



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## **Lower Skagit Tributaries Temperature Implementation Strategy**

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**Actions to Revitalize Regional Efforts  
to Reduce Water Temperatures**

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For more information contact:

## Water Quality Program

P.O. Box 47600

Olympia, WA 98504-7600

Phone: 360-407-6600

[Washington State Department of Ecology](http://ecology.wa.gov) — [ecology.wa.gov](http://ecology.wa.gov)

- Headquarters Office, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Union Gap 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

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**Lower Skagit Tributaries  
Temperature Implementation Strategy**

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Water Quality Program

Washington State Department of Ecology

Olympia, Washington

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# Executive Summary

In 2004, the Washington State Department of Ecology (Ecology) published a study about high surface water temperatures in several tributaries to the Lower Skagit River. Ecology completed a Water Quality Improvement Report (WQIR or Total Maximum Daily Load/TMDL) in 2008 which described the severity of the impairment and restoration methods to reduce water temperatures. Reestablishing riparian forested buffers is the primary restoration practice needed to reduce water temperature. Forested buffers increase effective shade and reduce the potential of surface water heating. Numerous organizations are actively working in the Skagit River watershed to promote salmon recovery through plantings, easements, property acquisition, and other multi-benefit restoration practices. However, based on the historic and current rates of restoration, the TMDL's goal of planting 100% of all riparian areas by 2020 will not be met.

The slow pace of restoration led the Puget Sound Partnership Leadership Council to adopt Resolution 2019-02 in March 2019 requesting "...the Department of Ecology develop and implement a nonpoint Strategy to achieve temperature standards. This Strategy... should identify targeted Action Items to attain measurable progress as well as longer term area-wide strategies." Ecology agreed to convene an Advisory Group and prepare the "Lower Skagit Tributaries Temperature Implementation Strategy" (hereinafter referred to as the Strategy) by December 31, 2019. Due to the short timeline and limited funding, the Strategy describes broad, high level goals to inform future work and discussions, and identified specific actions that Ecology will take in the near term.

Ecology invited representatives from local government units, tribes, non-profit organizations, conservation organizations, and stakeholder groups to attend a series of five meetings to develop, inform, and refine the Strategy with the intent to renew efforts and refocus attention on surface water temperatures in the TMDL area. This Strategy summarizes the discussions and recommendations of the Advisory Group to increase the pace of riparian restoration (Chapters 2 and 4). Informed by those discussions, Ecology has identified action items for Ecology to implement in 2020 (Chapter 5). The Strategy is not a technical summary of the status of temperatures, riparian restoration or other relevant conditions, however a brief summary of the tributaries and their priority sequence for renewed efforts is found in Chapter 3.

The Advisory Group's discussion identified elements that are key in increasing the pace riparian restoration and reinvigorating other temperature improvement work in the Skagit Tributaries. Those actions are organized under the key elements of "Outreach and Education", "Restoration Efforts", "Data and Research", and "Strategic Planning and Policy".

Importantly, the Advisory Group members have expressed a desire to continue the discussions and coordination that has begun with this 2019 effort. Looking ahead to 2020 and beyond, Ecology will convene quarterly meetings of the Advisory Group to facilitate coordination between participants.

These meetings, augmented by conference calls and small group work as needed, will:

- Plan future actions and funding strategies, with an initial emphasis on reach scale planning, buffer maintenance, incentive program improvements, and local financial capacity.
- Provide input on Ecology's work plan and associated deliverables.
- Share information on local and regional efforts, and other national and state-wide projects designed or used to improve creek temperatures.
- Strive to obtain additional financial and technical resources to advance the Strategy and make measurable progress toward attaining water quality standards.

In addition to organizing ongoing Advisory Group meetings, Ecology has identified its own actions to be taken in 2020 and beyond to help put the key elements in place. With existing resources, Ecology will work with conservation partners, stakeholders and the public, as appropriate, to:

- Help raise awareness of the problem and available solutions through direct outreach activities and developing an online story map.
- Help establish a community-based social marketing campaign by performing informal community research and developing a scope of work for a potential future contractor.
- Help increase the pace of riparian restoration by supporting funding opportunities for reach-scale planning, performing field surveys to begin to identify cold water refuge and heat reduction opportunities, and developing evaluation criteria to inform project planning and/or compliance assurance as appropriate.
- Help advance data assessment and research objectives by identifying data-sharing opportunities and barriers, and performing an environmental justice analysis to inform outreach activities.

Ecology and numerous conservation partners are committed to improving water quality in the lower Skagit River tributaries to support salmon recovery and climate change resiliency. This Strategy is the beginning of Ecology's renewed efforts to work with partners to identify and implement actions which revitalize regional efforts to reduce water temperatures.

# Chapter 1: Introduction

Water temperature is an important physical parameter, which can determine the overall health of aquatic ecosystems. Many rivers and streams in the Puget Sound region are above state water quality standards for temperature, threatening the habitat needs for cold-water salmonids. The most effective known method to reduce surface water temperature is to increase effective shade in areas where trees have been removed. Restoring or maintaining forested riparian vegetation is an essential activity in lowering temperatures and critical for the success of Salmon and Orca recovery efforts.

The Skagit River is labeled as “one of the most unspoiled strongholds of fish and wildlife habitat in the Puget Sound” in the [2005 Chinook Recovery Plan<sup>1</sup>](#). The Skagit River provides spawning ground for all five species of Pacific salmon, often including several independent populations of Chinook, Chum, Coho, Bull Trout, as well as populations of Pink, Sockeye, Steelhead and Cutthroat. Due to the presence of diverse and numerous species, as well as its role in providing an estimated 50% of the wild Chinook population for the Puget Sound, restoring and maintaining the health of the Skagit River and its tributaries is paramount to salmon and Orca recovery efforts.

The Skagit River, including its tributaries, is a Treaty-protected Usual and Accustomed Area for local Tribes’ cultural, spiritual, subsistence and commercial way of life. The Sauk-Suiattle Indian Tribe, the Upper Skagit Indian Tribe and the Swinomish Indian Tribal Community have been negatively affected by dwindling salmon runs. They have invested considerable effort in habitat protection and restoration and continue to press for meaningful progress on improving temperatures in the Lower Skagit River tributaries.

Similar to the importance of the fishery, agriculture is a crucial component of Skagit County’s economy and a defining feature of the region’s identity. Skagit County leads in the Nursery, Greenhouse, Floriculture, Sod commodity category, producing more Tulips, Iris, and Daffodils than any other county in the United States. Skagit also ranks fifth in Washington State in Milk from Cows production and the Vegetable, Melon, Potatoes, and Sweet Potatoes commodity categories. Agriculture in Skagit County is important for food security in Western Washington, as well as in serving as a major producer of cabbage, table beet, and spinach seed for international trade.

The conflict between temperature and riparian restoration is often not based on a fundamental disagreement about the need for clean water, healthy fisheries, or quality habitat, but instead centers around who bears the financial or practical burden of restoration as an individual for the purposes of the public good. Across the United States, riparian restoration efforts frequently rely on conservation programs, incentives, property acquisition, easements, and cost sharing to reduce the burden on participating landowners. Unfortunately, these programs are

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<sup>1</sup> <http://skagitcoop.org/wp-content/uploads/Skagit-Chinook-Plan-13.pdf>

often limited by insufficient funding, grant limited timelines, and programmatic inflexibility. Participation is further delayed when restoration requires a land use change, particularly when the current land use is tied to economic or personal use/control of the property.

Balancing the issues related to environmental recovery and land management is an ongoing, difficult task. Conflict over the intersections of water quality, endangered species, urban development, and agricultural land use have led to multiple legal challenges, ordinance and policy revisions, and program developments. Recognizing and balancing the importance of healthy watersheds, robust fisheries, sustainable development, and ensuring the viability of agriculture has long been the goal of the Skagit County Board of Commissioners, County staff, and citizens.

Commissioner Dahlstedt stated during the Board of County Commissioners meeting on August 5th, 2014 that "...with 50% of the wild Chinook in the Puget Sound in the Skagit River system, if this is a priority then they (the legislature) better send money to where most of the fish are." While funding alone will not reduce water temperature, sufficient capital does not currently exist to remove many of the barriers preventing riparian restoration efforts from achieving the goals described in the TMDL. An increased investment in the Skagit River watershed is needed to fully support the recovery of salmon and Orca populations.

## **The Skagit River watershed**

The Skagit River Basin includes some area within British Columbia, Canada and covers most of Skagit County as well as the eastern parts of Whatcom and Snohomish Counties (Figure 1). The entire Skagit River watershed encompasses about 2,370 square miles. Major tributaries in the Skagit River include the Upper Skagit, Baker River, Cascade River, Sauk River, and Lower Skagit River.

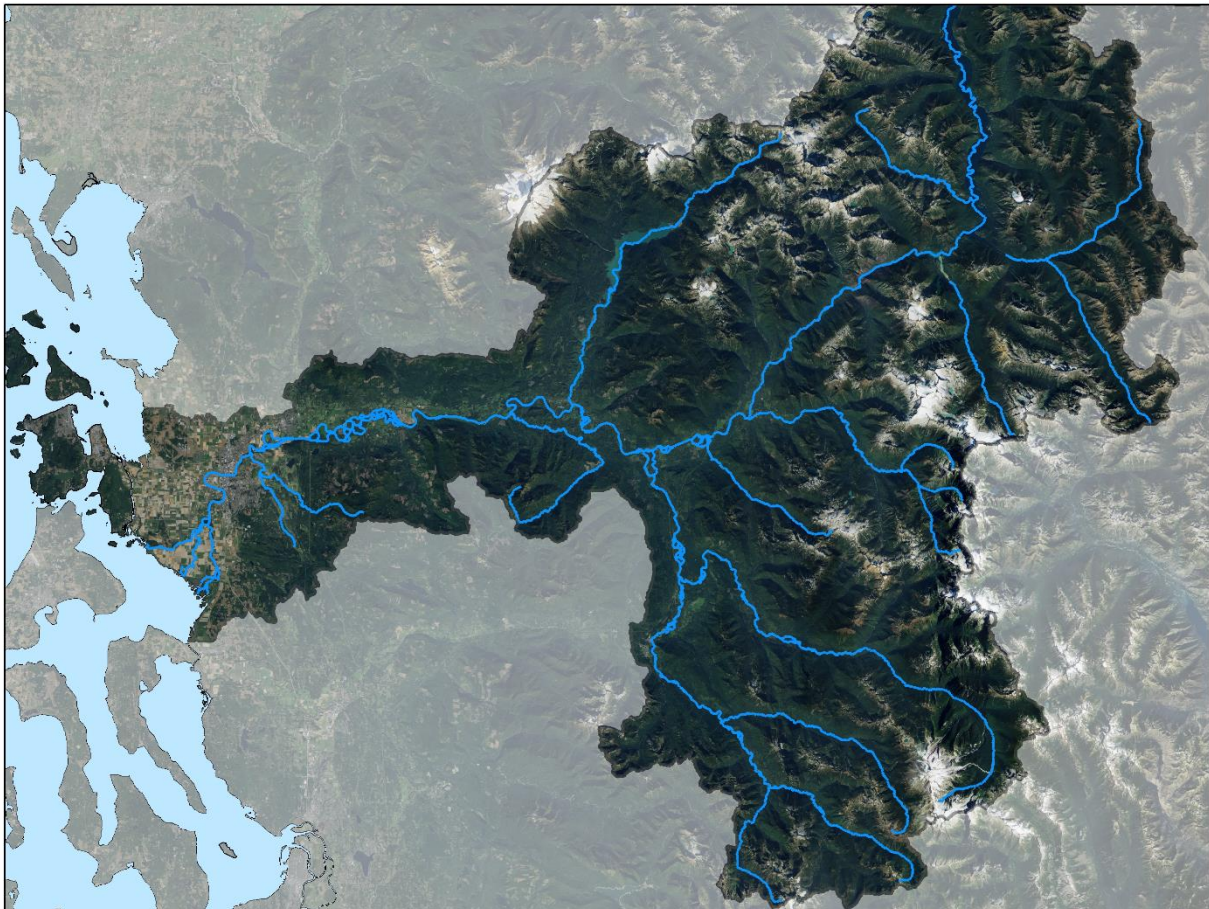
The Lower Skagit River, its tributaries, sloughs, and estuaries serve as important migration corridors, spawning areas, and rearing areas for five major species of salmon (Chinook, Coho, Pink, Chum, and Sockeye), as well as steelhead and cutthroat trout, and two char species— Dolly Varden and bull trout. The Skagit River watershed contains the second largest wild run of coho salmon and the largest run of Chinook salmon in the Puget Sound Region. The salmonid species' Puget Sound populations listed by federal and state agencies as threatened under the Endangered Species Act include (with listing dates):

- Puget Sound Chinook salmon (March 24, 1999)
- Puget Sound bull trout (November 1, 1999)
- Puget Sound steelhead (May 7, 2007)

As shown in Figure 1, the 2004 temperature TMDL focuses only on the tributaries within the Lower Skagit River watershed. Given the large size of the Skagit watershed, different areas face different challenges.

Although some restoration activities in this document may help restore other parts of the Skagit, Ecology and the Advisory Group discussed the remedies in this Strategy in the context of the Lower Skagit Tributaries area only.

This Strategy does not involve the Skagit Delta or Padilla Bay watershed. Thus, the information in this document is not intended to support restoration discussions outside of the Lower Skagit Tributaries area.



**Figure 1. Skagit Watershed. Home to five species of salmon, the Skagit is the largest watershed draining to Puget Sound. The Lower Skagit Tributaries addressed by this Strategy are important to spawning and rearing of several salmonid species.**

## **Lower Skagit River Tributaries addressed by this Strategy**

The tributaries included are Fisher, Carpenter, Hansen, Red, Nookachamps, Otter Pond, Lake, East Fork Nookachamps, and Turner Creeks (Figure 2). Based on historical and current water quality data, these waterbodies do not meet state water quality standards for temperature.

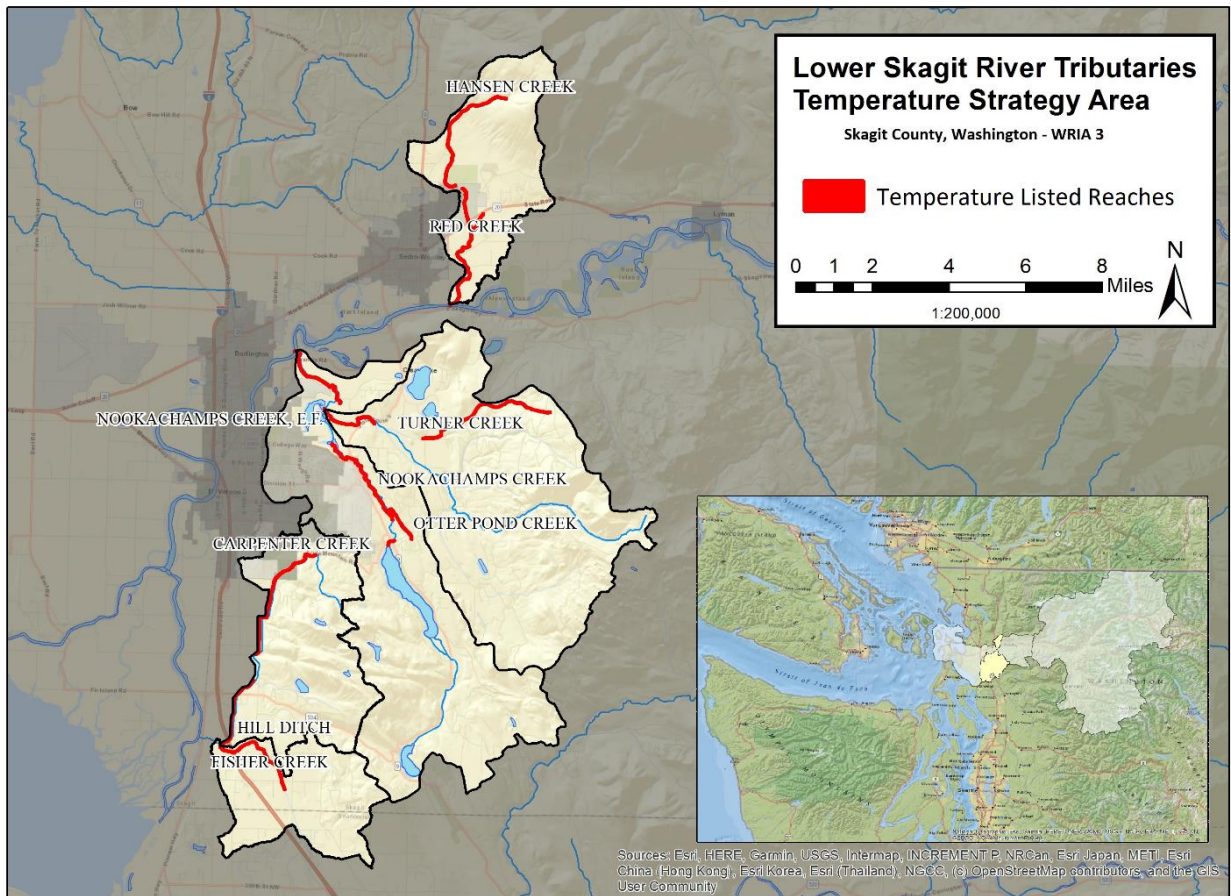


Figure 2. Lower Skagit River Tributaries.

Table 1. Waterbodies addressed by the Lower Skagit Tributaries Temperature TMDL.

Listing ID	Tributary Name	Impairment	Medium	Reach Code (Assessment ID)
6421, 6422	Carpenter	Temperature	Freshwater	17110007000033 17110007002079
6425	Fisher	Temperature	Freshwater	17110007000430
6426	Hansen	Temperature	Freshwater	17110007000917
6427, 6428, 6429	Nookachamps	Temperature	Freshwater	17110007002440 17110007000940 17110007000095
6423, 6424	East Fork Nookachamps	Temperature	Freshwater	17110007000110 17110007000108
6430	Red	Temperature	Freshwater	17110007000944
6431	Turner	Temperature	Freshwater	17110007000230
6432	Otter Pond	Temperature	Freshwater	17110007000330

## What is the problem?

The removal of vegetation and changes to stream morphology over many decades has increased water temperatures in the Lower Skagit Tributaries. Ecology documented our use of field studies and computer modeling to better understand local temperature impairments in the 2004 Lower Skagit Rivers Tributaries Temperature Total Maximum Daily Load Study. We identified a number of causal factors for the increased water temperatures in nine Lower Skagit River tributaries and gained an understanding of the benefits of riparian restoration in each waterbody.

Ecology worked with an advisory group to produce the 2008 [Lower Skagit River Tributaries Temperature TMDL Water Quality Improvement Report<sup>2</sup>](#) (WQIR). The WQIR satisfied TMDL submittal requirements for the Environmental Protection Agency under the Clean Water Act and identified riparian restoration, control of erosion and sedimentation, reductions in water use, and improved summer base flows as the primary physical improvements needed to improve stream temperatures. The WQIR outlined the organizations expected to participate in TMDL implementation and the actions they needed to take to reduce local water temperatures.

The restoration of forested buffers is the primary practice needed over the long term to lower stream temperatures and support salmon recovery efforts from a water quality perspective. The WQIR proposed a phased approach to implementation with the following goals:

- 100 percent of all stream miles of these creeks to be protected by riparian shade or enrolled as part of larger creek restoration and improvement projects by 2020 (pg 45).
- Attaining water quality temperature goals by 2080 (pg 23).

Numerous conservation organizations are actively working to establish buffers and promote salmon recovery through plantings, easements, property acquisition, and other multi benefit practices. Based on the current rate of implementation, the TMDL goal of 100% planted by 2020 will not be met.

## How cool should the water be?

The Washington State Surface Water Quality Standards establish that the Lower Skagit Tributaries must support the needs of salmon over a range of life stages. Our current state standards specifically call out summer use by salmonids where temperatures of 16 degrees Centigrade or less are expected during that period (June 15-September 15). There is either documented or presumed use of multiple salmonid species in the Lower Skagit Tributaries during some or all of the summer critical period (Apps.wdfw.wa.gov, 2017). Ecology's TMDL study included field monitoring and computer modeling to determine the potential of tributaries to meet or exceed water quality standards. Our modelling considered the effects of establishing full, effective shade on each tributary using the Shade and QUAL2Kw models.

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<sup>2</sup> <https://fortress.wa.gov/ecy/publications/documents/0810020.pdf>

At the time of the TMDL study, Ecology's Water Quality Standards set a less rigorous criterion of 18° C. Reflecting our better understanding of the cold-water needs of salmon throughout their different life stages, the 2008 WQIR incorporated Ecology's 2006 change in state standards to 16° C.

The results of the modeling included in the WQIR demonstrate that most of the Lower Skagit Tributaries can meet temperature standards with the establishment of full, mature native riparian shade and improved channel structure. The model predicts that full riparian shade would enable Carpenter, Fisher, and Hansen creeks, respectively, to meet the stricter 16° C standard. It also predicts that with full riparian vegetation and the expected deepening and narrowing of channels that occurs with mature buffers, both East Fork Nookachamps and Nookachamps creeks would meet the 16° C standard.

It should also be noted that while following the same restoration approach, the model predicts that portions of the tributaries will not meet the defined water quality standards. Lake Creek, which cools due to existing shade between its source at Lake McMurray and its discharge into Big Lake, could meet the stricter standard at its downstream end. However, due to the "lake effect," the upstream end does not meet standards under any modeled shade condition.

While meeting state standards removes a waterbody from the impaired waters list, this achievement should not be considered the end goal. Several of the tributaries show potential to attain cooler temperatures, some considerably below the standards, once full shade and additional restoration practices are in place. This additional protection of stream temperatures is especially relevant for climate resiliency.



## Chapter 2: Strategy Development

### Project goals

The goal of the Strategy is to reduce surface water temperatures to improve salmonid habitat in support of salmon and Orca recovery efforts. Forested riparian buffers are the primary restoration practice needed to accomplish this. Forested buffers increase effective shade, surface water heating, and help support other stream cooling processes. Due to the paramount role that the Skagit River salmon population plays within the Skagit community, the local Tribal groups, the greater Puget Sound region, and the State of Washington, it is the top priority of the Strategy to accelerate riparian buffer restoration.

### Advisory Group process

In July 2019, Ecology invited local conservation partners to participate in an ad-hoc Advisory Group to help Ecology reinvigorate efforts to implement findings of the 2004 TMDL study and associated 2008 Water Quality Improvement Report (WQIR). Invitees included representatives from the following entities:

- Department of Ecology
- Dike District Commissioner
- Puget Sound Partnership
- Sauk-Suiattle Indian Tribe of Washington
- Skagit Conservation District
- Skagit County Planning and Development Services
- Skagit County Public Works
- Skagit Drainage and Irrigation Districts Consortium
- Skagit Fisheries Enhancement Group
- Skagit Land Trust
- Skagit Watershed Council
- Skagitonians to Preserve Farmland
- Swinomish Indian Tribal Community
- Upper Skagit Indian Tribe
- Washington Department of Fish and Wildlife
- Washington State Conservation Commission
- Western Washington Agricultural Association
- WSU Extension



3. Data and Research needs – Identify and obtain new information to guide restoration and increase effectiveness.
4. Strategic planning and policy – Document barriers, potential solutions, and future efforts.

For each of the Key Elements above, Ecology developed an implementation “Action Matrix” or table of actions. Each Action Matrix lists the goals for the Key Element, along with the associated Action Items (for near-term work), Outcomes (representing longer term goals) and potential implementation partners.

It is important to note that the short timeframe for developing, reviewing, and commenting on even this high-level document prevented several organizations from committing to near-term actions. However, these parties expressed their willingness to continue working with Ecology and others to identify implementation activities that are appropriate for their organization and achievable when funding becomes available. In addition, some implementation activities involve too many partners to list them separately in the text—their anticipated participation is however reflected in each Action Matrix table.

Based on time and funding constraints, the Strategy does not include reach scale planning details or parcel level recommendations, but these are identified as a key Action Item. While estimating the costs of implementation and identifying funding sources levels are an important subject, this information is not included as an item in this document.

## **Funding**

A necessary component of implementing the Strategy is to identify funding sources for planning and on-the-ground projects. TMDL implementation projects are typically funded through a variety of federal, state, and local government programs, and assisted by the use of competitive grant programs such as the Combined Water Quality Fund Program—those existing funds are insufficient to meet the needs of Orca and the salmon they depend upon.

While grants will continue to be a source of funds, additional financial support is being sought through the development of the Strategy to back several of the Action Items described in the Action Matrix. The development of the Strategy is not directly linked to implementation funding. As such, the Strategy and Action Matrix are based on a broad, high level approach to planning that focuses on next steps, and identifying the financial resources needed to increase the rate of restoration.

## **Key element 1: Education and Outreach**

### **Goal: Raise awareness of implementation Strategy and watershed needs**

The importance of education and outreach is well understood and echoed by the Advisory Group. The willingness to engage in conservation or restoration activities is often directly tied to public perception, attitude, and awareness. Education and outreach is vital to create awareness of the pollution problems and is the first step in motivating landowners to take action. In an issue as sensitive and substantial as changing land use on private property, a thoughtful and well-designed education and outreach approach will be a critical element in developing solutions that result in engagement and behavior change.

Participants stressed the importance of addressing public concerns related to the reinvigoration of the TMDL/Temperature discussion. Due to the perceived lack of input or ability to comment on the Puget Sound Partnership resolution and the relatively brief window of time over which Ecology developed this Strategy, there is notable trepidation in portions of the community. Clearly communicating the intent of the Strategy, next steps, and existing programs to the public is a top priority. This community awareness will be achieved through public open house events, meetings with the Special Use Districts, news articles, and other direct outreach methods.

Two existing outreach programs also play a role in raising awareness with the public about water temperature issues. Skagit County has been successful in empowering local landowners and volunteers with the ability to collect their own water samples and data through citizen science. Likewise, the Skagit Conservation Education Alliance (SCEA) is another organization actively using partnerships between citizens, state, tribal and local governments, and nonprofit organizations to share information, research, and strategies for resource conservation at the community level. Increased volunteer monitoring and citizen science was recommended as an additional valuable education and outreach tool.

The Advisory Group also discussed the need to find and recruit local landowners who have completed restoration projects on their properties. These early adopters of restoration efforts will serve as local champions within their communities, by sharing success stories and providing demonstration sites that exhibit effectiveness in a tangible and approachable way. We anticipate hosting tours with these ambassadors to showcase their successful projects and positive experiences in working with our implementation partners.

Historically, local implementation partners have indicated that Ecology is generally not a trusted messenger within the Skagit community. For that reason, the Strategy recommends entrusting much of the direct landowner outreach activities to local partners. However, the Strategy proposes Ecology have increased dialogue with partners on this topic in the near-term to determine how direct outreach by Ecology can complement their work and provide motivating messages to appropriate audiences.

At this time, we envision Ecology's outreach efforts will continue to raise general awareness of the water quality issues at hand and support the ongoing work of partner organizations. Any outreach materials developed by Ecology to reach landowners will be thoughtfully designed and provided for review and comment by partner outreach staff before implementation.

Ecology is working with partners across Washington State to improve water quality in other impaired watersheds. These partners have developed and tested a variety of approaches to reach landowners using various combinations of digital and print media, kitchen meetings, door-to-door canvassing, and even ice-cream socials. Ecology will perform a review of these approaches and arrange information-sharing between partners so that these methods are considered and included, where appropriate.

Advisory Group members discussed the need for education and outreach materials to facilitate communication with landowners and key stakeholders. They identified the need to compile and share information with each other, such as implementation locations, vegetation analysis data sets, and outreach and education documentation, in order to track and efficiently coordinate implementation and outreach efforts. Effectively tracking the cumulative restoration progress within the Skagit River watershed is an important component that will provide useful data to showcase success, build momentum in the community, and enable adaptive management of the Strategy over time. Ecology received good feedback on the development and use of a "Story map" to display success stories and share other implementation information with the public, as one part of the effort to share data and demonstrate progress across the Skagit River watershed.

The Group members also discussed the desire to build a summary of temperature data on a reach scale. While the current available temperature data set does not provide reach scale resolution, a summary of temperature trends could be developed for general education in each sub-watershed. Ecology will work to develop additional educational resources identified as important by the group, as well as potentially expand data collection efforts listed in the Element 3 "Data and Research" goals.

### **Action Items:**

- Ecology will perform direct outreach by providing information, articles, and stories in local print/television/digital media, in coordination with partners.
- Ecology will host public open houses in collaboration with willing partners to discuss the Strategy, provide information, explore local concerns/priorities, and collect feedback.
- Ecology will meet with Special Use Districts (SUDs) to discuss implementation efforts and provide opportunities for collaboration.
- Host educational tours of properties with our ambassador landowners to showcase their thriving riparian buffers and positive experiences.
- Ecology will explore targeted outreach approaches used in other watersheds and share that information with local implementation partners.

- Ecology will develop a “Story Map” to showcase the success stories of our partners’ work accomplished within the Strategy focus area, and to increase public awareness of the water temperature problem. In order to accomplish this task, Ecology will establish a process for partners to share their data. The Story Map will serve as an outreach tool for partners, accurately reflecting the cumulative activities and knowledge of our Advisory Group members.

## **Goal: Establish a coordinated community based social marketing plan**

Community-based social marketing (CBSM) is a tool that can be used to identify local concerns and create “motivating messages” that resonate at local and individual levels. Advisory Group members discussed the benefits of using a CBSM approach in the Skagit River watershed, where it has been difficult to fine-tune messaging enough to build momentum and change behavior in the community.

Advisory Group members had different opinions on what might be driving resistance to riparian restoration, including concerns around “losing” property, or losing control of property already in use for another purpose. Likewise, group members identified regulatory enforcement as a tool that could be both motivating and a potential “call-to-resist” that could significantly impede future voluntary participation. Overall, there is a definite need to get public feedback to guide core messaging and increase our success in working with landowners. CBSM uses research methods and focus groups to obtain this input and test messages for their effectiveness in bringing about the desired change in behavior. In this case, the behaviors to be changed involve riparian land use and taking voluntary action.

Additional capacity and funding is needed to evaluate local opinions through CBSM, as Advisory Group members pointed out. To avoid bias and encourage sincere responses from focus group participants in the community, outside CBSM expertise is needed. This requires a source of funds and a contracting mechanism with a project sponsor. Once a contractor is in place, Ecology, along with local outreach and education experts, will provide input to the hired CBSM professionals to guide their research and provide valuable context. This includes Skagit County, who has extensive experience with education and outreach efforts related to the Clean Samish Initiative (CSI). The work done by Skagit County as well as some Ecology-lead initiatives, using CBSM to tailor their outreach and education messages, will serve as models of successful programs as we build our campaign.

A question posed to the group multiple times was, “who is the most-trusted messenger?” to maximize the effectiveness of future outreach efforts. While it seems like a simple question, the physical location and guiding interests of the public are highly variable. The CBSM approach will guide the development of appropriate messaging and materials, as well as influence the delivery itself.

For example, a dairy operator may be more willing to engage with WSU-Extension or the Conservation District to discuss pasture or forage enhancement potential to offset riparian area restoration, as opposed to a fisheries or county staff member discussing other considerations.

Similarly, discussion of restoration activities may not be well received from entities or organizations who hold regulatory authority, as it may be perceived as a requirement instead of a voluntary program. The information obtained through CBSM research will tell us or confirm who is best suited to give deliver a message to a community or an individual landowner. Due to the relative small scale of the TMDL area and the sequencing of the watersheds, coordinating these efforts is achievable.

The development and implementation of the CBSM plan will include frequent meetings with outreach partners and extensive collaboration to ensure a smooth rollout of the new messaging, reduce any potential duplication of efforts, and prevent confusion about roles within the community. If funding for external expertise is not available, CBSM principles can still be used to improve outreach efforts and coordination, and to build upon existing efforts to create behavior change in the community.

### **Action Items:**

- Ecology and outreach partners will build a CBSM plan and Scope of Work to prepare for a potential future larger scale effort to be performed by a consultant.
- Ecology and outreach partners will perform initial research, including informal surveys and information gathering. Data obtained will further guide the CBSM plan, Scope of Work and the larger scale effort to be performed by a consultant.
- When funds become available to contract with outside CBSM professionals, Ecology will work with the project sponsor and partners to develop and evaluate successful CBSM program development and subsequent messaging.
- Identify trusted messengers to landowners within a defined project area.

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Table 2. Key Element 1: Education and Outreach Action Matrix

Key Element 1 - Education and Outreach			
Goal	Action Items	Long Term Outcome	Implementation Partners
Raise awareness of implementation strategy and watershed needs	Ecology will perform direct outreach by providing information, articles, and stories in local print/television/digital media, in coordination with partners.	Increase public awareness, Ecology presence and partner collaboration.	All partners
	Ecology will host public open houses in collaboration with willing partners to discuss the Strategy, provide information, explore local concerns/priorities, and collect feedback.	Engage with the local community face-to-face as the Strategy is implemented and address their concerns. Increase public awareness, Ecology presence and partner collaboration.	ECY, SPW, SCD, SFEG, SWC, WSU-Ex
	Ecology will meet with Special Use Districts (SUDs) to discuss implementation efforts and provide opportunities for collaboration.	Increase understanding of local needs and priorities on a reach/sub watershed scale. Increase public awareness, Ecology presence and partner collaboration.	ECY, SCD, SUD staff
	Host educational tours of properties with ambassador landowners to showcase their thriving riparian buffers and positive experiences.	Build momentum within the community, increase public awareness and partner collaboration.	SCD, SFEG, SPW, WSU-Ex
	Ecology will explore targeted outreach approaches used in other watersheds and share that information with local implementation partners.	Increase effectiveness of outreach and partner collaboration.	ECY
	Ecology will develop a "Story Map" to showcase the success stories of our partners' work accomplished within the Strategy focus area, and to increase public awareness of the water temperature problem. In order to accomplish this task, Ecology will establish a process for partners to share their data.	Increase public awareness, Ecology presence and partner collaboration. Continue to update and promote the "Story Map" as needed, and track implementation in the watershed.	All partners

## Key Element 1 - Education and Outreach

Goal	Action Items	Long Term Outcome	Implementation Partners
Establish a coordinated community based social marketing plan	Ecology and outreach partners will build a CBSM plan and Scope of Work to prepare for the eventual, larger scale effort to be performed by a consultant.	Partners will be prepared to submit a competitive application for funding as opportunities arise. Increase partner collaboration.	ECY, SFEG, SCD, SPW
	Ecology and outreach partners will perform initial research, including informal surveys and information gathering. Data obtained will further guide the CBSM plan, Scope of Work and the larger scale effort to be performed by a consultant.	Increase effectiveness of messaging and outreach efforts until CBSM professionals are brought on. Increase competitiveness of funding proposals and partner collaboration.	ECY, SFEG, SCD, SPW
	When funds become available to contract with outside CBSM professionals, Ecology will work with the project sponsor and partners to develop and evaluate successful CBSM program development and subsequent messaging.	Increase effectiveness of messaging and outreach efforts, increase public awareness and partner collaboration.	All partners
	Identify trusted messengers to landowners within a defined project area.	Increase effectiveness of messaging and outreach efforts, increase public awareness and partner collaboration.	All partners

## **Key element 2: Restoration efforts**

The need to improve water quality is often the result of numerous practices and changes across a watershed. Due to the wide range of factors that lead to degraded systems, focusing on a singular practice or program is not likely to improve the overall conditions of a watershed. It is often said that there is no “silver bullet” to improve water quality, meaning that no individual approach or practice will resolve an issue. However, water temperature issues are unique in that significant improvement can be attained using a single practice: planting trees to shade the water.

While this Strategy does recommend other in-stream restoration actions, it highlights riparian plantings as the key to increasing effective shade and lowering water temperatures. Based on modeling efforts within the original TMDL study, most of the impaired reaches will meet temperature standards once sufficient tree canopy and effective shade is developed.

Meeting the goal of reducing temperatures will require the cooperation of diverse stakeholders, organizations, agencies and interests. Numerous conservation organizations are actively working to establish buffers and promote salmon recovery through plantings, easements, property acquisition, and other multi-benefit restoration practices.

Multi-benefit restoration projects and programs are already taking place within the TMDL area. Alluvial fan restoration, stream re-meandering, in-stream flow protection, and wetland restoration efforts are ongoing, with the goal of increasing ground water infiltration and reestablishing natural stream processes. Skagit County and the City of Mount Vernon are controlling stormwater pollution and improving local hydrology by implementing Low Impact Development strategies as part of their National Pollutant Discharge Elimination System (NPDES) permits.

Reestablishing natural watershed function and improving geomorphic stability also aids in reducing stream temperatures and improves system resiliency as we face the uncertain effects of climate change. Identifying multi-benefit restoration practices which incorporate local priorities and interests is an effective way to increase riparian buffer implementation. Similarly, coordinating and co-planning efforts related to rural and urban drainage issues will allow consideration of long -term maintenance needs and water quality.

### **Goal: Conduct reach scale planning**

The primary goal of this Strategy is to increase the rate and volume of riparian plantings and restoration. Reach scale planning helps guide and coordinate salmon-recovery and water quality improvement actions by refining priority project implementation or restoration areas through parcel scale vegetation analysis, integration of local priorities and projects, and development of detailed cost estimates.

Through the reach scale planning process, a summary table will be developed for each tributary watershed describing the riparian restoration goals based on the TMDL and WQIR, the current conditions, and changes in riparian vegetation and habitat over time where data exists.

While not necessarily a management practice in and of itself, reach scale planning for each of the tributary watershed is a priority effort. Advisory Group discussion noted that projects and priorities should provide durable solutions developed at this sub-watershed scale, and incorporate existing planning efforts and conservation partner priorities.

The Hansen Creek Watershed Management Plan was often cited an example of what a reach scale plan should look like. The level of data collection and analysis to develop reach scale planning for each sub-watershed is beyond the scope of this Strategy, but is a priority for future efforts. The Hanson Creek Watershed Management Plan took approximately three years to complete (1999 – 2002), and included a cost estimate of \$2.83 million dollars. Reach scale planning for the additional Lower Skagit Tributaries will require funding and time.

Restoration efforts should also include in-channel and watershed restoration efforts. While costly, in-channel work such as channel re-meandering projects, width to depth ratio reductions, strategic placement of large woody debris, cold water input identification, and cold water refuge enhancement/creation will assist in reducing temperatures, or provide cooler habitat when temperatures begin to reach critical levels. Increasing system stability will also potentially reduce sediment loading to system, reducing stream heating potential and improving habitat.

Other watershed restoration efforts, such as wetland establishment/restoration, alluvial fan restoration, and other upland practices can increase groundwater infiltration, enhance base flows, and reduce sediment and nutrient loading. Other near-channel restoration work, such as oxbow reconnection, or increasing flood plain connection through integrated floodplain management, can improve flood conveyance, restore habitat, and reduce damage to infrastructure.

Several Dike, Drainage, and Irrigation special purpose districts exist within the TMDL project area. These districts provide important flood control, drainage, and infrastructure and property protection in Skagit County. These districts are often interrelated to other districts, and ongoing maintenance is necessary for the integrity of the system. Balancing of the needs for special purpose districts and natural resource concerns will continue to be a priority.

Consistent with the findings of the Skagit Basin Comprehensive Irrigation District Management Plan (CIDMP, 2006), special purpose districts can contribute directly to meeting the goals of this Strategy by focusing on:

“Improvements in the availability and management of water resources for instream flow and beneficial uses, Solutions for avoiding or minimizing impacts to improve prospects for recovery listed species, Improvements in water quality, and Assurances for the agricultural community that their actions are in compliance with the Clean Water Act, the Endangered Species Act, the Rivers and Harbors Act, and Washington State water right laws. “

### **Action Items:**

- Develop sequencing strategy to prioritize restoration on a sub-watershed scale. Identify priority watershed based on conservation partner goals, programs, and previous success levels.
- Secure funding for reach scale planning for priority sequenced sub watershed.
- Quantify reaches and parcels where additional restoration is necessary. Identify site potential tree heights based on soil type and site characteristics.
- Incorporate existing plans and maintenance goals for dike, drainage, and irrigation districts, with the goal of developing multi-benefit implementation efforts in partnership with district managers and commissioners
- Evaluate landscape conditions and create recommendations based on site grade, wetland potential, and other drainage concerns.
- Work with conservation partners to develop and support an existing local implementation review team to review proposed implementation partner’s project design to consider fish, drainage, sediment, and other pollutants needing attention.

### **Goal: Establish new riparian vegetation using existing, expanded, and new programs**

Existing programs are doing a great job with the resources at hand but they cannot significantly increase the pace of riparian restoration without more on-the-ground resources. This includes staff, equipment, and of course trees. This challenge is not unique to the Lower Skagit Tributaries, but what is unique is the determination and developing partnerships in the Lower Skagit Watershed to pilot an effort that meets this challenge.

Ecology believes that restoration targets should be established to help frame, fund, and accomplish the restoration challenge in the Lower Skagit Tributaries. We propose to work with our implementation partners to establish targets in 2020 that reflect the pace of restoration that can be accomplished if additional resources are made available. At this time, we anticipate that the pace of restoration will take time to ramp up until reaching an increased, sustainable level. That increased, sustainable level will be built upon the foundation of strategic education and outreach, a broad landowner assistance toolbox (assistance providing trees, technical assistance, and in some cases financial incentives), and capacity for invasive plant removal, tree planting, and maintenance activities.

We expect little historical information exists to help us set accurate targets because few if any intensive efforts like the one proposed for the Lower Skagit Tributaries exists. However, setting targets and tracking progress in providing all the foundational elements listed above will form the basis of our adaptive management of this effort.

The Strategy recognizes that the differing goals and priorities of conservation partners create some inefficiencies as well as uncertainty about what funding sources and programs exist within the watershed. Developing and maintaining a list of active grants or programs will help ensure coordination and reduce redundancy, but will not solve the problem of inadequate resources.

To help with information sharing between partners and public, a detailed summary list of existing grant or program funding, target areas, project timelines, eligible practices, and cost share or payment information. This information can be used in concert with the “Story Map” and other data sharing tools to leverage funding and assist interested partners and property owners by reducing out of pocket costs, explore individual or suites of implementation options, or receive referrals to other programs. If more funding is made available to meet the challenges detailed in this Strategy, this summary information will help ensure efficiencies and coordination as riparian restoration work ramps up in the Lower Skagit Tributaries areas.

### **Action Items:**

- Conservation partners should collaborate to develop a summary list of ongoing or available programs which contains an updated list of active obtained grants and funding available to partners. The list will detail target areas, project time lines, and cost share or payment information and partner contact information. Identify programs/practices that can be leveraged or work together.
- Partners should collaborate to establish restoration target areas and identify the resources needed to accomplish that task within the sub-watershed.

### **Goal: Maintain newly established and existing riparian vegetation**

Both restoration specialists and landowner representatives in the Advisory Group noted the importance of maintaining existing and newly established riparian vegetation. While CREP currently offers funding for maintenance, most other grant funds do not. And even in the case of CREP, the level of invasive species control needed for site preparation and the amount of money provided for quality plants at a sufficient density affects the amount of maintenance that can be done with CREP. Increasing density of the buffer may help suppress invasive species.

Various external stressors affect the ability of new riparian planting to survive and serve as a durable and effective buffer. These stressors include invasive species, drought or flood conditions, pests, diseases, planting density, or other planting stock issues.

Developing a program or funding mechanism for ongoing maintenance or enhancement of buffers was a priority for the group. Maintenance should include replanting, control of invasive species/noxious weeds and pest management, and watering where necessary.

Improperly implemented or maintained buffers with dead or dying trees, or overtaken by invasive species, can create a negative local response to restoration efforts. With the potential of significant public reluctance to implement buffers, proactive planning and maintenance is needed to ensure that restoration efforts are both aesthetically pleasing and functional. Maintenance considerations must also include the management of specific trees or shrubs that are impacting drainage district infrastructure or function.

While the Advisory Group did not have extensive discussions on beaver management, this Strategy recognizes both the benefits beavers bring to stream restoration and salmon recovery and the need to manage their activities in some areas. Academic sources indicate beavers have the ability to recharge groundwater by elevating water tables; reconnect and expand floodplains, increase hyporheic exchange, increase summer base flows, expand wetlands and cold water refuges; create sediment traps and improve water quality (Pollock, Castro, and Lewallen 2018; Bouwes et al 2016; Weber et al 2017, Rosell et al 2005).

Extensive planning is needed where beavers and humans interact or in places where beaver relocation or reintroduction may be under consideration. Active outreach and education to inform landowners about beavers and how to live with them (including the challenges) should be explored. Management strategies should include technical assistance contacts, strategies for managing pond levels, and relocation options. Local technical resources must be available to help landowners address concerns or problems related to beavers.

### **Action Items:**

- Investigate the potential to develop a program and funding for ongoing maintenance of buffers. Ecology will work with conservation partners to ensure that maintenance actions should include dealing with density issues, invasive species, noxious weeds, drainage easements and pest control.
- Develop regional beaver management approaches with the long-term goal of providing clear guidance for property owners, a management strategy for the area, and resources to facilitate beaver management in the Lower Skagit Tributaries

### **Goal: Increase use of easements, acquisitions, and incentive programs**

Increasing the pace of riparian restoration requires a robust tool box. Current strategies using CREP or the offer to plant trees for landowners have been ongoing through the TMDL area with good results; however, significant restoration potential remains. In several areas, conservation partners have successfully used easements and property acquisitions to meet landowner needs and gain their participation.

A conservation easement is a binding agreement and transfer of certain property rights between the landowner and another party, the holder of the easement. Easements are especially appropriate to protect lands with high biodiversity value. Conservation easements restrict the type and amount of development that can take place on the land and in some cases extinguish development rights completely. Easements are recorded on the deed and therefore “run with the land,” applying to both present and future owners—this approach provides certainty that public investments in riparian restoration will remain undisturbed into the future. Easement lengths and payment rates vary by the program offering the easement

In addition to conservation easements, the Advisory Group discussed the general topic of incentives and alternative payment programs. Incentives include limited time annual payments (such as CREP payments), one-time upfront payments, and tax credits or benefits and can be a flat rate or graduated (e.g., increased incentives with increasing buffer width, or single BMP rate less than BMP suite implementation). Conservation easements and other incentive payments are generally considered impractical for use at every riparian restoration site and are most applicable where landowners experience loss of land for agricultural purposes or where the biodiversity value of a stream segment is very high.

#### **Action Items:**

- Continued support and expansion of existing easement and acquisition programs with various partners offering assistance and/or referrals where possible.
- Conservation partners should support and participate in the Conservation Commission’s pilot program if it is funded in the future. Lessons learned during the pilot project will be used to inform future implementation efforts and policy discussions.

#### **Goal: Promote stormwater management practices, including Low Impact Development, to maximize shade and groundwater infiltration where feasible**

Stormwater impacts from developed areas can affect flow and temperature of surface waters. While the majority of the Lower Skagit Tributaries watersheds are comprised of rural or low density development, using low impact development (LID) practices can help manage and mitigate stormwater impacts from developed locations. LID involves land planning and design approaches to manage stormwater runoff and use of on-site natural features to protect water quality and increase water infiltration, filtration, storage, evaporation and transpiration.

LID goals should limit disturbance of local hydrologic processes to pre-development conditions. This is often done by emphasizing conservation of undeveloped areas, site planning, and distributed stormwater management practices into a building project design. Stormwater facilities such as rain gardens, permeable pavements, roof downspout controls, dispersion, vegetated roofs, minimum excavation foundations, and water re-use play a key role in LID implementation.



LID practices should always be used in new development and redevelopment project where feasible as well when retrofitting older stormwater systems in existing developed areas.

The communities of Mount Vernon and Sedro-Woolley have urban or urban growth areas within the Lower Skagit Tributaries TMDL area. Most urban areas that collect stormwater runoff in municipal separate storm sewer systems (MS4s) and discharge it to surface waters are required to have a National Pollutant Discharge Elimination System (NPDES) permit under the federal Clean Water Act. The Department of Ecology develops and administers NPDES municipal stormwater permits in Washington State. Mount Vernon, Sedro-Woolley and Skagit County are covered under the Western Washington Phase II Municipal Stormwater permit requires local governments to manage and control stormwater runoff to protect water quality using a wide range of programs and practices, including LID.

Several members of the group expressed interest in expanding the voluntary implementation of LID projects and retrofits to manage stormwater, increase infiltration, and decrease runoff in areas where it is not currently required. Projects such as rain gardens, rain barrels, and other small projects have been successful within Skagit County, and additional education about other LID principles and best management practices (BMPs), as well as project funding, would likely increase participation. Other discussion focused on expanding local requirements to mitigate or manage stormwater on an individual and community scale.

#### **Action Items:**

- Encourage expanding existing LID requirements for new and redevelopment to the rest of the TMDL area.
- Promote the voluntary use of LID BMPs to manage stormwater onsite and increase stormwater infiltration to ground where feasible.
- Ecology will assess, with permitted entities, opportunities for public stormwater system retrofits to reduce temperatures, especially where temperature effects are measured.

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Table 3. Key Element 2: Restoration Efforts Action Matrix

Key Element 2 - Restoration Efforts			
Goal	Action Items	Long Term Outcome	Implementation Partners
Conduct Reach Scale planning	Develop sequencing strategy to prioritize restoration on a sub shed scale. Identify priority watershed based on conservation partner goals, programs, and previous success levels.		SWC, SFEG, ECY, SCD, SPW
	Secure funding for reach scale planning for priority sequenced sub watershed.	Document reach scale efforts needed in sub watershed, and develop a budget estimate to improve water quality, habitat, and support local concerns. Use reach scale plans to secure long term funding to support restoration.	ECY, SWC, SPW
	Quantification of reaches and parcels where additional restoration is necessary. Identify site potential tree heights based on soil type and site characteristics.	Continue to develop data sets for all sub watersheds. Expand identification to include tributaries to TMDL reaches.	ECY, SCD, SPW, SWC
	Incorporate existing plans and maintenance goals for dike, drainage, and irrigation districts, potential to develop multi-benefit implementation efforts in partnership with district managers and commissioners	Leverage multi-benefit projects for improved watershed health and drainage management.	ECY, SUP, SPW, WDFW
	Evaluate landscape conditions, and create recommendations based on site grade, wetland potential, and other drainage concerns.	Identify and documents potential restoration features while developing strategies to maintain drainage easements and water rights	ECY, SCD, SWC, SPW, SUD
	Work with conservation partners to develop and support an existing Local implementation review team to review proposed implementation partner’s project design to consider fish, drainage, sediment, and other pollutants needing attention.	Continued review based of projects as they are developed.	All partners

## Key Element 2 - Restoration Efforts continued

Goal	Action Items	Long Term Outcome	Implementation Partners
Establish New Riparian Vegetation using existing, expanded, and new programs	Develop list of active programs and existing funding to be distributed to partners. Detail target areas, project time line, and cost share or payment information. Identify programs/practices that can be leveraged or work together.	Track program funding changes, identify pilot projects, and potential funding gaps	ECY, SPW, SCD, SWC, WCC
	Partners should collaborate to establish restoration target areas and identify the resources needed to accomplish that task within the sub-watershed	Develop goals and timeline based on existing programs, and develop estimate of additional funds necessary to reach goals.	ECY, SPW, SCD, SWC, SFEG
Maintain newly established and existing riparian vegetation	Develop program or funding for ongoing maintenance of buffers. Maintenance should include increasing density, invasive species, noxious weeds, buffer LWD, and pest control.	Establish permanent funding for maintenance. Develop long-term maintenance through USDA policy.	ECY, SWC, WDFW, SFEG, SPW
	Develop regional guidance related to beaver management. Identify process and contacts to deal with beavers where issues develop.		ECY, DNR, WDFW
Increase use of easement, acquisitions, and incentive programs	Continued support existing easement and acquisition programs, with various partners offering assistance and/or referrals where possible	Develop additional incentive programs at local and state levels	All partners
	Conservation partners should support and participate in the Conservation Commission's pilot program if it is funded. Lessons learned during the pilot project will be used to inform future implementation efforts and policy discussions.	Evaluate success based on participation levels. Document program flexibility and provide feedback.	ECY, SCD, SWC
Promote stormwater management practices, including Low Impact Development, to maximize shade and groundwater infiltration where feasible	Encourage expanding existing LID requirements for new and redevelopment to the rest of the TMDL area.	Evaluate Impact offset programs and practices for future development and retrofits, as well as voluntary adoption of LID programs to areas that are not currently required.	ECY, SCD, SPW
	Promote the voluntary use of LID BMPs to manage stormwater onsite and increase stormwater infiltration to ground where feasible.		All partners
	Ecology will assess, with permitted entities, opportunities for public stormwater system retrofits to reduce temperatures, especially where temperature effects are measured.		ECY

## **Key element 3: Data and research needs**

In addition to riparian vegetation restoration to increase shade, additional instream actions would help improve stream temperatures and improve habitat in specific locations. Significant in-stream project investments should be placed where they can have the greatest benefit, and be monitored to inform adaptive management. Determining the location of potential projects will require an assessment of the watershed conditions, field data collection, and topographic analysis. Information collected or compiled through this effort will further inform reach scale planning efforts. Key Element 3 includes goals involving the compilation of existing environmental data as well as the collection of new environmental data to identify instream restoration projects.

Also important to guiding implementation actions will be the information that Ecology obtains from performing an environmental justice analysis in the project areas. This will be done to ensure equal protection, meaningful involvement and equitable resource delivery as implementation progresses.

### **Goal: Identify and fill data gaps**

The Advisory Group spent significant time discussing the TMDL and WQIR results, existing temperature data, and restoration effectiveness. Although riparian restoration is the key activity needed to improve stream temperatures, other solutions can accelerate or improve success. The original TMDL documents that both natural and human-caused factors affect water temperatures in the Lower Skagit Tributaries including; impacts from shallow lakes, drainage and/or groundwater inputs from wetlands, removal of riparian vegetation, and channel modifications. To best understand and address these complex processes in the Lower Skagit Tributaries, this Strategy recommends a research agenda be identified to compile available data, evaluate data gaps, and develop methods to document further guide implementation and to measure status and trends within the Lower Skagit Tributaries.

Several Advisory Group comments noted the importance of a strong watershed dataset. Determining the relationship of temperature, stream flow, and developing an accurate baseline is necessary to evaluate ongoing conditions, as well as restoration effectiveness. Long term, continuous data sets are important determining watershed health, particularly in changing climatic conditions.

The Skagit County Water Quality Monitoring program has collected surface water data since 2003. The County compiles the data into an Annual Report, which includes annual and long-term trend information for several water quality parameters. While the number of sites has increased over time, limited data collection equipment has led to data gaps and highly variable data sets at some locations.

This Strategy recommends establishing permanent water quality and quantity data collection sites with dedicated equipment within the Lower Skagit Tributaries to assess effectiveness and inform long term trends. Collecting and sharing real time temperature and flow data can demonstrate current system health, show both patterns and unique differences between waterbodies, support additional public outreach and awareness, as well as provide information related to hydraulic response and potential flood conditions.

Expanding the water quality data collection network in sequenced sub-watersheds, particularly where work is occurring or has occurred, will improve temperature data analysis. Ecology is investigating methods to evaluate the existing data sets to establish magnitude, variability, frequency, timing, and rate of change within the watershed.

### **Action Items:**

- Compile and evaluate available research and data sets to identify data gaps and establish a research agenda designed to address those gaps. Where necessary, Ecology will assist in developing a long-term monitoring plan and associated Quality Assurance Project Plan (QAPP).
- Evaluate and potentially develop a transparent, publicly accessible assessment framework documenting relevant status and trends within the Lower Skagit Tributaries.
- Expand the data collection network by developing Standard Operating Procedure(s) for temperature sampling equipment and collecting data where feasible.
- Evaluate the feasibility of establishing stream gage sites and rating tables for existing sites.
- Support local installation of surface and groundwater gauging stations to inform development of implementation strategies.

### **Goal: Evaluate instream restoration opportunities**

Although riparian restoration is the key action needed to lower stream temperatures, trees take many years to grow and adequately shade local waters. It takes even longer until they can recreate other essential stream functions. Ecology believes that re-establishing habitat and thermal refuge during the growth and development of buffers is likely essential for the survival of the fish during periods of elevated temperatures. Areas of cool water created by processes other than buffers must be identified, protected, or enhanced to provide more immediate relief to heat-stressed fish.

Proper siting of Cold Water Refuge (CWR) areas provides salmonids a way to traverse excessively warm areas by creating “stepping stones” or a “cold water ladder” to thermally stable rearing and resting habitat. Ecology recommends identifying CWRs using identification

methods described in the EPA-developed [“Primer for Identifying Cold-Water Refuges to protect and Restore Thermal Diversity in Riverine Landscapes<sup>3</sup>”](#) by Torgersen et al, 2012.

In most of western Washington, summer stream flows are fully supported by groundwater stored during winter months. Re-creating or enhancing existing sources of cool groundwater available during warm summer months is another innovative approach being considered by stream restoration specialists. Properly designed restoration can complement flood control efforts and other land uses.

Ecology recommends in-stream data collection to assess and evaluate habitat and geomorphic conditions to further guide implementation efforts. Potential CWR sites will be determined in priority tributaries identified by conservation partners. Potential sites will be evaluated through a desktop review examining soils and surficial geology, aerial photos and available LiDAR data for information related to general land use, riparian vegetation, likely presence or absence of large woody debris (LWD), general stream morphology, and selected field study.

### **Action Items:**

- Identify potential CWR and groundwater restoration projects based on geospatial data sets and historic maps.
- Augment identification of potential CWR enhancement areas and LWD placement locations through field surveys.
- Coordinate with local governments and conservation partners working on salmon and Orca recovery to identify instream and near stream restoration potential within the priority watershed and combine water quality and salmon recovery needs when possible.

### **Goal: Compile data for shared use and analysis**

Implementation tracking and water quality data is critical to future adaptive management and effectiveness monitoring. The ability to evaluate and quantify riparian conditions is essential to multiple partners and programs to develop restoration and protection goals and strategies. Advisory Group members expressed the need to develop a shared geospatial database that tracks implementation activities, restoration priorities, and water quality information.

Using geospatial data and GIS analysis methods, conservation partners have spent significant time and effort to develop methods to document current conditions, track changes over time, and compile restoration project information. While various entities are developing data sets, the sharing and integration of the data sets has been limited by data privacy concerns and organizational program goals and timelines. It is a priority of the Advisory Group to increase coordination of riparian vegetation analysis and establish a database of vegetation analysis products, implementation location information, and other relevant data. Several members

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<sup>3</sup> [http://faculty.washington.edu/cet6/pub/Torgersen\\_et\\_al\\_2012\\_cold\\_water\\_refuges.pdf](http://faculty.washington.edu/cet6/pub/Torgersen_et_al_2012_cold_water_refuges.pdf)

appeared interested in developing a centralized dataset to support the efforts of multiple group members. This product can be used to support the “Establish new riparian vegetation using existing, expanded, and new programs” goal identified in Key Element 2.

A centralized dataset will require ongoing maintenance to ensure that the information is up to date and will require periodic updates when new information is available. Ideally, the data would be housed in a way that allows access and updates from project partners as work continues in the area. No specific agency or partner volunteered to house the dataset at this time. Additional information related how the data should be presented, questions regarding data privacy, and the practical cost of developing, storing, and maintaining the dataset will need to be reviewed.

Ecology will work with conservation organizations and other partners to track outreach and education, property owner contacts, and implementation activities occurring in the watershed. Tracked activities should include restoration or projects in the watershed that reduce temperature as a primary or secondary benefit. Implementation tracking efforts tracked should be as quantitative as possible, including details such as:

- Accurate location and size description of the project, including GIS based information if available (e.g., total feet of riparian buffer installed, runoff reduction practices installed). In situations where a landowner seeks confidentiality, participation information will be included at the reach or tributary watershed scale, but not tied directly to a parcel.
- Type of restoration activity installed, project cost, and potential reductions based on effectiveness estimates.
- Mapping of shared areas of active grants or program areas with conservation partners and identify project targets in highest priority areas.
- Identification of potential problem areas and barriers to implementation (e.g. locations where outreach or technical assistance was not accepted when offered).
- Documentation of education and outreach efforts – maps of targeted mailings, canvassing campaigns, surveys of participation/interest of landowners.

### **Action Items:**

- Establish and maintain a shared database that contains research data (e.g., riparian vegetation analysis products), implementation location information (both projects completed and projects needed), and other relevant data.
- Identify partner or organization best suited (in terms of funding and information technology) and willing to house and help maintain the shared database.

### **Goal: Measure our effectiveness and perform adaptive management**

Effectiveness monitoring is necessary to tell us whether our actions to restore local waters to good health are working.



Adaptive management allows us to fine-tune our actions to make them more effective, and to try new strategies if we have evidence that a new approach could help us to achieve compliance.

Information collected in the previous Key element 3 goal above should be evaluated regularly to measure the effectiveness of our accelerated restoration work and to support adaptive management of education, outreach, and engagement efforts. Our work to restore stream temperatures is dependent on using these tools successfully to gain landowner cooperation and participation.

Implementation progress will be evaluated based on the goals of the elements identified in the Strategy. Additional milestones and targets will be developed with reach scale planning efforts, and based on public feedback and priorities.

### **Action Items:**

- Use the new implementation dataset, story map, and other data management tools to track current conditions, outreach efforts, and additional implementation.
- Develop shared methods to evaluate the effectiveness of previously implemented riparian revegetation projects.

### **Goal: Coordinate with instream flow efforts**

Streamflow is a significant factor in the heat budget of rivers and streams. Reduced creek flow due to human uses and influences can have a significant impact on stream temperatures. Under state laws, Ecology oversees both the appropriation of water for out-of-stream uses (for irrigation, municipal use, and commercial and industrial uses) and the protection of instream uses (for example, for fish habitat, stock watering, irrigation, and recreational use). Ecology does this by adopting and enforcing water allocation and instream flow regulations and assisting citizens with both public and private water management issues.

Ecology's Water Resources Program is responsible for administering state water rights law regulating use of ground and surface water. Unauthorized water withdrawals can negatively impact stream temperatures by reducing stream flows and groundwater contribution to stream flows.

In 2006, Ecology amended the Skagit River water management rule (Chapter 173-503 WAC). The amendments created reservations to provide reliable water supplies for future development in the Skagit River basin, while still protecting flows needed for fish and other instream values.

In 2013, the Washington State Supreme Court ruled in [Swinomish Indian Tribal Community v. Department of Ecology](#)<sup>4</sup> that Ecology exceeded its authority in establishing the water reservations. The rule reverted to its original text from 2001. Without reservations, year-round water uses that began after the rule took effect in 2001 can be interrupted when stream flows are below the regulatory instream flow levels. Since the court decision, Ecology has been looking for water supply solutions for those homes and businesses affected by the ruling.

The Swinomish Tribe agrees existing water uses should not be curtailed while we are developing mitigation.

The Joint Legislative Task Force on Water Supply is actively working to quantify water usage, review water rights, and evaluate out-of-stream usage, which will refine the water supply information within the entire Skagit River Watershed. WRIA 4 (Upper Skagit) is scheduled to be complete by Early 2020. WRIA 3 (Lower Skagit) efforts are ongoing at the time of this document and final reports are not expected before 2021. Any information related to the Lower Skagit Tributaries Temperature TMDL Strategy should be incorporated in future planning and implementation efforts where appropriate.

#### **Action Items:**

- Coordinate as appropriate with ongoing legislative effort and research regarding water rights and use in the TMDL area.
- Work with conservation partners to promote existing irrigation efficiency grants and programs.

#### **Goal: Ensure equitable implementation considerations through environmental justice analysis**

Ecology is committed to advancing Environmental Justice and best practices that strengthen compliance with Title VI of the Civil Rights Act. Ecology also recognizes the importance of inclusivity and equity in the development and implementation of the Strategy. In line with these objectives, the composition of the Advisory Group reflected Ecology's intention to have meaningful involvement and diverse representation of people potentially impacted by actions taken, or not taken. As our work in the Lower Skagit Tributaries continues, Ecology will look closely at the focus watersheds to identify the specific populations who are impacted by action taken in that area. To ensure the protection of human health and the environment, meaningful involvement, and equitable resource delivery, Ecology will perform an environmental justice analysis as described below, within the Strategy implementation area.

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<sup>4</sup> <http://www.courts.wa.gov/opinions/pdf/876720.pdf>

All environmental justice information obtained through the analysis will be shared with partners. Ecology will continue to consult with individual tribal governments, and will coordinate communications with Ecology's Senior Advisor for Tribal Affairs.

**Action Items:**

- Perform the following environmental justice analysis within the Strategy focus areas:
  - Use demographic and other available data to identify populations with potential environmental justice considerations (including Tribes and tribal communities, communities of color, and low-income populations).
  - Identify and discuss the impact (positive and negative) of action or inaction on the potentially affected populations.
  - Develop a public involvement strategy addressing any known barriers to communication (e.g., language, education, technology, literacy).
  - Engage with potentially impacted populations to inform people about the expected impact.
  - Respond to concerns raised by potentially impacted populations.
  - Identify and/or develop resources to support awareness in these communities about the project, timeline, and engagement opportunities.
- Ecology will share applicable environmental justice information obtained in the analysis with partners in our regular meetings, as needed.

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**Table 4: Key Element 3: Data and Research Needs Action Matrix**

Key Element 3 - Data and Research			
Goal	Action items	Long Term Outcome	Implementation Partners
Identify and fill data gaps	Compile and evaluate available research and data sets and establish a research agenda that identifies and fills data gaps on monitoring restoration activities and overall TMDL effectiveness.	Continue to develop data sets, and identify data gaps are areas of future research.	ECY, SWC, WDFW, SFEG
	Evaluate and potentially develop a transparent, accessible assessment framework documenting status and trend within the Lower Skagit Tributaries.	Increase data analysis to effectively track trends, implementation effectiveness, and climactic conditions.	ECY, SWC, SPW, WDFW
	Expand data collection network. Develop additional data collection points based on sequenced priority of sub watersheds.	Permanent network expansion. Provide real time data temperature data at outlet of each Lower Skagit tributary.	ECY, SPW
	Evaluate the feasibility of establishing stream gage sites and rating tables for existing sites.	Evaluate dataset for changes in relationship between water yield, flow duration, and precipitation (system flashiness/hydrologic response relationships).	ECY, DNR, WDFW, WSCC
	Support local installation of surface and groundwater gauging stations to inform development of implementation strategies.	Establish live, web based surface and ground water monitoring within the Skagit River Watershed.	ECY, SPW
Evaluate Instream restoration opportunities	Identify potential CWR and groundwater restoration projects based on geospatial data sets and historic maps.	ID locations for oxbow and re-meander projects. Increase watershed assessment efforts in the area. Document stream changes/stability long term.	ECY, SWC, WDFW, SFEG, SPW
	Augment identification of potential CWR enhancement areas and LWD placement locations through field surveys.	Conduct geomorphic assessment to assess reach stability and support reach scale planning efforts	ECY, SWC, WDFW, SFEG, SPW
	Coordinate with local governments and conservation partners working on salmon and Orca recovery to identify instream and near stream restoration potential within the priory watershed and combine water quality and salmon recovery needs when possible.	Identify other system limitations or stressors.	SCW, WDFW, ECY, SWC, SFEG, WSDOT

## Key Element 3 - Data and Research continued

Goal	Action items	Long Term Outcome	Implementation Partners
Compile data for shared use and analysis	Establish and maintain shared database that contains research data (e.g., riparian vegetation analysis products), implementation location information (both projects completed and projects needed), and other relevant data	Ongoing maintenance of data. Information housed where available to partners.	ECY, SCD, SWC, SPW, SFEG, WSCC
	Identify partner or organization best suited (in terms of funding and information technology) and willing to house the shared database	Ongoing maintenance of data. Information housed where available to partners.	ECY, SCD, SWC, SPW, SFEG, WSCC
Measure our effectiveness and perform adaptive management	Use the new shared implementation dataset, story map, and other data management tools to track current conditions, outreach efforts, and additional implementation.	Document all implementation activities related to temperature impairment	ECY, SCD, SWC, SPW, SFEG, WSCC
	Develop method to evaluate the effectiveness of previously implemented riparian revegetation projects, in terms of temperature	Use expanded data set to evaluate restoration effectiveness over time.	ECY, SCD, SWC, SPW
Coordinate instream flow efforts	Coordinate with ongoing legislative effort and research regarding water rights and use in the TMDL area	Review water withdrawal/uses reporting developed for each sub watershed.	ECY,
	Promotion of irrigation efficiency grants and programs.	Reduce water use through the adoption of irrigation and water use reduction practices.	ECY, WSU-Ex,
Ensure equitable implementation considerations through environmental justice analysis	Perform an environmental justice analysis within the Strategy focus areas, as described above.	Maintain open communication with communities and request regular feedback throughout implementation.	ECY
	Ecology will share applicable environmental justice information obtained in the analysis with partners in our regular meetings, as needed.	Increase awareness of the number of people and diversity of groups receiving resources.	ECY

## Key Element 4: Strategic planning and policy

A wide range of policy decisions affect how Ecology and its partners address pollution concerns in the Lower Skagit Tributaries and other waterbodies across the state. Decisions by federal agencies can affect how the CREP program is operated, how our state administers the Clean Water Act, and how federal funds are spent. State and local governments make similar decisions on how and where to focus local public resources. The Advisory Group and Ecology staff identified a number of areas where current public policies and funding decisions can affect the approach and pace of restoration in the Lower Skagit Tributaries. Those areas were assembled below as goals for further discussion and action.

Reliable, long term funding was a re-occurring theme in Advisory Group discussions. Funding is necessary to support implementation efforts, particularly in projects where significant land use changes are necessary to support the goals of improving water quality. Permanent funding was recently identified as a priority under the “[Southern Resident Orca Task Force Report and Recommendations](#)<sup>5</sup>” document, with improving water quality as an urgent action to support recovery efforts.

Local conservation partners are currently operating at full capacity, actively pursuing grant funds, leveraging funding sources, and implementing projects across the Skagit watershed. Large-scale projects such as alluvial fan restorations, re-meandering projects, large-scale planting projects, and wetland creation/enhancements have taken place across the Skagit Watershed, including within the TMDL area. Due to the practical limitations of staff time, additional project-by-project funding alone is not enough to increase the pace and volume of riparian restoration. Increasing select partner staff capacity is essential to increasing implementation. This Strategy identifies some potential funding sources identified through the Advisory Group process below.

### Goal: Obtain funding for essential planning and local capacity

TMDL implementation projects are typically funded through a variety of federal, state, and local government programs and assisted by the use of competitive grant programs such as Ecology’s Combined Water Quality Funding Program. While grant funding plays a crucial role in ongoing implementation efforts, it does not support long-term staffing needs. Experienced staff that know the needs of both the watershed and its residents are critical to building and maintaining landowner trust, which is a foundational element of a voluntary approach to stream restoration.

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<sup>5</sup>

[https://www.governor.wa.gov/sites/default/files/OrcaTaskForce\\_reportandrecommendations\\_11.16.18.pdf](https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_reportandrecommendations_11.16.18.pdf)

Economic insecurity resulting grant-funded staffing models does not lead to the development and retention of experienced staff. The 2008 WQIR identified the establishment of a basin steward to begin building just such a resource.

Limited availability of grant funds, associated development timelines, and changing priorities can create patchworks of programs that can be frustrating not only to grant holders, but also to the public interested in participating in a program. Limited duration projects make good sense in some cases and help organizations operate at peak capacity. But relying on them to support needed core work, like a comprehensive and fast-paced riparian restoration program in the Lower Skagit Tributaries, can result in reduced effectiveness due to hiring, training, and retaining staff. Staff turnover hampers the ability to build trust with local stakeholders through repeated, long-term outreach and communication.

In contrast to the work of a basin steward, reach scale planning is a task identified by the Advisory Group that is a good fit for grant funding or other short-term funding mechanisms. It is an infrequent task of high value for conservation partners working to restore Lower Skagit Tributaries water quality.

Another discussion topic focused on the development of “new tools or programs”, with an emphasis on flexibility in implementation practices. An example is a recent proposal from the Washington State Conservation Commission. They are developing a two part pilot program to enhance the USDA CREP programs with the following goals:

- Part I – Technical Assistance: Provides funding for conservation district staff to build relationships with landowners and increase participation in CREP.
- Part II – Pilot Targeted Riparian Buffer Incentive Program: Develops a pilot state program that complements CREP by leveraging additional outreach strategies and incentives to increase landowner participation in targeted, high-priority watersheds to reach that goal of having 70 percent planted riparian buffers.

If funded, the program will explore buffer widths, financial incentives, landowner concerns related to buffer establishment. The pilot program would likely include willing partners in two areas in Western Washington, and two areas in Eastern Washington. Based on the goals of both the Strategy and the pilot program, Skagit County is an excellent fit to implement the pilot program.

### **Action Items:**

- Work as a group of watershed partners to investigate and pursue increased funding for local capacity and special projects to implement the Lower Skagit Tributaries Temperature TMDL.
- Participate in Conservation Commission-sponsored pilot projects or other innovative pilot projects wherever feasible and appropriate.



- Coordinate efforts between conservation partners to identify project sponsors and participants for actions identified in this strategy and other future efforts.

## **Goal: Consider emerging programs related to buffer sizes**

Advisory Group funding discussions were not limited to organizational capacity, but also program limitations and flexibility. For example, easement program payments are often designed to compensate property owners for the use of the property based on soil rental rates. Per the 2018 Farm Bill, soil rental rates have been lowered in an effort to reduce the impacts of USDA program rental rates to local farmland rental markets. Similarly, the rates at which contractors and other laborers working on the installation of CREP buffers have remained steady since the introduction of CREP. Local conservation partners state that the rates need to be adjusted if this restoration program is to be competitive in the current market.

In considering how to update easement programs, the Advisory Group discussed the need to provide adequate reimbursement for ground lost to plantings as well as secondary impacts such as crop shading. Several written comments noted that compensation needs to be at or above market rental rates, or current land sale prices. While changes to Farm Bill language and policy are beyond state and local control, this Strategy does compile the policy-related comments and recommendations in Chapter 4. The group also discussed other options to address the current gap in compensation such as the development of local or state programs to offer additional easements, payments, or incentives in combination with, or to supplement federal programs.

Monetary compensation is not the only limiting factor. The loss of control of property is a concern to property owners and users. Riparian buffers may be viewed as a “no touch” area based on prescriptions and limitations placed on the property through easements or program rules (Chapman, 2019). The loss of ability to actively manage land, use the property in some way, manage weed and pest concerns, and control aesthetics are reasons cited for not participating in programs.

Buffer width was also a significant topic of discussion. Default 100’ plus buffer widths were described by some members of the group as “dead on arrival” when meeting with landowners. Other members stressed the importance of using best available science as the starting point when discussing buffer widths, particularly when considering climate change. CREP buffers may be available at 50’ widths, depending on the site conditions. Other Skagit County programs have found success offering incentives or programs for the installation of 35’ buffers. The subject of buffer widths is also being reviewed by a Buffer Task Force as part of King County’s “Fish, Farm, Flood Initiative”. This effort involves compiling the best available science related to buffer widths and identifying watercourse-specific buffers in the Snoqualmie Valley. In general, a wider riparian buffer provides more certainty that all aspects of both water quality protection and salmon habitat creation/maintenance will occur.

This Strategy encourages the creation of buffers that provide both shade and microclimate to reduce stream temperatures as detailed in the TMDL. The TMDL is watershed-specific information that details buffer sizes modeled to fully reduce and protect stream temperatures. This Strategy also recognizes the National Marine Fisheries Service (NMFS) buffer widths as the established minimum width appropriate for the use of most federal funds provided by EPA for riparian restoration at this time (Table 5).

**Table 5. Minimum buffer requirements for surface waters based on NMFS recommendations (from funding guidelines).**

<b>NMFS Buffer Recommendations</b>		
<b>Category</b>	<b>Functions</b>	<b>Minimum Buffer Width West of Cascades</b>
A. Constructed Ditches, Intermittent Streams and Ephemeral Streams that are not identified as being accessed and were historically not accessed by anadromous or Endangered Species Act (ESA) listed fish species	Water quality, shade, source control, and delivery reduction.	35' minimum
B. Perennial waters that are not identified as being accessed and were historically not accessed by anadromous or ESA listed fish species	Water quality, shade, source control, and delivery reduction.	50' minimum
C. Perennial, intermittent and ephemeral waters that are identified as being accessed or were historically accessed by anadromous or ESA listed fish species	Water quality, large wood debris (LWD) for cover, complexity, shade, microclimate cooling, source control, and delivery reduction.	100' minimum
D. Intertidal and estuarine streams and channels that are identified as being accessed or were historically accessed by anadromous or ESA listed fish species	Water quality, habitat complexity	35'-75' minimum, or more as necessary to meet water quality standards

It was clear from Advisory Group discussions that the NOAA buffer width requirements are a barrier to participation in voluntary restoration efforts for some landowners. Some group members noted that additional flexibility in buffer sizes would increase the number of landowners participating in restoration and open the door to gradual improvements over time. Until additional science shows otherwise, this Strategy notes that smaller buffers do not provide the maximum benefit to streams with respect to temperature. It also notes that any improvement in shade density will provide some benefit to local streams but full protection of a

stream occurs when natural shade densities, microclimate, stream morphology, and water quality conditions are in place.

Ecology has established the [Voluntary Clean Water Guidance for Agriculture Advisory Group](#)<sup>6</sup> to advise us on the identification and implementation of practices that support healthy farms and help farmers to meet clean water standards. The guidance resulting from this process will be a technical resource to help the agricultural community implement practices in a way that insures protection of water quality. We expect that process to complete its examination and recommendations for riparian buffers in late 2020. In addition, the State of Washington has recently assembled the “State-Tribal Riparian Work Group” based on commitments made at the 2019 Centennial Accords. Results of both state-wide efforts will be integrated and used to inform future efforts in the Lower Skagit Tributaries.

### **Action Items:**

- Work with partners to share examples of other riparian buffer assessments and outcomes of the state-wide efforts, and apply these outcomes where appropriate.
- Compile and evaluate information on buffer width, flexibility, and implementation challenges.
- Provide comments and feedback related to USDA programs.

### **Goal: Clarify and implement regulatory authorities**

There is significant confusion among the Advisory Group regarding two of Washington State’s regulatory authorities that were cited in the TMDL and WQIR as supporting riparian restoration: [RCW 36.70A](#)<sup>7</sup>, the Growth Management Act (GMA), and [RCW 90.48](#)<sup>8</sup>, the Water Pollution Control Act (WPCA). Both laws demonstrate the Washington State Legislature’s goals for environmental protection. Although they work in tandem to protect the environment, each law is unique and administered separately from the other. These separate but differing approaches to achieving Washington State’s environmental goals have created uncomfortable and confusing situations during the development of this Strategy.

The GMA provides the framework for local land use planning (comprehensive plans and development regulations) in order to address the threat to the environment caused by uncoordinated and unplanned population growth. Following the Ruckleshaus Agreement, legislative decisions regarding the role of the GMA to compel riparian restoration on agricultural lands resulted in the creation of the Voluntary Stewardship Program ([VSP](#)<sup>9</sup>). The

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<sup>6</sup> <https://ecology.wa.gov/About-us/Our-role-in-the-community/Partnerships-committees/Voluntary-Clean-Water-Guidance-for-Agriculture-Adv>

<sup>7</sup> <https://app.leg.wa.gov/rcw/default.aspx?cite=36.70a>

<sup>8</sup> <https://app.leg.wa.gov/RCW/default.aspx?cite=90.48>

<sup>9</sup> <https://scc.wa.gov/vsp/>

purpose of VSP is to protect and enhance critical areas (i.e., critical aquifer recharge areas, wetlands, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas) while maintaining the viability of agriculture and reducing the conversion of farmland to other uses. VSP Plans are written to ensure there is no net loss of the structure, functions, and value of the critical areas in agricultural areas.

The Water Pollution Control Act (WPCA) differs from the GMA. It declares that it is the public policy of Washington State to maintain the highest possible standards to ensure the purity of all waters of the state. It establishes the state's powers and procedures to ensure that standards set for water quality are achieved and sets the state's expectations for uses of water (fishable, swimmable, drinkable, and others) and the quality of water needed meet those uses (biological, chemical, and other criteria). The WPCA provides the Department of Ecology with the authority to prevent and correct pollution problems using a variety of tools including but not limited to preparing water cleanup plans, awarding grant funding, issuing permits, and conducting enforcement actions.

The WPCA is not superseded by the GMA or provisions of the VSP. A summary document of differences between VSP and RCW 90.48 can be found in Ecology Publication No. [13-10-030<sup>10</sup>](#).

The GMA's VSP relies solely on voluntary actions and financial incentives to promote protection and enhancement of critical areas. The WPCA promotes voluntary compliance and includes enforcement authority to control pollution. Improved compliance with state and federal clean water laws is seen as a critical part of the Ruckelshaus Agreement that led to the creation of the VSP. This Strategy assumes that Skagit County will continue to address GMA through the adoption, review, and enforcement of local ordinances, as well as natural resource protection and enhancement efforts through the Natural Resources Stewardship Program (NRSP) and the VSP.

Ecology will continue to use the full range of authorities provided in RCW 90.48 to achieve clean water. Ecology's Compliance Assurance Manual describes our process and mechanisms for gaining compliance with environmental laws. We achieve compliance through a combination of education, technical assistance and administrative enforcement. Our enforcement actions must be based in fact and law, well documented, appropriate to the violation, and issued professionally and fairly. All of these characteristics are used to build a defensible case and associated durable behavior change on the part of the violator. A formal enforcement action is typically the last step in a suite of escalating actions.

Addressing nonpoint pollution sources requires more education and technical assistance than point-sources because point-source dischargers are already familiar with conditions described in their permit.

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<sup>10</sup> <https://fortress.wa.gov/ecy/publications/documents/1310030.pdf>

Where nonpoint problems are observed, Ecology will either refer property owners to a local conservation organization or work directly with the landowner on solutions.

Where landowners are unwilling to perform the steps needed to protect water quality at their property, enforcement remains a tool to protect water quality. When enforcement is used, it will match the significance of the violation.

There are a number of active water quality permits in the Skagit River Tributaries sub-watersheds and Ecology will compile and evaluate permitted facilities for temperature contribution potential, and conduct follow up actions as appropriate.

Ecology will prioritize use of formal enforcement tools where the lack of native riparian vegetation is causing multiple pollution problems and voluntary compliance supported by technical assistance efforts have been unsuccessful. In these situations, Ecology may pursue orders, directives, permits, or penalties to gain compliance with the standards. Orders may include multiple required restoration activities and management practices, including restoration necessary to fully attain temperature water quality criteria. To help clarify and guide Ecology's compliance assurance efforts regarding temperature pollution, we will develop screening criteria.

#### **Action Items:**

- Compile and develop guidance that clearly explains the differences between GMA/CAO and 90.48, as well as clearly outlines regulatory authority related to 90.48 and associated RCW definitions.
- Ecology will develop screening criteria for permitted (point) and unpermitted (nonpoint) sources to evaluate temperature contribution potential.
- Ecology will compile and evaluate permitted facilities for temperature contribution potential, and conduct follow up actions as appropriate.

**Table 6. Key Element 4: Strategic Planning and Policy Action Matrix**

<b>Key Element 4 - Strategic Planning and Policy</b>			
<b>Goal</b>	<b>Action Items</b>	<b>Long Term Outcome</b>	<b>Implementation Partners</b>
Obtain funding for essential planning and local capacity	Work as a group of watershed partners to investigate and pursue increased funding for local capacity and special projects to implement the Lower Skagit Tributaries Temperature TMDL.	Continue to fund projects using long term funding	ECY, SCD, SRSC
	Participate in Conservation Commission-sponsored pilot projects or other innovative pilot projects wherever feasible and appropriate	Use potential flexibility within pilot efforts to explore alternative implementation efforts, and provide feedback on success and challenges	WSCC, ECY, SCD, SCPW
	Coordinate efforts between conservation partners to identify project sponsors and participants for actions identified in this strategy and other future efforts.	Increased coordination between conservation partners in future grant and funding applications	All partners
		Investigate state level funding to support CREP goals and easements.	PSP, WSCC, USDA, ECY, WDFW
Consider emerging programs related to buffer sizes	Work with project partners to provide comments related to existing programs effectiveness and limitations. Includes comments on state and federal programs	Work to develop local or state support to enhance programs.	ECY, SCD, WSCC, SCPW
	Compile and evaluate information on buffer width, flexibility, and implementation challenges	Review buffer policy based on BAS and practicality. Integrate other regional efforts and policy related to buffer widths.	ECY, WDFW, SPW, WSCC
		Develop tributary watershed milestones based on sequencing, funding availability, and Phase I planning efforts.	All partners
	Provide comments and feedback related to USDA programs.	Work to increase CREP funding levels through policy change or state program match. Examine ESA considerations for program payments.	PSP, WSCC, USDA, ECY, WDFW

## Key Element 4 - Strategic Planning and Policy

Goal	Action Items	Long Term Outcome	Implementation Partners
Clarify and implement regulatory authorities	Develop guidance that clearly states the differences between GMA/CAO and 90.48, as well as clearly outlines regulatory authority related to 90.48 and associated RCW definitions.	Develop a regulatory assessment timeline, as a larger effort - ECY and others	ECY, SPW
	Develop screening criteria for point and nonpoint temperature contribution potential.	Conduct regulatory review of point and nonpoint sources using criteria.	ECY
	Compile and evaluate permitted facilities for temperature contribution potential, and conduct follow up actions as appropriate.	Reduce temperature contribution potential from permitted facilities.	ECY

# Chapter 3: Implementation Priorities – Sub-watershed Sequencing

To support targeted and coordinated action within the Lower Skagit Tributaries area, the TMDL sub-watersheds were sequenced in general terms of implementation priorities. The sequencing is not intended to exclude or discourage potential projects anywhere within the TMDL area. Any opportunity to implement projects, practices, or other efforts to reduce temperature and improve watershed health should be supported.

Numerous organizations that are actively involved with conservation, fisheries restoration, and agricultural/drainage issues within the Lower Skagit TMDL area have developed planning and implementation strategies. The sequencing of the Lower Skagit Tributaries sub-watersheds is based on these existing plans and priorities of regional partners, as well as on information previously assembled depicting the status of riparian vegetation and locations where additional restoration would provide multiple benefits.

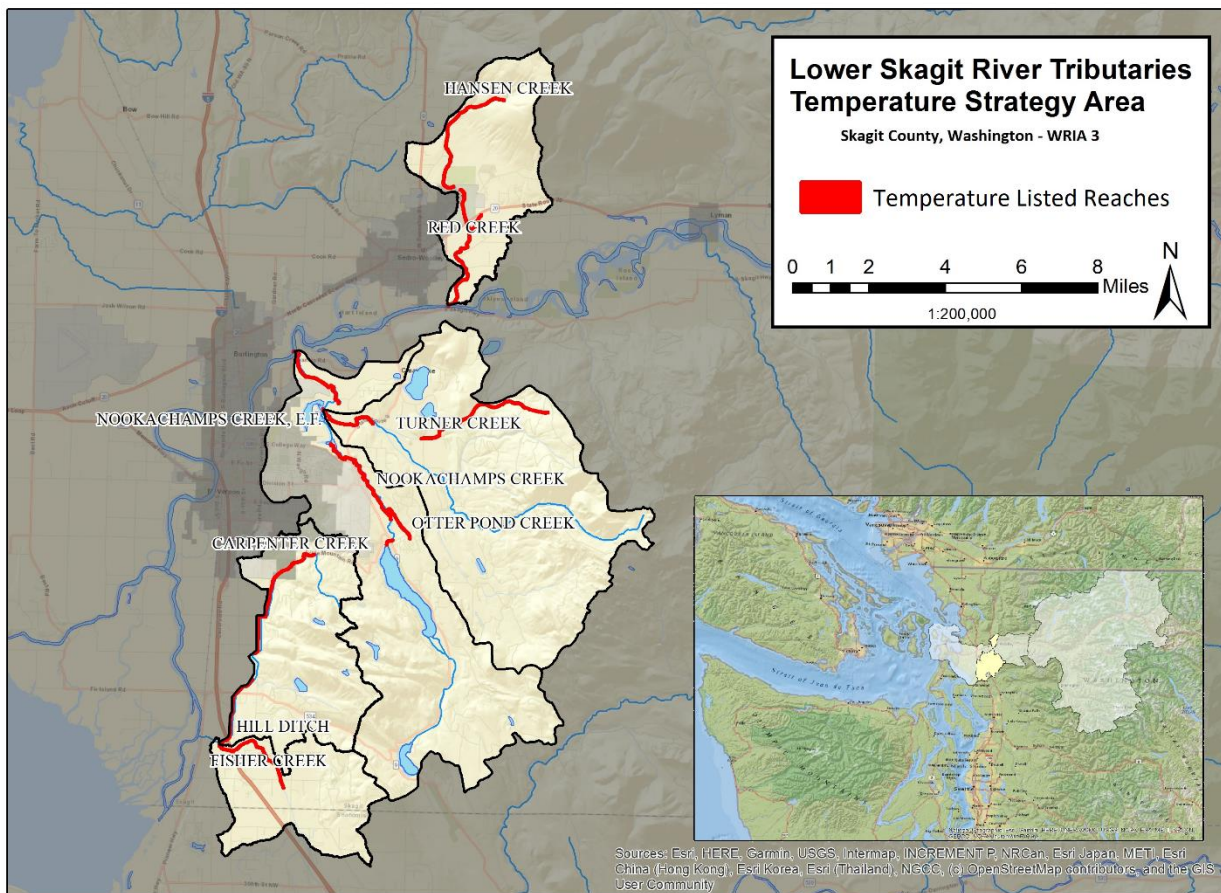


Figure 4. Lower Skagit Tributaries Temperature TMDL area



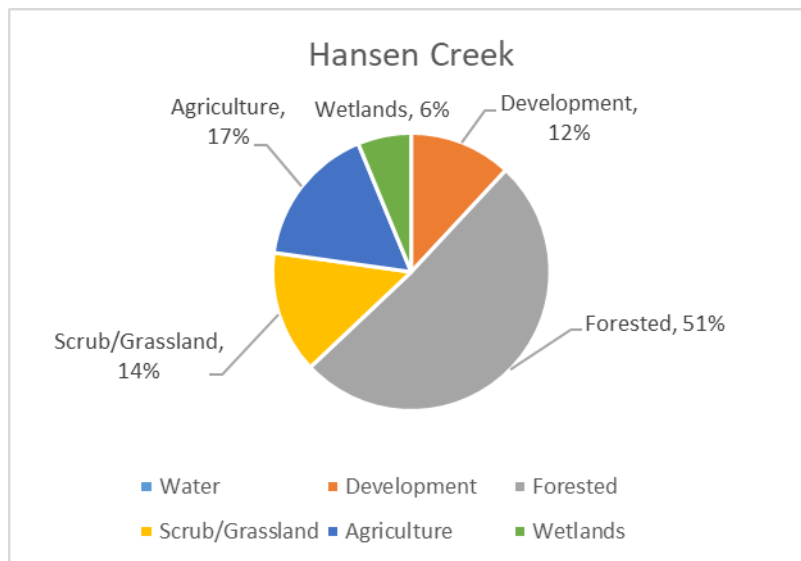
Based on the discussion of the group, the sequencing for the sub-watersheds is as follows:

1. Hansen Creek,
2. East Fork Nookachamps Creek
3. Nookachamps Creek
4. Fisher Creek
5. Carpenter Creek

Based on time and funding constraints, the Strategy does not include summary information for individual sub-watersheds, reach scale planning or parcel level recommendations. The reach scale planning (Key Element 2) and data set compilation work proposed in the Action Items will be used to detail the level of effort necessary and develop a cost estimate for each sub-watershed.

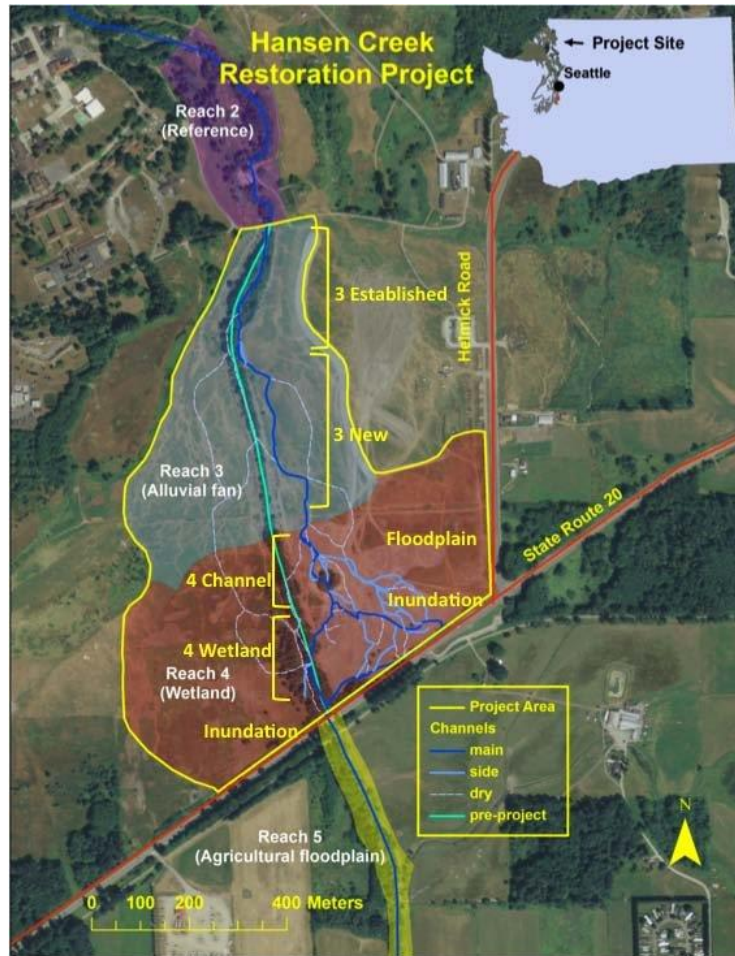
## Hansen Creek Watershed

The Hansen Creek watershed is in northwestern Skagit County, draining approximately 13 square miles. Hansen Creek headwaters start in the Lyman Hill area and flow south to its confluence with the Skagit River near Sedro Woolley. Red Creek is the major tributary to Hansen Creek, with several smaller tributaries entering just above the Northern State Recreation Area. Both Hansen and Red Creek are listed as impaired for temperature exceedances. Land use in the Hansen Creek watershed consists mostly of a mixture of forestry, rural, and agricultural uses, with low to moderate density and industrial development near Sedro-Woolley.



**Figure 5 - Land use in Hansen Creek Watershed**

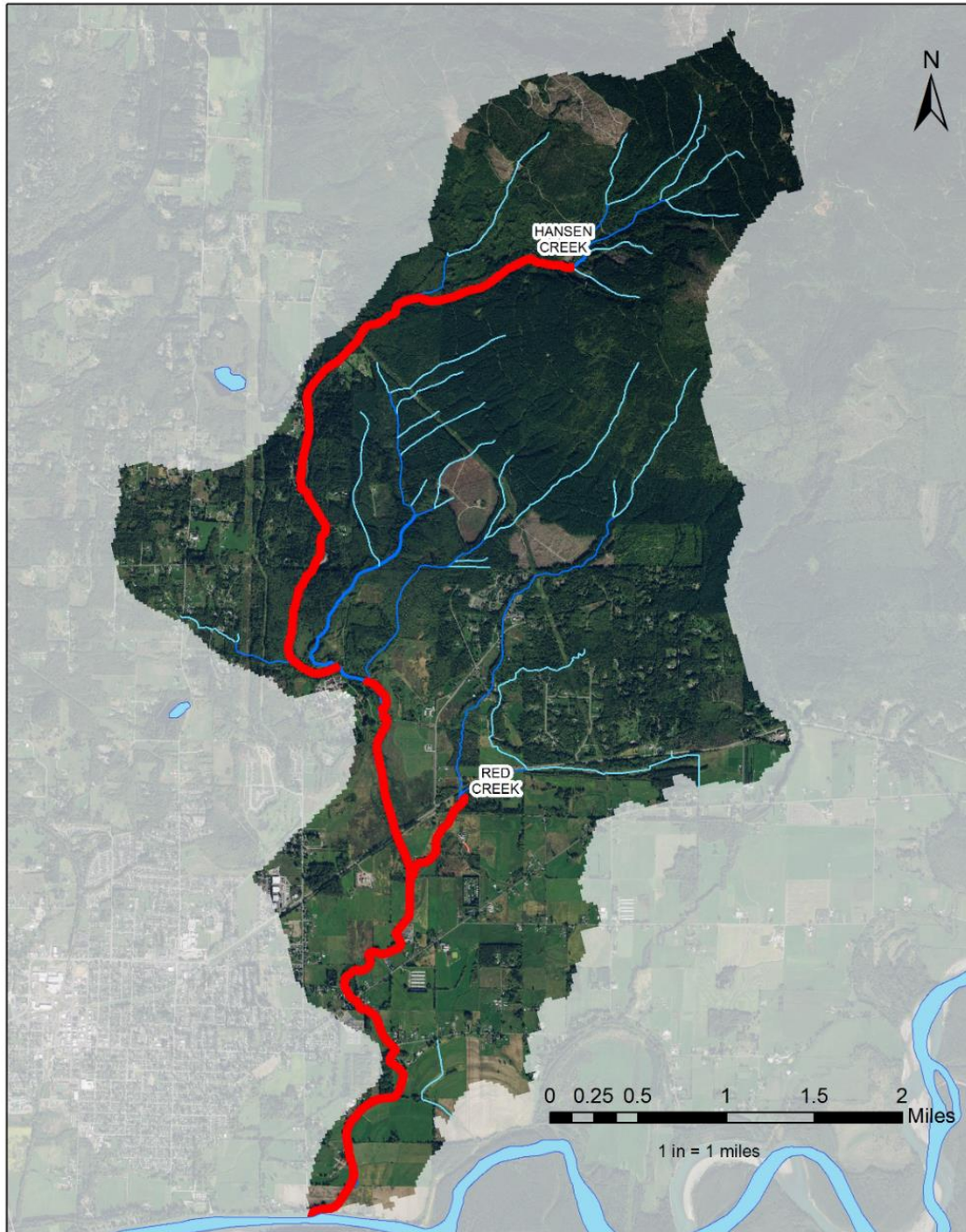
Ditching and diking of the system has impacted the streams' ability to transport sediment, access the floodplain, and develop an equilibrium. Long-term dredging and maintenance efforts to remove sediment created dredge spoils that act as small dikes, allowing little opportunity for surface water to drain back into the creek during flood events. The dredging contributed to the wide and shallow channel, which increased the surface area available to solar radiation (Skagit County 2002).



**Figure 6 - Hansen Creek restoration on reach 3 and 4**

Hansen Creek had a “reach scale” restoration effort as part of the Hansen Creek Watershed Management Plan. Started in 2002, this plan was initiated by Skagit County to determine a means to decrease flooding and improve fish habitat on Hansen Creek and its tributaries. Several conservation partners, including the Skagit River Systems Cooperative, The Skagit Fisheries Enhancement Group, the Skagit Watershed Council, the Skagit Land Trust, and the Skagit Conservation District, are working to acquire, restore, and study significant portions of Hansen and Red creeks. They have conducted channel construction and reestablishment, and riparian vegetation restoration. Additional plans and designs are being developed and implemented to restore flood plain connections, increase water retention, and improve habitat.

Due to the existence of the management plan, and the progress already made on Hansen Creek, this sub-watershed is at the top of the sequenced list. In order to facilitate additional implementation activity in Hansen Creek, funding sources such as “Direct Implementation Funds” and other potential pilot projects (WSCC pilot project) are being explored to increase and support restoration efforts in the near term.



**Figure 7. Hansen Creek Watershed. The red line above shows the documented temperature impairments in the main stem of Hansen Creek. The dark blue and light blue lines show the 1<sup>st</sup> and 2<sup>nd</sup> order stream segments of Hansen Creek as they reach into the headwater areas.**

## Nookachamps Creek Watershed

The Nookachamps Creek Watershed is the second highest sequenced area. Nookachamps Creek consists of main stem Nookachamps Creek (occasionally labeled West Fork) and East Fork Nookachamps Creek. The watershed is located in south-central Skagit County and drains approximately 81 square miles, making it the largest tributary watershed in the TMDL area. The majority of the lower sections of both Nookachamps Creek and East Fork Nookachamps Creek have been channelized and diked, which has resulted in wide shallow channels with limited riparian vegetation.

Nookachamps Creek has been highlighted a priority for restoration through the “Tributary Assessment for Potential Chinook Salmon Rearing Habitat and Recommendations for Prioritizing Habitat Protection and Restoration” produced by the Skagit Watershed Council in 2015. Restoration potential was ranked across the Skagit River Watershed using the following methods:

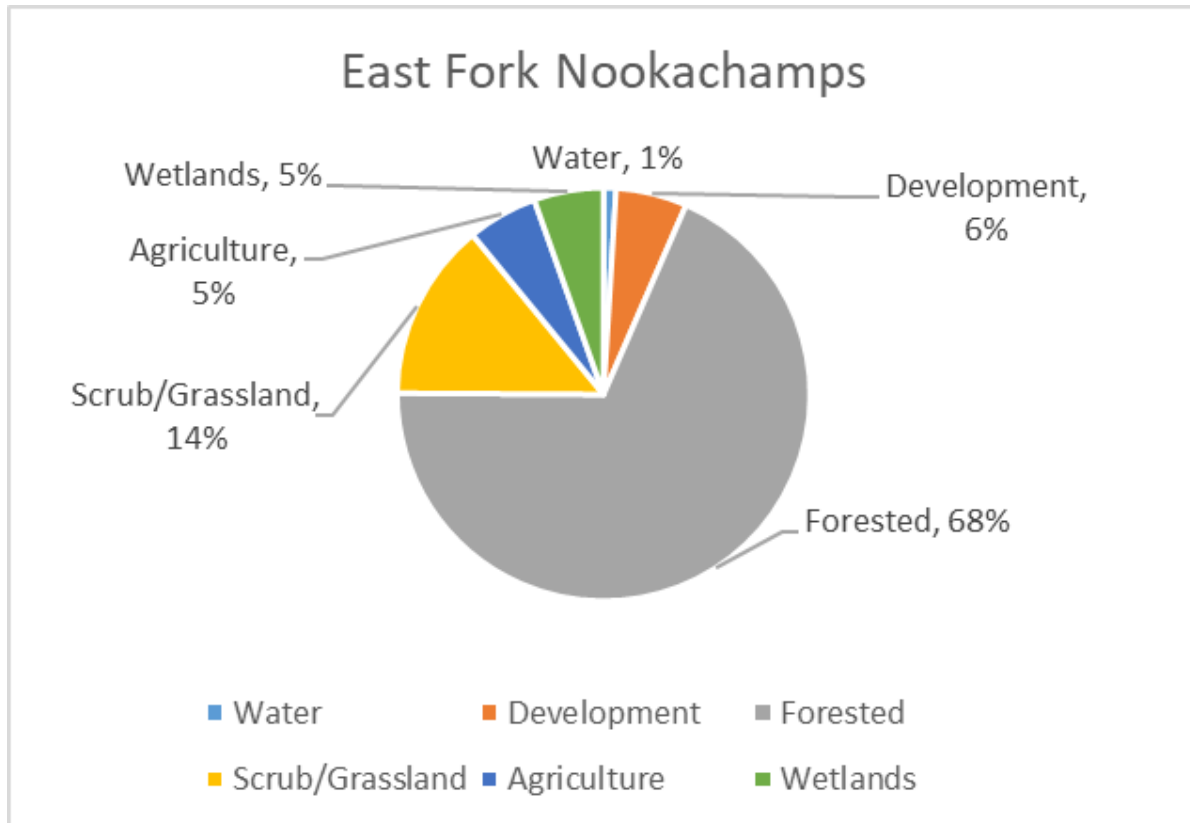
- Multiple Regression Approach using Spawner Abundance
- Intrinsic potential approach based on Spawner Densities
- Percent of Spawners contributed by tributary

Each metric was reviewed individually then aggregated to develop a rank based on cumulative score. Based on the cumulative scores, Nookachamps (6) and Hansen (15) were within the top 15 of all tributaries within the Skagit River watershed.

Similarly, West Fork Nookachamps Creek was identified as Steelhead target based on the in the “2016 Interim Steelhead Strategy” developed by the Skagit Watershed Council. The two Nookachamps Creek sub basins are discussed in more detail below.

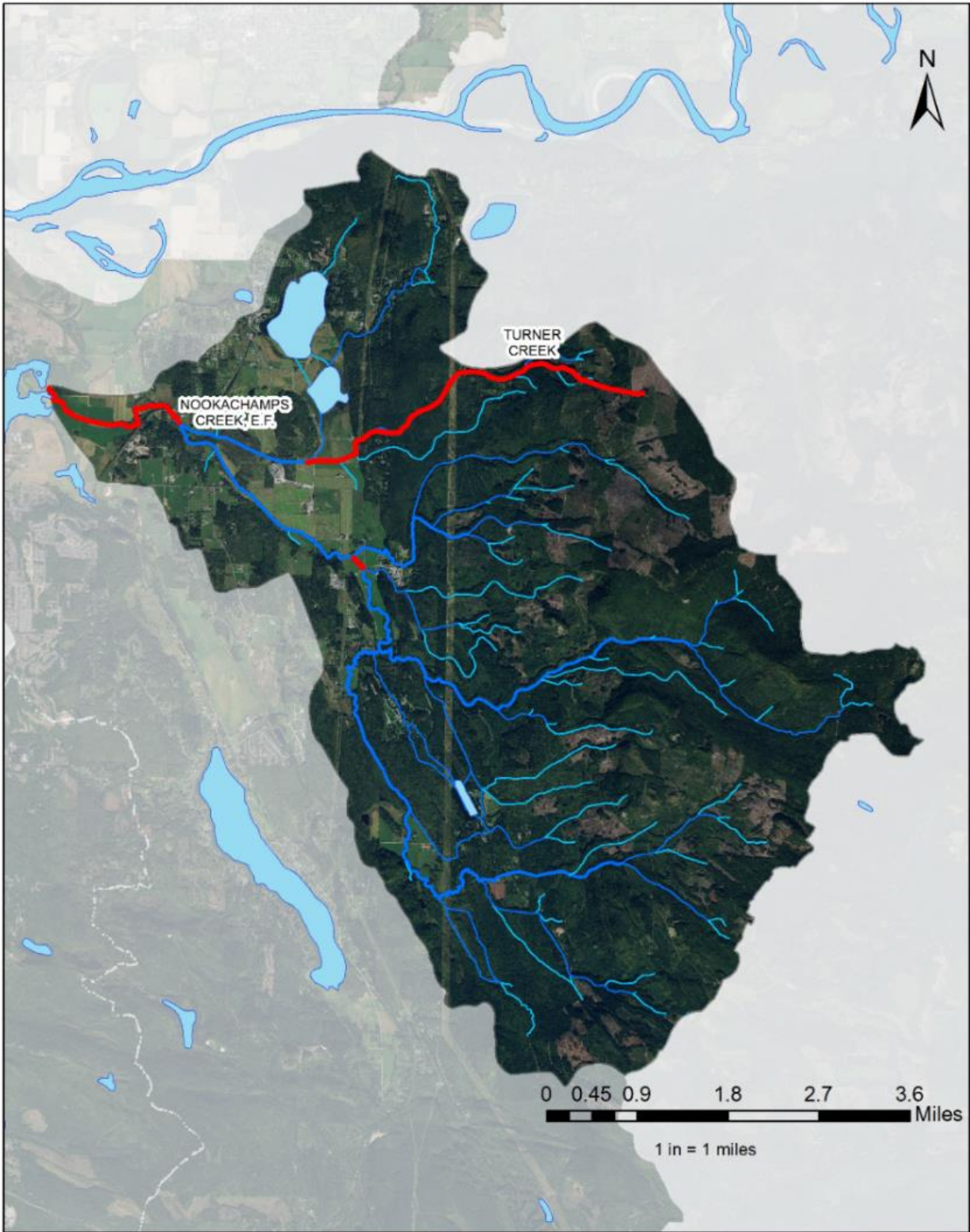
## East Fork Nookachamps Creek

The East Fork of Nookachamps Creek is formed by tributary streams descending from Cultus Mountain. The main tributaries to East Fork Nookachamps Creek are Day Creek, Turner Creek, Mundt Creek, and Walker Creek. Impaired reaches include portions of the East Fork Nookachamps and Turner Creek.



**Figure 8 - Land use in East Fork Nookachamps Creek is mixed.**

East Fork Nookachamps is considered a priority due to an ongoing watershed planning effort by Skagit County and the Skagit River Systems Cooperative, as well as local interest. Drainage and high water concerns exist in the area, and with proper planning and coordination, a multi-benefit plan could be developed to balance drainage and infrastructure concerns and water quality and habitat restoration.



**Figure 9. East Fork Nookachamps Creek and Turner Creek. Red lines are areas of documented temperature impairments.**

## Nookachamps Creek

The Nookachamps Creek “main stem” watershed consists of the drainages of Lake McMurray, Lake Creek, Otter Pond Creek, Big Lake, and Nookachamps Creek. Lake Creek flows from the outlet of Lake McMurray south to Big Lake.

Water from Big Lake discharges into Nookachamps Creek, which flows approximately 7 miles through agricultural lands and low density development, before its confluence with the Skagit River midway between the cities of Mount Vernon and Sedro Woolley. Summer outflow temperatures from Big Lake frequently exceed the water quality standard for temperature.

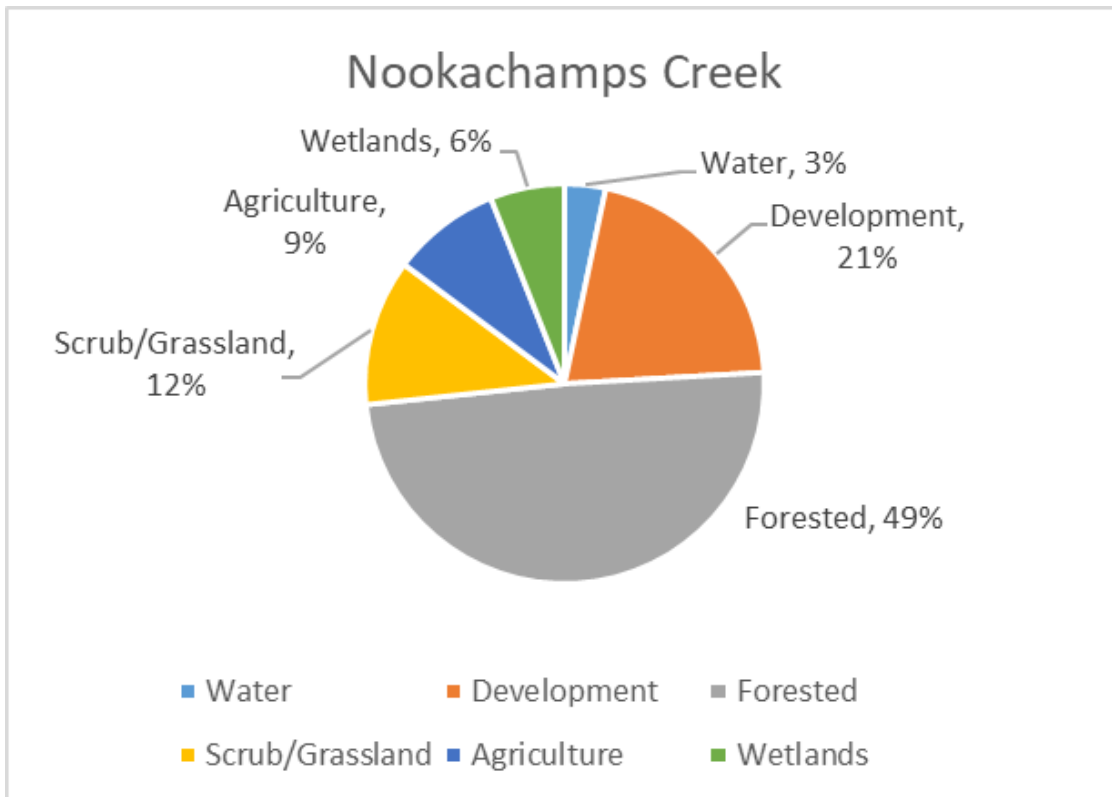
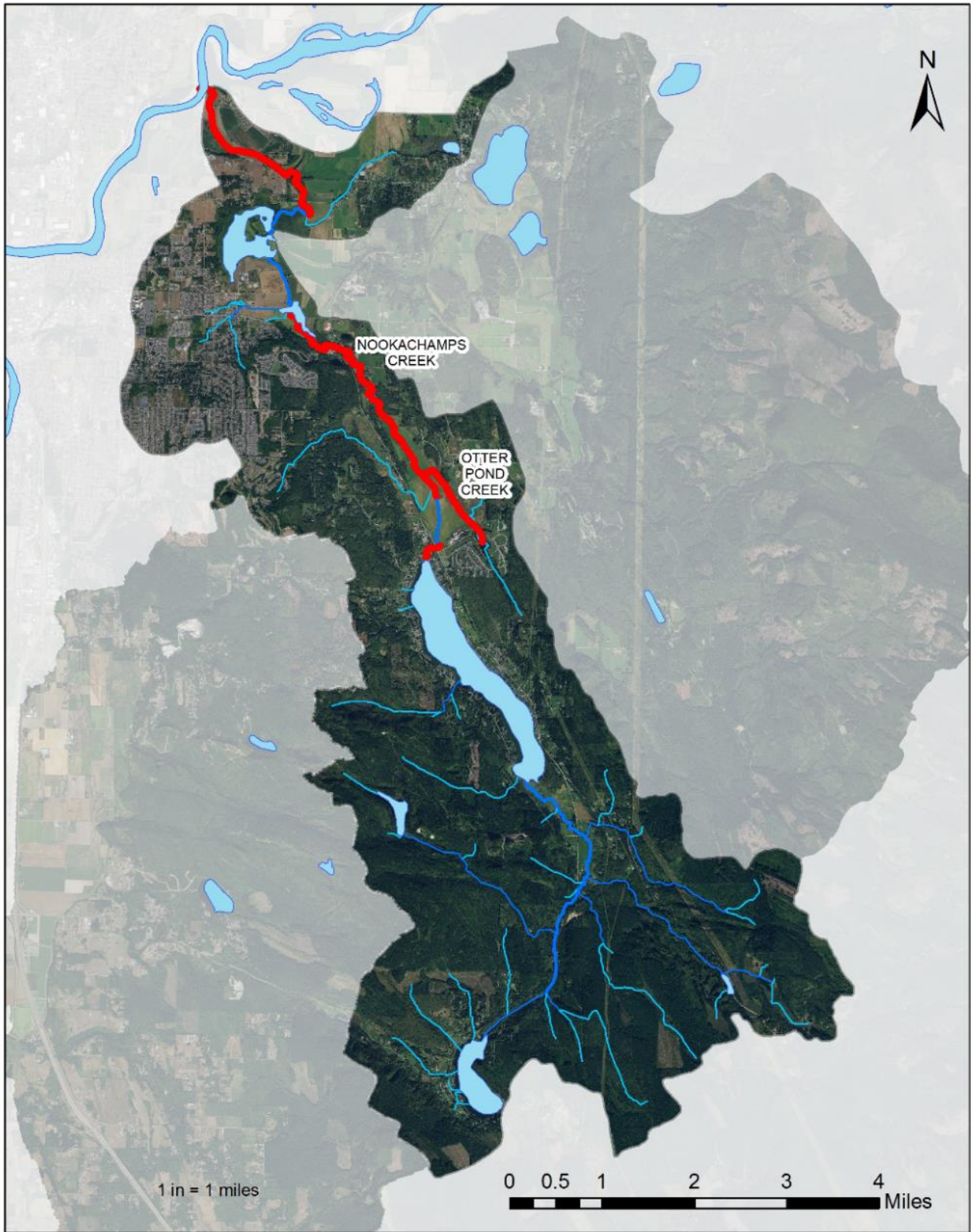


Figure 10 - Land use in Nookachamps Creek watershed.



**Figure 11. Nookachamps Creek Watershed, including Otter Pond Creek and headwaters streams. Red lines are areas of documented temperature impairments.**



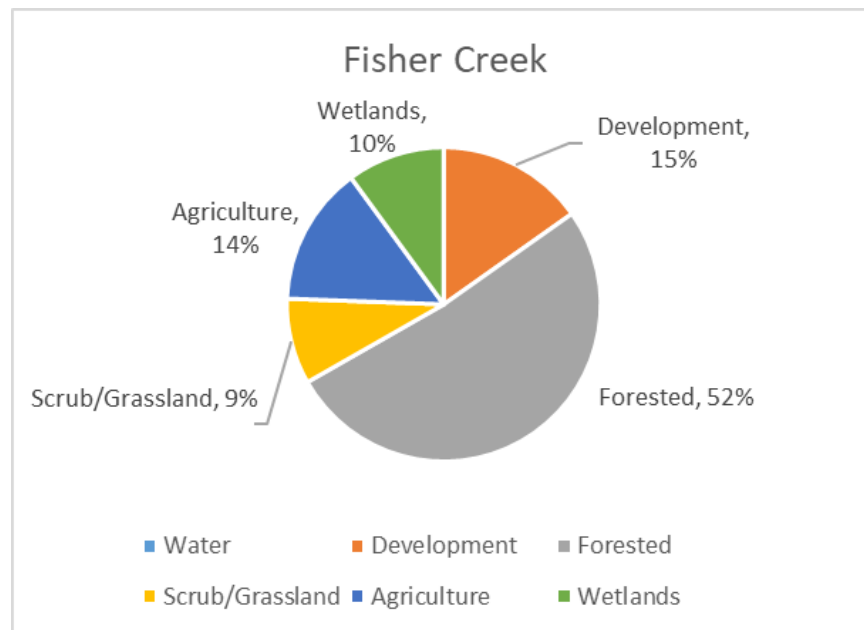
## Fisher and Carpenter Creek Watersheds

The Fisher Creek and Carpenter Creek drainages are located in the most southern portion of the lower Skagit Tributaries TMDL area, southeast of the city of Mount Vernon, with a small portion covering northern Snohomish County. Fisher and Carpenter creeks merge a short distance (0.8 km east) from the South Fork of the Skagit River. The combined drainage area for the two creek systems is approximately 25 square miles.

### Fisher Creek Watershed

Fisher Creek is the smallest sub-watershed in the TMDL area. Temperature data also indicates that this reach is closest to meeting standards, with approximately 3% of the 2013-2018 (missing 2014) data set exceeding 18°C. The Fisher Creek main stem drains towards the northwest and is fed by several smaller tributaries that drain the lower elevation hills of the southern and southeastern lowlands. Fisher Creek flows through alternating sections of forest and agricultural lands.

Due to the size of the sub watershed, total proposed restoration area is smaller than other impaired reaches. While the size is small, individual parcels are small, meaning impacts of restoration take a large percentage of the parcel by area.



**Figure 12 - Land use in the Fisher Creek watershed.**

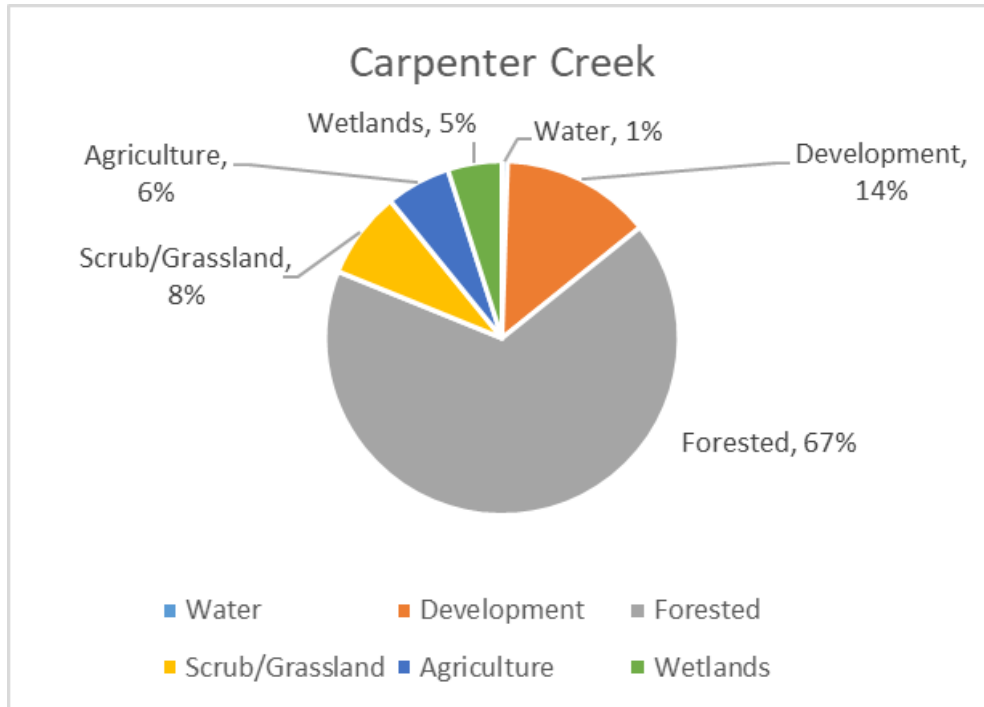


**Figure 13. Fisher Creek watershed. Red lines are areas of documented temperature impairments.**

## **Carpenter Creek Watershed**

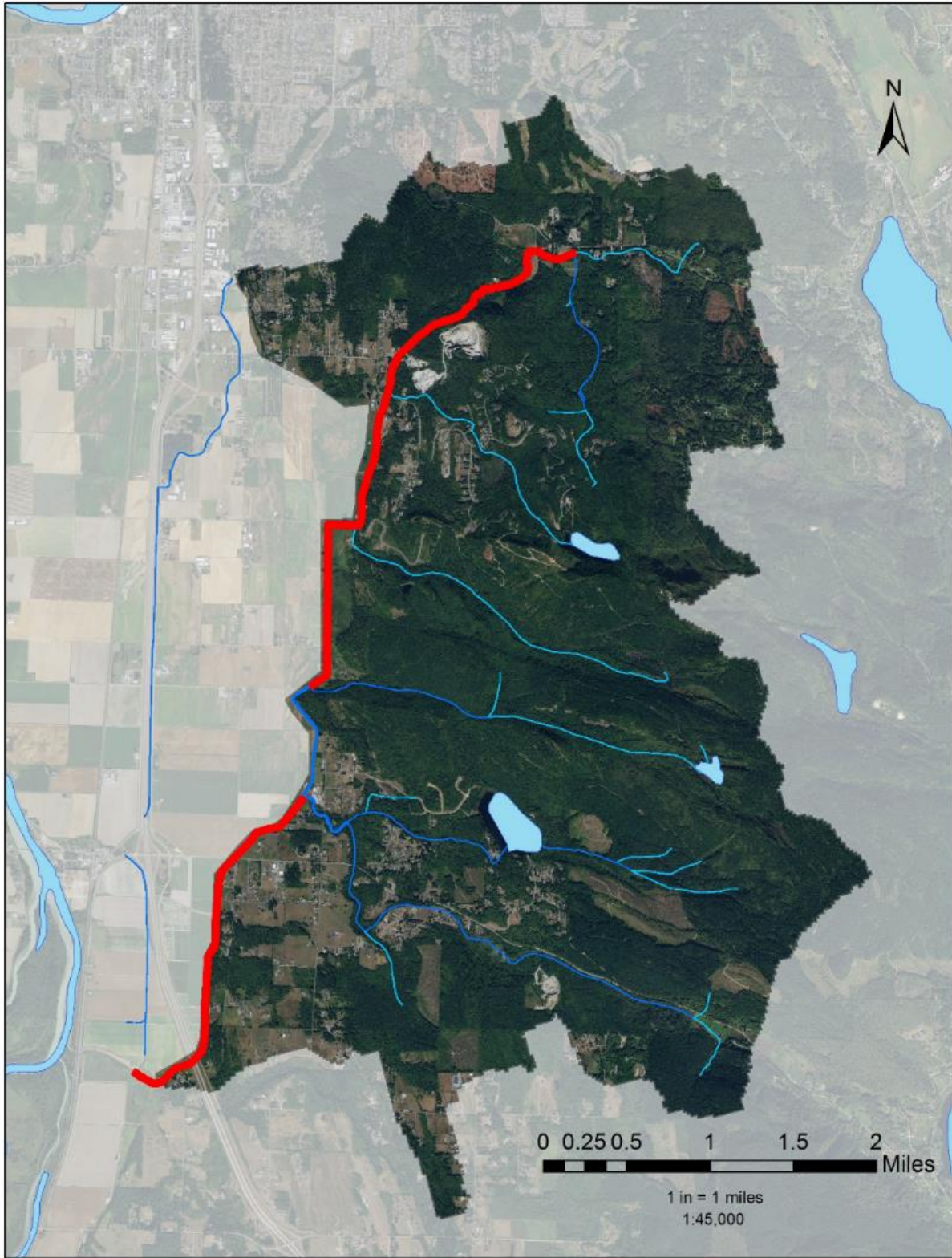
Carpenter Creek occupies the northern half of the tributary watershed, draining towards the south. The portion of the Carpenter Creek main stem that flows across the Skagit plain has been diked and channelized adjacent to the base of the uplands, and is known as Hill Ditch. Hill Ditch is maintained by Skagit County Dike District #3. Tributaries feeding both main stem Carpenter Creek and Hill Ditch drain largely from the east.

Carpenter Creek is listed at the end of the sequence not because it is a low priority, but instead due to the complexity of the efforts required in the area. The area includes portions of Dike District 3, Drainage District 17, and Dike, Drainage & Irrigation District 12. Restoration work will need to consider the concerns related to ongoing maintenance, existing drainage easements and district plans.



**Figure 14 - Land use in Carpenter Creek watershed.**

Existing infrastructure, such as dikes or grade controls, may limit the feasibility of riparian vegetation restoration. Additional efforts to consider watershed processes and alternative methods to reduce temperature should be explored. Ongoing or established projects in the area, such as alluvial fan restoration/infiltration and wetland creations/enhancement should be evaluated when considering future efforts. All agencies and partners should work together to balance the practical needs of the districts and goals of the temperature restoration efforts.



**Figure 15. Carpenter Creek and its tributaries. Straightened portions of Carpenter Creek in the southwest portion of the watershed are known as Hill Ditch. Red lines are areas of documented temperature impairments.**

## **Chapter 4: Policy discussion, comments and recommendations**

This chapter documents policy discussions and recommendations identified by members of the Advisory Group. These recommendations are documented in the Strategy so that they can be considered by entities responsible for these policies and programs who wish to help solve temperature problems in the Lower Skagit and potentially elsewhere. Each recommendation is not necessarily supported by all Advisory Group members, nor do they represent commitments made by Ecology or Advisory Group members.

Numerous conservation organizations and partners have developed successful voluntary participation programs. These programs and initiatives are achieving conservation gains across the state by working with landowners to deliver results. However, barriers and limitations of these programs keep them from being as successful as they could be. While changes to programs and policies are generally beyond the authority of local Ecology staff and the Advisory Group, this Strategy does comment and make recommendations to improve several existing programs. While several recommendations below deal with federal programs, others address state and local programs over which there is more local control.

### **Federal Programs**

#### **Conservation Reserve Enhancement Program**

The Conservation Reserve Enhancement Program (CREP) is one of the most widespread tools for restoring riparian areas in agricultural areas. Funded through the Farm Bill and designed to work in concert with other USDA programs, CREP offers an economic incentive for removing land from production when it is located next to salmon-bearing waters. CREP pays a yearly rental payment in exchange for farmers removing environmentally sensitive land from agricultural production and planting species that will improve environmental quality. Producers who qualify receive annual rental payments in exchange for not using the land for crop production or pasture during the life of the contract.

CREP policy specifies that county average rental rates must be set at levels that reflect the average cash rental rates per acre for non-irrigated cropland for production of the predominant annually tilled crop for each soil type within a soil survey area in a county during the past year, adjusted for inflation. A three-year average of National Agriculture Statistical Service data is used to establish these rates. CREP caps the weighted average soil rental rate at \$240 per acre. In the past, the Farm Service Agency (FSA, which administers CREP) has also paid a 40% Practice Incentive Payment (PIP) cost share rate, with the state paying an additional 10% (50% total installation cost). Under the new Farm Bill it is not yet known if FSA will continue paying the 40% PIP.

In addition to soil rental rates, FSA will pay up to 50% of the eligible cost to establish a CREP practice. The maximum annual non cost-share payment that an eligible person can receive under CREP is \$50,000 per fiscal year.

Because of the importance of the CREP and its potential to contribute significantly to gaining landowner participation in agricultural areas, this Strategy documents six recommendations to help the program keep up with the needs of landowners and restoration specialists.

### **Installation costs (contractor reimbursement rates)**

While soil rental rates are frequently reviewed, discussions with local implementers identified that the reimbursement and payment rates for contractors has remained relatively stagnant. Plant establishment expenses often exceed the cost-share “not-to-exceed” (NTE) values due to the extensive mowing/herbicide/vegetation control, tillage and seedbed preparation, tile or drainage alterations, or other site preparation needed to ensure plant survival. Increasing fuel and equipment costs, as well as increases in general construction and excavation do not seem to be reflected in current CREP rates.

**Recommendation:** Federal agencies should review and revise contractor reimbursement rates to match current costs and expenses of establishing forested riparian areas.

### **Availability of the program (per acre caps)**

The CREP program is subject to an acre cap, or a maximum allowable amount of area enrolled within the program each year. The total number of acres under the cap has been reduced over time. Since 1985, the cap has been reduced from a high of 39 million acres to a current cap of 27 million acres. However, increasing the total acres available to each state will be based on the historical enrollment levels. Also, while the acre cap was increased, the soil rental rates were decreased in an effort to target the most sensitive lands without negatively impacting the local rental market.

**Recommendation:** Federal agencies should increase acreage eligible for CREP. Increased acreage would reflect the need to continue previous sign ups and increase overall acreage caps to facilitate additional sign ups.

### **Endangered Species Act considerations**

CREP targets high priority conservation issues identified by local, state, or tribal governments or by non-governmental organizations. While this increases prioritization to areas with ESA listings, the presence or absence of ESA listings is not considered when calculating payment rates. CREP payment rates are based on county average rentals rates, and a weighted average of soil types on site. While it is possible to request an alternate county rental rate where producers can document higher cash rental rates, rates are largely fixed.

Allowing additional incentive payments, or rate calculation methods to consider endangered species, may increase landowner participation in the most critical areas.

**Recommendation:** Federal agencies should increase the incentive payments for the areas based on documented presence of ESA listings. Consider increasing the payment cap in ESA listings areas.

### **Removing payment caps for high priority areas**

The maximum annual non-cost share payment that an eligible “person” can receive under CREP is \$50,000 per fiscal year. The payment cap is a separate payment limitation from other USDA programs, applying only to CREP non-cost share payments. While significant acreage needs need to be enrolled in a program to exceed the payment cap, removal of the cap may be beneficial to specific instances to protect high priority areas.

**Recommendation:** Increase flexibly of the payment cap in highest conservation priority areas. One option would be to create criteria to allow petitioning or waiving of CRP payment cap.

### **Maintenance payments**

Maintenance payments are currently limited to 3-5 years. Increasing the length of maintenance within the contract will allow control of invasive species, non-native plants, or other stressors such as disease and ensure the quality of the buffer, as well as protect existing drainage easements in restored areas. While native grasses can often be established in two to three years, forested buffers take significantly longer to reach maturity.

*Recommendation: Extend the maintenance payment period to allow additional upkeep of the buffer well into the contract life cycle. Allow for the cost of replanting up to the 10th year of the contract.*

### **Increase/allow additional plant density design within the practice**

The shading value provided by a buffer depends on the type of tree planted, the vigor of its growth, and overall survival rate of a planting. In Western Washington, invasive species and other non-native plants and shrubs are more abundant and more likely to out-compete riparian plantings if the quality and density of plants is too low. Restoration specialists currently need to use local grants to supplement CREP funds when increase planting densities are needed to combat invasive species. Those resources could be put to use to support other stand-alone planting projects if CREP provided adequate funds for this portion of the restoration process.

**Recommendation:** Evaluate existing buffer density guidelines related to shade potential, water quality standards, invasive plant suppression, and flood water impacts to new plantings.

## State programs and support

Several members of the Advisory Group reported that the current opportunities and processes for funding riparian restoration need to be refined. The costs of improving water quality are highly dependent on the local priority, target areas, and specific activities selected to address temperature issues. For example, the cost of planting and maintaining forested riparian vegetation is relatively inexpensive on a cost per linear foot basis when compared to other restoration activities, such as wetland or channel restoration projects. A description of the major state funding sources used by restoration specialists is provided below along with a discussion of program elements affecting the pace of restoration in the Skagit watershed. Several areas were noted where funding guideline changes could be made that some believe would improve participation and effectiveness, including minimum buffer sizing, funding for maintenance, and stability of funding.

### Salmon Recovery Funding Board

In 1999, the Washington State Legislature established the Salmon Recovery Funding Board (SRFB). Composed of five citizens appointed by the Governor, and five state agency directors, the board brings together the experiences and viewpoints of citizens and the major state natural resource agencies. Since 1999, the board has awarded more than \$477 million in grants to more than 1,700 projects in 31 of the state's 39 counties. Many salmon recovery projects increase or improve habitat as well as improve water quality. The Salmon Recovery Boards reviews and identifies projects annually for funding

### Ecology's Combined Funding Program

Ecology's Water Quality Combined Funding Program is an integrated funding program for projects that improve and protect water quality throughout the state. The program combines grants and loans from state and federal funding sources. We also provide technical assistance to program applicants to help them navigate this process.

We have one combined funding cycle, one application, one competitive rating process, and one list of funding offers. A list of potential funding sources can be found on the [Ecology Grants website](#)<sup>11</sup> as well as opportunities from various conservation partners.

### Minimum buffer sizing

Although current guidelines provide some flexibility to on-the-ground implementers, some Advisory Group members felt the minimum buffer sizes in place at this time are creating a barrier to meeting riparian restoration goals. Conversely, there was concern that inadequately sized buffers (too small) are not an appropriate investment of public funds, especially if they do

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<sup>11</sup> <https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Water-Quality-grants-and-loans>



not consider the long-term needs of streams to provide natural functions like the recruitment of wood and new spawning gravels.

The Advisory Group recognized that infrastructure and existing uses must be considered with some members recommending state policy on buffer sizes be re-evaluated to potentially improve the overall rate of restoration progress while ensuring adequate value is gained through these public investments.

**Recommendation:** Evaluate work products of the both the State-Tribal Riparian Restoration Workgroup and Ecology's Voluntary Agricultural BMP Guidance when they are completed and revisit state guidelines for possible modification.

A side effect of the current minimum buffer size policy is that organizations designing programs to address multiple pollution problems (e.g., livestock access and manure management) cannot in good faith promise significant progress because the potential number of properties they can work with is greatly reduced by the current buffer requirements. It also affects their ability to use state funds to build better outreach and education programs.

## **Funding for maintenance**

Group members also noted that unlike CREP, the state's current grant structure does not adequately support maintenance of plants. In Ecology's short 3-year grant window, there is not enough time to perform maintenance, especially given Western Washington's challenge with invasive plant and animal management. Although it is possible to combine maintenance of older sites with new plantings, depending on competitive funding sources creates an unstable and unpredictable financial footing for maintenance work, which is just as essential as planting new trees in the first place.

**Recommendation:** Evaluate state options for increasing support for maintaining existing and future planting projects.

## **Stability of funding**

The availability of state grant funding to sustain local restoration programs was noted as important and essential. However, the amount of funding relative to the amount of progress that needs to be made is not adequate to meet state and federal restoration goals. Building stable programs on temporary funding sources is also problematic on several fronts. First, it is hard to retain staff under this funding model. Second, it is especially important in some communities, like in the lower Skagit Tributaries, to have well known and respected staff that have developed relationships and trust with the local community.

**Recommendation:** Increase grant funding available for developing and planting new riparian restoration projects.

## State funding for easements

Several states and nonprofit entities have found success in offering permanent conservation easements, or additional incentive payments to support federal payment rates and programs. Providing state funds to match or enhance federal program, Washington State can leverage CREP programs and payments, increasing landowner participation and reducing local costs. The Washington State Conservation Commission (WSCC) developed a supplemental budget year decision package for the 2020 session with the following proposals:

- Fund a few conservation districts to increase partnership building in areas we lack sufficient CREP participation.
- Survey landowners along targeted, high priority tributaries on which incentives would entice them to participate in CREP or a state-based CREP-like program.

WSCC would use this information along with discussion with partner agencies and tribes to develop a larger decision package for the next biennium to implement a targeted approach with the goal of restoring at least 70% of priority stream reaches to achieve measureable success in water quality or fish habitat.

**Recommendation:** Support the potential new WSCC program and allow Skagit watershed restoration specialist to participate in the pilot program. Continue to investigate additional Washington State funded easements and programs that broaden restoration practitioners' toolbox for working in partnership with landowners.

## Puget Sound Partnership and Local Integrating Organizations

The Puget Sound Partnership (Partnership) supports collaborative local forums through Local Integrating Organizations (LIOs). LIOs work to develop, coordinate, and implement strategies and actions that contribute to the protection and recovery of the local ecosystem. The Partnership believes local groups are best positioned to understand and respond to the complex and diverse environmental, social and economic factors inherent to Puget Sound. LIOs provide a venue for local partners to identify and develop locally driven recovery strategies. Primary roles of an LIO include guiding the implementation of Action Agenda priorities and prioritizing local actions for investment.

The Partnership helps to integrate, synthesize and build up local priorities into regional paths forward, integrating management and coordination processes, and shared learning systems. Through the LIOs, the Partnership elevates local voices and secures funding for implementation of recovery actions on a broader scale.

**Recommendation:** Explore feasibility and support of continued TMDL group facilitation and discussions through an LIO venue.

## Potential initiative or new funding source to support recovery efforts

Among the suggestions by Advisory Group members was the development of new targeted funding sources directed primarily or solely at supporting riparian restoration. The example provided was a previous effort investigated by Skagit County. In that effort, Skagit County researched and developed efforts to enhance habitat while balancing land use concerns.

The “Salmon Heritage Program” included efforts to fund easements and property acquisition at a county level. Information on the program below is from the Skagit County website:

“In early 2007, Skagit County prepared to launch a comprehensive program to acquire conservation easements along key salmon streams in agricultural areas. The effort, known as the Salmon Heritage Program, was modeled on the county’s successful Farmland Legacy program, and was intended to address long-running controversy over riparian habitat on actively-farmed land. The Salmon Heritage Program planned to raise funds through a county-wide ballot measure, pay fair market value for riparian habitat easements, and jointly manage that habitat in cooperation with the tribal-led Skagit River System Cooperative.”

Polling data indicated a positive public reaction to idea of balancing restoration efforts and property rights through fair compensation. However, the project did not receive public support regarding the use of a county level tax to fully fund and operate the program. Public opinion indicates that the Skagit River and its associated fisheries should be considered a regional asset.

“There is widespread support for the Salmon Heritage Program concept, so long as the burden of funding the effort is equitably shared by federal, state, and tribal governments. Finding funding sources for the Salmon Heritage Program, in whatever form it may ultimately take, is an ongoing and critically important topic of discussion.”

Ongoing recovery efforts take a considerable amount of capital. As proposed by Governor Jay Inslee, The 2019-2021 Washington state operating, capital and transportation budgets include approximately 1.1 billion in investments to support recovery efforts of orca and salmon populations. With the development of the Orca Recovery Task Force, ongoing salmon recovery efforts, as well as regional public interest and engagement with the restoration efforts, the use of an Initiative or other mechanism to provide dedicated environmental restoration funding was proposed for further discussion. While considerable time and effort will be required to finding an acceptable funding mechanism, other states or local programs have found success through fractional increases to state sales tax, or usage taxes and fees.

**Recommendation:** Explore feasibility and support of dedicated funding through the initiative or other mechanism process.

## Chapter 5: Conclusion and Next Steps

The Puget Sound Partnership Leadership Council adopted Resolution 2019-02 in March 2019. The resolution documents the Leadership Council’s request that Ecology work to develop a strategy to increase implementation and restoration efforts. Per Resolution 2019-02:

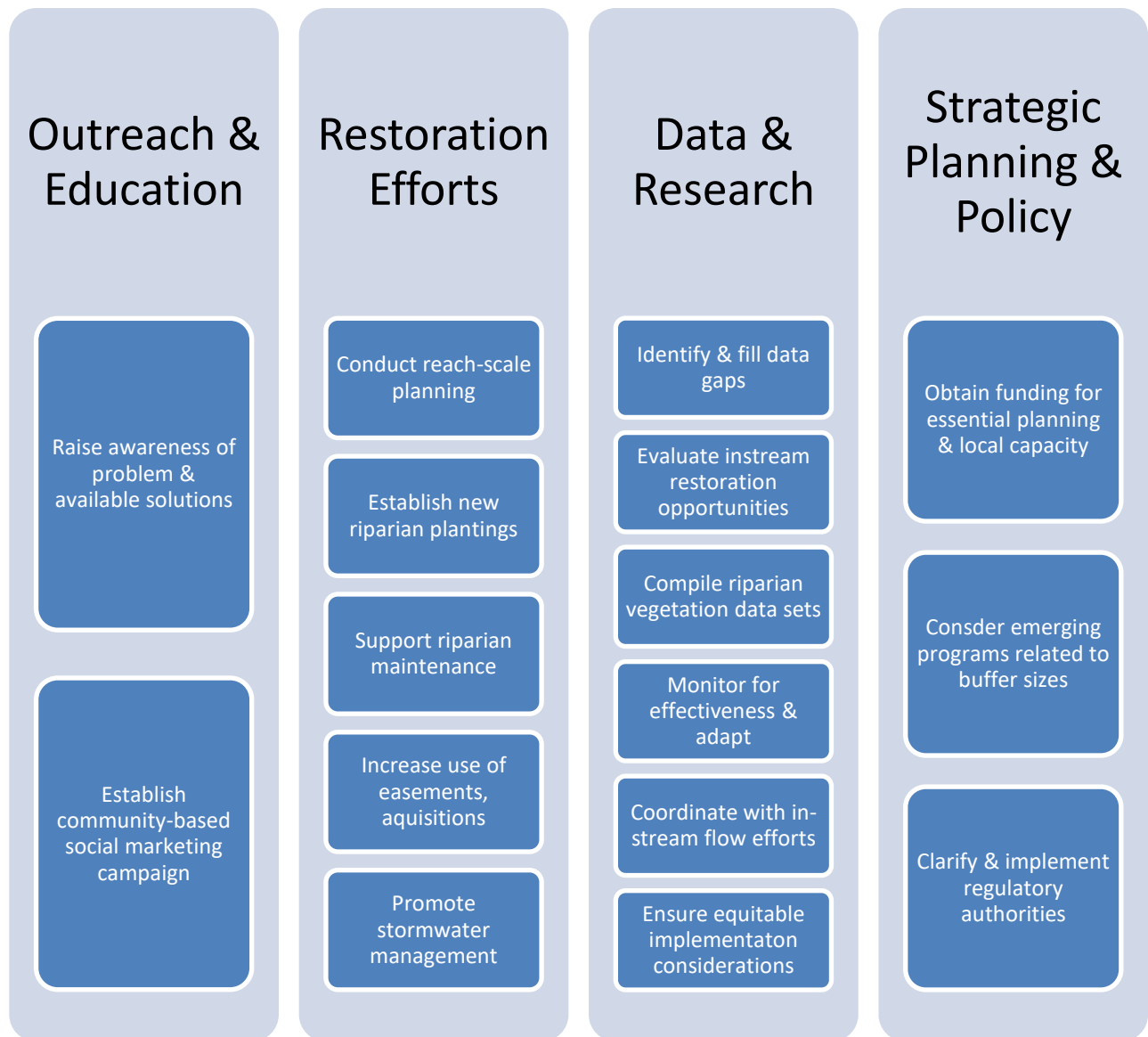
“This strategy should be developed by December 31, 2019, and should identify targeted near term actions to attain measurable progress as well as longer-term area-wide strategies.”

The entire resolution amendment is included in as Appendix A.

During the second half of 2019, Ecology held five Advisory Group meetings to develop the Strategy requested by the Leadership Council. During those meetings, the Advisory Group provided input on key elements the Strategy should address in order to increase the pace of riparian restoration in the Lower Skagit River Tributaries. We had good participation by a wide variety of local conservation partners. This Strategy reflects both the feedback we received from the Advisory Group and Ecology’s understanding of watershed needs based on the original TMDL and our best professional judgement.

Chapter 2 of this Strategy contains four Key Elements and associated Action Matrix tables that set out our goals, Action Items (Phase I, calendar year 2020) and Long Term Outcomes (Phase II, post 2020). Those Key Elements and Action Items are summarized in Figure 17. The Action Items identify tasks and goals to support restoration. The Long Term Outcomes continue the efforts and actions identified or completed during Phase I. Implementation and completion of Phase II actions will require significant funding that is not currently available. While existing funding sources will continue to support Phase II efforts, additional funds for Skagit restoration are necessary to complete larger, coordinated restoration efforts to increase the pace of restoration efforts.

Ecology is working to incorporate the needs identified in the Strategy development process into our work, but we cannot incorporate all of them. Ecology will work to complete the specific actions described below and listed in Table 7.



**Figure 16 - Key elements and action items to implement the Strategy for the Lower Skagit River Temperature TMDL.**

### **Ecology's Work Plan for 2020:**

Ecology has identified its own actions to be taken in 2020 and beyond to put these key elements in place. With our existing resources, we will work with conservation partners, stakeholders and the public, as appropriate, to implement these actions.

Ecology will **help raise awareness of the problem and available solutions** by performing the following direct outreach activities:

- Provide information/articles/stories for use in print and digital media (as opportunities arise), as informed by public feedback and interests.

- Organize at least one open house event to discuss the Strategy and explore local interests and concerns.
- Meet with relevant Special Use Districts to discuss existing efforts and opportunities to collaborate.
- Develop a “story map” to share existing information about the problem and solutions/successes with the online public.

Ecology will **help establish a community-based social marketing campaign** by conducting the following actions:

- Perform initial community research through informal surveys and information gathering at local events, open houses and landowner referrals.
- Develop a work plan and contractor scope of work for community-based social marketing research and campaign development in order to support future funding applications.

Ecology will **help increase the pace of riparian restoration** by conducting the following actions:

- Support funding opportunities for reach-scale planning. Use data compilation, collection and assessment to inform reach-scale planning efforts.
- Perform field surveys to begin to identify cold water refuge and heat reduction opportunities.
- Develop evaluation/screening criteria based on available data to inform project planning and/or compliance assurance as appropriate.

Ecology will **help advance data assessment and research objectives** by conducting the following actions:

- Research and compile data-sharing opportunities and barriers including costs, technology, security, and host responsibilities. Use ‘story map’ development as an initial pilot. Provide a summary memorandum of findings.
- Perform an environmental justice analysis and use findings to inform CBSM research and direct outreach activities.

Ecology will **help support strategic planning for Lower Skagit Tributaries TMDL implementation**, as guided by this Strategy, by performing the following actions:

- Convene quarterly meetings of the Advisory Group to facilitate coordination between participants. These meetings, augmented by conference calls and small group work as needed, will:
  - Plan future actions and funding strategies, with an initial emphasis on reach scale planning, buffer maintenance, incentive program improvements (e.g. WSCC/CREP, easements, acquisitions), and local financial capacity.

- Provide input on Ecology’s activities (described above).
- Share information on local and regional efforts, and other national and state-wide projects designed or used to improve creek temperatures.
- Prepare an annual progress report to document accomplishments, lessons learned and next steps.
- Strive to obtain additional financial and/or technical resources to advance the Strategy and make measurable progress toward attaining water quality standards.

## **What activities are funded and which are not funded?**

As shown in Table 7, several of the identified elements above can be achieved with Ecology’s new resources assuming local Skagit restoration specialists have the time to participate. During the development of this Strategy, some organizations did not have the capacity to attend all meetings. Even during Phase I activities, we anticipate that at times it may be difficult for local organizations to operate at a level that is over and above their present core work.

Several key foundational actions needed to jump-start riparian restoration in the Lower Skagit Tributaries do not have a source of funding. Those unfunded actions are displayed in red text in the table along with partially and fully funded actions

**Table 7. Phase 1 Ecology Action Items to implement the Lower Skagit Tributaries Temperature TMDL Strategy.**

<b>Proposed Phase 1 Ecology Action Items: Lower Skagit River Tributaries Temperature TMDL Implementation Strategy</b>			
<b>Goal</b>	<b>Deliverables</b>	<b>Timeframe</b>	<b>Funded?</b>
Raise Awareness of the Strategy and Watershed Needs	Provide print/television/digital media information, articles in 2020	Ongoing	Partial
	Hold open houses with partners	Q1 2020	Yes
	Meet with Special Utility Districts	Q2 2020	Yes
	Develop and Build Lower Skagit Tributaries “Story Map”	Q4 2020	Partial
Establish a coordinated community-based social marketing (CBSM) plan	Scope funding/identify/contract reputable CBSM Consultant (preferred option)	Q2 2020	No
	Conduct “Lite-version” CBSM effort (alternative option)	Q <del>2</del> 3 2020 <sup>12</sup>	Yes
	Identify local success stories and promote through print/digital media/tours	Q2 2020	Yes
Progress Tracking and Adaptive Management data sets & tools	Collect and compile partner data sets (list of available programs, funding sources, project timelines, spatial data, physical/water quality data) and evaluate methods to share data	Q2 2020	Partial
	Develop coordinated method for partners to track outreach/implementation work	Q2 2020	Yes
	Periodic updates of Story Map	Q4 2020	Partial
Ensure equitable implementation considerations through environmental justice analysis	Perform environmental justice analysis in focus area and share with partners	Q2 2020	Yes
Reach scale planning and scoping	Identify local lead partner and assist in RFP development	Q2 2020	No
	Collaborate with Skagit County Public Works East Fork Nookachamps drainage planning	Ongoing	Yes <sup>13</sup>
	Build future Phase 2 work plan based on priority tributary watershed Reach Scale Planning	Q4 2020 <sup>2</sup>	No

<sup>12</sup> Only if CBSM consultant resources are not identified

<sup>13</sup> Pending funding of Reach Scale Planning effort



Proposed Phase 1 Ecology Action Items: Lower Skagit River Tributaries Temperature TMDL Implementation Strategy			
Goal	Deliverables	Timeframe	Funded?
Instream Restoration Evaluation	Develop Quality Assurance Project Plan	Q1 2020	Yes
	Coordinate w/community and partners to collect field data in selected reaches	Q2 2020	Partial
	Summarize/Report on field work w/recommendations for refining restoration locations	Q2 2021	Yes
Maintenance and ongoing support for newly established and existing riparian vegetation	Short-term funding to increase maintenance work in 2020	Q2 2020	No
	Identify total acres needing maintenance within the Strategy area	Q3 2020	Yes <sup>14</sup>
	Evaluate total maintenance costs, develop annual budgets for next 10 years	Q3 2020	Yes <sup>3</sup>
Easement, acquisitions, and incentive programs	Explore Direct Implementation and other funding opportunities	Ongoing	TBD
	Participate as needed in WSCC Pilot Program	Q2 2020	No
Clarify and implement regulatory authorities	Develop screening criteria for point and nonpoint source temperature contribution potential.	Q4 2020	TBD
	Compile and evaluate permitted facilities for temperature contribution potential, and conduct follow up actions as appropriate.	Q4 2020	Yes
Facilitate Coordination Between Restoration Partners	Hold quarterly meetings of key partners	Ongoing	Yes
	Hold additional special project team/partner meetings as needed	Ongoing	Yes
Progress Reporting	Prepare annual report documenting progress completing key elements, identifying barriers, evaluating effectiveness and next steps	Q4 2020	Yes

<sup>14</sup> With partner participation

## **Conclusion**

Ecology is committed to leading or coordinating many of the needed actions in this Strategy, but most of the work must ultimately be done in close partnership with local restoration specialists and of course landowners. Additional actions and support of conservation partners will likely supplement the Key Elements and Actions identified in the Strategy, depending on funding, organization support, and local priority.

Local organizations, government agencies, cities, elected officials, and tribes are encouraged to undertake or facilitate the actions identified in this Strategy. The opportunity of additional funding will directly impact the capacity and availability of partners to support the effort. Ecology is committed to continue working and developing relationships with all partners, as well as assisting in the identification of potential funding sources and programs.

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# Appendices

## Appendix A. Puget Sound Partnership letter and Resolution 2019-02