Exploring the Relationship between Collaborative Partnerships and Outcomes

Prepared for The Intertwine Alliance

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List of Acronyms

BES	Bureau of Environmental Services (Portland)
CAFO	Confined animal feeding operation
Centro	Centro Cultural
CREP	Conservation Reserve Enhancement Program
CWS	Clean Water Services
DEQ	Department of Environmental Quality (Oregon)
DU	Ducks Unlimited
ECREP	Enhanced Conservation Reserve Enhancement Program
EQIP	Environmental Quality Incentives Program
FCGC	Fanno Creek-Greenway Complex
FFC	Fans of Fanno Creek
FOT	Friends of Trees
FPA	Forest Park Alliance
FPC	Forest Park Conservancy
FSA	Farm Service Agency
GFPCI	Greater Forest Park Conservation Initiative
HOA	Homeowner Association
IGA	Intergovernmental agreement
JBW	Jackson Bottom Wetlands
MET	Muslim Educational Trust
MOA	Murrayhill Owners Association
NAWCA	North American Wetlands Conservation Act
NiN	Nature in Neighborhood
NRCS	Natural Resources Conservatin Service
ODA	Oregon Department of Agriculture
ODF	Oregon Department of Forestry
ODOT	Oregon Department of Transportation
OWEB	Oregon Watershed Enhancement Board
PAWMAP	Portland Area Watershed Monitoring and Assessment Program
PSU	Portland State University
SPOTAC	Stream Protection Operation Technical Action Committee
STEM	Science, Technology, Engineering, and Math
SWCD	Soil and Water Conservation District
TFA	Tree for All
THPRD	Tualatin Hills Park and Recreation District
TIA	The Intertwine Alliance
TMDL	Total Maximum Daily Load
TRK	Tualatin Riverkeepers
TRNWR	Tualatin River National Wildlife Refuge
TRWC	Tualatin River Watershed Council
TSWCD	Tualatin Soil and Water Conservation District
USFWS	US Fish and Wildlife Service
VEGBAC	Vegetated Buffer Areas for Conservation Program
WMSWCD	West Multnomah Soil and Water Conservation District
WRC	Watershed Resource Center

Cover photo by R. McLain: Jackson Bottom Wetlands Preserve

Executive Summary

The Intertwine Alliance (TIA), a coalition of 150+ public, private, and nonprofit organizations, builds its success of conservation over large landscapes on collaborative partnerships between these organizations. With the goal of understanding the impact, depth, and benefits of these partnerships, TIA and its partner advisory group commissioned a research team from Portland State University's Institute for Sustainable Solutions to look at the value of collaborative partnerships. The study focused primarily on "Tree for All" (TFA) and the work it has done to improve the health of the Tualatin River watershed. Over the past 30 years, the Tualatin River, which flows through Washington County, Oregon, has experienced a transformation from being one of the nation's most polluted waterways to a place that functions more as the complex ecosystem it once was, with wildlife and bird populations returning and streams reconnecting to their floodplains. This transformation was made possible through a series of collaborative partnerships supported through the TFA program, which then catalyzed additional resources and partners into a broad landscape conservation program working across the entire Tualatin River watershed. This study was done with financial support from: US Fish and Wildlife Service (USFWS), dedicated to working with others in the conservation of fish, wildlife, plants and their habitats; and Clean Water Service (CWS), a special-purpose utility district responsible for wastewater collection and treatment and storm water services within the urbanized portion of Washington County.

Although all TFA projects include some type of restoration component, the activities emphasized vary from project to project. Some are focused primarily on getting trees in the ground or replacing invasive species with native vegetation; others have strong and long-term environmental education components. We selected three restoration case examples for in-depth study, and supplemented these with three mini-case studies of other TFA projects. We added two more mini-case studies of partnerships that are not part of the TFA program so as to capture a greater diversity of partnership types. It is important to remember that the handful of TFA projects we looked at comprise just a few out of the more than 700 projects in the watershed. Likewise, the two additional partnerships we looked at are just two out of the dozens of partnerships that make up The Intertwine Alliance. We collected data for the case studies and mini-case studies through semi-structured interviews with 34 key informants, consultation with CWS and USFWS staff, and from information gleaned from project documents, news articles, and government reports.

Our team's field observations revealed that the collaborative partnerships engaged in restoration in the Tualatin River watershed have had significant positive impacts on environmental conditions. Importantly, the impacts have been transformative rather than incremental, affecting more than 25,000 acres and restoring more than 120 river miles. Anthropogenic simplified ecosystems now look and function more as the complex ecosystems they once were, with wildlife and bird populations returning or increasing and streams reconnecting to their floodplains.

The case studies make clear that restoration would have taken much longer to accomplish without partnerships or would have covered much smaller areas. In some instances, without partnerships, it is likely that restoration would not have occurred at all.

- Without the incentives provided by Clean Water Services, Natural Resources Conservation Service, the Tualatin Soil and Water Conservation District, and Farm Service Agency through the rural landowner incentive program, the number of farmers participating in stream bank restoration programs would have increased at a much slower rate.

- Because property ownership is split between two landowners in the Jackson Bottom Wetland, a partnership involving CWS and the City of Hillsboro was vital to getting the work done.

- That Tualatin River National Wildlife Refuge has become a model of the USFWS' Urban Refuge Program is attributable to the close and long-term collaboration between USFWS and the Friends of the Tualatin River National Wildlife Refuge, as well as other important partnerships with other groups such as Tualatin Soil and Water Conservation District, CWS, Friends of Trees, Tualatin Riverkeepers, TFA, schools, and many others.

- In the absence of partnerships, the Tualatin Hills Park and Recreation District would have lacked both the human and financial resources needed to restore significant portions of public land along Fanno Creek.

A unique feature of TFA is that a series of autonomous and very loosely connected collaborative partnerships focused on restoration have, in aggregate, succeeded in achieving significant improvements in ecological conditions over much of the Tualatin River watershed. This has happened despite the absence of a formal watershed-wide restoration governance body, and the absence of highly formalized project planning and implementation structures. Some of the likely contributing factors to the success of individual TFA partnerships, as well as their success in aggregate, are described below.

Presence of a "regulatory driver" that prompted innovation: A key factor behind the success of the TFA partnerships is that Clean Water Services and other stakeholders in the Tualatin River watershed had regulatory requirements to improve water quality. This prompted CWS to create and initiate the TFA program, an innovative approach to reducing in-stream water temperatures, which grew into the broader landscape conservation program. For TFA, the driver was a regulatory one, but in other contexts the drivers might be a major natural disaster, such as an earthquake or flood, or a pressing social issue, such as widespread homelessness.

Presence of organizational cultures conducive to collaboration and experimentation: An important factor in TFA's success at large-scale conservation is an organizational culture within CWS that values and rewards collaboration. The willingness on the part of CWS leadership to take risks that many other utilities faced with similar pressures to improve water quality have been reluctant to take has also been important. District staff are proactive at reaching out and listening to others, and, equally important, value and know how to "lead from behind."

A critical mass of collaborative-minded partners: That TFA has resulted in restoration taking place in the Tualatin River watershed at a pace and scale well beyond initial estimates is attributable in large part to the emergence of a critical mass of collaborative-minded partners. These include not only CWS, but also many other organizations such as Metro, USFWS, Tualatin Hills Park and Recreation District, Tualatin Soil and Water Conservation District, Friend of Trees, the Tualatin River Watershed Council, local city governments, and many others. These partners have collaborative mindsets as well as staff and upper-level managers willing to take risks. A key element of this culture of collaboration is that participating organizations are willing to listen to prospective partners, learn what their needs are, and work together to identify mutually-beneficial solutions.

Presence of a common mental model developed through a consensus process: Visioning and prioritization processes, such as those that led to the development of the Tualatin River Watershed Action Plan, the 2005 Healthy Stream Plan, and the Regional Conservation Strategy, all played a

critical role in building a shared mental model of restoration needs and priorities, as well as building social capital and trust relationships that have enabled a broad spectrum of watershed stakeholders to turn the ideas contained in these documents into action on the ground.

Partnership composition conducive to complementarity: The TFA partnerships described in this study had more or less similar structures, generally consisting of the following elements:

1) A land management/natural resource agency or non-profit organization led the project, generally providing access to land, some funding, project administration, and in most cases, technical expertise.

2) CWS provided funding, plant materials, technical expertise in restoration ecology and hydrology, professional restoration contractors, and, in some cases, access to land.

3) Friends of Trees provided training for volunteers, volunteer recruitment, coordinated planting events, and in some cases, limited funding.

4) Community groups, such as neighborhood associations, "Friends" groups, and local non-profit organizations, recruited volunteers for planting events and generated political support for restoration activities.

5) Schools and after-school programs provided students to participate in volunteer plantings and, in some cases, wildlife or plant monitoring activities.

Together, CWS and the lead organization typically contributed a significant amount of funding which the partnership then leveraged to obtain additional funds from a variety of sources. Importantly, in all of the TFA partnerships, each partner brought a different set of skills, resources, and professional and social connections to the table. Having access to this diverse set of assets enabled the partnerships to accomplish their objectives efficiently and effectively.

Partnership composition conducive to social connectivity: An advantage of the partnership structure described above is that it has been conducive to connecting sectors (public-civil society-private), jurisdictions (city-special districts-federal-regional), and scales (site-level, sub-watersheds, watersheds, ecoregions), with variations depending on which sectors, jurisdictions, and scales need to be taken into account to accomplish the project. The long history that many of the participants have in working together on watershed issues, and the trust and familiarity they have developed through those processes, has lent further strength to many of these connections.

Connections into and engagement with the local communities: Common to all of the cases is the active participation of groups with connections within local communities. These groups have taken on responsibility for outreach to landowners or prospective volunteers. Regionally-situated bridging groups, such as Friends of Trees and SOLVE, have played a key role mobilizing volunteers to participate in planting events. These regional groups often work through local groups to mobilize local volunteers.

Stable funding: The TFA program is catalyzed by funding in the form of a portion of the fees paid by utility ratepayers, which in turn leverages additional resources. This has provided a solid and stable financial foundation that, together with approval from the CWS Board and upper-level management, has made it possible for CWS staff to engage in what is, in essence, a watershed-wide landscape conservation endeavor working across rural and urban communities. As the program

grew, millions of dollars were contributed by other TFA partners, which helped it grow into a cost-effective large-scale program.

Summing up

The study supports the assertion that partnering enables organizations to more effectively achieve their goals. Although some restoration likely would have occurred in the Tualatin River watershed without the presence of a collaborative partnership network, it would have happened at a much slower pace and smaller scale. In all of the cases included in our study, no one of the partners acting alone would have had the resources, skills, knowledge, and connections needed to make the project successful. However, joining forces enabled them to mobilize and put into action all of the pieces needed to achieve their objectives.

Additionally, in each of the cases we found that the collaborative projects provided multiple benefits to the broader community that encompassed much more than environmental improvements. Just a few of these benefits are: health benefits associated with a cleaner environment; mental health benefits associated with connecting community volunteers with nature; educational opportunities for schools and their students; and lower greenspace maintenance costs, freeing funds up to support the provision of other services. Investments in collaborative partnerships in the Tualatin River watershed have yielded a stream of benefits to a broad segment of the area's population, and further investments are likely to yield equally good returns.

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Introduction

The Intertwine is many things. It is first and foremost a vision and a goal: a set of interconnected trails, greenspaces, street trees, natural areas, and waterways of the Portland-Vancouver metro region that is being created by concerned citizens, local businesses, non-profit organizations, conservationists, local and federal government agencies and utility companies. Second, The Intertwine is a series of projects brought to life through collaborative partnerships. Third, and finally, The Intertwine Alliance (TIA) is an organization facilitating connectivity within the Intertwine and between projects in The Intertwine. TIA has a small core staff, but most importantly, is composed of partners and projects that share the common vision of The Intertwine connecting communities and habitats together across the region. TIA promotes collaboration as a key strategy for achieving sustainable and far-reaching environmental and social outcomes in the region. The four core assumptions listed in Box 1 underlie TIA's belief that collaborative partnerships yield better outcomes than if organizations and individuals work alone.

Box 1 - Four core assertions about collaborative partnerships

Assertion 1: Partnering enables organizations to more effectively achieve their goals.

Assertion 2: Collaboration leverages the unique strengths of each partner to create a sum greater than its parts.

Assertion 3: Collaborative projects create multiple community benefits.

Assertion 4: Collaboration enables organizations to address issues at scale.

However, there are costs as well as benefits associated with collaboration. Consequently, TIA's leadership has identified a need to clarify the impacts of collaborative partnerships on project outcomes and assess the overall value of collaborative partnerships to regional conservation. To address this need, TIA contracted with Portland State University's Institute for Sustainable Solutions in Spring 2017 to assess the value of collaborative partnerships for large-scale regional conservation in The Intertwine. This report examines case examples of collaborative partnerships focused on or related to watershed restoration in the Tualatin River watershed. Data from these case examples, together with supplemental data from other partnerships, enables us to do the following:

1) Identify key elements of successful collaborations as well as elements that hinder successful collaborations,

2) Provide feedback as to how collaborative partnerships can be improved so as to achieve even better outcomes, and

3) Design a data collection process that can be replicated to collect similar information about TIA's collaborative partnerships.

Study Approach

Our research team consisted of a social scientist, water quality specialist, Geographic Information

Systems analyst, and volunteer environmental scientist. The State of the Intertwine advisory committee selected the Tree for All (TFA) habitat restoration initiative in the Tualatin River watershed as the primary focus of the study. For the purposes of this report, we consider TFA projects to include all ecological restoration and related activities associated with Clean Water Services' (CWS) water quality trading program that began in 2004 (Porter et al. 2014), as well as activities aimed at meeting regional conservation goals. We use the Society for Ecological Restoration's definition of ecological restoration (McDonald et al. 2016: 9), in which ecological restoration is considered "the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed." Drawing on recent landscape restoration research, we also see ecological restoration in human-influenced ecosystems as intimately linked to human social, economic, and physical wellbeing (Stanturf et al. 2017).

The TFA initiative is a useful starting point for looking at the value of collaborative partnerships for several reasons. Most TFA projects rely heavily on collaborative partnerships, and a number have a long enough history that environmental outcomes are discernible. TFA projects vary greatly in their geographic scope, in the number and types of partners involved, and, to a lesser extent, their goals. Although all TFA projects include some type of restoration component, the activities emphasized vary from project to project. Some are focused primarily on getting trees in the ground or replacing invasive species with native vegetation; others have strong and long-term environmental education components. The diversity of projects within the TFA initiative enabled us to explore how different types of partnerships functioned within the framework of a common vision for watershed restoration.

Box 2 - Cases and mini-cases included in the study	
In-depth case studies (TFA)	Enhanced Conservation Reserve Enhancement Program (ECREP) Jackson Bottom Wetlands (JBW) Fanno Creek-Greenway Complex (FCGC)
Mini-case studies (TFA)	Tualatin River National Wildlife Refuge (TRNWR) City of Tualatin Volunteer Restoration Program Tualatin River Watershed Council's Homeowner Association Restoration Program
Mini-case studies (not TFA)	Growing Green: Urban Forestry Training Greater Forest Park Conservation Initiative (GFPCI)

The TFA initiative encompasses hundreds of projects carried out over the past 13 years. To make this exploratory study manageable, we therefore selected three restoration case examples for in-depth study. The in-depth cases included the Enhanced Conservation Reserve Enhancement Program (ECREP), which addresses stream bank restoration on private farmlands; and the Jackson Bottom Wetlands (JBW) and Fanno Creek-Greenway Complex (FCGC), both of which consist of a series of related restoration projects on publicly owned lands.

We supplemented the in-depth case studies with three mini-case studies of three other TFA projects: Restoration on the Tualatin River National Wildlife Refuge (TRNWR), the City of Tualatin's Volunteer Restoration Program, and the Tualatin River Watershed Council's (TRWC) Homeowner Association Restoration Program. To capture a greater diversity of partnership types, we included two additional mini-case studies of partnerships that are not part of the TFA program: Growing Green, an urban forestry training program, and the Greater Forest Park Conservation Initiative (GFPCI)(see Box 2 for a list of the cases, mini-cases, and profiles included in this study).

We collected data for the case studies and mini-case studies through semi-structured interviews with 34 key informants and from information gleaned from project documents, news articles, government reports, and consultations with CWS and US Fish and Wildlife Service staff. See Appendix A for a list of organizations from which key informants were interviewed. The interviews took place between April and August 2017. With input from the SOTI advisory committee members, we selected an initial set of key informants so as to reflect the diversity of partner organizations participating in TFA projects. Additional interviewees were selected based on recommendations from key informants.

We developed the interview protocol with input from the SOTI advisory committee members. We adopted a semi-structured approach in order to reduce variation in the data gathered across interviewees. The interviews were structured around five major themes:

1) Nature of the partnership
2) Project/program outcomes
3) Challenges and organizational changes linked to participating in the partnership
4) Values of the partnership and assessing outcomes
5) Lessons learned
6) Suggestions for future support from The Intertwine Alliance

Appendix B provides a list of the guiding themes and accompanying initial probe questions for the interviews. Although the guiding themes were the same across the interviews, each interview was tailored so as to be appropriate to the type of organization involved, the interviewee's position within the organization, and the interviewee's depth and breadth of experience and knowledge related to the program or project being explored.

The majority of interviews were conducted at locations chosen by the key informants, typically at their workplace. We audio-recorded the majority of interviews, but also took detailed handwritten notes for all interviews. We fully transcribed six of the interview recordings but, due to time constraints, transcribed only the handwritten notes for the remaining interviews. We analyzed the interview data in two ways. We first developed narratives for each of the case and mini-case studies. In developing the case and mini-case narratives, we supplemented the interview data with quantitative data on project outputs, environmental outcomes, and levels of funding when available. We then conducted a thematic analysis across all of the interviews to identify key themes and sub-themes related to our guiding questions.

The remainder of this report is divided into the following sections.

Part 1 reviews the literature on collaborative watershed management, with a focus on the variety of ways that collaboration has been defined, the values that participants have attributed to such partnerships, and sifting out the impacts of collaborative partnerships on environmental and social outcomes.

Part 2 consists of an overview of the Tree for All initiative, three in-depth case studies, and three mini-cases.

Part 3 examines key themes that emerged from the interviews with TFA participants and other stakeholders in The Intertwine with respect to collaborative partnership benefits, outcomes assessment, partnership diversity, and scaling up conservation. This section also includes a

discussion of the elements that contribute to viable partnerships, as well as challenges that impede their functioning.

Part 4 discusses key partnership patterns. To encompass a broader diversity of partnership types, we also provide profiles of two additional partnerships, Growing Green and the Greater Forest Park Conservation Initiative.

Part 5 reflects on how the interview data addresses the core assumptions guiding the study.

Part 6 summarizes suggestions from interviewees regarding actions that TIA could take to support collaborative partnerships.

Part 7 lays out a suggested framework for a broader assessment of the impacts of partnerships on environmental, social, and economic outcomes.

Part 1 - A look at collaborative partnerships in the scholarly literature

Interest in collaboration has been growing among the watershed restoration community in recent years, and research on these partnerships has been growing as well. But, as of yet, there is no one accepted definition of what is variously referred to as collaboration, collaborative partnerships, or collaborative governance in the restoration context. Some of the definitions in the literature emphasize shared decision-making (Gerlak and Heikkila 2007, Genskow and Born 2006, Ulibarri 2015). Gerlak and Heikkila (2007: 55) define collaborative institutions as ones "which involve the collective decision-making by multiple political agencies, communities, and stakeholders" and Ulibarri (2015: 283) states that collaborative governance "entails engaging public agencies and non-state stakeholders in joint decision-making - often utilizing deliberation and principled negotiation - to address public challenges that unilateral action cannot achieve". This description underlines the importance of the concept of synergy, which Lasker et al. (2001) describe as the crucial ingredient that gives collaboration its unique advantage over trying to solve problems individually. Collaboration involves much more than the exchange of resources — instead, through the process of combining resources, skills, and viewpoints, collaboration enables participating organizations to develop more creative, comprehensive, and practical solutions to complex problems (Lasker et al. 2001). As such, their impact is transformational, changing the participating individuals and organizations in the process of achieving their objectives (Lasker et al. 2001). Box 3 provides definitions for several key concepts related to collaborative partnerships.

Box 3 - Key definitions and concepts

Collaboration – "Activities that enhance the capacity of partners to produce mutual benefit and work towards a common purpose." (Kraak 2012: 505)

Partnership – "A mechanism for bringing together a diversity of skills and resources of various organizations in innovative ways to improve specific outcomes." (Kraak 2012: 505)

Collaborative governance - "Entails engaging public agencies and non-state stakeholders in joint decision making - often utilizing deliberation and principled negotiation - to address public challenges that unilateral action cannot achieve." (Ulibarri 2015: 283)

Synergy - The "power to combine the perspectives, resources and skills of a group of people and organizations." (Lasker et al. 2001: 183)

" By combining the individual perspectives, resources, and skills of the partners, the group creates something new and valuable together — a whole that is greater than the sum of its individual parts." (Lasker et al. 2001: 184)

Others emphasize that partnerships form across different types of institutions — public, private, and nonprofit (Galli and Fisher 2016, Lubell 2014a, Romolini et al. 2013, Thomas 2008). Thomas (2008: 5) defines collaborative environmental governance as "any local, state, or federal effort to solve an environmental problem within partnerships among public, private, and nonprofit organizations". An element of this is that collaborative partnerships are able to use mechanisms that are outside the normal role and processes of government (Lubell 2014a, Müller 2013). Müller (2013: 3) outlines one type of collaborative partnership as "decentralized and localized collaboratives that are self-regulated and diverse, which can act locally and [are] freed from much of the standardizing constraints characteristic of hierarchical bureaucratic government" and Lubell (2004a), quoting Kenney et. al. (1999: 550), describes a watershed partnership as follows:

> "[A] primarily self-directed locally-focused collection of parties, usually featuring both

> private and intergovernmental representatives, organized to jointly address water-related issues at the watershed level or a similarly relevant physical scale, normally operating outside of traditional governmental processes or forums, and typically reliant on collaborative mechanisms of group interaction characterized by open debate, creativity in problem and solution definition, consensus decisionmaking, and voluntary action.

Box 4 – Characteristics of collaborative partnerships

(Quoted from Genskow and Born (2006: 57))

They use watershed boundaries (at various scales) as units for analysis and management.

They address a more comprehensive scope of issues, including water quality, water use, habitat, and goals related to healthy ecosystems.

Multiple local and non-governmental interests participate meaningfully and share influence over decisions.
They are oriented toward collaborative planning and problem solving, which promotes specific situation-appropriate management actions.

Their decision-making processes draw upon bio-physical science as well as social and economic information and local knowledge, including perspectives on previous management efforts and site specific contextual information.

This definition also includes another theme running through the literature on collaborative watershed restoration — trying to address concerns at a localized, watershed scale (Diaz-Kope and Miller-Stevens 2014, Genskow and Born 2006). An additional element is that partners are there to achieve common goals of an improved environment (Brower 2016, Diaz-Kope and Miller-Stevens 2014, Galli and Fisher 2016, Lubell 2004a, Romolini et al. 2013, Smith 2015). Genskow and Born (2006) provide a description of the characteristics of collaborative partnerships (see Box 4) that includes most of the elements discussed above and some others not included by other authors.

Range of collaborations in the literature

Most of the literature we identified about collaborative watershed partnerships was from the United States. Three exceptions were a paper looking at collaborative environmental governance of agricultural lands in New Zealand (Brower 2016), a study of watershed organizations in Ontario, Canada (Chilima et al. 2013), and management of a biosphere reserve in South Africa (Müller 2013). The cases in the United States were wide-ranging both geographically and in the types of management issues being examined. Lubell (2004a) and Ulibarri (2015) looked at how two Federal programs, the National Estuary Program (Lubell 2004a) and Federal Energy Regulatory Commission relicensing (Ulibarri 2015) were being implemented differently across the country.

Most of the literature focused on specific groups or areas where watershed management was being approached in a collaborative manner. Different types of water-related issues were included: water rights and water supply (Koebele 2015, Genskow and Born 2006), agricultural water quality management (Brower 2016, Enloe et al. 2014, Lubell 2004b), and overall watershed health (Chilima et al. 2013, Genskow and Born 2006, Gerlak and Heikkila 2007, Lubell and Fulton 2007, Mandarano and Paulsen 2011, Romolini et al. 2013). There was a range of types of collaboration examined. These included some that were initiated by government agencies; such as the Gerlak and Heikkila (2007) study which looked at four large watershed partnerships in the Chesapeake Bay, on the Columbia River, California Bay-Delta, and the Everglades. Others were initiated by private citizens, such as Genskow and Born's (2006) examination of a watershed partnership in Wisconsin.

The names given to the collaborative partnerships varied across the literature; but as explained

above, without a shared definition of the labels assigned to these groups, the different naming conventions do not necessarily reflect the differences in governance characteristics or stakeholder roles. Brower's (2016) case study of 'collaborative environmental governance' seems to be similar to Genskow and Born's (2006) 'watershed partnerships' and Lubell's (2004b) 'collaborative management' when examining participation and goals. However, the term 'watershed partnerships' was used to signify several different ideas as highlighted in the differences between Mandarano and Paulsen's (2011) examination of Philadelphia partnerships that only existed during the planning phase and Enloe et al.'s (2014) Iowa partnerships that focused on implementation of nutrient controls among farmers. Scale was also different among the case studies in the literature. Gerlak and Heikkila (2007) only examined very large watershed-scale partnerships, while others, such as Romolini et al. (2013) looked at smaller neighborhoods within the cities of Baltimore and Seattle.

Partnership, collaboration, and community engagement continuums

Partnerships, collaboration, and community engagement can take a variety of forms and are often described in terms of different types existing along a continuum.

Partnership continuum: Austin (2003) identified three major types of partnerships — philanthropic, transactional, and integrative — which exist along a continuum ranging from low to high level of engagement and investment (Figure 1). Kraak (2012) replaced the term "integrative" with "transformational" and provided a framework for classifying partnerships based on the nature of the participants' relationship to each other and the partnership as a whole (Table 1).

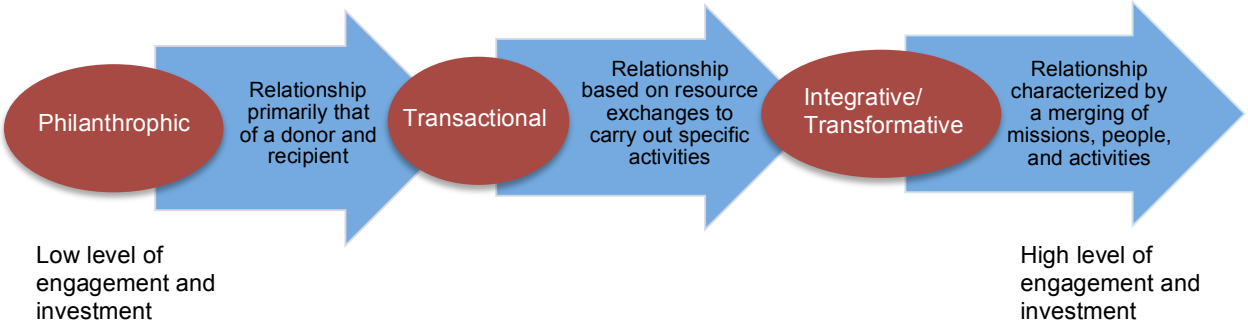

Figure 1 – Partnership continuum (adapted from Austin 2003)

Collaboration continuum: Himmelman (2002) developed a continuum that illustrates where collaboration fits along a continuum of inter-organizational forms of working together. He identifies four major modes that characterize how organizations share resources, rewards, risks, and responsibility. These are aligned along a continuum from low to high intensity of sharing (Figure 2), with networking located on the low end of the continuum and collaboration on the high end.

Community engagement: A common theme in the literature on collaborative watershed partnerships is the importance of community engagement for successful long-term sustainable collective action. The International Association for Public Participation (IAP2) has developed a spectrum describing the range of roles that communities have in planning and decision-making (IAP2 2017). They identify five different purposes of community engagement: inform, consult, involve, collaborate, and empower (Table 2).

Table 1 – Characteristics of different types of partnerships

Nature of the relationship	Philanthropic	Transactional	Transformative
Level of engagement	Low	Medium	High
Importance of each partner's mission	Peripheral	More important	Central
Resource investment	Small	Medium	Substantial
Scope of activities	Narrow	Focused	Broad
Level of interaction	Infrequent	Moderate	Intensive
Managerial complexity	Simple	Moderate	Highly complex
Strategic value to each partner	Minor	More salient	High

Source: Kraak et al.. 2012

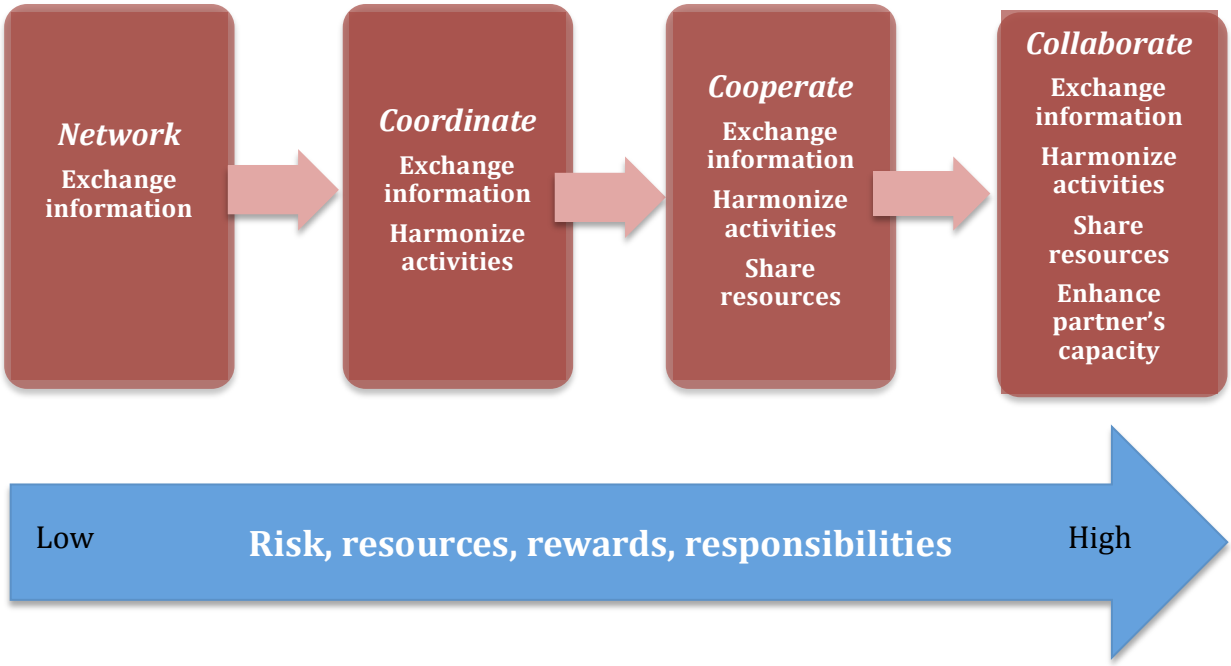

Figure 2 – Collaboration continuum (adapted from Himmelman 2015)

Table 2 – Spectrum of community engagement

	Inform	Consult	Involve	Collaborate	Empower
Public participation goal	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities, and/or solutions	To obtain public feedback on analysis, alternatives, and/or decisions	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered	To partner with the public in each aspect of the decision, including the development of alternatives and the identification of the preferred solution	To place final decision-making in the hands of the public

Source: IAP2. 2014. IAP2 Spectrum of participation. http://www.iap2.org/?page=pillars

None of the levels of community engagement is inherently better than the others. Which type of approach is best will depend on the goals, time and resources available, and the nature of the problem to be solved (IAP2 2017). The IAP2 spectrum starts from the assumption that an outside organization is leading or coordinating the planning or decision-making process; it also is focused on community involvement within a planning or decision-making process rather than within an implementation process.

Collaborative betterment or collaborative empowerment? Himmelman (2002) moves away from the assumption that the impetus for collective action lies with entities outside of communities, rather than within communities. He asserts that decision-making power reflect a "community's capacity for self-determination and can be enhanced or limited depending upon how collaboration is designed, implemented, and evaluated." He describes two categories of power relations characterizing collaborations involving communities: collaborative betterment and collaborative empowerment.

> *Collaborative betterment* originates from outside, and is brought into the community by public, private, and nonprofit organizations. This type of collaborative strategy delivers improved program delivery and services but generally doesn't increase the community's control or sense of ownership.
>
> *Collaborative empowerment* begins within the community and the community takes it to outside institutions. Like collaborative betterment, collaborative empowerment can improve program delivery and services. It also tends to have greater longevity because community members have a sense of ownership of the collaborative partnership's goals and processes.

Although there are times when collaborative betterment may be a viable approach, at least in the short term, in circumstances where sustained collective action is needed, an empowerment approach is more likely to result in lasting change.

Benefits of collaboration

A common theme in the definitions of collaborative partnerships is that they can do things that traditional governmental institutions cannot. Galli and Fisher (2016) point out that collaborations often form in areas where traditional top-down, command-and-control government actions have failed to solve the problem. The greater flexibility in implementation mechanisms that partnerships can provide is also considered a key benefit of collaboration (Brower 2016). Having greater flexibility enables organizations to tackle complex challenges that cannot be solved by a single institution working alone (Diaz-Kope and Miller-Stevens 2014, Genskow and Born 2006). Another important benefit of collaboration cited in the literature is the sharing of resources among partners (Diaz-Kope and Miller-Stevens 2014, Genskow and Born 2006). Diaz-Kope and Miller-Stevens (2014: 43) identify the shared resources as being "technical, financial, and human capital". Brower (2016) also talks about collaboration being more efficient, both in financial terms and in terms of avoidance of the frustration associated with bureaucratic, top-down mechanisms. Brower (2016) does, however, caution that some environmental groups view collaborative efforts as resulting in 'lowest common denominator' solutions that are an abdication of governmental responsibility for resolving environmental problems.

Another important benefit seen as associated with collaborative partnerships is a greater awareness of environmental issues and community building in the local area (Brower 2016, Koebele 2015). Brower (2016: 390) says that "to divided local communities it [collaboration] offers

greater awareness, understanding, and peace". However, the most important benefit most participants ascribe to partnerships is the ability to solve environmental problems that are otherwise insoluble (Brower, Diaz-Kope and Miller-Stevens 2014, Genskow and Born 2006). How much on-the-ground improvements can be credited to collaborations is, however, hard to measure, as will be discussed below.

Measuring outcomes linked to collaboration

Measuring outcomes from watershed partnerships is difficult. In the literature this difficulty is ascribed to the long time scales involved with realizing environmental outcomes (Genskow and Born 2006, Mandarano and Paulsen 2011), to the presence of confounding variables (Mandarano and Paulsen 2011, Thomas 2008), to the difficulty in seeing improvements at the local versus watershed scale (Chilima et al. 2013, Genskow and Born 2006, Mandarano and Paulsen 2011, Scott 2016, Thomas 2008), and on the bias of participants to seeing success because of all the hard work that has gone into the process, something known as the 'halo effect' (Koebele 2015). Mandarano and Paulsen (2011: 1295) sum up the key impediments to measuring the outcomes of watershed partnerships as follows.

> Because of the complexity of environmental systems, it can take years or decades for improvements to be realized. In addition, data needs to be collected consistently, and it is difficult to untangle the multiple factors that impact environmental conditions because so much of what impacts water quality occurs outside of actors' control.

Because of these difficulties, much of the early literature actually measured outputs and processes rather than outcomes (Mandarano and Paulsen 2011, Thomas 2008). Thomas (2008: 3) says,

> Most research on collaborative environmental governance focuses on processes (e.g. consensus, public participation, and mediation). Some research also addresses outputs (e.g. plans and projects) and social outcomes (e.g. trust and social capital). Very little research addresses environmental outcomes.

Methods for overcoming these difficulties appear in the literature. Chilima et al. (2013) recommend using a cumulative effects assessment, which looks at watershed scale changes rather than changes due to individual projects. However, one attempt to do this by Scott (2016) found no change in water quality indicators in areas with and without collaborative restoration activities.[1] Thomas (2008: 5-6) recommends using logic models (e.g. given characteristics a,b,c, if we take x,y,z actions then we should see 1, 2, 3 outcomes) not only to guide the measurements of outcomes, but also as part of the process of designing restoration activities. He describes the rationale for the use of logic models as follows:

> [L]ogic modeling *before* implementation compels us to state precisely what 'success' would mean in practice. Post-hoc rationalizations are less likely to occur if an explicit logic model exists prior to implementation. If a collaborative partnership defines 'success' in terms of outcomes prior to implementation, then subsequent backsliding to measures of outputs or process in performance appraisals will be readily transparent.

[1] Scott (2014) used water quality as an indicator for assessing the outcomes of collaborative watershed partnerships. Our study suggests that landscape-level indicators, such as biodiversity, acres in conservation, acres restored, or connectivity would be better measures.

Gerlak and Heikkila (2007: 58) looked at the longevity of a partnership as an indicator of the partnership's success and found that it was a good indicator or performance. However, they also found that learning within the partnership may be even more indicative of success. They say,

> ...a number of studies of common-pool resource management institutions suggest that underlying conditions that support the endurance of the collaborative institutions-particularly learning and adaptation-are characteristics of 'robust' resource management institutions, or those that are successful in managing the commons.

Common-pool resources are resources for which "it is costly to exclude individuals from using the good either through physical barriers or legal instruments" and "the benefits consumed by one individual subtract from the benefits available to others" (Ostrom and Hess 2008). Resources such as air quality, fisheries, grazing lands, and irrigation systems are examples of common-pool resources. Watersheds and rivers also fall into this category because activities by one individual that degrade riverine or watershed conditions will affect other users. Likewise, if some individuals invest in protecting or restoring a river or watershed, others may benefit even if they do not make similar investments.

Koebele (2015) recommends having a separate group evaluate outcomes rather than relying on those designing and participating in restoration to designate benchmarks of success. Mandarano and Paulsen (2011) recommend finding things that can be measured directly. For example, one could see if plans have actually been implemented or use a pre- and post-collaboration social network analysis to see if social connections have changed, rather than interviewing participants to determine if success has been achieved in social outcome goals.

Importance of diversity

The literature we reviewed about collaborative watershed partnerships does not specifically discuss diversity in ethnicity, race, gender, or livelihoods. The way diversity is talked about is in terms of having partners from different types of institutions—public, private, and nonprofit (Galli and Fisher 2016, Lubell 2004a, Romolini et al. 2013, Thomas 2008). In addition, quoting Borisovol, Recevskis, and Kipp (2012), Smith (2015: 157) indicates that "collaborative initiatives [that] have a broad representation of stakeholders' interests, attitudes, and opinions are more likely to be successful than those with limited stakeholder representation". Given the importance placed on improved community relations in collaborative environmental projects, this is an area that deserves further study.

Major challenges for collaborative partnerships

The literature reveals several challenges to achieving success in collaborative partnerships. At the heart of these challenges is the fact that "collaborative institutions often ask people to engage in new forms of behavior that are outside their standard operating procedure and therefore not rewarded by the political, economic, and administrative incentives embedded in existing policies" (Koebele 2015: 565). One way this can manifest itself is when government tries to keep all decision power to itself when partnering with others (Brower 2016). Associated with this are bureaucratic inefficiencies that can come with partnering efforts (Genskow and Born 2006, Koebele 2015). Quoting Ananda and Proctor 2013: 105), Koebele (2015: 64) says that "collaborations must work within a larger governance regime where the 'existing norms of agency authority and administrative inflexibility act as the most critical obstacles to collaboration'". In addition, Lubell (2004a) finds that environmental partnerships are hard to organize because of the diversity of

perspectives and scarcity of resources within the environmental community. Partnerships have also been criticized for underrepresentation of certain groups which leads to co-optation of decisions by larger, more powerful interests (Genskow and Born 2006, Koebele 2015).

Improving partnerships

Diaz-Kope and Miller-Stevens (2014: 42-43) point out that "The effectiveness of a partnership hinges on its ability to collaborate within a web of formal and informal networks". So, how can groups wanting to collaborate increase the chances that will happen? Gerlak and Heikkila (2007) say that the literature is full of information about what brings groups into a collaborative process, such as trust, reciprocity, and shared goals. But, experience working together and repeated interactions are also important (Genskow and Born 2006, Gerlak and Heikkila 2007). Trust is a theme through much of the literature (Gerlak and Heikkila 2007, Müller 2013). The literature on partnerships in agricultural lands especially highlights the need for trust built through respect for local knowledge and the involvement of local community leaders (Enloe et al. 2014, Lubell 2004b). For farmers, Lubell (2004b: 22) says "participation is driven largely by expectations of reciprocity from other farmers and trust in local government agencies". Lukacs et al. (2016) say this type of local informal neighboring network is also key with watershed groups, but points out that government participation is necessary to keep these partnerships intact over the long run. There is, however, a tension between too much and too little government direction. Lubell and Fulton (2007) conclude that a blended model, neither too top-down (i.e. agency-dominated decisions) or bottom-up, will work as well in the long run, but that locally-based networks are necessary for agricultural watersheds in particular. But, regardless of how the partnership comes together, Müller (2013: 5) states that a collaborative partnership "should be flexible, open to learning and capable of restructuring itself over time".

In the next section, we describe a range of collaborative partnerships that have implemented restoration projects under the Tree for All umbrella. These range from partnerships focused on site-specific restoration activities to those that aim to enable restoration across a broad geographic area.

Part 2 - Tree for All: Partnering to meet water quality objectives

This section explores how the use of collaborative partnerships transformed the pace and scale of restoration activities in the Tualatin River watershed. We begin with a brief history of the TFA program and how it emerged as an innovative approach to addressing Clean Water Service's need to meet federal and state regulatory requirements for reducing in-stream water temperatures. We then explore the role that collaborative partnerships have played in helping the TFA program meet its goals, through the lens of three in-depth case studies and three mini-case studies. These case studies reveal the unique aspects as well as the commonalities that characterize collaborative partnerships under the TFA program.

Tree for All: A new approach to water quality management

The Tree for All initiative encompasses ecological restoration work in the Tualatin River watershed, which is roughly aligned with the boundaries of Washington County, a rapidly urbanizing part of the Portland, Oregon metropolitan region. As of 2005, roughly 34 percent of the land within the watershed was categorized as either urban or urban fringe, with the remainder split between rural and forest land (Smith and Orry 2005). Clean Water Services (CWS), created in the 1970s as the

Unified Sewerage Agency, is a county-service utility district responsible for wastewater collection and treatment and storm water management within the urbanized portion of Washington County (CWS 2016, Cochran and Logue 2011). It rebranded itself in 2001 to reflect the expansion of its role from sewage and storm-water management to larger-scale water resources management.[2] The CWS service area includes twelve cities and portions of adjacent unincorporated county land (see Figure 3).

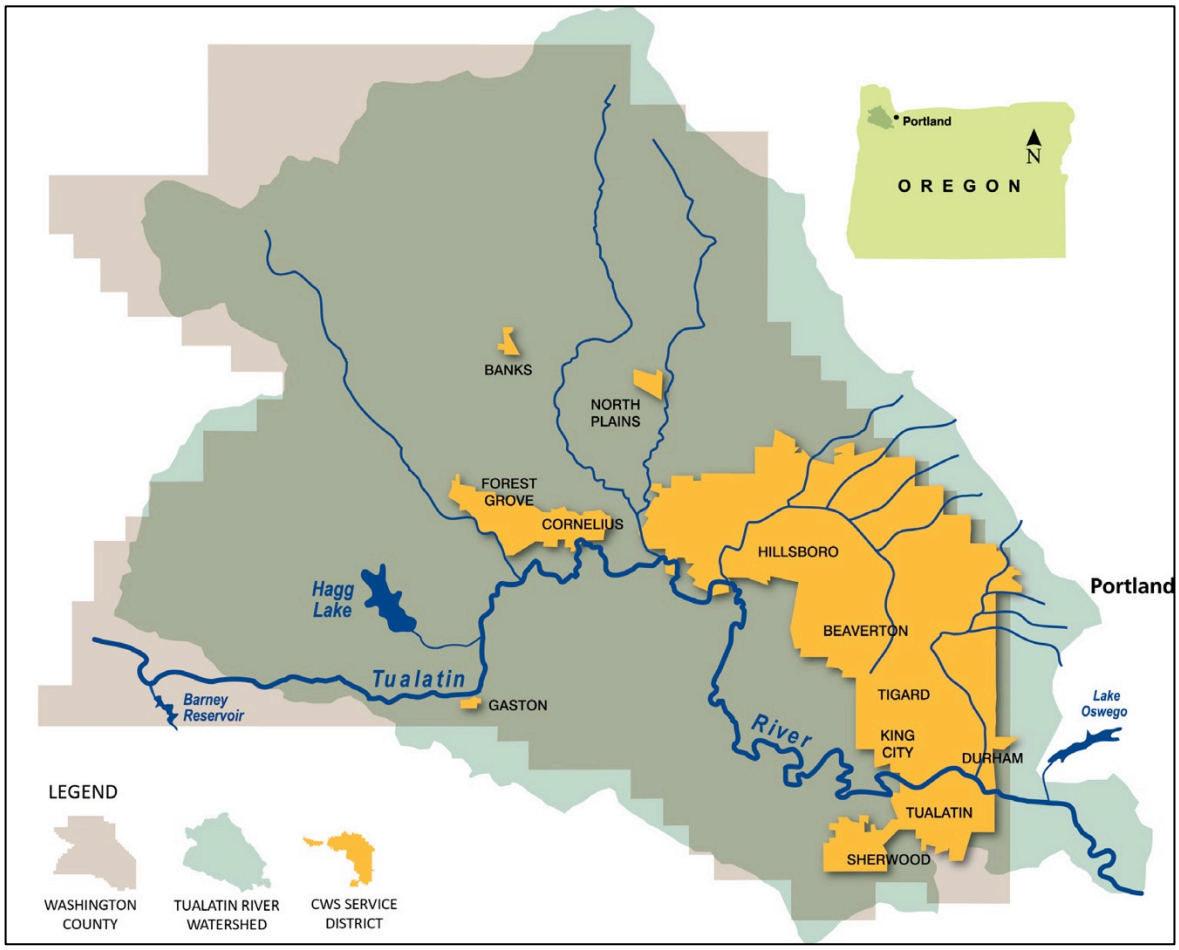

Figure 3 – Map of the Tualatin River Watershed and the CWS Service District. Source: Clean Water Services.

The Tualatin River discharges into the Willamette River upstream of Portland and is home to a number of native anadromous fish which are listed as threatened or endangered under the federal Endangered Species Act (Cochran and Logue 2011). There are several factors implicated in the decline of these native species, including elevated water temperatures throughout the region. Because of the impacts on fish, temperature standards were put in place and a Total Maximum Daily Load (TMDL) was adopted in 2001 (Porter et al. 2014). This TMDL includes maximum temperature discharges at two of CWS's wastewater treatment plants, at Durham and Rock Creek (Cochran and Logue 2011). At the same time, the communities within Washington County were looking for ways to comply with a land-use planning requirement in Oregon, known as Goal 5 (CWS

[2] https://www.cleanwaterservices.org/about-us/our-history/

2017). Goal 5 required that counties and cities establish policies relating to natural resources within community planning. To meet this requirement, Metro instituted Title 13, a habitat protection ordinance that included provisions aimed at protecting flood plan functions (CWS 2017).

Rather than trying to address these separate requirements in traditional, disconnected ways, CWS and the communities in Washington County decided to tackle all the problems in a comprehensive way using a watershed approach. In 1999, the Tualatin River Watershed Council published the Tualatin River Watershed Action Plan, a comprehensive document outlining guidelines and recommendations for watershed restoration and produced through a basin-wide multi-stakeholder process. The Plan viewed voluntary action and collaborative partnerships as the core elements of a successful watershed restoration strategy. The Plan provided a commonly agreed-upon framework that continues to guide restoration efforts in the Tualatin River watershed nearly two decades later.

The goals of the watershed approach were to improve the ecosystem services provided by the surface water system, build community partnerships, provide cleaner air, help make the communities resilient to climate change, and increase species habitat in a cost-effective manner (Porter et al. 2014). To do this, CWS obtained a watershed-based permit with help from an Environmental Protection Agency grant. The process of developing the watershed-based permit involved much creative thinking by CWS staff on how the permit requirements could be met; CWS also reached out to the Tualatin Soil and Water Conservation District and its partners to initiate conversations with local farmers to identify avenues for involving rural landholders. At the same time, CWS coordinated the development of the 2005 Healthy Streams Plan (Smith and Orry 2005), a process that involved bringing together many stakeholders to establish mutually agreed upon restoration goals and priorities for the Tualatin River watershed. The Healthy Streams Plan process played an important role in solidifying CWS' relationships with its watershed partners, as well as building and strengthening connections between participating stakeholders.

The watershed-based permit is the first in the country to include discharges from four wastewater treatment plants and the municipal separate storm sewer system, and also the first in the country to implement temperature trading (Cochran and Logue 2011). The temperature-trading component of the permit is implemented through a flow restoration and a tree-planting program. The tree-planting program consists of several sub-programs, including community tree planting, a rural landowners incentive program for rural areas, and capital projects. Tree for All began as an initiative known as the "Community Tree Planting Challenge" as a means to build buy-in from the 12 cities served by CWS as well as other urbanized areas of Washington County, and was aimed at addressing stormwater objectives. However, over time, the community tree planting, landowners incentive program, and capital projects all came to be collectively known as "Tree for All" (Roll et al. 2008, Porter et al. 2014).

Although in-stream temperature was a regulatory driver for the Tree for All program, it is important to recognize that when initiating the program, CWS and partnering organizations made a conscious decision to implement it in ways that not only created the shade needed to lower water temperatures, but also provided a variety of other benefits. Through restoring native vegetation, the intention was to set in motion an ecological cascade of events leading to terrestrial and aquatic diversity. As a result, Tree for All is larger than just permit compliance; some of the projects are not used for compliance, but rather to further the other goals of the partnerships.

Since the inception of the program, Tree for All efforts have restored over 100 miles of river and stream habitat, have enabled CWS to meet its permit requirements, and have built partnerships between CWS, twelve cities, other government agencies, more than 100 farms, nonprofits and

citizens (CWS 2016, TFA website (http://www.jointreeforall.org)[3]. The 2005 Healthy Streams Plan (Smith and Ory 2005), which emerged from a watershed-wide collaborative effort to develop a guiding vision for achieving a healthy watershed, continues to provide a framework for prioritizing restoration activities. In the case studies that follow, we explore the characteristics of collaborative partnerships that have enabled restoration to occur at a landscape scale in the Tualatin River watershed over the past decade and a half.

Case Study 1 – Rural Landowner Incentive Program, ECREP Component[4]

Rural Landowner Incentive Program's origins

Clean Water Service's Rural Landowner Incentive program has two components (Cordon 2006). One component, the Enhanced Conservation Reserve Enhancement Program, or ECREP, is a modification of a federally-funded program aimed at encouraging farmers to vegetation buffers along streams. Farmers enrolled in ECREP must adhere to federal rules and regulations that govern the program. The second component is the Vegetated Buffer Areas for Conservation Program[5], or VEGBAC, which also provides incentives for farmers to re-vegetate streamsides but which is funded through CWS rather than through a federal program. Both programs were modified later to include re-vegetation of upland forests (Cordon 2006), and are administered by the Tualatin Soil and Water Conservation District (TSWCD). CWS is currently working toward expanding the VEGBAC program by incorporating funding from the TSWCD so as to provide additional incentives to landowners to support conservation activities such as in-stream work, bank erosion, and wetland enhancement. Our case study focuses primarily on the federally funded Enhanced Conservation Reserve Enhancement Program (ECREP) component of CWS' Rural Landowner Incentive Program. VEGBAC was not the focus of our interviews and therefore we provide only limited details about that program.[6]

ECREP began in 2005, with a goal of restoring riparian areas on agricultural lands using a combination of federal, state and local funds. The basis for the program is the Conservation Reserve Enhancement Program (CREP). Managed by the Farm Service Agency (FSA), an agency within the US Department of Agriculture, CREP offers several options that local landowners can use to fund projects on agricultural land, including riparian habitat restoration. According to our interviewees, FSA found that few farmers were interested in enrolling in the CREP program, even though productivity in wetland and riparian areas is much less compared to the more productive upland sites. By 2000 no farmers in Washington County had agreed to participate in the program. If restoration was to occur on privately held agricultural lands, a new program with a more generous funding base was needed, as well as extension activities by TSWCD and NRCS staff to increase farmer awareness of the benefits of the program.

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[3] In the past 12 years, Tree for All has successfully restored over 120 river miles (10 plus river miles annually) across more than 25,000 acres in the rural and urban communities of Washington County, Oregon. [Blogpost in The Nature of Cities. https://www.thenatureofcities.com/2017/08/27/tree-journey-rethinking-urban-growth-landscape-scale/

[4] This case study is based upon interviews with employees of the Natural Resources Conservation Service, Farm Service Agency, Tualatin Soil and Water Conservation District, Clean Water Services, a landowner participating in the ECREP program, and a board member of the Tualatin Soil and Water Conservation District. The focus of our interviews was the ECREP program, hence the emphasis here on that component of the Rural Landowners Incentive program.

[5] The initial program was called Vegetated Buffer Areas for Conservation and Commerce, or VEGBACC.

[6] The restoration activities described in the Tualatin River National Wildlife Refuge mini-case study were funded in part through the VEGBAC program.

A member of the Board of Directors of the Tualatin Soil and Water Conservation District (TSWCD), along with the Natural Resource Conservation Service (NRCS) and FSA employees, convened a multi-stakeholder committee, the Stream Protection Operation Technical Action Committee (SPOTAC), to identify avenues for expanding the incentives available to farmers. A year's worth of negotiations and discussions ensued between nearly 30 members of state, local and federal organizations. As the talks went on, a number of SPOTAC participants dropped out, but eventually an agreement was reached between Clean Water Services (CWS), Tualatin Soil and Water Conservation District (TSWCD), Oregon Department of Agriculture (ODA), Farm Service Agency, Natural Resources Conservation Service (NRCS), Oregon Watershed Enhancement Board (OWEB) and the Freshwater Trust. The result was a new program, the Enhanced Conservation Reserve Enhancement Program, or ECREP. Each partner has its own motivations for contributing to the program, but they all share the goal of riparian restoration. Figure 4 depicts the key partners in ECREP. Input from local farmers played a major role in shaping ECREP's design; a feature that key informants believed was critical to the program's subsequent success.

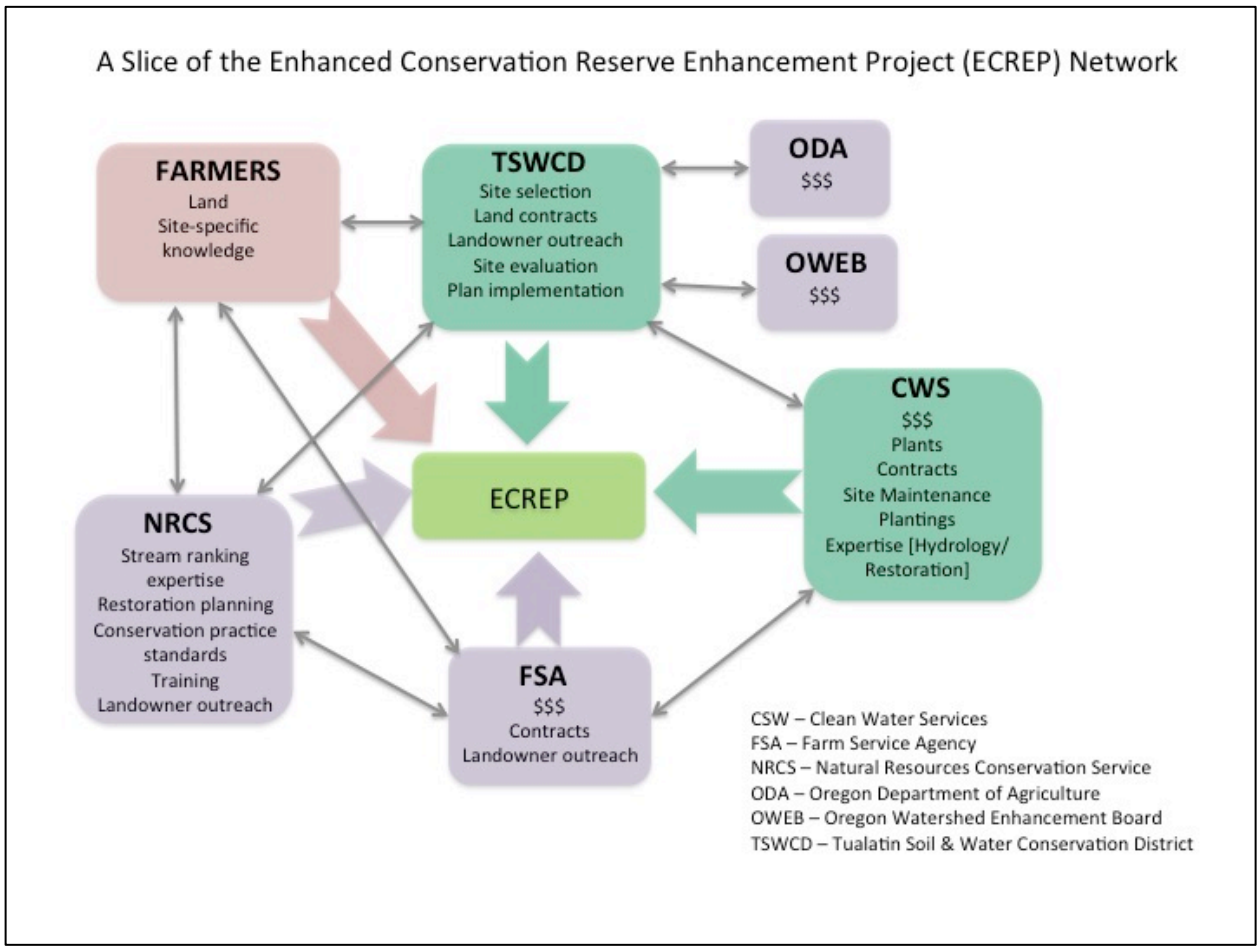

Figure 4 - ECREP restoration network partnership[7]

[7] Figure 4 represents only a portion of the ECREP network. A more extensive investigation, which was beyond the scope of our study, is needed to document the entire network.

Key partners

The Tualatin Soil and Water Conservation District plays a bridging role in the partnership, connecting all of the partners with each other. TSWCD employees provide technical assistance to landowners interested in reducing soil erosion and managing weeds. Despite much distrust of government among farmers and rural landowners, TSWCD is a well-received agency in Washington County. One district employee attributes this positive reception to TSWCD's recognition of the importance of being part of the community, and working to be a good partner doing meaningful work. Instead of dictating the actions that landholders must take, TSWCD offers programs that are purely voluntary. In the ECREP program, TSWCD functions as a facilitator with landowners, helps manage the contractors, offers technical assistance, provides marketing materials, and monitors projects. Although TSWCD is a government entity, farmers generally don't perceive it as one, which engenders trust between landowners and the agencies involved with the ECREP program. The riparian restoration work addresses the District's already established goals of achieving a healthy watershed and limiting soil erosion.

Clean Water Services is another major player in the ECREP program. As described in the previous section, CWS was under pressure during the early 2000s to reduce in-stream water temperatures that exceeded the established TMDL limits. This coincided with a time at which it became apparent that the CREP provided insufficient economic incentives for farmers to participate in restoration activities. Seeing an opportunity to create a win-win situation, the NRCS, the third major player in ECREP, and FSA approached CWS to explore the idea of planting trees along streams as a way to increase shade, which would in turn reduce water temperatures. The NRCS, a federal agency within the United States Department of Agriculture, had been working since 1998 with farmers to plant trees along streams that run through their farms under a voluntary program known as the Environmental Quality Incentives Program (EQIP). Through EQIP, farmers received funding after completing conservation practices they implemented via a contract with NRCS. This was a popular program for many conservation practices, but EQIP's incentive payments for planting trees along streams were insufficient to allow farmers to economically prepare sites, plant trees and maintain the trees, especially when land was taken out of agricultural production. The FSA had a Conservation Reserve Enhancement Program (CREP), which, like EQIP, provided insufficient incentives for farmers to economically justify planting trees along streams. Because the main focus of CREP was planting riparian forest buffers, FSA proposed modifying CREP to allow collaboration with CWS in order to increase the incentives for planting trees along streams.

One of the leaders of SPOTAC describes how the group started along the path toward arriving at consensus. He says,

> I invited, to be members of that committee, everybody I could think of, including the ones who I knew would be against it… we had 30 people sitting in that room, and I posed the problem, and we sat down to discuss it.

The problem of establishing a private-land riparian restoration program was presented at the first meeting, and discussions began. By the end of a year, a core group remained, including CWS, TSWCD, FSA, ODA, OWEB (Oregon Watershed Enhancement Board), NRCS and the Freshwater Trust. Eventually, the Freshwater Trust dropped out because securing funding for instream payments within the Tualatin River watershed became more challenging as projects elsewhere in the state had higher priority ratings. This left six core agency partners. During SPOTAC discussions it became clear that Clean Water Services not only wanted to receive shade credits for its effluent permits, but also wanted to improve habitats.

Employees with the FSA and NRCS were pivotal members of the SPOTAC meetings, attending meetings that started as one a month, and ending at one per week. Participants came to see the federal plan, CREP, as the most effective base upon which to build ECREP, the new restoration program. However, CREP is a program developed for use in multiple states. CREP has definite rules that must be followed to justify the expenditure of taxpayer funds and thus does not have the level of flexibility that was needed in the Tualatin River Basin. Nonetheless, CREP's advantages were that it already had the staff and a contracting system set up. FSA was able to provide guidance, a contracting framework, and cost sharing for the contracts. The TSWCD board chair indicated that having TSWCD take the lead in implementing the program was beneficial for FSA. He said, "They got… a real deal going on here, because they're getting a lot done by their money, far more than they would if they ran it themselves."

In the ECREP program that was designed by the SPOTAC, NRCS works in partnership with FSA, meeting with landowners and helping with the technical know-how FSA lacks. CWS provides additional funding to farmers via the TSWCD. TSWCD coordinates the ECREP effort by engaging with landowners, selecting sites (with input from CWS), developing plans and specifications (following NRCS standards and policies), and hiring contractors to implement those plans. TSWCD is responsible for the whole operation from beginning to end, engaging with landowners, helping with outreach, site selection (with input from CWS), site preparation, and handling money from the funding agencies. This last point—state and federal agencies entrusting a local agency to take such an active role in developing and implementing contracts—is highly unusual and required a change in federal policy to make it feasible. After the SPOTAC discussions ended, the committee officially dissolved. However, a steering committee composed of members of the partnership re-convenes every two years for a general check-in and to re-evaluate their approach in response to changes to the federal Farm Bill, the legislation authorizing the program.

An alternative to the federal program, the Vegetated Buffer Areas for Conservation Program or VEGBAC, began at the same time as ECREP and is currently solely funded by CWS. During meetings when ECREP was being rolled out, some farmers asked that an option be developed that funded riparian forest planting without requiring a 10-15 year contract like ECREP does. Because the VEGBAC program does not involve federal funding, it can be combined with a NRCS EQIP contract to provide additional funding and to ensure the involvement of NRCS staff in developing the plan and specifications. As of 2016, the TSWCD's tax base expanded, providing it with additional funds to work with CWS to expand the VEGBAC program. The lands enrolled in VEGBAC are typically located beyond the urban growth boundary, but can also be located within the urban growth boundary if they meet certain agricultural requirements.[8]

Also playing a key role in ECREP, and without whom there would be no program, are the farmers. Box 5 describes one farmer's experiences with and motivations for participating in the program. By 2016, there were 76 landowners enrolled in ECREP/VEGBAC programs (ODA 2016), and in total, the two programs had supported the establishment of native stream bank buffers on 634 acres bordering 38 miles of streams (TSWCD 2016).

How the partnership works

Each partner involved in ECREP works autonomously. The steering committee provides guidance, but everyone involved understands their position and purpose. The chair of the TSWCD board uses

[8] https://www.swcd.net/streamside-restoration/vegbac/

Box 5 – ECREP from a farmer's perspective
As Lyle Spiesschaert's ATV rumbled up to the patch of trees and shrubs surrounding the small stream bubbling along his property, he gestured to different parts of the property, pointing out the red clover and wheat he relies on as his livelihood. More than 10 years ago the area had been purely farmland, save some poplar trees scattered along the bank. Now, thanks to the Enhanced Conservation Reserve Enhancement Program (ECREP), Lyle has seen a dramatic change. "It's phenomenal, the amount of wildlife in 10 years that's come back," he says. "He continued, "I mean, we have deer in here all the time… there's squirrels, there's coyotes… they all have a place now". Even as a farmer he has kept the belief instilled in him in childhood that humans should only leave footprints behind, but he recognizes that modern agriculture doesn't do a very good job of that. "We humans are often shortsighted," he says, shaking his head, "you know, we often foul our own nests." When asked what motivated him to join the ECREP program, Lyle says, "[It] was a way to do the right thing." ECREP contracts run anywhere from 10 to 15 years.[9] In 2006, Lyle initially signed up for a 10-year contract, renewing it for another 10 years at the end of that contract. The variability in contract lengths provide flexibility for farmers should they decide at a later date that they would benefit from returning the area into productive land again. However, Lyle seems unlikely to take that approach. In fact, he worries about what will happen to the stream banks he's restored should he ever sell his land. He sees development and the expansion of the urban growth boundary as threats to restoration outcomes, such as improved pollinator habitats, an increase in wildlife, and the shade and filtration services provided by the plants and trees. For now, though, Lyle will continue partnering with the various agencies that brought the project to fruition. As one of the first farmers to sign on, he and his brother who owns the neighboring land, have 15 acres in the ECREP program. He has invested a great deal of time and land to supporting the conservation and restoration effort, and believes the project has benefited the larger community. He says, "I like the partnership because I think it's logical, it doesn't benefit me a great deal, however it benefits all of us because water and air are a public resource."

the analogy of a human body – there is a respiratory system, an endocrine system, the circulatory system – and each system has its own purpose, but relies on the others to properly function.

Although each agency acts autonomously, just as the human body requires that all parts work in concert, so too does the ECREP program. The first step in the process is that TSWCD does outreach to the person or area of interest. Landowners can contact the District on their own, or if another agency, such as FSA, encounters an area where landowners could be engaged, they direct TSWCD to evaluate the area. If the landowner is amenable, the TSWCD performs site visits, examining the suitability of the land for ECREP. There are times when sites do not meet ECREP requirements, or a stream scores too low on the ranking system used to determine if a stream is restorable. Flexibility and the need for TSWCD to maintain its role as a community partner comes into play again. With its new tax base, the District will be looking into alternative methods for a landowner to participate in riparian restoration, and staff hope to be able to do yet more work for those landowners who do not qualify for the current programs.

[9] https://www.swcd.net/streamside-restoration/ecrep/

If a site is deemed to be a good fit for the ECREP program, TSWCD will perform a more detailed analysis, working with the landowner to reach agreement on an area to work with, and officially establish its eligibility. The District then presents the project to each partner. Partners green light the project if it fulfills their needs. If it doesn't (for example, if it does not meet CWS's shade credit requirements) they may deny approval, or work to develop a better plan. Once the project is approved, conservation planning begins based on technical input from the NRCS. After that, the FSA County Committee must approve the project before it can move forward. The whole process can take 6 to 12 months, from a verbal agreement with the landowner to a contract being signed. A similar process works for VEGBAC, whether it if funded alone or in combination with the NRCS EQIP program. However, for VEGBAC, the FSA County Committee is not involved.

Assessing ECREP's environmental outcomes

ECREP/VEGBAC provide many of the water quality trading credits associated with CWS' National Pollutant Discharge Elimination System permit. The permit requires the monitoring of certain project effective parameters to demonstrate effective implementation and status over time. Because a relationship exists between shade and water temperature, CWS measures shade over time and other metrics that lead to inferences about shade development. However, CWS and its partners recognize that effectiveness includes more than temperature or even shade, and seeks to achieve multiple ecological benefits, such as biodiversity enhancement, carbon storage, flood attenuation, and improved fish and wildlife habitat. The monitoring protocols use a mix of qualitative and quantitative methods to measure these parameters.[10]

Qualitative monitoring is used to assess immediate treatment needs (e.g., inter-planting, weed control, seeding, protection from herbivores, etc.) and their timing, and occurs annually. Quantitative monitoring takes place every other year. Data is collected on the number of native trees and shrubs, types of species present, plant densities, and riparian structure. CWS uses function-based success criteria to assess project success. Performance metrics are based on species composition, density, structure, and riparian shade characteristics at reference sites (CWS 2015). Shade monitoring over the perennial waterway is conducted in five-year increments following the initially planting of the site.

Outcomes of the partnership

The most immediate outcome of the ECREP/VEGBAC partnership was that it led farmers to perceive restoration as economically viable. This prompted a rapid increase in farmer enrollments, which moved from a handful in 2004 to 76 by 2016 (ODA 2016). The programs have resulted in the removal of invasive species and the replanting of more than 53 native plant species along 39 miles of streams in the Tualatin River watershed (ODA 2016). Shade monitoring conducted from 2010-2015 identified that 50 projects had achieved or exceeded anticipated shade targets, often much sooner than anticipated, indicating that insofar as increasing shade coverage goes, the ECREP/VEGBAC programs have been successful. Other indicators that the programs have had a positive environmental impact is the increase in wildlife, such as deer, birds, beavers, and coyotes that farmers, such as Lyle Spiesschaert have observed on the land as the plantings mature. Lyle also noted that the increase in pollinator habitat is good for him as well as for wildlife as the red clover he plants requires pollination. The return of beavers to the area was an unexpected outcome that some farmers have not appreciated because of flooding associated with beaver dams.

[10] The description of assessment methods is based on CWS 2015 Annual Temperature Management Plan.

The increased level of planting was made possible in part through efficiencies linked to new site preparation and planting practices that were developed by the partner agencies. CWS developed collaboratively with its partnering agencies. The new practices, which involve the use of bare root seedlings rather than containerized plants and very high planting densities (approximately 2500 trees per acre), reduced plant production costs from $3-$4 per plant to less than $1 per plant (CWS 2014). Partners in the ECREP program were unanimous in the opinion that very little of the restoration accomplished through the program would have been accomplished in the absence of collaboration. The partnering agencies had to work together with flexibility to accommodate each other's needs, but doing so enabled them to take a much more holistic approach to restoration. For example, NRCS evaluated and then adopted the high planting densities. The TSWCD used a NRCS method for evaluating herbicide risk to ensure that no herbicides were used that would contaminate streams. CWS learned about how farmers make decisions due to CWS's collaboration with NRCS, FSA and TSWCD. Currently, none of the partners assesses the social and economic outcomes of the ECREP program. There was general agreement that doing so would be a good thing, but implementing such activities is challenging as it is unclear what to measure or how to measure it.

Along the collaboration continuum described in Part 1, the ECREP (and VEGBAC) partnerships fit most closely into the integrative or transformative category, in which there is a high level of engagement and investment by the key partners, all working toward the same objective of ecological enhancement of agricultural lands within the Tualatin River watershed. This is particularly the case for the VEGBAC program, which works closely in conjunction with the NRCS' Regional Conservation Partnership Program/Environmental Quality Incentives Program (RCPP-EQIP). Through this partnership, VEGBAC treats the riparian area and practices funded through RCPP-EQIP treat the uplands, with staff from SWCD and NRCS working together based on their areas of expertise.

Lessons learned and challenges

Interviewees emphasized the importance of having a common goal and for people to work as a team. They noted that this holds true from the agency level to the on-the-ground, hands-on work done by individuals. Having members in which "things have clicked" produces momentum and results in a strong, flexible partnership. Participants in ECREP felt that alternative perspectives are vital, and emphasized that being willing to change is an important characteristic of good partnerships.

The interdependence among ECREP's component parts underscores the need for the partners involved to trust one another and carry out their responsibilities. It also requires that partners recognize both their own limitations and the limitations of others in the partnership. An FSA employee emphasized that it was particularly important for local agencies to recognize that federal agencies are under stricter guidelines and so often have less flexibility. Nonetheless, she underscored the importance of being flexible to the extent possible. Lyle Spiesschaert, the farmer whose participation in ECREP is described in Box 5, also emphasized the need for flexibility, which he believes is a vital component of the program. Landowners are considered to be partners in this program (not just the core agencies), and their input is highly valued.

A common theme among the interviewees involved in the ECREP partnership is that partnerships rely on a give-and-take relationship. To work, they require that members contribute, but a working partnership also requires that action take place. In short, something must occur beyond just

building a rapport between participants. In John MacDonald's opinion the term "partner" is overused. He observes, "Getting together and talking about an issue is the lowest level of partnership I can imagine." In his view, a partnership is about actionable steps. He adds, "I don't believe a partnership is based on acquaintances… to me partners are when you both put something into something to make something happen." Elaborating further, he emphasized the importance that partnerships go beyond planning to take action. However, he noted that partnerships would degrade if they lose sight of their goal or vision, or become too unwieldy. Partnerships with too many partners, too much time, and too much money will slow down the likelihood of taking action. In this respect, the decrease in the number of members during the SPOTAC discussions is a positive outcome, as it left only the most essential agencies in the partnership.

One of the challenges of working as part of a partnership identified during the interviews was workforce turnover and the need to ensure that relationships of trust built up over years of working together continue to be nurtured by incoming employees. Interviewees also identified the unwillingness on the part of some individuals to collaborate as a problem for building durable partnerships. Another challenge is that some of the changes brought about through restoration, such as the return of beaver to the area's streams, clash with prevailing cultural norms about what types of outcomes are acceptable. Some farmers are fine with beavers; others hate them with a passion, due to the flooding caused by dams and the subsequent reduction in the availability of agricultural land. The current VEGBAC program offers financial incentives to program enrollees that have beaver. This water storage and habitat incentive allows the area influenced by the beaver dam to be enrolled in the program and the landowner compensated accordingly. Flexibility on the part of partners with one another, as well as flexibility between partners and nature, appears to be fundamental in successful conservation activities.

When asked about the relationship of TFA to ECREP, interviewees made a distinction between the two. They viewed ECREP as an important rural alternative to the mainly urban-based TFA. Although the interviewees felt that ECREP was not under the TFA umbrella, they acknowledged the importance of TFA, and recognized the existence of shared goals and values between TFA and ECREP.

Support from The Intertwine Alliance

When asked what actions TIA could take to support partnerships, interviewees made it clear that they already consider TIA to be important as a convener, getting people to the table and getting people talking to each other, and that they would like to see these activities continue. One ECREP partner indicated that help with publicity for the program would be useful. In her work she hosts community town halls on farms where the ECREP/VEGBAC programs have been implemented – this allows farmers who are considering joining to see the results of the conservation work. On a related theme, another partner said that assistance with getting programs more publicity would be helpful, but that it would be important to give smaller partners recognition. Another wants TIA to continue pushing into new areas, promoting collaborative work regionally and beyond.

Case study 2 – Fanno Creek-Greenway Complex

Origins of restoration in Fanno Creek

The 16-mile-long Fanno Creek originates in the steep canyons of the Tualatin Hills, which rise to an elevation of just over a thousand feet along Portland's western boundary overlooking the Tualatin Valley, and drains an area of roughly 32 square miles (Keith et al. 2014) (Figure 5). The creek drops

sharply in elevation in its upper reaches, falling roughly 210 feet in the first three miles. It then levels out, dropping only an additional 120 feet as it wends its way over the remaining 13 miles to the Tualatin River (Keith et al. 2014). Because of the low gradient through the valley, emergent marshes and wetlands dominate the middle and lower reaches of the creek. The majority of the area drained by Fanno Creek is located in Washington County, with short portions in Multnomah and Clackamas Counties. The creek flows through the southwestern suburbs of Portland, and the cities of Beaverton, Tigard, and Durham on its way to the Tualatin River. Residential, industrial, and commercial land uses linked to rapid population growth have heavily impacted the main channel and its stream banks (Keith et al. 2014).

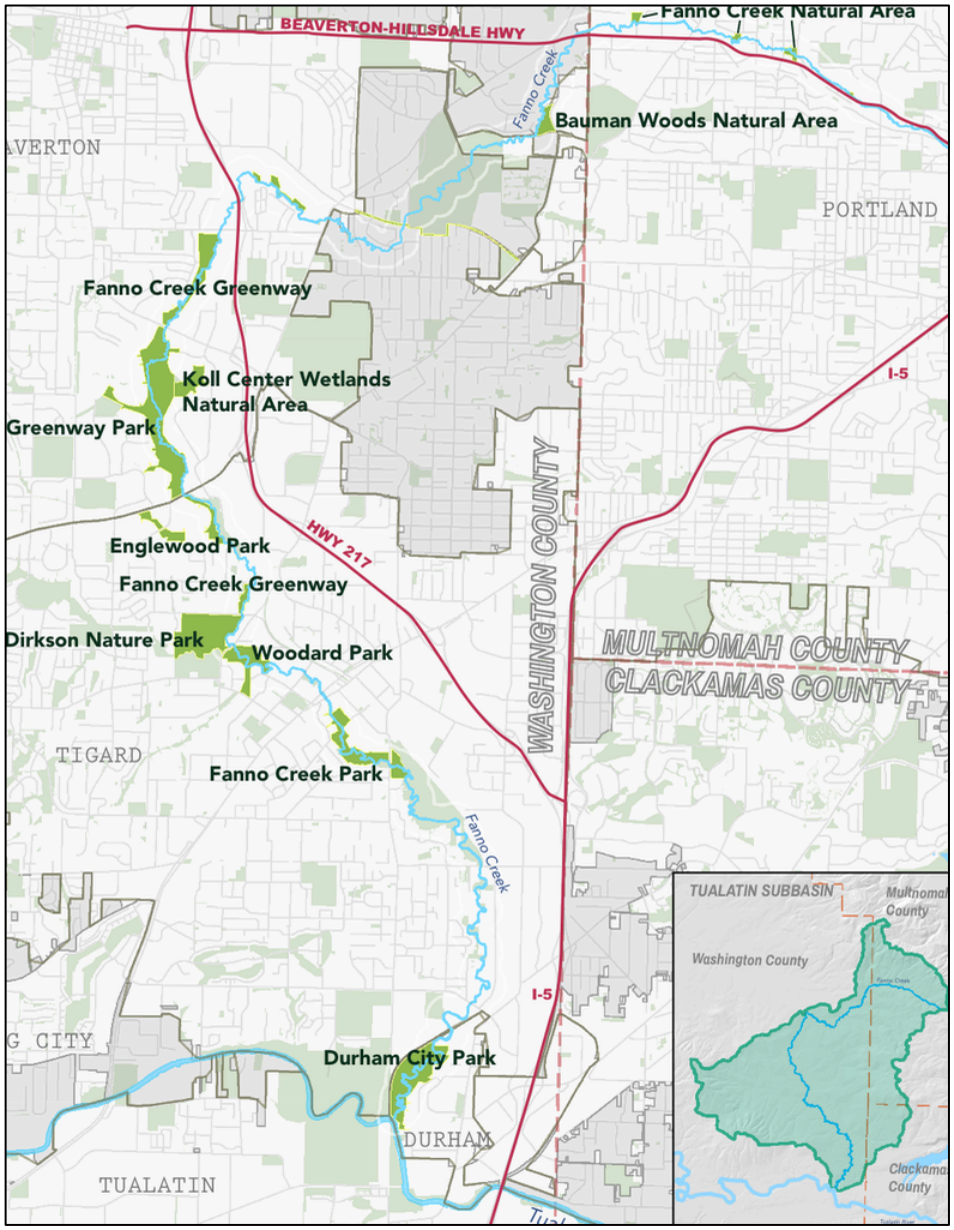

Figure 5 – Map of Fanno Creek including major TFA projects along the creek.

Over the course of the past 170 years, Fanno Creek's channel was straightened, vegetation was removed from the stream banks and uplands, culverts were installed under roads, and berms and

levees were built to control flooding (Lindstrom 2012). The amount of impervious surface in the watershed expanded as homes, businesses, and highways were built, increasing the quantity of water flowing into the main channel and exacerbating stream bank erosion. Poorly controlled use of industrial chemicals, pesticides, and herbicides resulted in heavily polluted water, a condition made worse by inadequate sewage treatment and overflows during storm events (Lindstrom 2012). With urbanization, impervious surfaces now cover nearly one-third of the watershed, exacerbating both flooding and erosion (Keith et al. 2014).

Fanno Creek historically has had a variety of water quality issues including, "pollution from urban and industrial sources, small sewage treatment plants, ineffective septic tanks and drainfields, CAFOs [confined animal feeding operations], agricultural operations, grazing, and illegal dumping."[11] The following quote from the Oregon Department of Environmental Quality's Water Quality Index webpage[12], describes some of the early efforts to improve the creek's water quality:

> Concerns about public safety and environmental health prompted closure of the wastewater treatment plants in the seventies and reduced the number of permitted sources of pollution, while increased population pressures reduced the number of CAFOs and amount of agriculture and grazing in the Fanno Creek drainage. The ban on phosphate detergents, increased residential connection to municipal sewers, stormwater management, and increased public education have helped to reduce urban nonpoint sources of pollution to Fanno Creek.

By the mid-1990s, the steps taken to improve the creek's water quality had enabled trout and other species formerly at risk to re-appear in the upper reaches of Fanno Creek (Cude 1995). However, Oregon Water Quality Index scores for many indicators, including ammonia, nitrate nitrogen, total phosphates, fecal coliform, dissolved oxygen concentrations, and water temperatures continued to be poor (Cude 1995). In 1993, DEQ placed Fanno Creek on the list of impaired waters for arsenic, iron, and manganese (OR DEQ. 2012), a listing that continues to this day. The creek was also placed on the 303(d) list for excessively high water temperatures along its entire length (OR DEQ 2012). However, despite improvements during the 1990s, Fanno Creek's water quality index scores were still poor in the early 2000s (OR DEQ 2012).

Erosion and flooding also affected Fanno Creek's water quality, as well as damaging residential dwellings and infrastructure. Up through the late 20th century, the standard approach taken to control erosion and flooding along Fanno Creek was to "harden" its banks with concrete structures. However, by the late 1990s, it had become clear that hardening was an exercise in futility. The need for more effective solutions to erosion control and flooding along Fanno Creek coincided with Clean Water Services' decision to use an integrated watershed management approach to reducing in-stream water temperatures. Fanno Creek figured high on the list of watersheds targeted as priorities for restoration under the Healthy Streams Plan, a watershed-wide restoration prioritization plan coordinated by CWS with input from numerous stakeholders (Smith and Ory 2005). Given the heterogeneity in private and public landownership along the 16-mile long creek, restoration was no easy matter. Not only were collaborative partnerships essential for restoration

[11] Oregon Department of Environmental Quality, Water Quality Index https://web.archive.org/web/20150430221302/http://www.deq.state.or.us/lab/wqm/wqindex/lowillsandy.htm

[12] Oregon Department of Environmental Quality, Water Quality Index https://web.archive.org/web/20150430221302/http://www.deq.state.or.us/lab/wqm/wqindex/lowillsandy.htm

to work, but also multiple partnerships operating in a coordinated fashion were needed.

Restoration sites and key players

Initially, restoration focused on publicly owned parks and natural areas located along the Fanno Creek mainstem. Major public landowners include Tualatin Hills Park and Recreation District (THPRD), Clean Water Services, Metro, and the Cities of Beaverton, Tigard, and Durham. Table 3 lists a dozen restoration projects implemented since 2004 along the mainstem under the auspices of Tree for All. These range from very small projects, of less than an acre, to projects encompassing dozens of acres. In all, 185 acres adjoining the mainstem of Fanno Creek have been restored through these TFA projects.

Table 3 – List of TFA projects completed along the Fanno Creek mainstem[13]

Project site	Acres	Location
Bauman Park	7.29	Beaverton
Fanno Creek-OES Marsh	30.75	Beaverton
Greenway Park	77.39	Beaverton
Englewood	17.09	Tigard
Trimet-Wetland mitigation (North Dakota)	3.36	Tigard
Fanno Creek (Hall Blvd to Ash Ave)	19.01	Tigard
Trimet-Wetland mitigation (Library)	3.18	Tigard
Durham Elementary	0.74	Durham
Durham Nature in the Neighborhood	5.46	Durham
Durham City Park	19.25	Durham
LTPS-Force Main	1.17	Durham
Durham City Park - Payment to Provide	0.41	Durham
Total	185.10	

Our case study focuses on activities taking place in the Fanno-Greenway Complex, which is situated along Fanno Creek between Denney Road and Scholls Ferry Road. This 100-acre complex is comprised of three administratively and ecologically distinct sections:

- The northern segment, which is approximately 21 acres in size, is known as Fanno Creek Park. About 15 acres are owned by THPRD and the remaining 6 acres are owned by CWS but managed by THPRD.

- The southern segment is Greenway Park and is owned by THPRD.

[13] Data obtained from the Tree for All interactive map, "Vegetation change detection on established projects". Clean Water Services.

- The third segment – the 13-acre Koll Wetlands – is located to the east of Greenway Park and is also owned by THPRD.

How the partnerships work

Since 2004, three major restoration efforts have taken place in the complex, with a fourth one scheduled to begin in summer 2017 (Table 4). THPRD and CWS have been the core partners on all four projects. Although the relationship between the two agencies is relatively informal, they have established memorandums of understanding for the projects they collaborate on. As the largest public landowner along this portion of Fanno Creek, access to land is among the important contributions that THPRD makes to the partnership. Both agencies bring some funds to the table; CWS through its collection of utility charges and fees and THPRD through funds from a Parks Bond Measure (34-156) passed in 2008. CWS pays contractors to do site preparation and maintenance and provides native plants and shrubs. Both agencies contribute some staff time to joint projects, with THPRD typically taking on responsibility for day-to-day project administration and CWS providing technical advice.

The following description by a THPRD manager of how the Fanno Creek Greenway project has unfolded provides a sense of the symbiotic relationship that exists between the two core partners, as well as the extent to which collaboration has enabled them to leverage their existing resources.

> One of the most recent projects we've worked on through TFA is the Fanno Creek Greenway. THPRD owns a big chunk of the creek. It's a high-functioning site but needs some help. We had money from a bond measure; CWS had more funding. We settled on an initial habitat restoration project of 12 acres. We paved a trail that's in the reach; the culverts were quite old so we replaced those…[CWS] had the dollars to do the habitat restoration. We wanted to bring the stream to the middle of the site but they didn't have money for a bridge. So we packaged everything together and got some grants together. Through that partnership and the match that we could both come up with we got an additional $240,000 unlocked.

Key partners involved in these four projects over the years and their roles are depicted in Table 4 and Figure 6. Additionally, Metro's Nature in Neighborhoods Capital Grants program has provided significant amounts of funding for restoration in the Fanno-Greenway Complex. In the early and mid-2000s, BES also partnered with the Fans of Fanno Creek (FFC), a citizens group that worked with the cities, CWS, and DEQ to advocate for stream health and mobilize volunteers to work on restoration projects. The FFC no longer have an active presence in the watershed, and BES now works with the Watershed Resource Center (WRC) to do outreach and volunteer recruitment for restoration activities in the upper reaches of Fanno Creek. The WRC, which receives its funding through BES and West Multnomah Soil and Water Conservation District, works closely with the Southwest Neighborhoods, Inc., a non-profit neighborhood organization, to support neighborhood stewardship groups in southwest Portland. In describing the WRC's role, a BES employee says,

> It's almost like a conduit for information and community engagement activities. They organize things when BES wants to do an open house. That's been in process since the 2000s. It has helped quite a bit — the community is very aware of the city services, watershed health issues, and storm water management issues.

Table 4 – Fanno-Greenway Complex projects[14]

Project	Partners and budget	Description
The Fanno Creek Floodplain Fix (2017)	Core partners: THPRD; CWS Other partners: Friends of Trees; Cascade Education Corps, Vose Neighborhood Association Funding: Metro NiN - $245,000; CWS - $615,000; Friends of Trees - $2,000 In-kind: THPRD/CWS staff time: $13,700	The Fanno Creek Floodplain Fix project affects 21 acres, extending the restoration work that occurred in the Fanno Creek Greenway between 2012-2017. Restoration activities will occur along a 0.7-mile stretch of the Fanno Creek trail located in Beaverton's Vose neighborhood. The hoped for environmental outcomes include a more diverse canopy and understory as well as increased numbers and types of wildlife. CWS owns the land; THPRD administers and maintains it under an intergovernmental agreement.
Fanno Creek Greenway Restoration (2012-2017)	Core Partners: THPRD (Project manager/access to land); CWS (Funding/access to land/ Other partners: Vose Elementary School (volunteers); City of Beaverton (easements) Funding: $267,000 (THPRD and CWS)	This five-year 21-acre restoration project removed invasive non-native species and replanted the area with native trees and shrubs. CWS owns six of the acres and THPRD the remaining 15. The area owned by CWS was formerly a wastewater treatment facility. CWS received shade credits with OR DEQ. The project was an extension of downstream restoration projects.
Greenway-Koll Wetlands (2012-2014)	Core partners: CWS (large scale habitat restoration/managed contractors), THRPD (turtle management, input on planning, access to land) Other partners: PS Business Parks; volunteers did invasive species removal, built turtle basking platforms, and installed some native plants. Funding: $61,700 (CWS and funds through THPRD's 2008 bond measure)	This project restored 25 acres, including 13 acres in the Koll Center Wetlands and 12 acres in Greenway Park. A major focus of the restoration work was to create habitat attractive to native turtles. Restoration activities included invasive species removal and replanting with 15,000 native shrubs and trees. Turtle basking structures were installed in the pond, nesting areas in the meadows, and willows in the stream channel.
Fanno Creek Greenway Park Enhancements (2006-2009)	Core partners: THPRD (in-kind staffing/project administration), CWS (funding/plants/contractors), Metro (funding) Other partners: Fans of Fanno Creek and Tualatin River Watershed Council (planting, advice, and weed control) Funding: Metro NiN – $30,000 CWS – $250,000 THPRD – $10,000 (Total = $290,000)	This project restored 20 acres of wetlands on Fanno Creek. Activities: invasive species removal, planting of 55,000 trees and native shrubs, re-meandering the creek; removal of several hundred feet of an impervious path; planting of native shrubs and trees along the former path; and installation of interpretive signs.

[14] Sources: Clayton 2006 and the following THPRD information sheets:
THPRD. 7/20/16. Nature in Neighborhoods capital grants application. Fanno Creek Floodplain Fix;
THPRD. 10/17/2012. Natural resources bond project: Greenway/Koll restoration project;
THPRD. Summer 2012. Natural resources bond project summary: Fanno Creek Greenway Restoration Plan;
THPRD. N.d. Proposed Greenway Park enhancements;
THPRD. N.d. Greenway habitat enhancement plan.

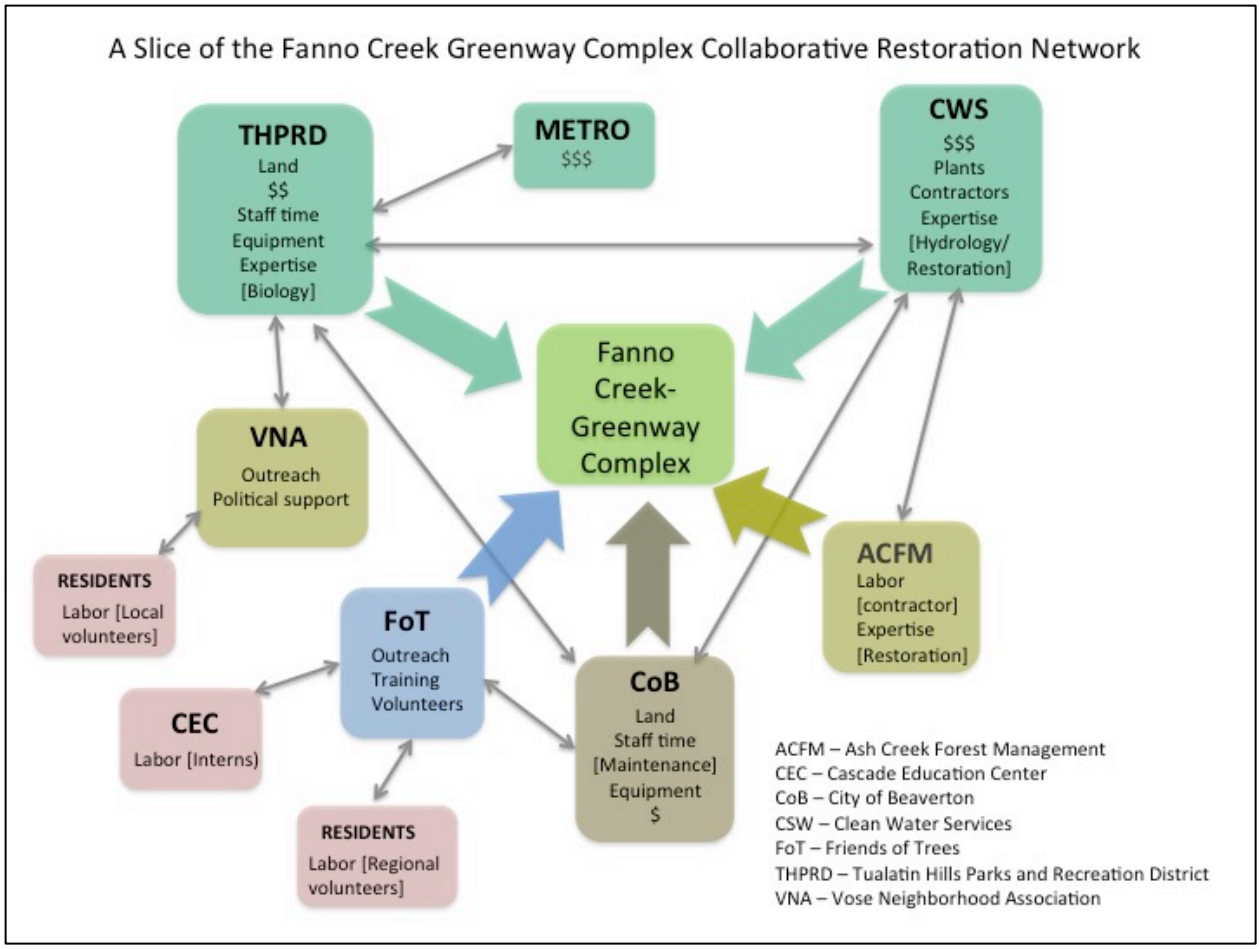

Figure 6 – Fanno Creek Greenway Complex Restoration Network[15]

Although located outside of the area within which CWS operates, BES collaborates with CWS on water quality studies, developing recommendations for watershed management, and watershed planning. The Cities of Beaverton and Portland have been key players in synergistic restoration projects located upstream; the Cities of Tigard and Durham have led similar projects downstream. For example, the City of Beaverton recently partnered with CWS to stabilize slopes on a commercial property located in an area that lies in between THPRD and CWS properties in the Fanno-Greenway Complex. This project involves multiple partners, with each partner contributing something different. The business owner provides access to the land, the City of Beaverton provides funding and has hired a contractor to handle site preparation and planting on the steepest portions of the property, Friends of Trees does outreach and trains volunteers to plant on less steep slopes, and CWS provides plant material and input on the restoration plan. As the following quote from an employee who has been involved in restoration in Portland's west side communities since the early 2000s illustrates, the Portland Bureau of Environmental Services (BES) also relies on partnerships to get the work done.

We replanted all the reaches [along the Fanno Creek mainstem] through the revegetation program.

[15] Figure 6 represents only that portion of the Fanno Creek Greenway Complex restoration network that was described in the interviews and document review. A more extensive investigation, which was beyond the scope of our study would be needed to describe the entire network.

We did that with the agreement of private property owners. Also we had revegetation projects on lands that were acquired by Metro. That work was done with the Parks Bureau. We mostly coordinate with city parks for natural areas. The forestry work is done by Parks. We do the site stabilization part. Parks does the maintenance.

Outcomes of Fanno Creek restoration

Through dozens of loosely connected partnerships, the TFA program has resulted in the restoration of much of the publicly owned land along Fanno Creek, with more than 150,000 native trees and shrubs planted between 2008 and 2016 in Greenway Park alone (Figure 7). CWS handles the responsibility of assessing environmental outcomes of restoration activities along Fanno Creek within Washington County. One of the measures CWS uses to assess the environmental outcomes is the change in mature canopy cover, with increases in canopy coverage indicating a positive outcome. Using this measure, the results of restoration activity along the Fanno Creek mainstem have been positive overall.

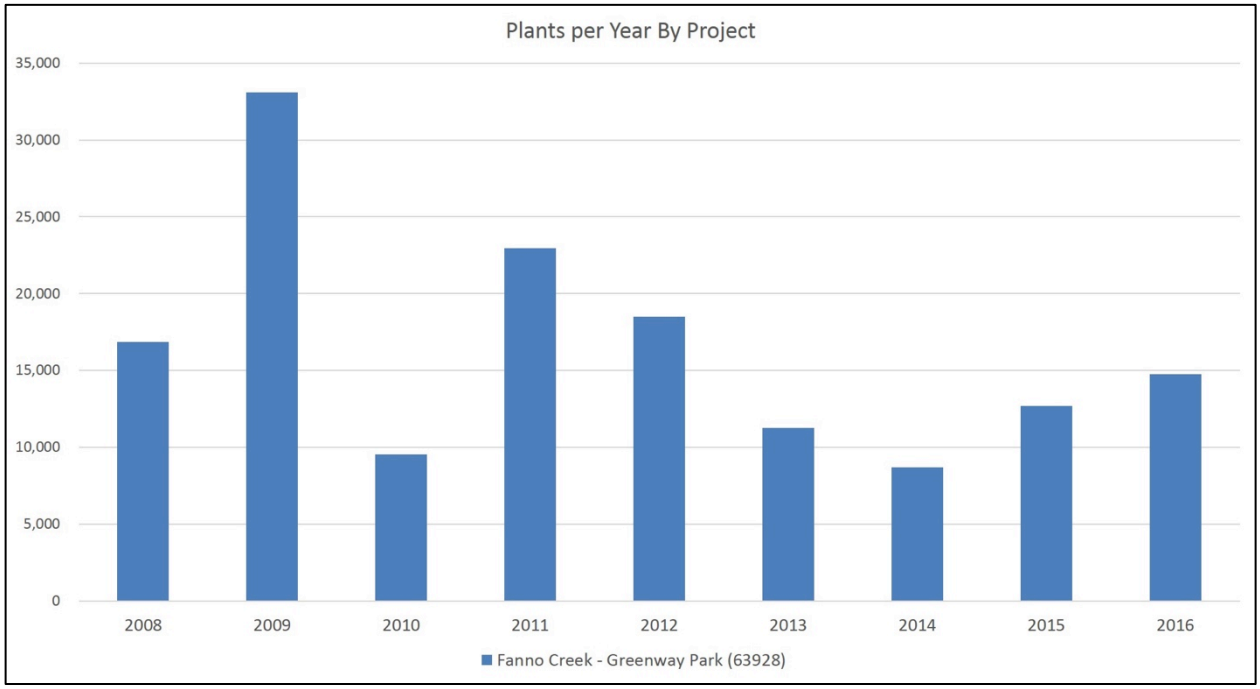

Figure 7 – Number of trees planted per year (2008-2016) in Fanno Creek-Greenway Park. Source: Clean Water Services.

Mature canopy coverage increased between 2007 and 2014 on all sites (Figure 8). Percentage increases ranged from a high of 32 percent at Bauman Park in the upper reach of Fanno Creek to a low of seven percent at Durham City Park at the creek's confluence with the Tualatin River. In Greenway Park, the only site on the chart falling within the Fanno Creek-Greenway Complex, mature canopy coverage increased by 11 percent.

From the descriptions of the changes observed by interviewees, restoration has unquestionably had a positive impact on Fanno Creek's biodiversity and ecological functioning. Areas that were once dominated by reed canary grass now are covered with a diversity of native plant species and the area's ecological functions and structure are correspondingly more complex.

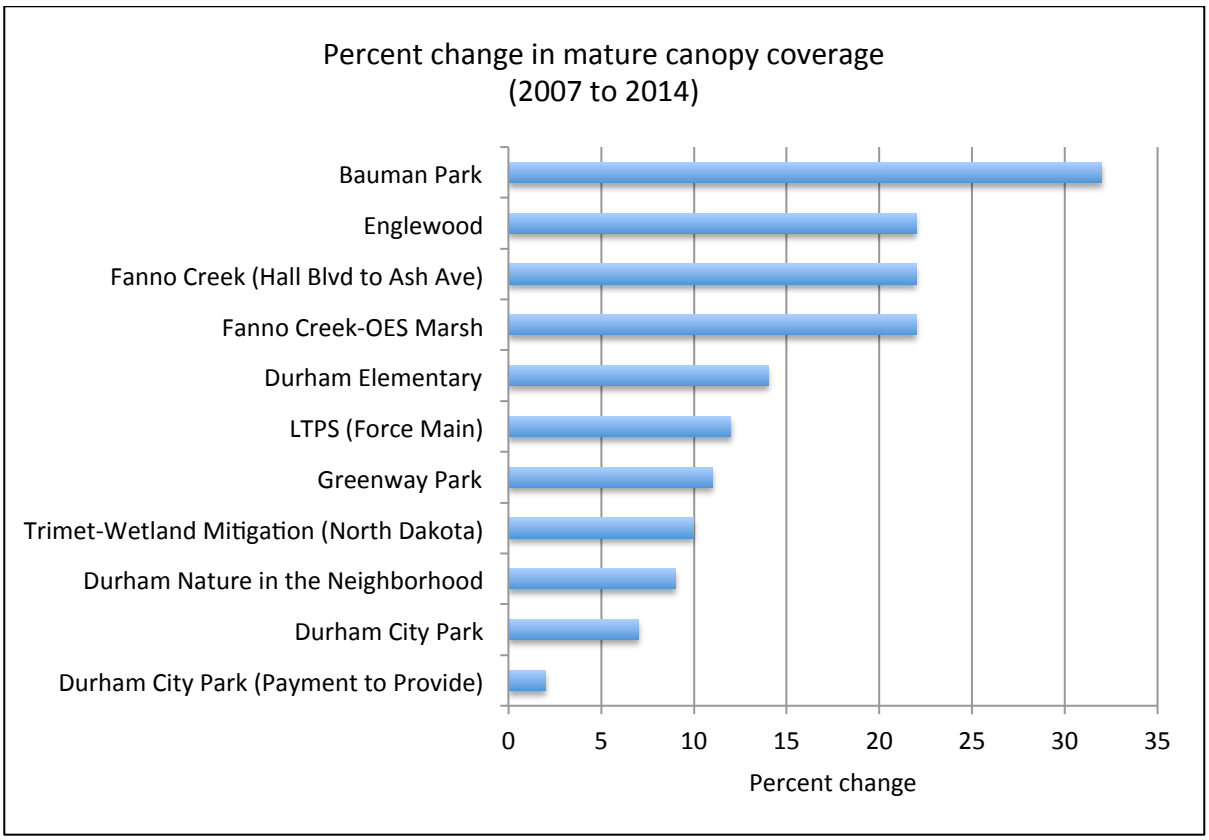

Figure 8 - Percent change in site area with mature canopy cover (2007 to 2014). Source: Clean Water Services.

Figures 9 and 10 illustrate this change for Fanno Creek-Greenway Park. Figure 9 shows that the percent area covered by native woody vegetation has increased dramatically whereas the percent area covered by invasive species of concern (primarily reed canary grass), has gone down. Figure 10 indicates that there was a noticeable increase in the diversity of native plant species present at the same site between 2010 and 2016.

The diversity of bird species has also increased. EBird[16] observations from 1900-2011 (pre-restoration) at the Koll Center Wetlands and Fanno-Greenway Park, two adjacent sites along Fanno Creek, show low bird diversity (71 total species). Between 2012-2017, after restoration activities began, the number of marsh birds and waterfowl species had increased for the two sites to 118. As shown in Figure 11 observations at Koll Center Wetlands prior to restoration were recorded mostly in late fall and winter, indicating that birders did not visit the site during other times of the year, most likely because there were few birds to observe. Figure 11 shows that since restoration (2012-2017), bird observations have been recorded throughout the year, indicating that the restored

[16] The eBird database (http://ebird.org/ebird/places) is an important data source for monitoring bird populations. It is a global database that stores bird observations made by the birding community from across the globe. CWS uses this database to store bird observation data collected by community–science birders at various CWS project sites in the Tualatin Basin, including Jackson Bottom Wetlands and Fanno Greenway. The eBird data can be used to track changes in bird diversity and abundance pre and post restoration. This is useful in terms of understanding how birds 'respond' to response to habitat restoration activities. CWS uses data on changes in wildlife biodiversity as one of the metrics of 'success' for its restoration projects (Personal communication from Carol Murdock, Clean Water Services November 29, 2017).

areas are now desirable bird-viewing sites year-round.

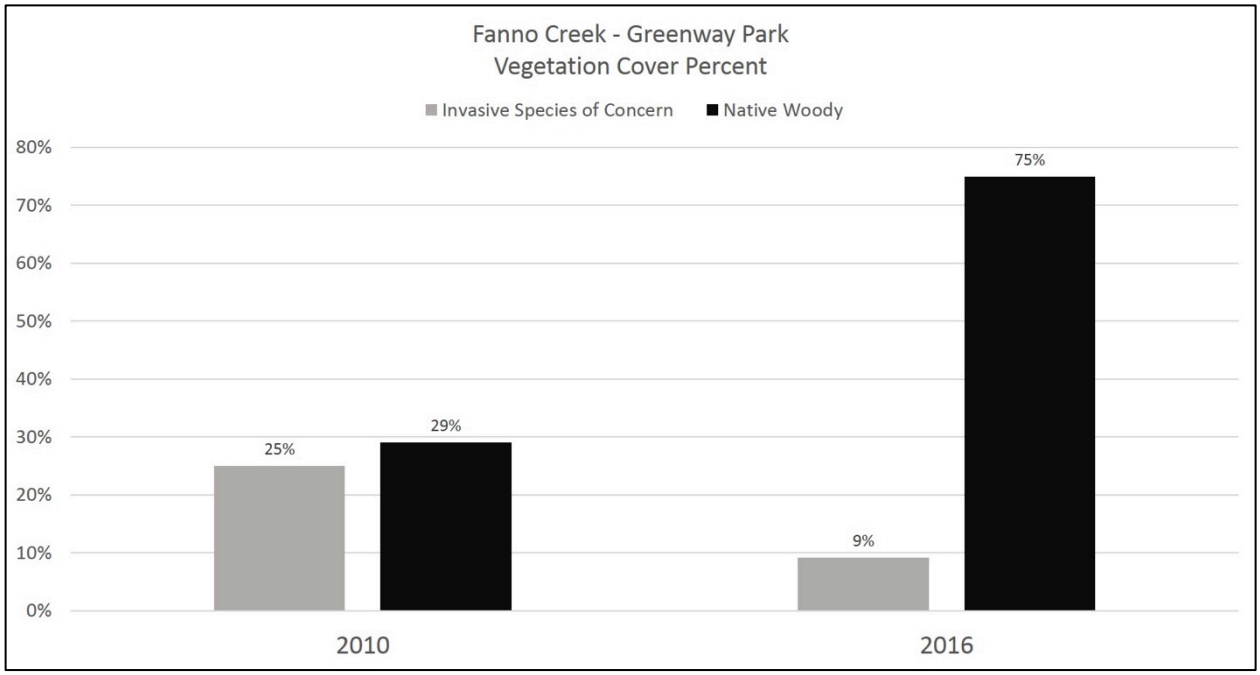

Figure 9– Change in percent vegetative cover for invasive species of concern and native woody species between 2010 (pre-restoration) and 2016 (post-restoration). Source: Clean Water Services.

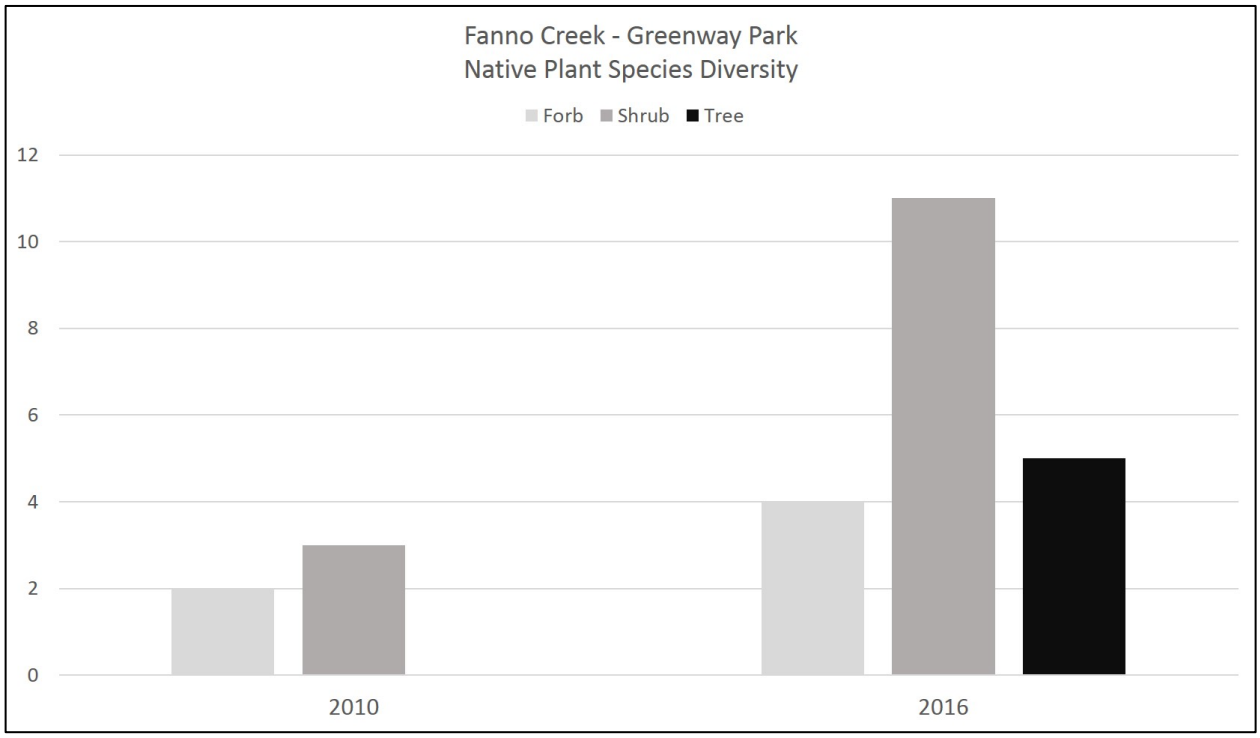

Figure 10 – Change in native plant species diversity for Fanno Creek-Greenway Park between 2010 (pre-restoration) and 2016 (post-restoration). Source: Clean Water Services.

Figure 11 – Sample of bird observations recorded each month at Koll Center Wetlands between 2002-2011 (left) and between 2012-2017 (right). Green areas indicate months during which sitings were recorded. Source: EBird database.

Another very visible indicator that restoration of Fanno Creek is having a positive environmental impact is the recent return of beavers to the area. The ecological implications of beavers re-colonizing the area, and the implications for what criteria should be used to judge watershed health are described in Box 6. Although the re-appearance of beaver dams in Washington County is not without controversy, their presence is an important factor in restoring the area's hydrological functions.

Because other factors could affect canopy coverage, and no control plots have been established to sift out the impacts of these factors, it is difficult to determine how much of the observed increase in mature canopy coverage or is due to the use of collaborative partnerships. However, a THPRD employee indicated that partnering was essential. As he puts it, "Our staff doesn't have the capacity to work at that scale, and the restoration of the creek might not have been our priority." He emphasized that the benefits of partnering were more than incremental, stating, "We chipped away a bit before but now are doing restoration at an order of magnitude greater." A City of Beaverton employee said something similar, noting, "We do a lot more with partnerships. If we had to do it alone, it would take us a lot longer." In short, without the partnerships, the work would eventually get done, but collaboration has accelerated the pace and the scale at which it gets done.

Value of partnering

The study participants described many benefits associated with TFA partnerships. The partners who had participated in the Fanno-Greenway Complex projects emphasized that having ready access to CWS' bare root native plant stock in very large quantities and at no cost was critically important because it made large-scale plantings financially feasible for them. For both THPRD and the City of Beaverton, partnering with CWS gave them access to expertise regarding natural

approaches to erosion and storm water control that they didn't have in-house, thereby reducing the costs associated with hiring specialists. Moreover, management uncertainties for THPRD staff have been reduced because, through the partnerships, CWS has shifted from short-term maintenance agreements to 20-year maintenance agreements on THPRD lands.

Participating in the partnerships has also affected how the landowning partners manage their other properties, resulting in improved environmental conditions in those spaces as well as reducing the costs associated with managing them. Interviewees working for the City of Beaverton described some of the ways in which the city has benefited from knowledge gained through its partnerships with CWS on restoration projects in Fanno Creek.

> We also have applied the same principles to treatment sites. It's a lot easier for maintenance. They don't need as much care as if it's in grass. It creates little greenspaces in places that used to be big grassy areas. Now they have native vegetation in them. A big one that we tore a fence out of looks more like a park now. People can go into the space. A fence won't stop vandals anyway. If we make it accessible, people will keep their eyes on it; gives us extra eyes. We have to believe it contributes to the health of the basin.

Box 6 - Return of beavers to Fanno Creek

A study participant describes the striking changes to Fanno creek brought about by TFA's investments in restoration:

Fanno Creek was basically a dirt canyon at the time. It was a boiling trickle of nasty-looking water. It was truly ugly, full of shopping carts, and there was not in-stream structure. The big emphasis was to put shade on the water. [Clean Water Services] had to cool the water down so they said, "Let's plant trees and shrubs."

We were incredibly successful; we planted Oregon ash, red osier dogwood, snowberry etc. We did the same thing at Beaverton Creek, where it was wildly successful. Things were chugging along when I got a call from Peter, "Beaver are eating all of our trees!" So I went to check things out, and I got out to the site and said, "Wow!" The beaver had cut down trees and built dams right in the middle of Beaverton! I called Peter back – "I see you are alarmed but let's not assume this is a bad thing."

The same thing was happening in Englewood Park, eventually creating a lake. The beaver were cutting willows and water was going into the back channels.

That's when I realized that it's not about shade on the water. You look at what beaver do to these systems. Their dams were incredible, perfectly placed. There were three orders of magnitude more water in the system behind the dams. It's about water, and how the beavers-water-landforms interact.

Yes, there are these beaver ponds but they have a lot of biological activity and also a lot of water that's infiltrating into many more areas upstream. Fanno Creek is now full to the brim with water; it's fully re-engaged with the floodplain. The previously disengaged creek is gone.

From the perspective of the partners involved, the benefits of collaborative partnerships aimed at restoring Fanno Creek go well beyond improving environmental conditions. In addition to the cost-savings mentioned previously, collaborative partnerships have provided participating organizations expanded opportunities to educate the public and public land managers about the value of native plants and taking a more natural approach to erosion and flood control management. Public works staff members with the City of Beaverton, for example, viewed planting events as an important education tool that they hope will lead to changes in residential landowner behavior:

> We talk about goals of the restoration to try to educate people about the role of the stream, invasives and non-natives, and importance of native plants. People like to buy pretty plants – so we want to encourage them to use native plants.

A key reason these employees gave for encouraging people to use native plants was to reduce the costs of managing public lands. As they expressed it, "If residents put in invasives or non-natives on their land, it will come onto ours. Plants don't know boundaries." The notion that collaboration is important because nature "doesn't know boundaries" was reiterated by a THPRD project manager who stated, "The creek doesn't recognize boundaries… species don't know boundaries either. So if you don't collaborate, your efforts only go so far." To make their efforts go even further, partners in the Fanno Creek projects also are now reaching out to a broader range of organizations to involve constituents who previously had not been very heavily engaged in restoration projects.

The higher profile that partnering provided for restoration work more generally was seen as an important benefit by some of the participants. For example, a THPRD project manager indicated that the visibility of the Fanno Creek-Greenway Complex projects had played an important role in educating upper-level management staff and board members about the importance of managing the District's greenspaces for more than recreation. This in turn had translated into more funding and management support for restoration projects.

Lessons learned and challenges

When asked to describe what made restoration partnerships work, all of the interviewees involved in Fanno Creek projects emphasized the importance of the long and established working relationships many of the key players had prior to the emergence of the TFA program. The trust developed through years of working together, along with the knowledge they had acquired about the strengths and limitations of their partners, helped create an environment conducive to collaboration. An additional benefit coming out of the development of trust relationships on the Fanno Creek Projects was the ability to move beyond establishing agreements on a project-by-project level to developing an inter-governmental agreement (IGA) to restore entire stream reaches that extend across multiple properties, saving time and administrative costs for the organizations involved. Several of the key players also met regularly in-person at meetings, which although not directly related to restoration, helped them strengthen and maintain relations with each other. Support for collaboration from upper level managers within their organizations further facilitated the partnerships. All agreed that good communication and flexibility was key to the success of the partnerships they were involved with.

Although participants generally had positive views about the value of the Fanno Creek-Greenway Complex collaborative partnerships, they also described a few challenges associated with such partnerships. One challenge had to do with differences in restoration philosophies. One partner described these contrasting philosophies as follows.

> …We have a philosophy that we'll plant the plants and then give them time to establish themselves, shepherd them along. But at Clean Water Services they basically believe in Darwinism. This can be an issue, especially when we work on a project together. We get better coverage by shepherding them. We won't have bare spots. [But] it takes a little investment on our part.

He attributes the difference in philosophy as being related to the differences in the scale at which the two organizations operate, noting that, "Clean Water Services has bigger areas and our projects

are small."

Another interviewee who supported limited post-planting care, however, argued that extra care, such as irrigation, was unnecessary. A forester by training, he believed that techniques, such as the use of bare-root seedlings rather than containerized plants and no post-planting irrigation, which were developed for restoring large-scale industrial forests, were needed to accomplish urban watershed restoration at a broad scale.

Other barriers to collaboration identified by private and non-profit sector partners were time-consuming reporting requirements and too-rigid restoration protocols on the part of larger government agencies.

The Intertwine Alliance support

All of the interviewees who participated in restoration projects along Fanno Creek were familiar with TIA. They were appreciative of the work that TIA has done to provide venues where members of the conservation community can get together and share ideas and learn what projects others are working on. Two interviewees also mentioned that TIA's effort to create a system of standardized regional trail signs was helpful in creating a sense among partners that they are all part of something larger. When asked what steps TIA could take to support collaborative partnering in the future, interviewees suggested that a greater emphasis on regional meetings in addition to the meetings held in Portland could facilitate participation by groups located outside of Portland. Several interviewees pointed out a need for strengthening connections between private firms and public sector organizations, and suggested that TIA was well positioned to be able to assist with that. One interviewee indicated that it was important for TIA to focus on activities that add value, and to make sure that it isn't just promoting what's already happening. He noted that TIA has done a very good job of bringing together groups to discuss ideas, but he felt it was now time for TIA to take steps to facilitate moving ideas into application.

Case Study 3 - Jackson Bottom Wetlands[17]

Origins of restoration at the Jackson Bottom Wetlands Preserve

Located within easy walking distance of downtown Hillsboro, the Jackson Bottom Wetlands Preserve (JBW) is 635 acres of wetlands and seasonally flooded uplands situated within the floodplain of the Tualatin River along Highway 219[18]. The JBW has split ownership, with some of it belonging to the CIty of Hillsboro and some to Clean Water Services.

Native people of the Tualatin River valley utilized the wetlands as a source of edible camas bulbs and wapato tubers. After European settlers arrived, the wetland was ditched and drained first for agricultural use and later for disposal of sewage and cannery waste. A sewage farm on the site employed over 200 people at one time, but in time this was abandoned and invasive reed canary grass took over[19]. Then, in the 1970s people began to look at the area differently, and the idea to

[17] This case draws upon interviews with employees of the City of Hillsboro Parks and Recreation Department, Farmington School, Clean Water Services, Ducks Unlimited, and a board member of the Jackson Bottom Wetlands Preserve.
[18]https://www.hillsboro-oregon.gov/departments/parks-recreation/our-facilities/jackson-bottom-wetlands-preserve/the-preserve
[19] Jackson Bottom Concept Master Plan, 1989

restore the wetland to its former glory was born[20].

The Friends of Jackson Bottom (now a nonprofit organization called Jackson Bottom Wetlands Preserve) was started by a group of citizens who wanted to preserve and restore the wetlands. In 1989, the City of Hillsboro, Unified Sewerage Agency (now Clean Water Services), Greater Hillsboro Chamber of Commerce, and Washington County Soil Conservation District[21] developed the Jackson Bottom Concept Master Plan with help from the Oregon Department of Fish and Wildlife, Audubon Society of Portland, and Tualatin Riverkeepers. This plan outlined a vision of a restored wetland complex with native habitat, improved hydrology, storm water and wastewater treatment, a trail system, and an education and interpretive center[22].

The earliest restoration efforts, digging big ponds on the site, probably did more harm than good from an ecological standpoint by helping to solidify the hold that invasive plants had in the area, but served as a learning experience to help managers figure out what would work. Experimentation was conducted in the early 1990s to better understand what could be done at the site. Restoration began in earnest after the 2005 Healthy Streams Plan was completed and adopted by Clean Water Services and the cities in Washington County.

Restoration projects and key partners

The first restoration project to be completed was Kingfisher Marsh, which is directly in front of the Education Center (see Figure 12). Next was restoration of Bobcat Marsh as a mitigation site in an area where soil had been deposited from the earlier restoration work. Some of this soil was used to create berms for the subsequent restoration of Wapato Marsh, which could not be dug down because of the presence of underground pipes. A new restoration is kicking off in 2017, Oak Island Marsh. Each of these projects has been a cooperative effort; pulling funding and resources from many sources and building on knowledge acquired from previous restoration efforts. Key partners and their roles are depicted in Table 5. A portion of the Jackson Bottom Wetlands restoration network is depicted in Figure 13.

The City of Hillsboro and Clean Water Services own the property that is used for the wetlands. Clean Water Services brings expertise in water management; Hillsboro brings expertise on programming for the public; both have experience in restoration. While these two organizations have specific missions, they both also recognize the larger role the wetland has for the region, considering it a significant site for wildlife and people from outside their jurisdictions. The partnerships they have formed with other organizations help to fulfill these other interests as well as the specific interests of the two landowners. Partnerships help the participants realize larger social and ecological benefits.

Agencies not interviewed as part of this case study but which were also important contributors to the restoration of Jackson Bottom Wetlands include the Oregon Department of Transportation (ODOT) and the Port of Portland, both of which contributed funding, and the Oregon Department of State Lands and the US Army Corps of Engineers, both of which were important partners for the mitigation banking instrument that made much of the restoration possible. The Port of Portland and ODOT are included as partners on the Inter-Governmental Agreement between the City of

[20]https://www.hillsboro-oregon.gov/departments/parks-recreation/our-facilities/jackson-bottom-wetlands-preserve/the-preserve
[21] Now the Washington County Soil and Water Conservation District
[22] Jackson Bottom Concept Master Plan, 1989

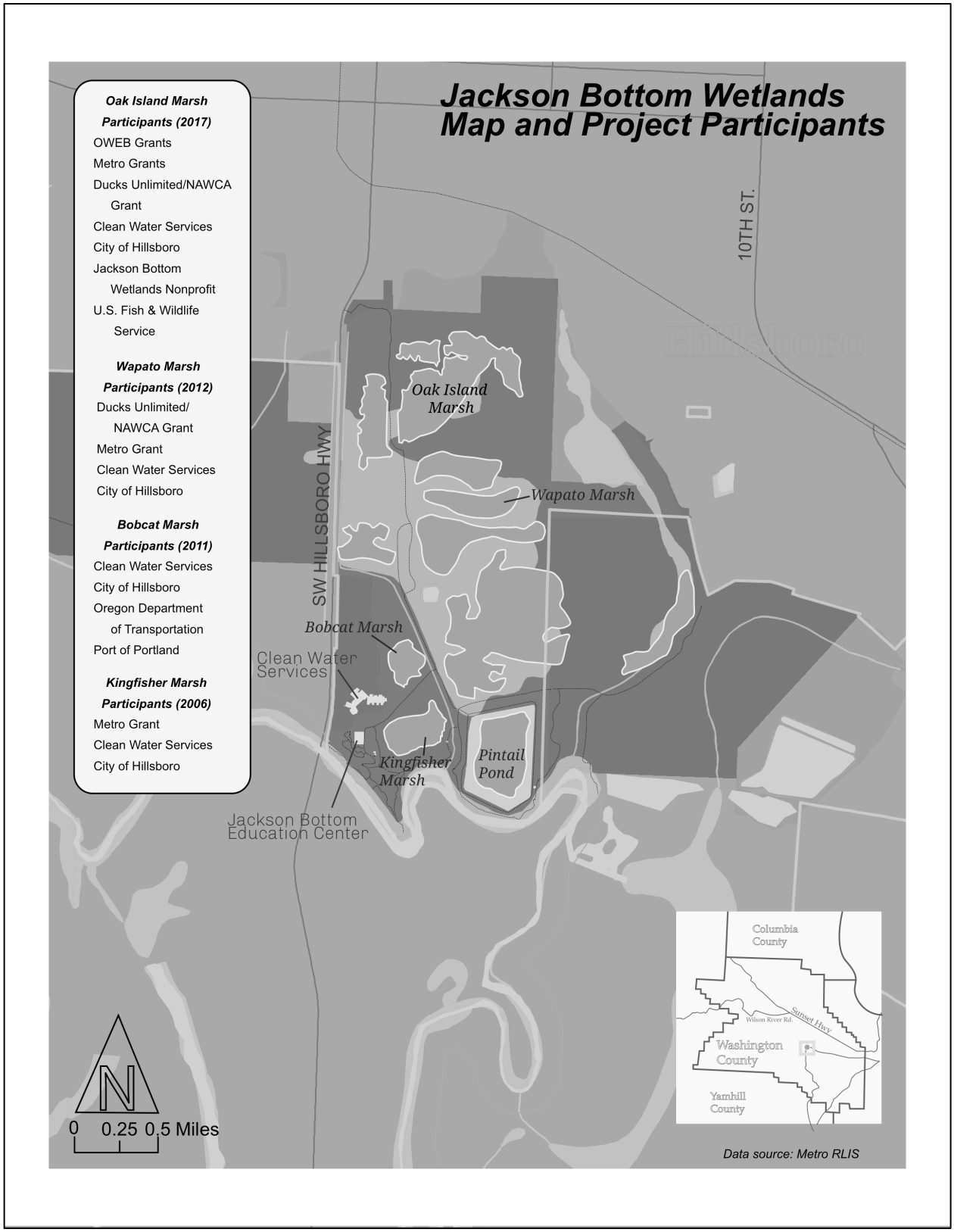

Figure 12 – Map of Jackson Bottom wetlands and list of partners

Table 5– Jackson Bottom Wetlands Restoration Projects (2006-2017)

Name of project	Date started	Basic information	Partners
Kingfisher Marsh	2006	20 acres	City of Hillsboro Clean Water Services (Metro grant)
Bobcat Marsh	2011	Mitigation bank: 19 acres	ODOT Port of Portland City of Hillsboro Clean Water Services
Wapato Marsh	2012	Site: 140 acres Four wetlands	Ducks Unlimited (NAWCA grant)[23] City of Hillsboro Friends of Trees Clean Water Services (Metro grant)
Oak Island	2017	270 acres Five wetlands	Ducks Unlimited (NAWCA grant) Clean Water Services City of Hillsboro (Metro, OWEB grants) USFWS Jackson Bottom Wetlands Preserve

Hillsboro and Clean Water Services. In addition to investing millions of dollars in planning, design, permitting, and implementation, ODOT and the Port of Portland also contributed funding for updating the master plan and integrating the Bobcat Marsh project as part of the area to be restored. The Bobcat Marsh project improved the functioning of Jackson Slough, which connects to other wetlands on the preserve. Additionally, the Bobcat Marsh project was a demonstration site that ultimately showed that it was possible to restore reed canary grass monoculture to a diverse native marsh. The lessons learned through this demonstration case have since been applied to hundreds of acres elsewhere on the site.

Ducks Unlimited (DU) has been a partner for both the Wapato and Oak Island projects. DU is a national organization that has conservation, restoration, and management of wetlands and associated waterfowl habitat as its mission (Ducks Unlimited 2017). They take the long-term view that healthy waterfowl habitat is important for survival and reproduction of waterfowl and other species. This has been a productive partnership for Jackson Bottom; DU supplies funding in the form of grant money and member donations as well as engineering and biological expertise.
In 2003, after a decade of fundraising, the Jackson Bottom Wetlands Preserve nonprofit organization built the Education Center. Ownership of the Center was transferred to the City of Hillsboro several years later, and the City provides staffing and educational programming. Programming includes classes and events for all ages, summer and after school camps, youth leadership development, and both classroom-based and field-based learning activities for local schools. The nearby Science, Technology, Engineering, and Math (STEM) focus school, Farmington View Elementary School in the Hillsboro School District, has a long-standing relationship with the wetland. Along with classroom activities and after-school offerings, students at Farmington View have conducted research at the wetland, including surveys for mammals, Northern red-legged

[23] North American Wetlands Conservation Act

frogs, and the frogs' predators. It was this research component that teachers credit with being instrumental in the school being chosen as the Intel 2011 Science School of Distinction, competing with schools across the United States. The award was for schools implementing innovative math and science programs and serving as models for other schools[24].

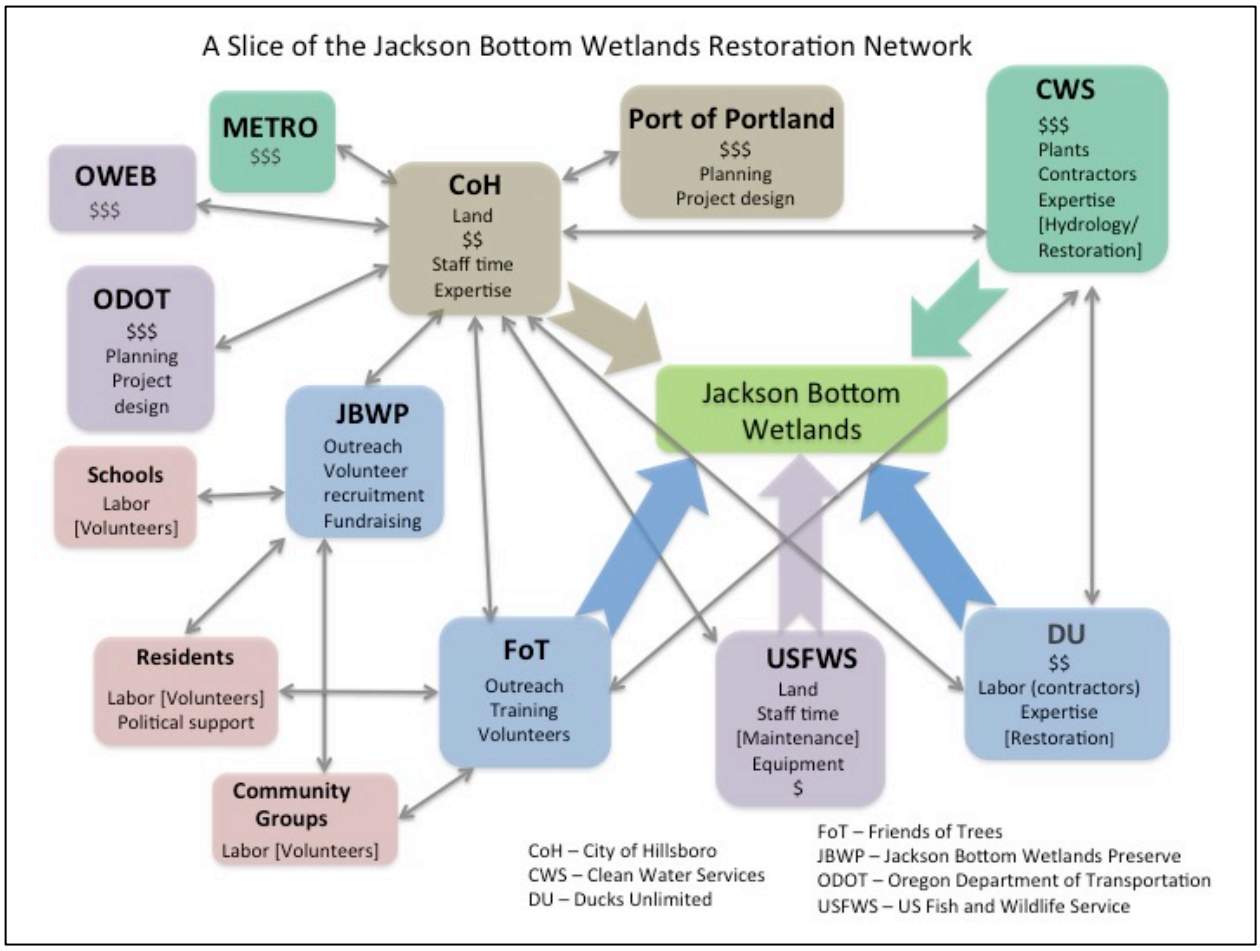

Figure 13 – Jackson Bottom Wetlands restoration network[25]

Value of collaboration

Because of the joint ownership of the property between the City of Hillsboro and Clean Water Services, all involved felt that collaboration is vital to restoration and management of the wetland. However, opinions differed on the definition of a 'partner'. Everyone agreed that the handful of organizations that directly partnered in restoration efforts (Table 5) were partners. There was less agreement about the partner status of the schools and volunteer organizations involved in planting efforts because they did not make direct financial contributions to the restoration efforts and because their involvement was seen by some as community relations actions rather than partnerships.

[24] https://newsroom.intel.com/news-releases/18-u-s-schools-named-intel-schools-of-distinction-finalists/
[25] Figure 13 represents only that portion of the Jackson Bottom Wetlands restoration network that emerged through the interviews and document review. A more extensive investigation, which was beyond the scope of our study, would be needed to document the entire network.

Similarly, the organizations that have supplied grant funds to the other organizations or are supporters of the nonprofit Jackson Bottom Wetlands Preserve were not always considered partners because they did not participate directly in on-the-ground decision-making. This does not mean, however, that the on-the-ground staff members did not value the contributions of these organizations. Regardless of how a partner was defined, there was a feeling that partnering with others provided an important diversity of perspectives and led to more, quicker, and better work than would otherwise have been possible. One interviewee emphasized that having diverse partners "brings a rich tapestry of interests and abilities," and enables the participating organizations to distribute the workload so that together they can work more efficiently.

The opinion of one city employee who has been involved with restoration work on the JBW for many years was that none of the restoration work would have happened without partnerships, and that working alone, the City of Hillsboro could have done only about a fifth of what's been accomplished through partnering with other organizations. Moreover, she noted that having a lot of partners and people involved has an important ripple effect, with those who are involved becoming proud of what's being done and wanting to learn and engage more. Another interviewee believed that having more partners was important also for creating enough critical mass to accomplish restoration on a large-scale.

Volunteers initially took on a lead role in the establishment and management of the JBW preserve, and volunteer board members continue to play a key role in fundraising. The City of Hillsboro, which has taken over management of the preserve and its educational center, continues to recruit volunteers to help with plantings and monitoring. However, from the City's perspective, the volunteer program is worth investing in less from the standpoint of getting restoration work done, and more for the benefits it provides in terms of raising public awareness, interest, and support for the preserve.

An interviewee who coordinates a STEM program that provides opportunities for school children to assist with plantings and wildlife monitoring talked about how having the opportunity to engage students in field work helps make science more tangible to students and, for many, improves their school work overall. In her experience, she said, "Partnerships make a huge difference in what's available to a school," and then added, "We have to work together; schools can't do it alone."

Restoration outcomes

Between 2006 and 2016, more than 170,000 native trees and shrubs were planted through TFA projects at Jackson Bottom Wetlands (Figure 14). From the descriptions of the changes observed by interviewees, these plantings have unquestionably had a positive impact on the preserve. Areas of the wetland that were once dominated by reed canary grass now are covered with a diversity of native plant species and the area's ecological functions and structure are correspondingly more complex. Restoration has literally transformed much of the wetland from wasteland to functioning floodplain habitat that supports a wide array of bird, wildlife, and insect species. Between 1900-2006, prior to the restoration activities at the Kingfisher, Wapato, and Bobcat Marsh sites, 173 bird species were recorded at the Jackson Bottom Wetlands Preserve. Between 2006 and 2017, the number of species reported had increased to 203.

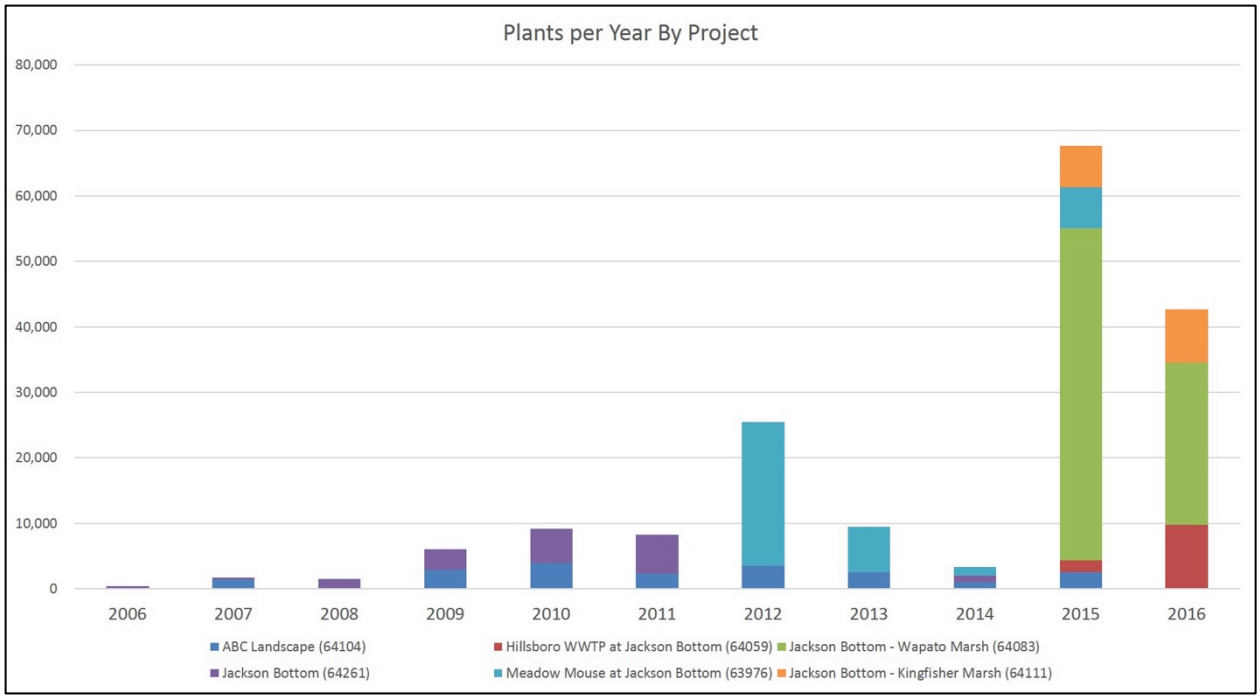

Figure 14 – Number of trees and shrubs planted on projects at Jackson Bottom Wetlands between 2006 and 2016. Source: Clean Water Services.

The interviewees involved in restoring the wetlands all described the restoration projects as having important social and economic outcomes. Those outcomes included greater opportunities for Hillsboro residents to access greenspace for relaxation or recreation, developing and strengthening people's connections with nature, and providing learning and critical thinking opportunities for children. Several interviewees also emphasized the importance of the restored wetlands as an economic development tool. Specifically, the business community has found that the proximity of the restored wetlands to Hillsboro serves as a quality of life draw for prospective businesses and employees.

Although all of the interviews recognized that restoration partnerships could yield important social and economic outcomes, they noted that measuring those outcomes is very challenging. Some possible measures of social outcomes were mentioned, including documenting the number of students involved in restoration plantings, monitoring participation levels (of adults as well as children) in volunteer activities, and tracking wetland visitor numbers.

Lessons learned and challenges of partnering

All of the interviewees expressed positive views about their experiences with partnering on the JBW restoration projects. One interviewee attributed his organization's positive experience to their long history of working with state and federal governments, which meant that they were familiar with the steps they needed to follow to meet the needs and expectations of those partners. He emphasized that agreeing on goals early on, and bringing agencies in at the beginning to have a healthy and ongoing dialogue, were key to the ultimate success of the restoration projects he'd worked on. Arriving at agreement about goals, he added, requires give and take and a willingness to listen to the ideas of others. However, he also noted that it is important to recognize that ultimately the landowner, in this case the City of Hillsboro or Clean Water Services, gets to make the final

decision since they will end up managing the land once the projects are done. Another interviewee believed that a key factor in the success of JBW partnerships is that they started small and tested different approaches out before they embarked on more ambitious restoration projects. Smooth relations within the partnerships were also facilitated by the fact that many of the participating individuals already knew each other from other contexts prior to working together on the JBW.

Interviewees associated with the JBW projects identified partnering organizations' conflicting objectives as the main challenge to successful collaboration. Tensions over misalignment in goals are sometimes exacerbated when partners don't see eye-to-eye because of other issues unrelated to restoration projects. Having too many partners was also seen as potentially problematic as the more partners involved, the greater the likelihood that differences in desired outcomes will emerge. To address this challenge, there was general agreement that it was important to arrive at shared goals and agreed-upon outcomes early on in a project.

Another commonly mentioned challenge was that it can take a long time to get a project done when working in a collaborative partnership. As one interviewee said, "It takes time to discover what everyone wants, to come to compromise agreements, and to revise those compromises when things change." Busy work schedules, which are a way of life for many of the interviewees, can make it difficult for them to engage in partnerships. To be an effective partner, one interviewee noted, it is important to avoid spreading one's self too thin.

One source of uncertainty interviewees highlighted was staff turnover. They noted that new staff members often brought their own way of doing things with them, and were unfamiliar with agreements worked out by previous staff. Changes in staff or board members thus required a period of adjustment, slowing the process of coming to agreement down.

Role of The Intertwine Alliance

The JBW case study interviewees who were familiar with TIA indicated that they felt it was useful because its activities allow members of the conservation community to understand the trends and take the pulse of what the community is interested in. One interviewee described The Alliance as a "source of collective experience, interests, and funding opportunities." Another indicated that TIA provided a platform for partnerships, and that it was important because it ties groups together and encourages groups to think more globally and, by coordinating their efforts, act more efficiently. Additionally, he emphasized that joining forces under TIA's umbrella has expanded the visibility of the work that each of the partnering groups is doing.

Mini-case studies

To broaden the range of partnerships explored in this study, we decided to incorporate mini-case studies of three additional TFA partnerships as well as two partnerships unrelated to TFA. The three TFA mini-case studies include:

- A partnership to restore a portion of the Tualatin River National Wildlife Refuge[26]
- The City of Tualatin's volunteer greenspace restoration program[27]

[26] This case relies on the thoughts and remembrances of three volunteers and an early USFWS Deputy Project Leader who generously agreed to be interviewed. Each one led and/or participated in the restoration program at the refuge.

- A partnership led by the Tualatin River Watershed Council to restore lands managed by the Murrayhill Owners Association in Beaverton

The two mini-cases of partnerships not affiliated with the TFA program include:

- Growing Green, in which three non-profit organizations combined forces to develop an urban forestry training program for immigrant Latino and Muslim residents of Washington County

- The Greater Forest Park Conservation Initiative, in which a coalition of government agencies, neighborhood associations, conservation organizations, and university research institutes have embarked on a landscape approach to restoring and preserving the City of Portland's Forest Park.

The five mini-cases, together with the three in-depth cases, provide a foundation for improving understanding of the value of collaborative partnerships in a range of circumstances.

Mini-case study 1 – Tualatin River National Wildlife Refuge (Dennis Unit)

Established in 1992, the Tualatin River National Wildlife Refuge (TRNWR) is a 1,300+-acre urban refuge in Washington County. The refuge is managed by the US Fish and Wildlife Service (USFWS) and operates under dual missions of conserving wildlife through habitat management and connecting people with nature. The refuge opened to the public in 2006, and a state-of-the-art visitor center opened two years later. The refuge supports riparian forest, seasonal wetlands, river and streams, oak savanna and grassland. Land use around the refuge is predominantly urban development, forestry and agriculture. The refuge supports crucial stopover and/or breeding grounds along the Pacific Flyway for migrating songbirds, waterfowl and shorebirds. Visitors can watch native mammals, birds, amphibians and reptiles while walking the trails. The environmental education program supports nature camp, school field trips and other group visitor programs, and an annual Bird Festival. The visitor center is a showcase of interpretive displays, and includes an overlook for viewing migratory waterfowl, birds such as bald eagles, osprey, egrets, and mammals and other wildlife

The Portland metropolitan area benefits from the refuge's open space, abundant wildlife, floodplain management, the free-flowing Tualatin River, and public programming and visitor services throughout the year. Recognizing the importance of having a broad base of community support, the National Wildlife Refuge System has expanded its goals to focus on deeper engagement with the surrounding community in order to foster a sense of land and wildlife stewardship. The refuge's approach to community outreach has made it a model for the USFWS urban refuge program.

Environmental restoration on the refuge has been a values-driven social process. The success of the refuge can be attributed to the ongoing synergy and collaboration between the staff of the USFWS and community partners. In the words of one citizen involved in initial efforts to establish the refuge, "The refuge grew out of a group of citizens; we wanted to create a barrier to urban growth from Portland." Another volunteer elaborated upon the citizens' motivation, stating, "We wanted to set aside some land that would stay natural and preserve a significant chunk of land from

[27] This case is based on an interview and email correspondence with the City of Tualatin's Volunteer Coordinator.

development." Working together, local citizens donated the first parcel of land and then lobbied the US Fish and Wildlife Service and Congress to begin purchasing additional land. Once the refuge was established, the band of citizens created a more formal volunteer "Friends of Tualatin River National Wildlife Refuge" group that went on to become instrumental in the delivery of the USFWS mission, closely working side-by-side with refuge staff. . The Friends group has assisted and continues to provide key support in the following activities, along with many others:

- Transforming former farmland to habitat supporting native wildlife;
- Developing visitor services and implementing an active interpretation program for the public with a focus on youth and communities;
- Conducting outreach to the community through natural history interpretation at places like the Oregon Zoo and community meeting places such as libraries, subsidized lunch programs for families, and farmer's markets.

The original refuge acreage was farmland, far from optimal wildlife habitat. Friends of the Refuge volunteers were actively involved in preparing the land for restoration, including removing, old equipment, barbed wire fencing, tires, as well as invasive plants. USFWS would identify land for habitat restoration, and in some cases, would work with Friends to restore it. One such case was a 21-acre site that historically supported floodplain hardwood forest that USFWS targeted for native tree and shrub planting. USFWS staff developed a restoration plan but lacked the staff to carry it out. The Friends volunteered to take on some of those tasks, but they too were a small group with insufficient capacity to do all the necessary work.

To accomplish the work, a partnership was formed between the USFWS, Friends of the Refuge, Friends of Trees (FOT), Clean Water Services, and the Tualatin Soil and Water Conservation District. Table 6 and Figure 15 depict the key partners and their main roles and contributions. Funding was obtained through the Vegetated Buffer Areas for Conservation (VEGBAC) program described in the ECREP in-depth case study in Part 2[28]. The partners brought expertise in all phases of restoration, including tree planting, stream bank protection, water quality enhancement, and the staging of massive tree-planting projects.

In describing this massive effort, the USFWS Deputy Project Leader in charge of restoration on the refuge at the time said,

> The project site that fit well with VEGBAC was on the Dennis Unit…We identified that area as one for restoration of floodplain hardwood forest. When the VEGBAC project was presented to us, it was a great fit because it met the VEGBAC goals of providing a buffer to the Tualatin River, providing shading, reducing soil erosion…it [was] in a priority area that we wanted to restore and it brought funding that gave us a springboard to do so...So VEGBAC brought the planting materials; what we then needed to bring to the table was the labor and site prep and monitoring, etc. We entered into the agreement that we work with the Tualatin Soil and Water Conservation District in 2007 and it took us 2-3 years to complete the actual plantings, all volunteer-driven labor and a huge partnership support group, the Friends of the Refuge.

Through an intensive outreach effort, the Friends gradually built their volunteer recruitment

[28] The (VEGBAC) program is a locally-funded variant of the ECREP program described earlier in this chapter.

Table 6 – Partners in the TRNWR VEGBAC-funded project on the Dennis Unit

Partner	Type of group	Restoration goals	Workforce	Contribution to the partnership
U.S. Fish and Wildlife Service	Federal agency	Restore wildlife habitat, educate the public about natural resource conservation, and connect people to nature	Professionals	Land ownership Restoration plan Project management Some staff time for site prep and maintenance Equipment
Tualatin Soil and Water Conservation District (TSWCD)	Local government, special district	Reduce stream/river temperature Decrease sedimentation	Professionals	Funding Expertise (restoration) Administration of VEGBAC program
Clean Water Services (CWS)	Local government, utility district	Reduce stream/river temperature Decrease sedimentation	Professionals	Expertise (restoration/hydrology) Funding Plants
Friends of Trees (FOT)	NGO	Expand the acreage covered with native trees and shrubs Educate the public about the value of native trees and shrubs	Professionals and volunteers	Labor Training (tree planting) Expertise (tree planting)
Friends of the Refuge (Friends)	NGO	Support refuge mission Develop community asset Buffer against urban sprawl	Volunteers	Tree planting and other labor Connection to community

capacity. Although a small group at the time, the Friends were strongly invested in the restoration program, internally and from the broader community. For two years, the Friends mobilized volunteers to plant trees every weekend during the winter months. When asked what made the tree planting program work so well, one Friends volunteer explained, "People or groups had common goals; they supported each other and agreed on the program." Another emphasized the critical role of FOT:

> They organized their annual volunteer training sessions on the refuge, tree-planting activities. Fish and Wildlife staff was depending on some input from Friends of Trees about programming [overall planning]. Also, for instance, what species are going to work here, that kind of thing.

Along with its expanded practical experience in successful restoration and habitat protection, the Friends began to address the refuge's other purpose, that of turning a face to the community and helping visitors and the public understand how natural processes on the refuge contribute to community and environmental health. The Friends have become, in the words of one volunteer, "the face of the refuge." Being the face of the refuge benefited the Friends, whose membership

remained small until the Visitor Center opened.

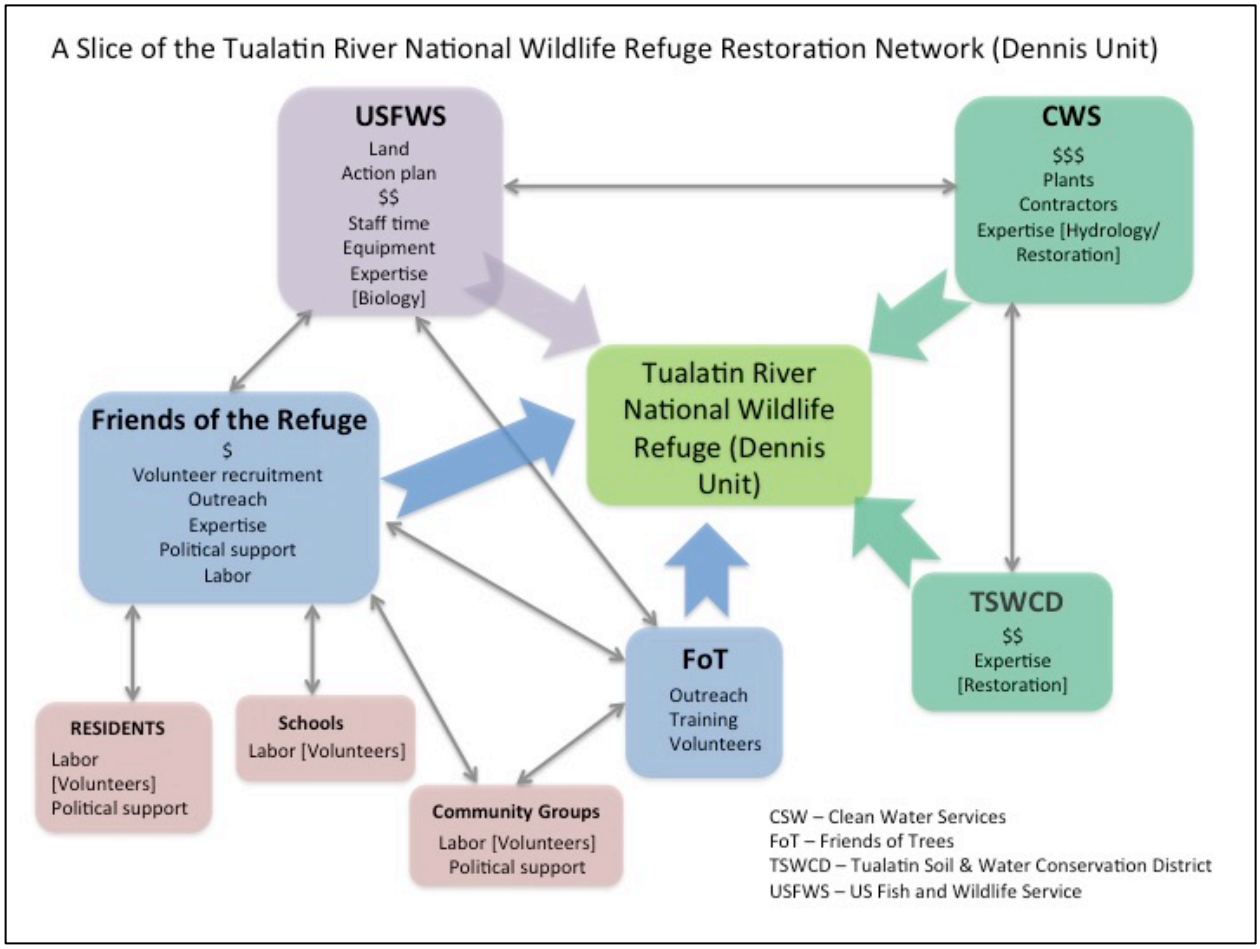

Figure 15 – Key partners in the TRNWR VEGBAC (Dennis Unit) project[29]

The Friends were empowered through partnering with the USFWS and FOT, observing other Clean Water Services projects, and playing a key role in restoring wildlife habitat. Through these joint activities, the Friends expanded their knowledge about restoration and achieved better environmental outcomes. They now think collectively about themselves as playing an important role in delivering the US Fish and Wildlife Service's mission. As the following quote from a long-term volunteer illustrates, the relationship between the US Fish and Wildlife Service and the Friends can best be characterized as one of interdependence, with the two organizations working closely together to co-manage the refuge.

> The [refuge] habitat is the property of the federal government so the Friends group always has to work together with "the Feds." Visitor contact is almost all conducted by volunteers: rovers on the trails, volunteer naturalists and staff at the Visitor Center are all volunteers. The people who coordinate their activities are Friends employees, not federal employees. We (volunteers) 'play' in the federal government's backyard but we're really the face of the

[29] Figure 15 depicts only a portion of the Tualatin River National Wildlife Refuge (Dennis Unit) restoration network. A more extensive investigation, which was beyond the scope of our study, would be needed to describe the entire network.

refuge for most people.

Box 7 provides one volunteer leader's reflections on the collaborative process that made restoration on the Dennis Unit a success.

The Friends entered into a cooperative agreement with the refuge to continue to deliver on their shared mission with the USFWS. This includes supporting three staff tasked with community outreach and engagement and training and managing volunteers who interact with the public on the refuge and in the community. These programs seek to expand the refuge's social benefits within the local community and beyond. For example, one program introduces children who attend summer lunch programs to wildlife and hosts school groups at the refuge for interpretive walks. The Friends have leveraged their tree-planting spirit and partnering skills honed during the early days into strong social capital that expands leadership, trust and reciprocity between themselves, USFWS staff, and the community.

Box 7 – Restoration tales

A long-time volunteer provides a first-hand account of collaboration between the Friends of the Refuge and US Fish and Wildlife Service on the Tualatin River National Wildlife Refuge:

"Winter time we would have tree plantings. One-to-two day events. I remember one of the first plantings was around the pond; we planted some cottonwoods and other trees. The next winter was planting the oak savannah. And then, of course, there was a big push to plant along the year-round trail. Get trees between the trail and the wetlands to have some screening there. When people walked the trail they wouldn't be scaring the waterfowl on the wetlands. We planted some pretty big trees for screening…

Fish and Wildlife purchased the trees from nurseries. Staff set the agenda for plantings, what we were going to do and where. I was involved with helping and getting other people involved with the planting. I talked to people who seemed to be interested, "Hey, would you like to help out?"

It was always kind of a hope you turn out a good number of people to get the work done. I sent email out to all these people hoping that enough people came out. And mostly, it worked out okay. We did what we could and if things didn't work out, then, well, let's finish it up next week. But it was really a pleasure to work with Fish and Wildlife staff. And Friends of Trees also were super."

Friends' volunteers are justifiably proud of their contributions' success. They believe that the refuge is a showcase for nature and wildlife habitat. As the following quote from a volunteer reveals, they expect that visitors on a Friends-led tour are likely to feel connected to nature, both while at the refuge and in a broader way that leads them to support conservation funding on voting day.

> Volunteering is great. It spreads the word; you get volunteers involved, get some commitment from them about this organization. We get these visitors and volunteers out on the refuge and then they're going to vote and make sure there's enough funding to keep it going.

Describing why the Friends values visitors, another volunteer said, "The refuge benefits from every visitor and every contact we have made. People understand better why there are refuges and why it's important if they have some contact." He described how opportunities to connect urbanites with nature become compounded when volunteers partner with community organizations.

> We provide the laboratory, the experience place, where people get in contact with nature at a level that's accessible to them. We have developed an Alternative Outdoor School where the sixth graders who attend are among the most nature-reluctant or their parents are the

> most nature-reluctant in the area. They are afraid of getting dirty, they're afraid of rain and wildlife; the whole thing is just pretty foreign to them. We take those kids for five days doing activities in a natural location and I can tell you the transformation in those kids is tremendous. That's the kind of connecting people with nature in its most literal sense.

Volunteers also point to the community benefits that flow from the outreach-oriented positions they support, such as launching the careers of young conservation professionals.

The Friends began their collaboration with the US Fish and Wildlife Service, aiming to develop a buffer against urban sprawl. They then expanded this partnership by working with local groups on a years-long project to re-vegetate portions of the refuge and return it to important wildlife habitat. Now they have achieved full collaboration status through helping to develop the refuge's additional purpose of connecting (mostly urban) people with nature.

> Modern thinking among the Friends and in the Fish and Wildlife Service is that the role is to protect wildlife. So the way to do that is to build a constituency among the citizens and when you get to restoration, it's not just habitat, it's like Thoreau: 'In wildness is the preservation of [nature].' Restore people and their lives by supporting opportunities to have contact with nature. That's the restoration.

As the story of the Friends of the Refuge's involvement in TRNWR demonstrates, collaborative partnerships in many forms and for several purposes have played a key role in building the constituency needed to support wildlife protection in the Tualatin River watershed over the long term.

Mini-case study 2 - City of Tualatin Parks Volunteer Program

Jackie Konen is the Volunteer Coordinator for the City of Tualatin. When she came on board in 2013, the Department's volunteer restoration program was "being done on a more grassroots and local scale." Due to restructuring in the Operations division, the position she stepped into had been scaled back from full to half time, requiring her to "take a look at the whole job differently, based on capacity." To compensate for limited in-house capacity she realized she needed to make connections with outside partners.

Under Jackie's leadership, and with support from upper-level park management, over the past four years, the City of Tualatin has developed a strong and long-term collaborative partnership with a diverse set of government agencies and non-profits. Chief among the partners and their contributions include:

> Clean Water Services — provides trees and shrubs; assists with pre-planting organization
> Friends of Trees — assists with planting and mulching and provides volunteer crew leadership
> Team Tualatin and Outward Bound — helps with plantings and provides follow-up care

A variety of other volunteer groups, such as high school clubs, AVID (Advancement Via Individual Determination) and honor societies also help with planting and mulching. In addition to supporting Jackie's coordinating and outreach activities, the City of Tualatin parks department hires contractors to do the physically more strenuous work of site preparation, as well as plantings on very steep slopes.

The outcome is a much more effective and efficient program. Describing the changes, Jackie says,

> Since we've started partnering…our plantings have become fewer because they're bigger. We're able to plant more plants, cover more acreage, get bigger results with fewer projects. My first year, I think we did 28 planting projects and we started to realize that if we had leadership we could do bigger projects. But it was hard to recruit volunteer crew leaders for us and after half a season of trying, [I] found out that Friends of Trees already does a really good job of that. They are the experts. So [I thought], why are we doing this? Why don't we just match up?

Partnering has expanded the scale of TPRD's plantings and increased the program's volunteer numbers and satisfaction. Instead of hosting 28 restoration events each year, COT now hosts six large projects, each with a two- to three-year cycle of seasonal work for park staff, restoration volunteers and contractors. Jackie admits that the transition was not always easy. She explains, "It did take time to evolve. I had to look at the success rates of the plants. And, how were the volunteers feeling. Sometimes the volunteers weren't leaving feeling like they'd made an impact." Plant survival rates are now 80 percent and higher. As a result, Jackie says, "I just find that everybody's happy: the volunteers are happy, staff is happy; the budget is happy; the plants are happy. It's just an incredible experience; we love it."

The scale at which the City of Tualatin's volunteer program now operates is illustrated by Jackie's description of the 2016 Martin Luther King Jr. planting day:

> …we thought we'd have 180 volunteers, which is pretty big and people just kept coming and coming. We ended up with 285 volunteers and — I call it flash-mob planting. They planted those 2500 plants in about an hour and a half and we were done. It was amazing. And, ever since, that was a marker, a good region-wide knowledge building for volunteers interested in greenspaces. Ever since then, our [volunteer] numbers have doubled. A good planting had been 50-60 people, and last year the average was 120 volunteers.

The crew leader training program run by was instrumental in improving restoration leadership capacity during planting events. This added capacity in turn has enabled COT to plant more trees in less time over larger areas.

Jackie has found that working with partner organizations such as Friends of Trees and Clean Water Services has long-term benefits as well. As she explains it, partnering "provides volunteers with all the tools they need and a well-run process so the volunteers will come back and spread the word because they see the impact they made." She credits advertising restoration events through Portland metro area volunteer opportunity websites such as *Hands on Portland* and *Just Serve* with the recent increases in the diversity in volunteer group make-up. Describing how the partnership has changed over the years, Jackie says:

> We're pretty much a well-oiled machine by now. When we started working together with Friends of Trees, there was that whole thing of…learning how to be integrated and now we're just dialed in. Playing on the same team; it's not a game of who gets credit; it's a game of let's get the job done and let's get this effect and impact. I think we're all on the same page now but it took time.

Collaboration with Park Maintenance staff has been essential to the selection and success of restoration sites. Park maintenance staff is the front line with essential knowledge about the sites

and understand the importance of connecting with community volunteers.

> With volunteers and volunteer projects, staff buy-in is always the biggest challenge. Staff will say, I wish you would have planted in rows so I can go back and do the spray maintenance; it's easier. Or, That whole bank on the south side is going to die out because you haven't got any volunteers to water it. That's probably my problem; the goal of our program is not to create more work for staff.

Ultimately, Jackie believes that the City of Tualatin's approach offers lessons that other cities can learn from. For organizations wishing to expand their volunteer restoration capacity, she has these words of advice:

> Look at our model, come talk to me, look at one of our plantings and evaluate it. Results are there, meeting all city goals, volunteers' goals. Don't take it all on yourself. To make a big impact be collaborative, find out who your partners are and engage them. Collaboration definitely helped me grow professionally. And, the City of Tualatin received the Friends Of Trees Community Partner Award in 2016 for 15 years of collaboration.

Mini-case study 3 - The TRWC and the Murrayhill Owners Association

> We all work, live or recreate in the Tualatin basin so we already have a common basis for wanting to have a healthy watershed. - April Olbrich, Tualatin River Watershed Council

As Coordinator for the Tualatin River Watershed Council (TRWC), April Olbrich plays a number of important supporting roles within Council projects, including identification of resources, outreach for restoration projects, and publicity about project outcomes. The TRWC acts as a bridging organization to promote building watershed management capacity, improving public relations, and fostering cooperation among urban, rural and other stakeholders. All TRWC projects are done in partnership with other organizations. Historically, the Council has worked closely with public land and natural resource management agencies. However, recently the Council's focus has shifted to engaging homeowner associations (HOAs) in invasive plant removal and native species plantings.

The Murrayhill Owners Association (MOA)[30] restoration project started out with neighborhood outreach. The October 2014 kick-off for the basin wide Tree for All planting event attracted at least 100 people including local dignitaries from the City of Beaverton, Clean Water Services (CWS), and the Murrayhill Owners Association board. The event gave neighborhood attendees, volunteer planters, and restoration groups an opportunity to mingle and exchange ideas. The event attracted a number of groups who had not previously been engaged in restoration, including members of the Somali community and students from the Cascade Environmental Corps and Southridge High School. As April explains, the contributions of each of the partners complemented each other, making it possible to do work that no individual partner could have done alone.

- The landowner (MOA) engaged the MOA board to take part in a larger and more participatory enhancement project. Their willingness brought other groups in and supported an interest in conservation and sustainability, and the interest to promote an educational element for the Murrayhill owners. Landowners are essential to any enhancement activities since enhancement is occurring on their land and needs to meet their goals.

[30] The Murrayhill Owners Association was formerly the Murrayhill Homeowner Association.

- Oregon Watershed Enhancement Board (OWEB) provided the grant funding secured through TRWC to remove and treat the invasive weeds found in the 8.6-acre project area.

- The City of Beaverton had a long-term working relationship with MOA. They provided mulch, a staff member, porta-potty, and other resources for the project.

- Clean Water Services brought technical, project, and restoration experience to the project. Their staff developed a planting plan with the types of plants and where they should be planted. They also furnished the plants and plant protection materials.

- Friends of Trees provided outreach for the planting event. They went through the neighborhood with door tags and invited several organizations to participate in the planting event. At the event they directed and organized the volunteers in how to install native shrubs and trees and mulch the plants once installed.

- The Cascade Environmental Corps provided additional on-the-ground types services, such as additional plantings and mulching.

TRWC often plans projects so that a contractor can perform similar tasks on several projects that are located close together. April coordinated with the contractors concerning their availability and made sure the landowner and MOA was aware of timing so there were no surprises.

Neighborhood walkers frequented one Murrayhill restoration site, which soon became a public window into the progression of urban restoration over the course of the two-year project. The MOA put up signs to explain the restoration process in the hopes of encouraging passersby to apply restoration practices, such as replacing English ivy and blackberry plants with native plants, to their own properties. April reports that the project has, indeed, resulted in behavioral changes:

> One of our TRWC members has said that when she starts on invasive species removal projects in the Tigard area, she always notices that the neighbors across the way watch the work for about six months, and then they take on some of those practices such as removing ivy or blackberries on their property.
>
> After TRWC started working in the Bonita area on two MOA owned pieces, some of their residents said, We really like what's going on across the street…we'd like to participate next time this grant is available. Now we are working with adjacent landowners who are MOA members.

"Working Together" is TRWC's guiding philosophy, where partnering is the cornerstone of their support for restoration work in the Tualatin basin. April believes that widespread participation in projects such as the one at Murrayhill is a critical factor in ensuring the long-term success and sustainability of restoration throughout the Tualatin watershed. She talks about why the Council incorporates strong participatory involvement in their mission:

> Working together is always a Council goal. We're composed of agencies, organizations and individuals. The rationale is that, when we have this broader base we can hear everyone's concerns, issues, and suggestions, we'll be able to come up with better solutions. It's always

> important when you want to accomplish something to have everyone thinking that this is a good idea and good direction moving forward.
>
> We think there's incredible value of having broad participation in a project. I realize it may take a little more time up front in defining roles and figuring out who might be best for each component of the project. As the saying goes, If you want to go fast you go alone; if you want to go long-term you go together. For longer lasting multiple benefits of communication and physical on-the-ground results, we live in a world where we all need to be involved and it's important to hear all viewpoints.

Stakeholder inclusion helps make both the concept and act of restoration more relevant to participants' lives. By working together with a broad set of stakeholders and community residents, the TRWC facilitates efforts by local agencies, volunteer groups, and residents to improve the ecological conditions of the places where they live, work, and play. At the same time, the TRWC also helps build social capital by bringing together a diverse set of people to work toward achieving a common goal.

Mini-case study 4 - Growing Green

Centro Cultural (Centro) promotes Latino culture and empowerment in Washington County. The Tualatin Riverkeepers (TRK) seeks to protect and restore the Tualatin River. The Muslim Educational Trust (MET) aims to increase understanding of Islam while serving the needs of the Portland metro area's Muslim community. So, given these seemingly unrelated missions, why and how did these three organizations recently form a collaborative partnership to co-develop and co-host Growing Green, an urban forestry jobs training program for the Latino and Muslim communities of Washington County?

Mike Skuja, Executive Director for TRK at the time of our study, saw Growing Green as an opportunity for his organization to provide Muslim and Latino immigrants with a meaningful way to connect with the river.

> Part of the reason we started this jobs training is we wanted to give them exposure to jobs training and skills sets related to environmental training. The tree planting is great but sometimes it's hard to get a broad coalition of people there. I would say that you really just have to make the time to make the connections with the people and the other organizations. And try to understand it from their side of things. I think there are limits to saying, Okay, let's just invite more people from different cultures to plant trees with us. Planting trees is great, but it's not the end all.
>
> And when you really want to look at creative ways to engage communities, especially some of the ones that we've been working with, it's been helpful to listen to them and their priorities. And so they're like, Yeah, we would love some environmental jobs training. How would that work out? And so that's where this came about. And so for us, if our mission is the river, trees are good for water quality. Well, can we do some jobs training around trees? Well, sure. We know a ton of urban foresters. So that's how that came about.

Rania Ayoub, MET's Director of Public Relations, saw Growing Green as an opportunity to provide Muslim immigrants with job skills that could help them find work and adapt to their new life in Portland.

> Mike approached us about the urban forestry training when he was applying for a grant from Metro. The initial idea was that the grant would support five students from MET and five from Centro Cultural to get training in urban forestry. We really appreciated the project. Many immigrants don't go into the field of forestry; most tend to go into engineering or become doctors or lawyers…They came [to the United States] with their own degrees, but it was hard for doctors, engineers, and professors to translate their skills and experiences to here.
>
> When Mike came to us, he said, This will be a chance for students to be paid to attend the classes. There will be 50-plus hours of training and then TRK will place them with employers. I thought it was a great way to get the Muslim community to get a foot in the door through training and employment. It is a way for them to figure out how to navigate the system.

For Juan Carlos Gonzalez, Development Director for Centro, partnering on the Growing Green project was a way to give Centro's staff an opportunity to learn more about green sector jobs, and to give Latino residents a chance to meet urban forestry professionals and get a sense for what the opportunities are in that field.

> Being in this program has given our community a chance to learn about what makes Oregon tick. It strengthens our professional relationships. I'm not sugar coating the obstacles that we had, but the relationship building is the most important aspect...I appreciate having the chance to work on this project. We got a good return on our investment. We have a better understanding of the green sector, which is important because of our small entrepreneur program, and we are meeting professionals in the field.

Juan Carlos went on to explain that each of the contributors brought different resources and knowledge to the table, thereby creating efficiencies in getting the work done.

> For the Growing Green project, the funder was Metro, the main contractor was TRK, and the sub-contractors were Centro and MET. Metro's interest in the project was equity. TRK had the capacity to be innovative, and MET and Centro had the connections into the communities. TRK wasn't trying to re-invent the wheel – they recognized that the most efficient use of their funds was to leverage the hubs. So we manage the relationships.

The Growing Green partners adopted a participatory approach to designing, implementing, and evaluating the project. Ayoub describes the process of working together:

> Mike had a very good plan; he had a draft proposal already developed. So in terms of the curriculum, he had it set up when he came to us. For us, it was more about, How do we go about doing this? We helped with designing the structure. We met together to work out what the program would look like.

Juan Carlos described the first year of Growing Green as a learning period, and explained some of the changes the team was planning to make in the second year based on what they'd learned:

> This year we'll do things differently. We had 10 modules and offered a module 2 times per week, one at MET and one at Centro. This year we'll do 5 at CC and 5 at MET. We'll try to integrate the Latino and Muslim students, so that we can build community.

Although Growing Green experienced a few hiccups during its first year, overall the experience was positive. The number of applicants surpassed the expected demand and local employers hired several students once the course was done. Ayoub reports that from MET's perspective the collaboration has been successful.

> I thought the students were very happy. All five were placed. One continued on with one of the cities after the internship was done. That's a great accomplishment. A lot can happen outside of what you anticipate. We're seeing that happen – we didn't expect that one of the students would continue on in their job, though we had hoped that might happen. For others who didn't get jobs, it opened up their minds.

She added that having a partner familiar with the urban forestry sector was essential:

> It was critical to have Mike there to start it. We don't have the capacity to start something like this. He has the connections that we don't have into urban forestry. It's a great opportunity but we needed someone to be in the leading place.

Ayoub also saw the partnership as having longer-term and broader social impacts as well.

> The broader benefit for the employers is that they get free labor, plus a more diversified work force. It gave them a taste of what it would be like to be more diverse. I think it was important also for them to see that Muslims and Latinos care about the environment. There was some indirect learning there, changing people's hearts and minds about Muslims and Latinos. I feel it is a great way to do outreach… we're hoping it will lead to replication; that other groups will be inspired to do something similar.

Indeed, the prospects are good that the program will continue to grow: In 2017, the team successfully campaigned to raise funds to set up a similar training program through Portland Community College where students can get college credit for their participation.

Mini-case study 5 - Greater Forest Park Conservation Initiative

The Greater Forest Park Conservation Initiative (GFPCI) is the brainchild of the Forest Park Conservancy (FPC), a nonprofit organization that brought together partners to form the Forest Park Alliance (FPA) in 2010. This group of government agencies, conservation groups, neighborhood associations, and university research institutes, led by FPC, developed the strategy of a 20-year initiative to restore 15,000 acres including Forest Park and public and private land around the park.

Partners of the GFPCI
Forest Park Conservancy
W. Multnomah SWCD
Metro
Portland Bureau of Environmental Services
Portland Parks & Recreation
Friends of Trees
Audubon Society
Columbia Land Trust
Forest Park Neighborhood Association
Linnton Neighborhood Association
Intertwine Alliance
PSU Institute for Sustainable Solutions
PSU Institute for Economics and the Environment
Oregon Department of Forestry
Skyline Ridge Neighbors
Neighbors for Clean Air

Viewed by many residents as the crown jewel of Portland's greenspace system, Forest Park also functions as an important corridor connecting coastal fish and wildlife with the Willamette Valley. However, as FPC's Executive Director, Renee Myers says, "the park does not exist in a vacuum: What happens in the park affects the area around it and

conversely, what happens outside the park, affects conditions in the park."

Recognizing the importance of these connections, the Forest Park Conservancy began the Greater Forest Park Conservation Initiative partnership as a way to work more effectively on achieving common goals across the landscape. One of the first tasks they set for themselves was to draw boundaries that would define where to focus actions taking place as part of the GFPCI. Through this process, they identified a 15,000-acre area encompassing Forest Park, private residences, industrial businesses, and farmland that surround Forest Park for the GFPCI's attention.

After completing the 85-page strategy document and implementing a number of projects, the Forest Park Conservancy, along with key partners, next embarked on developing a 5-year strategic action plan to guide its fundraising efforts and prioritize its on-the-ground activities. Renee Myers, Executive Director of the Forest Park Conservancy likened the FPC's role vis-à-vis the GFPCI to that of The Intertwine Alliance's role relative to the Intertwine region. She said,

> The FPC is the backbone for the Greater Forest Park Conservation Initiative. Someone has to convene meetings and bring everyone together. That's the biggest part of our mission: restoring, protecting and connecting people to nature.

Although getting funding was challenging at first, Renee noted,

> As the collaborative has grown, we have gained more clarity and have become more successful at getting multi-year grants from government agencies but we have more funds to raise to fully enact our strategy.

She clarified this by saying,

> By getting organized I mean coming up with the 5-year strategic plan as a way to focus the GFPCI, setting roles and responsibilities, and developing budgets.

After four successful years implementing the GFPCI, the Forest Park Alliance is ramping up its fundraising and implementation. Its members have decided to take another step toward formalization by creating an Advisory Committee and sub-committees that meet on a regular basis. Each of the GFPCI's original 10 members has a representative on the Advisory Committee. The Advisory Committee's decisions are based on consensus. Until recently, GFPCI members felt that a formal memorandum of understanding was unnecessary, but as they move into more complex activities, they are re-considering that decision as well.

Members of the GFPCI are not letting planning stand in the way of taking action. FPC partnered recently with the Oregon Department of Forestry (ODF) and West Multnomah Soil and Water Conservation District (WMSWCD) on a successful application for a community forestry grant to remove forest canopy weeds in the park and on surrounding private lands. Each partner brings a different set of skills and knowledge to the project. ODF provides fire education to private landowners; WMSWCD works with landowners on stewardship plans; and FPC organizes the removal of canopy weeds. "Without that partnership," explained Renee, "We couldn't have gotten that grant. You have to have partners." And getting the community involved, she added, "is critical to protect the boundaries of the park."

However, she acknowledges that there are also challenges with working collaboratively.

> One thing about working on projects collaboratively is that you aren't independent. So you have to communicate and stay engaged. You have to stay integrated and actively learning how to work together.

The GFPCI has also taken steps to keep track of the impact they're having and improve the members' ability to learn from each other and share information. With funding from Metro, FPC recently led a project to create a Unified Monitoring Protocol aimed at providing a standard vegetation monitoring framework for restoration projects. GFPCI members developed a set of measurable outcomes collaboratively, and all GFPCI members have agreed to follow the protocol. "We can take that data and analyze it," says Renee, "That will help us as time goes on."

Now that they've completed the vegetation monitoring protocol, the GFPCI is thinking about how to identify and measure the social outcomes of their projects. Renee acknowledges that this is more challenging than coming up with measurable ecological outcomes. The GFPCI is interested in figuring out how to put an equity lens on the work that they do, and has started to ask questions such as, "What community organizations do we support? Should we be working on expanding the availability of green jobs?" Renee describes the members as "very accepting" of this new direction:

> I think once we develop the equity lens, we will be stronger. Having a broader and more diverse partnership will make us stronger. Even if someone never goes to Forest Park, they still benefit. It would be useful to have a broader membership. We need to have all communities having a seat at the table…Right now we're in the process of listening and trying to hear what people want.

Her own organization, the FPC, has long embraced collaboration. Renee explained,

> "This is collectively what we do; everyone is aware of what we're doing, all of us—even our board. It's not just the executive director, not just the staff. It's the board and our lead volunteers. We're still working on better ways to get there."

Part 3 - Key themes identified through the interviews

Drawing on the interview data from the three in-depth case studies and five mini-case studies, as well as additional interviews with key informants knowledgeable about collaborative conservation partnerships in The Intertwine, we identified key points related to six thematic areas listed below.

- Benefits of collaborative partnerships
- Assessing project outcomes
- The roles and importance of diversity in collaborative partnerships
- Role of collaboration in scaling up conservation
- Characteristics of effective collaborative partnerships
- Challenges for collaborative partnerships

Benefits of collaborative partnerships

The benefits of collaborative partnerships identified during the interviews fell into three main categories: Ecological benefits, direct benefits to the partnering organizations or the partnership as a whole, and broader social and economic benefits. Each of these is discussed below.

Ecological benefits

In all of the Tree for All cases, the ecological benefits—more native plants, lower water temperatures, greater species diversity, better water quality, etc.—were the main goals of restoration work. It is clear from the interviews, our field observations, and monitoring data that the case study projects have had significant positive impacts on environmental conditions. Watershed-wide, TFA projects resulted in the planting of more than 7.5 million trees and shrubs between 2005 and 2016 (Figure 16). During TFA's tree-planting campaign to mark its 10-year anniversary in 2015, the extent of local support for TFA was such that nearly two million trees were planted, twice the number initially targeted by the campaign. Importantly, as the examples from the case studies illustrate, the impacts have been transformative rather than incremental. Anthropogenic simplified ecosystems now look and function more as the complex ecosystems they once were, with wildlife and bird populations returning or increasing and streams reconnecting to their floodplains. A LiDAR image showing the changes in vegetative cover along Fanno Creek between 2008 and 2013 provides a visual sense of the environmental impact that TFA projects have had (Figure 17).

It is difficult to determine which of these benefits would have occurred without the partnerships, but, as the case studies make clear, restoration would have taken much longer to accomplish without partnerships, and in some, the work might not have occurred at all. Without the incentives CWS provides to farmers through the ECREP program, the number of farmers participating in stream bank restoration programs and the number of acres enrolled in restoration agreements would have increased at a much slower rate. Because property ownership is split between two owners in the Jackson Bottom Wetland, a partnership involving CWS and the City of Hillsboro was vital to getting the work done. That TRNWR has become the "poster child" of the USFWS' urban refuge program is clearly attributable to the close and long-term collaboration between USFWS and the Friends of the Refuge, as well as less close, yet still important, partnerships with other groups such as TSWCD, CWS, Friends of Trees, Tualatin Riverkeepers, and others. And, in the absence of partnerships, THPRD would have lacked both the human and financial resources needed to restore significant portions of public land along Fanno Creek.

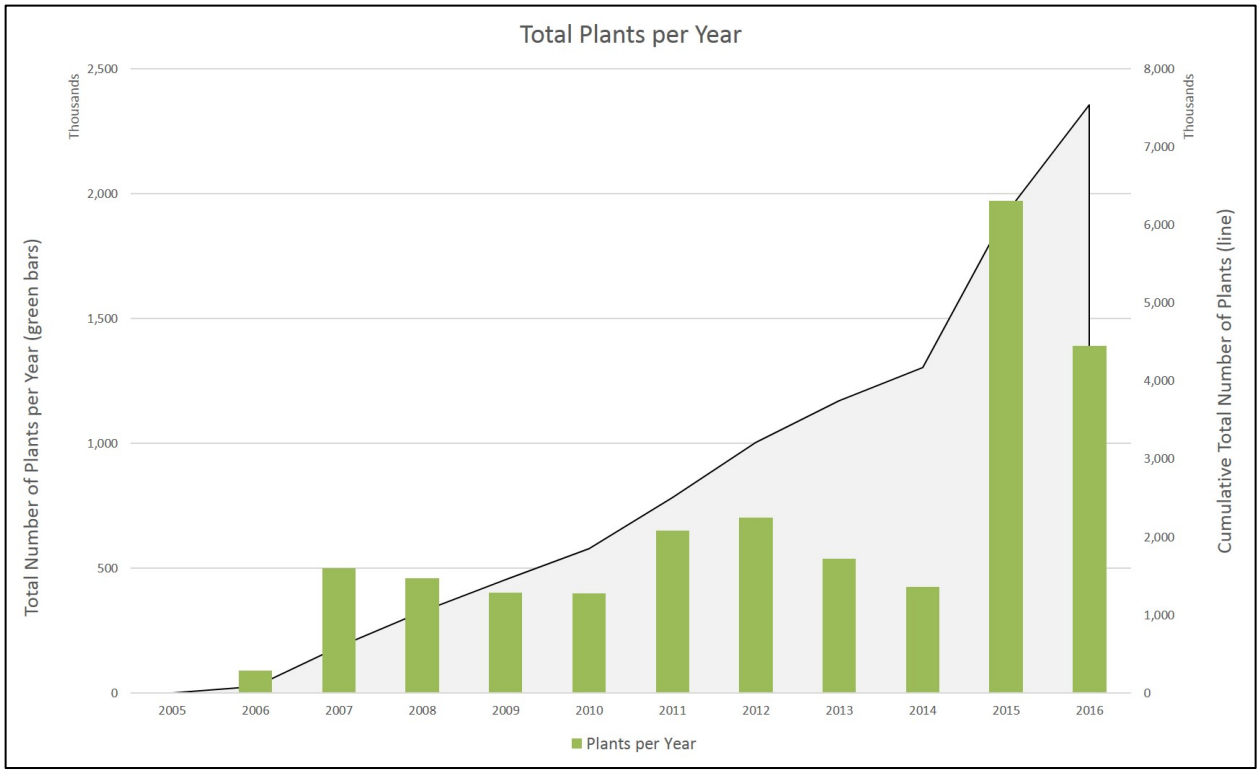

Figure 16 – Number of plants planted through TFA between 2005 and 2016; total number of plants planted per year is indicated along the left-hand side of the graph; the cumulative total number of plants is indicated along the right-hand side of the graph. Source: Clean Water Services.

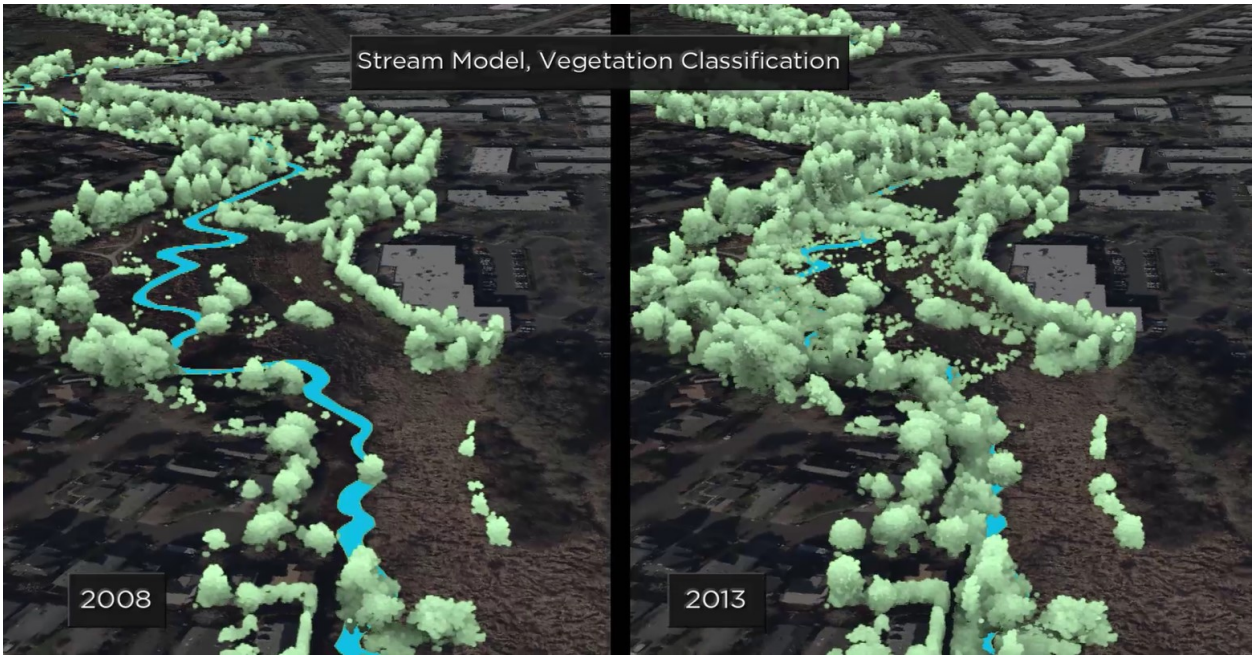

Figure 17 – LiDAR image showing the change in tree canopy cover in the Fanno Creek-Greenway area between 2008 and 2013. Source: Clean Water Services

Benefits to partnering organizations

Partnering benefited organizations participating in TFA projects in several ways. In all cases, partnering expanded and diversified the resources available to participating organizations. In some cases, partnering also catalyzed organizational changes needed for the partnering organizations to be more effective.

Funding: In all of the cases, collaboration enabled partnering organizations to expand their access to funding. Increased access to funding through partnerships was particularly important to smaller community organizations which often had limited capacity to do grant writing or grants administration. Interviewees working for organizations with significant amounts of in-house funding, such as THPRD, CWS, and the larger cities, indicated that partnering with other groups had enabled them to leverage their funds into much larger amounts. This was particularly important for major capital improvement projects, such as the installation of a bridge in the Fanno Creek Greenway, which involve costs that even relatively well-funded organizations cannot cover through in-house resources. Additionally, interviewees working for government agencies indicated that partnering with community organizations enabled them to access funds that only non-profit organizations were eligible to receive. Typically these were mutually beneficial arrangements because government partners often provided some or all of the matching funds needed for a successful grant proposal.

Labor: Many of the interviewees cited increased access to labor, whether to professional contractors, professional staff, or volunteers, as an important benefit of TFA partnerships. CWS played a critical role in providing restoration contractors to do site preparation and, in some cases, planting and maintenance. CWS' willingness to take on the task of locating and coordinating restoration contractors to do site preparation, planting, and maintenance was one of three critical factors[31] that made participation in the ECREP and VEGBAC programs feasible for most farmers. Even organizations such as THPRD, which has in-house greenspace maintenance crews, indicated that having access to highly skilled professional restoration contractors through CWS had greatly enhanced their capacity to meet restoration objectives. Partnering also enabled organizations to distribute work responsibilities, such as grant administration or project administration, leading to less duplication in workloads and overall more efficient use of labor and funds.

In all of the cases except the ECREP program, partnering greatly expanded participating groups' access to volunteers. Most often volunteers in TFA-related projects have been engaged to plant trees, but their roles also have included wildlife monitoring (Jackson Bottom Wetlands) and restoration planning and community outreach (TRNWR). Partnering has not only enabled groups to have access to more volunteers, but it has also made it possible for them to have access to better trained volunteers. In this respect, partnering with Friends of Trees, which provides volunteer crew leader training as well as helping partners with volunteer recruitment, has been particularly beneficial for many groups.

A theme emerging from many of the interviews was that it is important to recognize the costs, as well as benefits, associated with using volunteers rather than in-house staff or contractors to do restoration work. To make the best use of volunteer labor, many of the groups hire contractors or use city maintenance crews to plant trees on very steep ground and do site preparation, tasks which are typically very strenuous or physically risky. They focus volunteer efforts on less rigorous and safer tasks, such as planting trees on gentler slopes or monitoring wildlife. Some interviewees

[31] Funding and native plants were the two other critical factors.

questioned whether the use of volunteers provided any labor or cost savings. However, as discussed further on in this section, these interviewees believed that engaging volunteers was important for other reasons.

Expertise: Besides funding and labor, interviewees emphasized that partnering allowed them to gain access to different types of expertise than if they had worked alone. For some groups, this resulted in a cost savings as they would otherwise have had to hire consultants or contractors to get the job done. For others, having access to other partners' expertise meant the difference between being able to participate in restoration activities or not. In particular, numerous interviewees stated that Clean Water Services brought vital technical expertise to restoration projects, expertise that allowed for more successful projects than if the partnership had not happened. Friends of Trees expertise in training volunteer crew leaders and staging volunteer tree plantings was also mentioned as critical by many interviewees. Also important was the opportunity that partnering opened up for individuals to learn new ways of managing storm water and stream bank erosion, as well as innovative approaches to restoration.

Supplies and equipment: Partnering also expanded participating organizations' access to supplies and equipment needed to implement restoration projects. In all of the TFA cases, interviewees described CWS' provision of native plant materials as critically important. In some cases, such as the ECREP program, having access to plant materials through CWS was absolutely essential and very likely meant the difference between farmers agreeing to participate or not. For some of the other cases, such as the Fanno Creek Greenway Complex projects, CWS' provision of plant materials was less critical but was nonetheless important as it saved partners considerable time and money.

Social capital (within the partnership): An important benefit associated with the TFA partnerships was the opportunity they provided for groups to become connected with other organizations through their partners. These new connections often led to more collaboration and more and better projects for their organization.

Organizational change: An important, but often unexpected, outcome noted by interviewees was change in the culture of their organization that accompanied working with partners. Staff members have had to learn how to operate differently and in a more flexible manner when working in partnerships. There was also an indication of partners becoming more open and wanting to know more about the communities and organizations they have partnered with, being willing to look for diverse benefits from restoration work outside the narrow mission of their organization. For example, an interviewee stated that his organization in the past only thought about the ecological and technical science behind conservation, but employees are now also thinking about how to cultivate an appreciation of nature and facilitate connections to nature in culturally relevant ways.

Broader community benefits

Interviewees described a variety of broader community benefits associated with the restoration partnerships in which they participated. We focus here on three of the most frequently mentioned benefits.

People-nature connections*:* One of the most common broader community outcomes of restoration mentioned by the interviewees was that they helped build and strengthen people-nature connections. Many felt that it was particularly important that such connections be built among youth; and, as a result, most of the projects sought to engage schools in some aspect of restoration. Typically this took the form of either students providing volunteer labor at planting events or

classrooms engaging in wildlife or other types of monitoring programs. A related theme was that strengthening people-nature connections did not end once the restoration work was done. Indeed, many of the sites that were targeted for restoration have subsequently become attractive to people seeking outdoor recreation opportunities, while others, such as JBW and TRNWR, now offer extensive nature interpretation programs.

Learning about and support for conservation: Interviewees in all of the TFA cases perceived collaborative partnerships as beneficial in part because partnering enabled them to broaden and deepen community awareness of and support for restoration. Interviewees talked about the importance of carrying the stewardship ethic forward in their communities, and the need to diversify the people reached within their communities. They believed that partnerships helped with this because of the ability of different partners to reach out to different groups of people. Several interviewees noted that reaching a broader audience was especially important in light of the increasingly diverse ethnic and racial composition of Washington County and the Portland-Vancouver metropolitan region. A number of interviewees believed that it is likely that people who perform volunteer work, either through a nonprofit like Friends of Trees or through a volunteer effort organized by their employer, are more likely to vote to support those projects in the future. Additionally, there was a strong belief that connections with nature and general civic-mindedness created through participation in restoration efforts, especially among local children and under-represented groups, will have a large payoff in the long run through increased support for the environment. Figure 18 illustrates the range of perceived benefits from enhancing community awareness of conservation and engagement in restoration work.

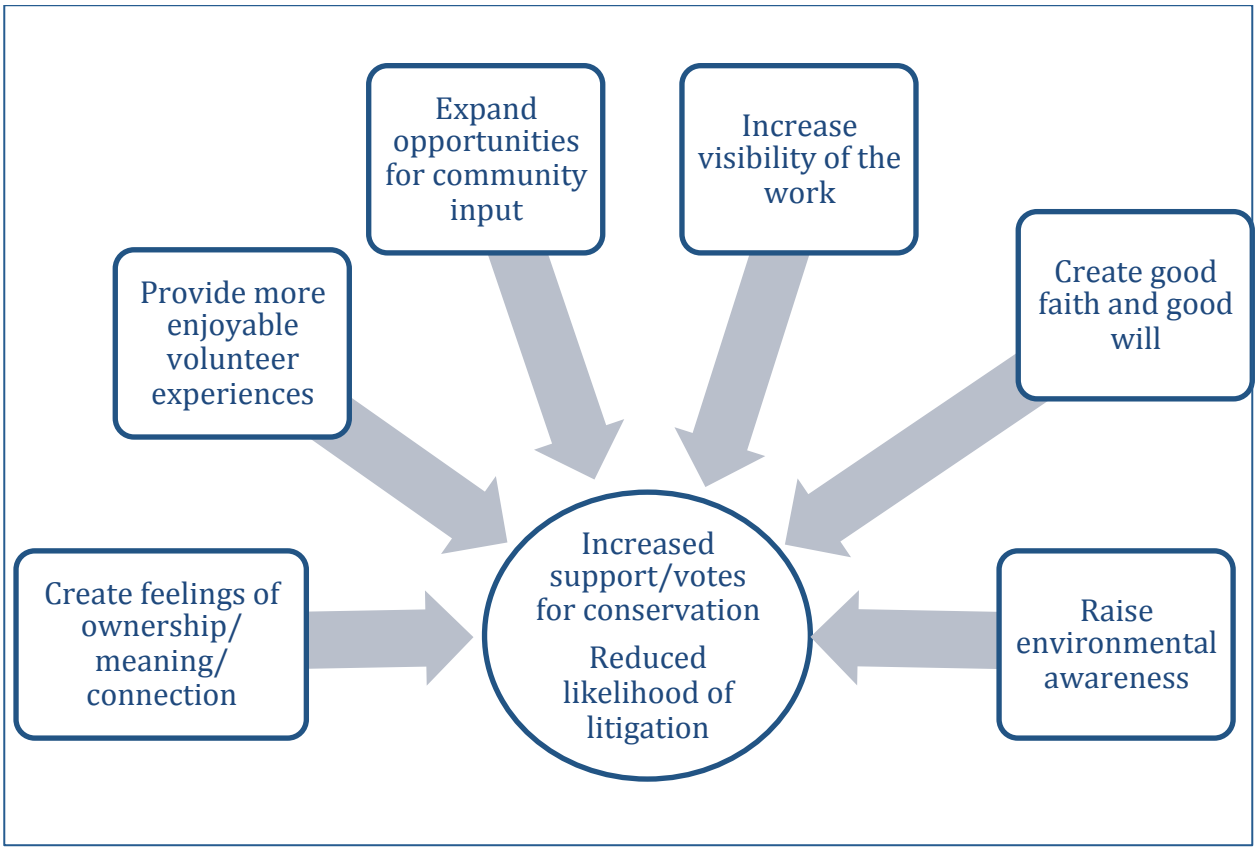

Figure 18 – Perceived benefits of partnering with community groups and engaging community members in restoration

Economic benefits: Individuals working in or closely with the private sector emphasized that collaborative restoration projects implemented through TFA partnerships had positive economic impacts. Individuals active in city and regional planning described the restoration of greenspaces, such as the Jackson Bottom Wetlands, as an economic development tool that could be used to attract businesses whose employees placed a high value on quality of life and having easy opportunities to access nature. Individuals working in or closely with restoration contracting firms emphasized how TFA's watershed-wide focus created a demand for more efficient restoration practices, a demand which in turn catalyzed the emergence of a thriving restoration industry in and around the Tualatin Valley.

Assessing project outcomes

Environmental outcomes

TFA partners have taken several approaches to measuring the environmental outcomes of their restoration projects. At the site-level, CWS measures changes in the amount of water covered by shade from the trees and shrubs planted in various ecological systems (i.e., marshlands, riparian areas, wetlands, and uplands), changes in mature canopy coverage, and changes in the percentage of plants that are native or invasive. Through a collaborative partnership with US Geological Survey, CWS also supports the monitoring of water quality and biological indicators at various points in the Tualatin River watershed. Most of the groups that participated in the interviews rely upon CWS data to track the environmental outcomes of their projects. Some groups, such as TSWCD, the City of Beaverton, and THPRD, among others, also do post-planting site checks. However, these tend to be qualitative and tracking is more ad-hoc.

Other organizations active in measuring environmental outcomes, such as the Audubon Society of Portland and Ducks Unlimited, have focused on measuring changes in the populations of specific species, species diversity, and amount of native habitat available. They emphasized that a fully functioning system with regional connectivity and a large variety of native species is healthiest, but that it's more challenging to measure connectivity and system function than species presence and population sizes. They considered the presence/absence of indicator species to be a useful measure of healthy environments, especially when those species are looked at in the context of a food web. An example is the Northern red-legged frog that is monitored at the Jackson Bottom Wetlands, because this species requires native plant communities for reproduction. Both the frogs and their predators are monitored; increases in both show that the wetland restoration work is helping native species to bounce back. As illustrated by the Fanno Creek case study, beaver have also returned to the system, a sign of improvement in their habitat.

Our study revealed the presence of a wealth of tools available for monitoring and evaluating environmental outcomes of conservation projects in The Intertwine, particularly at the watershed scale. Clean Water Services' Healthy Stream Plan published in 2005 provides baseline data at the watershed level for the Tualatin River watershed. In 2006, Metro published the State of the Watersheds Monitoring report (Hennings 2006). This report provides a set of environmental indicators for assessing watershed health within the Metro region as well as baseline conditions present at that time. It therefore can be used as a tool for evaluating whether improvements in environmental conditions have occurred at the watershed level. Since 2010, the City of Portland Bureau of Environmental Services has monitored habitat, water quality, hydrology, and fish and wildlife indicators through its Portland Area Watershed Monitoring and Assessment Program (PAWMAP) (BES 2015). Also relevant is the Greater Forest Park Conservation Initiative's Unified Monitoring Protocol for the Greater Forest Park Ecosystem (Forest Park Conservancy et al. 2016).

Portland Audubon Society and Xerces Society have partnered to monitor wildlife at TFA sites. These and other regional biodiversity survey efforts already are in place and provide data and information that can support further efforts to quantify environmental outcomes, a task that was beyond the scope of this exploratory project.

Other documents mentioned by interviewees as useful for guiding efforts to assess environmental outcomes included The Intertwine Regional Conservation Strategy (The Intertwine Alliance 2012a) and its companion document, the Biodiversity Guide for the Greater Portland-Vancouver Region (The Intertwine Alliance 2012a), Willamette Partnership's habitat (http://willamettepartnership.org/market-tools-rules/habitat/) and water quality (http://willamettepartnership.org/market-tools-rules/water-quality) assessment toolkits, the Oregon Conservation Strategy's monitoring guide (ODFW 2016), the USFWS North American Waterfowl Management Plan (https://www.fws.gov/birds/management/bird-management-plans/north-american-waterfowl-management-plan.php) and related conservation plans and assessments, and OWEB's project and watershed assessments (http://www.oregon.gov/OWEB/MONITOR/pages/index.aspx).

Despite the wealth of tools available for measuring environmental outcomes, several interviewees believed that assessing environmental outcomes in the short-term is problematic because many improvements happen over a long time scale. This is especially true for benefits associated with trees, because of the time it takes for many native tree species to grow. Additionally, it takes time for enough of the landscape to be restored for benefits to become noticeable. Also problematic is the presence of confounding factors, such as urban development and climate change that influence environmental variables that make sifting out the impact of restoration activities challenging. Lastly, several interviewees believed that the current emphasis within the TFA program on measuring increases in shade coverage over water was in need of rethinking. They believed that the volume of stored water in side channels is more relevant than shade on the water.

Impacts on partnering organizations

None of the organizations had in place a systematic process for measuring the impacts of collaborative partnerships on their organizations. However, several noted that the persistence of a partnership is an indicator that individuals and organizations find it useful enough to continue investing resources and time in it.

Social and economic outcomes

All of the interviewees believed that social and economic outcomes of restoration projects were important to assess, but none of the organizations had established systematic processes for collecting such data. Interviewees cited the difficulty of coming up with appropriate indicators and ways to measure them in a cost-effective manner as a major barrier to being able to assess social and economic outcomes. They also voiced the need for assistance in figuring out how to measure the social and economic benefits of restoration work, effectiveness of collaborations, increases in social connections, and changes in connection to nature within the community.

Linking collaboration to outcomes

There was general agreement among the interviewees that the contribution of collaborative partnerships to restoration outcomes is very difficult to measure. As one interviewee stated, it's possible to measure changes in water quality and habitat health but it's very hard to know if or how

these are connected to collaboration. This is equally true for social and economic outcomes. However, there was general agreement that it was important to develop ways to measure these outcomes as restoration in the Tualatin River watershed moves into a new phase.

Issues associated with assessing outcomes

The interviews revealed that many of the groups participating in TFA projects had a clear sense of how to go about measuring the environmental outcomes associated with restoration activities, even if they lacked the resources to do so themselves. Many groups had in place protocols and processes for collecting the data needed to measure those outcomes in the short and long term. In contrast, systems for measuring and evaluating social and economic outcomes were, for all practical purposes, non-existent.

However, even though much monitoring of environmental indicators took place, it was unclear what happens to the data once it is collected or whether and how it is shared with other groups, internal or external to the partnerships. One land manager summarized this saying, "For us, we manage the land for the species, and for the species we have a process for judging success. But we struggle as an agency with tracking and keeping good databases." Additionally, it was unclear whether all groups were actually measuring outcomes – when asked to describe the measures they used to tell whether their goals were being achieved, some interviewees listed outputs, such as number of trees planted, stream bank miles restored, and number of volunteers participating in planting events, rather than outcomes. Several interviewees indicated that their efforts to track indicators or analyze changes in variables over time were limited by lack of funding and expertise in how to do that. Others noted that social and economic outcomes were difficult to measure, and that they had yet to come up with appropriate measures.

There was general agreement that having data about outcomes, whether environmental, social, or economic, is important. Interviewees felt that providing evidence that their activities had a positive impact on the environment increased political support for their programs and the amounts of funding available to them. Additionally, they described having data about outcomes as important for helping them improve their approaches to restoration and enabling them to learn more about ecosystem functions. Interviewees emphasized that any effort to develop measures for social outcomes would need to include both qualitative and quantitative measures. Some stressed the importance of using mixed methods for assessments. One interviewee argued that stories were important assessment tools because "the quantitative is the what, but the qualitative is what tells you how." Some of the questions key informants identified as important to answer when developing outcome measures are listed in Box 8.

Box 8 – What do we need to measure?
What is our goal? What do we want to know? What benchmarks should we use? How do we measure broader outcomes? How do we reach agreement on what to track? Do we have the right data collection system in place? How will we use the data to shape decisions?

The roles and importance of diversity within collaborative partnerships

Most of the interviewees believed diversity was an important quality of viable partnerships. This was often expressed as a general feeling that diversity was good, and of there being incredible value in having broad participation in projects. Six major themes emerged related to diversifying partnerships:

1*) Diversity increases the scale and quality of conservation outcomes by expanding the types of expertise, skills, and resources available to the partnership*. Some partners bring technical skills related to biology or hydrology; others have expertise in outreach to the community or fundraising. Having access to different sources of funding was also mentioned as a benefit of having diverse types of organizations participating in a project. Broadening the range of resources the partnership has access to in turn enables it to expand the geographic scale over which it operates; bringing in partners with new ways of looking at things or different types of knowledge facilitates innovation, leading to better quality outcomes.

2*) Diversity allows the partnering organizations to serve a broader segment of the communities in which they operate.* Many of the interviewees worked for organizations that were seeking to involve communities of color in restoration projects; some groups that had historically been oriented primarily to serving rural populations also were seeking to diversify into serving urban residents. Still others had expanded their partnerships to include organizations serving children and youths as a strategy for engaging younger people in conservation activities.

3) *The impetus for diversification of partnerships varies considerably.* Many interviewees working with mainstream conservation groups alluded to Washington County's increasingly ethnically and racially diverse population as the impetus for reaching out to groups representing communities of color. For some, diversification to include partners advocating for these groups was seen as a strategy for ensuring long-term support from an increasingly diverse population for conserving and enhancing greenspaces. Some interviewees viewed diversification as important for equity reasons, and a means to achieve a better balance in how conservation benefits and costs are distributed. Others saw diversification as an avenue for empowering communities whose voices, needs, and concerns have traditionally been unheeded by mainstream conservation organizations and government agencies.

Conversely, interviewees working with groups advocating for communities of color saw partnering with mainstream conservation groups as a way of getting across the message to the broader community and government agencies that there are many ways of connecting with nature and that environmental stewardship can take many forms. They also indicated that partnering with mainstream conservation groups had provided them with access to resources that they would otherwise have had difficulty obtaining, and which had enabled them to achieve goals that were important to their constituencies.

4) *Diversity in partners may, in some cases, be the only way to make headway against otherwise intractable problems*. For example, one interviewee indicated that his organizations saw engaging with grassroots organizations as a means for generating the critical mass of support needed to get environment-friendly policies enacted. Another interviewee felt that engaging with more and different types of grassroots organizations was needed in order to accomplish restoration of private residential land on a broad enough scale to achieve healthier ecosystems.

5) *Diversification can be challenging and may require changes in individuals and organizational cultures*. Many of the groups included in the study were struggling with how to do a better job of working with communities of color and urban youth, two population segments with which they felt it was particularly important to engage. They emphasized that for such partnerships to be sustainable, mainstream conservation groups need to learn to listen to their prospective partners and make an effort to broaden their understanding of the ways in which people do or can connect

with nature. It also requires being willing to take the time to learn what a prospective partner's priorities are, as well as working together to identify mutually beneficial ways of meeting those priorities. Several interviewees said that their organizations had found that it was necessary to do a lot of internal work with staff, board members, and volunteers around what racial and ethnic equity looks like, and how to develop culturally sensitive ways of partnering with communities of color.

6) *Embracing diversity requires power sharing and attention to equity*: Interviewees associated with groups representing communities of colors stated that for them it was important that partnerships be empowering, with opportunities for them to participate meaningfully in all phases of a project, from design to implementation to evaluation. One interviewee who worked with a group advocating for communities of color noted that it was important for partnerships to be genuine, stating, "I'm not too comfortable if groups want to have us as a partner just for the names. I'd rather see fewer collaborations but true ones." True collaboration for her meant that the distribution of funding reflected the relative investment of time or resources that each partner contributed. It also meant that all partners were involved in all phases of a project from design to implementation to evaluation.

Metro's programs have played a particularly important role in providing support for culturally specific organizations to engage in conservation-oriented activities in the Tualatin River watershed and elsewhere in The Intertwine. Metro revised its Nature in Neighborhood's grants program subsequent to a 2013 levy that included an equity requirement. Since 2014, Metro has worked closely with culturally specific organizations, such as the Immigrant and Refugee Community Organization and Latino Greenspaces, among others to develop expand the capacity of these organizations to strengthen their community members' connections with nature. In describing how the process of working with culturally specific communities has affected the way Metro does business, one program manager said,

> Metro had to do a lot of learning to understand what a culturally responsive grant program would look like. It required listening to the community. It goes back to who is designing the project for the community being served. The communities were telling us, "to serve our community we need to design and deliver the services." So in the grant application we ask questions that get at what the community's role is in design and delivering services.

Underlying this approach is the recognition that there are diverse ways of connecting with nature, and that engaging communities in conservation activities is likely to be most effective when the communities involved have a role to play in determining what those activities should look like.

Role of collaboration in scaling up conservation

Collaborative partnerships can help expand conservation across a wider landscape than any one organization could do alone. This is especially true when organizations with different jurisdictional boundaries collaborate. Washington County is unusual in that the County boundaries are roughly the same as the boundaries of the Tualatin River watershed, but this does not mean there are not jurisdictional restrictions. Individual cities only act within their jurisdictions; managers of federal wildlife refuges can only act within their own property boundaries. But, through partnerships, the entities within Washington County have been able to collectively restore land over a wide area within the watershed.

Similarly to jurisdictional boundaries, property ownership divides landscapes. But, through partnerships, private and public land can be restored and preserved along a stretch of river to

provide habitat connectivity that would be impossible otherwise. The restoration taking place along Fanno Creek exemplifies the important role that partnerships can play in making it possible to coordinate restoration projects in a areas with a very heterogeneous land ownership pattern.

Interviewees also emphasized that different types of partnerships are needed for landscape-scale conservation than for site-specific projects. To achieve large-scale impacts, partnerships need to be more policy and programmatic-oriented. But, success won't come from only collaborating with large organizations. Local, site-specific knowledge is also necessary to achieve environmental outcomes at scale. Collaborations involving larger organizations that can think and act regionally working with smaller, local partners with site-specific knowledge and social connections have proved to be effective for achieving large-scale, high-quality results in the Tualatin River watershed.

An additional benefit of partnering is that the trust relationships that undergird viable partnerships enable organizations to shift from reliance on project-by-project agreements to the use of longer term intergovernmental agreements (IGA), or inter-organizational agreements more generally, to restore entire stream reaches that extend across multiple properties, saving time and administrative costs for the participating organizations. Restoration progress along Fanno Creek and of the Jackson Bottom Wetlands has been greatly enhanced by the use of IGAs.

Characteristics of effective collaborative partnerships

Several themes emerged from the interviews about what makes a collaborative partnership work. Each is briefly discussed below.

1. Trust: The first of these, trust, is something that was mentioned repeatedly. Trust is something that is built up over time through partnership, but also something that is necessary in order for a partnership to work. Types of trust mentioned include trusting someone else with your money, trusting that a partner will accomplish the work well, trusting that someone will do what they say, and trusting that partners will communicate effectively. Coupled with trust were the allied concepts of communication, mutual understanding, and respect. As stated by one of the interviewees: it's important to have trust upfront and to continue building trust by following through on the commitments that are made. Partnering can be more risky than working alone, so part of trust is being willing to take a risk for partners.

2. Flexibility and compromise: Many participants mentioned flexibility as a key to successful partnerships. Rigidity in some of the regulatory agencies was seen as a barrier that needed to be overcome in order for the partnership to work. One interviewee stated that flexibility is key to successful partnerships, that there needs to be give and take, and that compromise is essential. This includes experts being willing to listen to local people who have experiential knowledge and change how they do things in order to accommodate local desires. VEGBAC partners, in particular, thought this was important. In addition, it was recognized that the natural environment is constantly changing, so partners need to be willing to be nimble and change plans when necessary.

3. Commitment: Another theme had to do with willingness to take partnering seriously and dedication to partnerships. The more the participating organizations saw partnership as part of their core mission, the better the partnerships. This included taking a long-term perspective, and recognizing that although your partnership activities might not match up with your individual mission exactly now, in the long run the partnership will help you reach your goals.

4. Agreement on goals: A common thread through the interviews was the belief that having a shared goal was essential. In some cases, interviewees felt that partners needed to have a common vision; others felt that having a common vision was less important as long as there was general agreement that the project was worthwhile. In other words, a project might serve different ends for different groups, but for a partnership to work, all the partners had to feel that it was meeting some need of theirs. Interviewees felt it was important to identify areas where goals overlap, to build a common perspective in terms of how the partnership will reach its goals, and to align priorities and agree on the scope of the project. Visioning and prioritization processes, such as those that led to the development of the Tualatin River Watershed Action Plan, the 2005 Healthy Stream Plan, and the Regional Conservation Strategy, all played a critical role in building social capital and trust relationships that have enabled a broad spectrum of watershed stakeholders to work together over the long term to turn the ideas contained in these documents into action on the ground. Many of the current partnerships between Metro and CWS, for example, emerged as a result of those organizations and others working together to develop the Regional Conservation Strategy.

5. Knowing your limitations and the limitations of your partners: A key factor interviewees identified as essential to successful partnerships was to understand what your own organization's limitations were and also what constraints your partners work under. This was especially true when partnerships involved government agencies, which often have less flexibility in their operations than private or nonprofit organizations. Interviewees working for smaller organizations emphasized the importance of avoiding mission creep by learning to say "no". Establishing the roles and responsibilities of each partner early on, and being honest about your organization's limitations, was considered important for identifying what partners could realistically commit to.

6. Building a partnership culture: Partnerships, like any relationship, require that the parties involved learn how to work together productively. Interviewees stressed the importance of building a "partnership culture" by establishing good communications, following through on commitments, being willing to compromise, respecting that there are different ways of doing things, learning to listen to others, and not being territorial.

7. Nurturing relationships: Many interviews state that making the time to build and maintain relationships was an important ingredient of viable partnerships. Interviewees attributed the success of TFA partnerships to the fact that many of the partnering organizations belonged to other planning coalitions that brought them together face-to-face on a regular basis. Additionally, many of the individuals active in TFA projects have worked together for many years on conservation-related projects. Interviewees pointed out that strong partnerships were those in which partners gave each other adequate recognition and where partners could look beyond their own organizational goals and work toward reaching solutions that would also benefit their partners.

8. Communication: The importance of good communications in ensuring the success of partnerships cannot be overstated. Interviewees emphasized that establishing open channels for discussion, meeting regularly in person, and keeping your partners in the loop were all critical to a healthy partnership. Learning to ask questions early on and how to listen to others were also considered key ingredients for long-term sustainability of partnerships.

9. In-house support: A common factor in the case studies was that all of the collaborative partnerships enjoyed in-house support from upper-level management and boards of directors. Without such support, CWS staff would not have had the resources that have enabled them to provide the financial incentives that were key to the ECREP program's success; nor would they have been able to expand their capacity to provide technical assistance to partner organizations, or

invest in developing a native plant supply and restoration contracting network, all of which have proved to be critical for the success of projects along Fanno Creek, at Jackson Bottom Wetlands, and on the Tualatin River National Wildlife Refuge. In-house support was a critical ingredient in expanding the City of Tualatin's volunteer restoration program's capacity to recruit volunteers and increase by orders of magnitude the number of trees planted each year. Likewise THPRD, the City of Beaverton's Public Works department, and the City of Hillsboro Parks and Recreation department, all have benefited from support from upper-level management, making it possible for them to take the risk of investing time and resources in new approaches to greenspace management.

10. Community support: Without community support, partnerships may not get started or be sustainable. If someone has a good partnering experience they will communicate that positive experience to their social networks, making the partnership grow. Participating in activities that are not directly beneficial to your organization in order to build and strengthen relationships and foster community support can result in greater success in meeting your organization's goals in the long run and foster social readiness for innovative solutions to meeting broader community objectives. These objectives could include ecological, social, or economic or all three.

11. Fairness in the distribution of rewards to work: Another characteristic of successful partnerships was that the participants perceived that the rewards relative to the amount of work put in were fairly distributed. This does not mean that funding needs to shared equally, but rather, as one interviewee explained, that the "distribution of funding is fair relative to work."

Challenges for collaborative partnerships

Interviewees described a variety of challenges to successful collaborative partnerships. These were related to the characteristics of organizations, individuals, and the nature of partnerships.

1. Limited capacity: A challenge to engaging in partnerships that was commonly cited by interviewees was their limited capacity to invest time and resources in such endeavors. Lack of capacity was particularly a problem for smaller organizations, which were often under-capitalized, had few employees, and relied heavily on volunteers. However, even larger organizations faced capacity issues, including limited funding and lack of personnel with the appropriate type of expertise. However, interviewees working for large and small organizations alike identified lack of time as their biggest capacity issue.

2. Differences in organizational cultures and restoration philosophies: Another common challenge mentioned was working out differences between prospective partners when embarking on a partnership, as well as working out differences that arose in the course of implementing projects. One major theme was the disconnect informants had observed between government agency and private and non-profit cultures. Another source of tension had to do with differences in sense of urgency for getting work done, with a mismatch, for example, between organizations like Metro that have long planning horizons and local governments which typically have much shorter planning horizons. Differences in philosophies about how to go about doing restoration were another source of tension.

3. Personality issues: Personality differences were cited as a challenge to the smooth functioning of partnerships. Characteristics identified as poorly suited to collaboration partnerships included inflexibility, lack of respect for others knowledge or needs, being territorial, and inability to keep lines of communication open.

4. Staff, board, and volunteer turnover: A common theme in the case studies was that changes in key staff, board members, and, in some cases, volunteers, made the task of keeping partnerships running smoothly challenging. In some cases, this was because new partners inevitably needed time to build trust, establish the necessary personal relationships, and familiarize themselves with both the goals of the partnership and its functioning. In other cases, new staff or board members may not agree with the goals of the partnership, and, as a result, may lack the commitment necessary to keep the partnership functional.

Part 4 – Factors contributing to the success of TFA

An interesting feature of the TFA restoration program is that a series of autonomous and very loosely connected collaborative partnerships focused on restoration have, in aggregate, managed to achieve significant improvements in ecological conditions over much of the Tualatin River watershed. This has happened despite the absence at the watershed level of a formalized watershed-wide restoration governance body, and, at the project-level, despite the absence of formal project planning and implementation structures. The question of how TFA could be successful under such circumstances warrants further examination. This section explores some of the likely contributing factors to the success of individual TFA partnerships as well as their success in aggregate.

Presence of a regulatory imperative

A key factor behind the success of the TFA partnerships is that Clean Water Services and other stakeholders in the Tualatin River watershed had a regulatory imperative to come up with solutions that would lead to improved water quality. One interviewee's description of TFA's regulatory underpinnings is worth including as a reminder of the origins of the program:

> In any story about Tree for All, it's important to remember its history, which is that it emerged out of a lawsuit over water quality. TFA was seen as a win-win, but it didn't start out as collaborative partnership…It's important to recognize that it came out of a fight and that the community pushed it, not Clean Water Services. We need that underpinning of the regulatory framework. It's the backbone of regulation that protects the environment. So part of collaboration is the social contract that we have as community members with regulatory institutions.

It was this regulatory imperative to improve water quality—combined with the presence of a critical mass of individuals and organizations pre-disposed to look for innovative solutions and willing to take risks and collaborate with others—that eventually resulted in CWS and its community partners coming up with an innovative approach to reducing in-stream water temperatures that involved planting millions of trees rather than installing far more expensive water chilling facilities.

Presence of organizational cultures conducive to collaboration and experimentation

The presence of a regulatory imperative does not mean that effective collective action will follow. That TFA has resulted in restoration taking place in the Tualatin valley at a pace and scale well beyond initial estimates is attributable in large part to an organizational culture within CWS that values and rewards collaboration. Equally important, has been the willingness on the part of CWS leadership to take risks that many other utilities faced with similar pressures to improve water

quality have been reluctant to take. A key aspect of CWS' collaborative culture is the presence of staff members who are proactive at reaching out and listening to others, and, equally important, who value and know how to "lead from behind." The ability to lead from behind is particularly important given that CWS has far more resources at its disposal than other restoration stakeholders in the watershed.

Important as it was for CWS to have a collaborative culture and leadership open to experimentation, equally important was that other partners also have collaborative mindsets as well as staff and upper-level managers willing to take a few risks. A common thread in all of the case studies is that individuals were not only willing, but also able to collaborate with others. And as with CWS, many of the individuals at partnering organizations had support from board members and supervisors to experiment with new ways of doing things.

Presence of a common framework developed through a consensus process

Another important element undergirding the cumulative successes of Tree for All projects is the long process of multi-stakeholder watershed planning and inventorying that took place in the 1990s and early 2000s. That process helped create a generally agreed-upon mental model of the Tualatin River watershed among diverse stakeholders; a mental model that is reflected in the consensus-based 2005 Healthy Streams Plan's restoration priorities. That plan created a framework that allows the partners to meet multiple regulatory needs with the highest priority ecological actions. It provided a common guiding framework for prioritizing watershed restoration projects and continues to guide restoration choices for TFA participants today. The collaborative process that led to the development of the Regional Conservation Strategy in 2012, built upon the Healthy Stream Plan, providing participants with agreed upon conservation goals and objectives, as well as identifying high priority stream corridors for restoration.

Partnership composition conducive to complementarity

With the exception of the ECREP program, the TFA partnerships described in this study had more or less similar structures, generally consisting of the following elements:

> 1) A land management or natural resource agency or non-profit organization led the project, generally providing access to land, some funding, project administration, and in most cases, technical expertise;
>
> 2) CWS provided funding, plant materials, technical expertise in restoration ecology and hydrology, professional restoration contractors, and, in some cases, access to land;
>
> 3) Friends of Trees provided training for volunteers, volunteer recruitment, coordinated planting events, and in some cases, limited amounts of funding.
>
> 4) Community groups, such as neighborhood associations, "Friends" groups, and local non-profit organizations recruited volunteers for planting events and generated political support for restoration activities.
>
> 5) Schools and after-school programs provided students to participate in volunteer plantings and, in some cases, wildlife or plant monitoring activities.

CWS and the lead organization together typically contributed a significant amount of funding which

the partnership then leveraged to obtain additional funds from a variety of sources, such as Metro's Nature in Neighborhood grant program (regional), OWEB (state), and NAWCA (federal), among others.

Slight variations from this structure occurred among the cases. For example, Ducks Unlimited provided contracting services for some of the JBW projects instead of private sector contractors; Friends of the Tualatin River National Wildlife Refuge co-led the TRNWR VEGBAC project along with the USFWS; and members of the Murrayhill Owners Association provided access to land for the Tualatin-Murrayhill case rather than TRWC, which in this case was the project lead.

The ECREP program differs from the other partnerships in that it doesn't include the volunteer element; and private landowners rather than government agencies provide access to land for restoration. However, as is discussed below, the ECREP partnership takes an approach to generating participation in the program that is similar to that used in other TFA partnerships.

Importantly, in all of the TFA partnerships, each partner brings a different set of skills, resources, and professional and social connections to the table. Having access to this diverse set of assets enables the partnerships to accomplish their objectives efficiently and effectively.

Partnership composition conducive to social connectivity

An advantage of the partnership structure described above is that it has been conducive to connecting sectors (public-civil society-private), jurisdictions (city-special districts-federal-regional), and scales (site-level, sub-watersheds, watersheds, ecoregions), with variations depending on which sectors, jurisdictions, and scales need to be taken into account to accomplish the project. The long history that many of the participants have in working together on watershed issues, and the trust and familiarity they have developed through those processes, has lent further strength to many of these connections. Additionally, many of the lead partners interact with each other and employees of CWS on a regular basis in other planning and professional venues, further solidifying existing connections.

Also common to all of the cases is the active participation of groups with connections into the local community. These groups have taken on responsibility for outreach to landowners or prospective volunteers. In the Fanno Creek Greenway Complex case, for example, Friends of Trees serves as the main bridge between community groups and the land management agencies/CWS. In other cases, Friends of Trees has shared the bridging role with other groups, such as the Friends of the Refuge (TRNWR mini-case), Jackson Bottom Wetlands Preserve (JBW case), and TRWC (TRWC-MOA mini-case). For projects that involve schools, Friends of Trees connects schools to the project when planting events are involved; for monitoring activities, the schools tend to connect to the project through park outreach programs, with "Friends" groups or conservation groups, such as Audubon, often serving as intermediaries.

Although city parks departments and THPRD typically have the capacity to conduct some community outreach, they still rely heavily on bridging groups to mobilize volunteers. For the ECREP program, TSWCD functions as the bridge between agricultural landowners and land management agencies/CWS, and it is through TSWCD that the majority of landowners are mobilized to participate in the program.

In five of the case studies and mini-case studies (Fanno Creek-Greenway Complex, JBW, TRNWR, City of Tualatin Volunteer Program, and TRWC-MOA) Friends of Trees plays a bridging role. In

particular, Friends of Trees excels in mobilizing volunteers regionally and locally to participate in planting events. They also work through local groups, such as the Tualatin Riverkeepers and other community-based groups, to mobilize local volunteers. Interviewees indicated that building capacity to incorporate local volunteers is important because local residents are more likely to have a greater sense of ownership and logistically it is easier for them to participate in nearby restoration projects on an on-going basis.

Stable and diverse sources of funding

The TFA program is underwritten by a substantial and relatively stable amount of funding in the form of a portion of the fees paid by utility ratepayers. This has provided a solid and stable financial foundation that, together with the green light from the CWS Board and upper-level management, has made it possible for District staff to engage in what is, in essence, a watershed-wide experiment aimed at learning how to do ecological restoration cost-effectively at a relatively large scale.

Also important, however, has been the availability of significant amounts of funding from a variety of other local sources, including Metro's 2006 $227.4 million bond measure for protecting the region's water quality and habitat and expand access to nature, THPRD's 2008 $100 million bond measure to fund land acquisitions, restoration, and development of parks and greenspaces, and the City of Tigard's 2010 $17 million bond measure to acquire and preserve greenspaces, water quality, and habitat (TIA 2012a). Metro's Nature in Neighborhoods program, which has four grant programs (capital grants, restoration grants, conservation education grants, and trails grants), has been an important source of funding for many TFA projects. The Nature in Neighborhood grants are designed to support collaborative partnerships. In describing the program, a Metro program manager said,

> The idea was that in building partnerships we could achieve better outcomes. We put partnerships first and the outcomes second. That's a bit unique to our program. We really emphasize partnerships across multiple sectors: government, nonprofits, business, and private landholders.

More recently, Washington County residents passed a property tax measure that will support TSWCD, greatly expanding its capacity to carry out restoration work. Other consistent sources of funding for TFA projects include OWEB and NAWCA, but as indicated by the case studies, many other agencies and organizations have provided funding for TFA projects over the years.

Situating TFA partnerships along the partnership, collaborative, and community engagement continuums

It is useful reflect on how the partnerships explored in this study fit within the three continuums — partnership, collaborative, and community engagement — described in the literature review. Using the example of the Fanno Creek Greenway Complex partnership (depicted in Figure 6), and comparing it with the partnership continuum (depicted in Figure 1), it is apparent that the partners in the partnership span the continuum from philanthropic (Metro, a major funder) to transactional (Ash Creek Forest Management, professional restoration contractor services provision; Friends of Trees, volunteer services provision) to integrative (Clean Water Services-THPRD-City of Beaverton). Organizations may also be situated at multiple locations along the partnership continuum. For example, on a project basis, much of CWS' interaction with its partners is transactional. However, when CWS enters into intergovernmental agreements with other partners, which involves making a long-term commitment to accomplish broader goals beyond the

scope of either of the partners involved in the agreement, its interactions fall closer to the integrative end of the partnership continuum.

If the same partnership is placed along the collaboration continuum, all of the partners except Metro fall somewhere between cooperation and collaboration. Metro is perhaps best situated in the "network" space; the Vose Neighborhood Association, the schools, Ash Creek Forest Management, and Friends of Trees are situated toward the cooperation section of the continuum, and CWS, THPRD, and City of Beaverton are situated in the collaboration end of the spectrum.

Further investigation into the nature of the broader community's role in the decision to restore this portion of Fanno Creek would be needed to determine where the partnership fits along the community engagement spectrum. Likewise more data on the community-partnership interface is required to locate where most of the other TFA cases fit along the spectrum. However, we have sufficient data on community engagement for the TRNWR case to be able to situate it somewhere between the "collaborate" and "empower" columns, and it clearly fits within Himmelman's "collaborative empowerment" category of community engagement.

The finding that the Fanno Creek partners are spread across the partnership continuum helps explain why it was so challenging for interviewees to come up with a single definition of what it means to be a partner. The very existence of a partnership continuum suggests that there is no one definition that covers all types of partnerships, and the TFA cases, many of which have a similar structure to that of Fanno Creek's, suggest that in many cases, partnerships are likely to have a range of partner types involved at various points in a project. Indeed, in some circumstances, having such diversity in the level and types of partner engagement within a partnership may be advantageous.

Also emerging from the interviews was the importance of collaboration for achieving synergistic impacts, where the process of combining resources, skills, and viewpoints enabled the partnering organizations to accomplish far more than they would have done acting on their own. In all of the cases examined during this study, interviewees were adamant that without partnering, they either could not have achieved their objectives with respect to watershed restoration, or at best they would have accomplished a fraction of what they were able to accomplish working with others.

Part 5 - Returning to our guiding assertions

We examine briefly the insights this exploratory study shed on the four assertions that guided our inquiry about the value of collaborative partnerships.

Assertion 1: The study supports the assertion that partnering enables organizations to more effectively achieve their goals

The level of farmer participation in stream bank restoration in the Tualatin River watershed increased by an order of magnitude because of the funding, labor, and material incentives that were leveraged through the ECREP partnership, as well as the associated social learning that occurred as farmers shared their experiences with neighbors. Restoration along Fanno Creek, Jackson Bottom Wetlands, and the Tualatin River National Wildlife Refuge would likely have happened eventually, but the landowning agencies would have proceeded at a much slower pace and much smaller scale. Collaboration has enabled the City of Tualatin to run a much more effective volunteer restoration program, involving more volunteers, reducing costs, and covering more ground.

Assertion 2: The study supports the assertion that collaboration leverages the unique strengths of each partner to create a sum greater than its parts.

In a typical TFA project, CWS provides plants, access to contractors, and expertise on restoration ecology; another partner provides access to the land, a third partner trains and coordinates volunteers, and multiple community partners mobilize the volunteer workforce and advocate for the project. No one of the partners acting alone would have the resources, skills, knowledge, and connections needed to make the project successful; but joining forces mobilizes all of the pieces needed to achieve the partners' objectives. Without TSWCD's involvement as a bridge builder, farmers would be much less likely to work in partnership with CWS. Friends of Trees and Tualatin Riverkeepers play a similar bridging role, linking government organizations and volunteers.

Assertion 3: The study supports the assertion that collaborative projects create multiple community benefits.

The primary objective of TFA projects is to restore riparian habitat so as to reduce water temperatures, improve water quality, and improve storm water management. However, we found that the projects provided multiple benefits to the broader community that encompassed more than environmental improvements. Some of these benefits are: health benefits associated with a cleaner environment, mental health benefits associated with connecting volunteers with nature, and lower greenspace maintenance costs, freeing funds up to provide other services.

Assertion 4: The study supports the assertion that collaboration enables organizations to address issues at scale.

The case studies demonstrate that the TFA program's emphasis on collaborative partnerships has been very effective at enabling restoration to take place over broad geographic areas. Interviewees indicated that partnering with other organizations enabled them to increase the amount of restoration they were able to accomplish by orders of magnitude relative to doing the work alone. The ECREP program and Fanno Creek projects, both of which cover relatively large geographic areas and have heterogeneity in land ownership, are perhaps the best examples of how collaboration can expand the area of effective intervention.

Part 6 - Recommendations for nurturing collaborative partnerships

In addition to exploring the question, "What is the value of collaborative partnerships for conservation in The Intertwine?" our study's secondary objective was to identify steps that TIA could take to enhance conservation-oriented partnerships. We asked each of the interviewees to provide suggestions as to what types of support they would find most useful for strengthening the collaborative partnerships in which they participate. Those suggestions are listed below.

Facilitate social network building

The most important support that TIA could provide is to help organizations and individuals build their social networks. This is something that can build on the work TIA is already doing to bring people together in workshops and meetings, events that many participants mentioned as beneficial. The following suggestions were some of the recommendations for how to improve networking opportunities.

- Increase the number of sub-regional meetings.

- Expand the summits to include summits that focus specifically on private businesses or communities of color.

- Reach out to groups that do not normally participate in environmental restoration.

- Groups identified included the health and medical professions, as well as minority groups and communities of color. In some cases TIA will need to reach out to key individuals rather than groups, as some communities don't have groups that represent them. Research conducted by the Coalition of the Communities of Color (Curry-Stevens et al. 2010) provides a model for how TIA could approach collecting the data needed to develop appropriate outreach strategies with communities of color.

- Host more networking sessions between TIA partners and funding organizations.

- Expand "match-making" events that bring together different types of groups and match them up with other groups that they might not have been familiar with.

Facilitation assistance

The additional up-front time and effort that collaboration requires is a barrier to getting partnerships going and continuing smoothly. Moreover, the restoration field tends to be dominated by scientists and engineers, few of whom are trained in negotiation and compromise. Having someone available who could take on a facilitation role could allow partners to come to agreement faster and, through having a well-designed agreement, facilitate better experiences with partnerships.

Promotion of successes

Public agencies tend to have a limited promotional budget with restrictions on where and how to promote events and facilities. Celebrating the partnerships that exist, and reaching a broad audience in the area, would benefit all of the partners and make decision-makers more likely to participate in something similar in the future. In order for this to work, though, all of the partners need to feel that they are receiving the appropriate credit for the work that is done. However, this must be done carefully as grouping projects together for promotion and messaging has sometimes downplayed the contributions of smaller organizations. To enable further partnerships, all groups need to feel that their work is valued.

Assist in bridging the public-private sector disconnect

Differences in culture between the private and public sectors were identified as a major impediment to productive collaborations. Restoration contractors have considerable on-the-ground knowledge. The Intertwine Alliance could take on the task of figuring out ways to help organizations to bridge those differences.

Facilitate moving from ideas to action

The Intertwine Alliance has gained a well-deserved reputation for successfully bringing together members of the conservation community and other potential partners to share experiences and discuss ideas for how to advance conservation efforts in The Intertwine. Now is the time for TIA to take on the task of facilitating the translation of ideas into action, with a focus on those ideas that are most compelling and have the greatest promise of furthering regional conservation goals into action.

Continue doing what TIA already does well

Most of the interviewees were familiar with TIA and had participated in TIA sponsored events, an indication that the organization already has considerable name-recognition within the restoration community. Many interviewees said they found the work TIA does valuable, and recommended that it continue doing events, publicizing the Daycation app, celebrating successes, and encouraging partnerships. However, a cautionary note from one interviewee warrants attention, namely that TIA consider its activities carefully and sift out those that promote what's already happening while supporting those that truly add value that would otherwise not be available.

Part 7 – Key take-home messages and a framework for moving forward

The interviews produced a wealth of data about TFA and other collaborative partnerships, and many lessons can be derived from an analysis of that data. We focus here on the three key take-home messages that we believe are most relevant to improving support for collaborative conservation in The Intertwine.

1) Providing an enabling environment for collaborative partnerships that have the potential to achieve conservation outcomes at scale requires understanding how power, information, and resources flow between and across societal scales and sectors.

An in-depth investigation of the community and private sector social networks, and how those function to mobilize volunteers, access to landholdings, and other resources needed for restoration of such lands, was beyond the scope of our project. However, as the focus of restoration in the Tualatin River watershed shifts from public lands to private lands, the success of restoration activities will require an expansion in the capacity of TFA partnerships to mobilize private landholders, including residential, commercial, and industrial property owners, as well as volunteers from an increasingly diverse population. In other areas of The Intertwine, similar situations prevail in many cases. A key take-home message from our study is that the importance of bridging groups with the capacity to mobilize diverse segments of society should not be underestimated, and an effort to better understand how information, resources, and power flow out of and into the "capillaries" of watershed social networks is needed. Our study revealed that bridging occurs at multiple levels. Friends of Trees, for example, excels at mobilizing regional and local volunteers for TFA projects but it also relies on locally-based groups, such as the Tualatin Riverkeepers, to mobilize local volunteers. The Tualatin Riverkeepers, in turn, works with groups like the Muslim Educational Trust and Centro Cultural to mobilize volunteers from their constituencies. Social network analyses (Bodin and Crona 2009, Sayles and Baggio 2017a, 2017b) and analyses that draw on actor-network theory (Kunz et al. 2010, Ngaruiya and Scheffran 2016, Saunders and Bylund 2009) are two types of analysis that are suited to developing better understanding of the structure of such social networks and how different types of resources flow along those networks.

2) It is important to understand the range of partnership structures and planning and decision-making processes that are most effective, as well as the circumstances in which they are effective.

Although the partnership network structure that typifies TFA projects has proved to be effective for accomplishing restoration on a large scale in the Tualatin River watershed, the Growing Green and GFPCI mini-cases demonstrate that other partnership structures may be appropriate depending on the needs and goals of the groups involved. The Growing Green partnership, for example, has adopted a very participatory approach where all partners are involved in all phases of the project. This differs from the general TFA pattern in which a small set of "core" partners typically handle project design while other partners, such as Friends of Trees or professional contractors, may only be involved during the implementation phase. Whether such a division of labor is beneficial will vary on the circumstances and the preferences of the parties involved.

The GFPCI case provides a model of what a partnership might look like when a large number of partners are involved. To streamline planning, the GFPCI has found it useful to create an advisory committee and topical sub-committees. Moreover, as the GFPCI moves out of the strategic planning phase and begins to focus more on on-the-ground action, the partnership is shifting toward adopting a formal memorandum of understanding to govern decision-making and administrative processes. This level of formalization contrasts markedly with the less hierarchical and more informal approach adopted by Growing Green and most of the TFA partnerships. One hypothesis is that larger partnerships that anticipate being in existence over a long time horizon may find that formalization reduces uncertainty and enhances the likelihood that the partnership will remain effective over the long term.

3) Assessing outcomes of collaborative partnerships is neither straightforward nor easy. A collaborative participatory approach is likely to prove most useful in developing appropriate and workable measures of outcomes and assessment protocols.

A common theme in the interviews was the difficulty associated with assessing project outcomes in general and the outcomes associated with collaborative partnerships more specifically. There was widespread agreement that environmental outcomes were comparatively easy to measure and that numerous guidelines and tools already exist for measuring them. However, there is still some question as to whether the correct parameters are being measured (i.e., the debate over whether "shade on the water" is the right thing to aim for). Additionally, although large amounts of monitoring data are being collected on environmental variables, analyses and reports of that data either are not done on a regular basis or are not easily locatable. Individual organizations appear to store much of the data and reports in in-house databases that are not readily accessible to outsiders, making compilation of the disparate sets of data for the purposes of developing sub-watershed, watershed, and regional assessments time-consuming. A number of websites aimed at centralizing and making accessible such data and reports exist, but in many cases they do not appear to be maintained on a regular basis. For social and economic outcomes, for the most part the organizations included in our study are struggling with identifying what to measure, and have yet to reach the stage of figuring out how to go about or putting in place systems for measuring, analyzing, and reporting on those outcomes.

Given the current situation, our team has concluded that rather than developing a framework that could be used to assess outcomes of collaborative conservation partnerships in The Intertwine, as we were tasked to do, it is more productive to lay out a framework for how to structure an Intertwine-wide process that would be aimed at developing an appropriate system for outcomes

assessment. We use the term "system" rather than framework because for an outcomes assessment process to be useful, it needs to address the following aspects:

- Appropriate measures of the outcome(s) being assessed,
- Methods for collecting such data,
- A system for processing and storing the collected data,
- A data storage system,
- A process for analyzing the data on a regular basis,
- A process for reporting the results of the analysis on a regular basis, and
- A system for making the data, analyses, and reports accessible, when accessibility is desirable or appropriate.

The challenge will be to develop a system that meets the needs of the many and diverse types of collaborative partnerships operating in The Intertwine. Toward this end, we recommend that TIA or one of its member organizations convene a task force to develop an assessment system that can be used to assess environmental, social, and economic outcomes of collaborative conservation projects, programs, and initiatives across The Intertwine. That task force can draw upon efforts already completed, such as CWS' system for monitoring restoration outcomes, the GFPCI's United Monitoring Protocol for vegetation monitoring, the City of Portland's Bureau of Environmental Services watershed health monitoring protocol, and the protocols and tools used by Audubon and the US Fish and Wildlife for monitoring birds, fish, and wildlife. It can also draw on ongoing efforts by groups such as the GFPCI to identify relevant measures for assessing and tracking trends in social and economic outcomes. The Task Force would need to account for variability in the degree to which there is already general agreement on what to measure and how to measure it, variability in project types, and variability in the capacity of partners in collaborative conservation partnerships to collect, organize, store, analyze, and report on outcomes data. To be effective over the long run, it is imperative that the Task Force is both collaborative and participatory so as to account for the diversity of views, needs, and capacities of organizations with a stake and interest in contributing toward improving the socio-ecological health of The Intertwine.

Conclusion

This exploratory study demonstrates that collaborative partnerships have proved to be an effective strategy for accomplishing conservation at a landscape scale in the Tualatin River watershed. One important outcome of these partnerships is a visible improvement in ecological conditions. However, as the case studies show, the collaborative partnerships that have enabled TFA partners to make progress toward their ecological objectives have numerous other benefits, including reducing maintenance costs for greenspace and stormwater infrastructure, expanding community members' connections with nature, and building social capital in multiple ways, among others. Many of these benefits were initially framed as ancillary benefits to the water quality impacts of TFA. However, it is these ancillary benefits that have brought the community together and made the program a success, emphasizing the connection between healthy watersheds and healthy communities (see Appendix C). The TFA program provides an important model for other communities interested in implementing landscape-level conservation; collaborative partnerships that can bring a diversity of views, knowledge, sources of funding, and ways of doing things appear to be a key component of its success.

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Appendix A - Organizations included in interviews

Audubon Society
Centro Cultural
City of Beaverton-Public Works
City of Portland-Bureau of Environmental Services
City of Tualatin Parks
Clean Water Services (multiple interviewees and consultations)
Department of Environmental Quality; Western Region
Ducks Unlimited
Farm Service Agency
Farmer in Tualatin Valley
Farmington Middle School
Friends of Trees
Friends of Tualatin River National Wildlife Refuge (multiple interviewees)
Greater Forest Park Conservation Initiative
Hillsboro Parks and Recreation Department (multiple interviewees)
Jackson Bottom Wetlands Preserve
Metro (multiple interviewees)
The Nature Conservancy
Muslim Educational Trust
Restoration contractor
Tualatin Hills Park and Recreation District
Tualatin Riverkeepers
Tualatin Soil and Water Conservation District (Board)
Tualatin Soil and Water Conservation District (Staff)
Tualatin River Watershed Council
US Fish and Wildlife Service (multiple interviewees and consultations)
Washington County Natural Resources Conservation Service
Westside Economic Alliance

Field visits, conferences, meetings
Field visit to Clean Water Services Tree Farm, Maroon Ponds, Fernhill (April 28, 2017)
Greater Forest Park Conservation Initiative Conference (May 16, 2017)
Field visit to Fanno Creek restoration site (June 30, 2017)

Appendix B - Interview guiding themes

Theme 1: Nature of the Partnership

- Please describe the program/project, its objectives, and how it came to be a collaborative partnership.
- What groups were involved when the partnership started, and what were their roles (including your own)?
    - How have those changed over time?
- How are decisions made within the partnership?
- What are the most important types of relations you have with each of the partners? (i.e., give and/or receive information, funding, resources; work together on projects or tasks; etc.)
- How has the partnership benefited from being under the Tree for All umbrella?

Theme 2: Project/Program Outcomes

- To what extent has the program achieved the outcomes you hoped for? (i.e., environmental, social, and/or economic)? How have you measured those?
- Have there been any outcomes you hadn't anticipated that are linked to the presence of the partnership? (Explain)
- What has working as a partnership enabled you to do that otherwise wouldn't have happened?

Theme 3 – Challenges and Changes

- What challenges have you encountered in taking a partnership approach to this program?
    - What steps have you taken or are you taking to address those challenges?
- How has working as part of this partnership changed the way your organization/office does things?

Theme 4 - Values of the Partnership

- Has working in this partnership provided your organization a good return on the time and resources it has invested? (How so/how not so)
- How do you go about assessing whether you've gotten a good return on your investment in the partnership?
- In what ways has taking a collaborative approach to this program benefitted the broader community (i.e., beyond the partners and individuals enrolled in the program)?
- Have you tried to document those benefits? (If yes, how; if no; what are the barriers to doing so)
    - What suggestions do you have for how one might go about measuring the environmental outcomes of collaborative partnerships? Social outcomes? Economic outcomes?
- Some people claim that collaborative projects are better suited to achieving large-scale impacts than projects that don't involve collaboration. How does this claim fit with your experience?

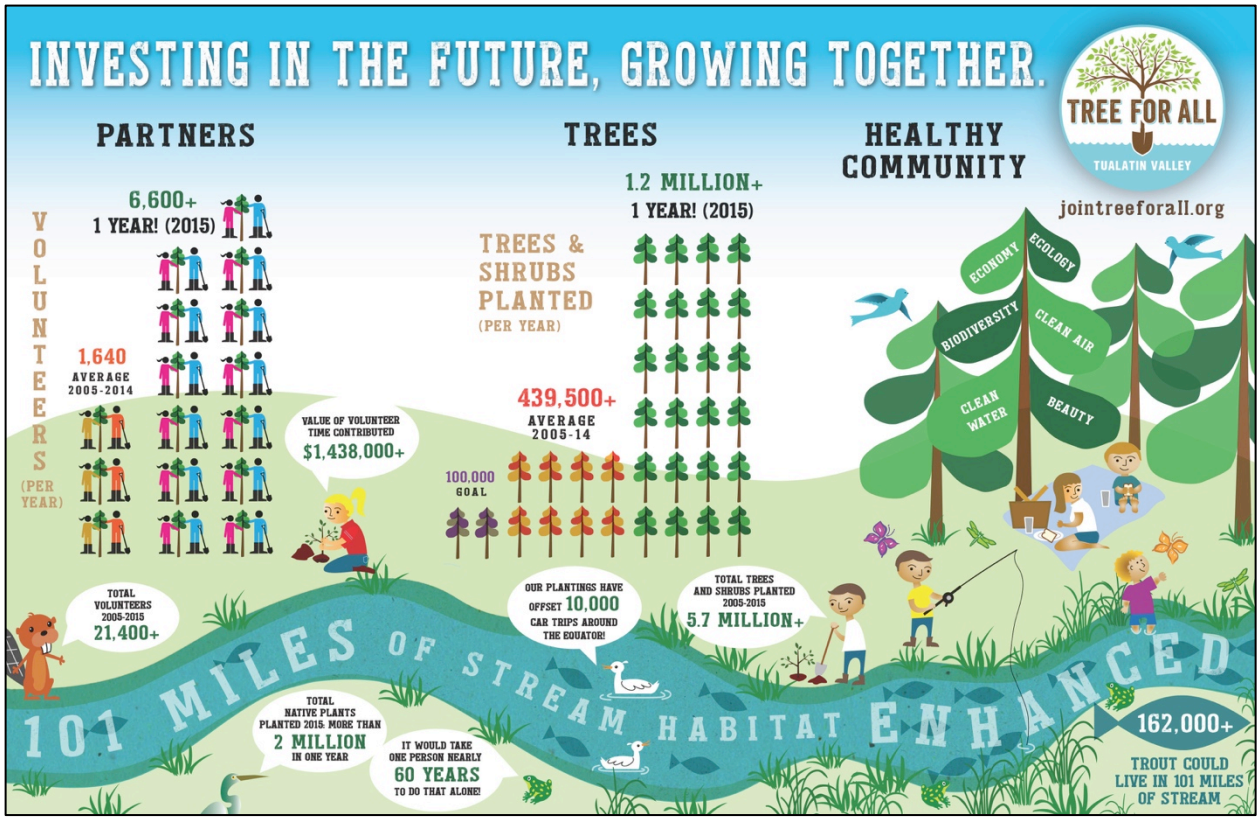
Theme 5 – Lessons Learned

- What are the three most important lessons that you learned through working in this partnership?

Theme 6 – Future Support from The Intertwine Alliance

- What suggestions do you have for how the Intertwine Alliance could help support collaborative partnerships?

Appendix C - Healthy watersheds and healthy communities: TFA's vision



Source: Clean Water Service