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**Regional Open-space Conservation Strategies:
A Case Study of the Intertwine Alliance's *Regional Conservation Strategy***

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Abstract

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Ecological processes do not adhere to political boundaries. As planners grapple to accommodate natural processes with human development, these borders must be reevaluated and strategies of coordination across them must be developed. Transcending these boundaries is necessary to achieve environmental goals. This transformation is currently occurring in metropolitan areas across the country, as regional planning institutions evaluate mechanisms and strategies for collaboration, conservation, and protection. The primary purpose of this study is to examine the methods used by the Intertwine Alliance, a collaborative partnership of public, private, and nonprofit actors in the greater Portland, Oregon region, to develop a regional open-space conservation strategy. By comparing the strategies, difficulties, and opportunities discussed in the existing literature with lessons learned from the Intertwine Alliance case study, this study attempts to identify critical factors essential to the development of open-space planning efforts at a regional scale and details possible solutions to address the greatest challenges presented by this type of work.

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1. Introduction

Open space is a broad term that generally refers to undeveloped land, kept in a natural state. It refers to forests, grasslands, fields, parks, greenways and other landscapes left intentionally unbuilt. Open space is distinguished from developed land by a lack of anthropogenic alterations, such as buildings, pavement, or streets (Ahren, 1991). As development encroaches upon natural areas, existing landscapes are split into varying spatial extents, taking on a different structure of patches, corridors, and nodes. This spatial shift permanently alters the processes that once took place in these areas, resulting in a fundamentally different set of conditions (Ahren, 1991).

The preservation, management, and maintenance of open-space networks provides many benefits for ecological, economic, and human lifestyle purposes (McKinney, 2008). Open-space networks allow movement of native species and preservation of taxed habitats, fostering opportunities for the preservation of biodiversity. Furthermore, open space provides economic benefits when acting as green infrastructure, increasing water & air quality, providing opportunities for expansion of important natural resources, expanding possibilities of clean energy capture, and reducing the risk caused by natural disasters. Finally, open-space networks allow for improvements in human health, not only through an aesthetic function, but by enhancing cultural connections to the land and increasing recreational opportunities (McKinney, 2008).

By altering the pattern, form, and function of ecological networks, human development threatens to diminish the benefits that open space provides (Ahren, 1991). In urbanized areas, the transformation is often viewed to be complete, requiring new techniques and creative solutions to ensure adequate ecological function in urban areas (James et al., 2009; Tzoulas et al., 2007). Furthermore, as the extent of human development continues to expand into currently undeveloped regions, open-space planning provides an opportunity to coordinate development in a pattern that allows for continued function of ecological processes (Ndubisi, 2014).

While the issues are obvious, the solutions are not simple. Though many studies have shown the promising capacity of open-space networks to provide certain ecological and social benefits, there is little consensus regarding how to best match science and policy. The potential benefits provided require an understanding of complex and interconnected networks; an interwoven tapestry of landscape functions (Beck, 2013). Though it difficult to comprehensively understand any ecological relationship, there is a general consensus in the literature that planning and policy focused on open-space conservation can act as a tool to properly guide development decisions in conjunction with assessments of cultural, historical, economic, and legal factors.

Further complicating the issue, functional open-space networks operate across modern political boundaries of city or county and there is a growing consensus in the literature that effective preservation must happen across these boundaries at the regional scale. While regional planning efforts occur across the country, collaboration and coordination of open-space preservation at the appropriate scale faces many challenges. Legal, governmental, and jurisdictional boundaries, private property concerns, and an entrenched history of planning at the local level are all barriers that prevent the successful implementation of open-space goals at the proper scale (Seltzer and Carbonell, 2011). These roadblocks often complicate coordination and decrease the potential for appropriate regulatory frameworks.

The primary objective of this study is to detail the critical factors regarding the development of open-space conservation planning efforts at a regional scale. The study will be shaped by a thorough literature review, providing an understanding of the science that guides these efforts and the planning strategies available to enforce them. Further understanding will be gained by analyzing a case study, 2012's *Regional Conservation Strategy* from the Intertwine Alliance regarding open-space and biodiversity conservation in the Greater Portland-Vancouver region. By contextualizing and synthesizing these examples, this study aims to develop an understanding of how open-space networks function,

how preservation areas are identified and maintained, how disparate regional entities can work together effectively, and what strategies are most useful, culminating in the presentation of applicable solutions to the greatest challenges regarding regional open-space planning.

2. Literature Review

2.1 Foundational Literature

The recognition of open-space preservation as an essential mechanism to maintain natural and human health is not new. The call for institutional protection of natural areas exists in the literature of ecological design and planning throughout its history. Ian McHarg, a progenitor of the environmental planning field, claims that sprawl and human development “are often needlessly destructive to other organisms and systems, and ever more important, by conscious choice and inadvertence, also deleterious to man” (McHarg, 1998). The scope of human development is destructive to ecological processes, McHarg argues, but is detrimental to the human condition as well. To rectify this situation, McHarg concludes that “the form of metropolitan growth and the distribution of metropolitan open-space should respond to natural processes” (McHarg, 1998). Per McHarg, the continued function and viability of natural processes should control, constrict, and determine where development occurs, and where it does not.

Many prominent thinkers within the field voice a similar concern. In a modern piece describing the largest challenges facing environmental planners and designers, Forster O. Ndubisi includes conservation of “prime farmlands, valued natural and cultural resources, and rural values and character in the face of rapidly accelerated urbanization” (Ndubisi, 2014). In discussing necessary conditions to begin facing these challenges, Ndubisi details a framework that has nearly universal support within the field: regionalism.

Ndubisi defines a region as “a geographic location that is larger than a local area in spatial extent, distinguished by common or unifying attributes, and composed of interacting physical, biological, and cultural phenomena that establish its natural and cultural character over time” (Ndubisi, 2014). While this definition is ambiguous, it reflects the true character of regions. Regions are not rigidly

defined geographically and do not align with modern political boundaries. Rather, regions are tied together by common physical and natural traits, which over time have created similar patterns in ideology, lifestyle, and culture.

Support for regional solutions to environmental problems is not new and is found throughout the history of ecological planning. In an essay from 1940, Benton MacKaye, a prominent figure in the genesis of regional planning, asserted that “the region is the unit of the environment. Planning is the charting of activity therein affecting the good of the human organism; its object is the application or putting into practice of the optimum relation between the human and the region. Regional planning in short is applied human ecology” (MacKaye, 1940).

Furthermore, Ndubisi infers that “support for employing the region as the spatial framework for balancing human use with environmental concerns and, by extension, creating and maintaining adaptive resilient places, comes from different perspectives” (Ndubisi, 2014). He goes on to detail support of the viewpoint from planning, ecological, sustainability, and resilience perspectives. Further support for regionalism exists within the field of economics. In many respects, open-space conservation exhibits the difficulties in managing common-pool resources, made famous by Garret Hardin’s influential article “The Tragedy of the Commons” (Hardin, 1968). Studies from ecological and economic perspectives show promising capacity to overcome these difficulties by matching the scale of the solution to the scale of the problem (Cash et al., 2006), by having clear knowledge of external boundaries, and by engaging the persons involved in utilizing the resource (Ostrom, 1999). According to experts in a variety of associated disciplines, a regional perspective is necessary to tackle the pressing environmental issues related to open-space management and protection.

To properly identify and protect regional networks of open space, a change in the pattern of urban development is necessary. Within the field, there is support for a “systematic way of identifying and preserving land most suitable for open space, diverting growth from it, and directing development

to land more suitable for urbanization” (McHarg, 1998). The argument follows economically, that open-space preservation must begin by discerning areas most suitable for protection; those that provide the highest level of human and natural service. Ecosystems “that serve as ‘life-support systems’ and provide a variety of services and benefits to humans should receive the highest priority for preservation” (Ndubisi, 2014). Development patterns should not stretch out indiscriminately. They should be delineated with consideration to ecological processes and responsive to the identification and subsequent protection of natural areas most important to continued human health.

To act effectively in land conservation, shifts in social and governmental priorities are necessary, particularly in the United States, which has a free-market economy and an entrenched history of private property rights. Ndubisi details the American “tradition of making individual choices about the use of their land, tempered to carrying degrees by federal, state, and local regulations, as well as by land-use laws and policies” (Ndubisi, 2014). While this tradition makes governmental regulation more difficult, it further speaks to the need to identify priorities, clarify the benefits, and provide incentives to consistently direct resources to those areas most suitable for preservation.

Furthermore, a fundamental shift in governing practices is necessary to achieve ecological goals that operate across modern political boundaries. Currently, many political processes and land-use regulations, including environmental preservation, take place at the local level, while regional frameworks are nascent or non-existent. “Design and planning frameworks calling for a vital role for the region are unlikely to be implemented because they require a shift in power and authority from the local to the regional level of governance. Local governments typically tend to be opposed to such shifts” (Ndubisi, 2014). Institutionalized open-space preservation strategies must identify sources of cooperation and mechanisms of regional enforcement.

2.2 Scientific Findings Regarding Benefits of Open Space

The foundational pieces of literature reviewed above reveal several key details regarding open-space preservation. First, it requires the incorporation of scientific information and ecological processes into the realm of land-use planning. The scientific literature supports the assertion that open-space networks are essential for a variety of ecological processes, such as habitat functionality, carbon sequestration, water retention and flow regularity, flood prevention, nutrient cycling, and air quality.

These processes are often referred to as ecosystem goods and services, or green infrastructure, attaching a positive economic connotation to ecological processes. In 2005, the Millennium Ecosystem Assessment, an international scientific effort called for by United Nations Secretary-General Kofi Annan, detailed the linkages between ecosystem services and human health. The Assessment codified ecosystem services into four categories: regulating, provisioning, supporting, and cultural. Regulating services include reduction of climate change impacts, flood regulation, and water purification. Provisioning services refer to ecosystem functions that provide immediate economic goods, such as food, fresh water, timber, and biofuel. Supporting services aid in the development of regulating and provisioning services, such as nutrient cycling and soil formation. Finally, cultural services provide direct anthropogenic benefits, including aesthetics, recreation, and educational opportunities (Millennium Ecosystem Assessment, 2005). The provision of these services is directly tied to the availability of undeveloped land. Open-space conservation is essential to maintain the effectiveness and productivity of ecosystem services.

In addition to the provision of ecosystem services, the preservation and maintenance of open-space networks is intrinsically linked with the notion of biodiversity. In the simplest terms, biodiversity refers to biological diversity, the total sum of biological variation in a given area. The concept of biodiversity is exceptionally complex, as the spatial range investigated can extend from a local population, to an entire biome, to all life on Earth (Beck, 2013). Further complicating the concept,

biodiversity not only entails the overall species richness of a specific area, but the diversity of genotypes, communities, habitat types, and ecosystems present (Haines-Young, 2009).

Detailing the precise mechanisms or measurements of biodiversity and its complex, interdependent relationship with land-use change is beyond the scope of this study. Despite this, certain consistencies exist in the literature. First, human transformation of land use is a driver of the reduction of biodiversity (Czech et al., 2000; Haines-Young, 2009; Vorosmarty et al., 2010; Carrara et al., 2013). Second, biodiversity and specific levels of species richness and evenness affect how an ecosystem functions (Hooper et al., 2005; Haines-Young, 2009; Beck, 2013). As diversity within an ecosystem increases, with multiple species existing in large enough populations to exert a particular influence on the function of the ecosystem, multiple functions can be performed more effectively. As the complexity of sources of ecosystem services increases, ecosystem function becomes more stable over time and can adapt more easily to changing conditions (Beck, 2013). Simply put, “a long history of ecological experimentation and theory supports the postulate that ecosystem goods and services, and the ecosystem properties from which they are derived, depend on biodiversity” (Hooper et al., 2005).

The spread of urbanization in America is clear. A study from the U.S. Department of Agriculture in 2007 shows that urban land acreage in the country has quadrupled since 1945, a rate of increase nearly twice the growth in the American population over the same period (Nickerson, 2007). The urbanization of un- or underdeveloped land has significant effects on the availability of habitat, the range of species and biodiversity in general.

A study from 2000 shows that urbanization is one of the leading causes of species loss in the United States, as “urbanization endangers species by replacing habitat directly and by depleting resources needed to support urban economies” (Czech, et al., 2000). Thus, urbanization and natural land conversion has a negative effect on standing biodiversity as the area available for plants and animals is reduced and fragmented by large expanses of development and impervious surfaces (McKinney, 2008;

Fishburn et al, 2009). Urbanization has continued effects on biodiversity through the addition of non-native plant and animal species. Non-native species are introduced accidentally through increased transportation or intentionally through cultivation, domestication, or husbandry (McKinney, 2008). The conversion of land for urban uses negatively affects the condition of local species through habitat removal and substantially alters local biodiversity.

In addition to effects on local wildlife, the loss of open space through urbanization negatively impacts natural carbon sequestration. Climate change is the result of human actions that release greenhouse gases into the atmosphere, particularly through the use of fossil fuels. Of these greenhouse gases, carbon dioxide is of greatest concern. Trees store and sequester carbon from the atmosphere, meaning forests serve as an important resource for the mitigation of climate change impacts. Despite the positive effects, deforestation continues and “can mostly be attributed to land-use changes such as agricultural development, urban expansion, and wood extraction” (Vaughn et al., 2014).

Open-space networks offer benefits in the form of water regulation and are important for flood attenuation. Urbanized land, particularly land with impervious surface coverage, impacts the water regime within a region. Water that falls on impervious surfaces must be piped, channeled, and distributed away from the area through water infrastructure networks. During high levels of rain or water runoff, these manmade infrastructure systems can become overloaded and fail. Natural areas, however, “have the capacity to store water, facilitate transfer of groundwater, and prevent or reduce flooding... Important inland water components, such as wetlands and lakes, are key agents of flood attenuation through energy dissipation of runoff peaks” (Bravo de Guenni et al., 2005). Through natural water retention and transfer, human populations benefit from greater protection from flooding. Natural systems offer increased security from the potential failure of anthropogenic water distribution systems. This service is increasingly necessary in the face of global climate change, as weather patterns and water flows are affected by increasingly uncertain climatic conditions (Lennon et al., 2014).

In addition to the many ecological and economic benefits afforded through open-space preservation, the availability of natural areas has direct importance to human health as well. Urban residents utilize natural areas for recreational needs, encouraging active and healthy lifestyles through the availability of recreational resources. Furthermore, urban open spaces contribute to the cultural identity of city dwellers by offering places for natural experiences (Kabisch, 2016).

2.3 Planning Frameworks

The second lesson derived from the foundational literature is the need for a framework to incorporate the scientific findings with policy and planning. Though many states currently have growth management strategies aimed at curbing the negative effects of sprawl, research shows that these policies often lack the necessary means and practices to be successful (Boyle and Mohamed, 2007). The effective preservation of open space requires the development of plans, goals, and regulatory frameworks based on ecological principles.

The preservation of open space is intrinsically linked with the idea of sustainable development, which is “defined as a condition of stability in physical and social systems achieved by accommodating the needs of the present without compromising the ability of future generations to meet their need” (Ahren, 1991). In the past two decades, sustainability has become one of the defining forces in urban and regional planning. Broadly, sustainable planning addresses three distinct elements: environmental health, economic prosperity, and social equity (Conroy & Berke, 2004). Sustainability planning attempts to enhance all three elements to the highest degree possible, considering the effects and repercussions that any action may have on all elements and the relationships of influence between them. Planning based on ecological sustainability is at the heart of open-space preservation. The goal is to provide for sustained function and use of the natural systems that benefit human and ecological health. Regional

open-space planning aims to increase environmental function at the regional level by providing methods of analysis to evaluate the health of the system.

The justification for open-space planning at a regional scale has its foundation in landscape ecology. The earliest known use of the term landscape ecology is found in the writings of German biogeographer Carl Troll in the late 1930s (Beck, 2013). Gaining in popularity throughout the following decades, the field coalesced around certain foundational principles in the 1980s (Dramstad et al., 1996). The word ecology is broadly defined as the study of the relationships of organisms: relationships between different organisms, and the relationship between an organism and its specific environment. The word landscape is used to describe an area across which different ecosystems, land types, and land uses occur and recur. Combining the two, landscape ecology is the study of the relationship between organisms and their surroundings across a varying mosaic of land patterns (Dramstad et al., 1996). Essentially, landscape ecology distinguishes itself from traditional ecosystem ecology in scale. The spatial scale is significantly larger in landscape ecology, as landscapes comprise several or many local ecosystems (Ahren, 1991).

The spatial language utilized by landscape ecologists is very similar to the ideas that drive the planning and design of built space. Urban planners are driven by the relationship between form and function, with a fundamental belief that how spaces are patterned and designed affects how they are used and experienced. As such, built spaces are designed to be human and purpose centric, located in a coherent pattern with roads, paths, highways, and bridges providing the necessary connections between different uses. Landscape ecology extends this method of thinking to organisms and ecological processes. “No single entity can be understood without considering its relationship to what is nearby. Furthermore, the spatial pattern in which those entities are arranged is important to how a landscape works” (Beck, 2013).

Flowing from this argument lies the justification for regional open-space planning. Ecological processes that occur within a landscape are defined, altered, and manipulated by changes in the spatial pattern found within. The services provided by these processes function best in certain places and with the necessary connections between them. Landscape ecology suggests the best way to configure existing, “preserved, restored or constructed habitat and how to link such habitats across a landscape. It also offers broader insight into how considerations of spatial structure and context can help us build and manage landscapes to achieve higher overall levels of ecological function” (Beck, 2013). By analyzing ecological processes within the confines of the given environmental conditions, a hypothetical spatial pattern emerges that provides the greatest benefit to proper function. Different spatial configurations and different land cover types provide different benefits for varying ecological processes. As such, the hypothetical spatial pattern must be place specific, acknowledging the processes most valuable for protection. This spatial pattern allows planners and designers to select parcels for preservation, increasing the ability to direct human development in ways that minimizes the deterioration of ecological function and services.

The spatial language utilized by landscape ecologists is based on three basic elements that comprise any given landscape: patches, corridors, and matrices. The distinction of these three basic elements provides a universal language to describe the configuration of any landscape, facilitating the potential for coordination and cooperation across disciplines (Ahren, 1991). By viewing an aerial photo of a landscape, the distinction of these elements becomes clear. Patches are non-linear, contiguous areas that have relatively homogeneous characteristics that distinguish them from their surroundings (Dramstad et al., 1996). A good example is a grove of coniferous trees left standing in an otherwise cleared field. Corridors are linear features that differ from the immediate surroundings, such as a stream, path, or trail. Corridors connect patches within a landscape, allowing organisms, materials, and energy to move between them (Beck, 2013). Within a landscape, the matrix is the predominate element

present, facilitating a primary role in determining the function of the landscape (Ahren, 1991). This taxonomy of elements lends itself to spatial analysis, allowing attributes such as size, shape, connectivity, and aggregation to be observed. These observations provide the basis of tying landscape structure to landscape function.

Landscape function is the primary area of concern for landscape ecologists. Landscape function is defined as “the flow of energy, species and nutrients between landscape elements” (Ahren, 1991). The arrangement of landscape elements affects materials flow regionally, and the flow of these actors can have a feedback effect on the spatial arrangement of the elements themselves (Forman, 1995). In an undeveloped landscape, these flows are naturally occurring, including water regimes, soil erosion, and species movement. In regions defined by human development, these flows are altered, accelerated, or halted, creating human-induced flows, such as pollution, increased runoff, loss of habitat, and soil manipulation (Ahren, 1991). By observing and analyzing the spatial relationships in landscape structure, planners and designers are equipped with useful tools to evaluate the consequences a specific human-induced change may have on landscape function (Ahren, 1991; Dramstad et al, 1996; Forman, 1995). Landscape ecology provides the framework for joining environmental sustainability with economic and social sustainability. An understanding of these systems informs development decisions and comprehensive planning, functioning as an ecological resource to consider in conjunction with “detailed assessments of cultural, visual, historical, economic, and legal factors” (Ahren, 1991).

Turning these principles into planning strategies and policies has not been easy. Arguments exist in the literature that call open-space planning strategies ineffective and nonessential to conservation. Certain studies argue that sustainable development or smart growth principles have little impact on the preservation of undeveloped land when compared to business-as-usual scenarios (Thorne et al., 2013). Others assert that the act of open-space planning, selecting parcels for conservation, and even plan quality have little effect on the ability to achieve concrete results. A study from Steelman and Hess

argues that stakeholder involvement and relationships among local landowners has a greater effect on successful conservation than detailed conservation planning efforts (Steelman and Hess, 2009).

Though these studies shed light on the complications and intricacies of effective open-space planning at a regional level, it is these difficulties that make planning essential. In a policy evaluation from 2003, Bengston, Fletcher, and Nelson describe the many tools available to regional open-space conservationists, all of which must be utilized to varying degrees to be successful. The first, public acquisition, transfers land to public use, such as parks, forest, wildlife refuges, greenways, environmentally sensitive areas, or others designated for non-development. The second type of tool is regulatory mechanisms, such as zoning or mitigation ordinances, allowing governmental regulations to drive where development occurs. The final tool set is incentives, including transfer of development rights, conservation easements, and tax relief, which provide financial incentives to developers and private land owners to partake in conservation efforts. (Bengston et al., 2003).

Public land acquisition removes land from the market by placing ownership in the hands of a public entity. Public acquisition, often referred to as fee simple acquisition, establishes conservation or recreation uses, removing the land from consideration for further development. Public acquisition is an effective tool for shaping development patterns and preserving the areas most crucial to landscape function, including wildlife habitat, forest areas, stream corridors, lakes, riparian areas, and other ecological features. Public land acquisition often has high degrees of voter support (Bengston et al, 2003; Backlund et al., 2004). Despite these benefits, public acquisition alone cannot function adequately in the effort to secure functioning open-space networks. Under the Fifth Amendment of the U.S. Constitution, government entities must purchase land at market value. This makes public acquisition very expensive, especially in metropolitan areas with high growth rates and increasing land values (Santos et al, 2014).

Various regulatory mechanisms are utilized across the country to both restrict the extent of urban development and to protect open space. In many respects, growth management and open-space preservation can be viewed as two sides of the same coin. Growth management policies, urban growth boundaries, cluster zoning, rate of growth controls, and development or building permit moratoriums are regulatory policies aimed at constricting urban development. Regulatory approaches to open-space conservation include the restriction of development in environmentally sensitive areas, such as floodplains, critical habitat, wetlands, or steep slopes; large lot zoning, restricting the amount of buildable land in rural areas; and exclusive zoning for agricultural or forest purposes (Bengston et al., 2003). These regulatory tools are necessary, but do not adequately ensure proper function of open-space networks, as policies often include workarounds and face political pressure from developers (Steelman and Hess, 2009).

Incentives to enhance open-space preservation are found in a variety of forms. Transfer of development rights (TDR) is a mechanism that is commonly associated with conservation efforts. TDR programs create the opportunity for increased development capabilities for developers who build in areas designated for growth in exchange for a reduction in development in areas targeted for protection. In a TDR arrangement, subdivision opportunities, potential increases in density, and other development rights are sold or transferred from the owner of a parcel designated for conservation, the sender, to the owner of a parcel designated for development, the receiver. This allows for greater development density at the receiving site in exchange for a reduction in development at the sending site (Bengston et al., 2003). Voluntary in nature, TDR programs provide one method of compensating landowners for conservation-focused regulatory restrictions that diminish property value (Linkous, 2017). Conservation easements are another a common resource in the toolbox of open-space preservation. Easements allow for land to remain in private hands while restricting development on a parcel. Easements are voluntary legal agreements between a land owner and a land trust, non-

governmental conservation entity, or public body, where the land owner receives compensation or tax relief for the associated restriction of land use (Fishburn et al, 2009). Though the two tools are similar, easements are distinguished from TDR arrangements in that development rights are not transferred elsewhere (Bengston et al., 2003). Incentive programs are useful for conservation efforts. However, like public acquisition and regulatory mechanisms, these incentives not independently adequate to ensure conservation efforts to the necessary degree. As incentive programs are typically voluntary enterprises, they often do not secure the amount of land or connectivity necessary for proper landscape function.

As no one method of conservation policy can promise to provide adequate resources for functioning open-space networks, the tools available to conservationists are best utilized in conjunction with each other by creating coordinated strategies to achieve common goals. Bengston, Fletcher and Nelson's study goes on to argue that administrative efficiency and coordination of implementation are essential elements to successful open-space conservation. It is not enough to have to the tools available. It is necessary to coordinate their uses across different organizations in different situations (Bengston et al., 2003). While planning efforts may not alone be successful, they trigger the necessary processes of coordination to properly implement conservation efforts.

2.4 Regional Scale

Many of the greatest issues facing planners and policy makers exhibit great complexity and occur across jurisdictional boundaries. Transportation coordination, affordable housing, growth management, social equity, air quality, water supply, and economic sustainability are complicated issues that require coordinated responses, as the actions of one municipality on any of these problems affect the conditions of its neighboring communities. Planning for ecological stability, environmental conservation, green infrastructure, or open-space connectivity display these same conditions, as ecological processes occur across political boundaries of neighborhood, town, city, or county. As issues

continue to transcend the legal and geographic bounds of existing jurisdictions, planners are left with an incongruous spatial construct to provide solutions, as no entity has sufficient authority to adequately address the problem (McKinney and Johnson, 2009).

To properly coordinate solutions to these issues, many planners have called for greater regional collaboration to bridge the institutional gaps that exist in contemporary land-use politics (McKinney and Johnson, 2009; Gerber and Loh, 2011; Seltzer and Carbonell, 2011). This idea is neither new nor revolutionary within the realm of land-use planning, as justifications for regional collaboration exist within the discipline's literature from its early stages (Norris, 2001). Despite these conditions, regional strategies largely remain elusive, as planning and policy remain firmly entrenched in either state or local politics.

In the context of regional planning in the United States, there are many reasons for this gap between the scale of a problem and the scale of a solution. In many respects, regional planning is institutionally discouraged. Discussing regional planning outlooks, Seltzer and Carbonell (2011) highlight that the distribution of political powers defined by the Constitution offers little to regions. Rather, issues not addressed at the federal level are delegated to state governments and further delegated to city or municipal political actors by state constitutions. As such, the "notion of regional planning has been held up as a fundamental threat to local control and home rule and, in more rhetorical ways, to democracy itself" (Seltzer and Carbonell, 2011). In essence, local governments are wary to give up jurisdictional control of land use, an issue controlled almost exclusively at that scale, for fear of a lack of control and the redistribution of influence to neighboring communities. This institutional framework discourages regional collaboration on the issues that often require regional solutions (Gerber and Loh, 2011).

Despite this barrier to initial entry, regional planning continues to be discussed, developed, attempted, and manipulated due to the importance of the issues at hand. While the prospects of municipal governments ceding control of land-use distinctions and development decisions are limited,

the opportunity for collaboration still exists. McKinney and Johnson (2009) detail an important distinction when considering regional collaboration: the difference between regional government and regional governance. The term government refers to the formal, institutional, and legal authority to act, including tax and police powers. Governance may or may not have authoritative power. Rather it refers to a situation in which “citizens and groups (often including government agency officials) work together to plan and act based on their shared goals” (McKinney and Johnson, 2009). Furthermore, Elinor Ostrom details the potential benefits that informal governance structures which incorporate community opinion on a regional scale can have on overcoming the problems of managing common-pool resources (Ostrom, 1990; Ostrom et al., 1999). Regional problems exhibit a gap in both regional government and regional governance. Though the institutionalization of regional government remains unlikely, mechanisms to increase governance offer opportunities for collaboration.

Regional planning efforts face difficulty not just from receiving buy-in from the smaller jurisdictions of which the region is comprised but from the definition of the region itself. The scales at which land-use planning typically occurs, such as city or county, are defined by clear boundaries. These boundaries offer rigid distinctions regarding the spatial extent over which a planning body has authority (Seltzer and Carbonell, 2011). Regions do not have this luxury. Regions are often loosely defined and are not based on strict boundaries, but on softer considerations that can shift based on current conditions. Depending on the issue in question, regions may be defined by natural features, such as watersheds or climatic zones, or anthropogenic traits, including economic connectivity, cultural similarity, or transportation networks (Foster, 2011).

Considering the ambiguous nature of regions, it is imperative for planners operating at that scale to properly define the territorial boundaries of the region and to pair this definition to the problem at hand (McKinney and Johnson, 2009; Seltzer and Carbonell, 2011). Though the boundaries of a

regional action may not be hardline, allowing flexibility and adaptation if necessary, it is an important condition to know what is being considered and what is being left out.

2.5 Proper Scale for Open-space Planning

Distinguishing the proper scale for open-space or ecological planning is not an exact science. Ecological networks are open systems and are constantly influencing or being influenced by the processes of their immediate surroundings. With this consideration, it is easy to imagine that the proper scale of ecological planning efforts can balloon beyond the realistic boundaries of collaboration. As such, it is necessary to identify the extent of the systems that most directly affect the area in question. This process is influenced by the idea of bioregionalism. A bioregion is defined as having a “unique overall pattern of natural characteristics... The main features are generally obvious throughout a continuous geographic terrain and include a particular climate, local aspects of seasons, landforms, watershed, soils, and native plants and animals” (Berg, 2002). Bioregionalism provides the building blocks for determining the scope of inquiry in the initial stages of an ecological planning process.

Certain authors suggest that, in addition to the comparable environmental aspects proposed as necessary in bioregionalism, that regions should be defined by material flows. Certain materials flow in a concentrated fashion, such as water or silt in a river, while others are dispersed over larger spatial territories, such as erosion, air pollution, or habitat movement (Forman, 1995; McKinney and Johnson, 2009). The boundaries of these flows, such as a watershed or a habitat corridor, provide a spatial reference for ecological processes and can be used to distinguish the geographic scope of a plan. This strategy is increasingly institutionalized in planning and water management directives. In 2000, the European Commission issued the Water Framework Directive, which required EU member countries to manage surface water concerns at the watershed scale (Vicory et al., 2003).

While these ecological spatial units provide useful tools for discerning the appropriate definition of a region, there is a general consensus in the literature that strict adherence to any given ecological boundary can be problematic. Drainage basins and watersheds vary widely in scale, from a small stream to an entire system as large as the Mississippi River (Forman, 1995). Furthermore, there is not a single unit that effectively correlates to all possible environmental criteria. Watersheds are useful for delineating surface flow processes, but do not correlate with aquifers. Habitat extents for a terrestrial mammal do not correlate with the habitat extent of a bird.

Perhaps most problematic is that spatial extents rigidly defined by ecological processes ignore the influence of human action and the possibility for jurisdictional coordination. While ecologically-defined spatial units inform the proper scale of regional planning, and environmental function is the primary determinant, the exercise remains anthropogenic in function and the boundaries of a region must appeal to the shared interest of the people it affects (McKinney and Johnson, 2009; Beatley, 2011). Addressing human influence while defining the ecological region's boundaries serves an important, utilitarian function, as eloquently elaborated by Richard Forman. "Although boundaries determined by natural processes, such as drainage basins and bioregions, are theoretically optimum, it is not wise to wait for society to redraw the land. To accelerate the use of ecology in design, planning, conservation, management, and policy, we must use regions and landscapes that balance and integrate natural processes and human activities" (Forman, 1995).

2.6 Planning and Coordination Efforts

Effective collaboration is difficult. Planning and conservation requires the input of a disparate set of actors with varying goals, visions, and motives. As the scope of an initiative grows, so does the variation in desired outcomes and possibility of opposition. In line with issues discussed in the foundational literature, many authors detail the difficulties of conservation in American society. In a

study regarding open-space planning in Texas, Francine Romero shows that planners often encounter the opinion that “open space (or its attendant functions) is not prized as highly as the alternative, or the costs of preservation (fiscal or ideological) are unacceptable” (Romero, 2016). What some people consider to be destruction of natural processes is viewed as progress by others. To achieve conservation goals across a regional scale, as the literature suggests is necessary to effectively plan for the preservation of open-space networks, planners must rectify these disparate opinions by finding common ground and detailing the value of open space. This effort requires successful collaboration, implementation, and leadership.

In 2006, Nancy Rottle published a case study of effective regional conservation by detailing the successful preservation efforts in the Mountain to Sound Greenway (MTSG) in King County, Washington. While this project is considerably smaller in scale than the efforts detailed in this study, important lessons can be derived regarding the coordination and implementation of preservation policies across a wide range of actors. The recommendations in the case study are echoed elsewhere in the literature.

Rottle argues that “broad stakeholder representation, setting multi-faceted goals through a consensus-based process” (Rottle, 2006) was an essential step to achieving success. By incorporating the opinions and concerns of all stakeholders, the effort gained legitimacy and strength. One planner interviewed for the case study observed that the process allowed the various actors to find the “90% percent we could agree on” (Rottle, 2006), allowing stakeholders to share viewpoints and overcome differences to accomplish common goals.

An important method to initiate the stakeholder involvement detailed in the MTSO analysis is the successful linkage of open-space conservation to economic benefits. Planners in the MTSO effort were able to adequately connect the preservation of ecological resources to enhanced scenery, increased recreational opportunities, maintenance of small town character and culture, and greater efficiency in development patterns. These factors all proposed increases in the economic standing of

stakeholders that may have initially opposed conservation efforts. By detailing the human benefit of environmental conservation, planners were able to combat the attitude that preservation efforts would result in constraining policies with potentially harmful economic repercussions, allowing for a shift beyond the struggle of environment versus development (Rottle, 2006).

The last factor detailed in the MTSG case study was effective leadership. The planners involved in the effort were able to effectively coordinate the conditions detailed above thanks to a dedicated staff and effective leadership system, capable of collaboration and appropriate issue-framing. Romero expresses similar attitudes to effective leadership in the analysis from Texas, detailing “strong political leadership, civic engagement and advocacy are crucial to surmounting barriers, especially the pro-development orientation of many American municipalities” (Romero, 2016).

2.7 Synthesis and Theoretical Framework

By taking a step back and viewing the literature holistically, certain consistent themes emerge regarding regional open-space conservation strategies, allowing the development of a theoretical framework regarding the factors that necessitate consideration when formulating a plan or strategy (Table 1). First, human development and anthropogenic influences have a direct and often negative impact on the function of natural systems. Increased sprawl, impervious surface coverage, and urban development split natural areas into varying spatial structures which fundamentally manipulate the ecological processes that occur there. Without efforts to conserve undeveloped lands, the availability and functionality of ecosystem services and green infrastructure provided by natural systems will diminish significantly. Furthermore, landscape ecology informs us that landscape function is affected by form, implying that a theoretically optimum spatial configuration exists to promote the function of a given ecological service. Specific land cover types provide specific benefits and the pattern with which they are arranged and connected directly affects functionality. These building blocks provide the tools to

select those areas most critical to conservation efforts and the pattern in which these areas should be arranged. Planning exercises dedicated to open-space functionality should address the desired spatial pattern, including methods to incorporate relevant scientific knowledge into the planning process, allowing for evaluation and selection of available conservation efforts.

Second, effective open-space planning requires collaboration at a scale which is currently underrepresented in existing governance structures. The benefits provided by open-space networks do not align with political boundaries. Open-space and ecological networks are open systems. Materials and organisms flow seamlessly across the landscape. City or county governments, the traditional forums of land-use planning, do not provide adequate jurisdiction to properly coordinate solutions. As such, regional coordination is necessary to achieve ecological goals. While official regional government structures are rare and remain unlikely in the American context, increasing regional collaboration and governance provides opportunities to unify conservation efforts.

Furthermore, planners must address the proper scale for any open-space planning strategy, a process that does not have a clearly delineated methodology. This effort is complicated by the uniqueness of regions. With significant differences in ecological functions, geographic settings, climate, culture, political ideology, governmental structure, and many other variables, it is difficult to assign a consistent, applicable structure for successful regional open-space planning. It is nearly impossible to do so without considering local conditions. Ecological elements, such as bioregions, climatic considerations, or watershed boundaries, provide a useful starting point, but planners must remember that while the focus of such efforts is environmental, the actors and beneficiaries are human. The scope of any regional planning effort should not overextend beyond the reasonable boundaries of human collaboration. Strategies must develop criteria for the selection of scale, providing opportunities for cross-jurisdictional collaboration.

Third, the literature shows the importance of institutionalized coordination. There are many mechanisms within a planner’s toolbox to enhance conservation of undeveloped land, including public acquisition, regulatory measures, and financial incentives. While these strategies are often independently effective, no one measure will be successful alone and the efficacy of conservation breaks down further when efforts are uncoordinated and piecemeal. A collaborative forum bringing together public, private, and nongovernmental organizations is essential and is further strengthened through broad stakeholder involvement, clear vision, and dedicated leadership.

Table 1: Theoretical Framework from the Literature Review

Issue	Loss of Open Space		
Themes	Spatial configuration	Regionalism	Coordination
Challenges	Identification of optimal spatial configuration	Mismatch between scale of problem and scale of solution	Lack of cross-jurisdictional coordination
Potential Solutions	Analysis based on principles of landscape ecology	Regional governance	Collaborative forums
Necessary Considerations	<p>Consider ecological potential of different landcover types</p> <p>Utilize relevant spatial data to guide policy</p> <p>Identify conservation priorities</p>	<p>Select appropriate scale and boundaries</p> <p>Recognize ecological and social boundaries</p> <p>Explore methods to overcome jurisdictional constraints</p>	<p>Coordinate conservation tools to maximize scarce resources</p> <p>Strive for broad stakeholder involvement</p> <p>Generate effective leadership</p>

This theoretical framework codifies the for open-space planning, developed from the literature review, into three themes: spatial configuration, regionalism, and coordination. Each theme has associated details further describing the greatest challenges, potential solutions, and necessary considerations for each theme, as detailed by the literature. Much like ecological processes themselves, these themes and details are interrelated and exhibit great complexity. The details codified within a specific theme influence and relate to other details organized elsewhere. As such, each detail is organized with the theme to which it most directly relates. Though many horizontal linkages between themes exist, they are not shown, as the framework was developed intentionally to provide clarity to the issues.

2.8 Ethical Implications

While the benefits provided by open-space networks are of utmost importance, it is important to recognize certain ethical implications of broad conservation efforts. These implications are generally outside of the scope of this study but certainly warrant consideration. Land conservation necessitates a reduction in the amount of land available for development. In a region characterized by tremendous population growth, it might be argued that conservation efforts directly affect the availability of affordable housing, leaving conservationists and housing advocates fighting for land, funding, and resources (Bobrowski, 2003). However, it is shortsighted to assert that open-space conservation and the provision of affordable housing are incompatible ideals. Increased urban densities, the designation of areas suitable and capable to handle growth, institutionalization of accessory dwelling policies, and offering financial incentives to developers to provide affordable housing are some of the many policy avenues that can facilitate successes in both arenas. The solutions to complex problems require creativity and dedication on behalf of governments and planners. Important issues should not be

written off as incompatible, though it is essential to assess the ramifications on the entire urban system when considering any land-use decision.

Furthermore, it is imperative to address equity during the planning process. The history of environmental planning, and the broader field in general, are rife with examples of inequitable distribution of goods and resources, both intended and unintended. It is essential to address equity not only in the distribution of benefits open-space conservation provides, but throughout the planning process, including broad stakeholder involvement in nascent phases. This allows for a greater knowledge base, larger buy-in, and higher degrees of public support. Conservation efforts, and indeed any land-use decision, will suffer a lack of validity if the process and the outcomes disproportionately affect any community, positively or negatively, and any action must consider environmental justice, accessibility, and equitable distribution.

The literature on regional open-space planning shows agreement on certain consistent themes; regionalism, ecological based planning, and coordination. What is lacking in the literature is a framework to bring these components together into a coherent strategy. While a tremendous amount of research has been dedicated to the individual components that comprise regional conservation efforts, little has been written about how these components function together at the appropriate scale. This study attempts to bridge that gap by providing identification and analysis of the factors essential to regional open-space conservation strategies.

3. Methods

3.1 Theoretical Framework from the Literature Review

The previous theoretical framework was developed through the literature review and details the factors that necessitate consideration in an open-space planning process. This framework will be used to guide the case study. In turn, the case study will provide applicable solutions to these factors based on the lessons derived from the evidence collected. The literature selected for incorporation into the review was found primarily through online resources, including the University of Washington's Library Resources and Digital Catalog, Google Scholar, and other comparable scholarly research databases. In cases where publications were not digitally available, physical copies were acquired through the University of Washington's library system. Only peer-reviewed articles were selected for inclusion in the review, except in situations where research was related to a strict definition of a term. For broader subjects, such as the history of ecological planning or the status of regionalism in the American political system, textbooks or comparable publications of collected sources not subject to the peer-review process were included. Sources were stored in Mendeley, a digital citation manager. To be considered for inclusion in the framework regarding regional open-space planning, the theme or detail had to show consistency in the literature reviewed. As shown in the review, the theoretical framework consists of details that were discussed by multiple sources. Factors not mentioned by a plurality of sources were not considered for inclusion in the framework.

3.2 Case-Study Approach

To develop an understanding of the research questions that guide this study and to address the theoretical framework developed from the literature review, a case-study approach was selected as the most appropriate research method. In a seminal guide for conducting case-study research, Robert Yin details the various methodological approaches available to social scientists conducting research. Five

distinct approaches are discussed: experiments, surveys, archival analyses, histories and case studies.

Yin argues that three factors direct the researcher to the most appropriate approach. These factors are the form of the research question, the requirement of control of events, and whether the research has a focus on contemporary events (Yin, 2014).

Yin goes on to detail that a case-study approach is most appropriate when the research questions investigate how or why a phenomenon occurred, when the study does not require researcher control of behavioral events, and when the phenomenon under study is contemporary. Experiments and histories aim to answer comparable research questions, though experiments require behavioral control throughout the research process and histories do not deal with contemporary events. Archival analyses and surveys aim to answer different sets of research questions. Yin further hones his analysis of the suitability of a case-study approach by presenting a twofold definition of case-study research. Not only does a case study aim to detail contemporary events, but it is possible that “the boundaries between phenomenon and context may not be clearly evident” (Yin, 2014). Essentially, it is likely that a case study will involve important contextual considerations to properly understand the answer to the how and why questions being asked. Furthermore, Yin argues that a case-study inquiry is suited for a distinct situation in which “there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and... benefits from the prior development of theoretical propositions to guide collection and analysis” (Yin, 2014). The necessary contextualization of case-study research presents a reality that the amount of information required to detail a single data point, a case, will be voluminous. As such, multiple sources of evidence and a theoretical framework are necessary to successfully draw conclusions from the case being studied.

With this definition, a case-study design is the most appropriate approach for this study. The research questions guiding this study are concerned with how regional open-space planning strategies

are crafted and why the decisions essential to their development are chosen. This study addresses contemporary events and does not require control of behavioral events, as this control is impossible to achieve. It is not possible to craft and implement a strategy, observe two similar regions, apply the strategy to only one region, and observe the outcomes in both areas. This type of experimental control is not applicable to the current inquiry or at the scale of this research. Furthermore, an investigation of any regional planning strategy must be contextualized locally, as varying ecological, political, cultural, and economic factors will influence the tools necessary to the strategy developed. Per Yin's assertion, a set of theoretical propositions, discerned from the previous literature review, will help to guide the research. Based on the definition and detailed applicability of case-study research developed by Yin, it is the most appropriate approach for this study.

3.3 Case

This study takes a single case-study approach to compare the lessons learned in the literature review with an example of an actualized regional open-space planning effort. The case being examined is the *Regional Conservation Strategy for the Greater Portland-Vancouver Region*, referred to as the *Regional Conservation Strategy* or RCS, published by the Intertwine Alliance in 2012. The *Regional Conservation Strategy* presents an approach to coordinating conservation efforts in the Portland Metropolitan Region, which incorporates 3,000 square miles in Northern Oregon and Southern Washington. The Intertwine Alliance is not a governmental organization, nor does it have regulatory authority. Rather it is a coalition of public, private, and nonprofit organizations convened to protect and promote environmental resources in the Portland, Oregon region.

This case was selected for multiple reasons. First, it is an example of a collaborative effort related to open-space preservation at the scale deemed appropriate through the literature review. Many comparable efforts occur at a finer spatial scale, within the confines of a specific area or city, or a

larger scale, such as an entire state. As such, it is a unique case to detail the questions that are central to this study. Second, the Strategy incorporates urban, rural, and natural areas. Often, open-space conservation strategies do not incorporate urban areas and the urban-rural fringe into the analysis. These factors make the *Regional Conservation Strategy* a unique document and an intriguing case study for analyzing the methods of preservation available to a growing or developing metropolitan region.

3.4 Data Collection

Five sources of data were collected for this case study. The published strategy was the first and primary resource, documenting existing conditions, important considerations, and specific strategies to identify conservation opportunities throughout the region. The published document is important, as it is the formal statement regarding the methods chosen as most pertinent to accomplish the stated goal of increased open-space connectivity in the Portland Metropolitan region. Information was selected as pertinent from the plan itself based on importance to the strategy, consistency of reference within the document, and its applicability to the lessons derived from the literature review.

The second source of information was the *Biodiversity Guide for the Greater Portland-Vancouver Region*. This document was published by the Intertwine Alliance in tandem with and acts as a companion to the *Regional Conservation Strategy*. In essence, the *Biodiversity Guide* provides the biological framework for the strategy, summarizing the scientific information regarding the region's biogeography. While the *Regional Conservation Strategy* acts as the primary statement of policy, the *Biodiversity Guide* provides species, area, and watershed specific information and details unique strategies to address issues at these finer scales.

The third source of data was other material published by the Intertwine Alliance. The Intertwine Alliance is a continuously functioning nonprofit coalition that works in many capacities within the Portland metropolitan region. The *Regional Conservation Strategy* is not the group's only effort. By

reviewing other reports and studies published by the Alliance, insight was gained into the motivations and justifications of the *Regional Conservation Strategy*.

The fourth data resource was interviews with planners from the Intertwine Alliance and their partners; persons who were intimately involved with the production of the Strategy and could provide insight to the decisions that were necessary to craft the document. These interviews provided meaningful insight into the thought process that guided the effort but may not be explicitly stated within the document, including methods of regional collaboration, potential roadblocks, how the strategy has functioned since its publication, the specific strengths and weaknesses of the approach, and experiences unique to the Portland context. Interviews were semi-structured, guided by list of questions that was generated before the interviews were conducted and were developed to provide greater information on the evidence extracted from the written document and on the ideas that guided the Strategy's development (see Appendix A: Interview Questions). From these initial lines of inquiry, conversation flowed naturally.

The first interview was conducted with Mike Wetter. Mike Wetter is the founder and former Executive Director of the Intertwine Alliance and was instrumental in the formation of the *Regional Conservation Strategy*. He provided additional contacts who had been intimately involved with the development of the Strategy. The interviewees included Kathleen Brennan-Hunter, currently the Director of Conservation at the Oregon Chapter of the Nature Conservancy, she formerly worked as Director of Metro's Park and Nature department and served on the steering committee for the *Regional Conservation Strategy*; Jonathon Soll, a conservation biologist with Oregon Metro who is the manager of Metro's Science and Stewardship Division and served on the steering committee for the *Regional Conservation Strategy* and the *Biodiversity Guide*; Mike Houck, a member of the steering committee for the *Regional Conservation Strategy* and the Executive Director of Urban Greenspaces, a conservation driven nonprofit in the Portland region; Dan Roix, who serves as Conservation Lead at the Columbia

Land Trust and acted as Project Manager for the *Regional Conservation Strategy*; Lori Hennings, a Senior Natural Resource Scientist at Metro who served on the steering committee for the *Biodiversity Guide*; and Steve Whitney, Senior Program Officer at the Bullitt Foundation, an organization that provided initial funding to the Intertwine Alliance for the *Regional Conservation Strategy*. Interviews were recorded with participant consent to allow consistency of understanding and precision of information regarding the participant's contributions. Extensive notes were taken by the author during the interview process. Interviews were transcribed into a physical format. Information from participants was thematically categorized to allow for comparison of responses based on varying subjects.

Interviewees were first contacted by email. An initial list of twelve candidates was developed from a list of contributors to with the *Regional Conservation Strategy* found within the document, with further suggestions and contact information generated from previous interviewees. As the Intertwine Alliance functions as a coalition of public, private, and nonprofit actors, the intention of the initial list was to reflect this diversity of representatives. Though private actors work with the Intertwine Alliance on other conservation efforts, the *Regional Conservation Strategy*, as a statement of science and policy, was primarily generated by public and nonprofit actors. Follow-up emails were sent within two weeks to potential interviewees who did not respond to the first inquiry. The final list, which included three representatives of public office, three representatives of nonprofit organizations, and one funding resource, was based on eventual participant response. All potential interviewees who responded participated in the interview process. With more time, a larger list of participants, including persons within communities affected by the Strategy, may have developed, adding a deeper perspective to the process and the outcomes.

The final data source was other planning or conservation efforts that had used the *Regional Conservation Strategy* as a data source. Many ecological efforts drafted after the publication of the Strategy have relied on the framework and the data detailed within the document. This data source

provided a greater understanding of the conditions surrounding the process, how it was perceived by the public, and how it has been utilized since its publication.

3.5 Data Analysis

In a guide for conducting case-study research, Gary Thomas insists that researchers must clarify the purpose of a specific case. According to Thomas, case studies fall into one of two broad categories; intrinsic or instrumental. Intrinsic case studies explore a phenomenon to expand knowledge on the subject; a curiosity-driven exercise without secondary purposes. Instrumental case studies are done with a specific secondary purpose, utilizing the case as a tool to achieve a purpose. Thomas further dissects case studies into subcategories; evaluative or explanatory. Evaluative studies attempt to explain how well a case has fulfilled a given purpose. Explanatory studies offer an explanation regarding how or why a case functioned as it did (Thomas, 2011).

Using Thomas' framework, this study utilizes the *Regional Conservation Strategy* as an instrument to explain the process of regional open-space planning and collaboration. This case study is not evaluative, as it does not attempt to critique the functioning capacity of the *Regional Conservation Strategy*. Though the findings detail successes and difficulties related to the strategy's development and how it has been used since its publication, comprehensive policy evaluation is not the purpose of this study. Rather, the Strategy serves as a representative example to explain how open-space planning strategies are coordinated and implemented at a regional scale.

3.6 Generalizability

The lack of generalizability derived from single case-study research is a frequent critique of the methodology. It can be difficult to deduce lessons or conclusions based on a single example or data

point. In discussing this concern, Thomas argues that the poor relation between case studies and generalizability exists “only because it is conspicuously deficient in its potential for generalization. Its weaknesses in terms of generalization, in other words, are not disguised” (Thomas, 2011). According to Thomas, broad generalizations are not realizable outside of the natural sciences. Yin explains this condition by detailing that “case studies, like experiments, are generalizable to theoretical propositions and not to populations or universes. In this sense, the case study, like the experiment, does not represent a ‘sample,’ and in doing case study research, your goal will be to expand and generalize theories and not to extrapolate probabilities” (Yin, 2014). Per Yin, the goal of case-study research is to generalize based on the observed conditions and not to particularize or predict a specific outcome. “The assumption in a case study is that, with a great deal of intricate study, looking at our subject from many and varied angles, we can get closer to the ‘why’ and the ‘how’” (Thomas, 2011). To frame the issue of generalizability of case-study research in another way, Robert E. Stake asserts that “the real business of case study is particularization, not generalization. We take a particular case and come to know it well, not primarily as to how it is different from others but what it is, what it does. There is emphasis on uniqueness, and that implies knowledge of others that the case is different from, but the first emphasis is on understanding the case itself” (Stake, 1995).

These discussions imply an important distinction regarding the applicability of single-case studies. Single-case studies are not necessarily prescriptive, nor are the lessons derived meant to be precisely reapplied out of context. Rather, the value of this methodology exists in providing applicable solutions to real-world situations. As situations that exhibit similar conditions to the case under study recur elsewhere, the examples of how and why a particular strategy was selected can be recontextualized within the unique environment of a different locale, providing rough guidelines for comparable strategies in varying circumstances.

To this end, the strategies found within the *Regional Conservation Strategy*, discerned from the interview process, and detailed in the affiliated material are thoroughly documented to triangulate the Intertwine Alliance's decisions regarding the broad factors essential to open-space conservation strategies detailed in the theoretical framework. By contrasting and synthesizing the lessons derived from the case study with the necessary components developed through the literature review, this study presents potential strategies to facilitate open-space conservation planning on a regional scale.

4. Findings

4.1 Context

4.1.1 Portland, Metro Regional Government, and the Region

Portland is the largest city in the State of Oregon and in Multnomah County. Sited in the northern portion of the state, near the border with the State of Washington, the city sits at the confluence of the Willamette and Columbia Rivers. Portland is nestled between the mountains of the Oregon Coast Range to the west and the Cascade Range to the east. According to estimates from the 2016 American Community Survey, the city is home to nearly 640,000 residents (U.S. Census, 2016).

In any discussion of regional planning, the Portland region is unique due to the presence of Metro, the only directly elected regional government in the United States. Serving more than 1.5 million residents in Clackamas, Multnomah and Washington counties, Metro has official jurisdictional capacity to manage certain infrastructure for the region, coordinate growth management strategies, oversee numerous public amenities, provide leadership in a regional research capacity, and to manage the region's parks and natural systems. The Metro Council, the organization's primary governing body, consists of a president that is elected regionwide and six councilors who are elected by smaller voting districts. The Metro Council is elected every four years in non-partisan races (Metro, 2018).

Aside from the presence of an institutionalized regional government structure, the Portland metropolitan region is unusual due to its proximity to a state boundary. The Columbia River separates Oregon from Washington. Vancouver, Washington, which has an estimated population of 175,000 per the 2016 American Community Survey (U.S. Census, 2016), sits on the northern banks of the Columbia. The two primary cities of Portland and Vancouver make up the Portland-Vancouver-Hillsboro Metropolitan Statistical Area, a designation from the U.S. Office of Management and Budget that describes a contiguous geographical region, regardless of jurisdictional boundary, that has close

economic ties throughout the area. The 2016 American Community Survey estimated the population of the Greater Portland-Vancouver region to be over 2.4 million residents (U.S. Census, 2016).

4.1.2 Relevant Planning Frameworks

Oregon has long been a pioneer in urban planning and growth management at a state level and it was one of the first states to adopt a statewide policy regarding these issues. Adopted in 1973, the Land Conservation and Development Act requires all cities and counties to prepare comprehensive land-use plans that reflect consistency with established statewide goals. The Act established the Department of Land Conservation and Development (DLCD) and the Land Conservation and Development Commission (LCDC) to oversee the program and to review and approve local plans for consistency with state goals (Gosnell et al., 2011). As currently constructed, there are nineteen explicit planning goals, including citizen involvement, land-use planning, agricultural and forest land protection, clean air and water, transportation, economic development, and housing. The goals are accompanied by guidelines, which suggest strategies to apply a specific goal, but are not mandatory. The DLCD describes the planning program as a partnership between state and local governments, as local governments are required to plan by state law, and the state mandates certain standards for planning. Within this framework local governments do the necessary planning, develop appropriate decisions, and administer associated regulations. Per the DLCD, “the resulting mosaic of state-approved local comprehensive plans covers the entire state” (DLCD, 2010).

The goals of Oregon’s statewide planning program do address the conservation of working and natural lands and the preservation of open-space processes. The protection of natural resources, scenic and historic areas, and open spaces is the focus of Goal 5. The goal details that riparian corridors, wetlands, habitat, scenic areas, natural resources, and other environmental features must be inventoried and protected. The suggested guidelines include establishing the need of a given resource,

utilizing planning to direct development to conserve the needed amount, and to use various methods to take necessary land into public control (DLCD, 2010). Similar goals and guidelines exist in relation to agricultural land (Goal 3), Forest Land (Goal 4), Air and Water Quality (Goal 6), and Areas Subject to Natural Hazards (Goal 7).

Goal 14, Urbanization, addresses the same issue from a different angle. The goal mandates the establishment of Urban Growth Boundaries (UGB) in every city in the state. The establishment and potential change of a UGB is designed to be a cooperative process between cities and their respective counties, and in the case of the Portland region, the regional government. DLCD describes that UGBs are designed “to provide for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries, to ensure efficient use of land, and to provide for livable communities” (DLCD, 2010). UGBs are based on 20-year population, housing, and employment forecasts and cities must show that they have the available capacity to accommodate the expected population.

While the goals of the statewide planning program include mandated evaluations and protections of undeveloped land and the benefits it provides, certain problems arise from the law as currently constructed. UGBs are aimed to restrict urban development and sprawl, which is beneficial to open-space conservation outside of these boundaries, though it fundamentally diminishes the value of open space and its associated ecological processes within these boundaries. This essentially creates a dichotomy of urban or non-urban, negating the potential value of maintaining non-urban lands within the urban context. The goal specifically states that “land within urban growth boundaries shall be considered available for urban development” (DLCD, 2010). Though the other goals specifically related to preservation are expected fill this gap, there is no effort to coordinate preservation across UGBs or between cities, creating a situation where conservation efforts have little connectivity and are not considered at a scale necessary to properly evaluate ecological efficiency.

The presence of Metro provides a unique opportunity to fill this gap of connectivity at a regional scale. Following its establishment by approved ballot measure in 1978, Metro was given the responsibility of coordinating the comprehensive plans of the 27 formerly independent jurisdictions within its boundaries and to establish a UGB for the metropolitan region. Changes to state law empowered the Metro Council with the ability to craft policy regarding the size and placement of the UGB and the pattern of development within its boundaries (Metro, 2000). This allowed Metro to coordinate development and conservation strategies at regional scale.

Additionally, throughout its history, Metro has been proactive about coordinating open-space preservation and using its resources to acquire land to be kept in a natural state. In 1992, Metro, and the cities and counties within Metro's jurisdictional boundary, adopted the *Metropolitan Greenspaces Master Plan*. Aiming to enhance community awareness to the value of land conservation and natural-area protection, the plan called for a "cooperative regional system of natural areas, open space, trails and greenways for wildlife and people" (Metro, 1992), including specific references to significant natural areas, trail networks, biodiversity, and education, designating the region's priorities for investment and protection of greenspaces. The *Metropolitan Greenspaces Master Plan*, the first collaborative effort at open-space conservation in the region, was pivotal in Metro's successful land-acquisition efforts in the following years, including two bond measures passed in 1995 and 2006. The two bond measures, of \$136 million and \$227 million respectively, have placed 17,000 acres and 90 miles of riparian areas in Metro control, expanding Metro's role as an operator and manager of parks and natural areas (Metro, 2017).

Though the previous examples show that Metro has had notable successes in open-space planning, conservation, and land acquisition, Metro is still constrained by its jurisdictional boundary. This is particularly noteworthy considering Metro's proximity to the Columbia River and the state line. Residents of the Greater Portland-Vancouver region are intrinsically linked socially, culturally, and

economically, as are the ecological functions that take place in the region. The separation of a large river and a state boundary does not segregate the environmental processes that provide benefits to the residents of the region, yet the boundary does prohibit collaboration and coordination of planning and funding.

4.1.3 The Intertwine Alliance

The Intertwine Alliance is a coalition of over 150 organizations from the public, private, and nonprofit sectors, working within the greater Portland-Vancouver region to promote environmental goals. The Intertwine Alliance is a nonprofit entity, offering an opportunity for collaboration across jurisdictional boundaries on ecological issues, including the state boundary that separates Portland from Vancouver. The Alliance acts as a regional convener for its partner organizations and other interested parties, providing a forum for discussions and projects that would otherwise be difficult to coordinate. Notable partner organizations include city governments, including the City of Gresham, City of Forest Grove, and the City of Oregon City; organizations within city governments, such as the City of Portland Bureau of Environmental Service, Portland General Electric, and Hillsboro Parks and Recreation; county and regional bodies, such as Metro, North Clackamas Parks and Recreation District, and Vancouver-Clark Parks and Recreation; state-level entities, including the Oregon State Parks and Recreation Department; federal-level agencies, such as the National Park Service, and the U.S. Fish and Wildlife Service; private entities, including Kaiser Permanente, Pacific Continental Bank, and multiple private landscape architecture firms; and many nonprofit organizations working in environmental issues and conservation, such as the Audubon Society of Portland, the Urban Greenspaces Institute, and the Northwest Trail Alliance (Intertwine Alliance, 2018).

Broadly, the purpose of the Intertwine Alliance is to work together “to integrate nature more deeply into the Portland-Vancouver metropolitan region” (Intertwine Alliance, 2018). The Intertwine

Alliance aims to develop, conserve and promote the Intertwine, a term used to reference a connected network of parks and natural areas throughout the greater Portland-Vancouver region. The Vision Statement of the Intertwine Alliance reads as follows:

We envision an exceptional multi-jurisdictional, interconnected system of neighborhood, community and regional parks, natural areas, trails, open spaces, waterways and working lands, educational programming and recreation opportunities distributed equitably throughout the region. This region-wide system is acknowledged and valued here and around the world as an essential element of the greater Portland-Vancouver metropolitan area's economic success, human and ecological health, civic vitality, and overall quality of life.

As the region grows and develops, this region-wide system also expands, diversifies, and matures to meet the needs of a growing and changing population. All residents, including low income and communities of color, live and work near and have access to nature, areas for recreation and leisure, and public spaces that bring people together and connect them to their community (Intertwine Alliance, 2018).

The Intertwine Alliance aims to complete this vision by leveraging investments in the natural resources that constitute the Intertwine, facilitating forums, acting as a regional convener for actions and strategies, and developing capacity through training and education. The Intertwine Alliance acts as a leader to “catalyze, nurture, facilitate and manage complex, collaborative initiatives” (The Intertwine Alliance, 2018). The Intertwine Alliance organizes this work into five primary initiatives: conservation, including protection and maintenance of undeveloped land and natural resources; acquisition of land to transfer remaining resources into public ownership; active transportation in the form of a network of regionwide pedestrian and bicycle trails; establishment of a regional system, which is the Intertwine itself; and conservation education to foster stewardship and to promote the next generation of conservation champions within the region.

The Intertwine Alliance was initially created and incubated as a Metro organization aimed at expanding and maintaining Metro's inventory of parks, trails, and natural areas. Initially called the Connecting Green Alliance, the foundations of the Intertwine Alliance's current structure were placed in 2007. According to Mike Wetter, former Executive Director of the Intertwine Alliance, the birth of the

Alliance was “a recognition that every achievement at any scale that we accomplished in the Portland region relating to parks, trails, natural areas, or conservation, always involved a coalition of public, private, and nonprofit organizations and leaders working in alignment towards a common vision” (Wetter, 2018). Though conservation professionals in the Portland region have a long history of success and collaboration, the idea to institutionalize the relationship created the early genesis of the Alliance. “Rather than put this [coalition] together every time we want to do something big, why not just put it together and keep it together and keep doing big things” (Wetter, 2018). In the words of Jonathan Soll, collaboration “was the whole idea behind the Intertwine Alliance. We can be better working together. It doesn’t mean working in lockstep. It means having a forum or multiple forums, in which everchanging partnerships and overlapping alliances can stay in touch and leverage each other’s capacity and resources in order to be more efficient, reach new stakeholders, and get more conservation work done for the region” (Soll, 2018). Per Mike Houck, members of the conservation community came together, participated in many focus groups, and “collectively formed a framework for what we thought this entity should be” (Houck, 2018).

In 2011, the Intertwine Alliance moved out of Metro’s umbrella, independently incorporating as a 505(c)(3) nonprofit organization. The Alliance is governed by fourteen-member Board of Directors. The Board is comprised of representatives from member organizations in public, private, and nonprofit sectors and is voted on by partner organizations of the Alliance. Funded primarily through dues collected from its partner organizations, the Intertwine Alliance maintains a small staff that primarily acts to coordinate projects and resources between partners (The Intertwine Alliance, 2018).

4.2 Regional Conservation Strategy

In 2012, the Intertwine Alliance published the *Regional Conservation Strategy for the Greater Portland-Vancouver Region*, henceforth referred to as the RCS or the Strategy. The RCS, described by

Houck as an “early action project” (Houck, 2018), was one of the primary efforts developed by the Intertwine Alliance following its formation. The effort that eventually became the RCS began in 2010. Led by a sixteen-member steering committee representing the various organizations affiliated with the Intertwine Alliance, the RCS reflects the work and contribution of hundreds of members from Intertwine Alliance partners, staff members, conservationists, and volunteers. The RCS details current conditions, threats, and opportunities relating to the development of Intertwine and natural areas within the region. The scale of the RCS is ambitious. The bi-state region detailed within the Strategy (Figure 1) includes nearly 3,000 square miles of land, including both highly developed urban areas and remaining rural lands. The region covers all or portions of ten counties, including Clackamas, Columbia, Marion, Multnomah, Tillamook, Washington, and Yamhill in Oregon and Clark, Cowlitz, and Skamania in Washington (The Intertwine Alliance, 2012a).

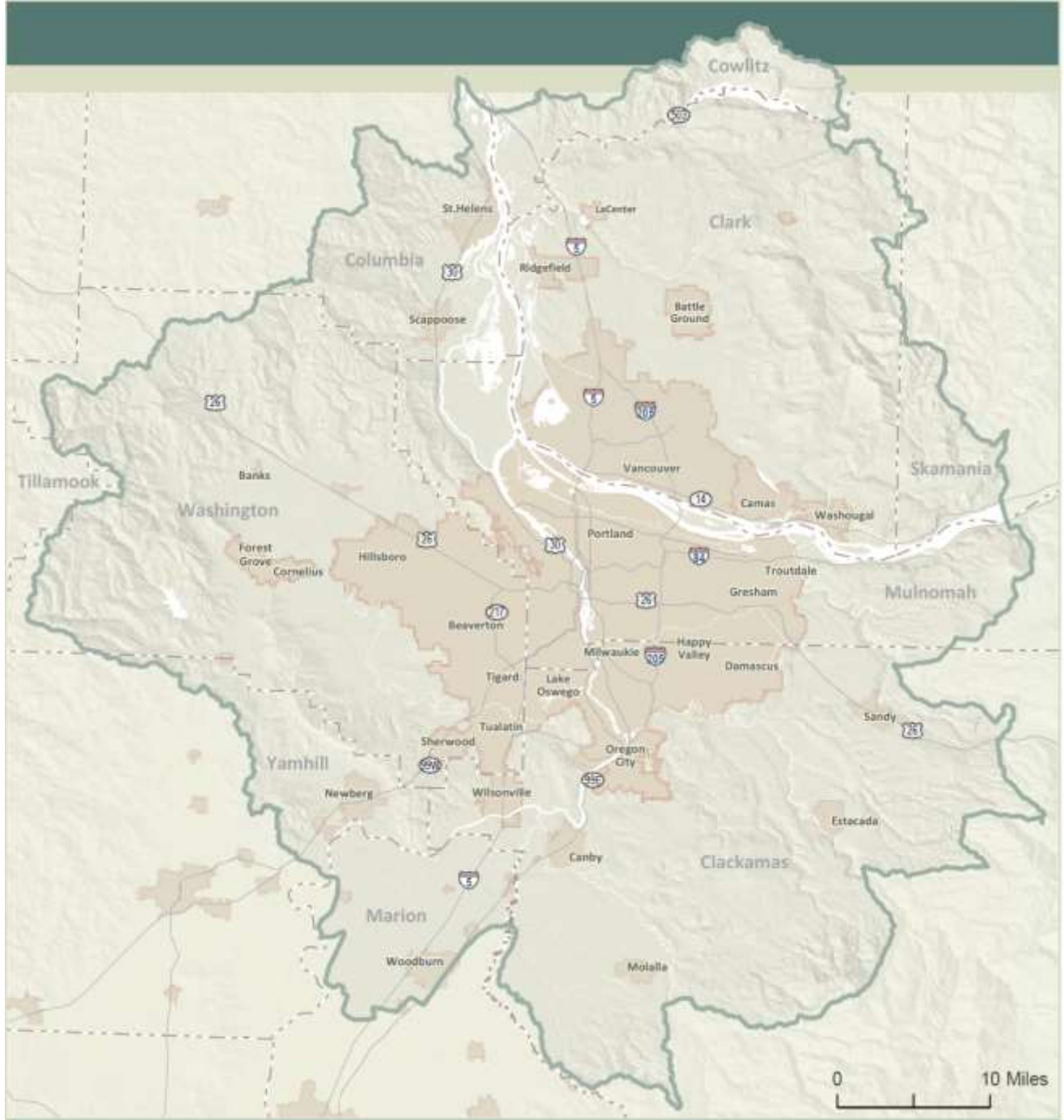


Figure 1: RCS Scale (The Intertwine Alliance, 2012b)

Though the RCS details methods for open-space conservation and land acquisition, the Strategy has a unique focus on biodiversity. Per the Strategy's *Executive Summary*, the RCS' "primary purpose is to describe how we can protect our region's biodiversity for the long term" (The Intertwine Alliance, 2012c). Detailing the relationship between biodiversity and ecosystem services, the Strategy acknowledges that "diverse natural systems exhibit greater stability and ability to recover from disturbances than do simplified systems. With the future always unknowable, conserving a robust and biologically diverse network of ecosystems offers society its best chance to maintain the many benefits it receives from nature" (The Intertwine Alliance, 2012a). Per Dan Roix, the RCS "was about trying to develop a framework to conserve the biodiversity of the region" (Roix, 2018). In many respects, the term biodiversity is used in the RCS in a fashion that makes it interchangeable with the term open space, as defined in the literature review. If biodiversity is the focus of conservation strategies developed within the RCS, large and interconnected networks of undeveloped land are the mechanism for success. "Ecologists generally agree that a well-connected system of protected natural areas, supported by residential and working lands strategically managed to provide ecological benefits, can work together in both conserving biodiversity and providing clean water and air" (The Intertwine Alliance, 2012a). As such, planning for open-space conservation and connectivity is integral to achieve the primary purpose of the RCS. "Large patches of habitat and larger fish and wildlife populations are typically more genetically diverse and more likely to persist over time than smaller habitat areas or populations with fewer individuals. Functionally connected habitats allow for larger populations and more genetic mixing, dispersal, and recolonization" (The Intertwine Alliance, 2012a). Within the context of the RCS, conservation of biodiversity and open-space networks are inextricable.

The RCS was developed to fulfill the vision of the Intertwine Alliance, specifically the "regional goals of ensuring that the diversity of plants, animals, and habitat types in the greater Portland-Vancouver region is protected, conserved, and restored across the region's urban and rural landscapes"

(The Intertwine Alliance, 2012a). The RCS aims to accomplish this broad goal through three primary directives:

- 1) Develop, adopt, and actively implement a bi-state, multi-county regional biodiversity recovery and management plan. Integrate it with other sustainability and transportation plans and planning efforts.
- 2) Identify significant natural areas for acquisition and protection. Formally integrate natural area conservation into transportation, land-use, and other sustainability plans and projects through regional and local policies.
- 3) Develop and implement a toolbox of innovative strategies to conserve the region's natural resources and ensure that large and small refugia are interconnected in every neighborhood and watershed in the region (The Intertwine Alliance, 2012a).

Essentially, the RCS is intended to function as a framework to be considered as an ecological resource in conjunction with “detailed assessments of cultural, visual, historical, economic and legal factors” (Ahren, 1991). It is a pathway to integrate the Intertwine Alliance’s vision into the planning process and into the minds of policymakers. It is the formal statement regarding the state of the system, and “provides accessible and usable information on regional conservation for practitioners, policymakers, funders, and the public” (The Intertwine Alliance, 2012a).

The RCS was not developed independently. Rather, it is the centerpiece of a threefold approach to develop an understanding of the issues and present solutions to achieve the stated goal. The Strategy was developed and published in tandem with the *Biodiversity Guide for the Greater Portland-Vancouver Area*, henceforth referred to as the BG or the Guide. The Guide is a summary of the science and biological conditions upon which the Strategy is based. Addressing specific habitat types, species, and watersheds, the Guide “is intended as a resource for those who work on the ground, do planning for specific areas, or simply want more information about the land cover and ownership, the region’s prominent natural features, major habitat types, and the plants and animals that rely on those habitats” (The Intertwine Alliance, 2012a). The third product developed during this process was a high-resolution land cover map and GIS model of the region. The land cover data was collected at a resolution of 5x5 meters, allowing practitioners to observe land cover types at a very fine scale, with the specific intent to

“encourage strategic, targeted investment in conservation where it will be most effective and will help achieve common goals” (The Intertwine Alliance, 2012a). The BG and the land cover map provide the necessary data and scientific background on which the RCS is built and are first-of-their-kind efforts in the Portland-Vancouver region (Soll, 2018; Houck, 2018; Brennan-Hunter, 2018).

The RCS and its companion products are not regulatory documents, do not contain prescriptive policies, and do not identify specific parcels, areas, or jurisdictions for conservation. The authors of the document are careful to recognize that the RCS should not be misconstrued as a replacement, substitute, or update of existing plans or regulations regarding land use and environmental conservation. “Rather, it synthesizes and provides a larger context for local efforts, reflects upon regional issues, and can serve as a framework for strategic conservation actions into the future” (The Intertwine Alliance, 2012a).

The RCS builds upon comparable efforts of the past, reflecting a history of conservation and ecological thinking within the region. Drawing inspiration from Metro’s 1992 Greenspaces Master Plan, which directly affected the passage of the bond measures aimed at increasing Metro’s land holdings and conservation ability; the work of the Greenspace Advisory Committee that resulted in the formation of the Intertwine Alliance; comparable efforts in Clark County and Washington State; and countless other historical efforts aimed at regional open-space collaboration, the RCS can be viewed as the next step to build upon previous efforts and to modernize the data necessary to complement the work being done. The existing evidence regarding the genesis of the RCS shows that there were three primary justifications for taking on the effort. First, the existing mapping and land data within the region was antiquated, causing difficulties in generating the information necessary to drive conservation within urban areas. Second, existing conservation efforts often did not operate at an appropriate scale. Finally, a formalized statement of existing conditions and intended purpose allowed greater opportunities to attract and coordinate limited funding. These three justifications, the need for modernized data, a

desire to produce analysis at the proper scale, and coordination of funding resources, correspond respectively with the broad themes that drive the theoretical framework developed from the literature review, spatial configuration, regionalism, and coordination, though lessons learned from each justification provides insight to multiple themes.

4.2.1 Mapping

One of the distinguishing factors of the RCS is that it attempts to set a strategy for conservation across land-use types. Though the region is surrounded by large natural areas and lands held in conservation by federal or state agencies, approximately one-fifth of the region detailed by the RCS is found within urban growth boundaries, referred to as urban growth areas in Washington State.

“Because urban areas are intended to concentrate development, it is to be expected that they would have a high amount of developed lands and less overall habitat. But that does not mean that they lack habitat” (The Intertwine Alliance, 2012a). Therefore, it can be assumed that the protection of habitat within urban areas requires land cover information at a fine scale, as the existing natural areas are expected to be smaller than areas found outside of the urban growth boundaries.

Per Mike Wetter, there was a recognition that opportunities for conservation investment within urban areas were being missed because land inventory mapping and conversation work was being done at a state or multi-state scale. Working at a scale that large ignores the value of smaller habitat patches that remain in urbanized areas. “The habitat [in urban areas] has been fragmented due to human development, and though there is habitat worth protecting, it doesn’t show up on the maps when your planning and GIS work is done at that level,” described Wetter. “We needed to look at a different kind of strategy, a different set of values around what makes natural areas important. Rather than just large acreage, we needed to think about it in a different kind of way” (Wetter, 2018).

In many ways, this deficiency was due to a lack of computing power. According to Jonathan Soll, land-classification maps and biodiversity analyses are completed through the interpretation and computer modelling of aerial photography and satellite imagery, as there is no practical way to map this type of information by hand. Historically, the limitations of the resolution of existing imagery and computing power meant that land analyses were available at a pixel of size 30x30 meters (Soll, 2018). This reduces the ability to identify remaining pockets of habitat in urban areas that are often too small to be recognized at that resolution, resulting in a simplification of urban areas in land-classification maps (Figure 2). “The whole metropolitan region would usually be turned some shade of gray [on the map] and called urban, giving no value to habitat. That discounts the value of investment in the geography for conservation” (Soll, 2018). According to Dan Roix, attempting “to do a spatial prioritization at the state level, the urban areas will always get grayed out, because at that scale, relative to other large blocks of forest areas, they will get lost” (Roix, 2018). As existing conservation efforts operated at a larger scale and lacked the necessary technology to map at a finer grain, the entire “Portland region looks like a white splotch in an otherwise green state” (Wetter, 2018).

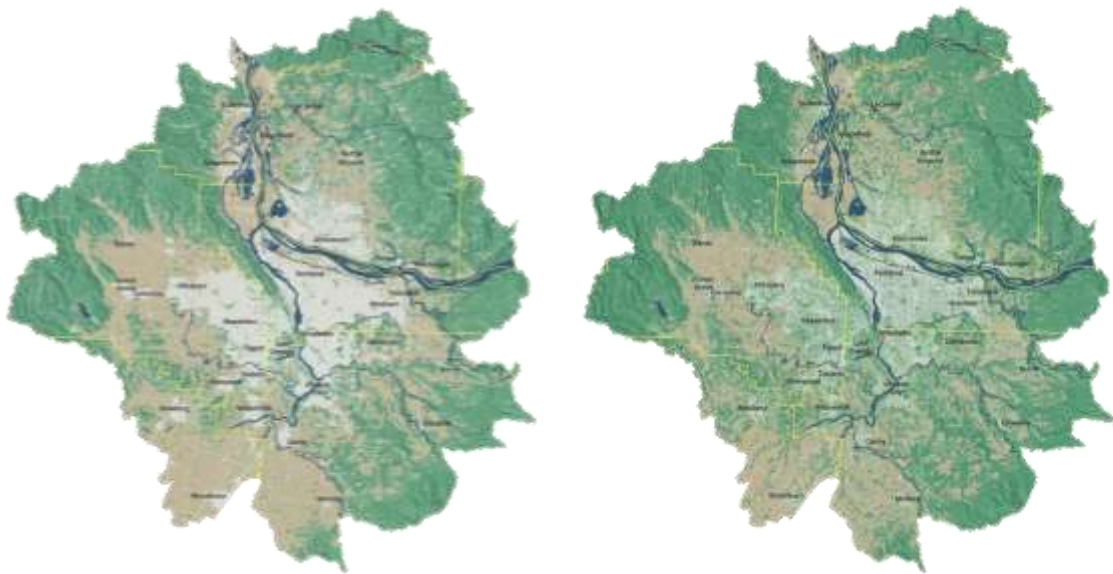


Figure 2: 30m Resolution v. 5m Resolution at Regional Scale (Soll, 2013)

Modern advances in photography and computing power increases the ability to interpret aerial and satellite imagery at a finer resolution, allowing for an increased capability to identify habitat in urban areas. “The previous mapping was out of scale and the resolution wasn’t very useful,” said Mike Houck. The initial thought process regarding the RCS was focused on “how do we put together mapping and a model that allows us to look at the most significant percentage of habitat both inside the UGB and outside? That is what resulted in the decision to go with a 5-meter pixel size” (Houck, 2018). By replacing the existing landcover map detailed at a 30-meter pixel size with a map featuring a 5-meter pixel size, the size of recognizable habitat decreased from 900 square meters to 25 square meters (Figure 2). This new tool “represents a dramatic increase in resolution over previously existing data and allows for detailed analysis necessary to model biodiversity conservation priorities at an urban scale” (The Intertwine Alliance, 2012a). This shift in technological capability represented new opportunities for conservation efforts in the region, and an increased ability to identify existing open space within urban areas (Figure 3). “The hallmark of the mapping and modelling was that, for the first time in our region, we had the ability to operate at those different scales. Down to the streetscape and up to the 3,000 square mile region” (Houck, 2018).



Figure 3: 5m Resolution v. 30m Resolution at Neighborhood Scale (Soll, 2013)

The technological advances in land cover mapping not only allow for the recognition of habitat and conservation opportunities in areas previously ignored, it allows for the development of one the important distinguishing traits of the RCS; differentiation of strategy based on land cover type. The RCS recognizes that “the same conservation strategies are not appropriate for every land use... [though] each category of land use has a role to play in protecting and restoring the region’s biodiversity, and strategies exist for developing the conservation potential of each land category” (The Intertwine Alliance, 2012a). To identify appropriate conservation strategies across land-use categories, the RCS codifies land into three distinct classifications: natural areas, defined as undeveloped land that is primarily comprised of natural habitat; working lands, including agricultural and forest lands that provide food, timber, and other ecological services; and developed areas, including industrial, commercial, and residential properties of all densities.

The recognition of habitat in existing urban areas, and the resulting classifications, allows for specialized recommendations based on land type. Analysis of threats, opportunities, and strategies are tailored to meet different needs based on the varied conditions, allowing each land-use type to maximize its conservation potential. This allows for a coordinated strategy of action at a variety of scales. This process of tailoring different strategies at different scales encourages involvement from interested participants at the smallest scales. Local-level initiatives detailed in the Strategy’s discussion of developed areas include creation of backyard habitats, alternatives to pesticides, reduction of nighttime lighting, and methods to decrease predation by domestic cats. By detailing strategies down to the individual scale, the RCS can “encourage and assist private land-owners in taking actions that will help sustain the regions biodiversity by managing and restoring portions of their land to enhance and sustain the regional system” (The Intertwine Alliance, 2012a). Contributions of any magnitude are effective in reestablishing habitat in developed areas.

Furthermore, the new mapping capabilities led to increased potential in creating data driven strategies for conservation efforts. The information gathered through the mapping and modelling process was utilized to create the region's first habitat prioritization model, striving to provide "science-based scalable models for determining the relative conservation value of habitat that would complement and support the *Regional Conservation Strategy*" (The Intertwine Alliance, 2012b). Relying on extensive stakeholder involvement, the principles of conservation science, and local expertise, each 5-meter pixel was assigned a score from 0 (no habitat value) to 100 (highest habitat value). The scores were based on considerations of many criteria, including patch area, proximity to roads, presence of wetlands, and soil makeup. The resulting map and associated GIS data allows any interested party to view the habitat value of a specific pixel, parcel, or area; a first step in developing place-specific conservation priorities and providing the building blocks of an optimal spatial configuration.

This habitat prioritization modelling had significant impacts on furthering a goal of the Intertwine Alliance and one of the primary purposes of the RCS. "The RCS was really about trying to make a case for investment in conservation in an urban region. Conservation is much cheaper, land is cheaper, and the land is more pristine outside of metropolitan areas than it is inside," said Mike Wetter. Within urban areas, "habitats have been fragmented by development and land values are high. It is just more expensive to do business in an urban region. So, the natural tendency is for people to invest outside of urban area for conservation work" (Wetter, 2018). Despite this condition, the RCS is based on the belief that, across land types, "nature is a fundamental part of having a thriving metropolitan region" (Soll, 2018). The habitat priority model, when viewed on a regional scale, has the same gray splotch covering developed areas discussed earlier. However, the data within the model can be viewed by land cover type, such as developed areas, or by city, allowing the user to view remaining habitat of highest value within its appropriate context. This ability to contextualize data represents "urban habitat in a way that makes the best fine-scale habitat within or near urban areas 'competitive' with large,

intact habitat blocks in the urban fringe” (The Intertwine Alliance, 2012b). By having data available at a finer resolution, the model provides greater detail than previous mapping efforts, highlighting the opportunities and strengthening the argument for conservation potential within developed areas. This expands the opportunity for more regional open-space connectivity throughout the urban-rural matrix, as “habitats barely or not recognizable at large scales, such as local parks, creeks, vegetated hillsides, or tree patches can be woven into a meaningful framework and incorporated into local habitat conservation planning, neighborhood by neighborhood” (The Intertwine Alliance, 2012b). “We wanted data that would be meaningful at a neighborhood scale, in an urban context, which, at the time, we couldn’t find any models of that being done before,” explained Kathleen Brennan-Hunter. The data was collected such that “we could look at the neighborhood scale and then have it be scaled up to the regional [scale] and was valid all the way in between” (Brennan-Hunter, 2018).

4.2.2 Scale

The selection of scale for the RCS began with a dedication to promote natural areas in an urban or urbanizing metropolitan area. “The scale of [the Intertwine] started with our interest in the metropolitan region,” said Mike Wetter. “The Intertwine Alliance is an organization set up to champion nature in the metropolitan region” (Wetter, 2018). As discussed in the previous section, one of the guiding ideals of both the Intertwine Alliance and the RCS was to develop strategies to promote, conserve, and manage remaining natural areas, undeveloped land, and habitat across the urban and rural fabric.

Despite this relative focus on promotion of habitat within urban areas, there was an underlying premise that ecological processes do not adhere to political boundaries or land cover types. “Our philosophy was strictly an ecologically based effort,” said Mike Houck. “Boundaries were irrelevant” (Houck, 2018). Expanding the boundaries of analysis provided an opportunity to contextualize urban

areas within their surroundings. “We wanted to get a big enough area that it really put the urban within the context of the greater landscape” (Brennan-Hunter, 2018). This recognition drove the scale of the effort outward, beyond existing jurisdictional boundaries. “Habitats cross both political and geographic boundaries, and it is important to be able to put local conservation and restorations efforts into a larger context” (The Intertwine Alliance, 2012a).

In many respects, the process of selecting a scale for the Strategy was directed by existing conservation efforts surrounding the metropolitan region. To the east of Portland lie the mountains of the Cascade Range, much of which is held in federal conservation as the Mt. Hood and Gifford Pinchot National Forests. The region is buffered to the west by the mountains of the Coast Range, which has significant state and federal management, as well. The Puget Trough and the Willamette Valley, to the north and south respectively, feature environmental and conservation efforts by state branches of the Fish and Wildlife Service and local jurisdictions found in those areas (Houck, 2018; Roix, 2018; Soll, 2018). “As we started thinking about our projects, instead of thinking from the outside in, we thought from inside [the urban areas] and out,” said Jonathan Soll. “What is the scale of analysis, and what is the flow of energy and organisms, that we should be thinking about” (Soll, 2018). As the scale expanded, the work being done in surrounding management areas became a deciding factor. “The geography of the Intertwine that we selected was very intentional. The 3,000 square mile geography was selected so that we would be nested among other efforts,” described Houck. “We viewed what we were doing as complimentary to but not overlapping with those other geographies” (Houck, 2018). The physical scale was initially developed to fill a gap in conservation efforts between existing federal and state level management units.

Within the broader framework of nesting within existing conservation efforts, and with a conscious acceptance that hard boundaries are not applicable when analyzing ecological processes, certain constraints were necessary for practical purposes. “We needed to define a hard boundary

because we are collecting data and doing analyses, so you have draw a line somewhere,” said Soll. “We will collect data in here and not out there” (Soll, 2018). To delineate this boundary, the Intertwine Alliance followed a developing trend within the region to work at a watershed scale. In the years preceding the RCS, local stormwater management agencies were beginning to explore strategies of collaborative, watershed-based initiatives aimed at increasing ecosystem services and the function of natural processes to properly service a growing population, reduce costs and inefficiencies associated with traditional water infrastructure networks, and to adhere to state and federal mandates, such as the Clean Water Act. This drove an increased collaborative capacity between stormwater management agencies and local park providers. “The collaboration between park providers and stormwater agencies has resulted in a more holistic, watershed-based approach to regional open-space planning and multi-objective approach to the acquisition, restoration, and management of urban landscapes” (The Intertwine Alliance, 2012a).

Building upon this movement, watershed boundaries were used to delineate the border of data collection and analysis (Houck, 2018; Soll, 2018; Wetter, 2018). The general guideline of land existing between other efforts corresponded with the boundaries of eight HUC-4 watersheds, or 22 HUC-5 watersheds. HUC stands for Hydrologic Unit Code, a hierarchical watershed classification system developed by the U.S. Geological Survey (The Intertwine Alliance, 2012b). “Specific boundaries were selected to keep the extent of the area reasonably small, to exclude most federal owned land, and to moderate data processing costs” (The Intertwine Alliance, 2012b).

The selection of the spatial scope of the RCS was not a rigid process. There was a fundamental understanding that ecological processes do not confine themselves to human constructed boundaries. The Guide specifically details that certain boundaries “have real biological meaning, but many are somewhat arbitrary delineations along a continuum of change. Whether a given area is just inside or just outside our assessment area says more about the vagaries of available data, our budget, and our group’s

judgment than any hard and fast conservation biology axiom” (The Intertwine Alliance, 2012b). The eventual definition was based on a focus on the metropolitan area, an effort to avoid overlapping with existing management efforts, and the extent of local watersheds. “Working within that theme of urban areas surrounded by other lands, not going up into the lands that have already had extensive analysis and have significant public ownership. That is how the boundaries got defined,” detailed Soll. “There was a soft rule set and some human decision making” (Soll, 2018).

In addition to filling a spatial gap, the RCS strives to fill a jurisdictional gap by coordinating and aligning local efforts within a larger framework of existing conservation work. “It is a premise of this *Regional Conservation Strategy* that ultimate success will require coordinated efforts at multiple scales: individual, local, state, and federal. Until now, most conservation plans and related documents in Oregon and Washington have focused on a specific resource, covered a geography smaller or larger than the greater Portland-Vancouver region, or dealt primarily with either urban or rural lands” (The Intertwine Alliance, 2012a). By detailing open-space conservation strategies at a regional scale, across the urban and rural fabric, the RCS provides coordination between existing state or federal regulations and local or resource specific efforts to contextualize conservation in concerted fashion.

Much like the RCS, the *Oregon Conservation Strategy* and the *Washington State Wildlife Action Plan*, which detail statewide conservation strategies and priorities for their respective states, are not regulatory documents. Each strategy was developed by the state-specific department of the Fish and Wildlife Department. By design, the statewide efforts are intended to be utilized as a tool “to inform conservation priorities and guide conservation actions statewide. It is envisioned that any government entity and conservation partner that has an interest in wildlife and habitat conservation will be able to use the information presented and implement actions that align with their own conservation mission and goals” (WDFWS, 2015). Indeed, the *Oregon Conservation Strategy* details that the strategy was specifically developed with the assertion that “the intent is for localized or species-specific plans to tier

off of broader, overarching Conservation Strategy” (OSFWS, 2016). The RCS aims to act as a localized version of the larger statewide conservation documents, claiming that it “borrows from the research and conclusions of the statewide plans while adding local information and perspectives at a scale not possible in statewide planning documents” (The Intertwine Alliance, 2012a). In this sense, the RCS provides a function as a stepping stone between large-scale, statewide conservation efforts and local or city-scale initiatives. “We were thinking of {the RCS} as a step-down from the state-wide plans and as a connection to smaller, local conservation plans, at the watershed, sub-watershed, or city level,” explained Dan Roix. “We were trying to connect with those higher-level strategies” (Roix, 2018).

The stepping stone function of the RCS is multidirectional. In addition to providing data, research and information at a scale not available to statewide management units to promote large-scale goals, the RCS attempts to coordinate local efforts by placing them in a larger, regional context. By providing data, supporting new partnerships, and clarifying regional priorities, the RCS develops a framework, and the Intertwine Alliance acts as a forum, to increase coordination of conservation efforts taken on by local government entities or regional nonprofit organizations. This coordination is particularly necessary to achieve the connectivity of undeveloped land and habitat that the RCS and the Intertwine Alliance champion as its paramount vision.

The scale at which the RCS operates necessitates collaboration across existing lines of jurisdictional capacity, as is the case with any regional planning effort. What makes the RCS unique is that it is a bi-state effort. This level of jurisdictional divide presents significant barriers to collaboration, as state funding mechanisms in one state cannot be utilized across the boundary. The Intertwine Alliance exists as a collaborative forum to patch together the network of actors, facilitating conversation, coordination, and connectivity across existing jurisdictional lines.

The Intertwine Alliance’s status as a nonprofit entity increases their ability to do so. “The beauty of having a nonprofit is that we are not bound by state lines. Bald eagles that roost on the Oregon side

of the Columbia will frequently roost in Clark County or feed in the Ridgefield National Wildlife Refuge [in Washington],” argued Mike Houck. “When we worked within Metro in the past, they are bound by the state boundary. The fact that we’re a nonprofit means we can operate at any scale we please” (Houck, 2018). Though Metro was instrumental in the foundation of the Intertwine Alliance, the necessity of separating as a nonprofit became apparent as the scale of the Intertwine grew and the goal of true regional connectivity was established. “The bi-state [aspect] is part of the Intertwine Alliance. The Metro Regional Government, as a formal entity, can’t be a force in Washington State,” said Johnathan Soll. Despite “the fact that there is a state boundary and a major river that separates Portland from Vancouver, the biology of the two areas are linked... It was great to have something like the Intertwine Alliance which is able to ignore that boundary and use resources as appropriate” (Soll, 2018).

Many of the Intertwine Alliance’s partner organizations are nonprofit entities working in conservation efforts and the RCS functions to coordinate these individual conservation organizations to achieve a broader goal. “Nonprofit organizations often offer a high level of flexibility in developing and implementing conservation projects. In order to be truly effective on a regional scale, these projects need to be developed within a broad context and be well coordinated with other efforts” (The Intertwine Alliance, 2012a). To facilitate the necessary coordination with the RCS project, the Columbia Land Trust, a nonprofit land trust working in both Oregon and Washington, was hired as the project manager (Houck, 2018; Roix, 2018; Wetter, 2018). The influence of nonprofit organizations had further positive externalities related to bridging jurisdictional divides outside of the ability to spend at any scale. “Metro didn’t want to produce the document and have it [perceived as] a Metro document. We wanted it to be something that represented the best thinking of a broad suite of stakeholders in the region and could be a product of that group,” explained Jonathan Soll. “It wasn’t tarnished in the eyes of some stakeholders as just being the government telling people what to do... it was great that it wasn’t just a Metro project” (Soll, 2018). The influence of nonprofit organizations allowed greater flexibility in

spending and facilitated stakeholder buy-in across jurisdictional divides that may not have existed were the RCS created by a governmental entity.

4.2.3 Funding

Attracting the necessary funding to acquire, conserve, restore, and preserve natural areas is a difficulty encountered by any entity interested in open-space conservation. The RCS plainly describes this reality, stating that “in an era of tightening budgets, with few stable, long-term funding sources for conservation, it is likely that the vision in [this Strategy] will only be achieved through a combination of funding approaches, both familiar and new” (The Intertwine Alliance, 2012a). The RCS attempts to positively impact the reality of limited funding options in three distinct ways. First, as a collaborative nonprofit, the Intertwine Alliance has a unique capacity to lower the initial costs of efforts such as the RCS. Second, the RCS was designed to operate as a tool to attract greater funding from state and federal resources. Finally, the RCS and the Intertwine Alliance offer opportunities to coordinate and maximize scarce financial resources.

Regional planning efforts of this scale taken on by governmental organizations not only suffer from jurisdictional restraints, they are often politically contested, creating roadblocks and elongating the time necessary to complete them, and require large amounts of public financial resources, further increasing the roadblocks to completion. Per Mike Wetter, “that kind of project in the past would have been done by a government agency, such as Metro or U.S. Fish and Wildlife Service. Those kinds of projects took 4 to 5 years and upwards of a million dollars or more to do a planning exercise at the scale” (Wetter, 2018). By operating as a nonprofit, the Intertwine was able to bring regional partners together, attract volunteers, leverage existing resources, and attract alternative funding sources. According to Kathleen Brennan-Hunter, during the early stages of the RCS, “there were so many different ideas about what we need, and we didn’t have a lot of resources. We knew we would have to

write grants or have people pitch in and pull together the money to do something” (Brennan-Hunter, 2018). This collaborative effort generated an ability to pull from multiple funding sources, including government entities Metro, Clean Water Services, and the East Multnomah Soil and Water Conservation District; nonprofits the Bullitt Foundation, and the Audubon Society; and federal conservation programs provided by the National Parks Service. According to Jonathan Soll, who works with Metro and the Intertwine Alliance, Metro provided funding and said, “we’ll help support this if the other members of the Intertwine Alliance step up and engage” (Soll, 2018). By coordinating resources, volunteers and labor outside of an official governmental entity, the Intertwine Alliance was able to significantly reduce the costs associated with the development of the RCS. “We convened everyone who had been on the frontlines of conservation for many years. We develop it collaboratively with contributions from dozens of people and organizations from throughout the region, and we developed it for about \$100,000” (Wetter, 2018).

Attracting greater funding to the greater Portland-Vancouver region was one of the driving motivators to develop the RCS. “We had been passed over for conservation investment by state and federal agencies because we didn’t have a plan, and if you don’t have a plan, it is very difficult to make the case for investment,” explained Mike Wetter. “That is really what we set out to do: to get our property on the map and get to a place where we could advocate for it and attract more funding” (Wetter, 2018). This sentiment was echoed by Kathleen Brennan-Hunter. “One of the drivers of the RCS was that we felt like Portland was missing out on federal money because we didn’t have a unified vision across the region and we didn’t have a plan that the partners had agreed to,” she explained. “Having the RCS was an important part of demonstrating that we had our act together and were working together. We were thinking about collective impacts and we could demonstrate that investments from state and federal governments were going to have an impact that was coordinated and aligned” (Brennan-Hunter, 2018). The RCS was a tool to convene the interested partners, develop the appropriate data, formalize a

statement regarding the conditions and the desired end state of ecological conditions in the region, and to clarify regional priorities. By doing this, the RCS exists to “help elected officials and nonprofit organizations set their own conservation priorities and target scarce financial resources. In addition, having regional priorities documents may also be helpful in making a political or funding case for conservation initiatives” (The Intertwine Alliance, 2012a). “There is nothing more valuable [in the grant writing process] than saying ‘this is where we are working, this is what we are working on, and this is how it is part of a larger conservation effort,’” explained Lori Hennings (Hennings, 2018). The value of a clear, contextualized statement of broader purpose was echoed by Steve Whitney of the Bullitt Foundation, who provided funding to the Intertwine Alliance and the RCS. The RCS provides the ability to clarify how smaller, local projects fit into a larger effort, increasing legitimacy of these projects in the eyes of funders (Whitney, 2018).

Furthermore, as the scarcity of resources dictates the scope of what is possible in open-space conservation efforts, the RCS and the Intertwine Alliance provide greater opportunity for coordination of existing funding. By providing a forum for partner organizations and conservation professionals to work together, the Intertwine Alliance aims to reduce competition and maximize efficiency by leveraging resources aimed at common goals. “Because the resources available for conservation related work are limited, priorities and goals need to be set – and difficult decisions made – to determine how and where to invest resources” (The Intertwine Alliance, 2012a). This formalized statement allows for consistency of efforts across scale and “can be useful to federal agencies and local conservation practitioners in identifying priorities of mutual interest and developing complimentary strategies” (The Intertwine Alliance, 2012a).

4.3 Collaborative Effort

Though it has been discussed in depth throughout this study, the unique approach to regional conservation generated by the Intertwine Alliance deserves specific consideration. The RCS was developed in a collaborative effort by a vast array of interested parties and member organizations. “With its broad level of collaboration and deep engagement of civic, elected, and business leaders and the residents of the region, the Intertwine Alliance is a fundamentally new approach to expanding and protecting the region’s network of parks, trails, and natural areas” (The Intertwine Alliance, 2012a). The effort was guided by a Steering Committee that started with seven members and eventually grew to incorporate sixteen members (Brennan-Hunter, 2018). The Steering Committee was represented by members from federal, state, regional, and city governments and nonprofit organizations, including representatives from both Oregon and Washington. Two additional committees guided the development of the supplemental materials published in conjunction with the RCS, the *Biodiversity Guide* and the land cover data, and necessarily featured more scientific and technical expertise. Though the process was guided by a committee of individuals, the effort would not have been possible without the contributions of many individuals, including Intertwine Alliance staff, partner organizations, and volunteers (Houck, 2018; Wetter, 2018).

The insistence on working collaboratively created hurdles from the beginning. “It was a fairly organic process. We didn’t go in with a definition of where we were going to start and where we were going to extend,” described Kathleen Brennan-Hunter. “It is just messy to do that kind of work” (Brennan-Hunter, 2018). The Steering Committee participated in regular meetings and discussions to develop the scope and how the process should unfold, described Mike Houck, and “collectively we formed a framework after many, many focus groups” (Houck, 2018). The process did not always move forward consistently, as disagreements and arguments between participants were relatively common. Due to the insistence of broad stakeholder involvement, “we had a wide spectrum of organizations at

the table. We had the city and other public agencies, but also folks like the Audubon Society were strong advocates. [Certain parties] had been engaged in lawsuits against some of the other entities at the table” (Brennan-Hunter, 2018).

To bridge the disagreements found within the diverse group of stakeholders driving the effort, Dan Roix of the Columbia Land Trust was brought in as a project manager. The Columbia Land Trust is a nonprofit organization that promotes conservation efforts surrounding the Columbia River in both Oregon and Washington, one of the only organizations to be actively involved in conservation across the state boundary (Roix, 2018). “We really needed a project manager that would be viewed as neutral, but conservation driven. We we’re able to convince the Columbia Land Trust to play that role and herd the cats” (Brennan-Hunter, 2018). The importance of the Columbia Land Trust’s contributions was echoed by all interviewees. Mike Houck detailed that the Columbia Land Trust was able to “crack the whip and get us all to work together.” “We settled on the Columbia Land Trust to be the facilitator and the one who would call the meetings and harass people to show up,” described Jonathan Soll. “That was great because they don’t have any role in rule making; they can be seen as a neutral party. [The Steering Committee] was appreciative that we had a land trust with good capacity and experience that was willing to carry the burden of that aspect of the project” (Soll, 2018). Explaining his role as Project Manager, Dan Roix explained that the Columbia Land Trust is “a non-profit organization, so we were well situated to not have it feel like a regulatory process; to not have it feel like it was someone coming in with a strong agenda” (Roix, 2018). By selecting a conservation-focused entity that was could act as a neutral party, the Intertwine Alliance and the RCS Steering Committee developed the leadership necessary to facilitate coordination between diverse stakeholders on a common goal.

In addition to strong leadership, the process benefited from a feeling of shared trust and a willingness to collaborate. Interviewees detailed that the history of conservation within the region developed a “social capital. Many years of professionals meeting informally that has now been

formalized in the Intertwine Alliance” (Wetter, 2018). Mike Houck detailed that one “unique aspect of our work is that we have an interesting dynamic between advocates and government agencies, in that we can beat each other up and still work together” (Houck, 2018). “There were a lot of people at the table who had worked together for a long time and knew each other. They didn’t always agree, but they were okay with that because there was a baseline of trust,” explained Kathleen Brennan-Hunter. “So even though there were a lot of different ideas about what was needed, how it should be done, and what the ultimate product should be, there was a willingness to have some give and take” (Brennan-Hunter, 2018). Dan Roix detailed that “people came to the [RCS process] with a collaborative spirit. We had a lot of people engaged and a lot of people spending time and energy, working toward a shared goal” (Roix, 2018).

The decision to intimately involve multiple interests operating at different and across jurisdictional boundaries led to an increased feeling of legitimacy and buy-in. “What you really need is an organization that transcends the other jurisdictional boundaries... The RCS wouldn’t have been as useful or valuable if it was Metro’s [project,]” argued Kathleen Brennan-Hunter. “We wouldn’t have broad ownership if we approached it that way” (Brennan-Hunter, 2018). Echoing this assertion, Jonathan Soll detailed that the RCS “never would have had the power that it does have if it hadn’t been for so many organizations investing their time and energy into it” (Soll, 2018). Through the involvement of disparate stakeholders, strong relationships within the conservation community, and dedicated leadership, the Intertwine Alliance was able to produce a strategy that was strengthened by a dedication to collaborative effort.

4.4 How the RCS is Used

As described previously, the RCS was designed intentionally to be a nonregulatory project. “The *Regional Conservation Strategy* is not a regulatory document. It is not the product of, nor is it directed

at, any particular jurisdiction... It does not identify or prioritize specific projects, which generally should be developed based on local conditions and funding opportunities” (The Intertwine Alliance, 2012a).

Rather than developing that level of specificity, the RCS was produced “for policy makers, presents accurate scientific information and summarizes conservation opportunities and approaches to be considered during decision making... meant to serve as a guidebook to a future that includes healthy ecosystems throughout the greater Portland-Vancouver region” (The Intertwine Alliance, 2012a).

Interviewees concurred with the assessment portrayed in the document. “Rather than think of it as a plan, I think of it more as a toolkit,” described Dan Roix. “The idea was to provide a lot of information for practitioners, but also accessible information for people that aren’t necessarily conservation practitioners, but that do work that impacts the biodiversity of the region” (Roix, 2018). Mike Wetter explained that the Strategy was developed as a tool, in that it “maps and provides the parameters for identifying certain types of habitat. It doesn’t actually prioritize or make policy decisions on which properties should be conserved first. It provides the underlying infrastructure of data that would be necessary to make those decisions” (Wetter, 2018). Jonathan Soll argued that the RCS provides policy makers and conservationists an opportunity to “look at this document and see how their mission might align with the large ideas that guide conservation in the region... It is a framework of strategies and ideas to be considered when contemplating any action” (Soll, 2018).

The decision to invest the energy in a nonregulatory product was a practical one. Quite simply, the jurisdictional capacity to promote regulation at this scale does not exist and as a nonprofit entity, the Intertwine Alliance does not have regulatory capacity. Though the Metro Regional Government does have the capacity to direct cities within its jurisdictions to adhere to adopted regulations and conform comprehensive plans to meet these criteria, that route was not selected for a variety of reasons. First, as discussed in previous chapters, by working as a nonprofit, the Intertwine Alliance was able to develop greater stakeholder involvement, remove the skepticism of top-down policy making, and expand the

spatial context of the region. Secondly, had the people involved in the RCS pushed for specific policies of this magnitude through the institutional power of Metro, “it was going to get so watered down that it wasn’t going to be very rich. Instead, we tried to get the best thinking about the opportunities that exist to address what we all can generally agree on as the most important threats to biodiversity conservation over time” (Soll, 2018). The focus was on developing a deep understanding of what the conditions were and which strategies, based on the data developed and on general conservation principles, would promote biodiversity regionally. “That was done purposefully, because there would have been a lot more politics to identify specific properties,” explained Mike Wetter. “That was left to the local governments, and regional, state and federal governments, and whoever is doing the investing. They’ll be able to use the data as a way to make the case for those investments” (Wetter, 2018).

The evidence shows that the RCS has fulfilled its intent in this capacity. The Forest Park Conservancy published the Greater Forest Park Conservation Initiative in 2013. The Initiative is a detailed plan to guide conservation activities in, maintain the health of, and address the threats to Forest Park, a large urban park in Northwest Portland. Information and strategies detailed in the RCS were a foundation of the analysis generated in the Greater Forest Park Conservation Initiative (Forest Park Conservancy, 2013). On a larger scale, Metro’s Parks and Nature System Plan published in 2016, details Metro’s plan of action regarding its natural acquisitions and land holding, intended to provide “a framework for future decisions about the funding needed to sustain Metro’s Parks and Nature portfolio” (Metro, 2016). Metro’s Plan draws on the RCS as a starting point. Detailing specific strategies and key actions to increase their land acquisition program, Metro’s Plan states that “the long-term approach should be based on the *Regional Conservation Strategy*” (Metro, 2016). Furthermore, Metro has incorporated the RCS as part of its conservation grant funding process. “Any project has to report how it connects with RCS” (Brennan-Hunter, 2018). The information and strategies provided in the Strategy are being incorporated into planning and decision-making efforts throughout the region.

Many interviewees specifically cited that the RCS had a positive effect on preexisting efforts to document, map, and conserve oak and prairie habitats within the region (Houck, 2018; Roix, 2018; Soll, 2018; Wetter, 2018). Both the RCS and the BG detail the importance of oak habitat to native species in the region and document that oak habitat is declining. “The conversation in writing that section of the document identified a lack of map extent of white oak as a limiting factor for us to be strategic in conserving that habitat,” explained Jonathan Soll. “Getting that section of the strategy written really helped to energize the group and we are about to complete the map of oak in the region and finish a strategic action plan to take organized steps forward in conserving oak and prairie habitat” (Soll, 2018). Lori Hennings, who has worked in oak conservation in the region for many years, was careful to explain that efforts related to oak habitat had been in place well before the RCS was published, but elaborated that “the RCS has generated financial help to get some of the work done among the partners, as well as some grants... It is a major organizing principle and document. As people are writing grants, even though we didn’t have spatial data on oak and prairie habitats, we can still say that this is one of the top priorities of the RCS” (Hennings, 2018). Though efforts related to oak and prairie habitat conservation have been in effect for many years, “developing the strategy had a catalytic effect and made everyone recognize and convince their supervisors that this is a priority, and time and energy should be devoted to it” (Soll, 2018).

Additionally, the Intertwine Alliance worked with GreenInfo Network, a nonprofit organization dedicated to expanding the availability of GIS information and mapping applications for public outreach and advocacy, to produce the Regional Conservation Strategy Viewer. The viewer makes the GIS data and modelling completed in conjunction with the RCS available online. The Viewer is “an online tool that watershed councils and other people who were working locally and didn’t have in-house GIS or mapping resources could go on online to create and print maps” (Brennan-Hunter, 2018). This allows conservationists the ability to utilize the data produced by the Intertwine Alliance in local efforts.

4.5 Further Work in the Region

Despite the achievements of the RCS, there is a clear consensus among interviewees that the work is not done. The RCS, though acting as a multipurposed tool for policymakers and conservationists, does not represent the end game of the people who initiated the effort. Indeed, the Strategy itself claims that is intended to “serve as a framework for strategic conservation actions into the future” (The Intertwine Alliance, 2012a). “We created a framework that people can use as inspiration. We didn’t create a plan of action or a set of rules. Its power is in its ability to inspire,” detailed Jonathan Soll. “We have recently been saying in our conservation working group, ‘we are five years in from publication. Has it migrated to bookshelves never to be looked at again?’ That is what tends to happen when something isn’t new anymore. How do we keep it alive and integrated into the thinking of organizations as they consider their priorities for the next 1 to 20 years of work?” (Soll, 2018). “Now we are at the point where we recognize that there is a lot of opportunity to look at what sort of [regulatory] strategy might emerge here,” explained Mike Wetter. “How do we start to use the data that has been created to look at habitat corridors and start to think about connectivity across the region? How do we elevate those priorities and get them funded? That’s the next piece of work that is starting to emerge” (Wetter, 2018). “That is the next big step for the Intertwine Alliance; to take that document and get the right folks together and ask, ‘what are we implementing and what aren’t we doing that we need to do?’” explained Mike Houck. “That is our next big task... Use the [RCS] as a tool to jumpstart other efforts” (Houck, 2018).

Though much more work is necessary to achieve the goals of biodiversity conservation and the establishment of a regionally connected network or natural areas, the RCS represents a significant step towards that end. “In some ways, to call it a strategy is a bit of a misnomer, because it really is an analytical tool that is then used to create strategy” (Wetter, 2018). “It is a framework of strategies and ideas to be considered when contemplating any action” (Soll, 2018). Beyond providing the information

necessary to begin connecting regional open spaces, the RCS had value in highlighting that habitat exists in urban areas and providing a tool to document and advocate for it. “We have always been told that our region is a gray blob of nonvaluable land, but when you dig in, you find that there is a ton of biodiversity. These species are here. High quality habitat types are here,” said Jonathan Soll. “It had significant value in the doing of it... The product has proven to have real and symbolic value and I believe it will continue to” (Soll, 2018).

4.6 Applicability of the Findings

Due to the unique considerations regarding the generalizability of case-study research detailed in Chapter 3, it is important to address certain aspects of the Intertwine Alliance case to consider potential impacts on applicability of the findings for other regions engaged in comparable efforts of open-space planning. Considerations of place are important for any planning exercise. Each neighborhood, city, or region will have a specific cultural, sociological, demographic, ecological, and legal history that generates a unique set conditions, the exact blend of which are unlikely to be found anywhere else. This does not decrease the ability for social scientists to derive lessons from a case study that may be applicable elsewhere, though certain considerations derived from this study deserve mention; specifically, the presence and impact of the Metro Regional Government and unique cultural conditions found in the region that may enhance regional or ecological thinking.

4.6.1 Metro

It is impossible to ignore the influence of Metro on regional efforts within the Greater Portland Region. Considering Metro’s status as the only elected regional government in the United States, it would be easy to diminish the generalizability of studies regarding regional planning efforts from the Portland area due to Metro’s presence. Though Metro provided funding and staff capacity to the

Intertwine Alliance to complete the RCS, the evidence shows that presence of an elected regional government structure is not a necessity and its presence doesn't diminish the ability to derive lessons from the process the Intertwine Alliance used.

The influence that Metro has on promotion of bond measures, land acquisition, and natural area protection has been detailed throughout this study. Furthermore, all interviewees agreed that Metro was a positive force in the completion of the RCS. "Although the boundaries of the greater Portland-Vancouver region extend far beyond Metro's jurisdictional boundary, Metro's role in shaping land use and natural resource protection for the urban and urbanizing portions of the Portland metropolitan region significantly affects regional conservation efforts" (The Intertwine Alliance, 2012a). Furthermore, the influence of Metro extends beyond its governmental capacity. Metro focuses on acting, "historically, as a convener, bringing people together and providing some degree of anchor funding for projects and anchor staff time to keep projects moving" (Soll, 2018). The RCS is an example of this type of effort, as the Intertwine Alliance has its foundations in Metro efforts to convene local conservation professionals. Mike Wetter described that Metro has a further positive influence by creating "a regional consciousness. It connects people across the region to regional planning and to that kind of thinking" (Wetter, 2018).

Despite this positive influence and Metro's role during the nascent phases on the RCS, several interviewees detailed the difficulties presented by Metro's presence. "To some degree, Metro fills the vacuum that the Intertwine Alliance is trying to fill. So, it is a little bit more complicated than how it might appear on the surface," explained Mike Wetter. "Having a regional government, people tend to leave it to the regional government to do that work" (Wetter, 2018). Despite its ability to act regionally, Metro's status as a government entity can diminish the value of certain products. "I was at Metro at the time, and it felt like we needed something like the RCS," detailed Kathleen Brennan-Hunter. "I didn't want to just have Metro produce something because we wouldn't have broad ownership if we approached it that way" (Brennan-Hunter, 2018). This sentiment was echoed by Jonathan Soll. "We

wanted it to be something that represented the best thinking of a broad suite of stakeholders in the region and could be a product of that group, so that it wasn't tarnished in the eyes of some stakeholders as just being the government telling people what to do" (Soll, 2018). Furthermore, though acting on a scale larger than most existing jurisdictional constraints, the scale necessitated by the RCS stretched well beyond Metro's range. Metro was fundamentally constrained to act within its spatial capacity.

Describing previous efforts by Metro and its partners to coordinate across the state boundary, Mike Houck described "the idea that we had a bistate regional effort was a philosophical one and not a real one. It was real in that both sides were working to try to knit together this interconnected system, but from a governmental perspective, they were two different actors. [In that capacity,] Metro is technically and legally constrained" (Houck, 2018). The Intertwine Alliance offered solutions to these problems of stakeholder representation and jurisdictional constraint by coordinating the efforts of many actors on both sides of the state boundary, in public, private, and nonprofit capacities, to tackle a common goal.

As such, the presence of a regional convener, a role played by the Intertwine Alliance, not an institutionalized regional government structure, is necessary for the formation of regional open-space strategies. "What is necessary is to have an entity, a small group with resources and commitment to serve as the anchor to get it started," said Jonathan Soll. "It takes time to gather momentum and to create the inertia to get the thing through so many meetings and minor conflicts and challenges. If you don't have an organization with strong commitment, it is more likely to fall apart, but you don't need a regional government" (Soll, 2018). "What you really need is an organization that transcends the other jurisdictional boundaries," explained Kathleen Brennan-Hunter. "I don't know that you need a regional government, but what you really need is an organization that transcends those boundaries and has the credibility to convene a diverse group of partners to have the conversation and to get it started" (Brennan-Hunter, 2018).

4.6.2 Unique Cultural Considerations

Interviewees were asked whether cultural conditions within the Greater Portland-Vancouver region created an increased likelihood for regional or ecological efforts to gain momentum and take hold. Though all respondents felt that the region has special characteristics that make it unique, none felt that these attributes decreased the applicability of lessons learned from the RCS process.

“I don’t think Portland isn’t generalizable,” explained Mike Houck. “The fact that we have an urban growth boundary is totally unique... Where we are not unique at all is that there are fabulous open-space efforts all over the country, but they also have sprawl... They don’t have the land-use system to contain that urban footprint. They’re very much like us in that the citizens want that open space, but the planning and urban containment is not there” (Houck, 2018). Though the urban growth boundary does help to contain urban sprawl, the lack of an urban containment program does not ensure connectivity of open-space networks throughout an urban region. The lessons derived from the Intertwine Alliance are still applicable to metropolitan regions dedicated to preserving the benefits of open-space networks, despite the lack a growth management system.

“Maybe it is an advantage for Portland to be a little smaller. In some ways it is a big, small town. It is possible for folks to know each other and get in the room together and have ongoing professional relationships,” claimed Mike Wetter. “Over time, the relationships among the professionals have developed that it sustains itself. There are a few key individuals here who have been connectors or champions for this work for decades. I think that is different; not unique, but unusual” (Wetter, 2018). This level of social capital exists not only among conservationists, but between advocates and government agencies, as well, changing what may typically be an adversarial relationship into a productive one, with both sides willing to work together (Houck, 2018). Though this level of social capital is beneficial to the level of collaboration seen at the Intertwine Alliance and throughout the RCS effort, organizations that convene regional stakeholders can increase this level of cooperation.

“Nature is fundamental to who we are here. We were building on something very powerful,” said Jonathan Soll. “As a result, you have a lot of organizations working on different aspects of that. ‘Friends of this park, this or that land trust.’ You have all these organizations working in that capacity on top of a population that is proud of where they live” (Soll, 2018). “The environmental ethic has been ingrained in our society... there has always been a higher than average amount of investment going on here for natural resources than other areas,” explained Lori Hennings. “We have a cultural history of that here” (Hennings, 2018).

Despite the cultural attitudes, existing relationship, and social capital that positively influence environmental and natural area conservation throughout the greater Portland-Vancouver region, interviewees agreed that the work of the Intertwine Alliance would be applicable elsewhere. “I’ve heard some people dismiss some of the work that happens here as, ‘that’s so Portland, that can’t happen here.’ I don’t think that is true,” detailed Kathleen Brennan-Hunter. “The work that we did, any city or region could do. It really is just the leadership and the way that we did it... I think that as long as there is leadership and a way to have that cross-jurisdictional or bigger picture view, any region should be able to do something like this” (Brennan-Hunter, 2018). As Mike Wetter described, “the methodology, in general, in how that work was created would be of value to people trying to replicate something like that. There are lessons learned in terms of how it was done” (Wetter, 2018).

5. Discussion

The theoretical framework developed through the literature review suggests that three broad themes require consideration in generating a strategy for open-space conservation: a proposed spatial configuration, a regional approach, and measures to implement coordination of efforts. The findings from the case study directly address the necessary themes detailed in the theoretical framework (Table 2).

Though the RCS does not detail specific parcels or areas for conservation, a broad spatial configuration is proposed in the form of a regionally connected network of parks and natural areas. The mapping and modelling efforts of the Intertwine Alliance reveal the potential for greater conservation in urban areas. By increasing the precision of mapping from 30m resolution to 5m resolution, previously unidentifiable pockets of open space were revealed within the urban context, clarifying opportunities for conservation and connectivity of undeveloped land. Furthermore, the habitat prioritization modelling provides the necessary data to prioritize habitat across a variety of scales, contextualizing the value of smaller, urban open spaces with larger patches outside of the urban context. The results from the case study clarify the necessity of data and the opportunities that investments in data resources provide.

The findings detail the importance of regionalism, including processes to set the boundaries of inquiry. By observing the presence of other land-management efforts in surrounding areas and utilizing watershed boundaries to clarify the extent of the region, the Intertwine Alliance developed a scale of analysis that filled existing spatial and jurisdiction gaps. By nesting within other efforts, the RCS contextualizes the metropolitan area, which is the focus of the Strategy, within its surrounding landscape, providing strategies for conservation unique to landcover type. Furthermore, the findings show that by operating as a nonprofit entity and regional convener, the Intertwine Alliance was able to

mitigate potential constraints on cross-jurisdictional collaboration by reducing the perception of a top-down, government enforced, regulatory effort.

Finally, the nature of the Intertwine Alliance itself and the process of formulating the RCS offers potential solutions to increase coordination and effective collaboration from a cross-jurisdictional perspective. The findings reveal that selecting a project manager considered to be neutral yet conservation-focused increased stakeholder involvement and sense of ownership. The case study also clarified the importance of coordination of funding, as resources for open-space conservation are often limited. The Intertwine Alliance's status as a regional nonprofit allowed for a diversity of funding resources, an ability to spend outside of jurisdictional constraints, and lower initial costs than comparable efforts carried out by a government entity. In turn, as a formal statement of regional vision, the RCS offers value in coordination of local conservation projects, to each other and to larger efforts, and to attract great funding for future work.

Table 2: Theoretical Framework with Applicable Findings from Case Study

Issue	Loss of Open Space		
Themes	Spatial configuration	Regionalism	Coordination
Challenges	Identification of optimal spatial configuration	Mismatch between scale of problem and scale of solution	Lack of cross-jurisdictional coordination
Potential Solutions	Analysis based on principles of landscape ecology	Regional governance	Collaborative forums
Necessary Considerations	<p>Consider ecological potential of different landcover types</p> <p>Utilize relevant spatial data to guide policy</p> <p>Identify conservation priorities</p>	<p>Select appropriate scale and boundaries</p> <p>Recognize ecological and social boundaries</p> <p>Explore methods to overcome jurisdictional constraints</p>	<p>Coordinate conservation tools to maximize scarce resources</p> <p>Strive for broad stakeholder involvement</p> <p>Generate effective leadership</p>
Applicable Findings from Case Study	<p>Contextualize ecological potential by area or land-use type</p> <p>Increase the resolution of spatial data to expand recognition of open space</p> <p>Appropriate data expands conservation potential</p>	<p>Recognize and nest within existing land-management efforts</p> <p>Contextualize focus area with surrounding landscape</p> <p>Nonprofit organizations offer increased ability to operate beyond jurisdictional lines</p>	<p>Clarifying regional priorities increases funding opportunities and promotes efficiency</p> <p>Collaborative development of projects increases stakeholder ownership</p> <p>Neutral leadership facilitates stakeholder involvement</p>

5.1 Spatial Configuration

The RCS is not a regulatory document and does not detail specific areas or parcels selected for conservation. That is not the intent of the Strategy. As such, there is not a strict guideline regarding the spatial configuration of conservation efforts. Despite this consideration, a loose spatial construct of desired future conditions is detailed. “Conceptually, there should be an interconnected system of function natural areas across the urban and rural landscapes” (The Intertwine Alliance, 2012a). This implies a pattern of undeveloped areas, within and outside of urban spaces, with connections through trails and habitat corridors.

Though a detailed spatial configuration is not outlined, the RCS process provides useful insight for developing the necessary information to begin designing an open-space system, particularly in an urban context. The mapping and modelling completed in association with the Strategy provide the scientific data to begin the process. By generating mapping data at a finer resolution than previous efforts, the Intertwine Alliance was able to identify remaining undeveloped parcels within the urban context that would not have otherwise been recognized. Remaining tracts of open space in developed areas are expected to be smaller, as human development has fragmented habitat into varying spatial extents. Prior to the completion of this effort, land cover maps showed the metropolitan region as a contiguous gray splotch, giving little to no value to habitat within urban areas. The mapping data provided by the Intertwine Alliance in support of the RCS shows that valuable habitat remains throughout the urban-rural matrix, highlighting the existence of remaining parcels, the potential for connection between existing open spaces, and the areas in greatest need of conservation.

Additionally, the habitat prioritization model contextualized the value of a given undeveloped parcel within its immediate surroundings. Comparable habitat modelling tends to devalue habitat in urban areas, as they are typically smaller and biologically simpler than larger, contiguous undeveloped areas found in rural areas. The habitat modelling developed by the Intertwine Alliance and its partners

shows the relative value of existing habitat across spatial scales, allowing the user to view and prioritize conservation efforts regionally or locally. As the broad spatial configuration suggested by the RCS involves interconnected open spaces throughout the metropolitan region, which necessarily requires the conservation of smaller patches within urban areas, this ability to view the value of a specific area in relation to its surroundings was immensely valuable, as it increases the Intertwine Alliance's ability to advocate for conservation in urban areas.

The information generated through the mapping and modelling component of the RCS provide the scientific data necessary to begin constructing the spatially optimum configuration of open-space networks throughout the greater Portland-Vancouver region. Data developed at the 5x5 meter resolution found in the RCS allows for greater recognition of the importance or undeveloped parcels "down to the streetscape and up to the 3,000 square mile region" (Houck, 2018). This process speaks to the importance of developing comparable land cover data in association with regional open-space conservation efforts.

5.2 Regionalism

The efforts of the Intertwine Alliance in crafting the RCS yield possible solutions to relevant issues when working at a regional scale. With a relative focus on the greater metropolitan area, the scale of the region considered for inclusion necessitated placing the urban heart of the metropolitan region into its surrounding context. The fundamental assertion that ecological processes require analysis at a greater scale than typically found in land-use planning efforts drove the boundaries of the RCS outward, though maintaining open spaces as a mechanism to promote biodiversity within the urban context remained the focus of the Strategy. Based on the analysis derived from the literature review, these conditions are not unusual, though the work of the Intertwine Alliance in crafting the RCS provide useful insight into scale selection.

Watersheds were used as the primary scientific delineator regarding the scale of the RCS. This process was built off a growing recognition that coordination of efforts between municipal organizations at a watershed scale led to greater efficiencies in fulfilling public desires and federal mandates for provisions of clean water. While watersheds provided the ecological building blocks, the people who developed the RCS were conscious of existing land-management efforts within the region. The greater Portland-Vancouver region is surrounded by lands held by state or federal entities, and other ecological efforts to the north and south. The Intertwine Alliance viewed the RCS as complimentary, though not overlapping with these efforts, allowing the Strategy to fill a spatial gap regarding land conservation efforts. The literature describes that though regionalism is a necessity for open-space planning and other ecological considerations, practitioners should not allow the scale of an effort escape the realistic boundaries of effective jurisdictional collaboration. By remaining cognizant of other efforts, and detailing methods to provide increased connectivity between existing efforts, the Intertwine Alliance naturally developed a spatial scale that was sensible for the necessary analysis.

The RCS also provides solutions to a jurisdictional gap found at the regional level. Though both Oregon and Washington have statewide conservation strategies, the large scale of these efforts prohibits the development of regional priorities. Conversely, local conservation efforts within the region often occur independently and without connectivity or regional context. By formulating strategies based at the appropriate scale, the RCS provides the necessary framework to contextualize smaller efforts, both with each other and with larger goals. Operating at the regional scale allows the Intertwine Alliance to bridge the jurisdictional gap between statewide and local efforts. This is buoyed by the mapping and modelling completed at a resolution to allow for recognition of conservation opportunities from the neighborhood scale to the regional scale.

Furthermore, acting as a nonprofit entity allows the Intertwine Alliance to escape certain pitfalls of cross-jurisdictional collaboration. Modern political boundaries decrease the ability for public entities

to spend money or staff-time outside of their jurisdictional constraints. The RCS case shows that this is true despite the presence of an institutionalized regional government structure. Working as a nonprofit allowed the Intertwine Alliance to disregard political boundaries and operate at the scale deemed appropriate. Working as a nonprofit increased the accessibility of funding, volunteer, and staff capacity, and other resources across jurisdictional lines as necessary. Though the development of regional government institutions remains unlikely in a broader context, nonprofit organizations such as the Intertwine Alliance offer opportunities to work in a cross-jurisdictional capacity at regional scales.

5.3 Coordination

The collaborative nature of the Intertwine Alliance provides useful insight for the coordination of diverse actors. Open-space conservation involves the input of disparate entities with varying desired outcomes, goals, and resources. The relationships between these actors can often be adversarial. As noted in the RCS experience, certain actors at the table had gone as far as to take legal action against others in the room. Despite the potential for disagreement, the Intertwine Alliance and the RCS rely on a dedicated belief that a greater amount of work can be achieved by coordinating efforts and working together.

To increase stakeholder support, the Intertwine Alliance relied on the Columbia Land Trust as a project manager. Viewed as a neutral party regarding regulation, yet firmly entrenched within the conservation community, the project manager was able to corral the various actors to make a unified statement. Multiple interviewees detailed that this leadership increased a feeling of ownership and buy-in from the stakeholders to a degree that would not have been possible had the RCS been directed by a government entity. By establishing a leadership structure that was seen to be neutral but directly involved with conservation efforts, the process increased in legitimacy amongst the wide array of actors at the table.

The RCS provides insight not just on stakeholder coordination, but on coordination of existing conservation efforts. Federal, state, city, and nonprofit agencies all work in open-space conservation to certain degrees, whether by legal mandate or to fulfill a broader purpose. By providing the necessary data, establishing partnerships through a collaborative forum, and clarifying regional conservation priorities within a larger context, the RCS provides the necessary information and cohesion to coordinate existing efforts that would have otherwise occurred piecemeal. This allows conservation professionals to avoid overlapping efforts, minimizing duplicative work and maximizing the scarce resources available to conservation efforts.

Furthermore, the findings from the case study speak to an increased ability to coordinate scarce funding resources. By acting outside of the political constraints of a governmental organization, the Intertwine Alliance was able to attract funding from a variety of sources, recruit and rely on volunteer input, and escape the political pushback expected from working in an official governmental structure, the Intertwine was able to reduce to initial costs expected from comparable efforts.

The RCS itself has value in attracting additional funding for conservation efforts within the region. By describing how a specific local project relates to a broader purpose, such as a regional statement of conservation priorities, a project increases in legitimacy in the eyes of potential funders. As an organizing document to contextualize how smaller efforts fit together into a larger framework, documents akin the RCS allow for greater advocacy and funding of conservation efforts.

5.4 Implications

The actions taken by the Intertwine Alliance in crafting the RCS, detailed in this case study, provide applied examples of potential solutions to the necessary considerations of regional open-space planning and conservation efforts. Several useful lessons can be derived from this case study for organizations crafting regional solutions to ecological efforts:

1. Provide data and mapping at the appropriate scale, allowing for the identification and development of an optimal spatial configuration of open space.
2. Contextualize habitat prioritization modelling by landcover type.
3. Nesting regional efforts within existing land-management programs addresses spatial and jurisdictional gaps and provides initial guidance to scale selection.
4. Nongovernmental entities provide opportunities for greater regional collaboration and increased ability to allocate resources.
5. Dedicated, neutral leadership or project management increases broad stakeholder involvement.
6. Collaborative forums increase stakeholder buy-in and ownership.
7. Clarifying regional priorities in a formalized document presents greater potential for coordination of efforts and an increased ability to attract and efficiently utilize funding resources.

The findings of this case study elucidate the importance of generating landcover data at an appropriate resolution for analysis. Interviewees detailed the importance of this effort and much of the planning and strategy developed in the RCS relies on the existence of this data. Though mapping and modelling to this degree of precision represents an enormous effort, the returns are extremely valuable, if not dependent upon this process, particularly in an urban context. By developing this information, organizations engaged in open-space conservation efforts in regions defined by urban development can identify remaining undeveloped parcels which may be unrecognizable with landcover data generated at a greater resolution. This increases the ability to promote connectivity of open space throughout the urban fabric and provides the foundation of a spatial configuration which will yield the greatest returns.

Furthermore, by generating landcover data at the appropriate scale, conservation practitioners can contextualize the value of smaller tracts of open space in urban areas with larger tracts on the urban fringe. The mapping and habitat prioritization modelling completed through the RCS process allows users to view the value of a given piece of undeveloped land relative to others of its kind, allowing differentiation of strategy across landcover types. This is particularly important in the metropolitan context as it increases the importance of smaller remaining parcels which must be utilized to generate connectivity in built areas.

By nesting the analysis of the RCS within other federal and state regulated land-management programs in surrounding areas, the Intertwine Alliance not only filled a spatial gap, but also a jurisdictional gap. By acting as step-down from larger, statewide initiatives, the RCS serves to contextualize local conservation within broader goals. By remaining cognizant of existing efforts, practitioners enhance a region's ability to tie local projects into larger priorities and to provide connectivity between existing efforts. This process of nesting within other management units provides further value regarding selection of scale. Complementing but not overlapping with comparable work being done elsewhere provides a rough framework for the process of determining the scale of analysis. Further specification can follow by analyzing ecological units within that initial framework, such as watersheds or sub-watersheds.

Conservation practitioners may find success in overcoming the pitfalls of cross-jurisdictional collaboration by exploring nongovernmental or nonprofit collaborative forums. Despite the presence of Metro, an institutionalized regional government structure with heavy influence in land use and planning, interviewees detailed the necessity of operating outside of the confines of Metro to increase support from a vast array of stakeholders. Due to its status as a nongovernmental organization, the Intertwine Alliance decreased the perception that the RCS was a top-down, regulatory action. This facilitated greater involvement from smaller jurisdictions within Metro's boundaries and across the state border. Furthermore, by acting outside of governmental constraints, the Intertwine Alliance was able to utilize funding and resources across jurisdictional boundaries, generating a unique ability to operate at the scale deemed necessary by the Alliance. Institutional barriers to regional collaboration continue to exist, even with the existence of a formal regional government, particularly with regards to allocating financial resources across jurisdictional lines. Operating outside of governmental structures increases the ability for conservation practitioners to ignore otherwise rigid jurisdictional lines.

In addition to working outside of official government structures, this case study shows the benefit of dedicated, neutral leadership. By selecting Dan Roix of the Columbia Land Trust to serve as project manager of the RCS, the Steering Committee achieved greater stakeholder involvement. This further decreased the potential feeling that the RCS process was a top-down, regulatory effort, reducing potential conflict between nonprofit advocates and government entities, and across jurisdictional boundaries. As such, the RCS is a unified statement reflecting the input of public, private, and nonprofit actors. Interviewees detailed how neutral leadership increased stakeholder ownership and support. Organizations engaged in open-space conservation at a regional scale may find greater success in attracting disparate voices to the process by utilizing a comparable strategy.

Furthermore, by convening a collaborative forum of the disparate entities, the Intertwine Alliance increased a sense of legitimacy and ownership amongst stakeholders. Though the collaboration process utilized in shaping the RCS generated disagreements throughout the effort, interviewees detailed that it produced greater results. By avoiding a strict definition of the boundaries, scope, direction and purpose of the RCS in its initial phases, the process facilitated collaboration and reflected the input of all stakeholders involved. By approaching regional planning efforts in this way, practitioners can increase the sense of buy-in amongst involved parties and create a strategy that is strengthened by broad ownership.

Finally, the benefits of this type of effort are reflected in way the RCS has been used since its publication. By clarifying regional priorities, the RCS allows for greater coordination of existing conservation efforts. This coordination not only increases the ability for conservation practitioners to efficiently utilize scarce resources, but to tie local efforts into broader goals and priorities. As a formalized statement of how local efforts fit into a regional context, the RCS increases the ability to attract funding for existing and future conservation work.

6. Conclusion

At the heart of this study is an assertion that ecological processes are fundamental to the health, vitality, and sustainability of the human condition. In a recent essay regarding the maintenance of adaptive landscapes, Forster Ndubisi asserts that “new ideas on how to effectively balance human use with ecological concerns are necessary because of the increasing extent, diversity, magnitude, urgency, and complexity of ecological problems arising from changing demographic, social, economic, and technological forces” (Ndubisi, 2014). The conservation and management of functional open-space networks is an important piece of this balancing act. The literature review documented that open-space networks provide benefits for ecological, economic, and human lifestyle purposes and that these benefits are most adequately provided by conserving open space within a regional context. Furthermore, the literature review elucidated that effective preservation of open space requires coordination of efforts and funding, as resources for conservation are scarce. As such, the theoretical framework derived from the literature review codified the necessary considerations for open-space planning efforts into three broad themes: spatial configuration, regionalism, and coordination.

By identifying and examining the methods used by the Intertwine Alliance to develop the *Regional Conservation Strategy*, a document created to preserve biodiversity in the Greater Portland-Vancouver region, this case study presents applicable solutions to address the necessary considerations for regional open-space planning efforts. This study clarifies the importance of developing appropriate data, the specific benefits this data provides in an urban context, the process of selecting the scale of analysis, the potential of nongovernmental organizations to provide cross-jurisdictional collaboration, and the value that such an effort has on coordination and contextualization of conservation efforts, and the attraction of greater funding.

Though this study has value in this capacity, further work is necessary to craft and implement policies to successfully conserve and connect adequate open-space networks on a regional scale. In

many ways, this study reflects the conditions and mechanisms appropriate at the starting point of a regional conservation initiative. Reflected in the responses of the interviewees, further effort will be required to develop regulatory strategies to permanently protect open-space networks. The *Regional Conservation Strategy* was intentionally developed without a regulatory aspect. Indeed, this allowed the Intertwine Alliance and its member organizations to avoid many of the political and legal struggles that often occur in conjunction with any shift in land-use policy. Continued evaluation and sustained advocacy remain necessary to fulfill the vision of the Intertwine Alliance and to “make conservation efforts in the region as seamless as species’ habitat use across jurisdictional boundaries” (The Intertwine Alliance, 2012a).

Though further work is necessary, the merits of the *Regional Conservation Strategy* and the value of the lessons learned from the efforts of the Intertwine Alliance are not diminished. The findings of this study show the potential of collaborative forums and the value of developing regional strategies. Though institutionalized regional government structures remain rare within the American context, regional collaboration on ecological issues is not beyond our capabilities. Indeed, as Ndubisi eloquently elaborated, new ideas are essential to effectively balance ecological processes with the demands of continued human development, and planners should not rely solely on traditional mechanisms to explore potential solutions to this growing problem.

Appendix A: Interview Questions

1. What is your background? How do you view yourself professionally?
2. How did you come to work with the Intertwine Alliance?
3. What was the genesis of the RCS?
4. How was the scale/scope of the plan selected? How was the extent of the region distinguished?
5. To what degree did the principles of landscape ecology affect these initial efforts?
6. What difficulties were encountered planning at that scale?
7. Were there significant barriers to regional collaboration? How were these barriers mitigated?
8. Was there a regular meeting or convention associated with these efforts?
9. How is a specific parcel or area selected for conservation?
10. What are the factors or attributes that contribute to the selection process?
11. What specific strategies or mechanisms have been useful in conservation efforts?
12. To what degree do the strategies detailed in the plan affect specific policies locally?
13. Personal opinion: What are the strengths/weaknesses of the plan?
14. How have you seen the RCS be used in the region? Have you seen any specific successes?
15. What is the status of the RCS now?
16. What else is happening in Portland following the release of the RCS?
17. How has METRO been important?
18. Is there anything about Portland that makes this case unique?
19. Do you find your experience and recommendations to be generalizable?

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