Bainbridge Island Land Trust

Conservation Plan 2024 Update

Adopted July 24, 2024

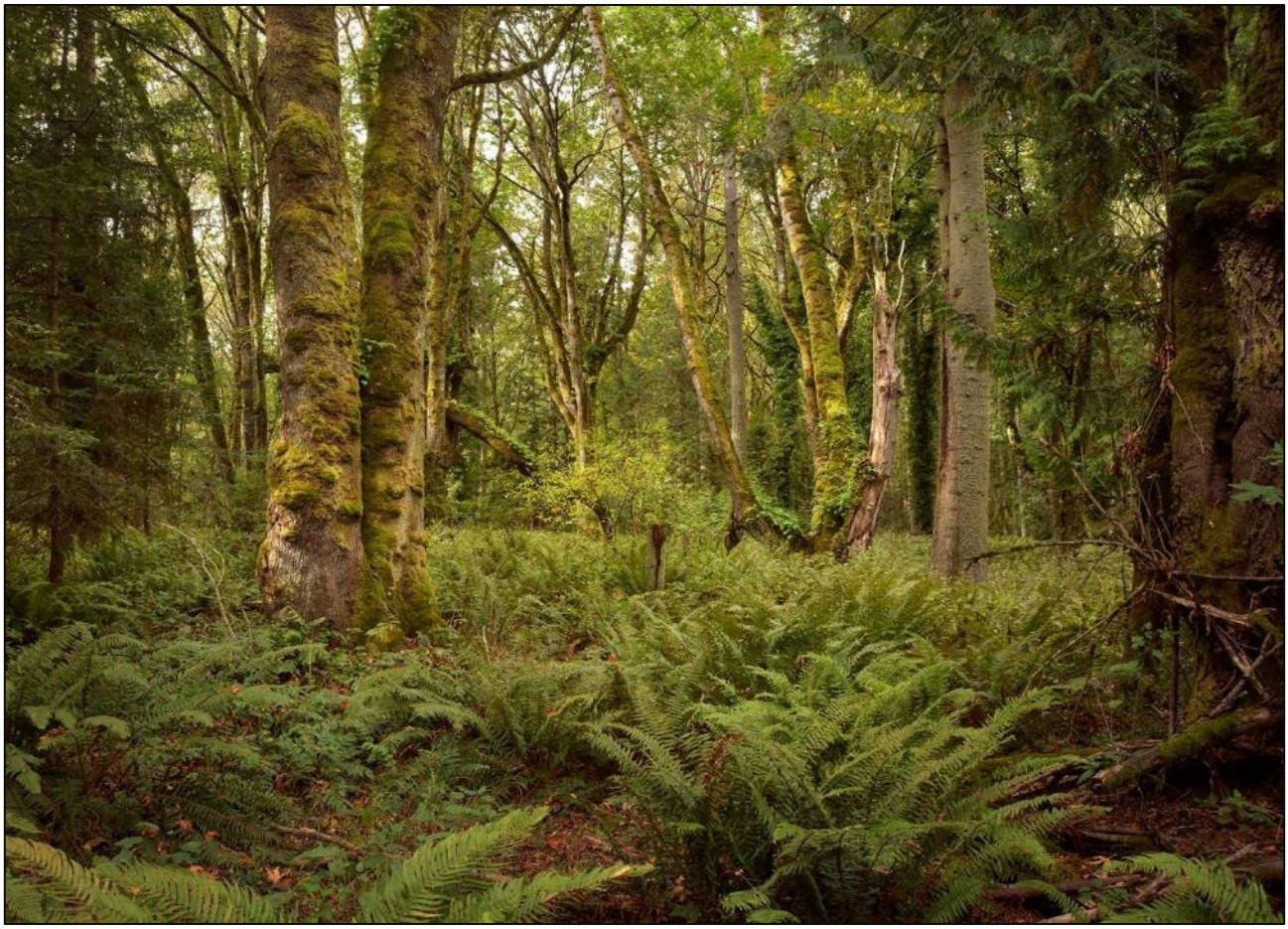


Table of Contents

Table of Contents

APPENDICES

Executive Summary

The Bainbridge Island Land Trust (Land Trust) is a non-profit land trust that serves the people and wildlife of Bainbridge Island, Washington. As per our 2021-2025 Strategic Plan, "We envision a future in which healthy natural systems support diverse and thriving populations of native plants and wildlife." Over the last 35 years, the Land Trust has protected and helped restore some of the most valuable natural places on Bainbridge Island, including forestlands, wetlands, shorelines, streams, and riparian corridors. Land Trust protects natural and working lands with high conservation values largely through land acquisition and conservation easements. Since its inception in 1989, the Land Trust has worked cooperatively with willing landowners, other conservation organizations, and governmental/tribal entities to help preserve more than 1,500 acres on Bainbridge Island, with 1,100 acres open to the public.

The 2024 Conservation Plan Update is designed to build upon the 2012 Conservation Plan and 2018 Conservation Plan Update. The 2018 update included a substantial effort to compile data and perform analyses to produce a Conservation Values Index. This greatly enhanced our ability to strategically focus our conservation efforts. This 2024 update refines our strategic initiatives for protection and restoration endeavors based on the current status and trends in conservation, our current strategic plan, and community values on Bainbridge Island. In past plans, the Land Trust recognized that the supply of intact habitat areas on Bainbridge Island was diminishing due to the continued pressures of development. In 2024, these concerns remain and are heightened due to population growth in the Puget Sound area and on Bainbridge Island.

This 2024 Conservation Plan Update includes the following activities:

- **Conduct 2024 Community Conservation Survey**. Residents expressed support for protection of vulnerable natural resources that provide ecological services and support habitat and community values.
- **Update the Conservation Values Index**: updating land cover data; running new forest core and connector analyses; updating natural resources layers that have changed since 2018; adding new data on stands of larger trees, modeled aquifer recharge areas, bodies of freshwater, and shoreline habitat migration zones due to anticipated climate change. Appendix B identifies the data sources collected for this update.
- **Update property land use status** to quantify shifts in Bainbridge Island lands from *Unprotected & Undeveloped* to either *Some Level of Protection* or *Some Level of Development*.
- **Clarify identification of conservation emphasis areas** (CEAs). Prioritization will factor in these defined emphasis areas in the Project Checklist.
- **Incorporate additional climate change projections**, potential mitigation and adaptation through restoration as considerations in project evaluation, stewardship and public

education. In particular, reaffirm continued work on culvert and shoreline armoring removal efforts, and restoration of degraded riparian and wetland areas, as high priorities.

- **Update project evaluation criteria** to reflect 2024 Conservation Plan updates.
- **Update lists of conservation partners and tools**.

The 2012 and 2018 Plans identified two priority ecological systems worthy of our increased attention and action: wildlife networks and shorelines. The 2024 Conservation Plan Update reflects the conservation priorities further elucidated in our 2021-2025 Strategic Plan:

- *Watershed & Landscape Scale* - taking a broad view of conditions across our watersheds and landscapes to ensure functioning of ecological systems.
- *Wildlife Networks* - prioritizing large, intact, habitat core areas that create cross-landscape connections and form a habitat network that supports sustainable fish and wildlife populations.
- *Forests* - protecting and promoting the restoration of mature interior forests, vital to sustain the Island's wildlife networks and native species.
- *Streams & Wetlands* - protecting these habitats that are essential for fish and many of the Island's birds and amphibians and also serve as critical systems for clean water and healthy watersheds.
- *Shorelines* - protecting these dynamic systems that contain diverse, irreplaceable habitats, including tidelands, estuaries, lagoons, nearshore, marine riparian and adjoining upland areas. Our conservation and restoration efforts here contribute to the health of the wider Puget Sound ecosystem and salmon recovery.
- *Climate* - pursuing on-the-ground, natural climate solutions, including protecting and restoring ecosystem function and resilience, sequestering carbon and planning for anticipated changes due to sea level rise.

Finally, enabling public access to our protected lands has always been an important emphasis for the Land Trust. The Land Trust works hard to balance that emphasis by carefully tailoring permitted human activities on our owned properties to protect wildlife habitat values. Our vision statement includes "where people value the natural world and feel inspired by and compelled to care for their surroundings." Providing opportunities to connect with the natural world on the properties we protect supports this goal as well as supporting the community who make our work possible. Explicitly included in this 2024 Plan Update is the Land Trust's intention to expand opportunities for tribal access for traditional cultural practices appropriate to Land Trust-owned properties.

Land Acknowledgement

We acknowledge that Bainbridge Island is within the aboriginal territory of the suq̓ʷabš Suquamish People. Expert fisherman, canoe builders and basket weavers, the suq̓ʷabš live in harmony with the lands and waterways along Washington's Central Salish Sea as they have for

thousands of years. Here, the suq̓ʷabš live and protect the land and waters of their ancestors for future generations as promised by the Point Elliot Treaty of 1855.

Mission and Vision

Mission

Our mission is to conserve and steward the diverse natural environments of Bainbridge Island for the benefit of all.

Vision

We envision a future in which healthy natural systems support diverse and thriving populations of native plants and wildlife. Where people value the natural world and feel inspired by and compelled to care for their surroundings. Where conservation is the work of diverse community partners and is inclusive, equitable, and just. And where Bainbridge Island remains resilient and a special place to live, work, and play for generations to come.

Acknowledgements

Principal Preparers

Gina King – Conservation Director, Bainbridge Island Land Trust

Additional Contributors

Bainbridge Island Land Trust Conservation & Acquisitions Committee
Bainbridge Island Land Trust Board of Directors
Asha Rehnberg – Bainbridge Island Land Trust past Executive Director and past Board Member
Cullen Brady – Executive Director, Bainbridge Island Land Trust
Fawn Wagner – Community Education Manager, Bainbridge Island Land Trust

Recommended Citation

Bainbridge Island Land Trust, July 2024. Bainbridge Island Land Trust Conservation Plan 2024 Update. Bainbridge Island, WA.

Bainbridge Island Land Trust

Physical Address: 147 Finch Place #3, Bainbridge Island, WA 98110
Mailing Address: P.O. Box 10144, Bainbridge Island, WA 98110
Phone: (206) 842-1216
Website: www.bi-landtrust.org

The Land Trust is a 501(c)(3) Washington state private, nonprofit corporation. It is a qualified conservation organization under IRS Code Section 170(h). As an accredited member of the national Land Trust Alliance (LTA), the Land Trust has adopted the LTA's Standards and Practices and meets the highest standards for excellence, upholds the public's trust, and ensures that its conservation efforts are permanent.

A History of the Land Trust and Its Work

Bainbridge Island lies a short ferry ride away from downtown Seattle, but at the heart of the Puget Sound ecosystem – a region with significant ecological diversity, exceptional beauty, and abundant wildlife. In an area with growing population and development pressures, Bainbridge Island is a place where wildlife habitat, freshwater streams, open spaces, and shorelines form a mosaic of ecological systems where natural diversity and people continue to thrive.

The Bainbridge Island Land Trust (Land Trust) was formed as an all-volunteer organization in 1989 to conserve and steward this diverse natural environment for the benefit of all. From the outset, it was successful channeling local passion for conservation into an ever-growing network of protected natural area parks and donated Conservation Easements (CEs). Accredited since 2013, the Land Trust has grown into a strong, science-based, professional land trust and a vibrant, trusted community institution. It has a solid in-house technical capability to identify protection opportunities most aligned with our conservation priorities and to steward degraded lands toward high-functioning habitats resilient to anticipated effects of climate change.

In collaboration with landowners, donors, public agencies, local tribes, and community members, the Land Trust has been instrumental in conserving over 1,500 acres of forests and wetlands. These areas serve as crucial refuges for wildlife and include streams, riparian zones, and shorelines that provide essential habitats for threatened and endangered species, including salmon. Over 1,100 acres of those protected lands are open to the public.

In 2017, the Land Trust embarked on a major multi-year capital campaign (Stand for the Land) with which it has expanded protections of the island's Wildlife Networks. Although the Land Trust still occasionally protects land and then turns it over to Bainbridge Island Metropolitan Park and Recreation District (BIMPRD) to manage as logical extensions of existing natural area parks (e.g. a 12-acre addition to the Grand Forest transferred in 2022), we now often hold and manage lands ourselves, as the only Island entity with a primary mission focused on habitat protection. Since the Land Trust's 2018 Conservation Plan Update, we have acquired and continue to hold and manage important fish-bearing stream reaches (Springbrook Creek Preserve, Cougar Creek Preserve, North Fork Manzanita Creek and Manzanita Ridge Preserves), estuarine habitat (Miller Kirkman Preserve) and unique forest canopy serving as a wild bird refuge (Rockaway Bluff Preserve).

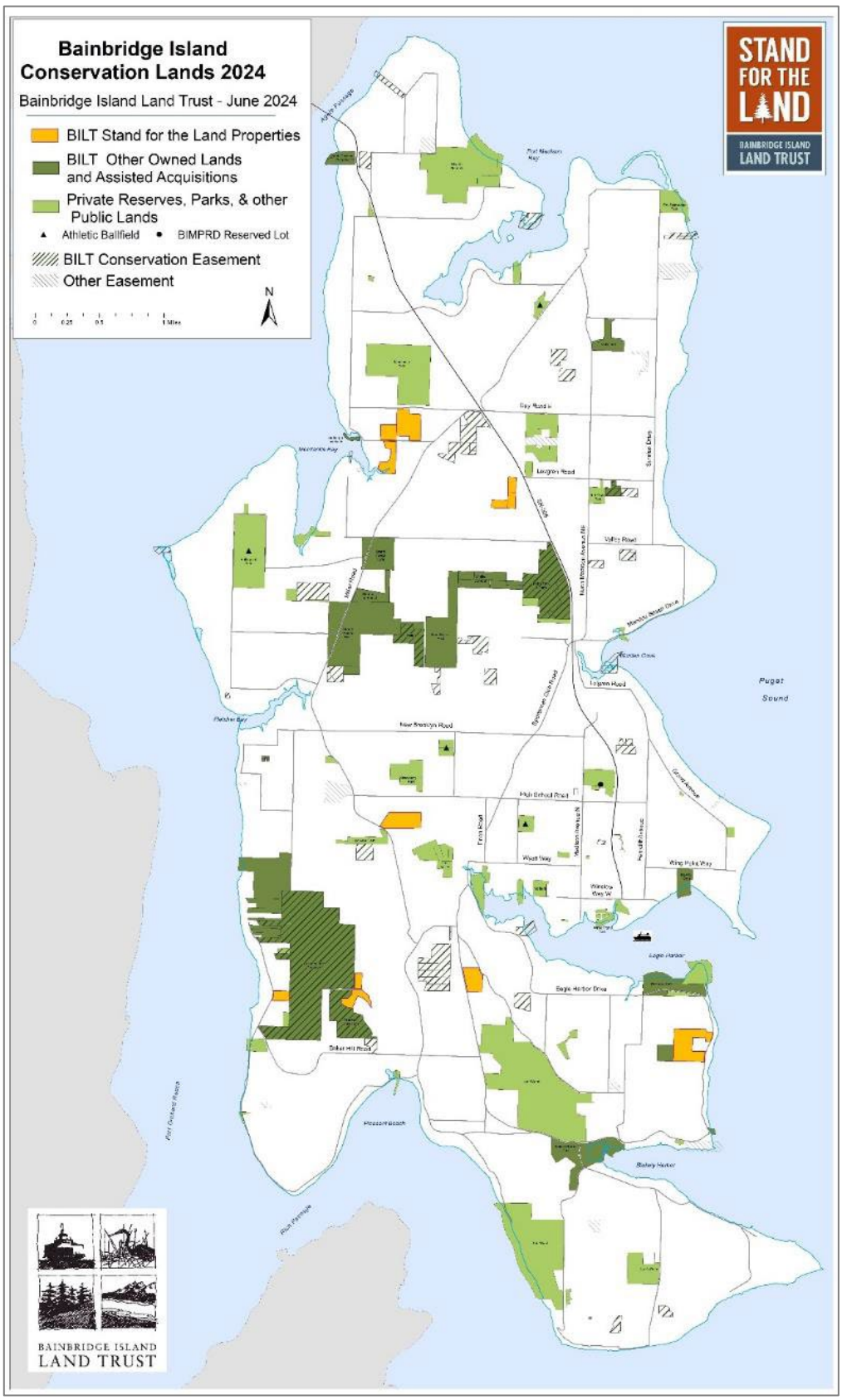


Figure 1. Conserved lands on Bainbridge Island.

The Land Trust has also added a strong restoration component to its focus, annually assembling teams of volunteers, seasonal workers, and regular staff to tackle invasive species removal and native plantings on protected properties. In 2015, it completed the largest shoreline restoration project that had been performed on private property in Puget Sound, removing shoreline armor and restoring riparian and intertidal function with the Powel Shoreline Restoration Project.

Strong partnerships are vital to these efforts to bring the best available science to inform resource management and tackle large projects. We supported the Wild Fish Conservancy in its efforts to conduct an updated island-wide stream type inventory. In 2018, we completed the Land Trust-led Springbrook Creek Watershed Assessment, the first comprehensive watershed assessment on Bainbridge Island. Since then, we have been working with organizations like Wild Fish Conservancy to implement the projects identified in the assessment as having the greatest potential to enhance watershed functioning. We have partnered with funding and regulatory agencies to remove fish passage barriers from our island's streams, replacing a full-barrier culvert from the headwaters of Springbrook Creek with a pedestrian bridge; receiving funding for removal of two additional culverts downstream of this project; and working with the City of Bainbridge Island to complete a preliminary design to secure over $2M in federal funding towards replacement of the failing culvert and weirs system near the mouth of Springbrook Creek. Through our Watershed Initiative we are also working on public education about how to care for our watersheds, including a demonstration pasture conversion to pollinator garden in a riparian area. We are also expanding our partnerships with local universities, engaging Western Washington University students to perform data collection and analysis at restoration sites. Additionally, we are collaborating with University of Washington students to study wildlife usage of our preserves and assess how human presence impacts these areas.

Plan Update Development and Prioritization

The Conservation Plan outlines our conservation priorities to ensure our efforts effectively preserve Bainbridge Island's healthy natural systems. While the plan may occasionally address land management questions, it primarily focuses on how we prioritize conservation, protection, and restoration activities rather than how we implement stewardship of lands we have already protected. Relevant activities include identifying and prioritizing opportunities for Land Trust-led permanent natural resources protection and/or restoration and bringing these through to implementation, as well as initiatives that work with the public or specific partner organizations to protect island resources.

The plan was developed through a process that included the following steps:

- Conducting a Community Conservation Survey (see Appendix C);
- Review of the existing Land Trust Five-Year Strategic Plan (2021-2025) (see Appendix D);
- Review and integration of available new resource inventories and assessments;
- Updating information on property classes and updating the analysis of developed, protected, and undeveloped and unprotected lands;
- Updating land cover data;

- Rerunning forest habitat network analyses;
- Updating the Conservation Values Index to reflect new data;
- Mapping our Conservation Emphasis Areas, and;
- Internal Land Trust presentations, discussions, and review.

Priority Natural Resources

Building on the foundation of our first formal Conservation Plan (2012), each subsequent iteration of the plan has become more detailed and robust. In the 2018 Update, we called out preservation of wildlife habitat networks and shorelines as our highest priorities for protection. Much of our work in 2017-2018 went towards gathering data and performing analyses to better define these networks and habitat connectors.

The 2024 Conservation Plan Update reflects the conservation priorities further elucidated in our 2021-2025 Strategic Plan:

Our Conservation Priorities

Watershed & Landscape Scale

We will take a broad view of conditions across our watersheds and landscapes to ensure the sustainable functioning of Bainbridge Island's ecological systems.

Wildlife Networks

We will prioritize large, intact, habitat core areas that create cross-landscape connections and form a habitat network that supports sustainable populations of the Island's fish and wildlife species.

Forests

Bainbridge was historically a densely forested island, and portions of these forests are in a state of regeneration from 19th-century clearing. We will protect and promote the restoration of mature interior forests which are vital to sustain the Island's wildlife networks and native species.

Streams & Wetlands

Wetlands are ecologically rich environments interconnected with our streams and Puget Sound. Protecting these habitats is a priority as they are essential for many of the Island's birds and amphibians and also serve as critical systems for clean water and healthy watersheds. Healthy in-stream habitats teem with life, and four Federally protected fish species (Puget Sound steelhead, Coho, Chinook, and Chum Salmon) rely on Island streams.

Shorelines

Bainbridge Island's 53 miles of shoreline constitute a dynamic system that contains diverse, irreplaceable habitats, including tidelands, estuaries, lagoons, nearshore, marine riparian and adjoining upland areas. These include a number of state and federally-protected habitats, including the entirety of the Island's shoreline designated as Critical Habitat for

threatened Puget Sound Chinook salmon. Our conservation and restoration efforts here contribute to the health of the wider Puget Sound ecosystem.

Climate

Climate change effects are anticipated to impact all of these natural systems in significant ways. As we learn and prepare, we will pursue on-the-ground, natural climate solutions, including protecting and restoring ecosystem function and resilience as well as sequestering carbon.

2024 Community Conservation Survey

Results of our 2024 public survey show strong support for these conservation priorities. This on-line survey was streamlined from previous versions and made available from February to April 2024. We advertised community participation in the survey through the following mediums: the Land Trust's Annual Meeting, electronic newsletters, social media, newspaper ads, partner organizations, and fliers posted across the Island. There were 262 respondents who completed the survey and provided their insights and ideas. Generally, the feedback from the Land Trust's Community Conservation Survey is consistent with other community visioning exercises, such as the 2017 City of Bainbridge Island Comprehensive Plan "Navigate Bainbridge" where residents expressed support for protection of vulnerable natural resources that provide many community functions and values (water resource protection, trails, etc.). Several respondents specifically commented on appreciation of the Land Trust's higher emphasis on protecting wildlife habitat value by constraining human activities on our owned properties.

Respondents identified top tier habitats (Fig. 2) as:

- Forests
- Wetlands
- Shorelines
- Streams & riparian

These were closely followed by:

- Tidelands and feeder bluffs
- Important habitats for at-risk species
- Large undeveloped parcels
- Corridors between existing protected habitats
- Meadows

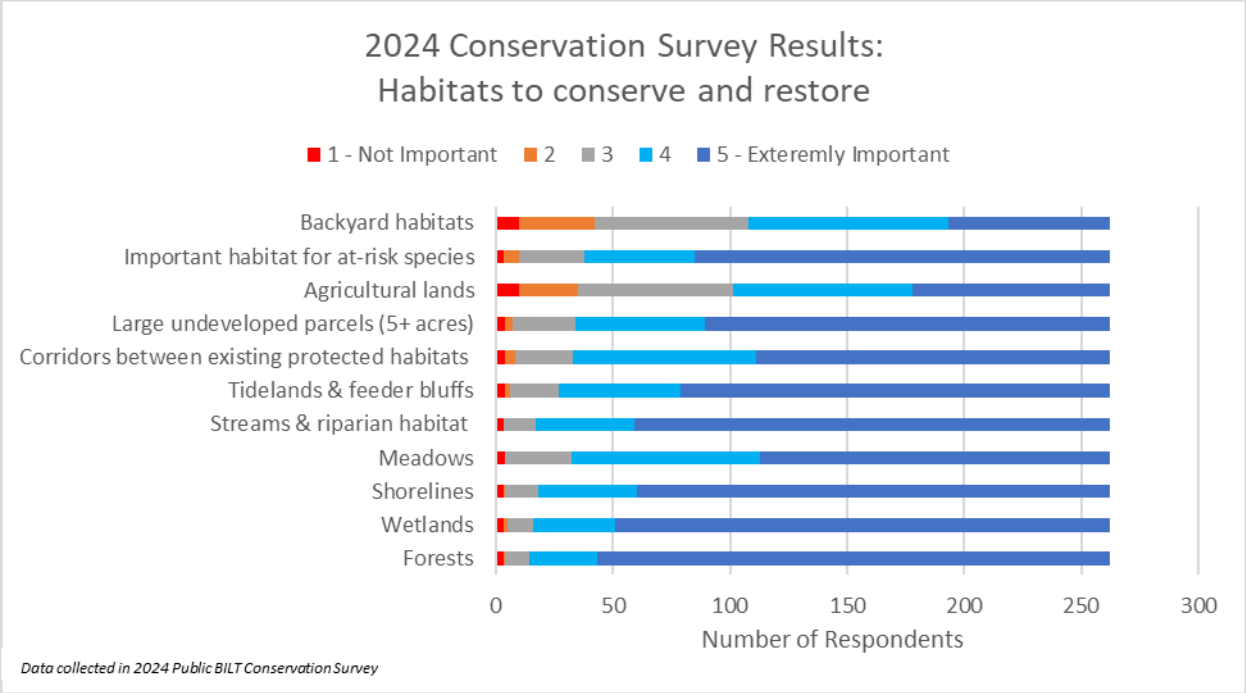


Figure 2. 2024 survey results: importance of conservation or restoration by habitat type.

In the past six years we have noted increased concern regarding development impacting natural resources, particularly stream health and adequate recharge of our sole source aquifer. The 2024 public survey indicates that the ecosystem services of greatest concern to respondents are water supply and purification, climate regulation, pollination, and the conservation of fish, wildlife, fungi, and plants (Figure 3). This feedback reinforces our growing emphasis on the Watershed and Landscape Scale priority, guiding our collaborative efforts with partner organizations to protect stream and watershed functioning.

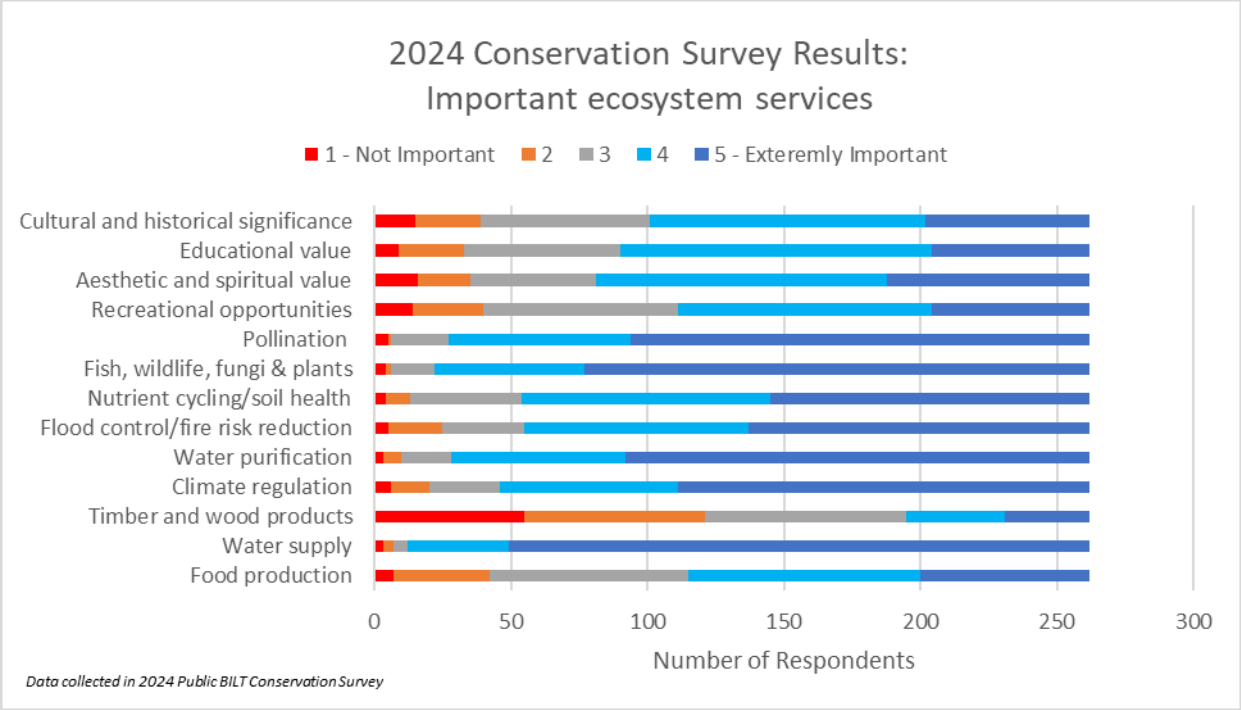


Figure 3. 2024 survey results: importance of ecosystem services.

Priority Habitat Types, General Status and Threats

Rapid population growth continues to place urgency on land protection efforts. In 2012, Bainbridge Island's population was 23,090, increasing to 24,825 by 2020 (7.5% change). A 2024 Bainbridge Island School District Enrollment Trends and Projections study did, however, report a slowing of development in 2010-2020 as compared to the previous decade, decreasing from 2,069 housing units added in 2000-2010 to 667 units in 2010-2020. Our analysis of trends in conversion of lands from "Unprotected and Undeveloped" to "Developed" is consistent with these trends, showing some slowing of conversion over the past decade. However, the school district's study predicts an acceleration from the current 50-60 housing units/year to 75 units/year in 2026-2033, with a predicted increase in population to about 27,000 people by 2033. The Washington State Growth Management Act dictates that the Island should plan for addition of 70 units/year until 2050 (2021 HB 1220).

Status and trends of our forests, streams and wetlands, and wildlife networks are closely intertwined. Before settlement by non-Native Americans, the Island was predominately covered by dense old growth forests of western redcedar, Douglas fir, western hemlock, bigleaf maple, and other temperate coniferous species. Many wetland areas would have been forested while some were likely shrubby marshes. Some openings may have been intentionally maintained by Native Americans using fire, but it is unclear whether significant portions of the Island were thus maintained to break up the predominate forest cover. By the late 1800s, these forests were completely denuded by settlers and the operation of large sawmills and boat building facilities along Bainbridge shores. Logging paid little regard to streams and wetlands. It is a true testament

to ecosystem resilience that we enjoy the wide variety of wildlife species we do today, following this ecological bottleneck period.

Fortunately, forests have regrown to cover approximately 70% of the island. However, this tree cover does not equate to the quality of forest habitat that once blanketed the Island. Our stands are comparatively young, and many are unhealthy due to overcrowding, which is discussed further in our Land Trust 2024 Forest Management Considerations and Guidance Report. Additionally, there is also a high level of fragmentation that prevents many stands from functioning as interior forest. The areas lack core zones sheltered enough to provide cool, low-disturbance refuge. Development has also fragmented large areas of the Island to the point where connections between the remaining refugia have become tenuous for our forest species.

Continued development is the primary threat to these forests. Much of the remaining intact forest is in low-density zoning allowing 1 home and 1 accessory dwelling unit per 2.5 acres. While this zoning has benefits for rural character and some benefits for habitat, it also disperses impacts, resulting in large areas of highly perforated forests. It is not unusual for the footprint of the buildings, paving, and landscaping to encompass over an acre within each parcel, leaving a ring of habitat.

For streams and wetlands, City codes are fortunately now highly restrictive of activities that can occur within their buffers, but extensive buffer areas nonetheless remain open from past clearing. This sometimes occurred because the resource was not identified, or the area was cleared long before there were regulatory protections. We have also spoken to well-meaning Islanders who cleared riparian areas recently thinking it was beneficial to the stream or improved their enjoyment of it. Regardless of intent, lack of riparian vegetation (shading) is a large contributor to high stream temperatures. Many of our stream reaches exceed healthy temperatures every summer. Some streams are also affected by fecal coliform bacteria, runoff of chemical contaminants, and sedimentation.

The Biological Index of Benthic Invertebrates (B-IBI), a measure of streambed-dwelling macroinvertebrate communities, is a good indicator of stream health. The City of Bainbridge Island (COBI) has been performing B-IBI monitoring of our watersheds since 2008. Results through 2023 show one stream is currently in “good condition” and trending *better*, three in “fair condition” (two *improving*, one *worsening*), one in “poor condition” but *improving* and two in “very poor condition” and *worsening*.

Annual salmon surveys performed around the Island show very few adults returning to the streams to spawn. Like many Puget Sound salmon in urbanized streams, the returning adults are potentially exposed to highly toxic chemicals and metals from roadway runoff and lack of sufficient riparian buffers. Migrating salmonids must also navigate a daunting series of fish passage barriers. Bainbridge Island has over 230 culverts on fish-habitat streams, and over half are known as ‘full’ or ‘partial’ fish passage barriers (Appendix A Map 4).

Bainbridge’s shorelines are intensely developed, with most of the Island ringed with long skinny parcels, designed to maximize the number of beachfront homes. Only 6 of the 53 miles of shoreline (11%) are in permanently protected parcels, and 26 miles (50%) of the shoreline are

armored. The City's Shoreline Management Plan (SMP) and associated City codes mostly prevent construction of new armoring, but existing armoring can still be rebuilt. Shoreline armoring degrades habitat for fish and other marine species and impairs healthy functioning of these naturally dynamic systems by impeding the ability for the tide to interact with the shoreline. Sea level rise will be an added threat to healthy shorelines in coming years. In addition to direct effects, we can anticipate indirect effects as shorefront homeowners look to increase armoring to protect their property.

Additional Community Values

Multiple approaches are needed to achieve our full vision of an island "in which healthy natural systems support diverse and thriving populations of native plants and wildlife. Where people value the natural world and feel inspired by and compelled to care for their surroundings. Where conservation is the work of diverse community partners and is inclusive, equitable, and just. And where Bainbridge Island remains resilient and a special place to live, work, and play for generations to come." Our first approach is protecting and restoring land to support all of the island's native species and essential ecosystem functions (such as aquifer recharge and flood control), for the collective public benefit. Other approaches focus on additional elements of fostering connections between people and the land and contributing toward community resilience and diversity by providing public access and education, as well as supporting working farms and affordable housing.

Public Access

Most of the lands we own or helped to protect have public trails through them, because facilitating access for people to enjoy nature is a high priority for the Land Trust. However, we are the only conservation entity on the island dedicated to protecting lands regardless of suitability for public access. Given the findings of our camera trap work and other studies on impacts of human disturbance on wildlife, we are mindful that the network of lands we protect to support biodiversity must include enough refuges from disturbance to be fully functional. Also, most lands protected using the conservation easement tool are privately owned, and it is entirely up to the landowner to decide if they would like public access to their property.

The potential for enjoyable public use is a bonus factor when evaluating a parcel for protection, but it is not usually a key decision factor. In fact, we often cannot determine if public use will be feasible at the time of protection. To ensure access can be designed to preserve low-disturbance areas, we need sufficient information about the land, particularly sensitive habitats like wetlands that may not have been mapped before acquisition. Consequently, we often lack the necessary information to make long-term management decisions about amenities such as trails and parking until well after a property has been purchased. Managing properties for public access is primarily considered part of Stewardship rather than Conservation.

Tribal Connections

Indigenous cultures, languages, and practices are inextricably tied to the landscape. The original inhabitants of Bainbridge, the Suquamish, used their knowledge of the land, waters, plants, and animals to build large thriving communities. The Suquamish Tribe's website shows nine summer and winter villages on Bainbridge Island. Chief Kitsap had homes at two of these winter villages (at Port Madison and Pleasant Beach). The Tribe's Port Madison Reservation is just across the Agate Passage Bridge. Old Man House, home of Chief Seattle and once the largest winter village in the State, lies only 1,500 ft across Agate Passage from the Island on this Reservation. Yet many tribal members report complete disconnection from present-day Bainbridge Island. The rapid rise in affluence and housing prices over recent decades has increased the perception of Bainbridge as a culturally- and financially-gated community.

The Land Trust is eager to partner with the Suquamish Tribe to facilitate revitalization of lost cultural connections to their traditional territories on Bainbridge. One example is ongoing conversations on arranging access for sustainable harvest of traditional plants. Another example is collaborating with the Tribe to bring conservation and stewardship educational opportunities to the Tribe's school. The Land Trust recently connected the National Wildlife Federation with the Tribe's Chief Kitsap Academy to create a Certified Wildlife Habitat garden on campus with grant funds from a private donor. The Land Trust also provided educational presentations to the students, advice on plant selection and sourcing, and participated in planting with the students.

In the Conservation realm, further discussions are needed with the Suquamish people to determine how we might partner in identifying high-priority lands to protect or restoration projects to pursue. The Tribe has generously provided letters of support and cultural resource report reviews for Land Trust-led protection and restoration projects such as the protection of Springbrook Creek Preserve and subsequent culvert removal. The inspiring words and songs that Tribal representatives shared at the public opening of this preserve in 2024 were clear highlights of the event.

Stream and shoreline restoration projects will continue to be important collaborative efforts, and these may include the Land Trust assisting the Suquamish and Great Peninsula Conservancy with projects on the Kitsap Peninsula, such as assisting with grant applications. When evaluating potential acquisitions, we have begun to consider proximity to historic village sites and further work to identify lands and resources that are valuable to tribal people (e.g., large distributions of culturally significant plants).

Agriculture

Agriculture is a more recent land use that shaped the island's landscape and culture from the 19th to mid-20th centuries. Japanese Americans were leaders in converting logged lands to farms in the late 19th century. Their employment of Native Americans, then Filipino immigrants, diversified what was becoming a largely European-American local population. By 1940, Bainbridge Island was the strawberry capital of the Pacific Northwest. Much of the landscape cleared for agriculture remains in open pastures today, even with a large decrease in agricultural activities. Preservation

of local farms is valued by the island's community for continuing this historic way of life for farmers, contribution to rural character, and for the carbon emissions reduction, health, and community benefits of locally produced food. Farms can also provide good habitat for birds, particularly when pesticide use is minimized.

The Land Trust's first Conservation Easement (CE) was placed on a largely agricultural property. This 1990 CE preserved a vista over open fields along the Island's main travel route, Highway 305, from the threat of conversion into a golf driving range. A few of our subsequent CEs included provisions for pasturing livestock within a portion of the Conservation Area, and the Meigs Farm CE included a model farm concept (that was not implemented). But generally, CEs have been designed to protect intact natural habitats within the conservation areas, with gardens, farm areas, and pastures falling within the residential areas of CEs. The Land Trust has not led the movement to preserve agricultural lands, instead seeing our appropriate role as supporting the island's agriculture-centered Friends of the Farms, a non-profit organization. However, Friends of the Farms is a small organization, and they and some local farm families have asked the Land Trust to play a more active role in helping to preserve the island's working farms. Therefore, we are investigating opportunities to expand into the realm of agricultural easements or other mechanisms to help prevent conversion of remaining farms to residential or commercial development, and to keep local farming viable.

Affordable Housing

Another community value is the availability of affordable housing. With the median home price on Bainbridge Island now around $1.5M and rentals rare and expensive, many people who work on Bainbridge - such as teachers, caregivers, and retail workers - cannot afford to live here. Schools are threatened with closure as fewer young families can move here, and people who grew up on the Island are often forced to move away when it's time to live on their own. Our community's diversity is rapidly diminishing. Housing Resources Bainbridge (HRB) is our local community land trust leading the effort to create permanently affordable housing and is committed to "sustaining the social connections across generations, cultures, and classes that strengthen and enliven our community" (https://www.housingresourcesbi.org/about/).

The Bainbridge Island Land Trust's mission envisions an Island where, "conservation is the work of diverse community partners and is inclusive, equitable, and just." As HRB shares our commitment to equitable access to nature and sustainable development, we have long considered partnering on a project that would combine conservation with affordable housing. The project we were looking for would have net conservation benefits by taking lands where development would have been allowed to sprawl across a large area, degrading the entire habitat area, and instead clustering development impacts in a small portion with lower ecological value while permanently protecting the core habitat area. Ensuring that the clustered housing was permanently affordable was a critical component, as opposed to programs where affordability restrictions apply only to the initial buyer, resulting in a perpetual need to develop more land to replace affordable housing.

The land trusts, Bainbridge Island Land Trust and HRB, signed a Memorandum of Understanding in 2023 to make the Lovgreen property this partnership project. This is 15 acres of mostly forested land within a large forest core area (modeled as part of our 2018 Conservation Plan), but past management activities removed much of the overstory and understory vegetation, impacting the ecological integrity of portions of the property. We observed that the vegetation closest to Lovgreen Road was recovering slowly from being clearcut 30 years prior, resulting in dense native and invasive shrubs under small alders and a very sparse scattering of larger overstory trees (mostly bigleaf maple resprouted from cut stumps). Consequently, this area has less overall conservation value compared to the region farther from the road, which retains more mature trees and contributes to a large band of contiguous interior habitat. If this degraded northern portion had existed as a separate parcel, we would not have included it in our purchase. Under this partnership, HRB is agreeing to purchase from the BI Land Trust 2-3 acres of this area nearest the road for clustered, small-scale, affordable housing. This allows us to focus our conservation dollars on protecting the 12-13 acres with highest conservation values, while assisting HRB's mission and providing residents of the affordable homes with ready access to the natural area.

Status & Trends of Landscapes on Bainbridge Island

Permanently Protected Lands

As shown in Figure 1, significant blocks of land on Bainbridge Island are in various degrees of permanent protection status. These areas encompass lands that may include some level of development for homes, recreation, or educational facilities (e.g., defined residential areas within larger CEs, recreation areas within parklands, and developed portions of the private reserves of IslandWood and Bloedel). However, primary emphasis within most of these protected lands is natural area preservation. **As of this writing, these permanently protected lands collectively encompass just over 2,700 acres, or about 15% of Bainbridge Island. The Land Trust was involved in the protection of 1,563 of these acres.** However, as further described under Status & Trends of Priority Habitat Types, these protected areas leave large gaps in protection of our shoreline resources and wildlife habitat networks.

Status of All Island Parcels

To better understand the status of the Island's land use and where protection opportunities exist, the land use status[1] of all Island parcels was analyzed for the 28-year period ranging from June 1996[2] to March 2024. Each land use status was assigned one of four broad categories:

- Undeveloped & Unprotected
  - Includes many land use types including active farms and forest lands without some type of protection in place.
  - This is the primary category where high-level conservation gains can be made.

[1] Land use status codes are defined and managed by the Kitsap County Assessor's Office. The Land Trust reviewed these codes, made modifications as necessary, and categorized them for our analysis.

[2] June 1996 was the earliest GIS tax parcel data readily available from the City of Bainbridge Island.

- Some Level of Development
    - The level of development ranges from very low density to commercial/industrial.
    - There still may be good conservation opportunities on properties with lower densities of development in this category.
    - This is a category where restoration may provide valuable long-term conservation gains.
- Some Level of Protection
    - The level of protection ranges from permanent (e.g., conservation easement or Land Trust-owned preserve) to less-than-permanent (e.g. unrestricted park land, current use tax status). A detailed parcel-specific review is necessary to determine the exact nature and durability of the protections affecting each property.
    - This category includes all park lands and private reserves (i.e., IslandWood, Bloedel).
    - This category includes properties that have some development if they also have some type of protection in place (e.g. open space farmland, parks with recreation facilities).
    - This category does not include properties affected by regulatory protections (e.g. critical areas & buffers or open space required by subdivision if the lands are not functioning like native habitat (i.e. lawn areas).
    - There are opportunities in this category to upgrade protections for strategically important resource lands from a less-than-permanent to permanent status.
    - Ongoing stewardship (maintenance, restoration/enhancement) of properties in this category may be necessary to maintain and improve conservation values.
- Rights of Way (utilized or reserved for roadways)

WHAT ARE SOME OF THE IMPORTANT TRENDS OVER THE LAST 28 YEARS?

The conversion of *Undeveloped & Unprotected* (U&U) lands to either *Some Level of Protection* (SLOP) or *Some Level of Development* (SLOD) from 1996 to 2024 is quite dramatic, with U&U declining from 33% of the Island to 11% (Figure 4). Of the Island's roughly 17,390 acres, 5,824 acres were U&U in 1996 and just 1,885 acres remain in 2024. The U&U parcels have split fairly evenly between development and protection over that 28-year time frame, with 11% going in each direction. At the time of our 2018 Conservation Plan Update, 17% remained in the U&U category and the trend in these last six years has also been to evenly split, with 3% converting to SLOD and 3% to SLOP (Figure 5).

Although recent trends show roughly equal areas of the remaining U&U lands being either protected or developed, this balance reflects a shift from earlier emphasis on development. Parcels developed to some extent total 10,339 acres, 59% of the Island. Lands with some level of protection are now at almost 4,000 acres, or 23% of the Island. This includes lands such as those

with Open Space or Forest designation (i.e., current use tax status), that could still be developed in the future.

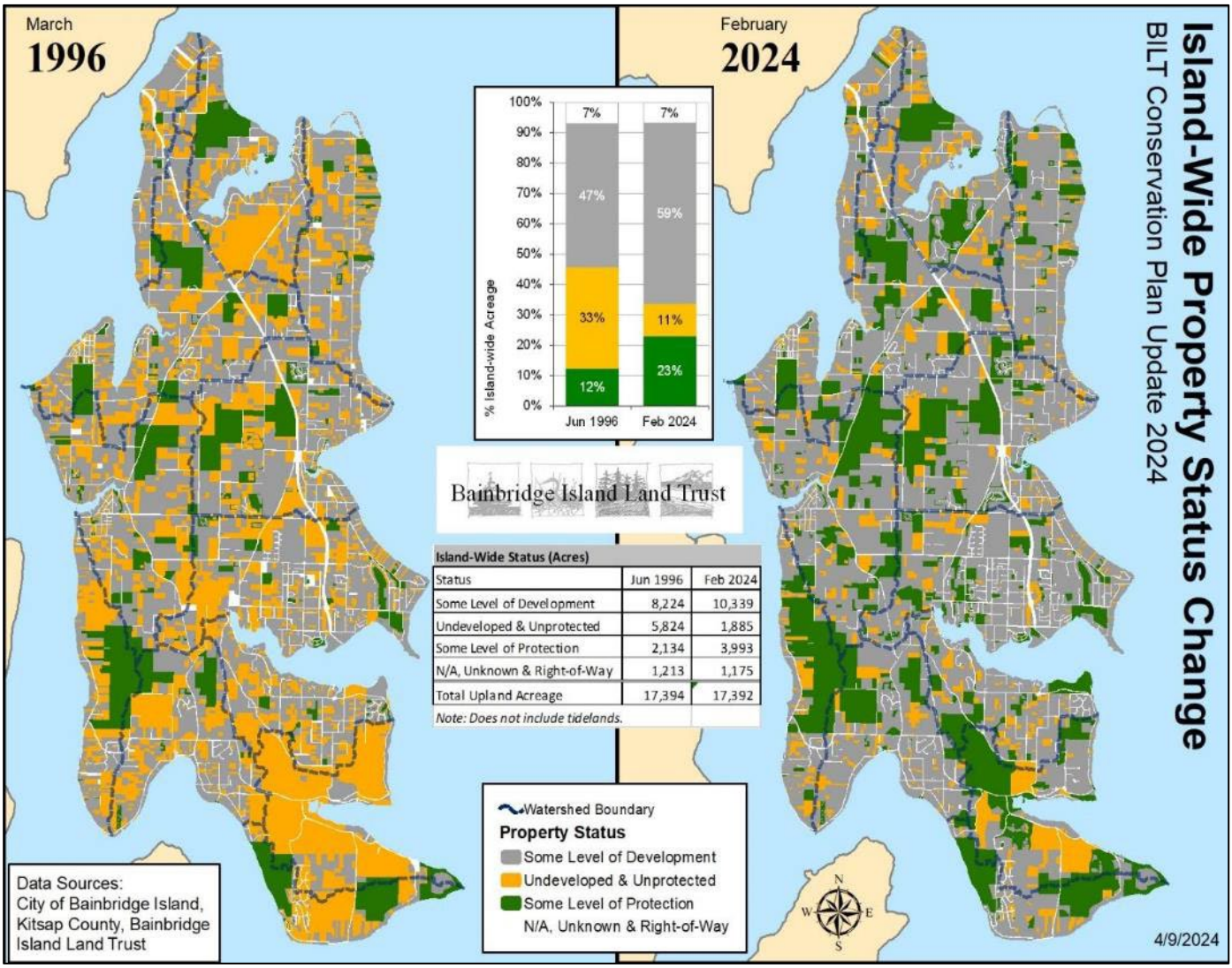


Figure 4: Island-wide property status change between 1996 and 2024.

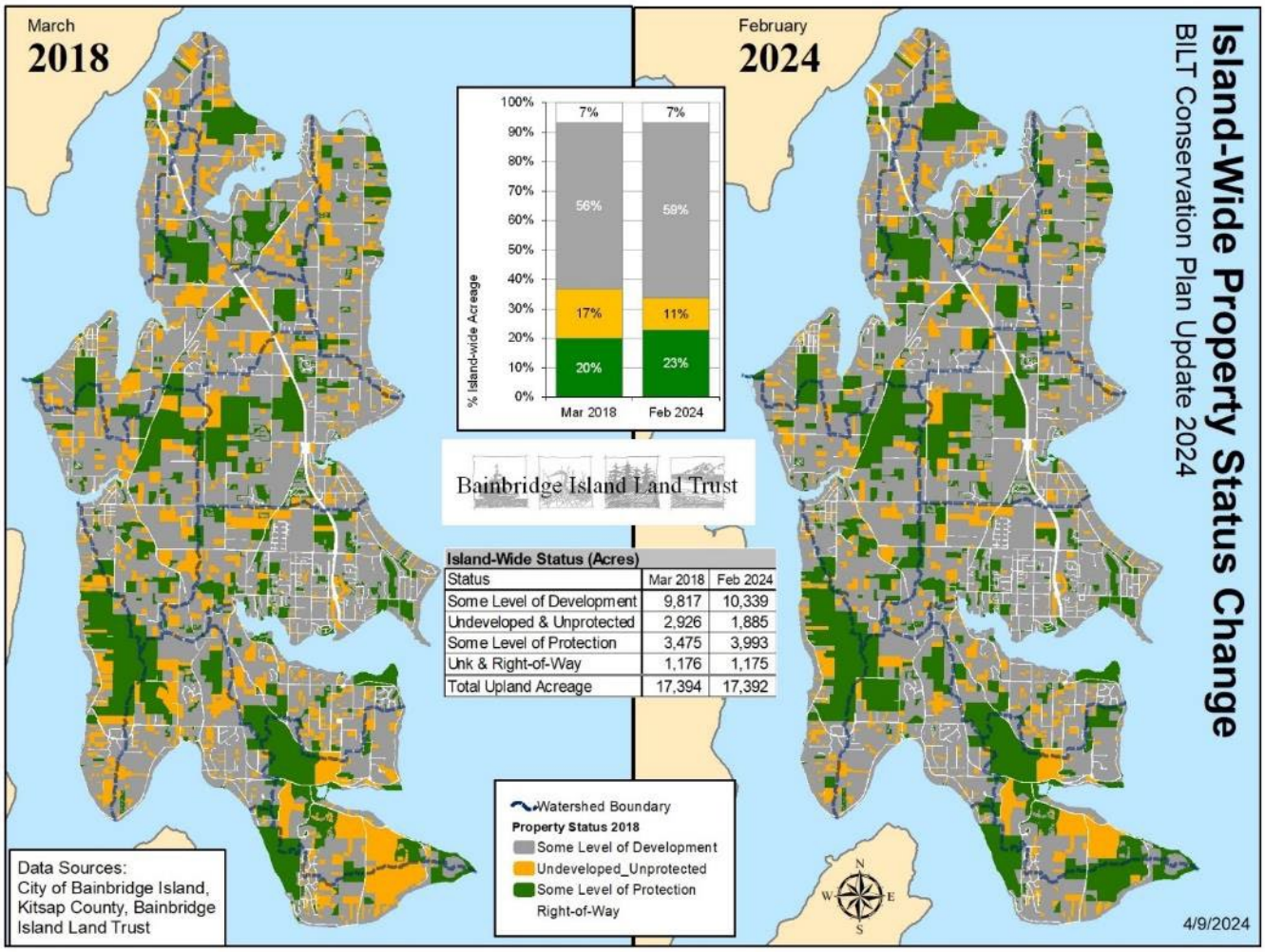


Figure 5: Island-wide property status change between 2018 (our last Plan update) and 2024.

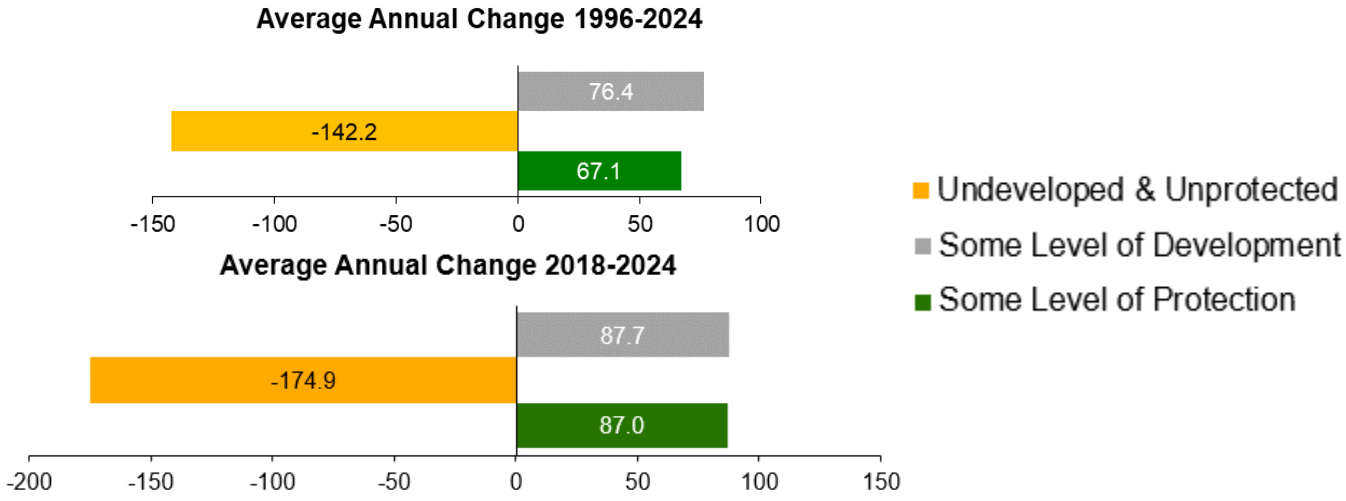


Figure 6: Annualized Change in Property Status Island-Wide, 1996-2024 and 2018-2024 (acres/year). Does not include tidelands.

Table 1. Island-wide property status change (upland acres).

Status	Jun 1996	Jan 2001	Dec 2005	Apr 2010	Sep 2014	Mar 2018	Feb 2024
Some Level of Development	8,224	8,957	9,652	9,857	9,754	9,817	10,339
Undeveloped & Unprotected	5,824	4,749	3,596	3,176	2,994	2,926	1,885
Some Level of Protection	2,134	2,533	2,934	3,186	3,478	3,475	3,993
N/A, Unknown & Right-of-Way	1,213	1,156	1,212	1,175	1,169	1,176	1,175
Total Upland Acreage	17,394	17,394	17,394	17,394	17,394	17,394	17,392

Table 2. Island-wide property status change (% of upland acres)

Status	1996	2001	2005	2010	2014	2018	2024
Some Level of Development	47%	51%	55%	57%	56%	56%	59%
Undeveloped & Unprotected	33%	27%	21%	18%	17%	17%	11%
Some Level of Protection	12%	15%	17%	18%	20%	20%	23%
N/A, Unknown & Right-of-Way	7%	7%	7%	7%	7%	7%	7%

How much time is left before all the "Undeveloped and Unprotected" land may be gone?

In 2012, the Land Trust calculated a simple linear projection using the average rate of change over the preceding 15 years to estimate future changes in property status. That projection was updated in 2014 (Figure 7). This projection estimated that the inventory of U&U land might be exhausted by 2030, either having received *Some Level of Protection* or been converted to *Some Level of Development.* That horizon was an approximation; market forces and community support significantly affect the pace of both conservation and development. The projection estimated that we would have only 6% of the Island's lands still in U&U category by 2024, when in fact we have about 11%. Regardless of the actual rate of conversion, this projection emphasized the urgency of protection before finite land resources are allocated to uses incompatible with maintenance of significant ecological processes and functions.

It is also important to remember that *Some Level of Protection* includes lands in Open Space and Forest designations that can be withdrawn and developed (subject to payment of back taxes). There are opportunities to extend permanent protection over these lands. Conversely, lands with *Some Level of Development* includes properties where not all development rights have been exercised and sufficient areas of intact habitat may remain such that permanent protection through conservation easements may be highly beneficial. **Working with landowners to put conservation easements in place on partially developed properties in high conservation value areas will be an increasingly important protection mechanism as we run out of Unprotected and Undeveloped parcels of substantial size.**

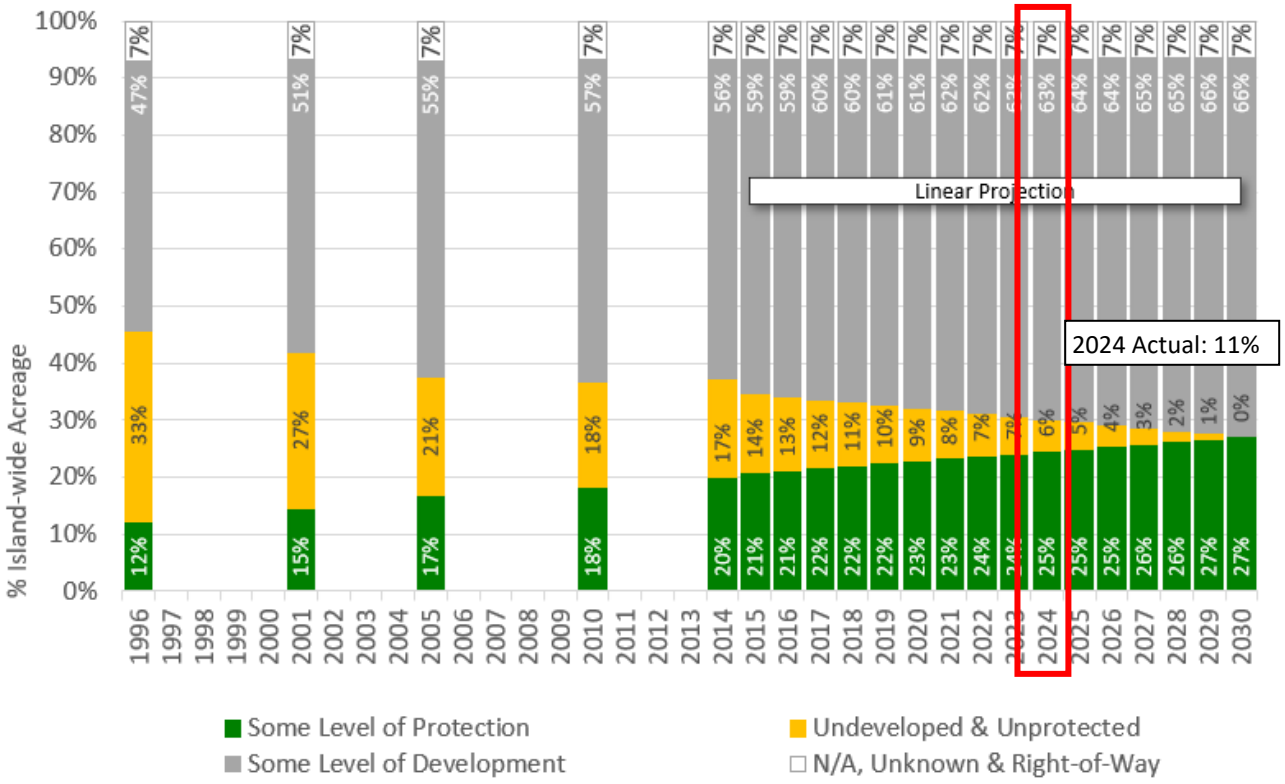


Figure 7. Linear projection based on 1996-2014 trends.

Changes in Acreage of Undeveloped & Unprotected Properties by Size Class (1996-2024)

Protection of the most ecologically valuable Undeveloped and Unprotected acres on the island is a key strategy to achieving conservation, watershed protection, habitat connectivity and community open space priorities.

Large blocks of strategically located land can act as the anchors of a wildlife habitat network (such as the modeled forest core areas shown in Figure 8). Large-sized undeveloped properties support numerous ecological processes better than smaller-sized properties. Staff and financial resources to steward large properties owned by a single landowner, such as a conservation easement, are typically less than stewarding a number of small conservation easements owned by separate landowners. For these reasons, it is important to evaluate property size and future stewardship obligations in connection with acquired properties and easements.

Examination of size distribution reveals that only 19 U&U parcels over 10 acres in size remain (Table 4). These would all be considered high priority for protection, including proactively exploring options with landowners we are not already communicating with. The remaining 39 U&U parcels between 5-10 acres in size are also of elevated priority for protection, with higher consideration of other evaluation factors.

Table 3. Changes over time in total acreage of Undeveloped & Unprotected parcels by size class.

Size (acres)	Jun 1996	Jan 2001	Dec 2005	Apr 2010	Sep 2014	Mar 2018	Feb 2024
<=1*	686	588	467	443	419	389	272
1 < x <= 2	601	471	398	379	380	357	283
2 < x <= 5	1,658	1,359	1,086	949	901	895	658
5 < x <= 10	857	841	555	498	466	509	288
10 < x <= 25	1,472	579	513	517	513	493	230
25 < x <=50	385	319	217	147	72	39	39
50 < x <= 100	64	365	233	116	116	116	116
> 100	101	228	127	127	127	127	0
Grand Total	**5,824**	**4,749**	**3,596**	**3,176**	**2,994**	**2,925**	**1,886**

*Many <1 ac "parcels" are artifacts in the Kitsap Co parcel layer and created by clipping to shoreline for this analysis

Table 4. Changes over time in number of Undeveloped & Unprotected parcels by size class.

Size (acres)	Jun 1996	Jan 2001	Dec 2005	Apr 2010	Sep 2014	Mar 2018	Feb 2024
<=1	1558	1400	1042	974	931	870	600
1 < x <= 2	457	360	306	292	295	279	218
2 < x <= 5	529	429	350	311	293	292	219
5 < x <= 10	125	120	82	72	67	74	39
10 < x <= 25	80	38	35	34	33	31	16
25 < x <=50	12	9	6	4	2	1	1
50 < x <= 100	1	6	4	2	2	2	2
> 100	1	2	1	1	1	1	0*
Grand Total	**2763**	**2364**	**1826**	**1690**	**1624**	**1,550**	**1,095**

*The >100 ac Country Club property was reclassified from U&U to SLOP in 2024 to reflect Forest Land classification

Land Cover Changes: 2015-2021

An important component of updating our Conservation Values Index and forest core mapping was utilization of more recent land cover data. Our 2018 Conservation Plan Update used 1m-resolution mapping of Bainbridge Island land cover derived from LIDAR in 2015. This categorized terrestrial and marine cover into 13 classes, such as impermeable surfaces (compacted or paved areas that don't let rain soak through), buildings, water, low vegetation, shrubs, trees, trees over roads or buildings, etc.

Re-running these analyses to reflect more recent land cover was an important task for this update, given that many changes have occurred since 2015. We delayed analyses in anticipation of receiving 2021 land cover through a statewide effort, but unfortunately only tree cover and impermeable surfaces mapping based on the 2021 data were available in time. A detailed complete coverage mapping based on 2017 data also became available after the 2018 update was completed, so we used that coverage to fill in the cover types other than trees and impermeable

surfaces. Although the 2017 data reflect the low vegetation types as mapped seven years ago, our analyses are not highly sensitive to differences between low vegetation types. The analyses are sensitive to trees and hard surfaces. For simplicity's sake, when we refer to the 2021 land cover here, we are referring to tree and impermeable surfaces compiled from 2021, combined with other cover types from 2017. These analyses include a total of 13 terrestrial and marine cover classes.

The 2021 and 2015 land cover layers were not completely consistent with one another in classification of cover types. It was nonetheless possible to pool categories to allow for comparisons that should represent changes over that time frame. Combining all types of tree cover in 2015 and all tree classes in 2021, we found that **the total acreage of tree cover was nearly the same, showing a net gain of just 3.6% (Table 5). Expansion of tree canopies and growth of small trees to a height that qualifies as tree cover appears to have offset the loss of trees in other areas.**

However, the acreage of mapped impermeable surfaces expanded a rather alarming rate of 72% (Table 5). Differing interpretations of bare land vs. impervious surfaces can lead to a false appearance of change, but mapped bare land increased from 76 acres to 109 acres over this time frame (Table 5), so changes in defining these categories do not explain the rapid increase in mapped impervious surfaces.

Mapped coverage of shrubs also changed considerably, decreasing 51% (Table 5). Many of the patches mapped as shrubs in 2015 were mapped as tree cover in 2021, while some shrub areas were converted to impervious surfaces or to lower groundcover. The total acreage in low groundcover such as grasses stayed essentially the same between the two years, which makes sense given that the 2021 layer drew on 2017 imagery for these classes.

Table 5. Land cover changes between 2015 and 2021.

Cover Type	2015 Land Cover Classes	2021 Land Cover Classes	2015 area (ac.)	2021 area (ac.)	Change (ac)	%
Impervious	Impervious, Road	Impervious	955	1,642	686	71.9%
Trees	Trees over road, Trees over bldng, Trees	Trees over Impervious, Trees, Forested Wetland	12,234	12,677	443	3.6%
Shrubs	Shrubs	Shrubs, P. Shrub Wetland, Est Shrub Wetland	845	411	-434	-51.4%
Low vegetation	Groundcover, Emergent Wetland	Cultivated land, Grassland, P. Emergent Wetland, E. Emergent Wetland	2,730	2,667	-63	-2.3%
Bare	Bare Ground	Bare Land	76	109	33	43.2%

Conservation Tools and Strategies

Conservation Values Index

Our 2018 Conservation Plan Update made important advances in our use of available Geographic Information System (GIS) datasets and tools, including **development of the combined Conservation Values Index (CVI). This mapping is intended to display areas of highest natural values.** Although the 2018 Conservation Plan Update discussed addition of factors such as parcel size and proximity to protected areas, we found that mapping which illustrates natural values alone is more useful. Such mapping does not need to be updated with every change in land status, and additional considerations regarding parcel attributes can easily be factored in qualitatively when evaluating opportunities.

The 2018 Conservation Plan Update and CVI development drew upon a considerable amount of new information developed or obtained between 2014 and 2018 thanks to several local and regional planning efforts. **The current update draws on the 2018 data with a few updates as new information has been acquired (such as refined mapping of streams, delineations of wetlands) and adds some additional layers (Appendix B). New layers include a geological model of aquifer recharge areas, addition of freshwater bodies, mapping of areas where shoreline habitats have space to migrate as sea level rises, and stands of trees with large average diameters.**

Another important advance in the 2018 analyses was our mapping of interior forest core areas and connections between these core areas. Together these make up the forest habitat network model and reflect current habitat value without regard to which portions are currently protected. Although the City of Bainbridge Island performed a Wildlife Corridor Network mapping in 2000 (Self 2000), these corridors were not protected in any way and habitat alteration rendered many ineffective. Also, new mapping software tools for use with ArcGIS came available since that time, allowing for mapping of habitat cores and connections based on species' biological needs and behaviors. We chose to model interior forest habitats because this was the dominant habitat type over the Island historically and our native wildlife community is largely dependent on intact forests. Combining this modeled forest habitat network with streams and wetlands and their buffers forms a good representation of the overall terrestrial habitat network.

Forest Habitat Networks Modeling

We modeled interior forest habitats utilizing Gnarly Landscape Utilities Resistance and Habitat Calculator tools (McRae et al. 2013). This software was developed in support of the Washington Wildlife Habitat Connectivity Working Group's (WHCWG) efforts to model statewide habitats and connections for multiple species (WHCWG 2010). To model habitat core areas, the landscape is divided into small cells and a habitat value from 0 (non-habitat) to 1 (optimal) is assigned to each cell. The software then uses a moving window analysis to identify large blocks of contiguous habitat forming habitat core areas.

We used northern flying squirrels as our focal species because this is a species known to occur on the Island that requires forested habitat and is reluctant to travel across openings or roads. It is therefore a good species to represent the intact, interconnected forest habitats that many of our native species evolved within. Parameters used to model the core habitat areas were based loosely on those used by the WHCWG in their state-wide efforts, with tailoring to fit our data and the much smaller landscape area. For our purposes, we reduced the minimum core area size from a scale appropriate for statewide analysis, to about six acres for the island (which is about the smallest area that functions for flying squirrel nesting).

In the 2018 and current analyses, the tree cover data lacked information on tree size. We did obtain a separate mapping of stands with average diameter over 15 inches, but this mapping from the Landscape Ecology Modeling, Mapping & Analysis group (based on 2017 imagery) was performed using 30m pixels. Our 2024 forest habitat network analysis utilized only our 1m pixel land cover layer, although the coarser mapping of stands with larger diameter trees was used as an input to the CVI. Modeling of flying squirrel habitat could be improved by addition of tree size and stand density information, as some stands may have trees too small or canopies too open for flying squirrels. However, these stands can develop into suitable habitat fairly quickly given the rapid rate of tree growth in our area - the most productive Douglas-fir growing region in the world.

To run the core mapping tool, the moving window area was set to 500m^2 (vs the 1000 m^2 used for the statewide analysis), such that it would select a window area as habitat if it was 80% habitat, amass all of the contiguous habitat areas, then drop out those encompassing less than 6 acres. The result was a map of areas on the Island that provide good contiguous blocks of forest with relatively few road divisions or openings. The modeled core areas based on 2021 land cover were slightly reduced from those mapped in 2018 based on 2015 land cover (Figure 8). **The 2024 core areas encompassed 4,740 acres, vs 4,836 acres for those mapped in 2018. The slight reduction in interior forest cores, despite an increase in total tree canopy, is likely due to the increase in impermeable surface cover and fragmentation of forest stands.** It also appears that the 2024 analysis was more likely to exclude openings within core areas than the 2018 output, although the parameters were set the same (Figures 9 and 10). This might have reflected a software update.

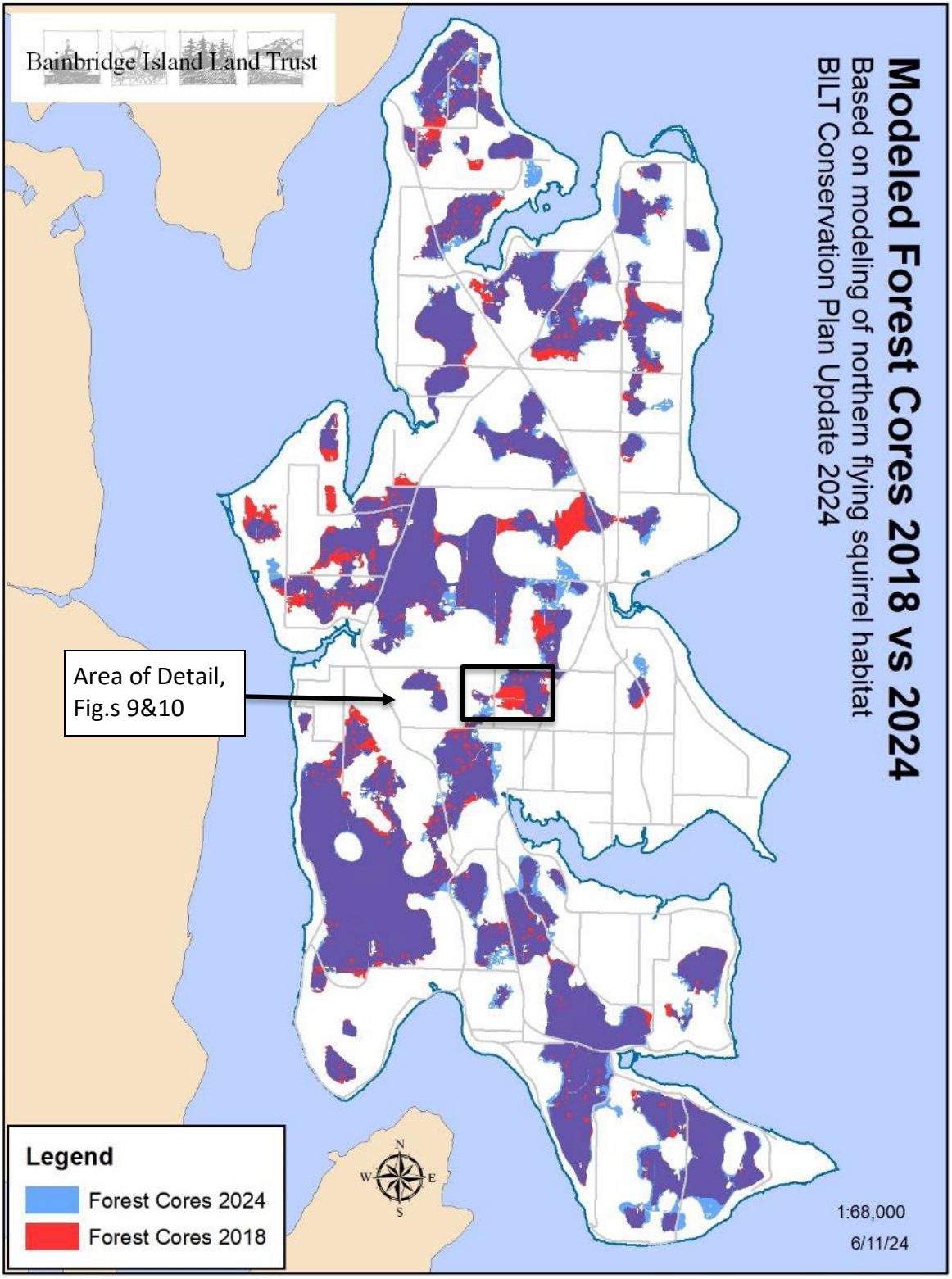


Figure 8. 2024 Modeled forest core areas, 2018 and 2024.

Figure 9. Example 2018 Forest Core Area with 2015 aerial photo

Figure 10. Same area in Figure 9 with 2024 Core Area and 2020 aerial photo

Connectors

The next step was to utilize the ArcGIS Pro 3.3 Optimal Region Connections tool to find connections between these core areas for a species reluctant to cross developed areas. This analysis uses a "resistance" value assigned to each land cover type, which is akin to the inverse of habitat value. Resistance in this context refers to the difficulty a species would have in traversing an area (e.g., an amphibian would be reluctant to cross an open, dry area). Our assignment of resistance value by cover type started with the values used by the WHCWG in the statewide analysis but tailored to local data. Thus, trees were set to be very easy to traverse through, then in increasing order of resistance: trees over buildings or roads; shrubs or low ground cover; buildings, bare ground, or water; roads; and beach and shoreline areas. Roads were added into the analysis such that the island's sole highway would be very difficult to cross, followed by secondary arterials, then smaller roads.

Least-cost-paths are mapped by calculating the difficulty of crossing from one place to another in terms of movement cost. That is, crossing over 1m of forest is a 1m cost for a flying squirrel, but because they are very reluctant to cross roads, each 1m of a road would be a 100m cost. The pathway between any two core areas that results in the lowest cumulative cost is then mapped. The process was repeated to find connective paths between the forest core areas. These paths were buffered to 100' on each side to form rough 200'-wide corridors. These sometimes encompass roads and other unsuitable areas that the least-cost path ran along. Some edits were performed to exclude the most egregious of these (e.g. Highway 305 included in connective paths), but these are not meant to represent the exact areas that should be protected to connect forest core areas. Instead, **these connectivity corridors are more of a general indication of where protection or restoration of forests might be most effective to preserve these connections.** Together, the cores and connections represent an island-wide Forest Wildlife Network. When combined with the interconnecting stream and wetlands networks, this provides an invaluable landscape perspective for evaluating the most valuable areas for conservation.

Figure 11 illustrates the island-wide forest core and connector network, while Figure 12 illustrates how the connectors are formed along least-cost-paths between the forest habitat core areas in a particular area of the Island. Darker background indicates better habitat (trees) and lighter shades highlight where openings, buildings, and impervious surfaces are more resistant to animal movement.

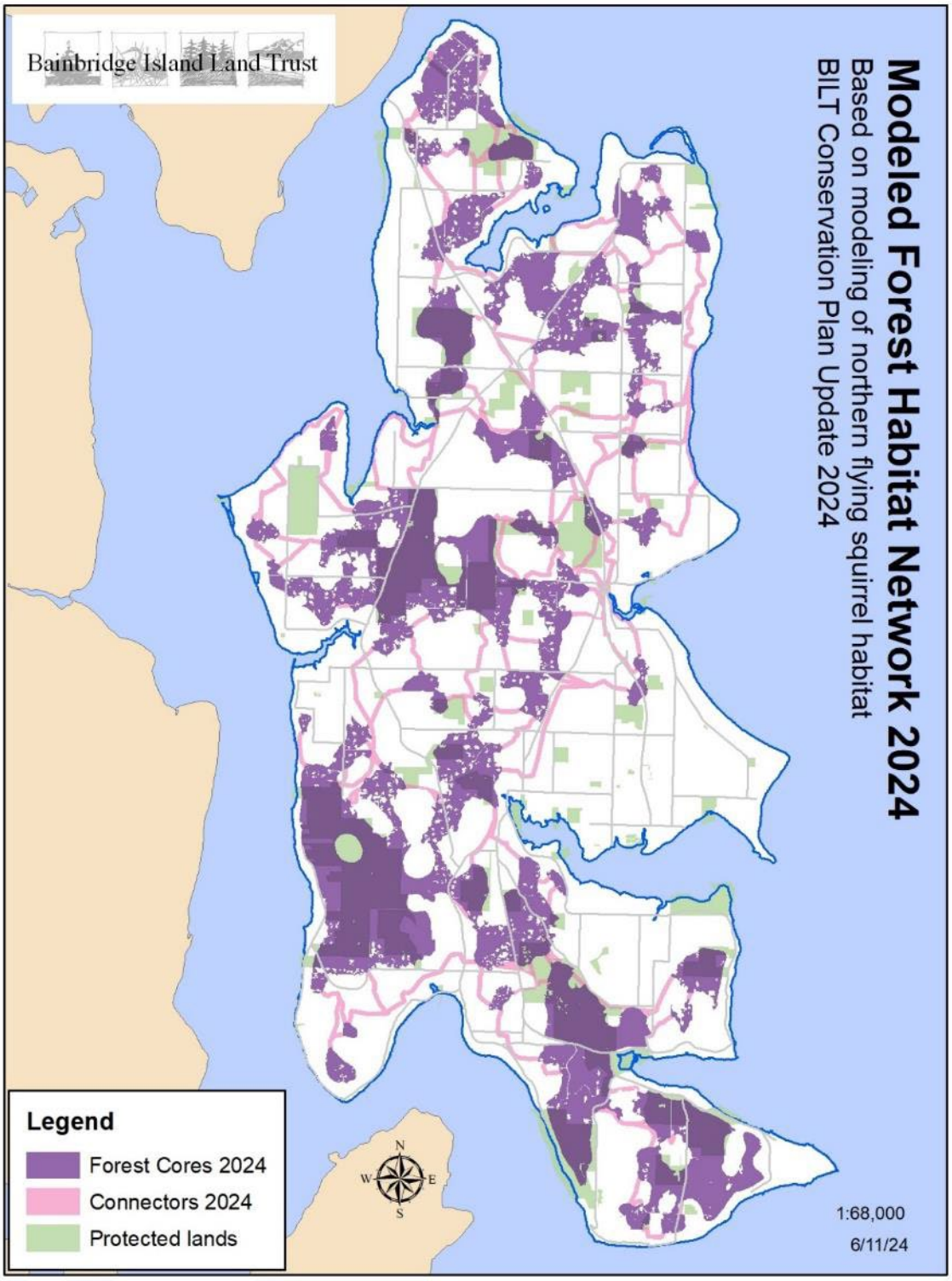


Figure 11. Island-wide modeled forest habitat network.

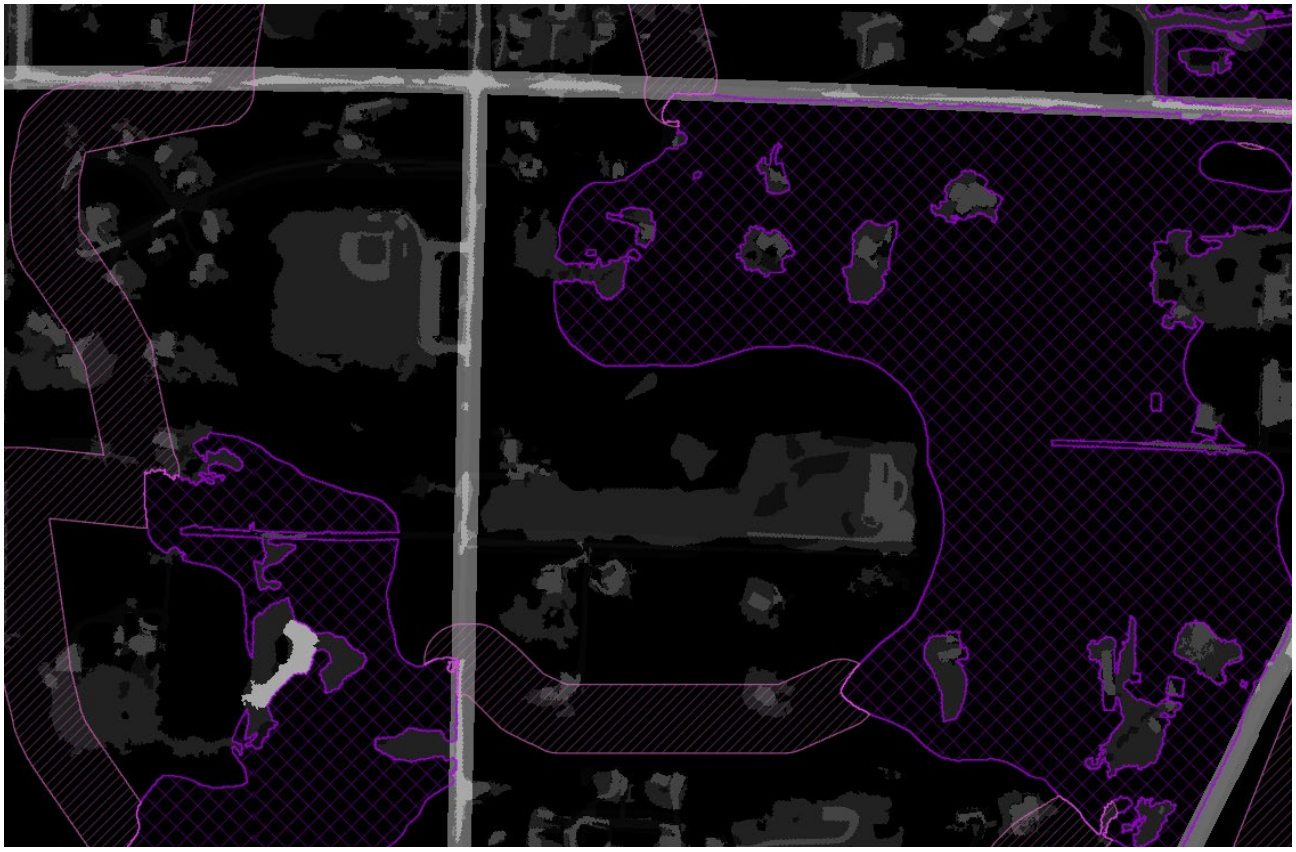


Figure 12. 2024 Forest core areas and connectors on resistance surface, same area as Figures 9 and 10. Darker areas are better habitat, presenting less resistance to animal movement.

Conservation Values Index Components and Process

Evaluation of the relative conservation value of a parcel or an area is a very complicated process. Visual inspection of maps showing all known (and mappable) conservation values is helpful, but with so many types of resource values mapped, how does one weigh the value of one parcel against another? The idea behind the Conservation Values Index (CVI) is to divide the island into a very fine grid and assign each grid cell points based on each of the resource values that fall within it. Then the points for each resource layer can be added to give a cumulative score for each cell. A place with a high concentration of resources, such as wetlands, streams, and rare species' nests, will show as a cluster of cells with high scores – represented on the map as darker. The ability to clearly visualize the relative concentration of resources across the Island and where a given parcel falls in relation to these large darker areas is an important tool in implementing the Strategic Plan direction of "taking a broad view of conditions across our watersheds and landscapes to ensure functioning of ecological systems."

The value assigned to each resource was generally scaled from 1-4, with 4 representing the highest value in that category. For instance, riparian areas were scored so that those around streams that flow only seasonally and do not bear fish were given a 1, and values ranged up to 4 for year-round fish-bearing streams. In the case of land cover, areas with buildings, pavement, etc. received a -4, so that points would be deducted from the total to reflect poor habitat conditions. But the

maximum number of points a cell would receive from each layer is usually 4. The maximum possible score is therefore 4 multiplied by the number of layers, if all are given the same weight.

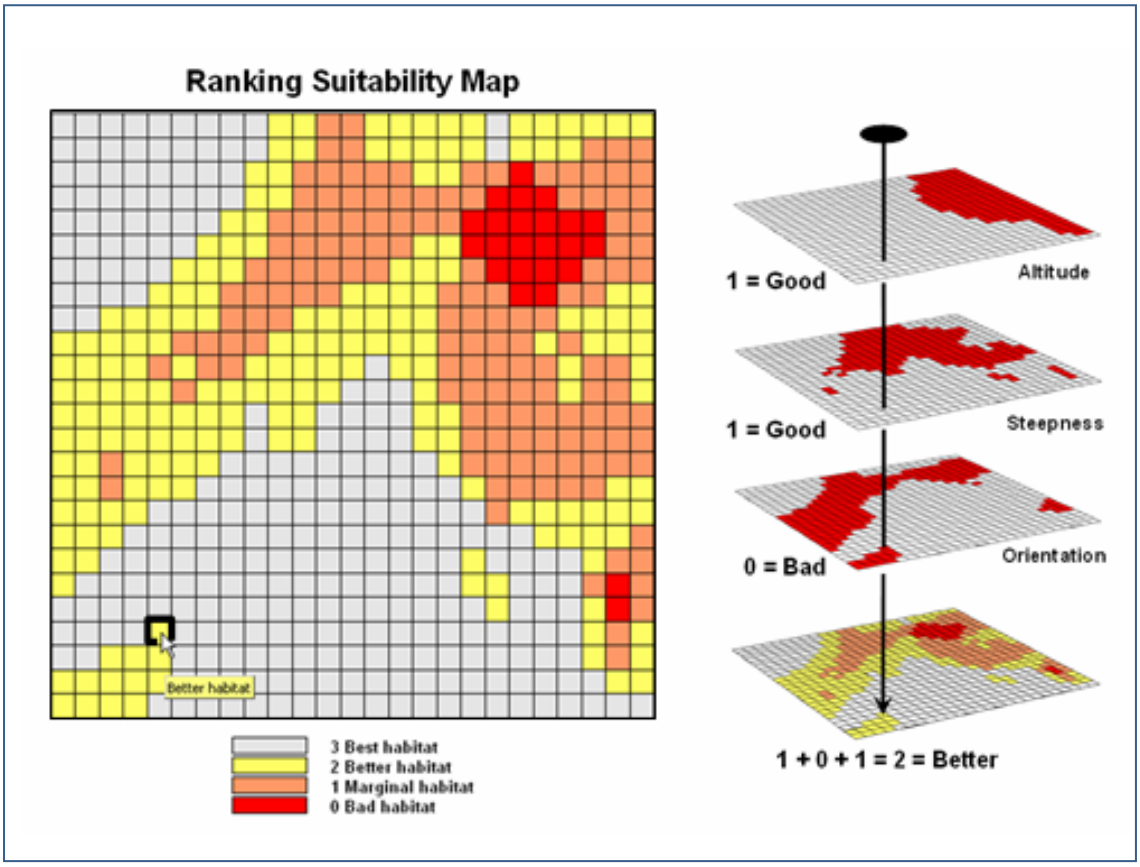


Figure 13. Basic sum analysis (from Joseph K. Berry, InnovativeGIS, GeoWorld, July 2004)

The addition of weightings allows some layers to be emphasized to reflect higher importance and/or lower redundancy (fewer layers reflecting similar attributes). In Table 6, the default weight is considered a value of 1, and higher numbers place more weight on that factor.

A few changes were implemented from the 2018 CVI model to the 2024 model. One is the addition of those layers marked as NEW at the bottom of each category. The USGS aquifer recharge layer is helpful in further identifying areas that are most conducive to recharge, as the Critical Aquifer Recharge Areas (CARA) identified by the County were overly broad (CARA 2s) or focused on proximity to wells (CARA 1s) rather than where recharge actually occurs. Freshwater ponds are an important addition, as the forest core and connections mapping is strongly avoidant of water, and even with fairly high scoring of water in the land cover layer we felt that ponds were showing with CVIs lower than their conservation value to amphibians and other wildlife. They are therefore intentionally “double-counted” by adding the pond layer.

Under Upland Habitats, forest core areas were weighted heavily in 2018. These seemed a bit too heavy compared to other values, and the addition of a layer for stands with larger diameter trees serves to weight some of these same areas in this iteration. Forest core weighting was therefore reduced from a 4 (the maximum weighting used in 2018) to a 3. Forest connectors were also

weighted heavily in 2018, particularly given that they can include pockets of development. These were therefore dropped from a weight of 3 to 1 in this run. Under Shorelines, we added a recently-acquired layer of modeled shore migration space, representing areas where topography appears to allow for shore habitats to migrate inland as sea level rises. The 2024 CVI now includes 32 GIS layers.

Table 6. Conservation Value Index - Descriptions and scores assigned to resource values.

	Value	2018 Suitability Scale	2018 CVI Weights	2024 Suitability Scale	2024 Weights	
Water Features						
	Riparian areas: Stream buffers		**2**		**2**	
	Type F: fish-habitat stream (200')	4		4		
	Type Np: non-fish-hab perennial stream (100')	3		3		
	Type Ns: stream connected to F or Np (75')	2		2		
	Type Ns: stream not connected to F or Np (50')	1		1		
	Fish Critical Habitat (200' buffer)	4	**1**	4	**1**	
	Salmonid occurrence (200' buffer)	4	**1**	4	**1**	
	Wetlands		**3**		**3**	
	Wetland 1 or 2	4		4		
	Wetland 3, 4, or unknown	3		3		
	Wetland buffer	4	**2**	4	**2**	
	Critical Aquifer Recharge Areas 1 (Overlays CARA2s)	4	**1**	4	**1**	
	Critical Aquifer Recharge Areas 2	4	**1**	4	**1**	
NEW	**USGS Aquifer Recharge Areas**				**1**	
NEW	>30" recharge/yr			4		
NEW	25-30" recharge/yr			3		
NEW	**Ponds**			4	**1**	
Upland Habitats						
	Land cover		**2**		**2**	
	Trees, shrubs (also macroalgae and intertidal bare, reflecting shoreline habitat)	4		4		
	Emergent veg, water	3		4		
	Tree over building or road	2		2		
	Groundcover	1		1		
	Bare ground	0		0		
	Impervious or building	-4		-4		
	Forest habitat network: core areas	4	**4**	4	**3**	Decreased
	Forest habitat network: connections	4	**3**	4	**1**	Decreased
	Rare bird spp nest sites (330 ft buffer)	4	**1**	4	**1**	
NEW	**Stands w/ trees >20"**			4	**1**	

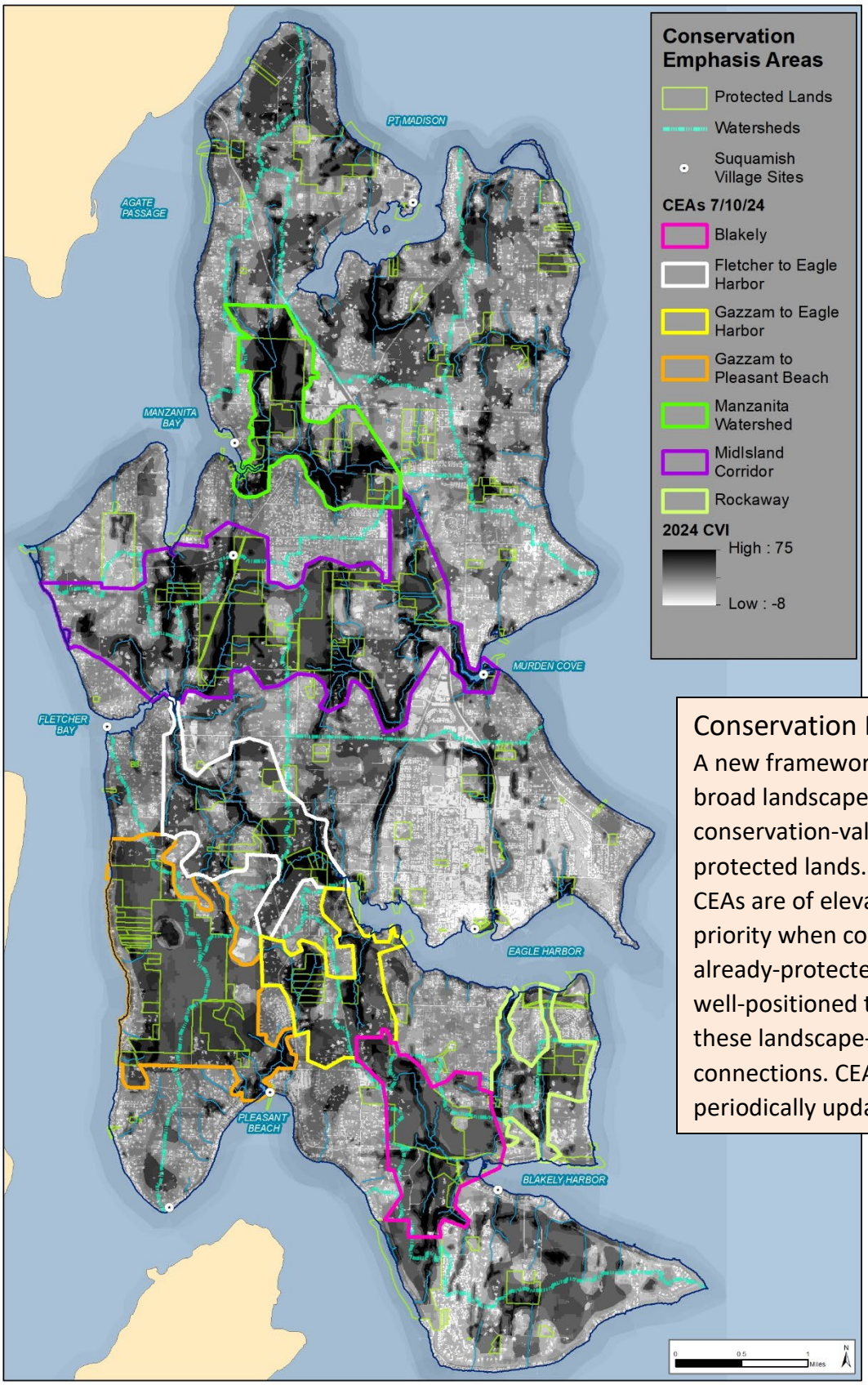
	Value	2018 Suitability Scale	2018 CVI Weights	2024 Suitability Scale	2024 Weights
Shorelines					
	Priority Feeder Bluff		**2**		**2**
	Protect or Restore Priority 1	4		4	
	Protect or Restore Priority 2	3		3	
NEW	Protect or Restore Priority 3 or blank			2	
NEW	Blank			1	
	NISP Priority Drift Cells	4	**1**		**1**
NEW	Priority protect and/or restore			4	
NEW	Mod priority protect and/or restore			3	
	NISP Priority (Protect or Restore) Reaches	4	**1**	4	**1**
	Shoreline veg: Eelgrass present	4	**1**	4	**1**
	Smelt spawning (50' buffer out from shore)	4	**1**	4	**2**
	Sandlance spawning (50' buffer out from shore)	4	**1**	4	**2**
	Herring spawning area	4	**1**	4	**2**
	Shellfish PHS	4	**1**	4	**1**
	PHS Marine Wetland Habitats (coastal habitats, waterfowl concentration areas)	4	**1**	4	**1**
	COBI Aquatic Conservancy	4	**1**	4	**1**
	COBI Shoreline Designation		**1**		**1**
	Island Conservancy; Natural	4		4	
	Shoreline Residential Conservancy	3		3	
	Shoreline Residential	0		0	
	Urban	-1		0	
	Nearshore Prioritization Parcel		**1**		**1**
	Tier 1	4		4	
	Tier 2	3		3	
	Tier 3	2		2	
NEW	Tier 4			1	
NEW	Shore Migration Space			4	**1**

Conservation Emphasis Areas

In practice, there are areas of the Island such as the Mid-Island Corridor (containing the Grand Forest, Meigs Park and Farm, the Wildlife Corridor, and numerous CEs), Gazzam Lake, and Blakely, where the Land Trust has long placed high priority on protecting lands that can build on existing large conservation areas. These large refuges are critical for sustaining a full suite of our island's species. In recent years, implementation of watershed approaches has also led to emphasis on the Springbrook Creek and Manzanita Watersheds.

However, we have not previously attempted to map these areas to define them more clearly. This makes it difficult to identify which parcels are part of a wider emphasis area (particularly for purposes such as grant applications). For this Conservation Plan Update, we have mapped seven Conservation Emphasis Areas (CEAs) to better focus attention on large protected areas and the most viable connections between them (Figure 14). Parcels within these emphasis areas are of elevated priority for protection when contiguous with already-protected lands and/or well-positioned to contribute to these landscape-level connections. The CEAs were not used as an input to the CVI mapping but are instead an additional lens in project evaluation.

Many lands outside of these CEAs are also certainly worthy of the investment to protect, considering all our project evaluation factors (such as CVI, rarity and integrity of resources present, size of area protected, building on other protected lands outside of these CEAs, cost, etc., as further described below). The CEAs should be periodically reevaluated and adjusted to reflect new cores of protected lands and new information.



Conservation Emphasis Areas

A new framework for recognizing broad landscape networks of high-conservation-value areas and protected lands. Parcels within CEAs are of elevated protection priority when contiguous with already-protected lands and/or well-positioned to contribute to these landscape-level connections. CEAs are to be periodically updated.

Figure 14. Conservation Emphasis Areas

Additional Climate Considerations

Incorporation into Stewardship and Project Evaluation

In 2019, the Land Trust contracted with EcoAdapt, a non-profit focused on climate change adaptation, to better understand how climate change might affect our island ecosystem and develop response strategies. In our area, temperatures are anticipated to climb while overall precipitation remains the same or increases, but with shifting patterns and intensities. Decrease in summer precipitation is expected to intensify our already pronounced summer drought periods. Increase in winter precipitation is anticipated to come from more intense storms with stormwater delivered so rapidly that it flows across the surface to flood or run off, rather than infiltrating to recharge groundwater and aquifers. Vegetation is expected to shift in response to these stressors. Decreased water availability will increase individual tree mortality and stands' susceptibility to insects, disease, and fire, while conversely, intense winter storms when soils are saturated will increase risk of blowdown. Warming air temperatures will result in increased water temperatures and decreased dissolved oxygen in streams. Expected increases have the high potential for crossing thresholds for habitability for our fish and other aquatic organisms. Sea level is anticipated to rise about 6" by 2050 and 24" by 2100, greatly affecting our 53 miles of shoreline.

Our stewardship activities are adjusting to reflect recommendations for increasing climate resilience of the lands we protect. Planting plans consider anticipated future climate, in both the species selected for each microsite and planning to start sourcing a portion of our tree seedlings from warmer, drier areas similar to our anticipated conditions. A multi-year effort leading to our 2024 Land Trust Forest Stewardship Advisory Committee Forest Management Considerations and Guidance Report includes these planting considerations and lays out activities for managing those of our forests that are overcrowded to increase resilience.

Incorporating climate considerations into prioritization of conservation efforts is the relevant topic for this plan. Many land trusts are making good use of resilient landscape mapping from The Nature Conservancy (TNC) to help identify high conservation priority lands that form a network of climate-resilient sites and landscape connections between them. This mapping is a very useful tool for larger terrestrial landscapes. However, our island is not represented well by this mapping due to our scale and the water bodies lying between us and the large resilient lands on the Kitsap and Olympic Peninsulas. Our CVI mapping substitutes for this, representing our larger habitat concentration areas and connections between them.

The TNC Resilient Lands mapping reflects expectation that plant and animal species will move up along elevation gradients in response to increasing temperatures. An interesting aspect of the island's environment is there is little range in elevation – our highest point is 425 ft above sea level. Species cannot migrate in elevation to adapt to climate change effects here. Our recurring periods of highest stress are likely to be during anticipated hotter and drier summer and fall droughts. **Our local climate refugia are logically areas with cooler and moister microclimates, such as interior forests and forested wetland and riparian areas. Our CVI represents these areas well, and our conservation strategy will continue to emphasize the elevated importance of protecting and restoring these habitats considering climate stressors.** EcoAdapt also provided us

with a list of questions to consider in project evaluation. **One of our planned additions to our Project Checklist (see section below) is the key question of whether climate change might threaten conservation values of a potential protection area.** This more extensive list of considerations is consulted in deciding the answer to this question.

Mitigation and Adaptation Through Restoration

Our island ecosystems are in a state of recovery from massive clearing and reshaping over the last 150 years. But the flip side of so many lingering impacts from past actions is an abundance of opportunities. In repairing this damage, there is great potential for biological lift that can help counter the anticipated future impacts of climate change. The Land Trust has been particularly active in shoreline and riparian restoration efforts, such as removal of fish-passage-barrier culverts. These activities are highly beneficial not only to fish by allowing them access to more climate-resilient habitats, but also improve capacity for streams to handle the increasing stormwater flows we are already experiencing. **Continuing these culvert and shoreline armoring removal efforts will continue to be a high Land Trust priority.**

The Land Trust has also been active in public education about the importance of beavers, organizing a beaver workshop in 2023 and beaver site tour for Governor Inslee in 2024. The local beaver population is beginning to naturally rebuild following past extirpation. Key messages we have been sharing include role of beaver in our watersheds to help store water, recharge groundwater, cool downstream waters, and restore habitat complexity for other wildlife such as amphibians, waterfowl, and salmonids. Beavers contribute greatly to climate resilience at relatively low to no cost. **Continuing public education on the benefits of beavers and connecting landowners with expert assistance to resolve any beaver-human conflicts that arise will continue to be a high priority.**

The shading of streams and ponds with vegetation will become critical to keeping stream temperatures and dissolved oxygen levels within acceptable ranges. As discussed above under Priority Habitat Types, General Status and Threats, extensive riparian buffer areas remain open from past clearing regardless of current regulatory protections. This sometimes occurred because a landowner was unaware of a stream with a protected buffer area and/or did not understand the benefits of riparian vegetation to the stream. **Restoration of shrubs and trees within cleared riparian and wetland areas represents a significant opportunity to counter some climate warming effects. This is a conservation action best accomplished through a variety of mechanisms, beginning with public education of the benefits of riparian restoration and connecting landowners with the resources they need.**

Restoration and maintenance of tree cover near homes and in our commercial areas is also important for maintaining cooler microclimates for our human inhabitants. Shading can significantly reduce the need to install and run air conditioners in this area where summers have historically been cool enough that many homes have no such systems.

An additional benefit of restoring cleared areas (riparian and elsewhere) is the carbon sequestration performed by the planted trees. Carbon sequestration is an important function of

forests and an important benefit of our forestland protection efforts. We have considered participation in carbon markets, which might then factor in both stewardship of lands we own and strategies for selecting and funding future acquisitions. As discussed in our 2024 Forest Management Considerations and Guidance Report, there are several factors that have prevented us from participating in carbon markets:

- procedures are overly cumbersome for the number of credits that could be derived from our small acreages;
- credits are typically derived from management changes that increase sequestration above current rates, thus few credits can be produced from already-protected lands, and;
- participation can be seen as enabling others to generate emissions instead of implementing efforts to more rapidly reduce overall emissions.

Nonetheless, carbon sequestration will continue to be a highly valued function of our activities, and some Islanders have expressed interest in funding targeted efforts to help offset their personal carbon footprints. **Restoration of cleared areas no longer used for farming or pasturing back to native forest is one of the most effective ways to sequester carbon. This could be an easily understood, quantifiable way to sequester while greatly enhancing habitat value and restoring broken habitat connections. Actions for the next six years are to explore this idea, identify opportunities and a potential framework, and begin communications to build interest.**

Project Evaluation and Selection Criteria

Current Evaluation and Selection Criteria

The Land Trust's current Project Checklist was adopted by the Board in 2012 (Appendix F). The checklist begins with the Mission Statement and checklist of project type (CE Donation, CE Purchase, Land Acquisition Donation, Land Acquisition Purchase, Habitat Restoration, and/or Partnership Project). The checklist includes fields for some general property information but directs to a Property Summary Sheet for further details.

Conservation Plan Habitat Type Priority Ratings are listed as:

- Primary: Wildlife Networks
    - o 1st-with Streams & Associated Riparian Areas
    - o 2nd-with Wetlands
    - o 3rd-with Forests
- Primary: Shorelines
- Secondary: Recreation (Passive Open Space, Trails, Public Shoreline Access)
- Support Partner Led Projects: Agricultural Lands
- Tertiary: Scenic Vista

Additional questions dive further into values including scarcity of resource, hydrologic features, wildlife habitat value, location within a wildlife habitat network or adjacent to protected areas, potential as a precedent for protection in a targeted area, scenic vistas in addition to primary

resources, ability to provide recreational and/or educational or research opportunities, productive agricultural lands, and restoration potential.

There are mandatory elements as per the Land Trust Alliance (LTA) Practice 8B, 8D, and 8E relating to the property's conservation values, ability to maintain those values, consistency with our Conservation Plan, and project's avoidance of impermissible private benefits.

The companion Property Summary Sheet includes more information on the property (such as zoning, current land and building value, % in Critical Areas, number of additional buildings allowable, any Kitsap County current use designation, owner name and contact info) and how the project was identified, what landowner communications have occurred, a narrative of potential restrictions or complications/concerns. This sheet has undergone multiple revisions to reflect new approaches and information, such as if the parcel has high CVI values, lies within a forest core area, or has been identified as a priority shoreline area. The Summary form also includes a current list of maps to be attached: 1) location, including already-protected lands in its vicinity, 2) aerial, 3) critical areas, and 4) CVIs.

There is an important statement at the end of the Project Checklist that the Land Trust Board of Directors "retains discretion over acquisition or disposition and will evaluate each project and proposal on its own merits after careful investigation of the property, its resources, and its public benefits." There is also no point system in place to try to quantify protection priority. We feel that the size of our service area and limited number of protection opportunities is more conducive to carefully guided qualitative assessment of value of an opportunity than an artificial quantitative system.

Updates to Evaluation and Selection Criteria

Upon adoption of this Conservation Plan Update, the Project Checklist is to be updated to reflect the changes in this update to the Conservation Plan and consolidated with the Potential Project Summary Form to minimize redundancies. This is to be drafted by the Conservation and Acquisition Committee for adoption by the Board. Changes include:

- Updating the Mission which was adopted in 2021.
- Adding an "Other" category to project types to reflect new mechanisms such as Deed of Development Right.
- Updating the Conservation Plan Habitat Type Priority rating to reflect the evolution of our mapping capability and current Strategic Plan:
    - Primary: Wildlife Habitat Networks
        - 1st – High CVI from combinations of Forest Core, Streams, Wetlands etc.
        - 2nd – Moderate CVI from Forest Core or Connector, Stream, or Wetland, or important area for stream/watershed functioning
        - 3rd – Other intact habitat area contributing to habitat networks
    - Primary: Shorelines
    - Secondary: Recreation (Passive Open Space, Trails, Public Shoreline Access)

    - Secondary: Working Agricultural Lands (either as lead or supporting partner-led project)
- A question as to whether the parcel lies within a Conservation Emphasis Area.
- Adding whether climate change might threaten conservation values of a potential protection area to the Potential Threats and Complicating Factors section.
- Reviewing current LTA Standards & Practices and IRS language and making any edits needed to remain consistent with those.
- Adding a required map list and non-redundant information from Project Summary Sheet.

Conservation Tools

Effective implementation of our conservation plan requires use of multiple tools. Below are the tools actively used today and potential tools to explore.

Table 7. Available conservation tools and applications.

Tool	How The Tool Can Be Applied
Conservation Values Index (CVI)	Essential for evaluating opportunities that arise and identifying parcels to pursue for protection. Also valuable in helping other landowners understand and protect their land's natural resource values.
Conservation Emphasis Areas	Identification of areas with heightened conservation emphasis for building large connected protected areas.
Conservation easements, including resource lands, agricultural lands, and trails	The Land Trust's primary tool for permanent protection over most of our history. To date, all of our CEs have been donated, but purchased CEs may need to be added to the toolbox in the future.
Acquisition	Use where significant threat of conversion to high priority ranked property exists and where conservation easements are not a viable option.
Acquire/ Protect/ Resell or Transfer	Acquisitions for the purpose of resale or transfer (e.g., to a local park district or government agency) with conservation easement or other permanent restrictions added to protect the areas of highest conservation value.
Acquisition of partial interests	Acquisition of purchased or donated development rights and/or timber rights where acquisition of fee simple ownership or conservation easement is not feasible.

Land Swaps/Land Sales	Trading/Selling/Swapping a non-conservation property or partner property for a priority conservation property.
Mitigation	Land can be protected or restored as part of mitigation, funded by the entity required to perform the mitigation. We are currently engaged in a wetland mitigation project with Puget Sound Energy.
Utilizing the Revolving Fund	The Land Trust has developed a revolving Legacy fund available for strategic property purchases. This is a particularly valuable tool when timelines are too short for full fundraising prior to a purchase.
Current use tax assessment	Low-cost tool for medium-to-high priority ranked properties, but typically not permanent.
Restoration	In a highly developed landscape like BI, restoration is an important tool to achieve long-term goals and vision.
Public Education	Assist Islanders in understanding the importance of habitats and how to protect and restore those on their properties. With the creation of a Community Education Manager position in 2024, the Land Trust has greatly increased our capacity to utilize this valuable tool.
Leadership on public policy that supports conservation projects	▪ Transfer of Development Rights (TDR) ▪ Public Support of Open Space Purchases (such as bond, excise tax on property sales, levy lid lifts) ▪ Updates to land protection regulations: Comprehensive Plan/SMP, Zoning, Critical Areas, Shorelines ▪ Capital projects (COBI, WSDOT, Utilities) ▪ Prioritization and removal of fish passage barriers ▪ Effective use of stormwater utility funds, such as for highest priority culvert removal ▪ Current use tax assessment program ▪ Could be improved with ag designation, joint/adjacent designations for small parcels, shoreline riparian areas
Leveraging	Area partners and their endeavors can be linked with the endeavors of the Land Trust.

Conservation Partners

Growing and maintaining partnerships with several like-minded organizations and entities have been key to our success, and partnerships will continue to be important as we work for strategic conservation. Our partners provide support in numerous important ways, including fundraising, scientific expertise and/or technical support in specific natural resource focus areas. Others provide education and outreach capacity and support. And occasionally, a local agency will act as the "takeout" partner, taking title at closing of a partnership acquisition, or accepting subsequent transfer of a property for which it is better suited to be the long-term owner and manager (e.g., when the property is adjacent to an already protected natural area park, and the Land Trust has determined that the level of permanent protection in place will be adequate to conserve its habitat values).

Table 8. Partnering organizations and their emphasis areas.

Partnering Organization	Partnering Area
Local	
Bainbridge Community Foundation	*Grant programs*
Bainbridge Island Metropolitan Park and Recreation District	*Recreational lands and trails, including acquisitions* *Fee owner of multiple natural area parks protected by Land Trust-held CEs*
Bainbridge Island Watershed Council	*Watershed planning, assistance with watershed assessments such as Springbrook Creek*
Bainbridge Island Weed Warriors	*Public involvement in improving natural landscapes*
Bainbridge Island Parks and Trails Foundation	*Trails and public open space supporter*
Bloedel Reserve	*Open space preservation and community outreach/education*
City of Bainbridge Island	*Connecting resource protection with public policy, such as shoreline protection and restoration, critical areas* *Non-motorized Transportation Advisory Committee* *Past supporter (and financial leader) for open space bond initiatives* *Fee owner of agricultural lands acquired through Open Space Bond* *Has jurisdiction over culvert improvement projects* *Water monitoring*

	Assistance with Springbrook Creek Watershed Assessment project
COBI Non-Motorized Transportation Advisory Committee	*Networking with local, regional and state non-motorized endeavors to connect existing trails/recreation lands with future endeavors (water and land trails)*
Friends of the Farms	*Farm preservation and agricultural land management*
Housing Resources Bainbridge	*Siting of permanently affordable housing away from highest conservation value lands, partnering where conservation and affordable housing can co-occur*
IslandWood	*Environmental education (primary school age and adult) and technical/scientific expertise*
Puget Sound Restoration Fund	*Community involvement in shellfish issues, commercial shellfish interests*
Suquamish Tribe	*Scientific and technical expertise in fisheries, timber, wildlife and cultural resources* *Potential collaborator on protection and management projects to restore resources and cultural connections*
Sustainable Bainbridge	*Community outreach and partnership development in local ag, energy, stream health, invasive weed management, etc.*
Kitsap – Puget Sound Region	
Great Peninsula Conservancy	*Sharing expertise and information, and coordination of efforts between the GPC service area on Kitsap Peninsula and ours on Bainbridge Island*
Kitsap Audubon Society	*Technical expertise, citizen science*
Kitsap County	*Kitsap County Noxious Weed Board* *North Kitsap String of Pearls Plan – water and land trail*
Kitsap County Conservation District	*Technical assistance, farm planning*
National Wildlife Federation, Northern Rockies, Prairies, and Pacific Region	*Garden for Wildlife Program, resources (e.g. pollinator plant database) for gardeners, funders of small grants the Land Trust and Sustainable Bainbridge have used for pollinator garden demonstration projects*
North Kitsap Trails Association	*Advocacy and planning for regional land and water trail system*

People for Puget Sound	*Technical expertise, partnership leveraging in Puget Sound*
Puget Sound Partnership	*Regional policy guidance, financial*
Puget Sound Restoration Fund	*Community involvement in shellfish issues, commercial shellfish interests*
Puget Sound Shoreline Collaborative	*Puget Sound land trusts cohort, data collection and sharing, strategic outreach, working to achieve protection and restoration goals*
Sound to Olympics Greenway Trail	*Regional non-motorized plan including Bainbridge Island section*
Trust for Public Land	*Real Estate technical expertise, regional scale priorities*
Washington Sea Grant	*Science technical assistance, citizen science, baseline data collection for marine/nearshore sites, monitoring of restoration projects such as the Powel Shoreline Restoration Project.*
Washington Water Trails	*Regional water trail development and community outreach*
West Central Local Integrating Organization	*Implementor of local stormwater, salmon and shellfish priorities – supported the Puget Sound Partnership Action Agenda*
West Sound Partners for Ecosystem Recovery (Salmon Recovery Lead Entity for WRIA 15)	*Connecting resource protection with public policy and funding*
Wild Fish Conservancy	*Science technical expertise, data collection and sharing, assisting in stream restoration projects*
Woodland Park Zoo	*Citizen Science, public education*
WSU Beach Watchers	*Citizen Science, baseline date collection, and monitoring of restoration sites.*
State and National	
Land Trust Alliance	*Accreditation, training, funding, advocacy, information sharing*
The Nature Conservancy	*Technical assistance, data*
University of Washington	*Student interns, partnerships on scientific studies*
Washington Association of Land Trusts	*Training, funding, advocacy, information sharing*

Washington Department of Ecology	*Technical assistance (Puget Sound Characterization Model), watershed health, funding, permitting*
Washington Department of Fish and Wildlife	*Technical assistance, science, permitting*
Washington Department of Natural Resources	*Tidelands, water of the state jurisdiction, permitting*
Washington Recreation and Conservation Office	*Technical assistance, public involvement, large grant programs*
Washington State Department of Transportation	*Highway 305 is a scenic highway, they have jurisdiction over priority culvert improvement projects*
Western Washington University	*Science technical assistance, natural resources data gathering by students*

References/ Information Informing Plan and CVI Development

Aspect Consulting, LLC, 2016, Bainbridge Island Groundwater Model: Aquifer System Carrying Capacity Assessment (Task 3 Scenario), City of Bainbridge Island, March 25, 2016.

Bainbridge Island Land Trust. 2008. Shoreline Parcel Analysis and Priority Action Areas.

Bainbridge Island Land Trust. 2024 Forest Management Considerations and Guidance Report.

Bainbridge Island Land Trust. 2021 Strategic Plan.

Bainbridge Island Metropolitan Park and Recreation District. March 6, 2020. BIMPRD Comprehensive Plan (2020-2026). https://biparks.org/planning-documents/#comp-plan

Bainbridge Island Watershed Council Salmon Spawning Data, 2005-2023.

City of Bainbridge Island. 2016 Comprehensive Plan Update. http://www.ci.bainbridge-isl.wa.us/615/Navigate-Bainbridge-Comprehensive-Plan-U

City of Bainbridge Island. 2006. Community Forest Management Plan. https://www.bainbridgewa.gov/DocumentCenter/View/8087/2006-Community-Forestry-Plan-PDF

City of Bainbridge Island. 2010. Bainbridge Island Current and Historic Coastal Geomorphic/Feeder Bluff Mapping. Prepared by Coastal Geologic Services, Bellingham, WA.

City of Bainbridge Island. May 2007. Mayor's 2025 Growth Advisory Committee Final Report. http://www.bainbridgewa.gov/DocumentCenter/View/5483

City of Bainbridge Island. October 2008. Bainbridge Island Open Space Study.

City of Bainbridge Island 2014 Shoreline Master Plan Update restoration and conservation plan.

City of Bainbridge Island Wetlands Inventory/GIS Data Update, 2017

City of Bainbridge Island. 2023 Watershed Health Metrics.

Haring, D. 2000. Salmonid habitat limiting factors: Water Resources Inventory Area (WRIA) 15 (East) Final Report. Washington State Conservation Commission: Olympia, Washington.

Landscape Ecology, Modeling, Mapping & Analysis. GNN Large Tree data from 30m 2017 LANDSAT imagery. https://lemmadownload.forestry.oregonstate.edu/

Mid Puget Sound Fisheries Enhancement Group. 2008. Bainbridge Island Fish Passage Study.

McRae, B.H., A.J. Shirk, and J.T. Platt. 2013. Gnarly Landscape Utilities: Resistance and Habitat Calculator User Guide. The Nature Conservancy, Fort Collins, CO. Available at: http://www.circuitscape.org/gnarly-landscape-utilities.

National Marine Fisheries Service. 2007. East Kitsap Salmon Recovery Strategy Summary; Puget Sound Salmon Recovery Plan. January 19, 2007.

Puget Sound Ecosystem Monitoring Program and Washington State Dept of Natural Resources. 2017. Eelgrass abundance and depth distribution on Bainbridge Island: Final report to the City of Bainbridge Island, DNR IAA 16-239; June 30, 2017

Puget Sound Partnership. 2016. The 2016 Action Agenda for Puget Sound. file:///C:/Users/Stewardship/Downloads/2016-action-agenda-comprehensive-plan.pdf

Self, D.E. , L. Hudson, S. Morse. 2000. Bainbridge Island Wildlife Corridor Network. Bainbridge Island Department of Planning and Community Development, Bainbridge Island WA.

Shirk, A.J., and B.H. McRae. 2013. Gnarly Landscape Utilities: Core Mapper User Guide. The Nature Conservancy, Fort Collins, CO. Available at: http://www.circuitscape.org/gnarly-landscape-utilities.

Stcherbinine, S., and B. Palmer. 2013. Farmland Prioritization Plan for Bainbridge Island, Washington. Capstone Project, University of Washington Professional Master's Program for GIS and Sustainability Management. August 2013.

Suquamish Tribe. 2016. State of our Watersheds Report, Kitsap Basin. In, 2016 State of Our Watersheds: A Report by the Treaty Tribes in Western Washington. Northwest Indian Fisheries Commission. https://geo.nwifc.org/SOW/SOW2016_Report/SOW2016.pdf

Washington Department of Fish and Wildlife Bainbridge Island Culvert Inventory. 2014

Washington Department of Fish and Wildlife Priority Habitats and Bird Nesting Sites. 2016

Washington Department of Fish and Wildlife Fish Distributions: coho, chum, cutthroat, and steelhead. 2017

Washington Wildlife Habitat Connectivity Working Group (WHCWG). 2010. Washington Connected Landscapes Project: Statewide Analysis. Washington Departments of Fish and Wildlife, and Transportation, Olympia, WA.

West Sound Watersheds Council. 2016. West Sound Nearshore Integration and Synthesis of Chinook Salmon Recovery Priorities, November 2016. https://spf.kitsapgov.com/dcd/PEP%20Documents/West%20Sound%20Nearshore_final_113016.pdf

Wild Fish Conservancy all Bainbridge Island fish detection data, 2023.

Wild Fish Conservancy Stream Type Assessment, Bainbridge Island, 2014/2015. http://www.moonlitgeo.com/wfc/

Williams, G.D, R.M. Thom, and N.R. Evans. 2004. Bainbridge Island Nearshore Habitat Characterization and Assessment, Management Strategy Prioritization, and Monitoring Recommendations. PNWD-3391. Prepared for the City of Bainbridge Island: Bainbridge Island, WA; by Battelle Marine Sciences Laboratory: Sequim, WA.