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Polluted Runoff/Green Infrastructure

Field Scan and Opportunity Assessment

Prepared for

The Russell Family Foundation

By

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THE RUSSELL FAMILY FOUNDATION

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Executive Summary

The Russell Family Foundation (TRFF) launched an "opportunity assessment and field scan" in October 2013 to evaluate the foundation's Polluted Runoff/Green Infrastructure (PR/GI) portfolio and identify strategic opportunities for private funders to reduce polluted runoff. This leading threat to Puget Sound occurs when rain picks up chemicals and other pollutants from roofs, streets, and developed areas and washes them into local waterways.

TRFF contracted with Sightline Institute, which interviewed 22 thought leaders in the field and obtained feedback from an additional 27 TRFF grantees through an online survey. The recommendations outlined below reflect a common impulse to tackle the problem on many different fronts. Yet it is not clear that these disparate efforts are adding up to strategic change.

Thought leaders emphasized two potentially transformative opportunities for private funders: (1) Help secure a permanent and stable funding source for Puget Sound cleanup and (2) promote coordination among groups that do not work toward shared objectives. Based on this advice, TRFF should consider organizing its grant making around a smaller number of initiatives in service of focused outcomes and rewarding coordinated approaches that leverage strengths of multiple organizations to achieve scaled-up goals.

The most frequently mentioned barriers and opportunities for funders were:

Barrier #1: Costs to fix outdated stormwater infrastructure are high, and funding is inadequate.

Opportunity:

- Invest significantly in a campaign to create a permanent and stable funding source for Puget Sound cleanup, and help advocates obtain other funding sources for green and other stormwater infrastructure.

Barrier #2: Groups working to reduce polluted runoff are not well coordinated and do not work towards clear or common goals.

Opportunities:

- Help organizations working in the field develop collective and strategic goals. Organize grant making around these focused objectives in the form of well-coordinated campaigns.
- Invest in a handful of organizations with the leadership, staff capacity, and vision to create transformational change. Trust them to make strategic and opportunistic decisions and to leverage strengths of other organizations.
- Persuade private foundations to invest collectively to maximize impact.

Barrier #3: Municipalities need technical and policy assistance on green stormwater practices.

Opportunities:

- Fund teams of technical and policy experts who could be "on call" to help municipalities design and install green infrastructure, brief elected city leaders, embed low-impact development (LID) practices into codes, and share how other municipalities are solving problems.
- Consider other models to help cities implement and finance green stormwater infrastructure.

Barrier #4: Pollution prevention solutions are essential, yet they are undervalued.

Opportunities:

- Pick one (or several) major pollutants and build a coordinated, multi-year strategy around reducing it in Puget Sound.
- Support advocacy that would grant the Department of Ecology the authority to ban priority Puget Sound pollutants after identifying acceptable alternatives.

Barrier #5: Incentives to voluntarily install green infrastructure on private property are lacking.

Opportunity:

- Investigate the local feasibility of innovative financing methods, incentives, and stormwater pricing strategies to entice landowners to voluntarily install green infrastructure.

Barrier #6: Efforts to build public support for polluted runoff solutions and investments have not been as effective as they need to be.

Opportunities:

- Invest in public education/polling/messaging research/outreach, but only in service of a focused campaign and goal.
- Investigate alternative outreach tools that have worked well in campaigns elsewhere.
- Ensure that education efforts resonate with the region's diverse population.

Barrier #7: Knowledge gaps can limit the effectiveness of green infrastructure and invite skepticism.

Opportunity:

- Invest in basic research to improve the effectiveness of green infrastructure and LID.

Introduction

Four years ago, The Russell Family Foundation (TRFF) refined its environmental sustainability program to focus on reducing polluted runoff, the single largest source of water pollution in Puget Sound. Also known as stormwater, it is a major threat to local streams, water bodies, beaches, and places where Northwesterners live and play.

"Any foundation gets hit with a mix of funding ideas that I would say are small to medium to large to transformative. I think the only real strategy is to go for the transformative because the small ones don't change patterns and are always overcome by the opposite forces, which is the status quo."
~ Thought leader interview

The problem is simple: Rain that once soaked into the ground picks up chemicals and other pollutants from streets, rooftops, parking lots, and other hard surfaces that multiply as the region develops. In urban areas, pipes and ponds built decades ago to handle those flows are no longer adequate or were not designed to address pollution in the first place.

The solutions are complex, with opportunities to work on many different facets of the problem and in many local watersheds. They start with finding less toxic alternatives for consumer products or industrial processes. They end with smarter and more cost-effective ways to handle runoff. That includes using "green" infrastructure (GI) that employs rain gardens, permeable pavement, green roofs, and other techniques that mimic nature's ability to slow and filter polluted runoff. On a particular site, these techniques may also be called "low-impact development" (LID) practices.

From September 2010 to February 2014, TRFF awarded 98 grants totaling $5,198,321 to 48 organizations through its Polluted Runoff/Green Infrastructure (PR/GI) program. Those grants, listed in detail in Appendix A, covered four categories: research, outreach, pilot projects, and policy. Some additional grants in TRFF's Environmental Education portfolio and Puyallup Watershed Initiative have supported the same goal.

The PR/GI investments funded important legal and policy work, community outreach, pollution prevention efforts, boat patrols, journalism projects, rain garden pilots, green infrastructure research, leadership development, marina cleanups, small business assistance, third party regulatory enforcement, and a host of other activities that aim to tackle the diffuse sources of stormwater pollution and challenges in reducing it.

Now, the foundation is exploring whether further refinements to its Polluted Runoff/Green Infrastructure grant making are desirable. To make the most of its investments and ensure they are well aligned, the foundation contracted with Sightline Institute in October 2013 to conduct an "opportunity assessment and field scan" to answer the following questions:

1. What are the major barriers to protecting Puget Sound through stormwater solutions?
2. Have previous TRFF investments effectively addressed those barriers?
3. Where are upcoming and strategic opportunities for private funders to drive meaningful change?

Approach

After consulting with TRFF and other funders, Sightline interviewed 22 thought leaders working on different dimensions of Puget Sound cleanup. They included regional policymakers, green infrastructure practitioners, city officials and engineers, scientists, non-profit advocates, regulators, academics, and national funding experts. The interviews lasted 60 minutes, on average.

Thought Leaders Interviewed	December 2013 and January 2014	
Name	**Title**	**Organization**
Lisa Bellefond	External Affairs Director	Puget Sound Partnership
Kevin Burrell	Executive Director	Environmental Coalition of South Seattle (ECOSS)
Aaron Clark	12,000 Rain Gardens Program Manager	Stewardship Partners
Chris Davis	Director of Conservation, Puget Sound	The Nature Conservancy
Paula Del Giudice	Executive Director	Pacific Northwest Pollution Prevention Resource Center
Mindy Fohn	Water Quality Manager	Kitsap County Public Works
Jan Hasselman	Staff Attorney	Earthjustice
Curtis Hinman	Low Impact Development Expert	Herrera Environmental Consultants, Inc.
Richard Horner	Professor, Departments of Civil Engineering and Landscape Architecture	University of Washington
Martha Kongsgaard	Leadership Council Chair	Puget Sound Partnership
Jay Manning	Partner	Cascadia Law Group
Chris May	Surface & Stormwater Management Division Director	Kitsap County Public Works
Jason McLennan	CEO	Cascadia Green Building Council
Scott Miller	President	Resource Media
Mark Palmer	City Engineer	City of Puyallup Public Works
Rebecca Ponzio	Puget Sound Policy Specialist	Washington Environmental Council
Mindy Roberts	Environmental Engineer, Environmental Assessment Program	Washington State Department of Ecology
Diane Schrauth	Program Consultant	Funders' Network for Smart Growth and Livable Communities
John Stark	Director	Washington Stormwater Center (WSU)
Tracy Tackett	Green Stormwater Infrastructure Program Manager	Seattle Public Utilities
Heather Trim	Science and Policy Director	Futurewise
Laurie Valeriano	Executive Director	Washington Toxics Coalition

In addition to TRFF grantees who participated in interviews, 27 organizations that received PR/GI grants participated in an online survey. The questions, which were also used to guide interviews, covered major barriers to stormwater solutions, near- and long-term opportunities for funders, emerging issues, low-hanging fruit, takeaways from funded projects, and other topics. Additional detail on survey questions and responses are included in Appendices B, C, and D.

To encourage a candid discussion, Sightline assured grantees and thought leaders that insights, quotes, and recommendations would remain anonymous to TRFF and to other parties.

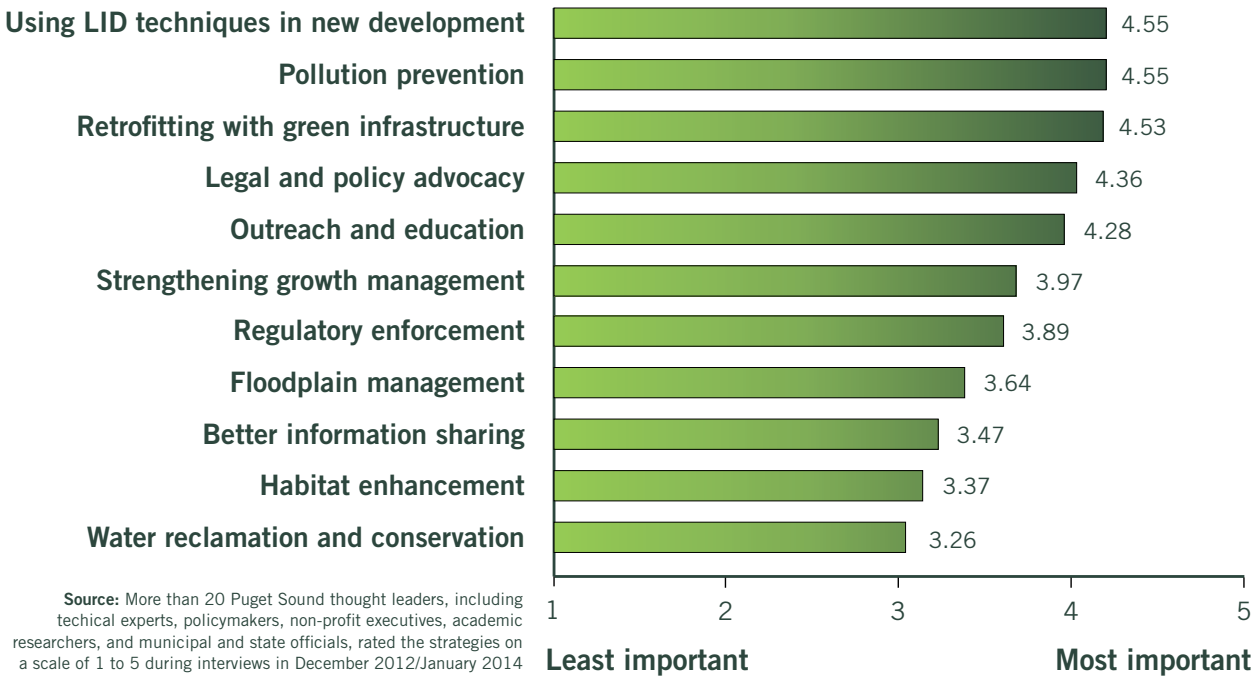
Findings: Top Priorities

TRFF has awarded the bulk of its PR/GI grants to organizations working in the following areas: Incorporating LID techniques in new development, retrofitting existing development with green infrastructure, pollution prevention, legal and policy work, education and outreach, regulatory enforcement, floodplain management, growth management, information sharing, habitat enhancement, and water reclamation and conservation.

To help inform future priorities, Sightline asked each thought leader to rate those strategies on a scale of 1 (least important) to 5 (most important). Figure 1 shows the results.

Important Actions to Reduce Polluted Runoff

Rated by Thought Leaders



Source: More than 20 Puget Sound thought leaders, including techical experts, policymakers, non-profit executives, academic researchers, and municipal and state officials, rated the strategies on a scale of 1 to 5 during interviews in December 2012/January 2014

Grantees generally agreed with thought leaders, with a few minor exceptions. Thought leaders put a slightly higher emphasis on pollution prevention efforts, such as controlling pollutants at the source, getting problematic chemicals out of commercial products, and helping industries and landowners find less toxic alternatives. TRFF grantees were inclined to view public education and outreach efforts more favorably. While those two categories are not mutually exclusive, that slight difference in emphasis or perception persisted between those two groups.

TRFF was also interested to learn how many of its PR/GI grants had produced tangible, on-the-ground progress in cleaning up Puget Sound. Though it is only one way of measuring success, grantees were asked **if they could demonstrate that their funded project had resulted in less pollution flowing into Puget Sound.** The survey results for that question were:

- **Yes:** 9 (33%)
- **No:** 13 (28%)
- **Sort of:** 5 (19%)

Projects that had demonstrably reduced pollution entering Puget Sound typically involved pollution prevention initiatives, LID research projects, and regulatory enforcement efforts. In those instances, grantees were generally able to demonstrate on-the-ground success because of monitoring that resulted from scientific investigation, regulatory requirements, or litigation.

Most projects focusing on education and outreach, policy and legal advocacy, pilot projects, and information sharing could not make a direct link to reduced pollution in Puget Sound.

Recommendations: Barriers and Opportunities

Although thought leaders and grantees collectively offered hundreds of recommendations, clear themes emerged. This section outlines the most commonly cited obstacles to curbing polluted runoff, as well as a detailed set of opportunities for the private funding community to meet unmet needs, provide direction, leverage other resources, and move the needle on cleaning up Puget Sound.

"We're going to all these local governments and saying 'Guess what? You have to do these 14 new things to control stormwater that you've never done before and we don't have a dime to help you.' A significant funding source that we could make available to them would completely change the debate."

~ Thought leader interview

Barrier #1: Lack of Money

Costs to fix outdated stormwater infrastructure are high, and funding is inadequate.

The most frequently mentioned barrier to curbing polluted runoff boils down to one word: Money.

Municipal employees cited lists of shovel-ready green infrastructure projects on hold for lack of funding. A report prepared for the Puget Sound Partnership by Bissonnette Environmental Solutions in 2010[1] estimated it would cost between $3 billion and $16 million to retrofit areas of the sound that were developed without adequate stormwater controls. Efforts to produce cost estimates for all the stormwater projects necessary to meet water quality goals in King County's Green/ Duwamish River watershed (WRIA 9)[2] alone appear likely to produce numbers in the billions.

"If TRFF really wants to make a difference, they could help lead an initiative…to create a steady source of funding for every issue we just talked about. If they said 'for a couple of years we're not going to fund any other grants, we're just going to do this,' that in the end would have the biggest benefit for Puget Sound."

~ Thought leader interview

Several interviewees felt strongly that the most important contribution that private foundations could make would be to help establish new funding sources to improve the health of Puget Sound and fund polluted runoff solutions. This could involve a ballot measure asking voters to approve a new tax. While the timing of such a measure remains unclear, respondents felt foundation funding could play a critical role now in laying the groundwork for a successful campaign.

Opportunities for funders:

- Help create a permanent funding source for Puget Sound by investing in the capacity and staff of organizations spearheading a campaign, conducting opinion and messaging research, building coalitions, improving communications, and making a compelling case to the public.
- Help convince the Legislature to give local governments the authority to create local Puget Sound Improvement Districts as a new funding source.
- Help convince the Legislature to allow municipalities to create street utilities as a dedicated source of funding for green streets and porous pavement installations.
- Support national advocacy to allocate federal funds for green infrastructure on the scale of a Superfund program.

"Cities and counties don't bother to imagine what they could do with money they don't have."

~ Thought leader interview

Barrier #2: Lack of Coordination

Groups working to reduce polluted runoff are fractured and do not work towards clear and common goals.

Because the sources of polluted runoff are so diffuse–toxics in consumer products, industrial processes, motor oils, lawn fertilizers, streets, rooftops, parking lots—solutions must necessarily be multi-pronged. But thought leaders and grantees felt efforts to combat up Puget Sound's largest pollution source had been hampered by a fractured approach among groups working on separate parts of the problem.

> *"We need a more coordinated regional NGO presence that is scaled to the needs. Right now people have little pieces of the pie but there's no real organized campaign. Just compare it to the coal export campaign happening now, which is a model of a really well coordinated campaign to achieve strategic ends. That is totally absent on the Puget Sound side."*
>
> *~ Thought leader interview*

Several cited recent efforts to oppose coal exports[3] as the kind of well-orchestrated and focused campaign that has been lacking for Puget Sound, with strategic coordination among groups working towards shared goals. They urged private funders to help convene stakeholders around common objectives and develop more focused strategies to achieve them. To a certain degree, respondents were less attached to a particular goal than to the idea that advocates need to be rowing in the same direction.

Opportunities for funders:

- Help organizations working in the field develop common goal(s). Organize grant making around these focused objectives in the form of well-coordinated campaigns.
- Invest significantly in a handful of organizations with the leadership, staff capacity, and vision to create transformational change. Trust them to make strategic and opportunistic decisions and to leverage strengths of other organizations.
- Focus on the same small but important number of issues and solutions to target, and fund the opportunities that can make those a reality over time.
- Pick one major pollutant and build a coordinated, multiple-year strategy around reducing it in Puget Sound.

> *"What element within stormwater will accomplish the change that the foundation is thinking about? Is it motivating landowners? Is it changing how we manage stormwater? Is it money? Is it how we talk about stormwater? Is it technology? There are so many options. One outcome of this could be the foundation helping all of us focus on something and finding the centerpiece."*
>
> *~ Thought leader interview*

- Focus on a simple, understandable, and measurable goal that is a proxy for all the other damage happening, such as a campaign to reduce the net amount of impervious surface in Puget Sound or to make a certain percentage of municipal stormwater infrastructure "green" by a certain date.
- Invite grant proposals from multiple organizations that require deep collaboration on a single topic.
- Encourage collaborations between larger organizations with more capacity and smaller, on-the-ground groups, but only when this makes sense.
- Reward grant proposals that embrace integrated approaches to green infrastructure and incorporate multiple community benefits (recreation, climate, transportation, and energy).

"Because we are in municipal government, we wind up talking with a lot of different people who are interested in helping crack the nut. But I can't quite tell who's running that show. We need someone to consolidate all these thinkers and help lead them in a shared direction."

~ Thought leader interview

- Convene all grantees or groups working on polluted runoff issues on an annual basis.
- Organize a grant-mandated or incentivized meeting of groups, perhaps via Skype or phone for groups to present what they are doing, identify shared goals, and discuss collaborative opportunities.
- Convince several private foundations to invest collectively and maximize impact.

Barrier #3: Public Investment in Green Infrastructure

Municipalities need technical and policy assistance on green stormwater practices.

"I've seen that some cities are just really uncomfortable with retrofits. Their engineers are really not sure how to handle this. For those starting up their program, there's a big learning curve."

~ Thought leader interview

The city officials interviewed for this assessment are clear leaders in using green infrastructure and low-impact development techniques. Yet they are not necessarily the norm. Public works officials in smaller jurisdictions wear many hats and may struggle to keep up with existing obligations. Some low-impact development principles, such as allowing rainwater to soak into permeable pavements, are anathema to engineers who have spent entire careers trying to keep water out of roads. Risk-averse municipalities and regulators may feel more comfortable with traditional infrastructure that has decades of data on life-span and performance.

Interviewees identified an unmet need to help some municipalities better understand low-income development techniques, to incorporate them into local codes, and to design appropriate and successful projects. There was general agreement that the need is greater for face-to-face technical assistance than for web-based information. However, the success of this strategy would depend on finding willing municipal partners, and additional research would be needed to gauge how many jurisdictions might actually seek technical assistance.

"From people who have bought into the concept of green infrastructure, practice it, study it, you see a lot of successful and innovative projects. From people who say 'someone is telling me to do this, I don't believe in it,' you see a lot of poorly designed and implemented projects. That human element is one that's very difficult, and it's hard to fund our way out of that."

~ Thought leader interview

Opportunities for funders:

- Fund a team of technical Green Infrastructure experts (likely drawn from private firms already doing this work) who could be "on call" to help municipalities design, vet, or implement green infrastructure projects.
- Fund policy experts who could be "on call" to help staff brief elected leaders, embed LID requirements into local codes, share how other jurisdictions are approaching issues, and help municipalities leverage multiple benefits from green infrastructure projects.
- Create a "best practices" template to help cities incorporate new LID requirements into building and land use codes, which is a key part of implementing new NPDES municipal permits.
- Support legal and policy work to a) help municipalities implement this gold standard for incorporating LID requirements and b) take action against cities that are lagging.

"We need to do outreach to cities on how they should embed the new NPDES permit requirements for LID development practices into their codes. Do they look at this as an opportunity to get ahead of the curve and reap the vast multiple benefits, including green jobs and stormwater benefits and property values and habitat and healthy communities? Or do they just drag their feet and do as little as possible?"

~ Thought leader interview

- Explore other models, such as the Environmental Finance Center at the University of Maryland[4], for helping municipalities implement and finance green stormwater infrastructure.
- Support work that turns elected leaders into champions and connects champions within municipal agencies or structures.
- Support up-front, basin wide GI retrofit prioritization and planning efforts[5], which have been key to Kitsap County's success.

- Fund "pre-design" and outreach work for municipal green infrastructure projects, as funding for non-construction work is harder to find.
- Support innovative retrofit demonstrations at the watershed level that use innovative permitting strategies, work across property and city/county lines, use the contours of a watershed to re-plumb a large area, and address vesting and other problematic growth management issues.

Issue #4: Pollution Prevention

Pollution prevention strategies are essential to solving the problem, yet they are underfunded and undervalued.

> *"People don't want to fund toxics work because everyone has gotten on the LID bandwagon. So there are a lot of sources of stormwater pollution that aren't getting the attention they need. The point of LID is really about water quantity, which is a big deal in suburban and rural areas. But in our densest urban areas, the real issue remains pollution and toxics."*
> *~ Thought leader interview*

Several thought leaders, including those that work directly pollution prevention efforts and some who do not, argued that prevention efforts were not given attention or funding that they deserve. Eliminating the chance for toxic chemicals to mix with rainwater in the first place—whether by getting chemicals out of consumer products or working with businesses and landowners to change habits and processes or helping industries find acceptable alternatives—was broadly recognized as an important goal. Several respondents said aggressive pollution prevention efforts will be essential for meeting new state fish consumption regulations that drive new water quality standards. Some raised the idea of giving Washington Department of Ecology broader authority to phase out chemicals of concern in Puget Sound, which is more efficient than lobbying for legislation to ban one chemical at a time.

Opportunities for funders:

> *"You wonder why the toxic stuff is in there in the first place for us to have to treat. Getting chemicals out of products really does feel like a stretch for municipal agencies to take on. But it's really important."*
> *~ Thought leader interview*

- Convene a discussion among green chemistry experts, regulators, policy advocates, and groups that work with businesses and landowners about the most significant sources of stormwater pollution and best opportunities to stop them at the source.
- Pick one or several major pollutants and build a coordinated, multiple-year strategy around reducing it in Puget Sound (i.e. getting rid of zinc in tires, copper in paint, toxic roofing materials, PCBs in roadside caulks and paints, phthalates in consumer products, PAHs from wood stoves and vehicle exhaust, flame retardants not already banned).

- Support advocacy at the state level to create a list of problem pollutants for Puget Sound and give the Department of Ecology administrative authority to prohibit their use, after a writing a Chemical Action Plan[6] and identifying less toxic alternatives that are acceptable to relevant industries.
- Apply the research from the Northwest Green Chemistry Center[7] to a problem or class of businesses in the Puyallup Watershed. Let the lab help solve a real world pollution problem there.
- Fund groups with capacity to do advocacy and technical research on reducing toxics.
- Fund research that helps demonstrate the scientific case for less toxic alternatives, as necessary.
- Fund research to ensure that perceptions about major problems and pollution sources are backed up and scientifically defensible (such as an ongoing Department of Ecology study[8] to determine how much toxic material sloughs off different roofing materials).

"Stormwater is not the problem. The water is the vehicle for the toxic pollution that winds up in Puget Sound. That might be the biggest way that it winds up there, but enough groups don't talk about this. The toxic chemicals in the stormwater are what get people engaged."
~ Thought leader interview

- Stop promoting low-bar and inconsequential pollution prevention efforts, like getting people to pick up dog poop.
- Work to inject a toxics focus into the next round of NPDES permits.
- Help the city of Seattle work with or compel restaurants to install grease traps, which remove fats and oils that wash into Puget Sound and also block pipes to cause combined sewer overflows.
- Build capacity of environmental justice organizations living in communities most affected by toxic runoff, possibly in partnership with larger organizations.
- Sponsor a technology competition as a fun way to engage the private sector in developing stormwater solutions and appeal to the region's enterprising nature, but only in service of a larger campaign to move the public towards a specific goal.

Barrier #5: Private Investment in Green Infrastructure

Many private properties are exempt from stormwater regulation, and incentives to voluntarily install green infrastructure are insufficient.

"Financing and incentives for private property owners are one of the up-and-coming issues."
~ Thought leader interview

Many landowners throughout Puget Sound are not required to control stormwater, unless they decide to redevelop. That

means many large properties—from shopping malls with acres of parking lots to suburban developments built in the 1970s—are contributing significantly to pollution problems but are not yet part of the solution. Because so much of Puget Sound's urban and suburban areas are already developed and privately owned, this is a significant barrier to comprehensive progress.

"Doing work on stormwater fee pricing and credits would be a really interesting nut to crack."
~ Thought leader interview

Some jurisdictions are experimenting with incentives to engage the private sector in voluntarily installing green infrastructure on a broad scale. These include everything from offering breaks on stormwater fees for undertaking projects to "reverse auctions" that allow homeowners to bid on having rain gardens professionally installed. Not all of these incentives may work under Washington State law, but thought leaders argued that continuing to explore local possibilities, in partnership with jurisdictions willing to test new approaches, could potentially have a large and transformative effect.

Opportunities for funders:

- Support research on the local feasibility of innovative incentives, financing methods, and stormwater fee pricing[9] to engage the private sector in voluntarily installing green stormwater infrastructure.
- Research the potential to employ more aggressive and transformative[10] green infrastructure strategies being tested in other cities[11] (i.e. Philadelphia[12] or Washington DC[13]).
- Invest funds to lower the risk for lenders or borrowing rates to help finance green infrastructure projects on private property that might not otherwise pencil out.

"We have a lot of development that was built in the 70s and 80s that has no stormwater treatment system associated with it. These mostly private developments...can have huge impacts on stormwater. But there's no hook that jurisdictions like ours can use to go to them and say 'you have to upgrade your stormwater system.'"
~ Thought leader interview

- Provide seed money for green stormwater infrastructure pilot projects on commercial or industrial private properties that could win hearts and minds of nearby landowners.
- Work to help the Department of Ecology expand NPDES permits so that the entire basin that drains to Puget Sound is covered.
- Investigate local feasibility of asking EPA to issue "retroactive" stormwater permits[14] for parking lots and other areas that that are contributing significantly to polluted runoff problems but are not subject to NPDES regulations.

Issue #6: Education and Outreach

Efforts to build support for polluted runoff solutions and investments have not been as effective as they need to be.

Thought leaders and grantees did not necessarily agree on this topic. No one disputed the importance of outreach, education, and engagement to build support for stormwater solutions. But many thought leaders—particularly those focused on regional or statewide issues—felt that outreach and communications efforts had not been effective in creating urgency or will to solve the problem on a large scale.

"We've dumped a lot of money into communications, but we really haven't had a concerted campaign focused on motivating the public to do something around water quality and stormwater. The communications have been very project oriented or program oriented, and none of those are a cohesive campaign. I'd give communication and outreach a five (the most important ranking) if it's done within a campaign-oriented effort. I think it's a zero as it's currently being done."
~ Thought leader interview

Thought leaders working in smaller municipalities felt local education efforts had been successful in reaching residents, changing behaviors, and convincing landowners to make positive changes on their properties. In addition, many, many grantees stressed in survey responses the effectiveness and value of public education and outreach.

Opportunities for funders:

"We continue to find and document that this just isn't a priority for most folks."
~ Thought leader interview

- Fund basic polling/advocacy/messaging research to uncover what aspects of the polluted runoff problem resonates with the public and touches their lives, *but only if it is in service of a focused campaign and goal*.
- Fund more refined messaging and communications research that could convince the public to spend the dollars necessary to solve the problem.
- Emphasize the multiple community benefits of green infrastructure vs. pitching it as a water quality or pollution solution.
- Ensure that materials are translated and culturally appropriate for non-native English speakers and business owners in neighborhoods most affected by toxic runoff.
- Support original research into toxics that wind up in our bodies/pets/furniture—public interest in toxics reduction legislation and source control increased greatly after local data was produced.

- Highlight innovative and groundbreaking examples in the media or online journalism projects so that we begin to "normalize" practices that we want to see incorporated in the next round of NPDES permits.
- Be wary of expensive dirt-moving projects, but continue to support targeted demonstration projects that demonstrate multiple community benefits. This is the way that people get it.
- Explore alternative outreach tools such as community based social marketing.
- Consider piggybacking on the tool that the Surdna Foundation is funding in Milwaukee[15], which allows residents and decision makers to test which green/gray infrastructure investments deliver the best benefits (including jobs, property values, aesthetics, and urban agriculture).
- Explore uses for the Green Values Stormwater Toolbox[16] developed by the Joyce Foundation and Center for Neighborhood Technology.
- Learn from other areas (Charlottesville, VA[17] and Southern California Water Committee[18]) where private funders helped seed communications aimed at people outside the environmental camp and that go beyond preaching to the choir.

"Looking at stormwater solutions as enhancing the places where people actually live, rather than just enhancing the water quality of Puget Sound is a very, very important distinction that the environmental community hasn't always gotten. Looking at Puget Sound makes people happy, but they're not worried about the Sound. They are worried about where they live. They are worried about whether they have a place to recreate or whether the stream down the street is polluted. We have to move from Puget Sound the water body to Puget Sound the place."
~ Thought leader interview

- Continue to fund outreach to businesses (in appropriate languages) on handling stormwater runoff and chemical spills. Less than 50 percent of businesses know what to do or have supplies on hand to control a toxic spill.
- Make people a part of the overall system—there's no such thing as "people" here and "Puget Sound" over there. The chemicals in the products they buy are what wind up in Puget Sound, and the same pollutants in fish and orcas are in their bodies too.
- Consider creating web-based educational resources but consider the core audience–homeowners interested in LID, the technical community, the political and community organizing sector all need different products.

Barrier #7: Research/Validation of Green Infrastructure Practices

Knowledge gaps about how green infrastructure works and performs over time can limit the effectiveness of installations and invite skepticism.

> *"I think the answer that we need more validation is boring and it's not true. I think as often happens with LID and green infrastructure and bioswales it's old news to say we don't know enough. Of course we do and we've got to do it now. You've got to get it in the code and in the NPDES permits."*
> *~ Thought leader interview*

This was another area of disagreement. Some thought leaders felt that funding more local green infrastructure demonstration projects—with monitoring components and cost-benefit analyses—would be effective in persuading skeptical municipal leaders to experiment with and ultimately embrace those practices. Others argued that many examples and studies already confirm the efficacy and cost-effectiveness of LID practices and that calls for more "validation" are typically made by people and municipalities who will never willingly buy in.

However, there was much wider agreement that scientific research to answer key questions about how LID practices work would be beneficial.

Opportunities for funders:

- Fund basic research into what combinations of treatments and media extract the most pollutants from stormwater.
- Support efforts to monitor the before-and-after ecological conditions in a small water basin that has been comprehensively designed with LID practices and green stormwater retrofits.
- Fund accelerated aging tests to find out how well porous concrete/pavement/asphalt installations hold up in Northwest weather over 30 years.

> *"Does Russell feel confident enough that green infrastructure is the way to go and just want to see it incorporated all over the place? Or do they want to validate that these practices actually work? That would lead you down two different roads in terms of what you would fund."*
> *~ Thought leader interview*

- Fund a substantial study to scour the world for the best technologies or combinations to remove pollutants from water, as higher fish consumption rates could drive standards that can't be achieved with existing technology.
- Ensure research projects and focus areas have relevance and applicability to other places. To achieve a Puget Sound-wide outcome, they must touch down

in a way that's relevant to other watersheds or cities.

- Don't spend time reinventing the wheel on problem pollutants and sources—the Department Ecology's Puget Sound toxic loading study[19] is broadly applicable to different land types.
- Test and validate pilot projects, which are designed from the start to be scientifically defensible, to prove they work and do provide a cost benefit.
- Fund studies to demonstrate that porous asphalt actually filters pollution so the practice can be reclassified from a "pollution generating surface" to a "water treatment technology," which currently limits its use.
- Fund monitoring in real world homeowner rain gardens, not just experimental sites.
- Fund local cost-benefit analyses to help convince local elected officials of the benefits of GI/porous pavements.
- Fund research on the right balance of GI solutions and traditionally engineered solutions in retrofit situations.

"We can put in pilots until we are blue in the face trying different media (to remove pollutants in bioretention systems) and different things and we might get lucky. Someone might throw the dart at the dartboard and hit it. But the complexity of that system really requires a more rational, scientific, systematic approach of testing and understanding the processes and building the media from that. It's really expensive."
~ Thought leader interview

Other Barriers/Opportunities:

The following section outlines topics that were cited by a smaller number of respondents or around which there was less consensus about opportunities for funders. Still, at least one or several thought leaders described these issues as important dimensions of the problem or had specific advice for TRFF and other foundations not covered in previous sections:

Fish consumption regulations

Changes to fish consumption rates[20] in the state of Washington could have a big impact on stormwater standards, depending on how they are implemented. Some thought leaders viewed the rules as a valuable opportunity to achieve a broader toxics reduction strategy, others feel they will create an enormous amount of ill will, and still others imagine there will be so many "off ramps" and such a long time horizon to implement that the rules won't drive much change.

Transportation policies

Local and state transportation policies are not well aligned with stormwater goals, good stormwater practices and management are not routinely built into transportation projects, and transportation agencies need to step up to solve the problem. The transportation sector in general is an underappreciated contributor to the region's polluted runoff, based on a) the amount of impervious surface in our cities and b) the contributions that cars make to pollution problems, from zinc in tires to PAHs in exhaust.

Comprehensive plan updates

Most stormwater planning is driven by individual, parcel-based permits, so change doesn't always happen in service of a larger vision. A state mandate to consider long-range stormwater planning in local comprehensive plans would be helpful, as would a set of best practices and tools to share with cities.

Equity concerns

There are up-and-coming issues around who will bear the costs to pay for stormwater retrofits. Local governments must consider how to make the changes equitable and affordable and how to build in mechanisms to protect low-income residents who may have to choose between eating and paying the water bill.

Vesting laws

Provisions that allow previously approved developments to be built under old laws may significantly undercut the LID requirements in the new NPDES permits. Many new developments for years to come will be vested under the old stormwater manual.

Graywater and blackwater policies

Regulations on many levels prevent people from treating waste on site with small scale systems and reusing treated wastewater. These barriers need to be removed.

Maintenance of LID

Municipalities have questions and issues around who will maintain green infrastructure, while some homeowners are afraid that rain gardens require special upkeep that they're not equipped to handle. There are basic research questions about best maintenance practices for businesses to keep toxics out of runoff, such as how to sweep, and or what the cost/benefit of cities changing their street sweeping practices would be. Other US cities have been experimenting with establishing worker cooperatives to maintain green infrastructure and generate green jobs.

NPDES municipal permits

In light of the latest NPDES permit process, it is unlikely that a magic-bullet permit

will ever emerge to solve all problems. Still, it is important to follow up to make sure that permits are being enforced and that municipalities are doing a good job of incorporating LID into their land use codes.

Valuing buildings

Convincing lenders and the real estate community to value buildings differently could radically change what we build. Current practices subsidize the wrong things. If we valued buildings properly, we would have green, living buildings now because it is the most cost effective way to build.

King County's WRIA 9 retrofit project

Stakeholders should pay attention to the results of this comprehensive modeling effort to determine which types of retrofits will be most cost effective in the watershed.

Identifying grantees/projects that can achieve scalability

Leaders and staff are the best indication of success – look at their track record, their vision and whether they have successfully implemented it in the past. TRFF could encourage grants that pair smaller organizations with larger/national ones with significantly more resources, but only when this makes sense. Compel deep collaborations between municipalities and NGOs on a focused topic.

Information sharing

Relatively few thought leaders and grantees mentioned the need for more online information repositories or websites, though a handful did argue those would be valuable and relatively low-cost investments. A greater number were inclined to believe that those resources already exist, and that the need is greater for face-to-face technical assistance or training for municipalities and private contractors, and for advocacy organizations to work toward shared goals.

Capitalizing on TRFF's influence

TRFF should use the board's influence with other industries and companies to showcase stormwater solutions and shape important conversations about where those working on polluted runoff issues are headed.

Conclusion

Over the last four years, The Russell Family Foundation's Polluted Runoff/Green Infrastructure grant portfolio has reflected the fact that there are dozens, if not hundreds, of strategies one could fund in service of reducing polluted runoff. The sheer number of opportunities that thought leaders identified in this process and lengthy wish lists from grantees confirm this fact.

However, this is arguably one of the barriers to making more progress. In a perfect world, these myriad efforts to address polluted runoff should add up to a sum that is greater than its parts. Yet it is not clear this is happening. One thought leader summed up the dilemma this way:

> *"Stormwater solutions need to be diffuse because of the nature of the problem. But spending time on small projects here and there is not going to get us there. We need at the very least to create a shared sense of how we're talking about the problem and what we are requesting and what are we requesting it for and what is the outcome we are going to show. We need a more coordinated approach."*

In its next round of funding, TRFF should consider ways to help those working in the field identify and work toward shared goals, reward coordinated approaches that leverage strengths of multiple organizations, and organize grant making around a smaller number of initiatives or campaigns in service of larger, more focused outcomes.

Appendix A

Polluted Runoff/Green Infrastructure grants awarded by The Russell Family Foundation

September 2010—February 2014

Organization	Amount Awarded	Project Name
Adopt A Stream Foundation	$45,000.00	Puget Sound Coastal Streamkeepers
American Rivers	$50,000.00	Promoting Sustainable Stormwater and Floodplain Management in Puget Sound
American Rivers	$40,000.00	Reforming the Corps to Restore Puget Sound Rivers
American Rivers	$50,000.00	Promoting Sustainable Stormwater and Floodplain Management in Puget Sound and Beyond
Antioch University Seattle	$55,000.00	Roadside Rain Gardens - Communities for Clean Water
Cascadia Green Building Council	$45,000.00	Green Infrastructure: Barriers and Levers
Cascadia Green Building Council	$75,000.00	General Operating Support
Cascadia Green Building Council	$100,000.00	General Operating Support
Ceres	$40,000.00	Financing Sustainable Water Systems
Chinatown International District Preservation And Development Association	$10,000.00	Community Outreach for the Green Streets Project
Citizens For A Healthy Bay	$80,000.00	Water Pollution Prevention, Enforcement and Education Project
Citizens For A Healthy Bay	$60,000.00	Water Pollution Prevention, Enforcement and Education Project
Citizens For A Healthy Bay	$40,000.00	Water Pollution Prevention, Enforcement and Education Project
Clean Boating Foundation	$15,000.00	Certified Clean Boatyard Program
Clean Boating Foundation	$15,000.00	Certified Boatyard Program
Clean Boating Foundation	$30,000.00	Clean Boatyard Program
Clean Boating Foundation	$60,000.00	Certifying boatyards as clean and green

Organization	Amount Awarded	Project Name
Duwamish River Cleanup Coalition/Technical Advisory Group (Drcc/Tag)	$30,000.00	General Operating Support
Duwamish River Cleanup Coalition/Technical Advisory Group (Drcc/Tag)	$25,000.00	General Operating Support
Earthcorps	$30,000.00	Sharing Stormwater Innovation
Earthcorps	$15,000.00	Estuary Restoration Corps Planning Grant
Earthjustice	$75,000.00	Legal Advocacy to Protect and Restore Water Quality in Puget Sound
Earthjustice	$65,000.00	Legal Advocacy to Protect and Restore Water Quality in Puget Sound
Earthjustice	$15,000.00	Municipal Stormwater Permit Defense
Earthjustice	$50,000.00	Legal Advocacy to Reduce Stormwater Pollution of Puget Sound
ECOSS - Environmental Coalition Of South Seattle	$80,000.00	General Operating Support
ECOSS - Environmental Coalition Of South Seattle	$40,000.00	South King County Cities Stormwater Initiative
ECOSS - Environmental Coalition Of South Seattle	$45,000.00	Suburban Cities Stormwater Program
Environmental Works	$50,000.00	Improving Puget Sound Water Quality through "Green Street" natural drainage design alternatives.
Forest Trends/Ecosystem Marketplace	$75,000.00	A Feasibility Assessment of a New Stormwater Reduction Certificate Program in Puget Sound
Friends Of The San Juans	$15,000.00	Preventing Polluted Runoff in San Juan County through Low Impact Development Training
Green Futures Research And Design Lab	$10,000.00	Puget Sound Stormwater Solutions Resource Bank and Web Portal
Green Futures Research And Design Lab	$35,200.00	Effects of Waterfront Stormwater Solution Prototypes on Water Quality Runoff
Green Futures Research And Design Lab	$50,000.00	Advancing Waterfront Stormwater Solutions
Investigatewest	$40,000.00	Puget Sound, Stormwater and the Clean Water Act
Jack Straw Foundation	$18,000.00	Green Acre Radio: A weekly public radio program on critical environmental issues.

Organization	Amount Awarded	Project Name
Kitsap Public Health District	$42,360.00	Use of Emerging Contaminants as an investigative tool for pollution investigation and correction
Lighthouse Environmental Programs	$20,000.00	Increasing Awareness of LID Systems for Commercial Properties.
National Wildlife Federation, Pacific Region	$40,000.00	Puget Sound Floodplain Protection Program
Natural Resources Defense Council	$20,000.00	Expanding the Investment in Seattle's GSI Approach
Natural Resources Defense Council	$20,000.00	Rooftops to Rivers to Puget Sound: Implementing Key Strategies for Advancing Green Infrastructure
Natural Resources Defense Council	$20,000.00	An Update to "Rooftops to Rivers"
Nisqually River Foundation	$50,000.00	Sustainable Eatonville Town Hall
North Olympic Salmon Coalition	$7,161.00	Stormwater Education Program
Northwest Straits Foundation	$40,000.00	General Operating Support
Pacific Nw Pollution Prevention Resource Center	$42,000.00	Assisting Businesses to Reduce Zinc Loading in Stormwater
Pacific Shellfish Institute	$71,700.00	Mussel Power: Engaging Communities and Improving Urban Water Quality through Nutrient Bioextraction
People For Puget Sound	$30,000.00	Capacity-Building Initiative to Improve Systems Technology, Business Management & Communicati
People For Puget Sound	$150,000.00	General Operating Support
People For Puget Sound	$50,000.00	Preventing Polluted Runoff to Puget Sound: Advocacy, Education & Outreach for LID Policy & Practice
Puget Sound Restoration Fund	$75,000.00	Port Gamble Bay Restoration Project
Puget Sound Restoration Fund	$75,000.00	Port Gamble Bay Restoration Project
Puget Soundkeeper Alliance	$80,000.00	The Puget Sound Leadership, Stormwater Regulation and Clean Water Act Enforcement Project
Puget Soundkeeper Alliance	$5,000.00	Washington Waterkeeper Alliance: Initial Strategy and Organization

Organization	Amount Awarded	Project Name
Puget Soundkeeper Alliance	$160,000.00	Stormwater Regulation and Clean Water Act Enforcement Project
Puget Soundkeeper Alliance	$90,000.00	Stormwater Regulation & Clean Water Act Enforcement Project
Re Sources For Sustainable Communities	$30,000.00	RE Sources North Sound Baykeeper Program
Re Sources For Sustainable Communities	$80,000.00	North Sound Baykeeper
Re Sources For Sustainable Communities	$40,000.00	North Sound Baykeeper, a project of RE Sources for Sustainable Communities
Resource Media	$75,000.00	Developing and implementing communications strategies to promote green infrastructure
Resource Media	$80,000.00	Polluted runoff communications strategy and solutions
Resource Media	$80,000.00	General Operating Support
Resource Media	$80,000.00	Communications strategies for green infrastructure
River Network	$60,000.00	Depave
Rosemere Neighborhood Association	$5,000.00	Appeal of Clark County NPDES permit modification
San Juan Community Home Trust	$22,000.00	Living Machine (reclaimed wastewater) for Sun Rise Permanently Affordable Housing Community
Seattle Tilth Association	$25,000.00	Water Smart
Seattle Tilth Association	$35,000.00	Water Smart Plus
Shorebank Enterprise Cascadia	$50,000.00	Strengthening the Enterprise Cascadia Septic Loan Program
Sightline Institute	$60,000.00	Sound Stormwater Solutions
Sightline Institute	$60,000.00	Sound Stormwater Solutions
Sightline Institute	$35,000.00	Sightline Stormwater Learning Cohort
Sightline Institute	$67,500.00	Sound Stormwater Solutions
Sightline Institute	$45,000.00	Sound Stormwater Solutions
Stewardship Partners	$95,000.00	12,000 Rain Gardens Protecting Puget Sound: Phase 2
Stewardship Partners	$20,000.00	Salmon Safe Puget Sound Urban Initiative
Stewardship Partners	$40,000.00	Puget Sound Salmon-Safe

Organization	Amount Awarded	Project Name
Stewardship Partners	$119,000.00	12,000 Rain Gardens Protecting Puget Sound
Stewardship Partners	$50,000.00	Puyallup Neighborhood Rain Garden Project
Sustainable Connections	$40,000.00	Legacy Watersheds - Public-Private Low Impact Development Solutions for Puget Sound
Sustainable Connections	$40,000.00	Legacy Watersheds: Public-Private Low Impact Development Solutions for Puget Sound
Sustainable Connections	$30,000.00	Legacy Watersheds: Public-private low impact development solutions for Puget Sound
Sustainable Connections	$30,000.00	Reduce Polluted Runoff to the Puget Sound by Mainstreaming Low Impact Development Practices
Sustainable Seattle	$25,000.00	Creating a Buzz for Rain Gardens
Sustainable Seattle	$50,000.00	Sustainable Neighborhoods in Seattle
Sustainable Seattle	$61,000.00	Sustainable Rain: Central Puget Sound Sustainable Business Project
Sustainable West Seattle	$20,000.00	Walking on the Backs of Salmon: A Vision for the Puget Sound
The Nature Conservancy	$75,000.00	Coordinated Investment: A New Approach for Puget Sound
University Of Washington Foundation - Shelf To Sound	$15,000.00	From Shelf to Sound - project expansion
Washington Business Alliance	$92,400.00	Applying "Lean" to Stormwater Regulation of Puget Sound
Washington Environmental Council	$150,000.00	People For Puget Sound Program at WEC
Washington Environmental Council	$150,000.00	Clean Water Communities Agenda
Washington Environmental Council	$75,000.00	General Operating Support to Protect Puget Sound
Washington State University Foundation - Lid Lab	$150,000.00	Field Evaluations of Low Impact Development Techniques for Cleaning Polluted Run-off
Washington State University Foundation - Lid Lab	$150,000.00	Low Impact Development for the cleaning of polluted runoff in the Puget Sound
Washington Toxics Coalition	$40,000.00	General Operating Support
Washington Toxics Coalition	$40,000.00	General Operating Support
Washington Toxics Coalition	$50,000.00	General Operating Support
Total:	**$5,198,321.00**	

Appendix B: Survey Questions

In December 2013 and January 2014, 27 organizations that received Polluted Runoff/Green Infrastructure grants from TRFF answered the following questions in an online survey. The same questions were also used to guide thought leader interviews.

1. What are the barriers to improving the health of Puget Sound through stormwater solutions?
2. Where are the best near-term opportunities for private funders to remove those?
3. To make progress over the next 10 or 20 years, where should funders invest now?
4. Where is the low-hanging fruit where relatively modest investment could yield outsize results?
5. What emerging issues are receiving too little attention?
6. Are any strategies receiving too much attention?
7. What are the most important strategies to reduce polluted runoff in Puget Sound? (Choose top 4)
8. What important problems aren't being addressed because they are perceived as too difficult to fix?
9. How did your TRFF-funded project result in less polluted runoff entering Puget Sound?
10. What are three takeaways from your project to share?
11. Would additional opportunities for networking/information sharing/collaboration be valuable?
12. What are innovative ways to increase public funding for polluted runoff solutions?

Appendix C: Pollution Reduction Impacts from TRFF Grants

The impact of grants can be measured in many different ways and are typically reflected in grant-specific evaluation metrics. However, TRFF was interested to learn how many of its Polluted Runoff/Green Infrastructure grants had produced measurable, on-the-ground progress in cleaning up Puget Sound.

In the online survey, grantees were asked a simple question: **Could they demonstrate that their funded project(s) had resulted in less pollution flowing into Puget Sound?** Here are the results:

- **Yes:** 9 (33%)
- **No:** 13 (28%)
- **Sort of:** 5 (19%)

Projects that had demonstrably reduced pollution entering Puget Sound typically involved pollution prevention efforts, LID research projects, and regulatory enforcement. In many instances, grantees were able to demonstrate on-the-ground success because of monitoring that resulted from scientific investigation, regulatory requirements for businesses, or litigation.

Here are some examples of TRFF projects that measurably reduced pollution:

- Research projects with monitoring demonstrate a reduction in runoff volumes flowing from LID practices
- Treating and dispersing wastewater to a drain field has improved water quality being infiltrated and diverted it from Puget Sound
- Reduced levels of flame retardant chemicals have appeared in Puget Sound following statewide bans(s) in consumer products
- Reduced pollutant concentrations have entered Puget Sound from industrial sites (based on discharge monitoring reports) as a result of litigation
- Community shellfish farms have measurably reduced pollution
- 45 pollution incidents and 18 dumpsites were reported on waterways, and most problems have now been corrected by regulators
- 200,000 gallons of liquid contaminants were removed from abandoned ships before they sank
- Less copper paint is being applied by boatyards and less toxic products like zinc anodes are purchased

As one would expect, most projects focusing on education and outreach, policy and legal advocacy, and information sharing could not make a direct link to reduced pollution in Puget Sound.

Grantees in the "sort of" category included those who had installed green infrastructure projects that they assumed would reduce pollution but who had not confirmed that with monitoring, grantees whose projects were too recent to demonstrate results yet, and those who planned to attempt quantitative analysis but had not yet done so.

Appendix D: Takeaways from TRFF Grant Projects

TRFF grantees were also asked the following question: **What are 3 takeaways from your funded project(s) that you would want to share with others in the field?**

The answers varied widely, due to the diverse nature of projects. Here is a sampling of direct responses, grouped by theme:

Education and outreach:

- Use exciting visual/social media
- Use tangible and easily implemented ideas as entry points but combine with opportunities for deeper education and activities
- Community driven projects have greater capacity to succeed
- Always include an educational component in your project
- Regulations don't enforce themselves and require concerted efforts by citizens
- The value of water is a common denominator that resonates
- The carrot is a powerful motivator for reducing pollution
- Focus on one substantive change people can make
- Advocacy and public engagement are key to changing policies
- Education requires time to have an impact
- There is a strong need for more educational opportunities about the ecological processes around water quality and solutions
- Modest results from a demonstration project can lead to more significant change
- Neighborhood youth should be able to get job skills and experience through projects
- Effective work can be done at the community level
- An exciting new idea can spread quickly
- Engage the business community
- Industry professionals are better messengers for promoting incentives and benefits
- It is critically important to highlight and support leaders
- Some challenges for expanding GSI are not technical but revolve around earning public trust
- Agencies and organizations are building that grassroots support

Ease and cost of GI/pollution reduction strategies:

- Consumers and businesses will use a less toxic alternative if it is around the same price and just as effective
- Contractors feel green infrastructure needs to be priced similarly and as easy to install
- Permits for community initiated projects need to be easy and affordable (i.e. free)
- Projects that include construction of demonstration sites need technical support and more than 12 months to complete

- Local jurisdictions are hesitant to push the limits without strong leaders within the community and without a clear nexus to other needs
- Build on strengths of natural infrastructure
- LID projects are not always implemented as designed

Pollution prevention and toxics:

- We forget to talk about what's in stormwater – it's not the problem but the vehicle for toxic pollution that winds up in the Sound and that gets people engaged
- Public interest in toxics increased enormously after original/local testing began demonstrating what winds up in their bodies and consumer products
- Health messages are very compelling
- Deepening connections to health community/ doctors/nurses has been extremely beneficial
- We need to make people a part of the system and understand that the same toxics that wind up in Puget Sound are in their bodies
- Addressing dog poop and lawns and car washing is important but doesn't get people fired up
- There is a huge need for educating businesses about pollution prevention and spills (from industrial companies to Korean restaurants)
- Training needs to be simple and easy
- Language-appropriate materials/training/ contact is key when working in diverse small business communities

Research, validation, information sharing:

- We need to communicate proof of concept on GI to regulators and decision makers who remain skeptical of its efficacy
- We need to increase trust from landowners that LID techniques are reliable and don't require special maintenance
- "Citizen science" is an effective way to help volunteers learn while conducting important research
- Cost-benefit analyses need to include externalized costs
- Don't assume that even basic GI information is well understood or being shared
- People in the field want to know about failures as much as successes

Collaboration:

- There is a need for better communication among advocacy groups
- Collaborate with other programs to tailor your message to their audiences
- Share your findings with others and network with like-minded groups
- Great work is happening but word is not always getting around
- Partnership opportunities abound—seek them out

Policy, regulations, funding:

- Identify and deploy innovative financial and market-based tools to promote GI
- Neighbors and businesses who install GI should be incentivized rather than charged fees
- There's no price to be paid for fighting against modest environmental protection standards and the perception is that there's a political price to be paid for supporting them
- Focused advocacy is needed to embed measurable goals into regulatory mechanisms
- Excessive WA Department of Health monitoring requirements impedes the use of small scale water reuse systems
- Need to maintain a drumbeat around green infrastructure in transportation/land use/ funding conversations and decisions
- Showcase avoidance of permit as a preferable opportunity
- Reorient the regulatory process towards better water quality
- Businesses must be encouraged and in some cases compelled to improve stormwater management and treatment
- This problem can't be solved in any strategic way by intervening here and there

Other:

- Small scale wastewater treatment systems can treat to a high enough standard for irrigation and toilet flushing
- Account for climate change impacts
- Boaters want to do the right thing
- Natural habitat restoration and stewardship improves water quality
- Regular patrols and vigilance can help address significant pollution threats along Puget Sound shorelines before incidents occur
- It's important for Russell to think about the capacity of their grantees to leverage other resources and funding and outcomes (i.e. how far will the ripples from this investment reach?)

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Cover photos: Stormwater discharge by eutrophication&hypoxia, Rain garden plants by Lisa Stiffler, and NW Seattle by Lisa Stiffler.