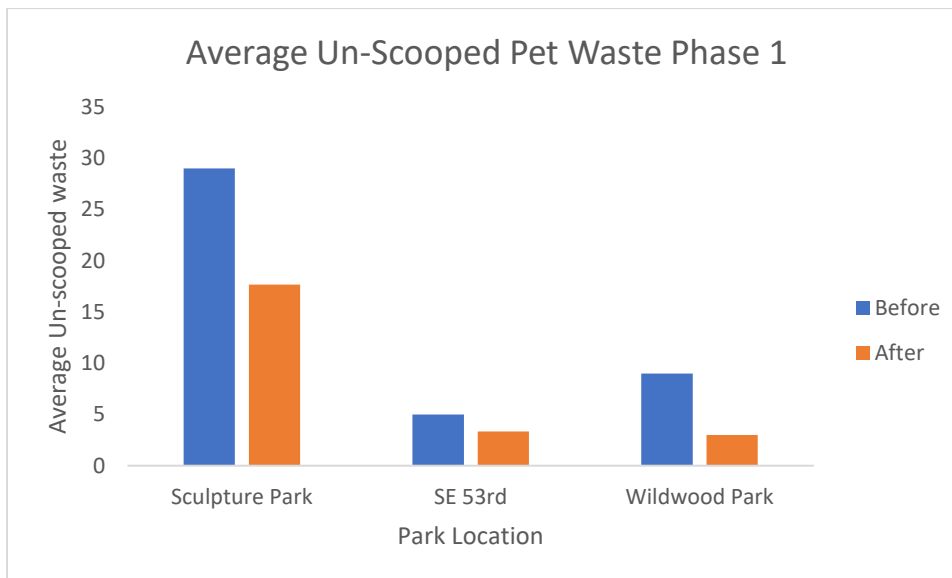
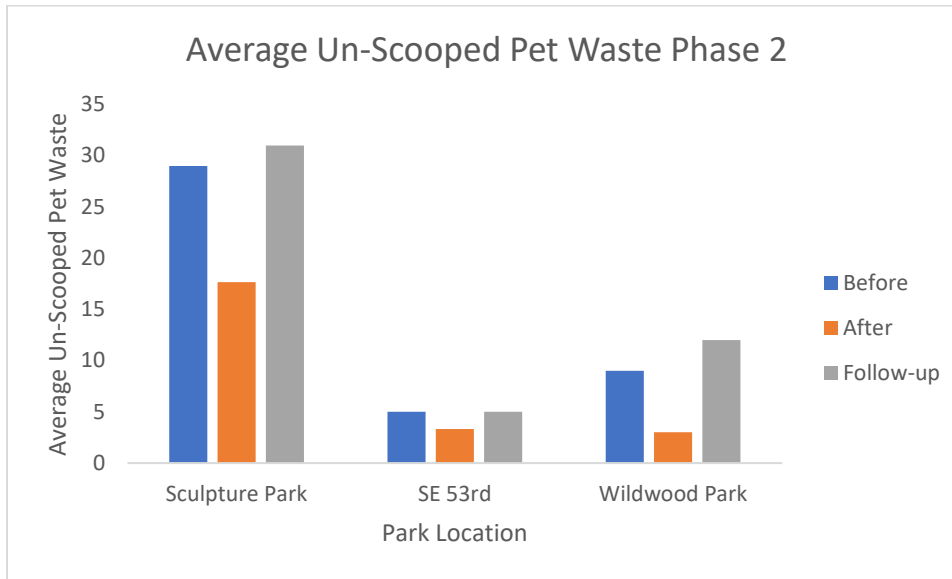**FIGURE 4.1: PHASE 1 AVERAGE UN-SCOOPED DOG WASTE PILES**

Phase 2:

For Phase 2 frequency monitoring, the average number of observed dog waste piles for the three sites was 16. The purpose of Phase 2 is to determine if behavior change of dog owners was sustained one year after education and outreach campaign. In Table 4-5, the data shows the average number of abandoned piles of dog waste at each study area.

TABLE 4-5: PHASE 2 ABANDONED DOG WASTE MONITORING

Location	Follow-up
Sculpture Park	31
Wildwood Park	5
SE 53rd Open Space	16

FIGURE 4.1: PHASE 2 AVERAGE UN-SCOOPED DOG WASTE PILES

Objective 3: Education and Outreach

Across the three-study area, over 107 brightly colored flags were placed next to abandoned dog waste piles. The flags served to initiate discussion and reaction with the target audience and residents on the Island as noted through staff interaction with those groups. The flags were very effective due to their high visibility.

4.2 Data Analysis and Hypothesis Testing

The data, when first collected was organized in an excel spreadsheet pre-, during, and post outreach campaign efforts. Excel was utilized for analyzing data for the dog waste frequency monitoring by using tables, formulas, and statistical analysis. Common analysis methods used were equations for sum, average, and percentage to compare data sets.

To determine if the target audiences' behavior change was due to the Pet Waste education and outreach campaign, a statistical analysis was used. Based on the data collected, a one-way ANOVA was used to investigate if outreach efforts had a measurable effect of the behavior of the target audience. The target behavior for the Pet Waste campaign is to change the scooping behavior of dog owners through targeted education and outreach. The null hypothesis for this campaign is that the educational and

outreach efforts promoting the scooping of dog waste will not change the behavior of dog owners. The alternative hypothesis is that the educational and outreach efforts promoting dog waste pick up will result in waste pick up by dog owners. After conducting the ANOVA analysis using data from Table 4-4, the p-value from the data collected was 0.68. The p-value represents the probability and measures how likely that any observed difference between groups is due to chance[7]. Since the p-value is greater than 0.05, there is no statistical significance, and the null hypothesis cannot be rejected.

For the hypothesis test of Phase 2 of the Pet Waste campaign, the one-way ANOVA was used to determine if the behavior of dog owners sustained a year after educational and outreach efforts. The null hypothesis for the data in Table 4-5, is that the behavior of dog owners will not be sustained a year after outreach efforts. The alternative hypothesis is that the behavior of dog owners will be sustained a year after outreach efforts. The p-value for the data set was 0.74, which means there is no statistical significance that the outreach efforts had an impact on the behavior of dog owners, and the null hypothesis cannot be rejected.

5.0 RESULTS & DISCUSSION

The results of the analysis show that there was some change in the behavior of dog owners when it came to picking up dog waste in the three areas of study. The data shows that the educational and outreach component of the campaign was statistically significant to impact change of behavior of the target audience. There was a noticeable 57% reduction of abandoned dog waste piles because of education and outreach efforts. This change lasted for three weeks, and a year later there was an increase of 50% in dog waste piles, resulting in a net change of 7% decrease of abandoned dog waste of the two phases of the campaign.

5.1 Changes to Understanding and Adoption of Target Behavior

The target audience adopted the target behavior for a brief period. In Phase 1, prior to outreach and education efforts, abandoned pet waste at the Sculpture Park, Wildwood, and SE 53rd Open space there was an average of 14 dog waste piles left un-scooped. After the outreach and education efforts, the average amount of abandoned dog waste decreased to 8 piles across all three sites. That is a 57% decrease of abandoned pet waste within the three-week outreach period. Through statistical and hypothesis testing, it was determined that the outreach and educational campaign efforts were not statistically significant in the change of the behavior of dog owners. In Phase 2 the average number of abandoned dog waste piles at the three areas of study was 16, one year after outreach efforts. This is a 50% increase of un-scooped dog waste piles compared to the previous year of an average of 8 waste piles. The data for Phase 2 was also not statistically significant to reject the null hypothesis of the outreach and education campaign efforts will not result in sustained target behavior. Based on the data from Phase 1 and Phase 2 of the Pet Waste campaign the target audiences' understanding of the target behavior increased a bit but change in behavior was not sustained.

5.2 Challenges Identified During the Evaluation

In order to increase the effectiveness of the behavior change campaign, it is important to reflect on the observations, data, and statistical analysis to overcome challenges that may have impacted target behavior. In Table 5-2, challenges from the Pet Waste campaign have been identified, along with mitigation measures that can be taken in the future to reduce the impact of these challenges.

TABLE 5-1: CHALLENGES AND MITIGATION APPROACH

CHALLENGES	MITIGATION APPROACH
Difficulty with sampling in dry season	Explore other sampling techniques, such as sapling by basin or outfall within area of study.
Change in behavior sustain for short duration	Increase outreach and educational efforts as well as duration
Lack of input/ engagement from target audience	Conduct surveys pre, during, and post campaign

6.0   FUTURE ACTION RECOMMENDATIONS

A variety of factors made it difficult to create a lasting impact of target behavior of dog owners on Mercer Island. The data showed that there aren't statistically significant links between the Pet Waste campaign education and outreach and behavior change of target audience. Lessons learned in this campaign include extending duration of educational and outreach efforts, effective sampling strategies such as sampling during rain event, and increasing postage of campaign media, whether in person or over social media.

Future recommendations for more effective campaign implementation:

- Increase education and outreach material to target audience.
- Further demographic reach by translating educational outreach materials.
- Increase campaign participation through engagement (online or in-person surveys)
- Improve campaign efforts by increasing duration of study from weeks to months to increase lasting behavior change.
- Conduct a literature study to identify recommendations and strategies to achieve the recommendations.

Strategies and process to implement changes to the campaign to be more effective.

- o There was only a small measurable difference between the pre and post data that indicated a change in the target audiences understanding and adoption of targeted behaviors. The strategy will be re-evaluated through pilot testing and revised based on the results.
- o There were limited avenues for response from the community. For future evaluations, the Permittee will strive to increase avenues for interaction and response from the community by hosting focus groups to identify alternative methods for interactions.
- o Revise behavior change campaign material to increase effectiveness of campaign, through clear explanations, diagrams, and providing resources.

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