



GREENLINK BELLINGHAM TECHNICAL ANALYSIS AND COMMUNITY ENGAGEMENT PROJECT



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GREENLINK BELLINGHAM PROJECT REPORT

WATERSHED-BASED GREEN INFRASTRUCTURE PLANNING PROJECT



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Data/Information Sharing Plan

Environmental data and information, collected and/or created under this grant/cooperative agreement is presented as part of this report. If any user would like copies of GIS layers (free of charge), please visit this website:

<http://www.futurewise.org/resources/reports/greenlink-bellingham> (NOAA award number

NA14NMF4540251)"Technical and engagement project to develop a green infrastructure plan at the watershed scale, Whatcom County." The sources for all data in map layers are referenced appropriately.

These environmental data and related items of information have not been formally disseminated by NOAA and do not represent and should not be construed to represent any agency determination, view, or policy.

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Figures 4 through 8: Heather Trim

Figure 9: Megan Lasley

Project Stakeholder and Technical Advisory Committees

Representatives from the following agencies and organizations attended some or all of the stakeholder and technical advisory committee meetings held from January 2015 to November 2016, and provided valuable feedback on the data analysis and maps.

Building Industry Association of Whatcom County
City of Bellingham
City of Redmond
Huxley College, Western Washington University
Lummi Nation
National Oceanic and Atmospheric Association
Nooksack Indian Tribe
Resources for Sustainable Communities
Snohomish Conservation District (Stormwater Program)
Sustainable Connections
Whatcom County
Washington Department of Fish and Wildlife
Washington State Department of Ecology
Whatcom Conservation District
Whatcom Realtors Association
Community 2 Community

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EXECUTIVE SUMMARY

GreenLink Bellingham (GreenLink) is a pilot program of coordinated project planning with the goal of creating an integrated network of green infrastructure throughout Bellingham's watersheds that provides safe, healthy movement of people, water, and wildlife. The project was motivated by the failure of current efforts to look holistically at land use planning, capital facilities planning, and water and habitat quality in urbanizing areas to meet salmon recovery goals while improving communities in the Puget Sound region. Specifically, GreenLink aimed to promote the design and delivery of green infrastructure throughout Bellingham, with a specific focus on the Squalicum Creek watershed.

The GreenLink process is intended to be replicated in other watersheds and jurisdictions to benefit water quality, mobility, habitat, and community quality of life. GreenLink Bellingham built upon previous work by the City of Bellingham and others to manage Bellingham's natural resources and to maintain a high quality of life for the community. GreenLink recognizes green spaces in natural and developed areas as a network for people and wildlife. The process included seven steps:

1. Convening a broad set of community stakeholders and technical advisors to develop a vision for the watershed and provide input to the project selection process
2. Compiling and reviewing available planning and technical documents
3. Using spatial data on a broad range of environmental stressors (such as impairments to water quality and habitat), mobility, and community assets (quality of life indicators) to create a catalog of maps illustrating existing conditions of watersheds in Bellingham
4. Public education and engagement, including innovative ways to solicit community input
5. Analyzing geographic information system (GIS) data and developing "heat maps" to identify areas within the Squalicum Creek watershed that would benefit from green infrastructure projects (for example, areas with the greatest needs for water quality or habitat improvement)
6. Developing an initial set of 20 green infrastructure projects that met project goals (projects that provide multiple benefits; can be part of a green infrastructure watershed plan; are cost-effective; and are responsive to community, economic and environmental needs)

7. Working with the GreenLink stakeholder and technical advisory groups to select a short list of projects, based on specified criteria, that are recommended for implementation in the next few years

The GreenLink effort demonstrated that the City of Bellingham has a history of developing its plans in a coordinated way and based on robust analyses and public engagement. Results of the existing conditions assessment showed that, overall, the City has maintained relatively healthy watersheds, with only specific localized water quality problems. The top nine projects that were eventually selected for recommendation met all or most of the following criteria:

- will provide significant ecological lift over the long term,
- will achieve multiple objectives
- will complement other projects
- are low cost relative to performance
- have community support
- are included in an existing plan
- are likely to be implemented within 5 years.

Project descriptions developed through the GreenLink process for the top nine projects are included in Appendix E of this report. They are available for use by stakeholders to advocate for funding, enabling implementation of projects that will benefit water quality, fish and wildlife habitat, and quality of life for people in the community.

INTRODUCTION

PURPOSE AND BACKGROUND

Planning efforts to recover species listed under the federal Endangered Species Act, implement municipal stormwater water quality permits, and plan for sustainable growth under Washington's Growth Management Act are often fragmented and not well coordinated across disciplines and agency departments. The resulting plans are inefficient and ineffective, and often lack support from local leaders and the community.

The Puget Sound Partnership has identified a number of targets that address ecosystem recovery in urban and urbanizing areas, including land cover and development, toxics in fish, and freshwater quality (Puget Sound Partnership 2016). An important strategy to help meet those regional ecosystem recovery targets is comprehensive watershed planning, which helps jurisdictions set priorities for restoration and green infrastructure projects.

GreenLink Bellingham (GreenLink) was a pilot project for comprehensive watershed planning in Bellingham, Washington. The goal of GreenLink was to demonstrate a coordinated approach for identifying projects with multiple benefits and that can be part of a green infrastructure watershed plan; projects must be cost-effective and responsive to community, economic, and environmental needs. The GreenLink process is intended to be replicated in other watersheds and jurisdictions to benefit water quality, mobility, habitat, and community quality of life.

GreenLink Bellingham sought to identify environmental stressors associated with land use actions and to explore achievable solutions for eliminating or reducing impacts of stressors. Specifically, the project aimed to promote the design and delivery of green infrastructure throughout Bellingham, with a specific focus on the Squalicum Creek watershed.

APPROACH

GreenLink Bellingham aimed for a holistic approach to evaluate the existing condition of watersheds. Spatial data for multiple characteristics (e.g., habitat, water quality, mobility) available from City of Bellingham (the City), Whatcom County, and Washington state agencies, as well as produced by the project team, were aggregated using geographic information systems (GIS). The project team applied weighting factors to the combined data to create maps that clearly illustrated watershed conditions.

GreenLink Bellingham built off decades of work by the City, nonprofit organizations, community groups, neighborhoods, and local businesses to manage Bellingham's critical land and water resources, prepare for climate change, maintain infrastructure, restore river and shoreline

ecosystems, and improve pedestrian and bicycle infrastructure. The City has a history of developing its plans in a coordinated way and based on robust analyses and public engagement. GreenLink was undertaken to further support the City's policies on green infrastructure, stormwater management, transportation, open spaces, wildlife and habitat areas, and shoreline and creek corridors. GreenLink was designed to assist in continuing to improve the function and performance of Bellingham's green infrastructure system, encouraging greater access and use of those spaces, ensuring the long-term health of watersheds, and extending the walking and cycling networks.

Project Identification and Prioritization

Just as growing communities need to upgrade, enhance, and connect their built infrastructure of roads, sewers, and utilities, they also need to upgrade, enhance, and connect their green infrastructure. Potential watershed projects were solicited from project stakeholders and then screened and evaluated to select feasible projects that will meet the project's goals. The projects selected show that the City's green assets can operate as key infrastructure that can shape and support sustainable growth, respond to the challenges of climate change, and deliver an improved quality of life for local citizens.

The project team and stakeholders used several criteria to rank potential watershed projects. To be considered, a project must:

- address stormwater quantity and/or quality
- provide multiple benefits

Projects that ranked highest:

- Are in locations where they can make an important ecological difference
- Have the most "bang for the buck"
- Build on projects that are already constructed, underway, or in existing City or other plans
- Support community desires

Definition of "Green Infrastructure"

"Green infrastructure" is an umbrella term that includes both built and natural systems. Natural green infrastructure includes community forests and farmlands, Puget Sound and other waterways, Bellingham's parks and open spaces, and parcel-scale green spaces and trees. When such spaces are planned and managed as an interconnected, green system, they can better absorb flood waters, manage stormwater, cool the urban environment, and clean the air. They

also serve to promote recreation and leisure, encourage walking and cycling, and provide habitat for fish and wildlife.

For the purposes of GreenLink Bellingham, green infrastructure was defined as green spaces that provide different functions within landscapes:

- At the citywide scale, green infrastructure is the patchwork of natural areas that provide fish and wildlife habitat, flood protection, recreation, food production, clean air, and clean water.
- At the neighborhood scale, green infrastructure serves as a stormwater management system that mimics nature, soaking up and storing water. Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban areas.

Research has shown that green infrastructure is highly effective at treating stormwater pollution and attenuating the increased stormwater runoff associated with urban development.

STUDY AREA

The overall GreenLink study area comprises six watersheds in Bellingham: Bellingham Bay, Spring Creek, Baker Creek, Squalicum Creek, McCormick Creek (tributary to Squalicum Creek), Toad Creek, Whatcom Creek (Figure 1). The Lake Whatcom watershed was excluded because of significant, recent investment in water-quality-based planning and subsequent implementation of the completed management plan.

The project team assessed existing conditions water quality, habitat, mobility, and community assets within the six watersheds. (See *Lay of the Land" Existing Conditions Maps* section of this report.) Community outreach was conducted throughout the city.

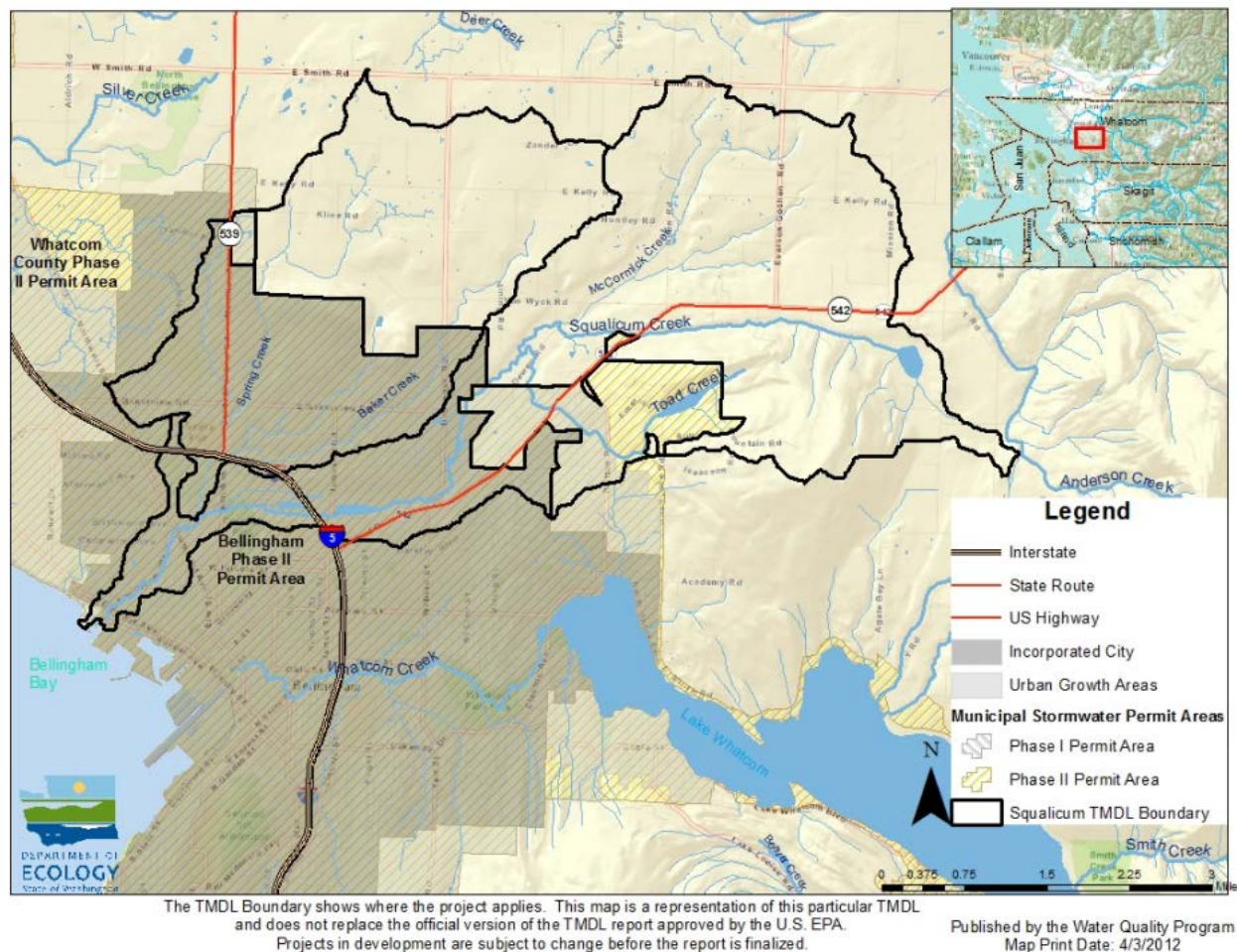


Figure 1. Squalicum Creek Watershed and Tributaries.

Source: Ecology 2012

FOCUS AREA

A detailed case study was completed for the Squalicum Creek watershed. The Squalicum Creek watershed encompasses land within the city limits of Bellingham and in unincorporated Whatcom County. It was selected for targeted study in GreenLink Bellingham because significant growth and development is expected to occur there. Bellingham is bordered on the south by the Chuckanut Mountains, on the west by Bellingham Bay, and on the east/southeast by Lake Whatcom and the foothills of the Cascade Range of mountains. Given these geographical constraints, Bellingham will naturally grow to the north and northeast into the Squalicum Creek watershed.

The City had high-resolution GIS data on the portion of the Squalicum Creek watershed within city limits (but not beyond). The County had only low-resolution GIS data for the portion of the

watershed outside of the city limits. Therefore, the focus area was limited the portion of the watershed within Bellingham (Figure 2) rather than the entire watershed.

Squalicum Creek is approximately 10 miles long. It originates in the Cascade foothills east of Bellingham and north of Lake Whatcom to Bellingham Bay. Major tributaries include Spring Creek, Baker Creek, Toad Creek, and McCormick Creek. The entire watershed encompasses approximately 25 square miles (Figure 3). Land uses in the watershed include suburban, industrial, rural, and natural areas.

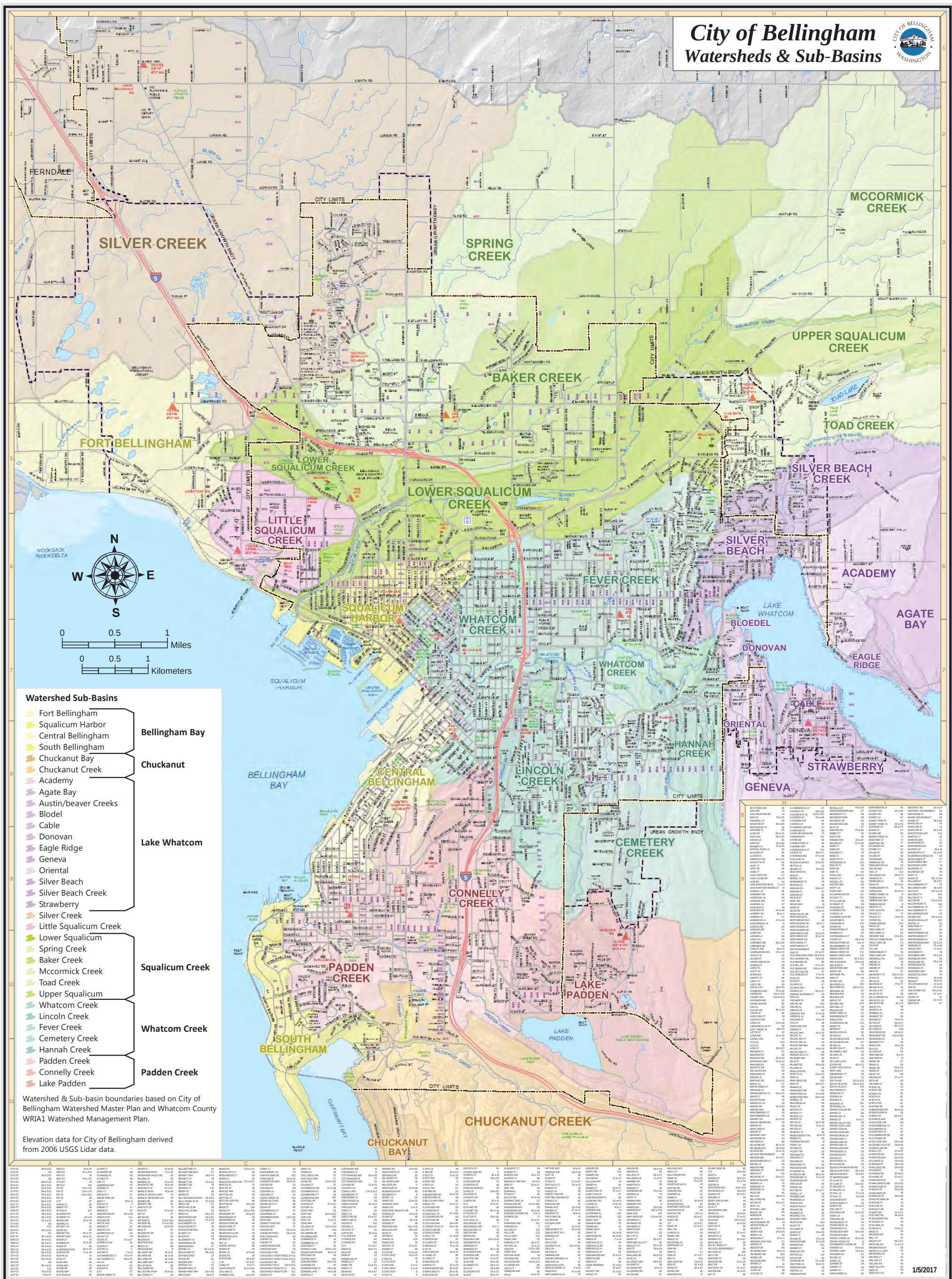
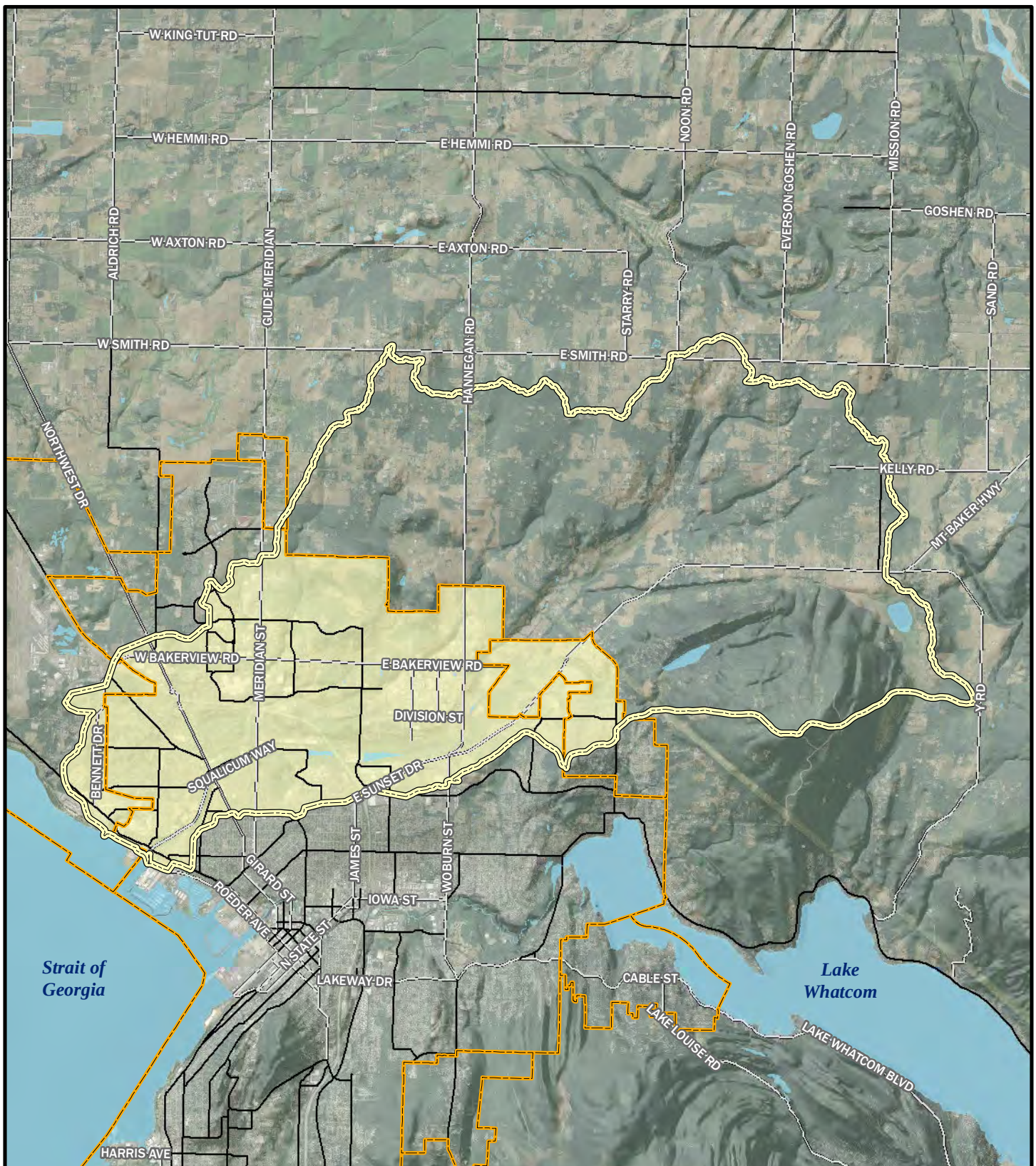


Figure 2. GreenLink Project Area: Six Watersheds of Bellingham.

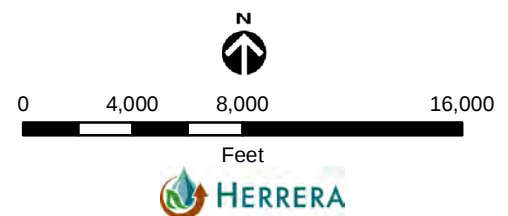


Legend

-  Squalicum Creek watershed
-  UGA boundary
-  Principal route
-  Secondary or collector route
-  Portion of the Squalicum Watershed inside of the Bellingham UGA

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Figure 3.
GreenLink Focus Area: Squalicum
Creek Watershed.



GREENLINK PROCESS

GreenLink Bellingham was designed as a pilot project to conduct green infrastructure planning, at a jurisdictional scale, considering benefits for three components: water quality (and quantity), habitat (for fish and wildlife), and community assets and mobility. Although several recent, watershed planning efforts in the Puget Sound area have sought to be holistic, none have addressed all three of these components.

GreenLink was partially inspired by the 2013 Redmond, Washington, Citywide Watershed Management Plan (Herrera 2013). The primary goal of that plan was to focus resources and efforts into five specific watersheds to recover in-stream habitat within decades. The plan established a long-term framework for restoring surface waters in Redmond using a watershed approach that included capital investment planning, design, and construction in addition to programmatic efforts. The plan: 1) reviews existing conditions within each watershed; 2) identifies the associated needs, requirements, opportunities, and constraints; and 3) focuses rehabilitation and mitigation efforts on priority areas and issues that have the greatest potential to protect or improve beneficial uses in Redmond's watersheds. The plan also identifies specific linkages between Redmond's watershed management plan and other planning activities to foster healthier watersheds. GreenLink Bellingham built on the approach used for Redmond's watershed management plan, and added the human mobility and community asset components to the assessment. The process for conducting GreenLink followed the seven steps described below.

Step 1: Convene Stakeholder and Technical Advisory Committees

A stakeholder advisory committee was convened in January 2015 to provide input into the GreenLink project and met numerous times over a nearly 2-year period. The committee identified data sources, gave feedback on the overall approach, helped gather implementable projects to be evaluated, and reviewed maps and project descriptions. Committee members were representatives from local, state, and federal agencies, local non-profits, businesses, and conservation districts. See *Acknowledgements* section for the complete list.

A technical advisory committee, which included representatives from the same entities as the stakeholder advisory committee, as well as from the City of Redmond, Washington, met less frequently. The committee's primary purpose was to ensure GreenLink Bellingham was grounded in the best available science.

All stakeholder and technical advisory committee meetings were open to the public. The meetings occurred from January 2015 to November 2016, with emailed updates in between meetings.

Step 2: Compile Existing Data (Citywide)

A major early effort of GreenLink Bellingham was the collection of available spatial data and previous studies for the six watersheds included in the study area. Data collection involved online searches, emails, and phone calls, and resulted in a compendium of more than 155 documents plus existing GIS datasets. Data from some of those documents and GIS datasets were used to create map layers showing existing conditions in the watersheds. Additional data from unpublished sources were included in some of the map layers. For example, for existing and planned stormwater retrofit projects, information was compiled from grant applications and unpublished reports to supplement publicly available datasets.

Step 3: Conduct Public Engagement and Education (Citywide)

Community engagement and education were key components of GreenLink Bellingham. The project team created basic public outreach tools, including a project website, press releases, fact sheets, and displays. Early in the project, a bus tour of the Squalicum Creek watershed was conducted for stakeholders and members of the public. The bus tour helped participants learn about existing conditions and projects in the watershed and encouraged them to share thoughts about green infrastructure opportunities. The team also developed educational games and interactive outreach booths, called “SpeakOuts,” in which participants answered survey questions using stickers on large panels. In addition, surveys of community members were conducted at local festivals, farmer’s markets, and other community events, and presentations and follow-up discussion occurred at regularly scheduled neighborhood meetings throughout the city. More information about public involvement is in the *Community Involvement* section of this report.

Step 4: Create Map Catalog of Existing Conditions (Citywide)

To create maps of existing conditions (or “Lay of the Land” maps) in the study area, data were initially compiled into three categories:

1. Habitat (marine, freshwater, shoreline, riparian, upland/terrestrial, etc.)
2. Water quality (conventional parameters, temperature, and toxic chemicals, etc.)
3. Community assets and mobility (trails, parks, community assets, transit, etc.)

Any datasets that were too incomplete to create maps were dropped. Examples include toxic chemicals and marine shoreline health. Two initial parameters were dropped for other reasons. Wetlands could not be mapped because the datasets include a range of dates in which the basic wetland rating system was revised and the technical advisory group deemed the dataset to be incomplete. Hydrologic function/flood capacity was dropped because the City is currently doing a high-quality assessment, which will replace existing data, so any layers produced for GreenLink would be out of date within months.

Concurrent with the first phase of GreenLink, the City was finalizing the Bellingham Habitat Restoration Technical Assessment (ESA et al. 2015). The habitat assessment is intended to provide a framework to guide future restoration, protection, and recovery of the terrestrial, freshwater, and riparian habitats in Bellingham. City staff asked that GreenLink build on that work. Therefore, the six watersheds in the study area were further divided into the subwatersheds that were delineated in the City's habitat assessment, and results from that assessment were used for the habitat component of the Squalicum Creek watershed focus effort.

To create the existing condition maps, parameters and stressors were assessed in each subwatershed. The current status of each parameter and stressor was assigned a relative value (high, moderate, low, etc.). The process is described in more detail in the *Lay of the Land Existing Condition Maps* section. The maps are presented in Appendix A.

Step 5: Conduct Heat Map analysis (Squalicum Creek Watershed)

After the catalog of Lay of the Land maps was complete, the project team aggregated the data to create "heat maps" that showed areas with highest need and greatest opportunity for projects in the Squalicum Creek watershed. All of the parameters and stressors that were mapped were then reviewed for redundancy and correlation to make sure that each was a unique driver. Three parameters in each category were selected to best represent the existing conditions for the analysis step. The three major categories handled this way were:

- Water quality
- Mobility
- Community assets

The three categories were overlaid to create a cumulative "function" heat map for each category. These three were combined in turn to show the "hot spots" where multiple needs could be met. The comprehensive heat map can be found in Appendix B and the supporting heat maps can be found in Appendix C.

Habitat was considered separately as a fourth category using existing maps from the City's recently published Habitat Restoration Technical Assessment in order to be consistent with the existing city work and to avoid duplication. The comprehensive GreenLink heat map was evaluated side by side with the habitat technical assessment maps found in Appendix F to identify the initial list of potential projects as described in the next section.

Step 6: Develop and Refine List of Potential Projects (Squalicum Creek Watershed)

Looking closely at the Squalicum Creek Watershed, the project team used two questions to identify potential projects that would provide the most benefit:

1. Where are projects needed most, or where are there gaps?

2. Where are existing or planned projects?

Water quality was used as the primary driver, followed by habitat and mobility/community assets. A list of potential projects was shown to the stakeholder and technical advisory committees to stimulate discussion of additional ideas and refine the list of potential projects. The list was narrowed to 20 projects. The project team then prepared high-level, one-page descriptions for each project, which are included in Appendix D. This step is described in more detail in the *Potential Projects: Squalicum Creek Watershed* section.

Step 7: Select Projects for Recommendation (Squalicum Creek Watershed)

Working with the stakeholder and technical advisory committees, the project team further assessed the 20 projects, using criteria such as ecological health and potential project performance. Nine projects, with the highest scores, were recommended for implementation in the Squalicum Creek watershed. More detailed descriptions of those nine projects were prepared and are provided in Appendix E. The more detailed descriptions are intended for use by nonprofit organizations, agencies, and others to help them obtain funding for project implementation.

COMMUNITY INVOLVEMENT

Community involvement was a key part of GreenLink Bellingham and had three main goals:

1. Educate the community about the value of green infrastructure for protecting the environment, creating economic opportunity, reducing costs by developing multifunction projects, and improving the health and quality of life of Bellingham residents
2. Gather the community's visions and ideas to inform and shape GreenLink Bellingham
3. Create support for green infrastructure approaches, planning, policies, and projects.

The community involvement program included traditional outreach methods and tools, such as a website (<http://greenlinkbellingham.org>), press releases, fact sheets, and displays. Bellingham has a strong neighborhood council system, so presentations about GreenLink were made at neighborhood meetings, with opportunities for dialogue about the project. Community involvement activities also included interactive outreach booths called SpeakOuts, in which participants answer survey questions using stickers on large panels, and surveys of community members conducted at local festivals, farmer's markets, and other community events. A bus tour of the Squalicum Creek watershed helped kick off the project. The community engagement and outreach activities are summarized below.

WATERSHED BUS TOUR

In March 2015, the project team hosted a bus tour of the Squalicum Creek watershed for stakeholder group and interested community members. The team's objective for the tour was to set the stage for GreenLink Bellingham by educating participants about watershed conditions, helping to create a common understanding of thorny key issues in the watershed, informing participants of past and ongoing projects in the watershed, discussing potential green infrastructure opportunities, and encouraging participants to provide input. Experts were invited and presented information about historical and existing conditions, ongoing projects and potential opportunities.

The tour included many stops, which are listed below along with brief descriptions of related projects and issues.

- Bellingham Technical College Low Impact Development Project.** As Bellingham Technical College has undergone significant redevelopment and expansion of new buildings, the college elected to incorporate many green infrastructure projects: green roofs, bioswales (vegetated channels that move stormwater; Figure 4), and rain gardens. Repurposing existing green infrastructure facilities would save the college money because it would not have to build large detention facilities.
- Bellingham's Greenway Program.** A conservation program that started in 1990 (through property tax levies) has since developed into a set of valuable, green infrastructure assets owned by the City and used for passive recreation. In total, about 150 transactions have netted approximately 900 acres of fish and wildlife habitat and trails. Land was initially acquired for conservation, habitat corridors, and stormwater management purposes. For example, in one location, the City is using an old channel to create green stormwater infrastructure.
- Birchwood Neighborhood.** The vast majority of parcels in the Birchwood neighborhood are developed, and most of the homes were legally built to code before stormwater controls were required. There is no regulatory requirement to retrofit existing development to implement modern stormwater management practices. Speakers at this stop discussed challenges related to incentivizing and planning for retrofitting neighborhoods with bioswales or other green infrastructure.
- Bakerview Costco Site.** At and adjacent to a new Costco store, development is occurring at a rapid pace. A large, residential development, incorporating 440 dwelling units (single- and multi-family) is planned for a site adjacent to the Costco site. Improvements required for new construction (including a regional stormwater pond) will meet the City's current stormwater standards, but there will be gaps in bike lanes, sidewalks, and other links to adjacent areas. At the nearby Fred Meyer store, required landscaping between the parking lot and the street was installed as mounds rather than as bioswales. The required landscaping could be retrofitted for bioretention. In sum, this is a transition area with partial infrastructure. Speakers at this stop focused on the following key questions: How can the City facilitate movement (circulation) of people and connection to other hubs and destinations? How can the City manage gaps in the stormwater infrastructure in the interim, that is, until future development can fill the gaps by building the rest of the system? Is there a way to incentivize the existing businesses to retrofit?

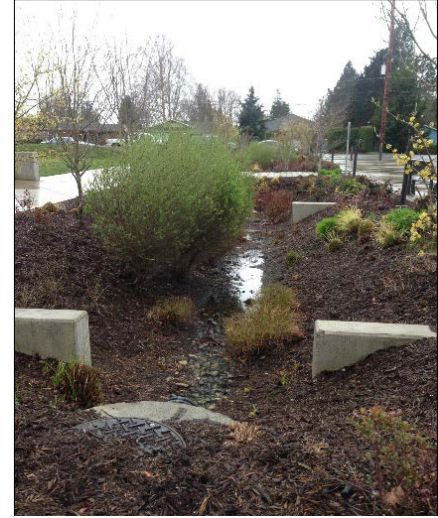


Figure 4. Bioretention Swale at Bellingham Technical College.

- **Bellis-Fair Mall.** The Bellis-Fair Mall opened in 1988 with parking lots sized for the peak shopping day, i.e., the day after Thanksgiving. Thus, the mall has overflow parking lots, from old lease terms, that are empty most of the time. One is now completely fenced off. Another was being used for motorcycle training as the bus tour drove by. The question is: What can we reasonably do that would help the landowners and would help with stormwater management? There are grassy bioswales along one side of the mall (along Interstate 5 [I-5]; Figure 5). Linking existing green infrastructure to retrofits could provide the greatest benefit for water quality and residual time to slow the flow of stormwater.



Figure 5. Grassy Bioswales Along I-5, Adjacent to Bellis-Fair Mall.

- **Trails.** There is conflict around managing access within riparian areas. On the one hand, there is desire to develop more trails (Bellingham has an excellent trail system); on the other is desire to protect and restore fish habitat, which requires trees and other riparian vegetation. To achieve a balance, future environmental stewardship can be encouraged by providing access to sensitive areas while managing the health of natural systems. Could an easy system of trail types be developed that correlates trail use to standard construction dimensions?
- **King Mountain Neighborhood.** A relatively high-density, single-family neighborhood next to King Mountain (Figure 6 is slated for significant growth. The steep slope behind existing homes is forested and provides wildlife corridors. The neighborhood lacks some urban services, such as transit, because it is an isolated area within the city limits. The key question related to this stop is: How do we maintain existing wildlife habitat and connections while increasing density within the city limits?



Figure 6. King Mountain Homes with Natural Area Behind.

- **James Street Corridor/Squalicum Creek Reroute at Sunset Pond.**

As part of the James Street Bridge replacement project, the City implemented several measures to improve water quality and salmon habitat. James Street was raised above the base flood elevation for Squalicum Creek, and seven modular wetland systems were installed (Figure 7). The modular wetlands filter stormwater and then direct it into an infiltration trench under an existing parking lot. They are estimated to cost 25 percent less than standard stormwater filters. A fish passage barrier at I-5 is being eliminated. Squalicum Creek is being rerouted to use former remnant channels, which will allow some natural stream migration, but will have essentially no net effect on downstream flow. Any new development in the area will be required to manage stormwater per current code. The City plans to improve the corridor by constructing a roundabout at the intersection of James and Bakerview Streets in 2017 and an Orchard Drive extension project in 2018. The Bay to Baker Trail goes through the site.



Figure 7. Modular Wetland Stormwater Filter Systems, James Street.

- **Cornwall Park.** At Cornwell Park in the lower watershed, the flow of Squalicum Creek tends to increase velocity. A notched fish way in the creek bottom, which is bedrock, is intended to help fish accommodate a significant elevation change. Key points discussed at this stop: 1) Some fish species avoid areas of high velocity flow and, therefore have difficulty with for some fish ways; 2) For stream crossings, bridges that span the creek are preferable to culverts.



Figure 8. Cornwall Park Notched Fish Way.

- **Lower Watershed Bluffs.** Areas along Squalicum Creek in the lower watershed are eroding along bluffs, causing significant sloughing. This is likely due to increased water flows in the creek. To help reduce erosion and restore fish habitat, some tree planting projects have occurred.

SPEAKOUT BOOTHS AND OUTREACH AT LOCAL EVENTS

The project team conducted outreach at fairs, farmer's markets, and events in Bellingham. In addition to providing education about GreenLink and green infrastructure, a SpeakOut approach was used to gain community input. A SpeakOut booth is a twist on conventional tabling. For the project, information about GreenLink was supplemented with a large, interactive survey that was

presented as a series of panels, inviting participants to physically engage with the project by writing comments on the survey and to provide their written and verbal thoughts and feedback. Figure 9 shows photographs of a GreenLink SpeakOut booth.



Figure 9. SpeakOut Booths and Surveys.

Participants were asked to identify which watershed they lived in with a sticky dot on a map, introducing participants to thinking about environmental issues at the watershed, rather than neighborhood, scale. Participants were asked to identify places they frequently visit with sticky dots and to provide written comments. This question became the basis for scoping categories for the Community Assets map. Participants were also asked to identify the mode(s) of transportation (walking, biking, driving, bus, or other) they used to get to their most-frequented places, as well as to write where there are “gaps” in their transportation network (e.g., missing bike trails or sidewalks). Finally, participants were asked to answer “What works in your community?” and “What could be improved in your community?” and to rank the priority of various improvements in their neighborhood in a matrix.

After taking the survey, many participants stayed at the SpeakOut booth for another 5 to 10 minutes, asking questions about the project and sharing their thoughts. In general, the

surveys showed that most participants at the community events lived within the Whatcom Creek and Bellingham Bay areas, which make up the core of downtown Bellingham and the nearby area.

NEIGHBORHOOD PRESENTATIONS

An important part of community engagement included presentations at neighborhood council meetings. Neighborhood councils not only have direct representation to city government through the Mayor's Neighborhood Advisory Council, they also tend to be politically engaged and know how to navigate the public comment process for City planning efforts, such as the comprehensive plan update. The presentations introduced GreenLink Bellingham and how green infrastructure could be a "first choice" planning solution for Bellingham, and then showed maps of existing conditions in their local area.

The GreenLink project team gave presentations to six neighborhood councils in Bellingham, including three in the Squalicum Creek watershed (**bold text**):

- **Cordata**
- **Cornwall Park**
- Puget
- Samish
- **Alabama Hill**
- Silver Beach

After the presentations, neighborhood council members asked questions and gave valuable feedback. Some of the information exchange included:

- Discussion by neighbors that the draft GreenLink map of "access to parks" was inaccurately rated because residents did not use the open space in their neighborhood as they would use a park (i.e., they lacked a developed park).
- Requests for copies of the existing conditions maps
- Desire to use the maps to consider projects for their neighborhood
- Potential for interconnection with the City's Greenways project
- Concern about increased precipitation (recently) and whether green infrastructure could mitigate excess flows
- Concern about leaves in the street contributing to localized flooding problems.

MAPPING AND ANALYSIS

“LAY OF THE LAND” EXISTING CONDITIONS MAPS

A “Lay of the Land” map catalog was created so that subsequent analyses could highlight areas of opportunity for GreenLink green infrastructure projects. After compiling available data and datasets, spatial data layers were created to map existing conditions for water quality, habitat, and mobility and community assets within the six Bellingham watersheds. Conditions of each attribute were categorized according to status (High to Low) using criteria specific to each attribute (Table 1) and using additional, citywide data layers (Table G-1, in Appendix G).

Each attribute was assessed at a subwatershed scale unless the data were more appropriately analyzed at a regional scale, such as habitat patch size and open space corridors. If there was only one data point in a subwatershed, that status was attributed to the whole subwatershed. If there was more than one data point and discrete quantitative values were known for those points, then the mean value was attributed to the whole subwatershed. If the data were qualitative, then the lowest value was attributed to the whole subwatershed. If there was no data point, then the attribution was assigned the same status as the upgradient subwatershed when both following conditions were met:

- The same tributary or main stem of the creek flows through both subwatershed
- The two subwatersheds have similar amounts of impervious surface (same or lower status)

Three attributes initially considered for inclusion in the GreenLink analysis were omitted. The attribute *freshwater toxic chemicals in water and sediment* was omitted because of insufficient data. *Water flow capacity of drainage and associated floodplain* was omitted because the City has new study underway, so data would be out of date soon. *Wetlands* was omitted because of inconsistent and incomplete data.

Table 1 lists the attributes considered in the existing conditions assessment. For each attribute, Table 1 shows the ranking criteria for each status category, the data source(s), and the source of ranking criteria. Five status categories were used to assess existing conditions: High (high function, including upper outliers), Moderately High (good function), Moderate (adequate function), Moderately Low (poor function), and Low (very poor function).

Table 1. Ranking Criteria for Attributes Considered in Existing Conditions Assessment.							
Attribute	Ranking Criteria by Category					Attribute Data Source	Criteria Source
	High	Moderately High	Moderate	Moderately Low	Low		
Water Quality (and Quantity)							
303(d) and 305(b)(4A)	Presence of listed water bodies						State GIS Layer
Freshwater Water Quality	1 standard deviation greater (higher quality) than water quality standards	Meets Class AA Standards	Meets Class A Standards	Meets Class B Standards	Does not meet a Class Standard	City’s 2013 water quality data (urban stream monitoring program), state 303d list	
Freshwater Index of Biotic Integrity (IBI)	Excellent [80, 100]	Good [60, 80)	Fair [40, 60)	Poor [20, 40)	Very Poor [20, 0)	City’s IBI data and WWU study	Puget Sound Stream Benthos
Coho toxic hot spots	NOAA Model Bins					Coho presence, impervious surface, road density, and commercial use type	NOAA (Feist 2011 and updated, unpublished maps)
Habitat							
Freshwater fish passage potential (as defined by WDFW)	100% No Barrier	67% Mostly Navigable	-	33% Barely Navigable	0% Complete Barrier	WDFW data	
Freshwater fish use (separate map for each species)	Documented Presence					SalmonScape, Salmon Stock Inventory, Spawner Surveys	

Table 1 (continued). Ranking Criteria for Attributes Considered in Existing Conditions Assessment.

Attribute	Ranking Criteria by Category					Attribute Data Source	Criteria Source
	High	Moderately High	Moderate	Moderately Low	Low		
Riparian Habitat function (within 150 feet of stream)	Full Canopy Cover	≥ 80% Canopy Cover	≥ 70% Canopy Cover and < 80% Canopy Cover	< 70% Canopy Cover and Fragmented	No canopy	ESA data intact habitat function (need to see definition)	WDFW Landscape Planning for Washington's Wildlife; Columbia River Atlas Team
Habitat patch size (meadow and forest)	> 25 acres	10-25 acres	5-10 acres	2-5 acres	< 2 acres	WDFW simple patch size	WDFW Landscape Planning for Washington's Wildlife
Habitat patch size: birds	> 500 acres	> 100 acres and ≤ 500 acres	> 50 acres and ≤ 100 acres	> 12 acres and ≤ 50 acres	≤ 12 acres	WDFW simple patch size	WDFW Landscape Planning for Washington's Wildlife
Habitat patch size: amphibians	Not supported by data	> 300 acres	> 65 acres and ≤ 300 acres	≥ 2 acres and ≤ 65 acres	< 2 acres	WDFW simple patch size	WDFW Landscape Planning for Washington's Wildlife
Percent natural landcover	> 80%	< 80% and ≥ 50%	< 50% and ≥ 40%	< 40% and ≥ 30%	< 30%	City and ESA data	WDFW Landscape Planning for Washington's Wildlife
Urban forest canopy height	> 50 feet	≤ 50 feet and > 33 feet	≤ 33 feet and > 20 feet	< 20 feet	No Tree Canopy	City data	Columbia River Atlas Team
Corridor Index WDFW method (combined buffer)	> 1,000 feet	≤ 1,000 feet and ≥ 500 feet	≤ 500 feet and ≥ 300 feet	≤ 300 feet and ≥ 150 feet	< 150 feet	WDFW	WDFW Landscape Planning for Washington's Wildlife

Table 1 (continued). Ranking Criteria for Attributes Considered in Existing Conditions Assessment.

Attribute	Ranking Criteria by Category					Attribute Data Source	Criteria Source
	High	Moderately High	Moderate	Moderately Low	Low		
Presence of priority species and habitat (susceptibility to development), including WDFW buffers	Presence/absence (not binned in 5 status categories)					ESA/City data Nahkeeta Northwest Habitat Assessment	
Significant plant assemblage	Presence/absence (not binned in 5 status categories)					WDNR Natural Heritage Program, City data	
Impervious area	< 10	≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 35%	> 35%	City data	Appendix D of WDFW Landscape Planning for Washington's Wildlife
Mobility and Community Assets							
Bike lanes/trails	Presence/absence (not binned in 5 categories)					City data, City TIP reports, ¹ and City TRAC/TRAM reports ²	
Sidewalks	Presence/absence (not binned in 5 categories)					City data, City TIP reports, and City TRAC/TRAM reports	

¹ City of Bellingham Transportation Improvement Program (TIP) reports released from 2012 through 2016 were used.

² City of Bellingham Transportation Reports on Annual Concurrency (TRAC) from 2011 through 2014 and Transportation Report on Annual Mobility (TRAM, 2015) were used.

Table 1 (continued). Ranking Criteria for Attributes Considered in Existing Conditions Assessment.							
Attribute	Ranking Criteria by Category					Attribute Data Source	Criteria Source
	High	Moderately High	Moderate	Moderately Low	Low		
City plans for street replacement (as an opportunity)	Presence/absence (not binned in 5 categories)					City data, City TIP reports, and City TRAC/TRAM reports	
Canopy coverage, by subbasin	>50% coverage	>40%	>30%	>10%	<10%	City data and ESA data	American forests
Community gathering places	Presence/absence (not binned in 5 categories)					Feedback from community outreach and City data	
Distance to walking trail access points, by subbasin (access within 1/2 mile)	95% (population) is within 1/2 mile	75% (population) is within 1/2 mile	50% (population) is within 1/2 mile	25% (population) is within 1/2 mile	< 25% (population) is within 1/2 mile	City data	
Distance to parks/open space, by subbasin	95% (population) is within 1/2 mile	75% (population) is within 1/2 mile	50% (population) is within 1/2 mile	25% (population) is within 1/2 mile	< 25% (population) is within 1/2 mile	City data	
Transit access, by subbasin (access to transit within 1/4 mile)	95% (population) is within 1/4 mile	75% (population) is within 1/4 mile	50% (population) is within 1/4 mile	25% (population) is within 1/4 mile	< 25% (population) is within 1/4 mile	City data	

GREENLINK HEAT MAPS

Once the catalog of Lay of the Land maps was complete, the GIS analysis moved on to produce heat maps that would facilitate identification and prioritization of projects to best achieve GreenLink Bellingham goals in the Squalicum Creek Watershed. Three categories (community assets, mobility, and water quality) and subcategories were used to identify opportunity areas and watershed needs. Criteria were developed for each category to help identify locations where projects would provide the most benefit. Datasets for the categories were overlaid to generate a cumulative heat map showing areas with multiple needs. Appendix C includes the heat maps for community assets, mobility, and water quality.

Subsequently, the project team and the stakeholder and technical advisory teams viewed the heat maps alongside habitat maps that were prepared for the City's Habitat Restoration Technical Assessment (ESA et al. 2015). Those maps are in Appendix F. The teams worked together to identify target locations for green infrastructure projects and set priorities for locations where projects are needed most. The rest of this section describes in some detail the process of developing the heat maps.

While the heat maps were developed to help identify and rank potential projects, they can also serve as useful planning tools. The maps identify areas where water quality, habitat, and mobility functions are poor, as well as areas where functions are meeting selected criteria (green areas on heat maps). Highly functioning areas are important to note because they represent opportunities to expand functional, intact habitat and effective, multi-modal transportation facilities.

Water Quality Analysis

Key water quality and quantity drivers/indicators were chosen to develop the water quality heat map (see Appendix C). Cumulative impacts were calculated from upstream to downstream throughout the Squalicum Creek watershed.

For consistency with past planning efforts, some of the water quality parameters selected for the analysis were taken directly from the Bellingham Habitat Restoration Technical Assessment (ESA et al. 2015). That analysis was done at the subwatershed or habitat patch scale, whereas the GreenLink analysis was done at the pixel scale. The intent was to take a subset of the methods used in the habitat assessment, where data were available, and apply them to a finer scale for the entire watershed. The parameters for the GreenLink water quality GIS analysis were derived from the "Water Quality and Quantity" and "Chemical Regulation" criteria for characterizing upland forest habitat in the habitat assessment (ESA et al 2015).

Parameters

Density of Stormwater Outfalls

The density of upstream stormwater outfalls draining to each 0.1 river mile (RM) of major streams in the Squalicum Creek watershed was measured. The calculation is cumulative, meaning that each RM includes the density of outfalls for the entire area upstream of that RM.

Impervious Area

The percent impervious area for the area draining to each 0.1 RM of major streams in the Squalicum Creek watershed was measured. The calculation is cumulative, meaning that each RM includes the percent impervious area for the entire area upstream of that RM.

Water Quality Impairments

Water quality monitoring data for streams in Bellingham include coliform bacteria, pH, dissolved oxygen, and temperature. For each subwatershed location pixel, the “worst-case” score from the GreenLink existing conditions analysis was used. If the subbasin was listed as low-functioning for coliform bacteria, pH, dissolved oxygen, or temperature, it was included.

Scoring

The data were evaluated on a scale of 1 (low functioning) to 5 (high functioning) using the criteria summarized in Table 2. The intent of applying these criteria was to prioritize areas in the Squalicum Creek watershed where the most potential improvement to water quality in receiving waterbodies could be obtained.

Table 2. Water Quality Criteria and Scoring Used to Produce Heat Maps.						
Dataset		Ranking Criteria by Category (and Score)				
		High Function (score 5)	Moderately High Function (score 4))	Moderate Function (score 3)	Moderately Low Function (score 2)	Low Function (score 1)
How many stormwater outfalls are upstream per 0.1 RM?	Outfall dataset from the Habitat Technical Assessment	0	1 to 50	51 to 150	300	>300
What percentage of the subbasin is impervious per 0.1 RM?	NLCD 2011 percent imperviousness raster	< 10%	≥ 10% and <20%	≥ 20% and <30%	≥ 30% and <35%	> 35%
What is the lowest score (based on the GreenLink existing conditions analysis) per subbasin based on water quality sampling for temperature, dissolved oxygen, coliform bacteria, or pH?	GreenLink Bellingham analysis based on Bellingham urban stream monitoring program (Bellingham 2013b) water quality data	1 standard deviation greater (higher quality) than water quality standards or no monitoring data	Meets Class AA standards	Meets Class A standards	Meets Class B standards	Does not meet a class standard

Community Assets Analysis

Community asset parameters were selected to prioritize projects that provide easy opportunities for healthy activities for community members by promoting access to parks and open space or walking trails. Community gathering spaces that are accessible by all modes of transportation were also highly scored. Community asset scoring was also influenced by residential population, with access to community assets more highly scored in densely populated areas. Table 3 shows the scoring criteria based on the number of categories of community assets within 1/2 mile of each parcel. Scoring is also influenced by population, with more densely populated areas receiving a higher weight. Red cells indicate low functioning; orange cells indicate moderately low functioning; yellow cells indicate moderately high functioning; and green cells indicate high functioning.

Table 3. Community Assets Criteria and Scoring Used to Create Heat Maps.					
Criteria	Score	Population per Residential Parcel^a			
		0 (non-residential parcel)	< 2.4 people	> 2.4 and < 10 people	> 10 people
No community assets (as mapped) within 1/2 mile	0	30	20	10	0
1 category of community assets within 1/2 mile	1	31	21	11	1
2 categories of community assets within 1/2 mile	2	32	22	12	2
3 categories of community assets within 1/2 mile	3	33	23	13	3

^a City of Bellingham 2015 Mapping.

Red cells indicate low functioning; orange cells indicate moderately low functioning; yellow cells indicate moderately high functioning; green cells indicate high functioning.

Mobility Analysis

Mobility parameters were selected to rank access to existing transit stops, pedestrian ways (i.e., sidewalks), and bikeways. Mobility scoring was also influenced by residential population, with mobility more highly scored in densely populated areas. The colors in Table 4 indicate those used in developing the mobility heat map.

Table 4. Mobility Criteria and Scoring Used to Create Heat Maps.					
Criteria	Score	Population per Residential Parcel^a			
		0 (non-residential parcel)	< 2.4 people	> 2.4 and < 10 people	> 10 people
No mobility infrastructure (as mapped) within 1/2 mile	0	30	20	10	0
1 category of mobility infrastructure within 1/2 mile	1	31	21	11	1
2 categories of mobility infrastructure within 1/2 mile	2	32	22	12	2
3 categories of mobility infrastructure within 1/2 mile	3	33	23	13	3

^a City of Bellingham 2015 Mapping.

Red cells indication low functioning; orange cells indicate moderately low functioning; yellow cells indicate moderately high functioning; green cells indicate high functioning.

Cumulative Heat Map

Datasets within the three categories (water quality, community assets, and mobility) were overlaid to generate a cumulative ("rolled-up" heat map (Appendix B). The map illustrates areas with multiple needs and helped the project team and others to target and rank potential project locations. The cumulative map also shows locations of planned retrofit projects.

HABITAT MAPS

Data layers related to habitat used for the project selection and ranking process were from the Bellingham Habitat Restoration Technical Assessment (ESA et al. 2015), which evaluated various terrestrial and freshwater habitats. No additional habitat analysis was done for the Squalicum Creek watershed. Habitat maps used for GreenLink are in Appendix F.)

POTENTIAL PROJECTS: SQUALICUM CREEK WATERSHED

Two framing questions were used when reviewing the heat maps and habitat maps for potential projects:

- Where are the projects needed most (i.e., for the heat maps, what areas show the most red/orange)?
- Where are existing or planned projects (i.e. where is a project planned that can be expanded)?

Following the map review, the project team identified potential projects and the stakeholder advisory committee nominated projects to include in the initial project list for the Squalicum Creek watershed. The nominations were based on the following screening criteria.

- Effectiveness
 - o Most ecological lift for documented deficits in one or more project categories (mobility, community assets, water quality, habitat)
 - o Durability and long-term performance
- Efficiency
 - o Achieves multiple project objectives
 - o Economies of scale or synergistic with another project
 - o Low cost (including capital cost as well as and operation and maintenance costs)s relative to performance
- Feasibility/Timeliness
 - o Probability that project would be implemented within 5 years (considering site ownership/control and funding availability)
 - o Community support
 - o In an existing city plan

An initial list of 20 projects (18 site-specific projects and two programmatic projects) was generated following application of the screening criteria shown above. Figure 5 shows the project locations and Appendix D provides one-page descriptions for each project. Project description sheets include a summary of existing conditions, a project overview, illustrative photos or graphics of potential solutions, and project benefits.

TOP GREENLINK RECOMMENDATIONS: SQUALICUM CREEK WATERSHED

The 20 projects on the initial list were reevaluated and ranked qualitatively (with a score of high, medium, or low), based on their ability to accomplish, achieve, or improve one of the following criteria.

- High ecological lift
- Durability and long-term performance
- Ability to achieve multiple project objectives
- Economies of scale or synergistic with another project
- Low capital and operational and maintenance costs relative to performance
- Reasonability of implementing the project in a 5-year period
- Community support
- In an existing city plan.

Evaluation and ranking results are shown in Table 5. Eleven of the 20 projects were eliminated for a number of reasons, including lack of available space, a lower habitat or water quality benefit compared with other projects, complexities related to land acquisition complexities, or high project cost. The nine remaining projects (highlighted with blue in Table 5) were recommended for further evaluation. Those top nine projects are summarized in Table 6 and shown on Figure 10. Three-page project descriptions of each project, which present concept designs, costs, regulatory considerations, and constraints on implementation, are included in Appendix E. Each three-page description also includes graphics, such as a cumulative heat map, photographs, local access, and a project layout.

Table 5. Final Project Selection Matrix.
(projects highlighted in blue were selected as top recommendations)

Project Number	Project Name	Move Forward?	Notes	High Ecological Lift	Durability and Long-Term Performance	Achieves Multiple Project Objectives	Economies of Scale or Synergistic	Low Cost Relative to performance	Probable 5-Year Implementation	Community Support	In an Existing City Plan?
1	Fred Meyer Parking Lot Retrofit and Improvements	No	Highly utilized parking lot; not much space available	L	M	M	L	M	L	L	No
2	West Bakerview Road Multimodal Transportation and Safety Upgrades	No	Small impact (intersection only)	L	L	L	L	L	L	L	Yes
3	Cordata Parkway and Stuart Road Enhanced Roundabout Installation	No	While adequate space appears to be available for additional GSI in the right-of-way, because of the large amount of pollution-generating impervious areas, the overall scoring is lower on this project than on James Street project	L	M	M	L	L	L	H	Yes
4	Bellis-Fair Mall - Parking Lot Retrofit and Improvements	Yes	Large impervious area; high scoring; high visibility; single land owner; integration with mobility elements; adequate space available	H	H	H	L	H	H	M	No

5	Meridian Street Shopping Area – North Parking Lot Retrofit and Improvements	No	More complex land ownership; Bellis-Fair Mall is a better version of this (if that project works out, this project could be a follow-up)	M	H	H	L	H	L	M	No
6	McLeod Road Urban Design and Watershed Enhancement	No	Small area in basins that can be improved; low volume road; low pollutant load from McLeod Road	L	M	L	L	L	M	L	No
7	Meridian Street Shopping Area – South Parking Lot Retrofit and Improvements	Yes	Potential to treat large impervious area; big impact for the money; more greenspace available for retrofitting	H	H	H	L	H	H	H	No
8	Squalicum Creek Nature Center and Culvert Fish Barrier Removal	Yes	This culvert replacement will open up previously restored habitat, so high leverage project; consistent with the City's Park Master Plan	H	H	H	M	H	H	H	Yes
9	Squalicum Way Culvert Replacement	No	Existing culvert is partially passable; expensive	L	H	L	L	L	M	L	No
10	Squalicum Way - North Bluff Area Stabilization and Riparian Habitat Restoration	No	Will prioritize addressing the south bluff	M	M	L	L	M	H	M	No
11	Squalicum Way - South Bluff Area Stabilization and Riparian Habitat Restoration	No	Bluff area is more unstable than north; will prioritize	L	M	M	L	M	L	M	No
12	James Street Multimodal Street Improvements	Yes	Leverages City plan; multi-benefit; adjacent to creek; leverages previous restoration	M	H	H	H	L	H	H	Yes
13	Orchard Drive Multimodal Use Extension	Yes	Leverages City plan; multi-benefit; adjacent to creek; leverages previous restoration	H	H	H	H	H	H	H	Yes
14	Green Stormwater Infrastructure Retrofits with Proposed Trail Improvements I	No	Small-scale project; low ecological lift	L	M	H	L	M	H	H	Yes

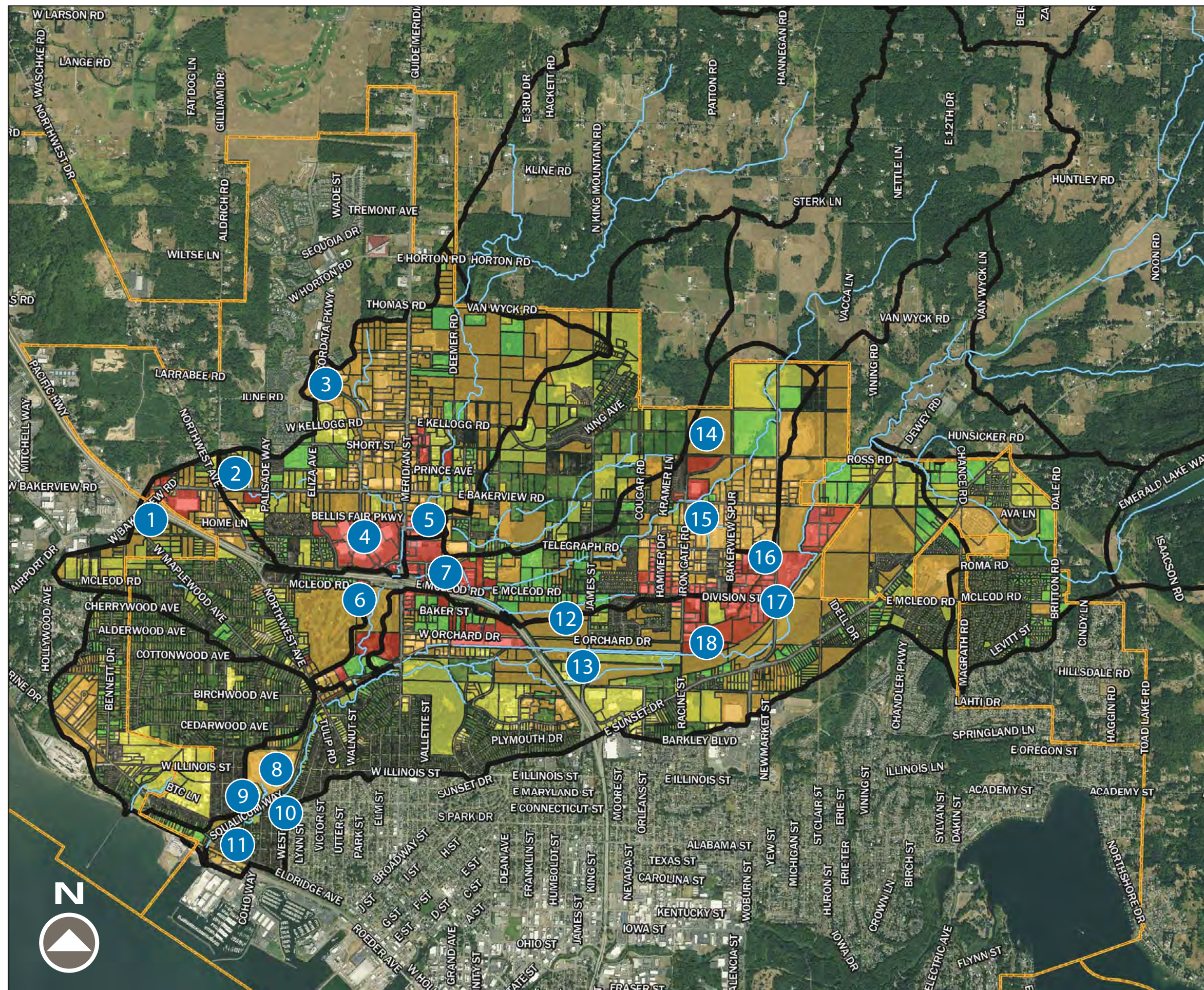
15	East Bakerview Road Stream Basin Enhancement	No	Small basin area to impact; area of greater impact would be to the south in Irongate	M	H	M	M	M	M	L	No
16	Hannegan Road Industrial Site Stabilization Improvements	Yes	Large scale impact; high ecological lift	H	H	H	M	H	M	M	No
17	Squalicum Regional Restoration Park and Interpretive Center	Yes	Meets City need for regional restoration site; multi-benefit; high ecological lift; large-scale impact	H	M	H	H	H	M	H	No
18	Green Stormwater Infrastructure Retrofits with Proposed Trail Improvements II	No	Small-scale project; low ecological lift	L	M	H	L	L	H	H	Yes
19	Fee In-Lieu Stormwater Mitigation Program (programmatic; not shown on map)	Yes	Large benefit to full watershed; flexible and adaptable	H	H	H	H	H	L	M	No
20	Green Stormwater Infrastructure Incentive Program (programmatic; not shown on map)	Yes	Large benefit to full watershed; flexible and adaptable	H	H	H	H	H	M	H	No

GSI = green stormwater infrastructure

L = low; M = medium; H = high

Table 6. Summary of Recommended Projects.		
Project Number	Name	Description
4	Bellis-Fair Mall Parking Lot Retrofit and Improvements	Project would construct bioretention cells in the parking lot of the Bellis-Fair Mall to improve water quality and reduce the amount of impervious surface area. The project would also incorporate bike and, potentially, transit improvements.
7	Meridian Street Shopping Area – South Parking Lot Retrofit and Improvements	Project would incentivize commercial landowners to complete water quality landscape improvements on their property to improve water quality and habitat.
8	Squalicum Creek Educational Kiosk and Culvert Fish Barrier Removal	Project would build on recent restoration work by eliminating a current fish passage barrier. It would also include construction of an educational kiosk.
12	Supplemental green stormwater infrastructure for the James Street Multimodal Street Improvements	Project would enhance the currently planned transportation project to include GSI improvements, thereby providing water quality benefits in addition to the mobility benefits that are the focus of the transportation project.
13	Supplemental green stormwater infrastructure GSI for the Orchard Drive Multimodal Use Extension	Project would enhance the currently planned transportation project to include GSI improvements, thereby providing water quality benefits in addition to the mobility benefits that are the focus of the transportation project.
16	Iron Gate Neighborhood Retrofit	Project would provide retrofit stormwater treatment and promote infiltration where feasible in a predominantly industrial area through a combination of public and private projects.
17	Squalicum Regional Restoration Park and Interpretive Center	Project would plant riparian restoration, create new trails, and provide stormwater retrofit treatment along Squalicum Creek.
19	Fee-in-lieu Stormwater Mitigation Program Feasibility Study	Project would evaluate the feasibility of establishing a stormwater control transfer program that targets the Squalicum Creek watershed. The program would allow developers in certain areas to pay into a fund that would support implementation of flow control in priority areas with the highest ecological lift.
20	Green Stormwater Infrastructure Incentive Program Development	Program would reimburse private land owners for implementing voluntary GSI retrofits on their property.

GSI = green stormwater infrastructure



GREENLINK BELLINGHAM POTENTIAL PROJECTS

- 1 Fred Meyer Parking Lot Retrofit and Improvements
- 2 West Bakerview Road Multimodal Transportation and Safety Upgrades
- 3 Cordata Parkway and Stuart Road Enhanced Roundabout Installation
- 4 Bellis Fair Mall - Parking Lot Retrofit and Improvements
- 5 Meridian Street Shopping Area - North Parking Lot Retrofit and Improvements
- 6 McLeod Road Urban Design and Watershed Enhancement
- 7 Meridian Street Shopping Area - South Parking Lot Retrofit and Improvements
- 8 Squalicum Creek Nature Center and Fish Barrier Removal
- 9 Squalicum Way Culvert Replacement
- 10 Squalicum Way - North Bluff Area Stabilization and Riparian Habitat Restoration
- 11 Squalicum Way - South Bluff Area Stabilization and Riparian Habitat Restoration
- 12 James Street Multimodal Street Improvements
- 13 Orchard Drive Multimodal Use Extension
- 14 Green stormwater Infrastructure Retrofits with Proposed Trail Improvements I
- 15 East Bakerview Road Stream Basin Enhancement
- 16 Hannegan Road Industrial Site Stabilization Improvements
- 17 Squalicum Regional Restoration Park and Interpretive Center
- 18 Green stormwater Infrastructure Retrofits with Proposed Trail Improvements II
- 19 Fee In-Lieu Stormwater Mitigation Program (Not shown on map)
- 20 Green Stormwater Infrastructure Incentive Program (Not shown on map)

Figure 10.
GreenLink Bellingham Potential Projects.

FINDINGS AND LESSONS LEARNED

GreenLink Bellingham was a pilot effort to determine if a coordinated and comprehensive approach to gathering data, creating maps and generating green infrastructure projects on a watershed scale can be done in a cost-effective, meaningful manner. Findings and lessons learned included:

- As a whole, the City of Bellingham has well-coordinated plans and has made priorities of both restoration and stormwater management projects. If the City continues to implement restoration and stormwater retrofit projects based on high-quality data, conditions should only improve. There remain areas of poor water quality in Bellingham's watersheds that can be addressed over time with specific projects and as redevelopment occurs.
- There was a substantial amount of data for Bellingham's watersheds that had already been generated by the City or other agencies.
- The amount of water quality monitoring data for pollutants of concern in fresh waterbodies was limited.
- Gathering and compiling data was a major challenge. Many data were in different datasets and housed in different departments at the City or at other agencies, some data were unpublished, and the data format was not uniform across datasets.
- It is critical to build on existing plans to capitalize on robust planning and public engagement that has been done before. Linking such existing plans was a key component of GreenLink Bellingham.
- The stakeholders did not begin the process with a ready list of potential projects. Therefore, more work than anticipated was necessary to develop feasible projects for use in the GreenLink analysis.
- Because project stakeholders have a wide range of technical sophistication, data for stakeholders need to be provided at various levels of detail.
- Community members were generally enthusiastic about the concept of green infrastructure projects. They were eager for the project team to return and give them results of the analysis.

- The pilot project demonstrated that pulling together existing data and soliciting feedback from stakeholders and community members can provide useful maps that highlight focus areas for project recommendations.

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