Clear Creek Basin Restoration Guidelines:

a framework for the future

10.11.11

ACKNOWLEDGEMENTS

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Cover: Clear Creek Trail
(Image by KC SSWM)

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Clear Creek Restoration Opportunities

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Executive Summary

Clear Creek Basin is an important watershed within the western Puget Sound region, and has a significant impact in flood control, salmon habitat, and aquatic life in Dyes Inlet, as well as water quality in the Silverdale area. Clear Creek has a number of dedicated stakeholders both in local county government and non-profit organizations. In the last ten years, the stakeholders have improved certain areas of the creek's ecosystem; however, their efforts were often completed independently of one another.

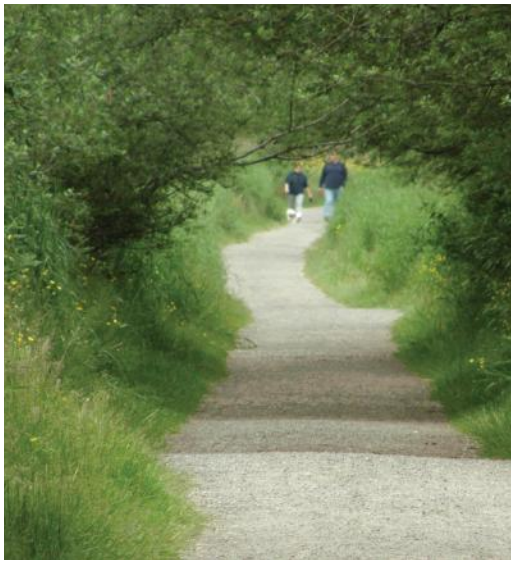

Figure 1.1
Clear Creek Trail at Schold Farm.
(Image by BCRA)

The Clear Creek Basin Restoration Guidelines presented in this document will bring together many of the stakeholders to provide a clear consensus of goals and objectives for the future of the Clear Creek watershed. This document is not meant to be a master plan for the watershed; rather it is an outline of general goals, which can be parlayed into a more detailed plan.

The Clear Creek basin extends from its headwaters on Naval Base Kitsap Bangor facility, winding its way south through the town of Silverdale, to Dyes Inlet near Old Mill Park. The development in the commercial core has produced many hydrology issues including increased runoff from impervious surfaces resulting in flooding, poor water quality, instability of stream flow and adverse affects to the native salmonids.

Significant constraints must be considered as creek proponents attempt to make improvements. These constraints include:

- Total impervious area
- Road density and road crossings
- Urbanized area
- Land ownership and easements
- Agricultural and forested land conversions
- Stakeholder responsibilities and capacities
- Not all stakeholders involved

However, many of these constraints can be mitigated to improve the effectiveness of restoration efforts.

Through site observation, analysis of existing resources, and discussion with stakeholders, four main guidelines for future projects were formed: coordination, mitigation, restoration, and trails.

COORDINATION

All stakeholders agreed that better communication and coordination between groups would improve the collective Clear Creek basin agenda. One suggestion is the creation of a collaborative watershed council. A horizontal leadership group representing the different stakeholders could tap into larger resources, perhaps at the regional or state level, and give legitimacy to goals.

WATER QUALITY

Water quality within Clear Creek basin is interrelated to many of the goals individual stakeholder groups have. Water quality can have direct impacts on salmonid populations and the safety of residents in Silverdale. Implementation of LID strategies is one example currently being planned within Silverdale, which may improve water quality in the area.

MITIGATION

Mitigation should continue as a high priority throughout the basin both in large projects, such as the Schold Farm efforts, but also on a smaller scale which may be more manageable for certain stakeholders.

RESTORATION

The connectivity between the estuary and the creek will be important in restoration efforts. The coordination of restoration activities at a landscape and project scale should have the following outcomes in mind:

Enhanced water quality

Flood control

Increased fish passage

Increased channel complexity in lower-watershed

Full restoration of portions of the stream which have been heavily impacted.

These kind of restoration activities will have an opportunity to significantly improve the watershed's ecosystem. Planned projects in the creek will remove previous barriers to fish passage. Public awareness of the planned restoration projects will provide opportunities to educate the public on the Clear Creek basin features, functions, and other improvements being considered.

TRAILS

Trails have been an important piece to the Clear Creek story, and should continue to be developed to provide exposure of creek and watershed issues to the broader public through education, and recreation. Due to this, improving

The guidelines need further refinement and more detail. It is the recommendation of this document that the next step provide specific actionable items in each of the three areas of the watershed; uplands, floodplain, and estuary, each consistent with the guidelines.

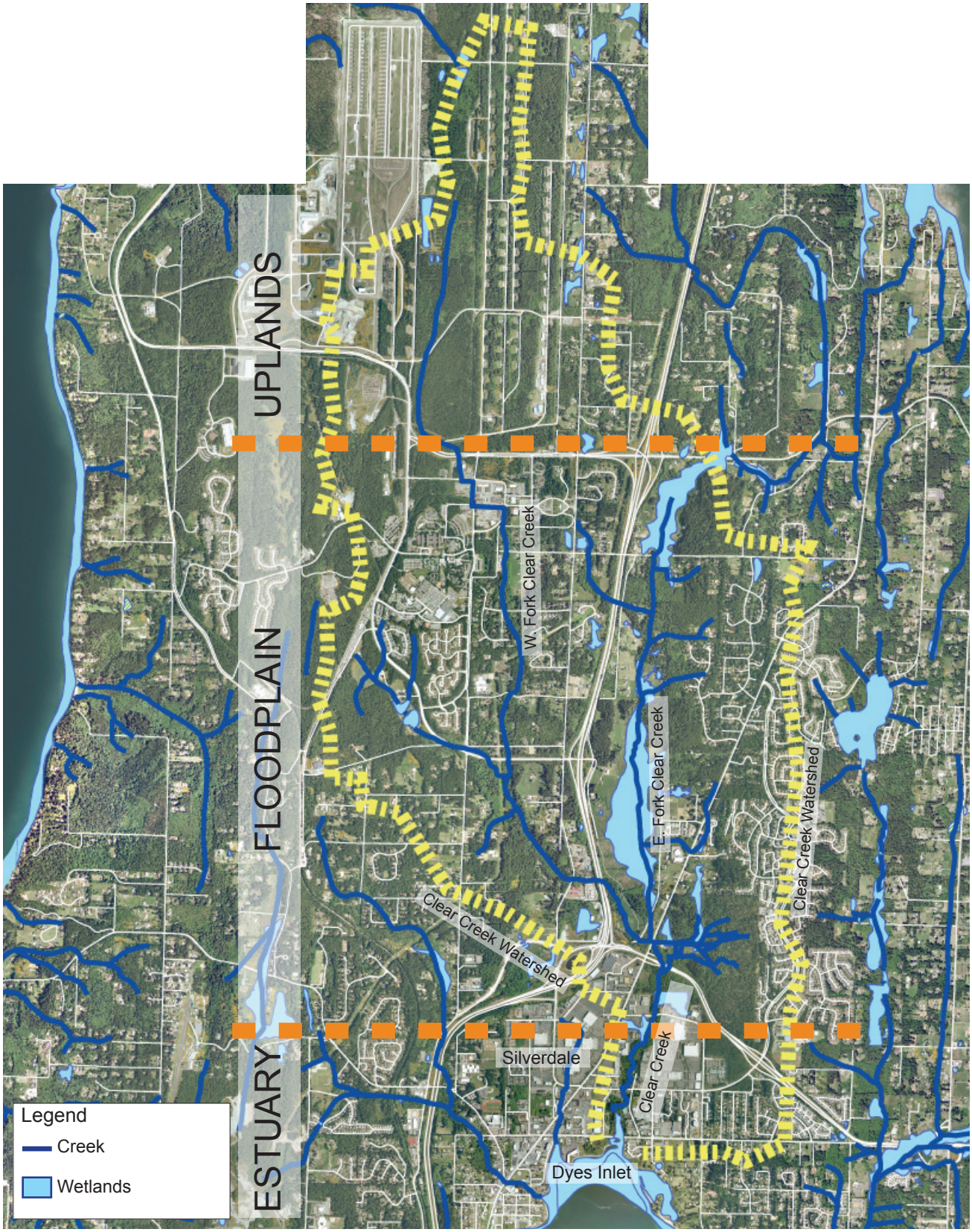

Figure 1.2
Clear Creek Basin: Creek & Wetlands

Introduction

The effects of agriculture, residential, and urban development have heavily impacted the Clear Creek Basin. Clear Creek suffered ill effects from pollution, channelization, increased impervious surface runoff, and diminished seasonal flow. Recently, there have been efforts to improve the water quality, habitat, and riparian areas within certain sections of the creek. Several departments within Kitsap County government, the Suquamish Tribe, and nonprofit organizations, often independently of one another, undertook the development and restoration efforts.

The goal of the Clear Creek Basin Restoration Guidelines is to bring together stakeholders who are invested in Clear Creek as an ecological, hydrological, and community resource. Three goals were identified in order to start the process to create the Clear Creek Basin Restoration Guidelines:

1. Initiate coordination amongst stakeholders who have invested in the Clear Creek Watershed.

2. Identify shared and common goals across the different groups of stakeholders.

3. Determine the best way to move forward in meeting the agreed upon goals.

This document is not intended to be a master plan for the watershed. Rather, it aims to provide common goals in which all stakeholders can follow with and participate in to bring Clear Creek back to a more productive natural resource. For the purpose of the guidelines and to provide a complete vision for Clear Creek, the entire watershed will be split into the following three zones: estuary, floodplain, and uplands.

The following activities were used by BCRA and Kitsap County to reach this document's goals: facilitate a walking tour and exchange of information between stakeholders; review existing reports, plans, and historical material; and complete guidelines based on gathered information and input from stakeholders.

Figure 1.3
Stakeholder walking tour along Clear Creek Trail.
(Image by BCRA)

Watershed Conditions

BACKGROUND

Clear Creek Basin is located in central Kitsap County Washington and is within the larger Dyes Inlet watershed. The largest of the Dyes Inlet sub-basins, it contains the Clear Creek headwaters on the on Naval Base Kitsap Bangor and rural forests, flood plains in agricultural fields, and the urbanized town of Silverdale located on the north shore of Dyes Inlet.

Prior to settlement, the area was forested with wetland meadows in the flood plain. In the mid and late 1800s the area was logged for timber and cleared for agriculture. Currently the broad valley, which includes the town of Silverdale, is a mix of 2nd and 3rd growth forests, commercial and residential development, agricultural fields, and military property. Today, the floodplain is primarily made up of agriculture and impervious services associated with the Silverdale commercial core. Approximately 22% of the watershed is developed with impervious surfaces disrupting the natural drainage process and affecting the water quality in the stream. The byproducts of development allow for less infiltration of stormwater, thereby creating additional surface runoff and which has contributed to increased erosion, downstream flooding, loss of natural aquatic habitat, and water quality problems (Development, 2007). The negative affects of urbanization and degraded water quality in Clear Creek have also impacted the larger ecosystem in the estuary and near shore environment of Puget Sound and in particular, the shellfish beds at Dyes Inlet (Bazzell 2009).

Figure 2.1
Existing interpretive sign along Clear Creek Trail.

The Washington State Department of Natural Resources (DNR) classifies streams and other water bodies based on whether or not they are used by fish. Water types are then used by the DNR to determine the buffer requried for protection of that water body. Clear Creek is predominately rated “F”, for waterbodies that are known to be used by fish or have the physical criteria to potenially be used by fish (Figure 2.2). However, there are some tertiary tributaries that are rated “N”, for non-fish, or “U” for unknown. These are areas in which a more specific determination has yet to be made (Washington State Department of Natural Resources 2011).

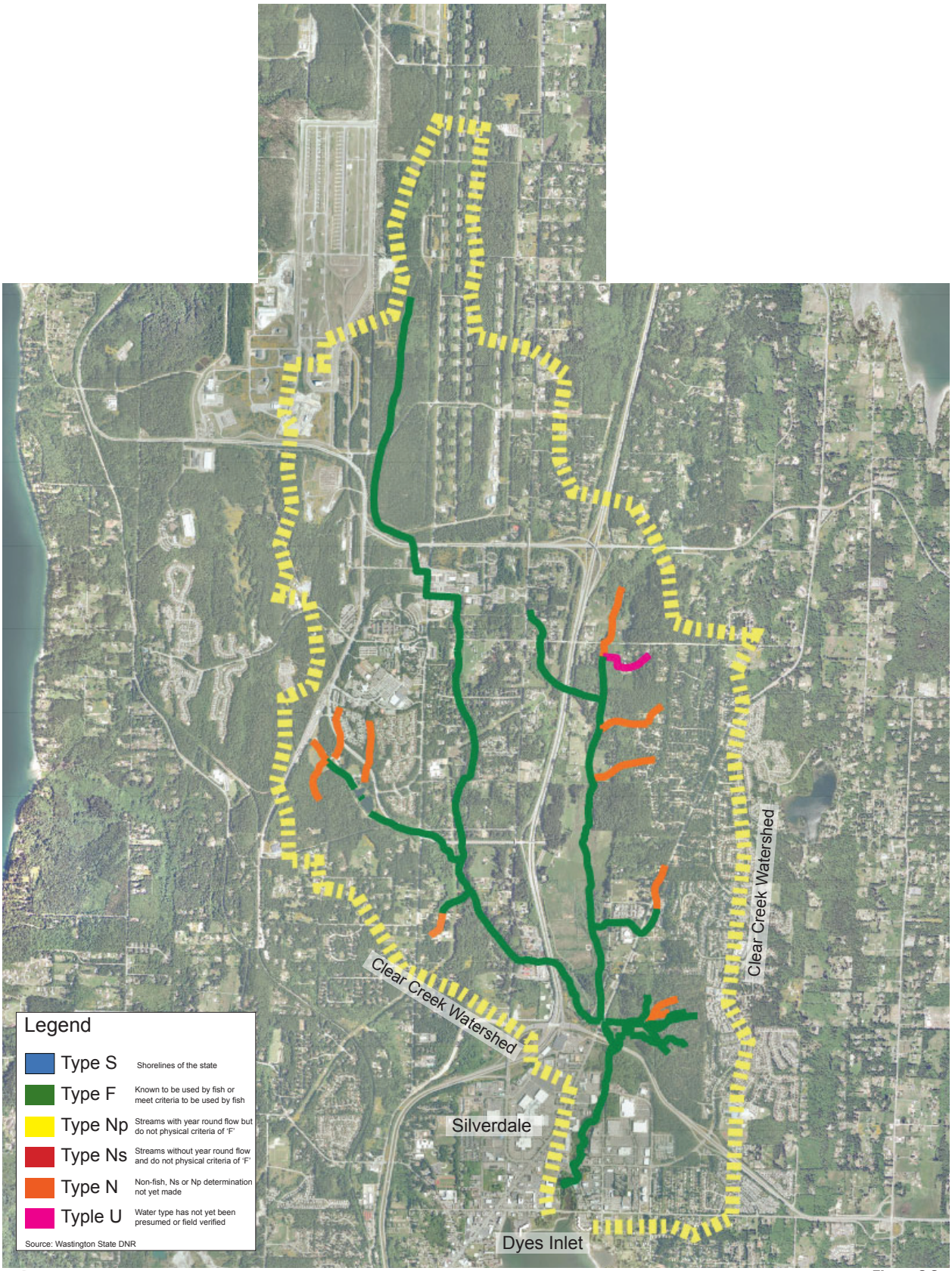

Figure 2.2
Clear Creek Basin: Slope Analysis

The Clear Creek basin sits in a geologic hazard zone with the rest of the Puget Sound due to the fault lines that run beneath it but the geo-hazards do not significantly affect the parameters of these guidelines. The eastern and western ridges of the basin have a 15 to 29% slope as shown in Figure 2.3, but are a small percentage of the overall land area. The primary soils in the area are Alderwood/Kitsap sandy loam, with parent material derived from glacial till and glacial drift. The Alderwood soils consist of a gravelly sandy loam and norma fine sandy loam. A more specific look at existing soils can be found in Figure 3.4.

here are a number of organizations who continue to be committed to the betterment of the Clear Creek watershed. Several departments within the Kitsap County government have initiated programs to improve water quality, particularly in the lower basin, while non-profit groups such as the Clear Creek Task Force and Great Peninsula Conservancy have increased public awareness by promoting recreation and habitat restoration opportunities.

The Clear Creek basin also has a sizable history of research, documentation and planning. These documents provide useful general information and in some cases specific historical data from which comparisons can be made to current conditions. These resources should be used appropriately to inform future planning programs to reduce duplication of past efforts:programs to reduce duplication of past efforts:

1987, Draft EIS Clear Creek Master Plan; Kitsap County Department of Community Development

1992, Dyes Inlet/Clear Creek Watershed Action Plan; Kitsap County Department of Community Development

1995, Clear Creek Trail Master Plan; Clear Creek Task Force

2003, Clear Creek Comprehensive Flood Hazard Management Plan, Tetra Tech/KCM, Inc.

2009, Draft Overall Restoration Plan for Schold Farm; Kitsap County Department of Community Development

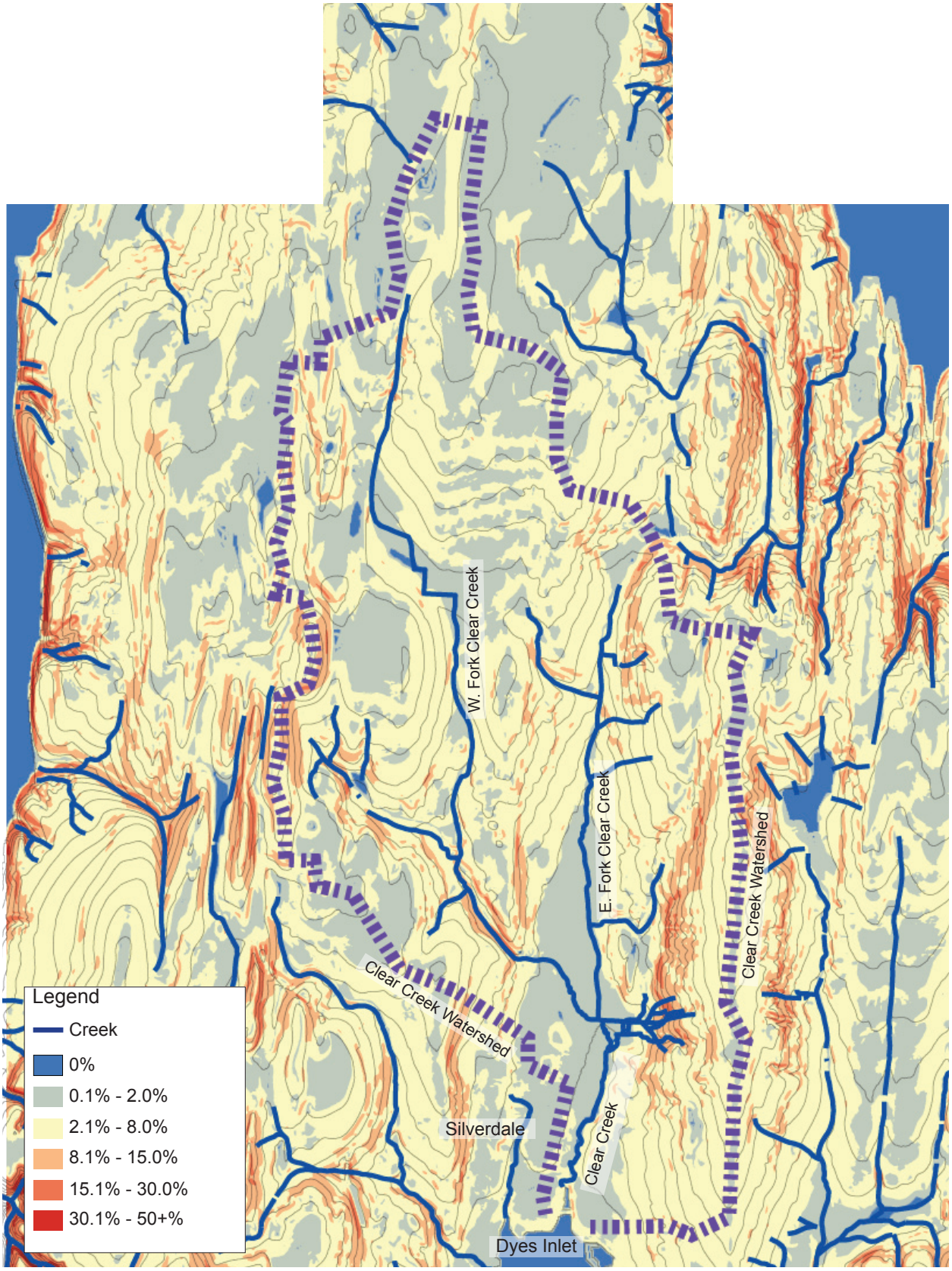

Figure 2.3
Clear Creek Basin: Slope Analysis

TOPOGRAPHY & HYDROLOGY

The topography of the Clear Creek basin is comprised primarily of a floodplain valley that makes up the southern half of the watershed, and gentle slopes from Luoto Rd/Trident Blvd. north into the Bangor submarine base. The basin is outlined by a ridge on the east that is aligns with Ridge Top Blvd. NW from Waaga Way to NW Luoto Rd, and on the west by moderate slopes adjacent to Clear Creek Road (Figure 2.5). The commercial core of Silverdale occupies the central valley extending from the shoreline of Dyes Inlet estuary north to the open spaces of the former Schold Farm. The majority of the Clear Creek Trail runs through this valley and the development of the trail has been a central focus of many of the past projects in the watershed.

Kitsap County Health District (KCHD), Kitsap Conservation District (KCD) and Kitsap County Public Works, through a unique stormwater utility funding partnership of the Surface and Stormwater Management (SSWM) have led a number of initiatives in the past few years to begin the process of improving the water quality of Clear Creek. Since 1995 several projects were implemented to reduce the documented high fecal coliform bacteria contamination in Clear Creek, Strawberry Creek, Barker Creek, and the near shore marine areas of Dyes Inlet. These projects include both an extensive water sampling program to determine the level of contamination and the locations of pollution. KCHD implemented projects to reduce fecal contamination from failing septic systems, KCD worked with agricultural property owners to reduce livestock waste problems, and Public Works focused on stormwater system maintenance of county road systems and commercial properties.

Image 2.4
Overlooking Clear Creek from the pedestrian bridge near Levin Rd NW.
(Image by BCRA)

NNonpoint source (NPS) pollution has also been had an impact on the ecosystem and water quality in the basin. NPS generally refers to land runoff, drainage, seepage or hydrologic modification. Due to this, improving the stormwater system infrastructure to include treatment of stormwater,

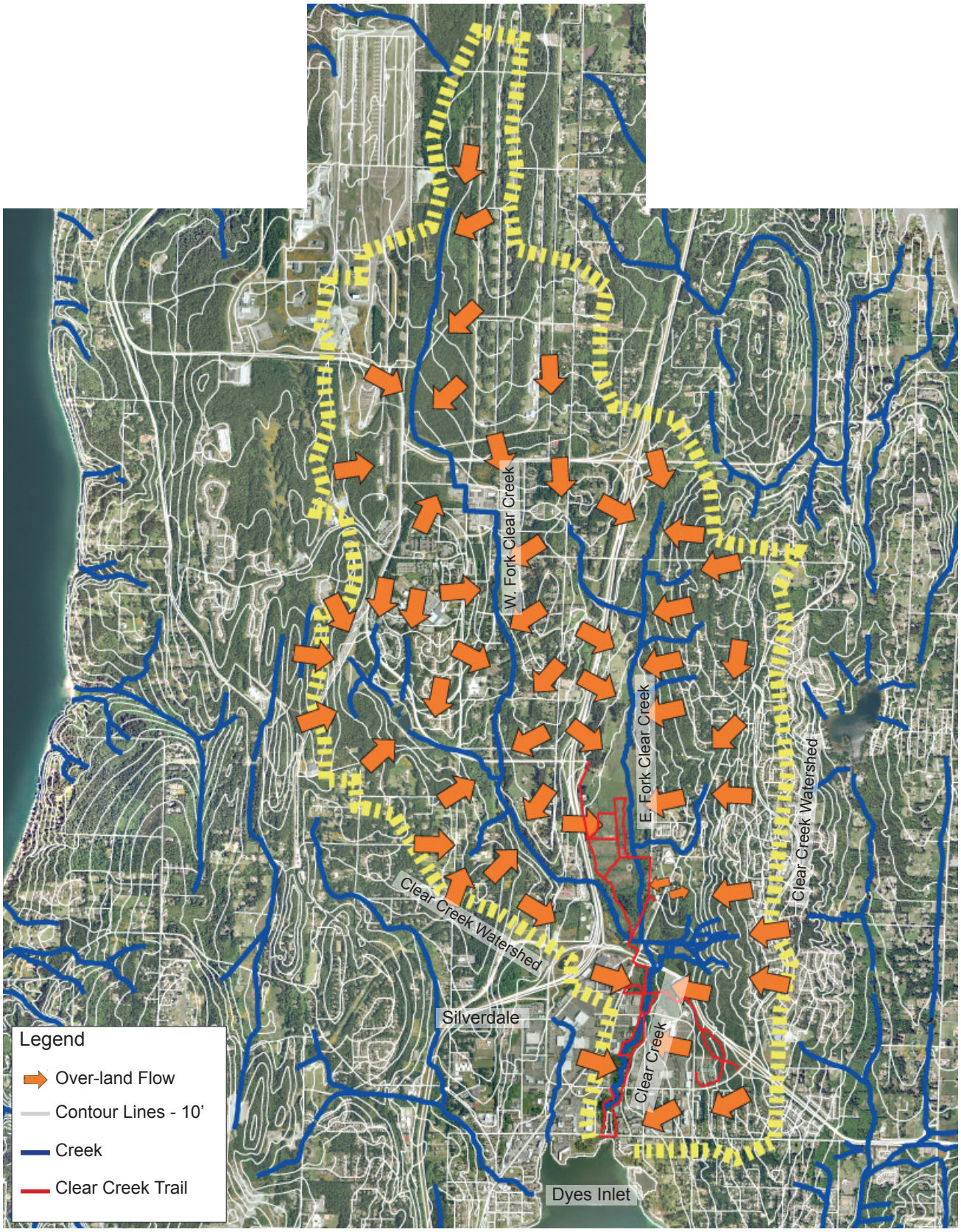

Figure 2.5
Clear Creek Basin:Topography & Overland Flow

Figure 2.6
A number of stormwater mitigration efforts have been completed at Schold Farm.
(Images by BCRA)

such as the construction of the wetland along Silverdale Way, is a part of the solution. These projects have resulted in significant pollution reductions, but some pollution problems remain.

Instability in stream flow rates has also been observed for many years in Clear Creek, hindering the effort to rehabilitate salmon populations in the basin. During winter storm events when the water velocity in the channelized stream is highest, buried salmon eggs can be scoured and cause mortality. Conversely, during periods of low flow in summertime, fish can be stranded due to low water levels (DCD, November 2006). Inconsistency in water level is a major factor in disrupting recent efforts by the Suquamish Tribe and others, to increase the salmonid populations in Clear Creek and other streams in the area.

HABITAT

The habitat of the Clear Creek basin has had significant degradation through human activities affecting wildlife in the watershed. In the floodplain, the creek has been channelized and straightened to provide workable agricultural fields. Increased commercial developments in the lower basin have significantly encroached on buffers of the creek. Both situations have reduced native vegetation that absorbs runoff, recharges the water table, and provides more consistent creek flows throughout the year. The result has particularly affected salmon populations in the creek. In addition, a reduced vegetative cover and open ponding along the creek makes it susceptible to increased water temperatures, which are also less conducive to salmon spawning (May 2003) (Washington Department of Health October 2010).

Figure 2.7
Schold Farm and Peterson Farm are important properties due to their location in the floodplain.
(Image by BCRA)

Wetland areas are an integral part of the Clear Creek water transport and filtering functions. They help buffer peak runoff and absorb contaminants before reaching Puget Sound as well as provide cover for many wildlife species. Wetlands also help mitigate flooding downstream, making this particularly important for Silverdale. Protecting and restoring the wetland areas will have a direct impact on private property as well as wildlife and is an integral part of the guidelines.

Constraints

PHYSICAL

Clear Creek is intrinsically linked to its location and surroundings, which provide rich and varied settings. However, this location can also be a hindrance due to large tracts of land committed to uses that are less flexible for future mitigation and restoration. Those two large land uses are the Naval Submarine Base Bangor and the city of Silverdale, which bookend the watershed to the north and south, respectively. These areas make up more than half of the watershed's land area. While direct modifications to naval land are not within the purview of these guidelines, the US Navy continues to be a supporter of creek initiatives. In addition, the navy could refer to community-supported documents, such as these guidelines, when projects are being planned on base property. The Silverdale commercial core is another large tract of land with significant impacts on the watershed, as it lies primarily in the Clear Creek floodplain and estuary. These impervious surfaces will likely be in place in perpetuity so their improvement will likely require substantial mitigation and coordination efforts.

Figure 3.1
Existing signage along Clear Creek Trail.
(Images by BCRA)

Kitsap County SSWM has worked with private land owners in the past and is poised to do so again. SSWM is currently engaged in a planning effort to locate areas in the Clear Creek estuary and lower floodplain where low impact development (LID) methods, such as rain gardens, could best be implemented on private land. This public-private partnership to implement LID features for the betterment of the larger community could be a model for others in the region.

Figure 3.2
Existing wayfinding along Clear Creek Trail.
(Images by BCRA)

The Clear Creek Task Force has had great success in gaining easements in order to provide a trail for public access from Dyes Inlet to Schold Farm. Work to secure easements for the last portion of the trail in the lower basin is on-going and discussions to extend the trail north of Schold Farm are a long range planning effort.

One of the basin's main recreational components, the Clear Creek Trail, can get lost in its urban environment. Ease of access and visibility issues reduce the positive impact the trail can have on the

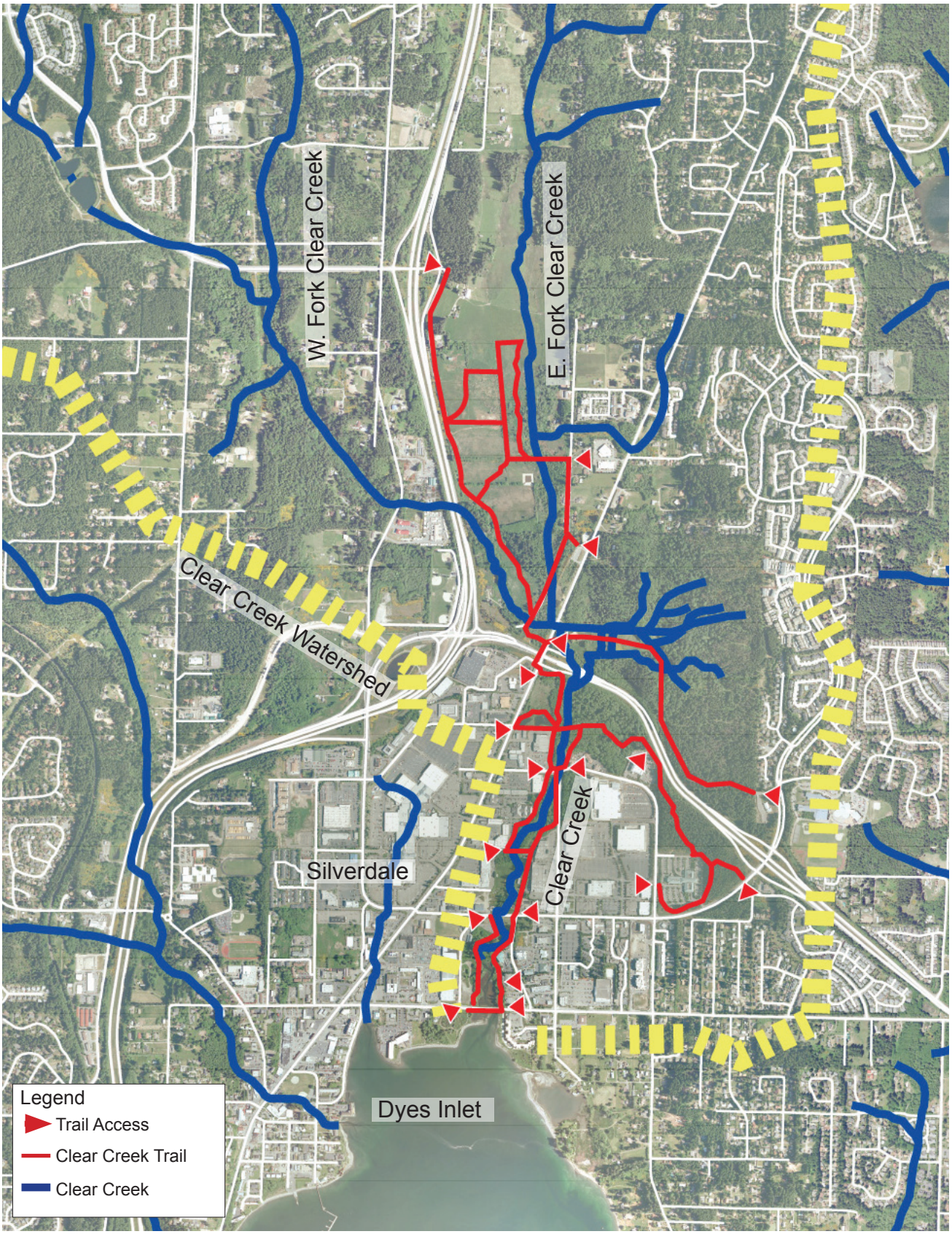

Figure 3.3
Clear Creek Basin: Clear Creek Trail & Access

community and vice versa. The site is within a complex weave of commercial buildings, highways, and agricultural fields, complicating how one can get from point A to point B.

The trail follows the creek from the Schold Farm property to Dyes Inlet but must cross many barriers in-between. Unfortunately, many of the access points and routes can be difficult to locate or navigate between. For example, navigating the intersections of Silverdale Way can be difficult. Having multiple road crossings within the Clear Creek Trail is not an easy task to tackle, nor is it without its coordination issues. However it is one example that may be easily mitigated with new or improved signage. These small opportunities, like way finding, can extend the reach of CCTF and the work they and other groups are doing to improve Clear Creek. The task force has brought awareness of the creek and its positive impacts in part by allowing the community access to the creek. In the future, there may be ways to further improve both of these objectives through better visibility and access.

DEVELOPMENTAL

Complying with the regulatory process of Kitsap County is an important and required step to improving the natural and recreational qualities of the creek. Standards are set to protect the health, safety and welfare of the public at large. In large part, this is an effort of coordination and should be incorporated in the workflow of all future stakeholder projects. However, smaller stakeholder groups often do not fully understand the authorities involved and their responsibilities in relation to the project at hand. It will be important to map out who those authorities are within the Clear Creek watershed to more effectively communicate intentions, potential restrictions, and as an end result provide appropriate actions and compliance.

ORGANIZATIONAL

There are certain limitations to the roles and responsibilities stakeholders can provide to the restoration of the Clear Creek basin. Each group has certain strengths and weaknesses they bring to

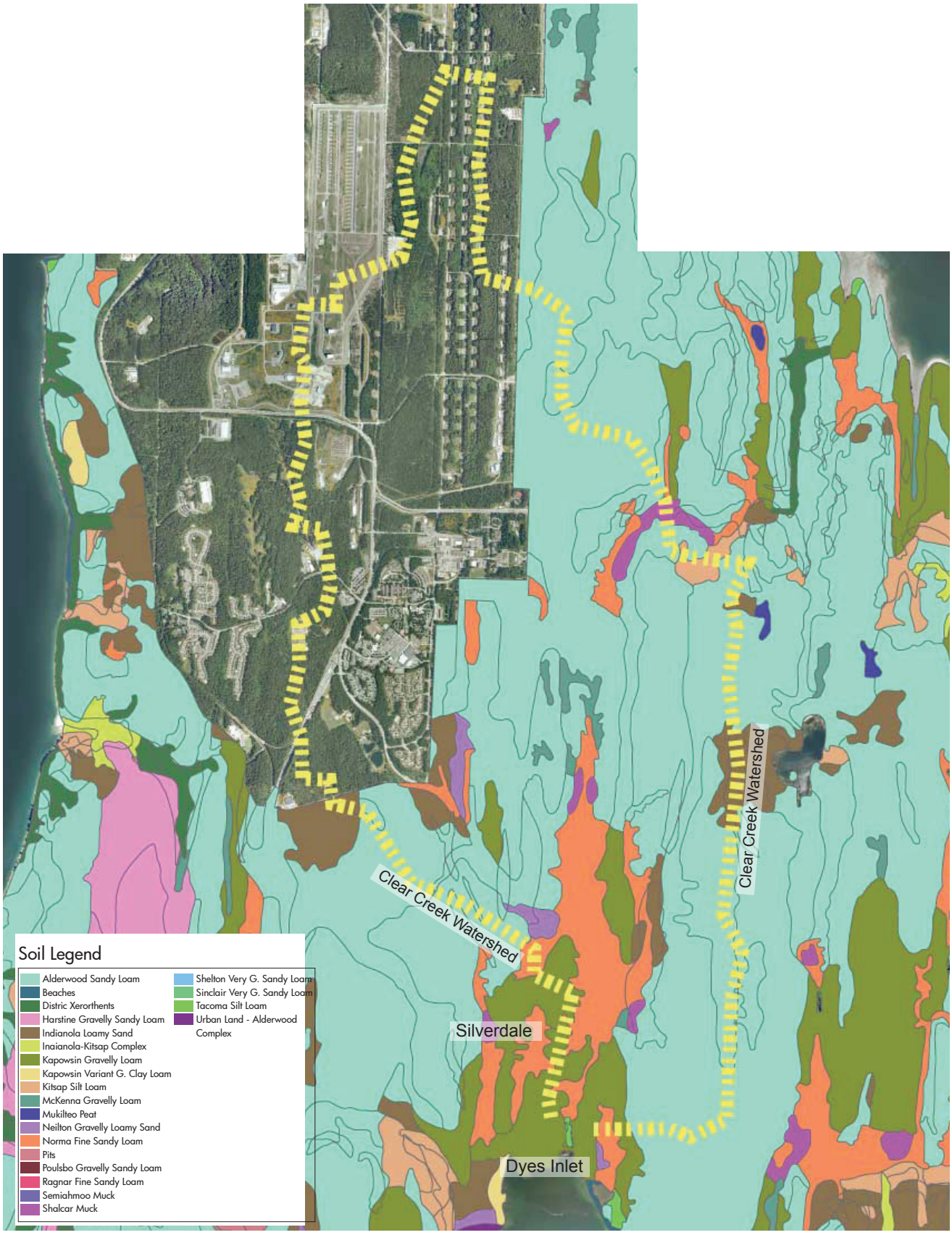

Figure 3.4
Clear Creek Basin: Soils

the table. For example, Kitsap County may be able to provide staff involvement for enhanced project coordination while CCTF can organize groups of volunteers for creek clean-up days. Additionally, not every stakeholder was involved or fully involved during the guidelines process, which should be seen as its own constraint. Moving forward, stakeholders should be aware of their own and their partners' organizational constraints in order to use each to their fullest capacity.

Stakeholder Interests

INFORMATION EXCHANGE

The guideline process started with an invitation to stakeholders to take a walking tour of the lower basin and discuss past successes, concerns, and plans for the future. The tour took place on June 30, 2011 from Gateway Rotary Park along the Clear Creek Trail to the Red Barn Interpretive Center where a discussion followed. The purpose of the tour and meeting was to provide information and a dialogue about the issues in and around Clear Creek, both as a resource for the production of the guidelines but also as a forum of exchange between all the stakeholders in one location. A cross-section of representatives from both government and non-profit organizations, who are actively engaged in the Clear Creek watershed, were in attendance:

Mindy Fohn, Kitsap County Surface & Stormwater Management (KC SSWM)
Chris May, KC SSWM
Mary Earl, Clear Creek Task Force (CCTF)
John Day, CCTF
Tex Lewis, CCTF
Kathy Peters, KC Department of Community Development, West Sound Watersheds Council
Scott Pascoe, Great Peninsula Conservancy (GPC)
Sandra Staples-Bortner, GPC
Alison O'Sullivan, Suquamish Tribe
Lori Raymaker, KC Parks & Recreation
Bryan Haelsig, US Navy
Dennis Oost, KC DCD

BCRA:
Don Mellott, Principal
Alan McWain, Project Manager
Daren Crabill, Project Landscape Architect
Justin Goroch, Project Support

Together the group provided a base of information and important questions in which to start the guidelines. During the discussion following the Clear Creek tour, BCRA led stakeholders in

Clear Creek Basin:
What's important to you...

Topic	Score	Rank
Estuary Restoration	1.7	1
Creek Restoration	1.9	2
Clean Water	2.4	3
Stakeholder Coordination	3.2	4
Trails	3.7	5
Public Access	4.0	6
Education Opportunities	4.3	7
Public Events	5.5	8

Additional responses by attendees:

Shoreline Restoration
Near Shore Habitat
Floodplain Restoration
Restoration of Scholl Road

Image 4.1
Stakeholder priority ranking exercise results.

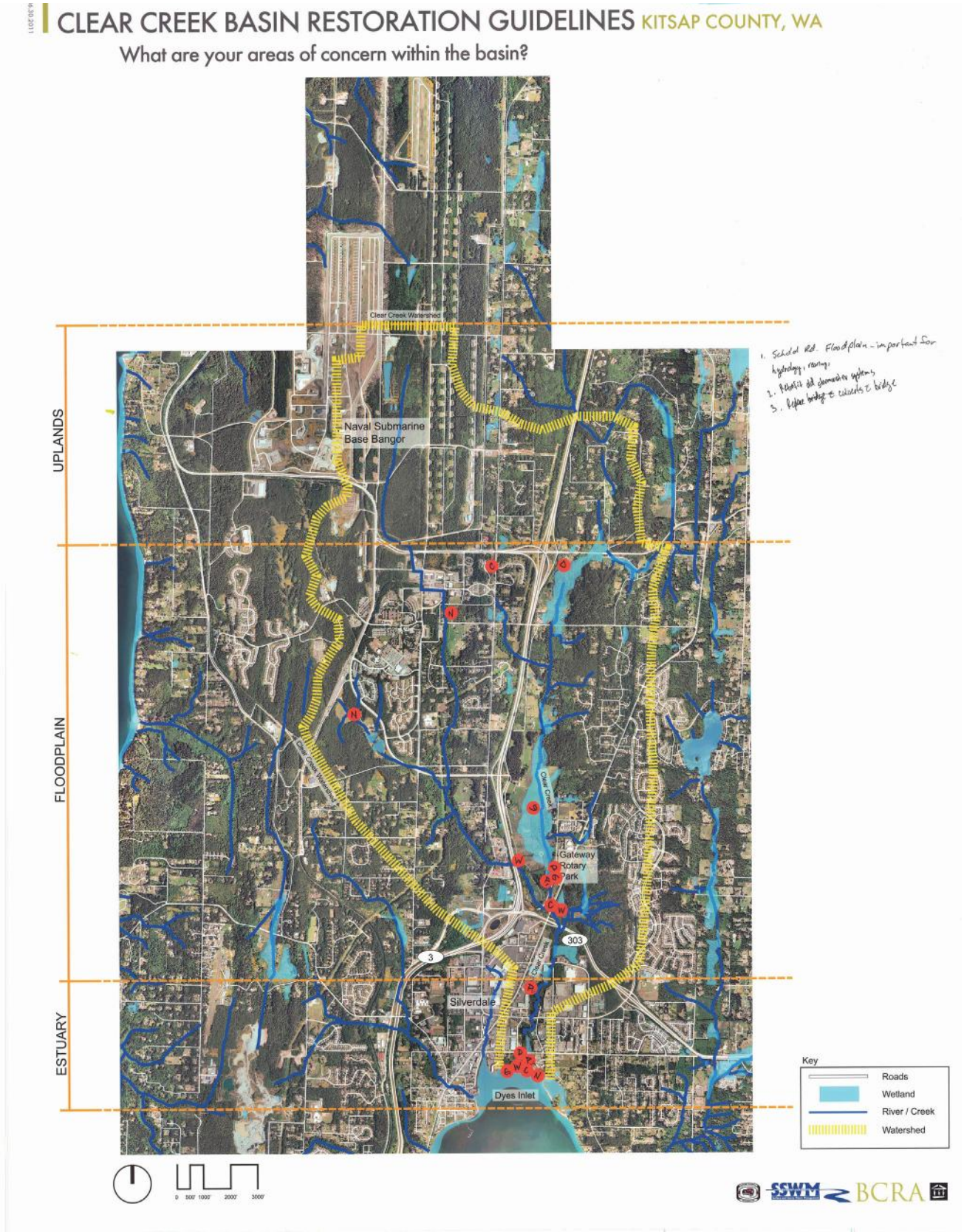

Figure 4.2
Stakeholder Mapping Activity 06/30/11: Mapping areas of concern

exercises designed to provide information of each group's area of concern and their priorities for the watershed. In the first exercise, each group placed two markers on a map and explained the reason for each concern (see appendix Figure 4.2). In a separate exercise, each stakeholder present ranked in order of importance, 1 (highest priority) to 9 (lowest priority), a list of topics pertinent to the rehabilitation of Clear Creek basin, (see appendix Figure 4.2). The outcome of the exercise is shown in Figure 4.1.

EDUCATION & RECREATION

Clear Creek Task Force has developed a strong concept of providing recreation and an educational trail from headwaters to estuary. Currently, the trail extends from the estuary at Old Mill Park to Schold Farm and has capitalized on multiple partnerships and resources. Building upon the successes of these existing programs may foster other partnerships or funding opportunities.

Two excellent examples of existing education programs are the annual Arbor Day tree planting and the Salmon in the Classroom Program. Arbor Day at Schold Farm is an opportunity that brings students and other volunteers out to plant hundreds of trees each year. These trees are the first step in helping transform farmland back into its more natural ecosystem. Similarly, the Salmon in the Classroom program provides hands on teaching for nearly 1,200 elementary school children in the area. In the fall, classes adopt a young fish and learn about it throughout the year while raising it. Then in the spring, during a field trip to Clear Creek, the children let their adopted fish go in an effort to help rehabilitate the creek's salmon population. In addition, having the Saq'ad Interpretive Center associated with Clear Creek provides opportunities to expand an onsite curriculum through its exhibits and indoor meeting space.

Figure 4.3, 4.4
Interpretive graphics on site can help describe the experience and surroundings to users in an educational way.
(Images by BCRA)

Clear Creek Trail is a great way to escape into a natural landscape mere steps from downtown Silverdale. Visitors are able to quickly hop on the trail to walk, jog, or ride a bike and forget that a busy urban mall is nearby. Those who take advantage of this trail can

make a 4.5 mile excursion roundtrip from Old Mill Park through Gateway Rotary Park to Trigger Ave. and back, or one can make a nearly 2 mile loop at the Schold Farm. One can see the benefit of working to make the extension of Clear Creek Trail north a part of the county's bike master plan and further coordinate non-motorized infrastructure so as to not adversely impact the creek, wetlands, and floodplain.

VOLUNTEERS The CCTF has been able to develop a strong volunteer base. CCTF, whose leaders are volunteers as well, have been able to partner with other non-profits, the US Navy, and detention youth to provide the manpower to build the Clear Creek Trail. Leveraging this resource will continue to provide future initiatives with lower overall costs for items such as trail maintenance, mitigation and re-vegetation, and future expansion of the trail.

Guidelines

The objectives of providing the Clear Creek watershed with protection, restoration, and mitigation can be ensured through the engagement and coordination of the stakeholders. The guidelines proposed here are not mandatory directives, but rather a flexible strategy to help set a course for planning and execution of detailed action plans. A future action plan would have defined goals, baselines and measurements of success formed around following five guidelines.

COORDINATION

Improved coordination between stakeholders, local government, landowners, and (perhaps most importantly) the public is the most important guideline to come out of this process. Coordination is not always the first inclination of individual stakeholders. However, early effort in coordination will reduce conflict and produce well-rounded, higher quality results. During the stakeholder meeting of June 30, 2011, and in separate two-party discussions, coordination was a topic that each group felt must be improved and coordination was cited as the activity with the most significant benefit to the restoration effort. The collaborative process of developing these guidelines is hopefully a first step in improving communication and coordination among the stakeholders.

WATER QUALITY

The keystone to the overall health of Clear Creek, Dyes Inlet, and its surrounding habitat is to improve the quality of water that is filtered into, and transported by, the creek. There will continue to be significant hurdles within the watershed to mitigate the effects of roads, commercial facilities and homes on the water quality of the creek. The mitigation of road runoff, maintenance of impervious surface drains, controlled use of fertilizers, setbacks for livestock, and correction of point source discharges are examples of the small-scale mitigation efforts that require ongoing attention. Another example is the Low Impact Development retrofit projects that are currently being promoted by KC SSWM and implemented by individual property owners within Silverdale.

MITIGATION

Mitigating the effects of existing or new development should continue to be a priority within the watershed. The envisioned Master Plan should provide opportunities to implement mitigation strategies at different scales, from the broad strokes of the wetland preservation to the Low Impact Development (LID) retrofits for homeowners and local businesses. The mitigation guidelines must also carry through to the Kitsap County permitting process to ensure that new development and construction comply with best practices to mitigate the adverse impact on the Clear Creek ecosystem. For both the large scale and small-scale mitigation, a monitoring program is required to assess the benefit and cost effectiveness of various mitigation activities. That assessment will provide the feedback for more specific goals and future action plans. The primary examples of recent large scale and small-scale mitigation measures include Schold Farm.

SCHOLD FARM

In addition to the recent 8.5-acre mitigation project in the Schold Farm area, the former farmlands in the central valley will continue to provide opportunities for large-scale mitigation. The 2009 Draft Overall Restoration Plan for Schold Farm is a guide for future mitigation projects. With its central and visible location, Schold Farm is an important part of both the stream's ecological and recreational systems. Schold Farm can be a model of a highly impacted urban stream section with good water quality, a fully functional ecosystem and recreational amenities for the community.

RESTORATION

Restoration efforts are required to achieve the Clear Creek vision shared by stakeholders such as re-establishing salmon runs and reducing peak flows during storm events. Restoration will be a long-term effort with piecemeal implementation. Both a shared Master Plan and on-going coordination will be critical to assure that restoration initiatives are on a synergistic path to achieve the ultimate goals.

Stakeholders agreed that estuary and creek restoration were of the highest priority and require actionable plans both on a larger

scale (county and municipal) as well as on a small scale (non-profit, volunteer driven). Examples of near term restoration efforts include:

Figure 5.1
Existing Bucklin Hill Road culverts at Clear Creek estuary slated for replacement in 2012. *(Image by BCRA)*

ESTUARY

The planned replacement of the Bucklin Hill Rd. culvert in 2012 is endorsed by all the stakeholders as one of the most beneficial restoration efforts in the watershed (Figure 5.1). The mouth of the creek has been largely passed over in restoration efforts of the past, but opening the estuary and allowing active tidal circulation will be a dramatic step to restoring the creek to its pre-settlement condition.

The culvert replacement allows for project planning as well as fewer hurdles for grant funding of salmon habitats both in the estuary and further up stream. West Sound Watersheds Council may provide an important partnership in helping to develop these relationships.

CREEK

Clear Creek has been impacted heavily by human development; however, it is human intervention of a different kind that may bring the creek back to life. Restoring and adding more complexity (meandering) to the creek where it is feasible can work toward several goals at once when done in highly visible locations like Schold Farm. The project will serve goals of salmon habitat restoration, improving water quality, and educating the public in addition to restoring the floodplain and creek. Also in planning by KC SSWM, are projects to remove fish-passage barriers at Sunde Rd., Shadow Glen Rd., and Mountainview Rd.

TRAILS

The establishment of the trail system has been an important piece of the watershed puzzle by providing tangible recreation and educational opportunities for residents in the area. The success of mitigation and restoration projects in the basin can be positively influenced through outreach to the public who use the trail.

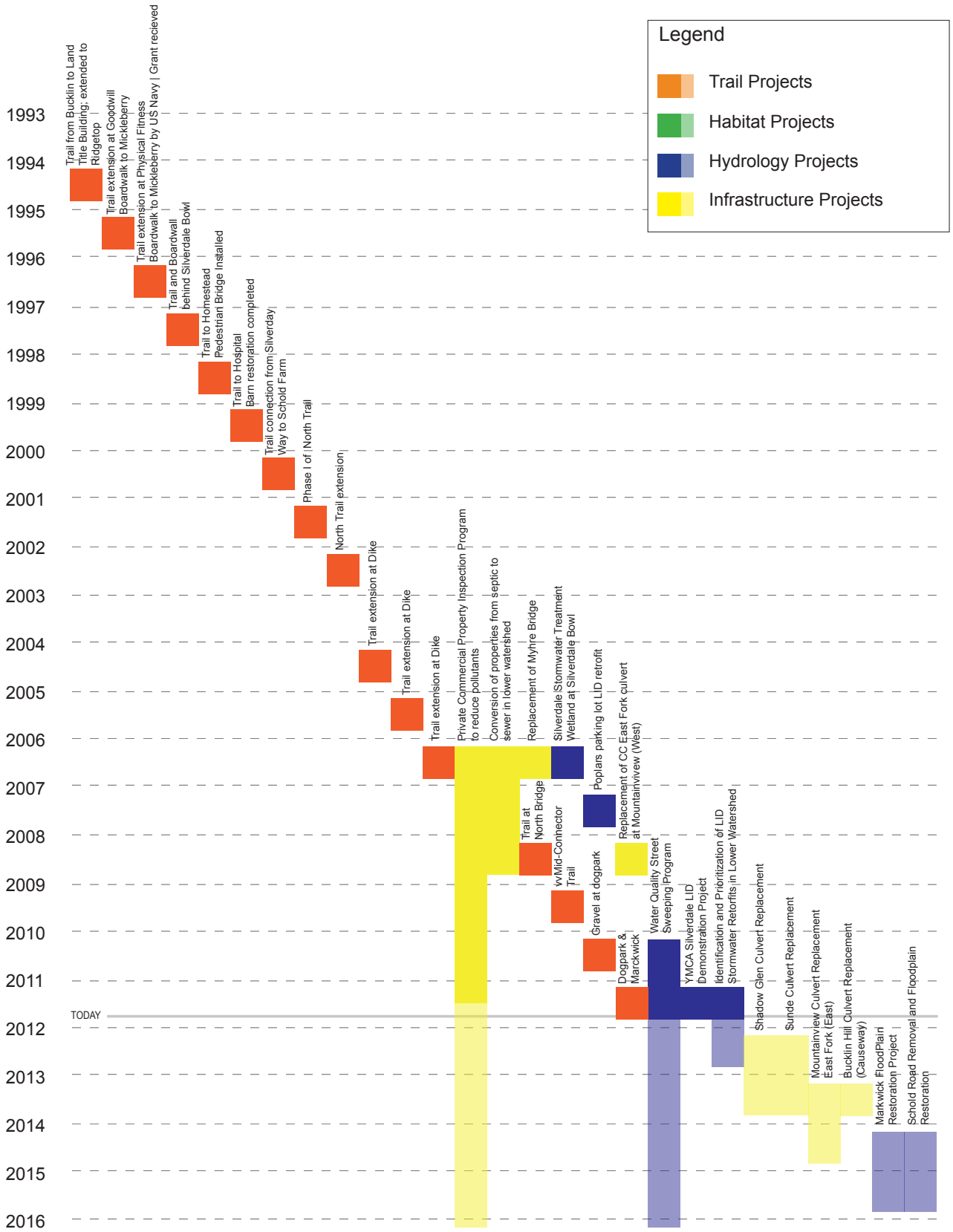

Figure 5.2
Clear Creek Basin: Past & Planned Projects

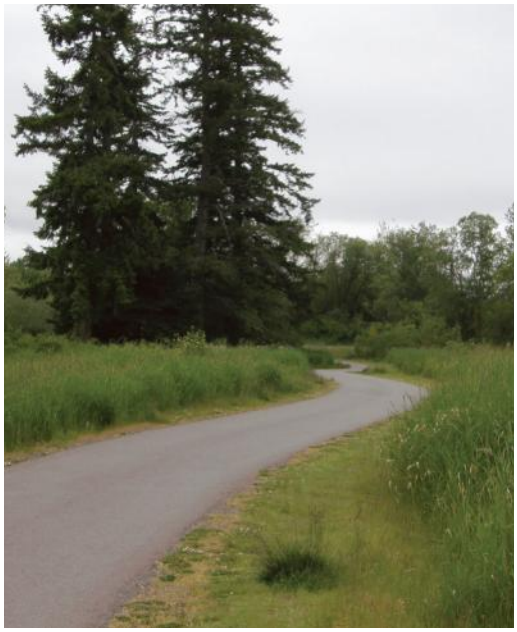

Figure 5.3
Bike trail extension through the Schold Farm property and example of added benefit when partnering with other stakeholders. *(Image by BCRA)*

Leveraging the current benefits of the trail to secure the ecology of the watershed as a whole should be a priority.

The trail serves the community needs as a place for exercise and recreation for both walkers and bicyclists (Figure 5.3). There may be significant advantages to being included in future updates to the Kitsap County Bicycle Facilities Plan and other comprehensive trail plans. Through inclusion and coordination, projects of common interest for walkers and bikers may gain funding opportunities and increased exposure.

As mentioned previously in this document, the trail is a connector providing easy non-vehicular access between residential, recreational and commercial facilities in the watershed. Connecting to communities to the north of the headwaters to the shoreline of the estuary through the trail system is a strong and viable concept. Stretching the trail north may be more difficult than developing the lower segments of the trail due to ownership and easement issues, but it is a common vision among the stakeholders. As previously stated, increased communication and coordination with county and other partners may make the trail connections more attainable.

Stakeholder Recommendations

COMPREHENSIVE WATERSHED PLANNING

After listening to the primary stakeholders of Clear Creek basin and through the development of these guidelines with them, it has become quite evident that passionate and capable people support the watershed. Given the right tools and funding, Clear Creek can continue to improve the lives of residents and visitors through its educational and recreational opportunities but--more importantly--thrive again as a working ecosystem for salmon and other wildlife.

For the establishment of these guidelines, stakeholders have come together to agree upon a set of collective goals for Clear Creek watershed. While important, it should be seen as the first step in the process. Next, this group of stakeholders desires a more detailed plan in which specific action items and projects can be prioritized for each of the guidelines. This would likely take shape as a comprehensive watershed plan. A comprehensive document such as this would provide an up-to-date, detailed assessment and analysis, with site-specific suggestions for improvements which are correlated to the above guidelines. A comprehensive plan will benefit the stakeholders by:

- Prioritize action and projects benefitting Clear Creek.
- Identifying opportunities to coordinate actions.
- Leverage the expertise of stakeholders in achieving common goals.
- Define baseline, set goals, and establish metrics to assess the success of actions.
- Establish ecological monitoring with a mechanism for feedback.
- Leverage and coordinate funding or funding opportunities for projects.

COLLABORATIVE WATERSHED COUNCIL

One possibility of providing integration and coordination between different groups is to develop a collaborative watershed council. Such a group would provide a place where stakeholders of a specific watershed, like Clear Creek, could come together to share in

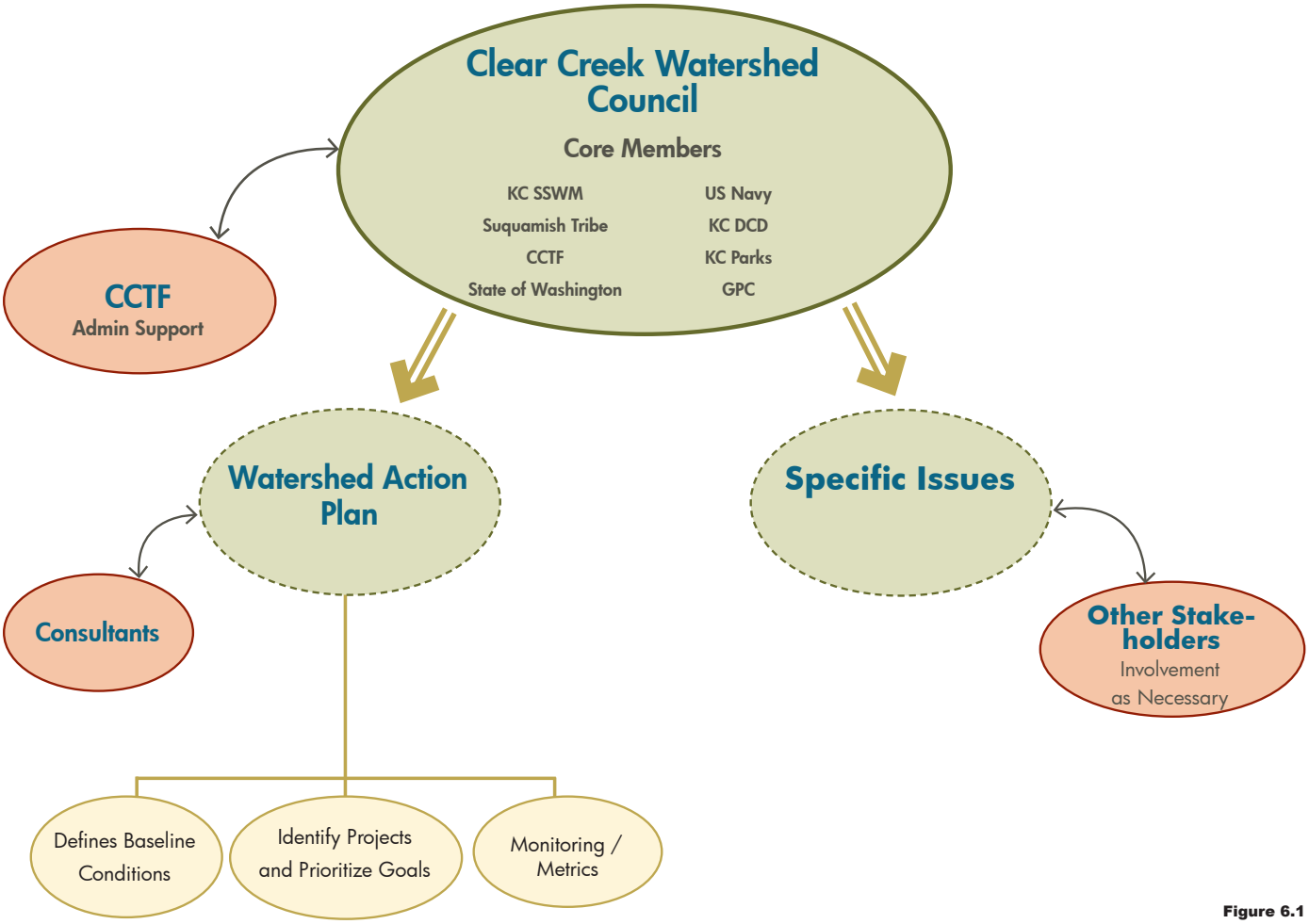

Figure 6.1
Clear Creek Basin: Schematic Organization of Watershed Council
Graphic shows how a horizontal leadership framework could be beneficial to developing a watershed action plan and other watershed projects.

an overall vision and most importantly provide direction for actions that fit the goals and objectives.

There are local examples of such groups that may provide a model for Clear Creek. While its scale and scope are different, Jefferson LandWorks Collaborative(JLWC) may be one such example. JLWC works to keep land available and affordable for small-scale farmers and work with them to become profitable small businesses in local markets. It has eight member organizations with

different expertise areas and objectives, but it came together as a collaborative to work toward a common goal for which they each can contribute (Jefferson Landworks Cooperative).

If a formal stakeholder group is convened, care should be taken during the formation so that each group is aware of their role, and how they will contribute to the larger goal of the council. With a horizontal leadership structure (Figure 6.1), it is reasonable to see the council would be able to “link in” to larger funding sources through their combined resources.

References

Kitsap Land Trust. *The Clear Creek Trail Master Plan*. Olympia, WA: Puget Sound Water Quality Action Team, 1995.

http://www.jeffersonlandworks.org/ (accessed September 8, 2011).

Bazzell, Richard. *Dyes Inlet Restoration Project FINAL REPORT*. Port Orchard, WA: Kitsap County Health District, 2009.

Economic and Engineering Services; Shapiro & Associates. *Dyes Inlet / Clear Creek Watershed Action Plan*. Port Orchard, WA: Kitsap County, December 1992.

Kitsap County Department of Community Development. *Barker Creek Instream Flow Study - Final Report.* Port Orchard, WA: Kitsap County, November 2006.

Kitsap County Department of Community Development. *Draft EIS Clear Creek Master Plan.* Port Orchard, WA: Kitsap County, June 1987.

Kitsap County Department of Community Development. *Draft Overall Restoration Plan for Schold Farm*. Port Orchard, WA: Kitsap County, December 2009.

Kitsap County Department of Community Development. K*itsap County Comprehensive Plan: Draft Environmental Impact Statement (Volume II)*. Port Orchard, WA: Kitsap County, 2007.

Kitsap County. *Resolution for Clear Creek Trail Joint Use Agreement between Great Peninsula Conservancy and Kitsap County*. Port Orchard, WA: Kitsap County, 2009.

May, C.W. and Peterson, G. *Kitsap Salmonid Refugia Report*. Kitsap County, 2003.

May, C.W., et al. *An Analysis of Microbial Pollution in the Sinclair-Dyes Inlet Watershed*. Publication no. 05-03-042, Washington State Department of Ecology, November 2005.

Stakeholders, Clear Creek, interview by Daren Crabill. Clear Creek Basin: Stakeholder Walking Tour (June 30, 2011).

Tetra Tech/KCM, Inc. *Clear Creek Comprehensive Flood Hazard Management Plan*. Port Orchard, WA: Kitsap County, 2003.

Washington Department of Health. *Fecal Coliform Pollution in Dyes Inlet: Year 2009*. WSDOH, October 2010.

Washington State Department of Natural Resources. 2011. http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx (accessed October 5, 2011).