

Birch Bay Characterization & Watershed Planning Pilot – Taking Action Final Report

Federal Grant #: PO-00J083-01 Project Period: 7/10/15 to 6/30/15

Lead Organization: Whatcom Conservation District

Collaborating Organization: Whatcom County Public Works

Program Summary:

The Birch Bay area was the subject of an innovative pilot study where local, state, and federal agencies collaborated to create a comprehensive set of watershed management recommendations using integrated watershed characterization tools and techniques. The Birch Bay Characterization and Watershed Planning Pilot – Taking Action, was intended to implement recommendations specific to select rural and urban subbasins to improve hydrological, denitrification and pathogen removal processes that support the full spectrum of valued activities in Terrell Creek and Birch Bay including swimming, shellfish harvesting and a healthy fish population. In order to accomplish this goal, a coordinated education and outreach program, identifying target audiences, behaviors and pathogen reduction practices needed to be established and programmatic structure developed.

To create and implement an effective landowner education and outreach program, intensive social marketing research was conducted to align the programmatic goals with the social structure of target watershed. Following tested models, the communication efforts were unified under an existing community-based watershed group, called the Chums of Terrell Creek (herein referred to as “Chums”). A local resident serving as the trusted messenger of information under the direction from an Advisory Board of local stakeholders led this effort.

With the guidance of the advisory board, goals and program focus were developed in accordance with the social marketing research and needs of the community. The direction of the program was the adoption of good stewardship practices and restoration projects by residents, farmers and commercial businesses in the upper Terrell Creek watershed.

Outreach Plan was built following these core values:

- Favor non-regulatory strategies
- Be landowner driven
- Be community based
- Identify supportive common values
- Create a sense of ownership
- Provide technical and financial support

Three target audiences were identified:

- Properties with an Onsite Sewage System (OSS)
- Properties with Livestock and Crops
- Properties proximate to Water Courses and Wetlands

Watershed residents were then delivered a diverse set of outreach materials and offered activities to impart a greater appreciation for the potential impacts of their individual actions that either improve or degrade their marine and freshwater ecosystems. This community based approach also offered free technical assistance, project design, mentorship by Chums staff and financial assistance covering 100% of project costs up to \$5,000 for Farm BMPs and Riparian Restoration Projects. On-site sewage system maintenance, repair and replacement was covered up to \$10,000 to ensure failing systems were improved.

Farm BMPs encouraged through the program included:

- exclusion fencing
- heavy use or sacrifice areas
- pasture management
- access control
- gutters and stormwater management
- manure storage facilities

Riparian and In-stream projects included:

- Spawning gravel placement
- native plant establishment
- large woody debris installation
- culvert replacement or repair

In addition to this rural effort, the Birch Bay Watershed and Aquatic Resources Management (BBWARM) District developed a stormwater master plan to serve as a prototype for analysis and planning of the remaining subwatersheds within Birch Bay’s urban Growth Area (UGA). Additionally, BBWARM designed and constructed a stormwater capital improvement projects in Cottonwood area of Birch Bay. These combine efforts have led to increased community connection to the watershed, improved water quality in Birch Bay and Terrell Creek and unified efforts amongst agencies working within the watershed. Specific outcomes by task are outlined below.

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Program Outcomes

(detailed report of expectations and outcomes found in Appendix A)

Task 1: Rural Initiative (Terrell Creek Subbasin)

R-1 Develop landowner education/outreach program:

An eight member advisory board was formed of local stakeholders including the Whatcom Conservation District (WCD), Birch Bay Aquatics Resource Management (BBWARM), Birch Bay Shellfish Protection District (BBSPD), Nooksack Salmon Enhancement Association (NSEA), British Petroleum (BP) and Terrell Creek area landowners to ensure a successful program, rooted in community need. Additionally, an experienced and knowledgeable resident advisor was hired and trained to represent the initiative and guide its successful roll out. To amplify efforts in the watershed a social marketing consultant was hired, rigorous behavioral survey was administered and social marketing plan developed.

R-2 Implement program of education, outreach and project development:

Outreach materials, Best Management Practice (BMP) fact sheets and the Terrell Creek Landowner Incentive Program was developed. The organization of these efforts were housed under The Chums of Terrell Creek with the hired trusted advisor as the lead communicator. While the social marketing plan identified newsletters and postcards as the primary means for nurturing pro-conservation behavior, this means of communication did not produce immediate results. After re-addressing the communication approach, the advisory committee recommended building a community that is supportive of the efforts for sustainability and normalizing conservation practices to encourage adoption of BMPs. One-on-one site visits, workshops, events and work parties were created to raise awareness and involve the community in the program, this resulted in enhanced adoption of conservation practices and behaviors.

Water Quality Best Management Practices for Water Quality Improvement:

(summarized in Appendix B)

- 44 landowners took action to improve water quality on their property
- 23 Farms assessed, 34 BMPs installed
- 1,792 acres of farm land assessed for resource concerns
- 31 acres of pasture management on 8 farms
- 5,729 feet of fencing established to exclude animals from critical areas
- 4 heavy use areas built
- 5 manure storage facilities installed
- 5 Septic Systems repaired or replaced

Outreach for Community Engagement and Program Enhancement:

(summarized in Appendix C)

- ~120 landowners reached through 11 water quality and farm planning workshops
- ~500 local residents participated in two Run with the Chums 5k Fun Run/Walk events, a family-friendly day to promote watershed awareness and how individuals can make improvements at home and beyond
- ~1,200 volunteers participated in ten habitat improvement work parties
- ~416 personal farm/home visits by the watershed steward promoting conservation action
- 7 Terrell Creek Watershed Stewardship signs installed on properties

R-3 Implementation of Riparian BMP projects and WQ monitoring

Riparian habitat improvement is vital for the Terrell Creek watershed. Two native salmon species historically relied on the Terrell Creek drainage for spawning and rearing. Many fish passage barriers were identified and prioritized prior to this project and with the assistance of willing landowners and engaged community volunteers 73 acres of habitat and 15 miles of stream bank were improved through this effort.

Riparian Habitat Best Management Practices:

(summarized in Appendix B)

- 27 riparian projects established
- 48,420 feet of riparian area protected
- 22,000 native plants established
- 14 large woody debris structures installed
- 6 fish barriers replaced
- 2012 Lake Terrell Dam was made fish passible

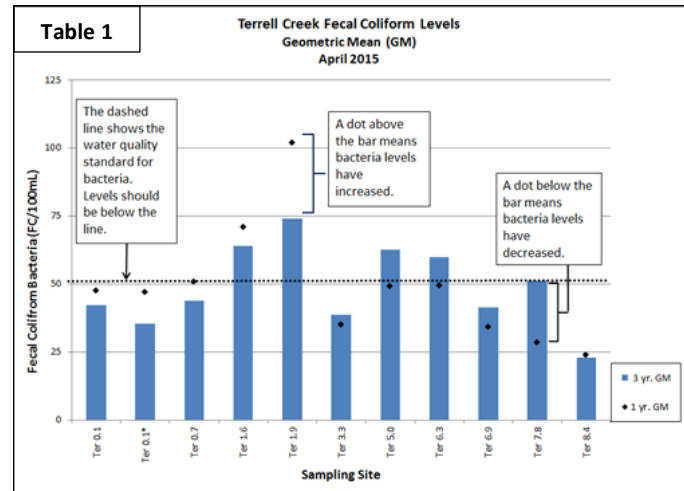
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R-4 Post-project evaluation:

A three-tiered evaluation methodology was used to assess the projects effectiveness in implementing water quality and habitat restoration projects and nurturing conservation behaviors in the Terrell Creek/Birch Bay area. Water quality changes overtime, an outreach evaluation survey and a case study analysis of participating landowners were used to determine the effectiveness of the program, and direction for the future.

Water Quality Changes over time:

Since the start of the program Birch Bay has seen dramatic improvements in water quality. The bay now has low bacteria levels well within state marine water quality standards. (See Table A) Comparing the one year and three year geometric mean (average bacteria level) at each monitoring site is one way to evaluate if water quality is improving or declining at that location. In addition, the State Department of Health is considering lifting a shellfish harvest closure area around the mouth of Terrell Creek due to improving water quality. But sections of Terrell Creek still have elevated bacteria levels, so continued efforts by watershed residents and on-going support by partner agencies to protect water quality essential.



Outreach Evaluation Survey: (See appendix D summary of findings)

A robust landowner survey was a mail survey to the 600 rural Terrell Creek residents who have received outreach materials during the project. The survey was developed by creating questions that fit within the theory of planned behavior, adoption diffusion theory and key demographic questions. There was a 10% response rate, 62 completed surveys. While this program evaluation is not statically representative of the entire watershed it does provides insight and assessment of outreach messages and messengers.

The results show that respondents:

- Have an increase in knowledge and importance of water quality over the project period
- Recognize that farm BMP's are the best way to improve water quality
- Recognize project partners as trusted sources of water quality information
- Are motivated to participate in water quality improvement projects

Case Study Review: (See appendix E for full report)

Five participating landowners were interviewed post program to understand the complex process of people's changes in behaviors and the choices that underlie them. Some themes occurred across these cases. These include the lack of difficulty for the landowner due to WCD's free, tailored, efficient and friendly services. The perception of WCD as highly competent also mattered. Another commonality are underlying high value placed on the rural natural environment as part of a larger common good that participants feel good about contributing to. For all, self-benefiting motivations were strong: either aesthetics, solving land management or improved animal husbandry.

R-5 Presentation of results and final report:

Results and successes associated with this project were presented to the Terrell Creek Advisory Committee, Birch Bay Water and Aquatic Resource Management (BBWARM) District Advisory Board, Birch Bay Shellfish Advisory Committee, and the general public through a variety of ways. A comprehensive Terrell Creek State of the Watershed report was drafted and distributed to all residents of Birch Bay and Terrell Creek. A site tour and lunch presentation, hosted by the Chums of Terrell Creek, invited local representative, concerned citizens and local land owners to celebrate the efforts over the last five years. The website www.chumsofterrellcreek.org has project reports, success stories and on-going efforts in the area to ensure lasting impact in the watershed. More outlets for presentation and reporting are continuing beyond the granting period.

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Task 2: Urban Stormwater Subwatershed Master Plan

The Birch Bay Watershed and Aquatic Resources Management District (BBWARM) completed task 2 through an interlocal agreement between the Whatcom County Flood Control Zone District (BBWARM is a sub-zone of the Flood Control Zone District) and the Whatcom Conservation District. Task 2 included two primary deliverables: an urban stormwater subwatershed master plan and design and construction of a stormwater capital project. Work on the subwatershed master plan began in early 2011 with the selection of a consultant to complete the Birch Bay Central North Subwatershed Master Plan and associated policy memo. A preliminary design for the Cottonwood Neighborhood Drainage Improvements Project was completed in 2010. The final design was completed in 2012 followed by permitting and construction in 2013. BBWARM hosted a series of public meetings and outreach events to engage Birch Bay residents in both the subwatershed master planning process and the capital project process and related efforts to improve water quality in the Central North subwatershed.

BBWARM completed its first subwatershed master plan for the Central North Subwatershed through this grant agreement. The process developed through this grant agreement produced a valuable product for the BBWARM program, and BBWARM is continuing to complete subwatershed master plans for the remainder of the urbanized subbasins within the Birch Bay watershed.

The subwatershed master planning process included:

- Developing a Quality Assurance Project Plan.
- Inventory of existing stormwater systems and facilities (e.g., ditches, pipes, catch basins).
- Hydrologic and hydraulic analysis and modeling of stormwater flows.
- Identification and evaluation of stormwater problems.
- Developing recommended solutions to identified problems (maintenance, small works, and capital improvement projects).
- Public participation and stakeholder meetings.
- Compiling information into a comprehensive subwatershed master plan.

The stormwater capital project process included:

- Identification of the proposed project in the Birch Bay Stormwater Comprehensive Stormwater Plan.
- Survey and development of a preliminary engineering solutions.
- Public meetings and outreach events.
- Final design and permitting.
- Construction.
- Design and installation of a bio-swale educational sign.

Reflection on Project Design and On-going Sustainability effort:

1. Finding the right trusted advisor: Relationships are important, the source of information or messenger on a community focused project like this must have the local knowledge, personality, background in the resource and respect of their neighbors. We learned the value of a familiar face who could establish trust and confidence. Only then could they deliver messages that would bring awareness and overcome barriers to positive action
2. Social Diffusion: The advisory board were already rooted in the community and vested in the outcomes. The majority of the farm plans and stream restoration projects came from “friends of a friend” or “neighbor of a neighbor” to our advisory board and trusted advisor. In the future expanding this board to encompass more of the community or ensuring that those on the board are trusted sources of information in the community is paramount.
3. Barrier Recognition: From the social marketing research it was determined that the focus of the project was to treat sources of pathogens – Better livestock husbandry, OSS operation and maintenance and riparian enhancement. The community that lives in Terrell Creek and has the opportunity to reduce these pathogens does not have a social center or necessarily talk to their neighbors, therefore reaching this audience takes diverse communication strategies.
4. Outreach: Throughout this effort we found that regardless of the incentives provided or information disseminated, the target action or behavior must resonate with the target audience. Therefore, simple strategies of informational mailings, advertisements and newsletters offering FREE technical and financial support failed to garner the support and participation anticipated. Only when exposed to the incentives and actions through varied approaches over significant period of time did the message resonate with the target audience.
5. Time: Social marketing research, development and adoption of a strategic behavior change plan takes time, for this project at least 1 year. Because of this the timeline for getting practices on the ground was pushed back. Developing

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relationships and trust is an investment of time, there must be longevity of personal interaction before productive action toward water quality improvements can take place.

6. Adaptive Management: As stated earlier, the social marketing plan identified newsletters and postcards as the primary means for nurturing pro-conservation behavior, this means of communication did not produce immediate results. After re-addressing the communication approach, the advisory committee recommended building a community that is supportive of the efforts for sustainability and normalizing conservation practices to encourage adoption of BMPs. One-on-one site visits, workshops, events and work parties were created to raise awareness and involve the community in the program, this resulted in enhanced adoption of conservation practices and behaviors.

Future Sustainability of Project:

The community-based Chums of Terrell Creek watershed improvement group nurtured through this effort is still working hard to improve water quality and habitat in Terrell Creek. BBWARM, WCD and NSEA have devoted funding and resources for at least the next 2 years to support this group and continued efforts including:

- Recruit, train and maintain water quality citizen volunteers
- Distribute Informational Postcards to target landowners
- Host Water Quality Workshops and Tours in Birch Bay area
- Update Chums of Terrell Creek website and social media regularly
- Host Chums of Terrell Creek outreach tent
- Coordinate “Run with the Chums 5k Fun Run/Walk” Event
- Produce article for BBWARM and WCD Newsletters on Terrell Creek