



Nexwlélexwm

Bowen Island

BIODIVERSITY PLAN

2026



With Support From:



Bowen Island
Conservancy



sitka foundation



Bowen Island Biodiversity Plan 2026

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We acknowledge that Bowen Island, also known as Nexwlélexwm, is on the unceded traditional territory of the Squamish Nation.

We thank the photographers who participated in the Bowen Island Conservancy's Photo Contest (2024 & 2025) for generously sharing their photos of the inspiring biodiversity and community of Bowen Island. Additional photos provided by L. Gilday, W. Husby, T. Sparling, J. Foy, E. Jones, D. Huth, O. Plowman, and T. Sisk.

Cover photos by W. Leithead, M. Marcantuoni, A. Williams

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Planning for a Biodiverse Future

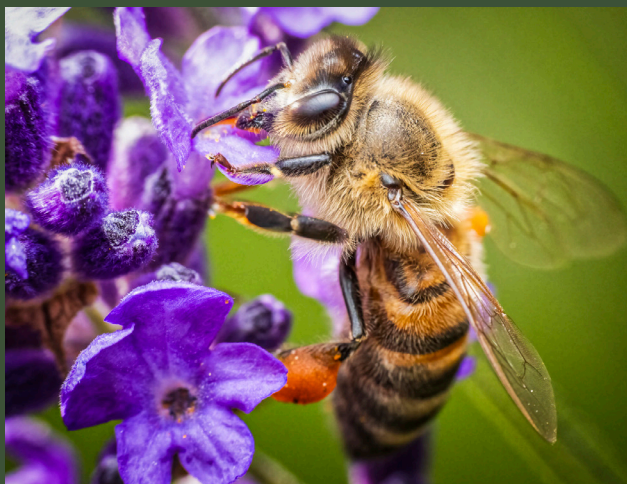
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A. Williams

EXECUTIVE SUMMARY

In 2024, the Bowen Island Conservancy's Caring for Nature initiative was formed by citizens, community leaders, and scientists to draw on the best available data and produce a rigorous, actionable plan that reflects public values and intent.

The biodiversity plan begins by stating its **Purpose & Approach**. This introductory section defines the term biodiversity, discusses public priorities and stewardship, and presents an analytical approach based on spatial analysis, mapping, and community engagement. These key concepts are introduced in nontechnical language that provides a foundation for biodiversity planning.

A section on **Patterns of Biodiversity** presents map-based information on Species and Habitat Richness. A key building block of the biodiversity plan is developed in the map of Integrated Conservation Values (pp. 24-27), which provides a synoptic view of the distribution of biodiversity across the island and informs subsequent analyses.

Threats to Biodiversity addresses the current understanding of two trends, identified in our public engagement process, that challenge island conservation: Vulnerability to Wildfire (p. 28-29), and Development Pressure (p. 31-32).

The **Conservation Analysis** section (p. 32-43) identifies priorities. Maps show the overlap of Conservation Values with key planning considerations, including Intactness, Private Lands, Protected Areas, Fire Vulnerability, and Human Development.

The Bowen Island Biodiversity Plan provides science-based insights and guiding principles for protecting the natural values held so highly by residents. It is the first effort to draw upon extensive data available from government, academic, and local experts, and the first to provide map-based information for the entire island that is directly applicable in planning and management. This document presents a series of maps, each illustrating new findings that provide a deeper understanding of biodiversity values and opportunities for protecting them. This information informs a series of recommendations for adopting a biodiversity plan that can be integrated with other planning efforts and implemented in a sustained, efficient island-wide commitment to conservation.

Bowen Island, Nexwlélexwm in the Squamish Nation language, sits at the entrance to Átl'ka7tsem/Howe Sound, the center of Canada's newest UNESCO Biosphere Region. It is among the most biologically diverse regions of British Columbia, Canada's most diverse province. Bowen's citizens have repeatedly voiced their love of nature and commitment to conservation.

Planning for a Biodiverse Future (p. 44-47) integrates results from the suite of overlay analyses to address the practical considerations that set the context for turning a technical outcome into a practical plan. These identify Candidates for Protection that would result in the protection of 30% of the island's land area, a goal that is consistent with provincial and national objectives. They also address Land Ownership and Stewardship Responsibility (p. 46-47) a key consideration in conservation strategies that honours the diverse perspectives and rights of community members.

The *Recommendations* section presents three foundational planning elements (p. 49-50), each followed by a series of specific actions (detailed on p. 50-51) for operationalizing the Bowen Island Biodiversity Plan. Adoption of these foundational elements is essential to a science-based biodiversity plan:

- Adopt a collaborative spatial planning approach that allows biodiversity to be considered alongside other planning priorities
- Identify, prioritize, and negotiate additional protection of Crown Lands to strengthen Bowen's conservation network
- Improve habitat connectivity through the protection of habitat corridors linking larger conservation areas, thereby improving the conservation value of the network as a whole

The plan's *Final Word* (p. 52) is an appeal for moving from the island's long-standing expression of conservation intent to a practical and coordinated set of actions that will provide protection for all species, while recognizing the growing needs of the island's human population. Adoption of this plan will inspire actions to safeguard biodiversity, with the knowledge that the data and tools are in hand to assess progress and refine efforts in the future. Bowen Island is poised to put nature into the planning process. By adopting and implementing a publicly inspired, scientifically informed Biodiversity Plan, Bowen Island serves as a visible example for prioritizing conservation in a dynamic and rapidly developing region.



B. Houle

Contributions & Acknowledgements

We are thankful for the substantial contributions made by the Bowen Island Conservancy's Caring For Nature team, including B. Turner, J. Matheson, W. Husby, J. Dowler, S.E. Fast, A. Whitehead, J. Gedy, S. Johnson, E. Wachtman, P. Hay, E. Olsen, B. Brokenshire, P. Matthews, L. Gilday, and M. Toom, as well as by the public participants in our technical workshop and community meetings. Financial support was provided by the Sitka Foundation and the National Science and Engineering Research Council. We acknowledge the valuable technical and scientific support provided by V. Kwok, K. Rolfe, M. Persram, M. Tylo (SFU Research Team), D. Martin, C. Skuce (Bowen Island Municipality), and W. Shulba (Islands Trust).



J. McBride

PURPOSE & APPROACH

What is Biodiversity and Why is it at Risk?

Biodiversity is the sum of all life as it occurs at multiple levels, from genes to ecosystems. It encompasses not only species diversity, but also the variation within species and the intricate functions that sustain the ever-changing, evolving web of life.

Life on earth comprises a tiny fraction of the planet's mass, yet it is what makes our planet different from every other known place in the universe. Earth's biodiversity has been shaped over several billion years into a fantastic interaction of many millions of distinct species, each molded by evolution for survival and persistence in a variable mosaic of habitats. This diversity of life – encompassing not just species themselves, but also their characteristic patterns of abundance and intricate roles and interactions – is encapsulated in the term Biodiversity. When we speak the word, we acknowledge this multi-layered hierarchy of life organized in self-regulating ecosystems.

Biodiversity is at risk because of the expanding presence and impact of humans. Since the rise of advanced civilizations, our planet has lost over 80% of its wild animal biomass and 50% of its plant biomass.

Today, humans comprise 36% of the biomass of all mammals, while livestock account for 60%. For birds, 70% of the global biomass comes from domesticated poultry, with wild birds making up the other 30%. These numbers say more than the list of injuries and insults that have led scholars to conclude that we are in the midst of the sixth great extinction, comparable to events like the asteroid-induced extinction of the dinosaurs 65 million years ago, and the four great extinctions that preceded it. While periods of mass extinction are a natural part of earth history, it is important to note that each transformed the fundamental way that life is organized on earth. The current spasm is entirely attributable to humans.

A unique aspect of the Sixth Extinction is our ability to respond in ways that minimize its impacts. Current extinctions are largely due to five overlapping human impacts (see p. 7). Habitat loss tops this list, but any combination of these five factors may combine with other variables in the environment to push a species toward extinction.

Nature is disappearing:

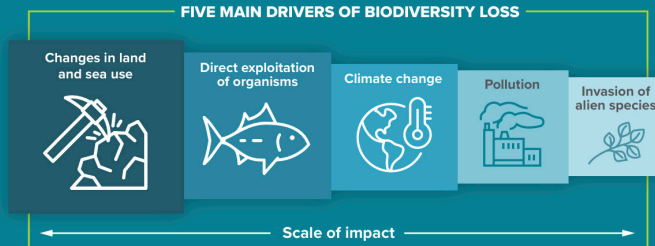
The average size of wildlife populations has fallen by a staggering 73% since 1970

Nature globally and in Canada

Globally:

- Up to **1,000,000 species** are threatened with extinction.
- Natural ecosystems have **declined by 47%** on average.
- **Approximately 25%** of species are already threatened with extinction.
- The global biomass of wild mammals **has fallen by 82%**.

FIVE MAIN DRIVERS OF BIODIVERSITY LOSS



Source: Adapted from IPBES Global Assessment Report on Biodiversity and Ecosystem Services 2019

IPBES (2019) The Global Assessment Report on Biodiversity and Ecosystem Services.

Conservation efforts typically centre on reducing or compensating for population declines caused by one or more of these factors. Protecting habitat and restoring it to a healthy, productive condition is the most obvious and direct way to protect biodiversity, but a changing climate introduces new considerations and uncertainties into even this axiom of on-the-ground conservation. Increasingly, biodiversity conservation requires anticipation of the effects of ongoing change, followed by the design of conservation strategies that are big enough to provide species with room to respond to changing conditions, and flexible enough to adjust to unanticipated challenges.



J. Foy



B. Houle

PURPOSE & APPROACH

Resource Setting, Public Priorities, & Stewardship

Bowen Island, Nexwlélexwm in the Squamish Nation language, sits at the entrance to Átl'ka7tsem/Howe Sound, the centre of Canada's newest UNESCO Biosphere Region. The island's terrestrial habitats span a broad range of northwest coast ecosystems, from mature regenerating forests to dry coastal bluffs, lakes, wetlands and productive estuarine environments. This natural abundance is the centrepiece of a dynamic human community on the fringe of Metro Vancouver, with its global reach and green leadership.

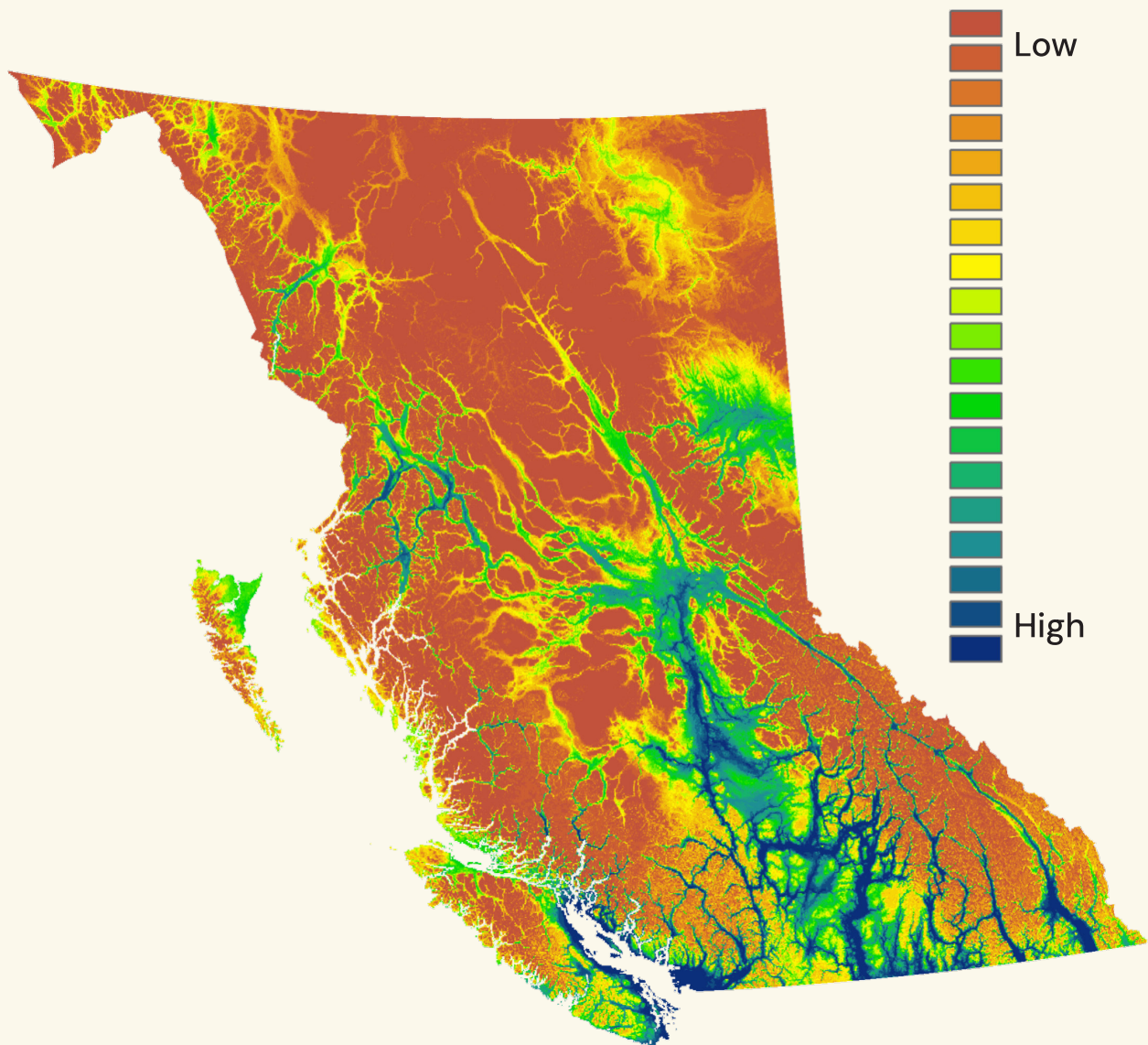
Bowen's citizens have repeatedly voiced their love of nature and commitment to conservation. Many expert naturalists and research scientists reside on the island, while others lend complementary expertise, island experience, and a shared commitment to restoring and protecting wildlife populations and healthy ecosystems. Surveys in 2025 showed that environmental protection remains at the top of a list of community values. Yet, despite clear priorities and resident expertise, Bowen Island has few science-based governing principles that address the natural values held so highly by residents, and limited policy by which to proactively guide development to outcomes that protect our natural heritage in the face of population growth, urbanization, and climate change.

For these reasons, the Bowen Island Biodiversity Plan was developed to bring rigorous science to inform strategic planning and identify actions needed to protect Bowen Island's natural heritage. And, encouragingly, it also aggregates local knowledge and inspires a large group of island stewards ready to put the plan into action via citizen projects, landowner consultations, municipal partnerships, and ongoing research and analysis. This combination of strategic planning and citizen engagement offers a local resource for island stewardship. While the plan provides new, island-wide insights and practical recommendations, residents – working with local government and organizations – will lead conservation efforts and provide a highly visible example of how to prioritize biodiversity conservation in a growing human-shaped landscape.



W. Husby

Vertebrate Species Richness in British Columbia



British Columbia is the most biologically diverse province in Canada, hosting more species and ecosystems than any other region of the country. Its biodiversity is shaped by dramatic variation in climate and geography, from coastal rainforests and alpine tundra to grasslands and temperate oceans. BC contains more than half of Canada's bird species, the greatest number of freshwater fish species, and the highest diversity of mammals and plants. Bowen Island is among the most biodiverse sites in BC.



R. Rowlands

PURPOSE & APPROACH

Assessing and Mapping Bowen's Biodiversity

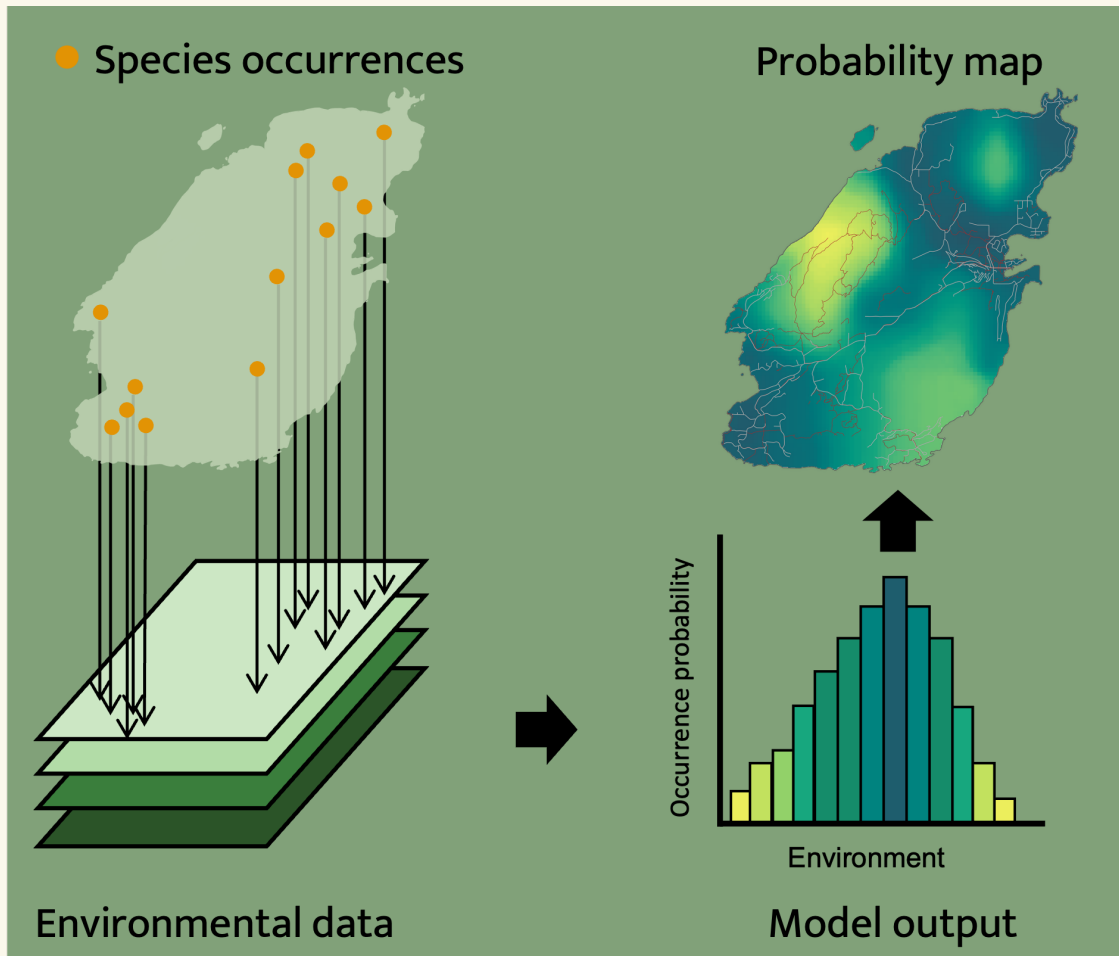
Biodiversity is not an easy word to understand, as evidenced by our definition, above (p. 6). When we are accustomed to thinking of wildlife as the set of individual animals seen on a beautiful trip across the island, it can be hard to grasp the fact that these are just a handful of the thousands of species sharing our island. A network of complex interactions link these species with their environment in particular ways that create and sustain healthy ecosystems, clean water, and productive soils. We all know that nature is more than a list of species or a collection of parks. To move forward we need new tools that can express the value and importance of biodiversity in terms that we all can understand and appreciate. With that understanding comes the will to act.

This biodiversity plan begins with a science-based examination of the distribution of biodiversity across the entirety of Bowen Island. Because no systematic, island-wide inventory has ever been attempted, we took a model-based approach that has the advantage of drawing on vast quantities of relevant data from across the wider region. These inputs inform statistical models that, in turn, provide a data-driven assessment of which species are likely to be encountered, and where.

Careful filtering of data on topography, climate, and other island characteristics, combined with the verified occurrence of hundreds of species in similar habitats from throughout the province, provides a baseline for biodiversity across the island. Areas of relatively high or low biodiversity can then be mapped. When overlaid with existing parks and protected areas, the gaps in Bowen's conservation network can be identified. Moreover, maps of planned or unplanned human activities can provide a clear idea of where threats to biodiversity occur, where they overlap with biodiversity 'hotspots', and where the opportunities for innovative conservation efforts are greatest.

This work, leveraged with thousands of volunteer hours, has led to the quantitative models, assessments, and recommendations that form the foundation of the biodiversity plan. In this context, maps are a visual representation of vast amounts of underlying data and complex analysis. They provide a medium for communicating current scientific knowledge in a format that is easier for all to understand and appreciate. Another product is a set of planning tools (see p. 55) that allow experts and the public to explore alternative land management scenarios and compare their likely outcomes in a spatially explicit, map-based manner that provides everyone with access to the science.

Translating Species Data to Distributions



We used published models of real observations of species occurrence along with environmental data about those point locations (e.g., temperature, precipitation, elevation, etc.) to predict where else a species is likely to occur.

These models, known as Species Distribution Models (SDM), can be used to inform continuous maps of habitat quality, as shown above.

"...a network of complex interactions link all species with their environment in particular ways that create and sustain healthy ecosystems..."



C. Gruneau



J. Cochrane

PURPOSE & APPROACH

Spatial Planning, Conservation Science, and Plan Development

Spatial models help us draw inference about the distribution of species, while spatial planning tools can identify important areas, often called ‘biodiversity hotspots’. The scientific details can be daunting, but this formalized approach has the benefit of being transparent, amenable to independent verification, and designed to be updated as new information becomes available.

This report draws heavily on these innovative techniques to pull together a wealth of publicly available data, screen it for what’s relevant to Bowen Island, and use it to build models and maps. These tools make it possible to consider biodiversity alongside other factors that often shape planning decisions, including community concerns such as the effects of population growth, residential development, and wildfire.

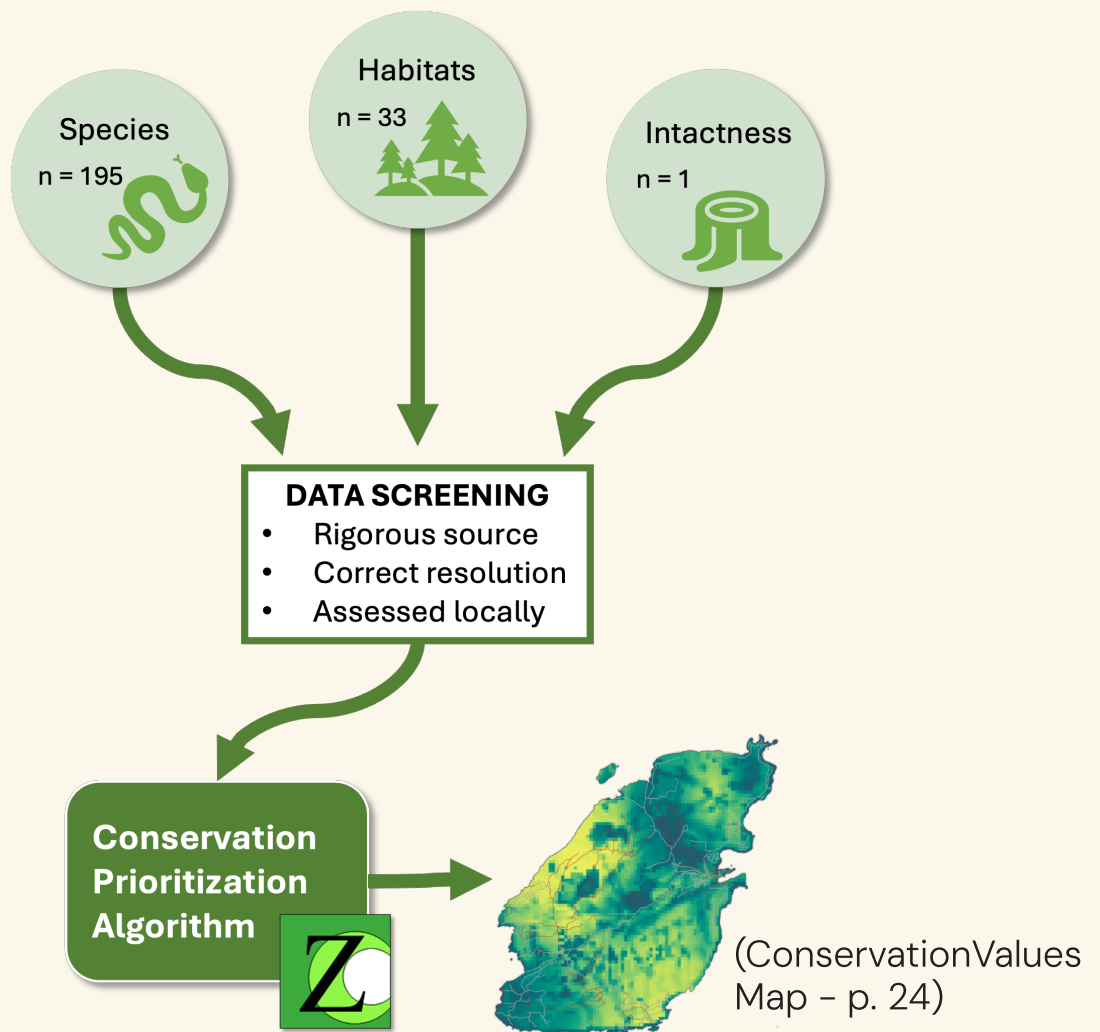
By taking a rigorous, data-driven approach, the report brings together important information that often sits unused on hard drives around the province. The results can then be visualized in maps and made accessible to all. These maps provide the foundation for assessing biodiversity. The spatial planning process allows all interested parties to overlay biodiversity onto other map-based information and explore planning scenarios that incorporate conservation objectives and identify opportunities for managing our lands and waters for biodiversity, as well as other community and regional goals.

It is easy to lose the forest for the trees, or in this case to lose sight of our definition of biodiversity when focusing on species lists. As we have seen, biodiversity is more than species diversity, yet the places where the greatest number of species thrive often represent locations that can best protect biodiversity as a whole.

This poses a challenge to conservation planners: we must move beyond the relative simplicity of direct observations to accurately represent the distribution of biodiversity across the planning area. Lists of species and habitat types, topography, site conditions, and climate records provide the raw information for mapping biodiversity. But we also need a way to aggregate these different types of data and adjust for inherent biases.

For example, species sightings are often along the roads and trails that humans frequent, making it hard to extrapolate findings to the vast majority of the island that is seldom visited. Conservation science – the scientific discipline that combines ecological science with our understanding of human behaviour and social systems – provides planners with the statistical and modeling tools needed to make practical sense of large volumes of seemingly unrelated data.

Mapping Biodiversity Value





C. Robertson

PURPOSE & APPROACH

Science & Community Engagement

These introductory paragraphs explain the scientific foundation of this work. Early in the initiative, participants agreed on a commitment to credible information, quantitative analysis, and reproducible results. That commitment was reaffirmed through a series of public meetings attended by more than 200 Bowen residents.

This structured public engagement process began in November 2024 with an Open House and continued with a technical workshop in February 2025. The team also presented to the Bowen Island Municipal Council, Municipal Planning Office, Official Community Plan Committee, and leaders of the Howe Sound Biosphere Region Initiative Society. These sessions gathered feedback from officials and organizations focused on our role in the broader Howe Sound Region. From the outset, this two-part approach – technical development and community engagement – encouraged meaningful exchange between data and lived experience. It also helped to ensure that the technical working group's outputs reflected the interests and concerns of the wider community.

Ultimately, policy is about society, not science, and it is unreasonable to expect that citizens will defer to scientists on policy issues that are also constrained by ethics, economics, and other social values.

Our task has been to convey the science effectively to all, so that non-experts can understand and 'own' the information, and use it when participating in biodiversity planning and policy development. By engaging experts and citizens in developing this plan, we have been able to apply cutting-edge tools in ways that respond to community needs. This is an ongoing process, and we hope that the results presented will be treated as a credible and significant advance that marks the beginning of a process of applying biodiversity data in all relevant planning efforts in the future.

Guided by mapped outputs and empowered with the data and tools to ask new questions and bring the weight of science to bear on public deliberations, the Caring for Nature team is ready to address many facets of conservation: community education, public land designations, voluntary private land programs, and explicit incorporation of conservation guidelines and mandates in municipal policy.

Biodiversity protection on Bowen Island aligns with the broader conservation vision of the Átl'ka7tsem/Howe Sound UNESCO Biosphere Region and the Preserve and Protect Mandate of the Islands Trust. By leveraging the work of the Caring for Nature team, including this Biodiversity Plan and associated data and tools, Bowen Island can become a conservation leader alongside neighboring communities, the Squamish Nation, and other entities already committed to safeguarding biodiversity in Átl'ka7tsem.

Community Engagement



L. Gilday

Development of the Biodiversity Plan was informed by an open house (100+ attendees), a technical workshop (40+ participants), special events at schools, and additional community events, including an on-going nature photography contest.



P. Robinson

PATTERNS OF BIODIVERSITY

Species Richness

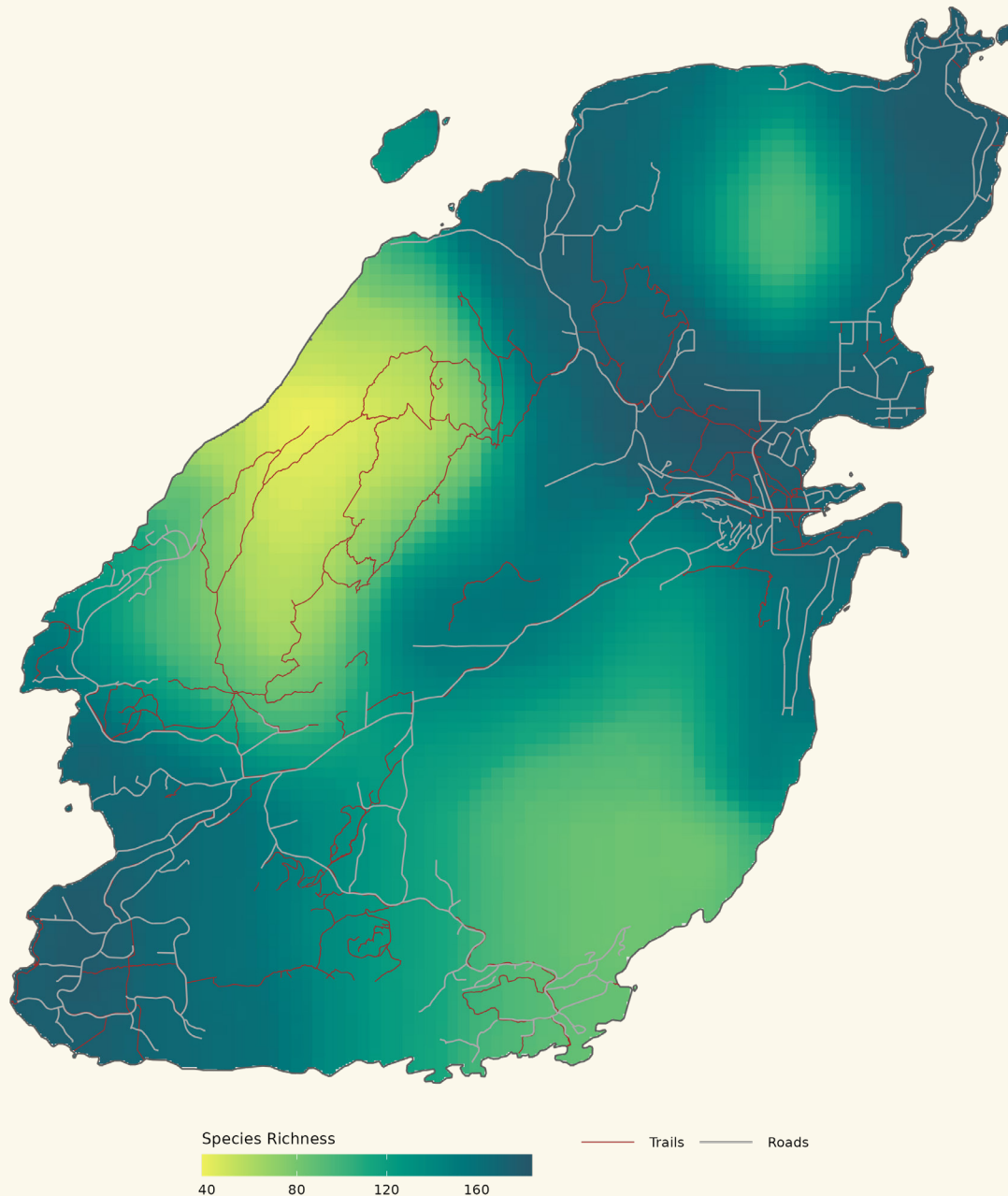
Diversity is most commonly portrayed as species richness, which is simply the count of the number of species present in a specific location. While simple in concept, richness is a difficult idea to quantify. Around the world, most species are rare, with a handful of common species accounting for most of the observations at any given point in time. Many species are represented by only a few individuals, most of which go unseen on most visits. To address this challenge, we drew on Species Distribution Models (SDM) developed by Wendy Palen's research group at Simon Fraser University. SDM's link observations from across the region to site characteristics, applying statistical algorithms to relate site characteristics to unvisited areas and estimate the distribution of each species across the study area, in our case Bowen Island.

For a large group of candidate vertebrates, we used citizen science (eBird, iNaturalist) and other verified detections to select the SDM of 193 vertebrate species that are highly likely or known to occur on Bowen. To these we added data on locally counted heron and raptor nests. These 195 data layers were then stacked, and for each 100 m x 100 m pixel on the island we computed the number of species likely to occur there.

This shore-to-shore map of species richness is the first of its kind for the island. While each individual species map contains a degree of uncertainty, the aggregated number of species provides a robust comparison of the relative vertebrate species richness across the island. It is this sort of relative measure that allows comparison of the conservation values of different locations, a first step toward establishing priorities for biodiversity planning.

Several general trends emerge immediately. Higher elevations generally support lower biodiversity, a finding that holds around the world and is the subject of an extensive scientific literature. Low lying and well-watered regions are relatively biodiverse. They often have deeper and more productive soils, seldom dry out during hot summers, and in general sport greater plant growth. However, these lower valleys and gentle hills are also areas prized by people, thus they are often the first to be altered or developed, creating inherent conflicts between development and conservation. These are patterns that demand the sort of explicit and creative planning that we hope to advance through this biodiversity plan.

Bowen Island's Vertebrate Species Richness



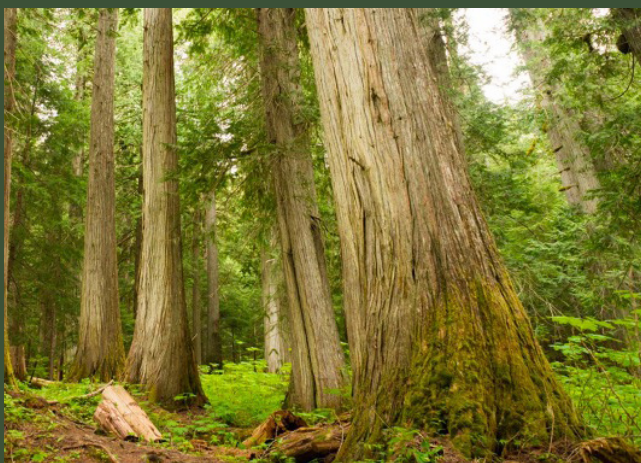
We drew on models and data for 195 species to estimate the distribution of each across Bowen Island.

By combining all species we created a shore-to-shore map of vertebrate species richness, the first of its kind for the island.

Species

n = 195





Bowen Island Conservancy

PATTERNS OF BIODIVERSITY

Overall Habitat Richness

While species richness is the most common way to quantify biodiversity, most species are hard to see, rarely recorded, and difficult to study. Our map of vertebrate species richness (p. 17) includes nearly 200 species, but it tells us little about plants, fungi, microbes, and many invertebrates -- organisms that hold ecosystems together and regulate key functions that all biodiversity depends on.

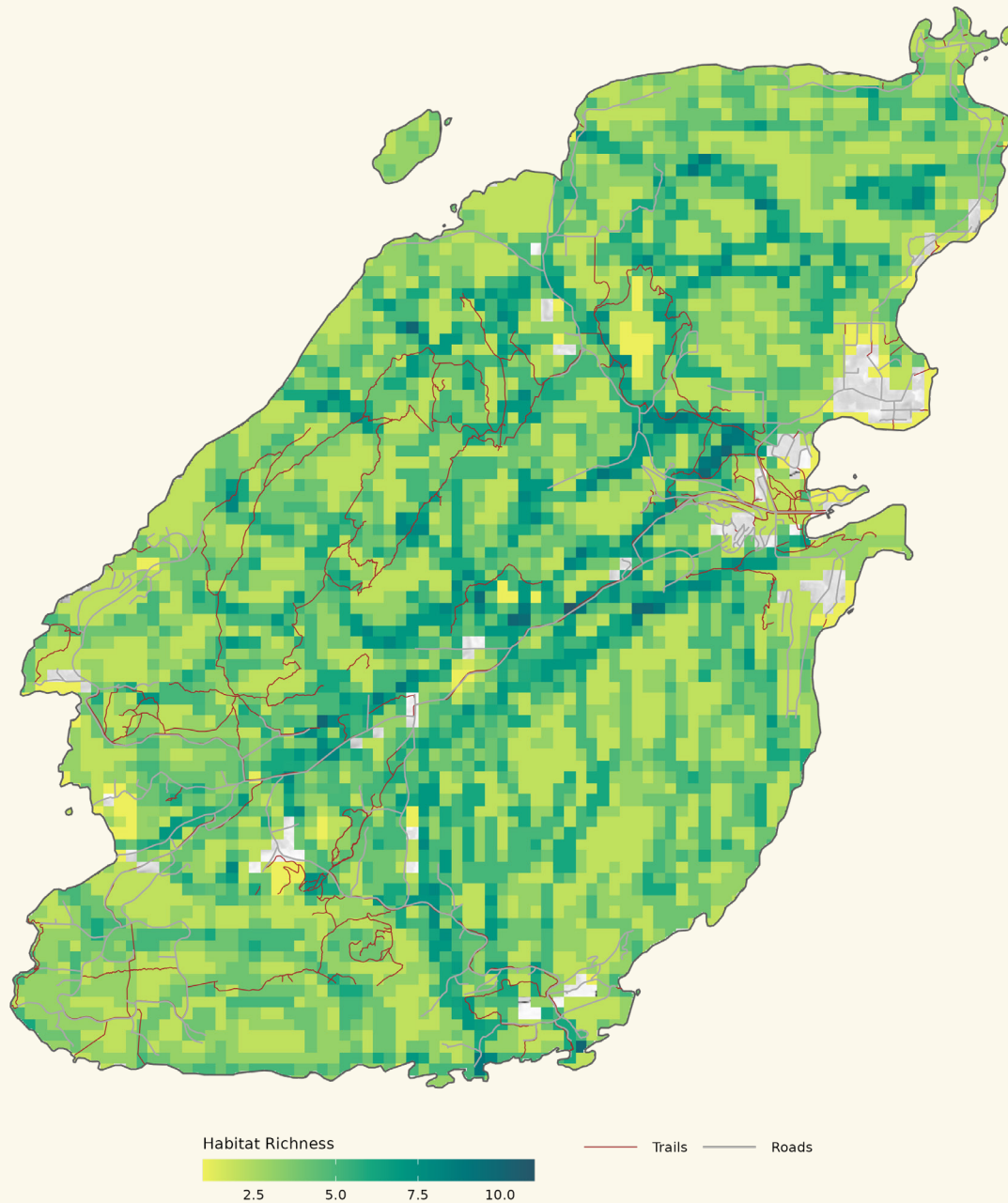
To capture this broader picture, we compiled maps showing the distribution of 33 habitat types across the island. Habitat refers to the mix of physical and biological conditions that provide the resources species need to survive in a specific place. Habitat types simplify this information by grouping areas that are similar, often based on dominant vegetation and climate.

For example, an ephemeral wetland is a habitat type defined by seasonal changes in water. These wetlands often dry out during part of the year, and they support a unique set of species adapted to these extreme conditions.

There are many systems for classifying and mapping habitat types. For our map of Habitat Diversity, we draw on Metro Vancouver's Sensitive Ecosystem Inventory (2021), the Islands Trust's Terrestrial Ecosystem Mapping initiative (2019), and local maps of freshwater ecosystems (Whitehead 2025). We combined the different mapping units, many of them highly detailed, into more general habitat types (e.g., Old Growth Coniferous Forest, Mixed Woodland, Wetland) for the purpose of identifying relative habitat richness across the island.

The following map (p.19) highlights areas on Bowen where different habitats co-occur, indicating higher levels of overall biodiversity. Habitats on the island show finer scale variation than vertebrate species richness, with higher habitat richness (darker areas of the map) found where multiple habitats overlap. In general, wetter and lower lying areas have higher habitat richness, indicating the close proximity of wetland, riparian, and forested habitats. Similarly, less accessible forested areas show a mix of older and younger forest types, while the coastal zone includes habitat types only found near the ocean.

Bowen Island's Overall Habitat Richness



The value of this map lies in appreciating how variation in habitat types differs from that of vertebrate species richness.

Together they offer a more complete picture of overall biodiversity; and we combine these two data sets in subsequent analyses.

Habitats

n = 33





W. Husby

PATTERNS OF BIODIVERSITY

Freshwater Habitat Richness

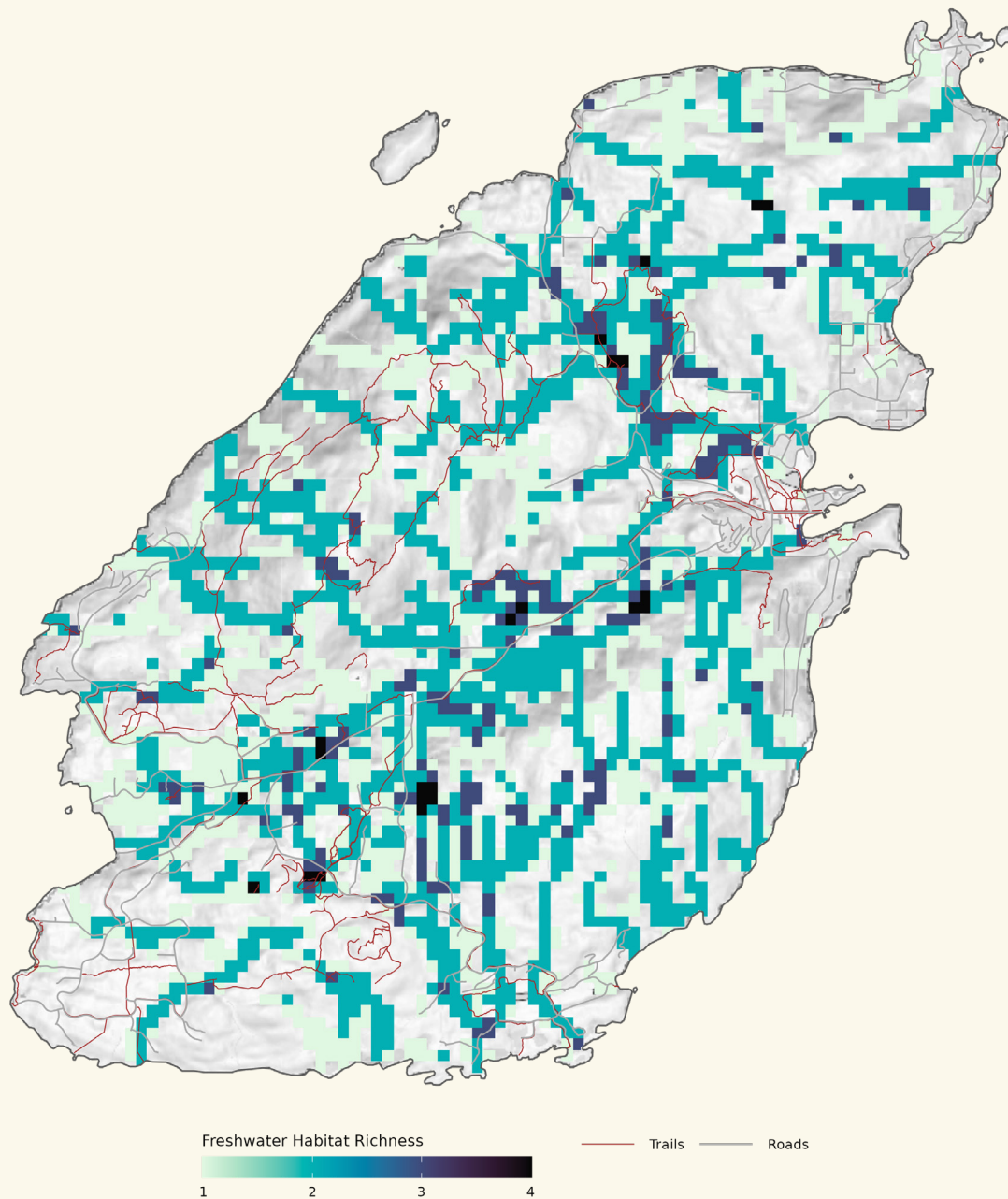
Freshwater resources play a fundamental role in sustaining Bowen Island's biodiversity, both as habitats housing unique aquatic species, and because the vast majority of terrestrial species also depend on wetland and riparian habitats during different seasons and different stages of their life cycle. Even a cursory glance at the map of vertebrate species richness shows higher values in the lower elevation areas where streams flow and ponds and wetlands hold surface waters, recharging groundwater and providing habitat for many aquatic and water-associated species. Unfortunately, most freshwater species are difficult to see, and their distributions and abundances are often poorly documented. We do not have large public databases that allow us to model their distributions, as we do for birds and mammals. Yet their omission from a biodiversity plan would leave an unacceptable gap in our analysis.

To address this in a different way, we have drawn on a unique database of locally-mapped freshwater habitats for Bowen Island developed by resident biologist Alan Whitehead.

We drew on this detailed inventory to represent the aquatic habitats falling within each of the 100 m x 100 m pixels used to map biodiversity across Bowen Island. For freshwater habitats, we grouped Whitehead's habitat types into six general classes. This map (p.21) shows the number of distinct aquatic habitats falling within each pixel (darker colours indicate more habitats present).

Two obvious patterns emerge: freshwater habitats occupy a relatively small proportion of Bowen's total area, and higher richness occurs most commonly in the island interior, where riparian vegetation buffers free-flowing streams, wetlands, and lakes. This map of freshwater habitat richness, by itself, offers few surprises, but when combined with maps of vertebrate species richness and overall habitat richness, it adds an essential component to our understanding of conservation value (p. 25).

Bowen Island's Freshwater Habitat Richness



Freshwater habitats on Bowen Island represent essential components of biodiversity on the island.



W. Husby

PATTERNS OF BIODIVERSITY

Ecological Intactness

People have lived on and visited what is now known as Bowen Island for millennia. The Squamish people and other First Nations continue traditions of harvest and ceremonial use that leave subtle evidence of habitat modification that has little or no impact on biodiversity. Since European settlement, however, humans have had a much greater and more lasting impact, and few areas on the island can be considered pristine. Some of these impacts are associated with structures, others result from resource extraction, much of it conducted in the past with little attention to biodiversity or sustainable use.

To better understand the spatial patterns of disturbance, scientists have created a measure of the cumulative influence of human population density, land transformation, accessibility, and power infrastructure, known as the Human Footprint. The Human Footprint project draws on 12 leading indicators to create a single high-resolution map of current and past human influence.

We used the inverse of this map to create an index of ecological intactness for Bowen. This map reflects historic patterns of disturbance, highlighting areas least impacted by human land transformation and, therefore, most likely to retain the biodiversity values indicated in previous maps.

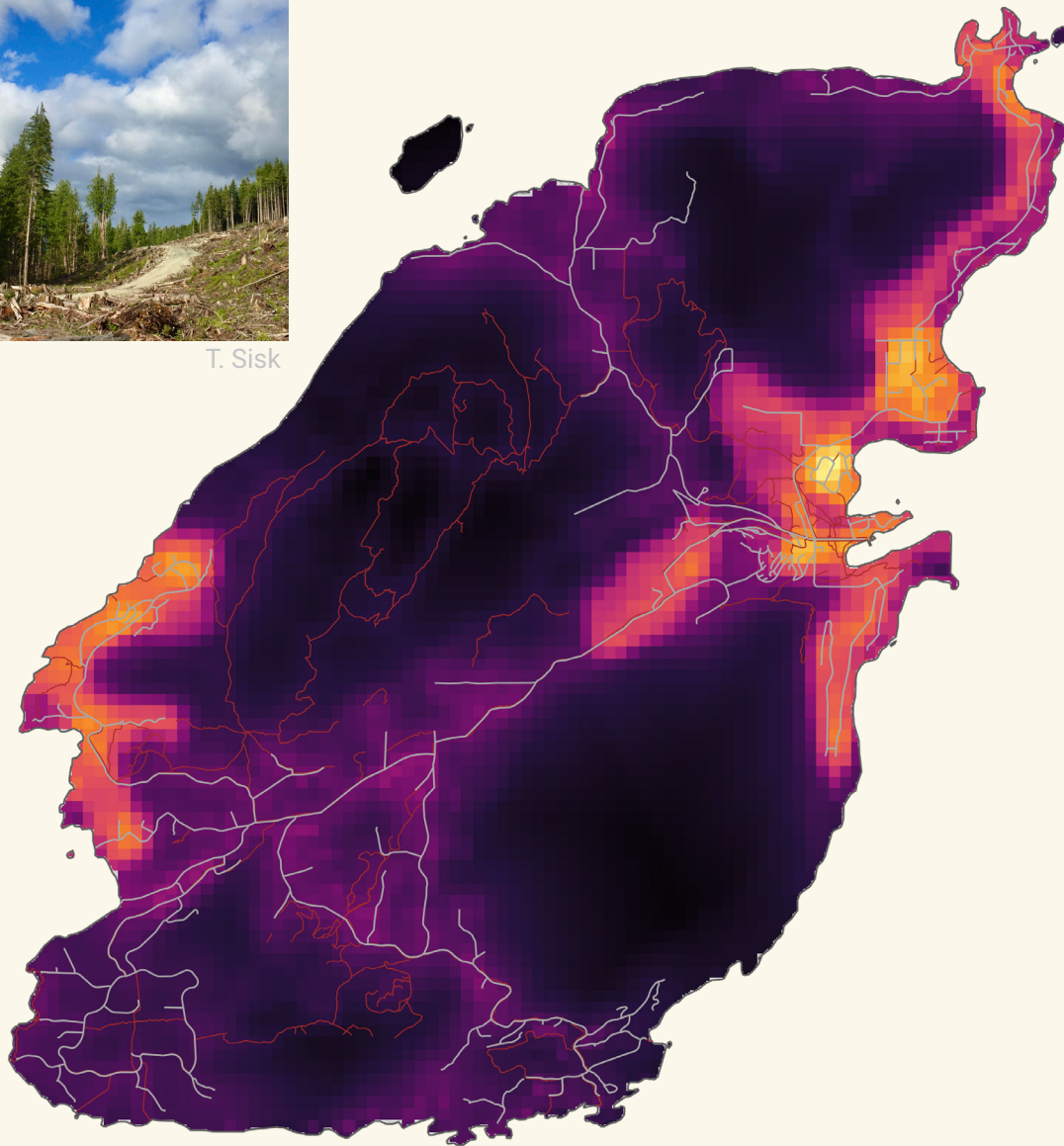
Areas with lower intactness are generally of lower value to biodiversity due to the conversion of natural habitat for human uses and the degradation of habitat quality in areas influenced by human activities. While previous maps reflect some human influence, such as the recovery of forests from historic logging, the human footprint approach offers a much more precise map of disturbance by integrating historical data with more recent satellite imagery, providing a spatial representation of the location and intensity of specific human modifications. Therefore, the inverse of the human footprint expresses habitat intactness and is a more intuitive component of conservation value.

Intactness is highest in the more remote areas of Mt. Gardner, Mt. Collins, and Apodaca Peak and lowest in the valleys and coastal areas where humans often focus residential development. The commercial area around Snug Cove has very low intactness as it is the centre of human activity, with the highest concentration of structures, roads, parking areas, and playing fields. By considering the overlap of the historic pattern of human disturbance with our maps of species and habitat richness, we can develop a detailed picture of relative conservation value for the entirety of Bowen Island.

Bowen Island's Ecological Intactness



T. Sisk



Trails Roads

Higher intactness points toward areas deserving more conservation effort and attention.

Less intact areas show us where improved management or habitat restoration could benefit biodiversity, especially where they overlap with rare habitats or connect larger protected areas.

Intactness

n = 1





B. Gheorghe

PATTERNS OF BIODIVERSITY

Integrated Conservation Values

Prioritizing conservation opportunities requires combining two kinds of information: where biodiversity is found and where it is most at risk from threats or impacts.

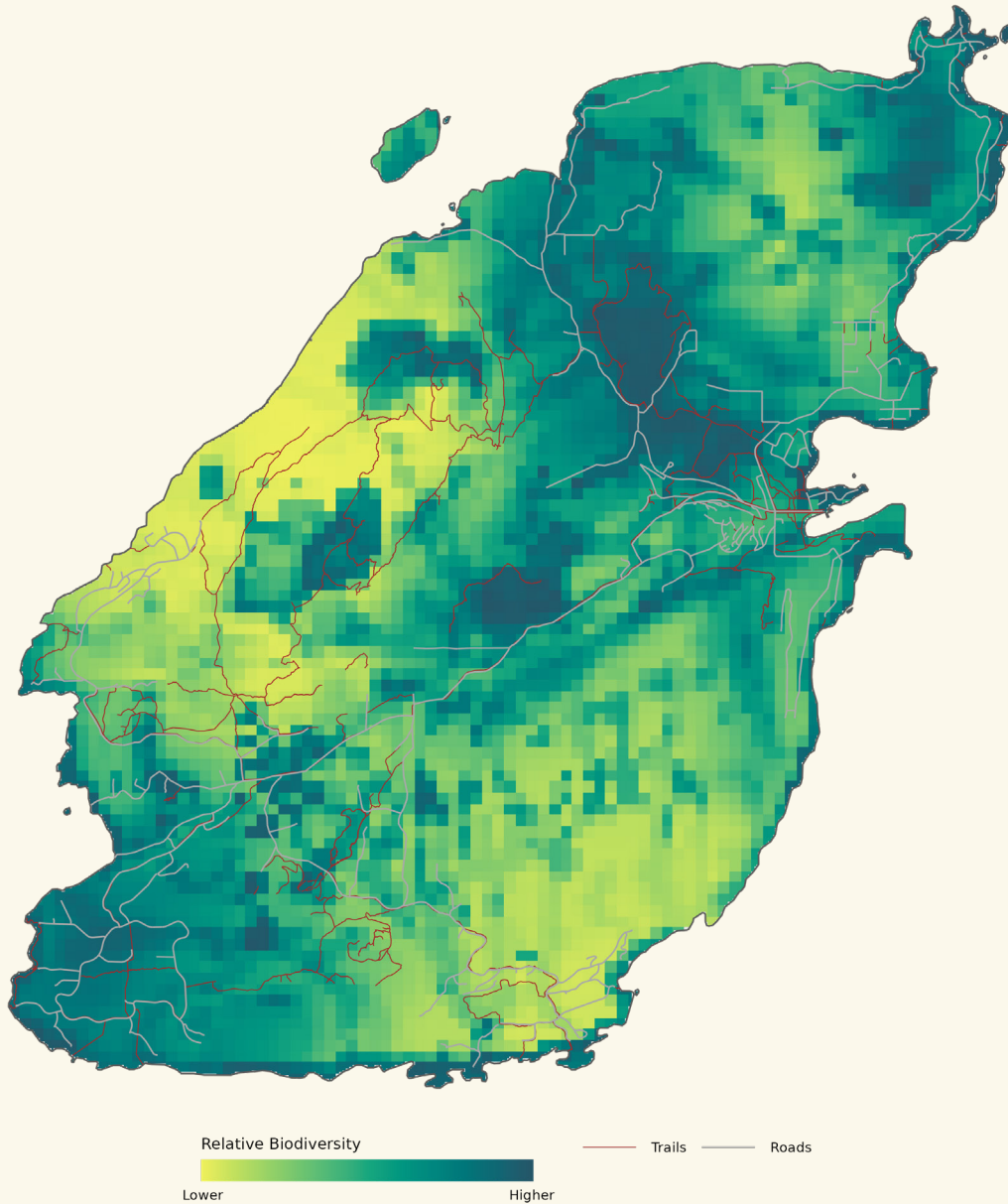
We brought together all biological data that met our standards for rigour and reliability into a conservation prioritization model called Zonation. Zonation is software that uses an algorithm that considers the rarity, richness, and intactness of underlying biodiversity features to rank locations by their overall conservation value. Scores range from 0 (lowest value) to 1 (highest), and the results can be mapped to show relative conservation value across Bowen Island.

In simple terms, Zonation – developed by Atta Moilanen and colleagues at the University of Helsinki – gives higher ranks to places where important biodiversity data layers overlap, while reducing scores for places that overlap with habitat loss or degradation.

The map on the following page (p.25) combines species richness (195 data layers) and habitat richness (32 data layers), along with the Human Footprint database (1 data layer) developed for BC by Oscar Venter at University of Northern British Columbia. Zonation uses the Human Footprint data to reduce scores in areas where the footprint is highest – reflecting greater historical human disturbance.

The map of conservation values is a central output of this biodiversity assessment and the foundation for all subsequent analyses.

Bowen Island's Conservation Values



This map incorporates species richness (195 data layers), habitat diversity (32 data layers), and the expansive Human Footprint database (1 layer). It is the key output of this biodiversity assessment and serves as the foundation for all subsequent analyses and planning recommendations.





B. Houle

PATTERNS OF BIODIVERSITY

Top Conservation Values

The map of integrated Conservation Values is a versatile data resource whose usefulness goes well beyond a single static map. We can display the data in different ways to reflect a range of real-world applications; from supporting land-use options and guiding planning to identifying candidate places for future protection.

Here, we illustrate this capability by mapping the top 30% of the island's biodiversity values based on our analysis. This is a relevant depiction because it corresponds to the commitment by Canada, and 195 other countries, to protect 30% of its land and waters by 2030. BC has joined with First Nations to embrace the '30 by 30' goal to stem and reverse biodiversity loss. Another more ambitious goal, termed 'Nature Needs Half', has been championed by a coalition of scientists, conservation organizations, and public officials working to secure biodiversity worldwide.

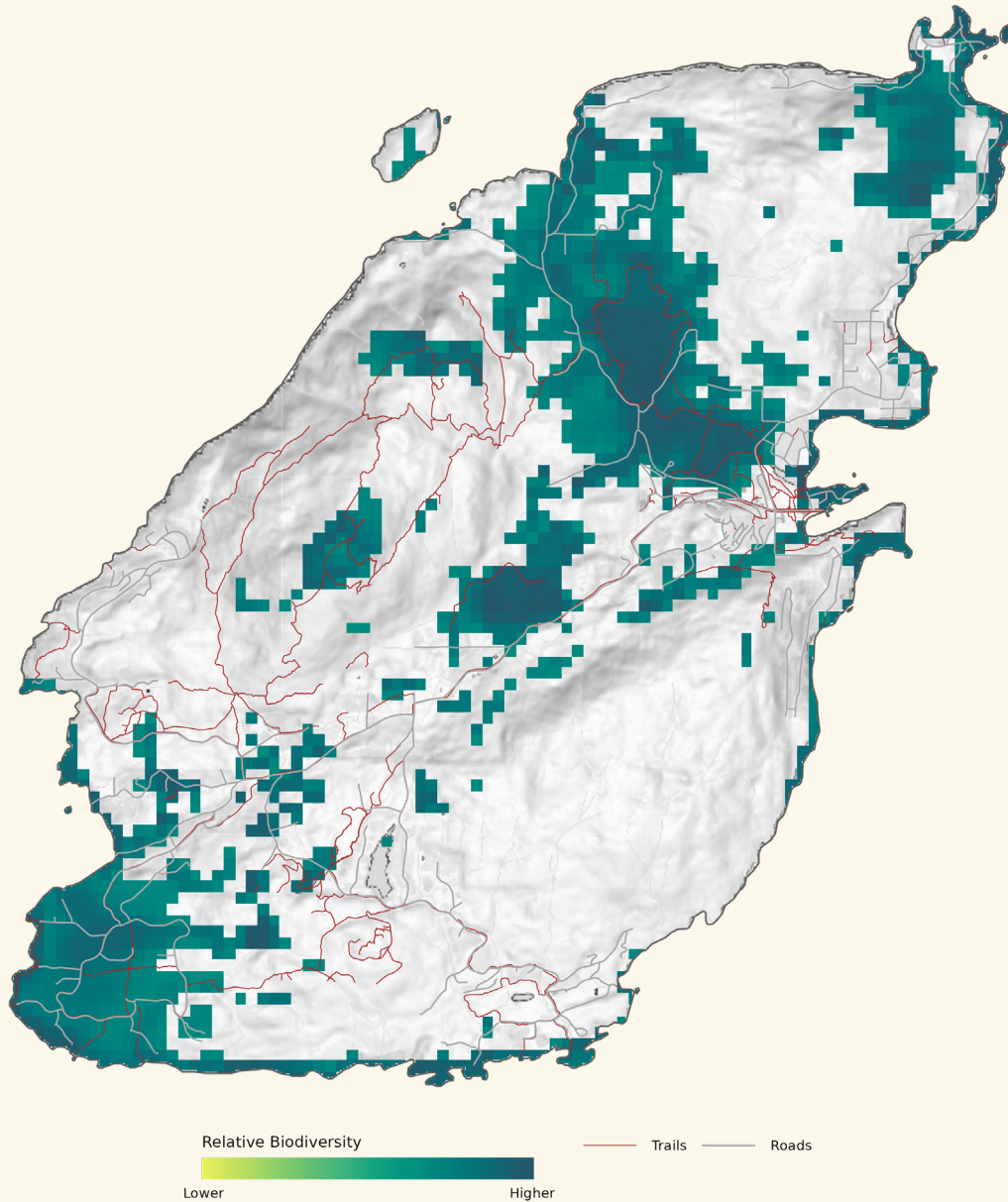
Our model of conservation values can display the top 30%, 50%, or any other threshold value that represents one's planning goals. The resulting map could then be combined with other data or existing maps in subsequent analyses.

The flexibility of this science-based and community-informed tool (see p. 55) allows a diversity of users to explore different goals, and overlay conservation values with other data or existing maps.

However you choose to slice the map, bringing the best available data to bear on the planning challenges at hand can increase understanding, clarify deliberations, and improve our ability to work together to maximize the effectiveness of our conservation efforts.

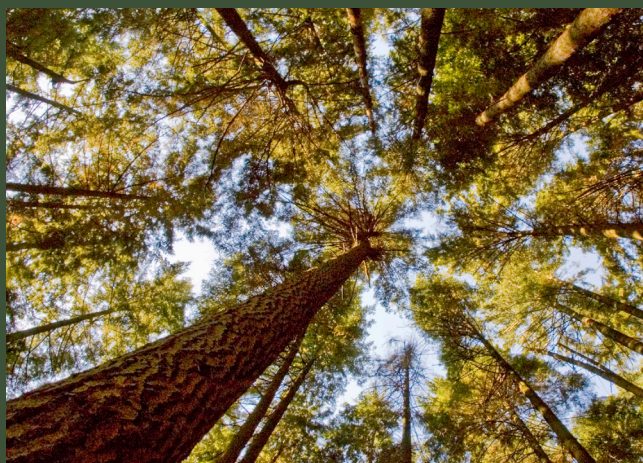
Bowen Island's Top Conservation Values

Top 30%



By mapping biodiversity value we can identify places of highest importance to Bowen Island and then ask what actions might help preserve them into the future.



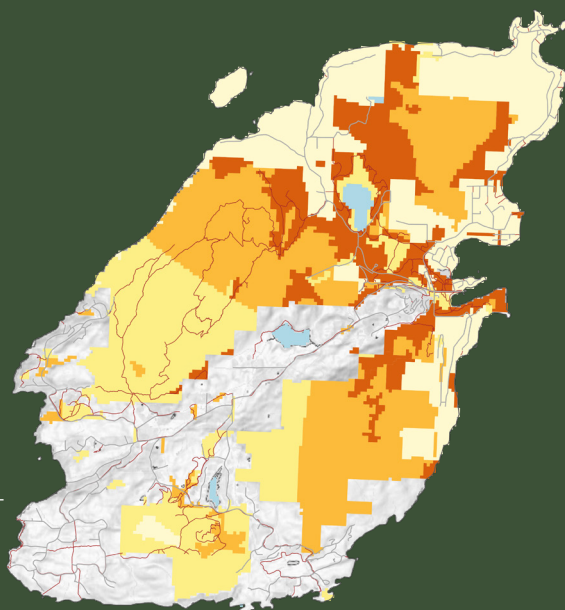


W. Husby

THREATS TO BIODIVERSITY

Wildfire Vulnerability

Wildfire tops the list of concerns for many Bowen residents. Drier conditions and warmer temperatures increase fire danger because fuels burn hotter and fires spread faster. Increasing tourism elevates concerns because of limited opportunities to educate visitors about fire risk, combined with limited prevention and firefighting capacities. Municipal and provincial efforts to prepare for the inevitable wildfires that ignite despite best efforts have focused on human life and property, but fire also threatens Bowen's biodiversity.



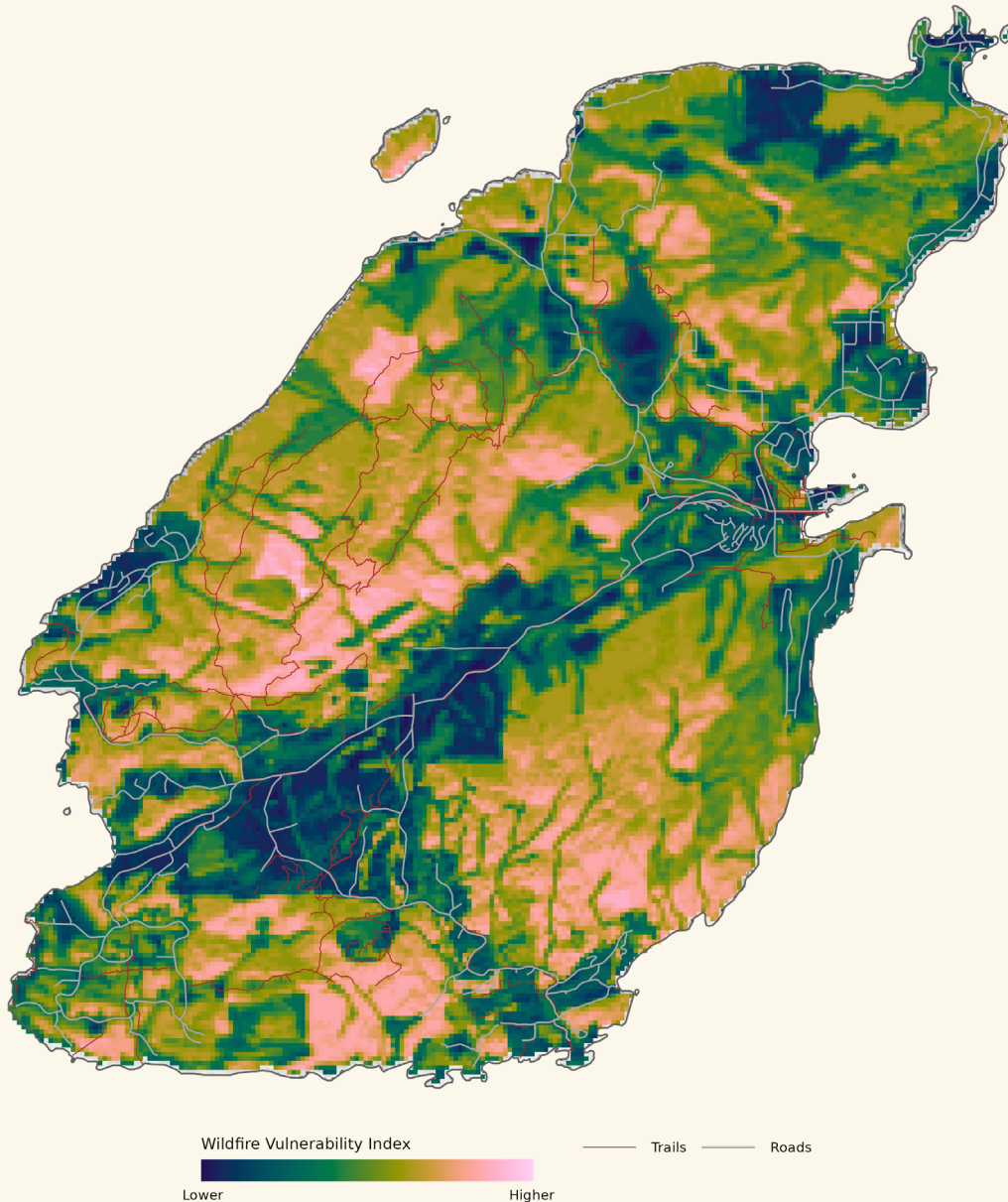
Wildland-Urban Interface map of Bowen Island. Red & orange colours indicate moderate fire risk, yellow low, and grey areas have no data.

FireSmart programs focus on the wildland-urban interface (WUI), where homes and infrastructure meet open land and natural habitats. However, fires just as often start in places that humans frequent and spread into wildlands, placing biodiversity and intact habitats at risk.

As a complement to FireSmart maps (inset), we developed a Wildfire Vulnerability Index to illustrate the susceptibility of biodiversity to the negative effects of wildfire. This map does not contradict the WUI map or distract efforts to keep people and property safe from wildfire. Rather, its value lies in differentiating wildland areas where biodiversity is more vulnerable to the effects of fire, should it occur, and informing conservation planning.

To create this index, we considered three primary factors affecting vulnerability to wildfire: aspect, slope, and vegetation. Our index is a preliminary effort to map ecological vulnerability to wildfire and its consequences for biodiversity. This simple approach should not be used to assess risks to people or property, nor guide wildfire responses. It can be used to guide fuel management efforts, such as forest thinning or removal of invasive species that increase wildfire threat. And it can help identify less wildfire-vulnerable areas with high biodiversity value, where new land protection efforts might be directed.

Vulnerability of Biodiversity to Wildfire



The index presented above highlights areas where biodiversity is thought to be most vulnerable to wildfire (shown in pink).

This map is appropriate for assessing wildfire risk to biodiversity, and caution is advised for any other interpretation or application. The wild-land-urban interface (WUI) map of Bowen Island (p. 28, inset), available through the Bowen Island Municipality, is the best reference for community safety and wildfire preparedness.



R. Izdebski

THREATS TO BIODIVERSITY

Development Pressure

Human development typically expands into less disturbed natural areas, converting native habitats for human purposes and affecting habitat quality in adjacent and nearby locations. In some cases development creates novel habitats that benefit some species, however, research has shown that, in most cases, the vast majority of species are negatively affected, as change disrupts the interactions among species and reduces the complexity and often the productivity of fragmented ecosystems.

Understanding where development is most likely to occur, and where it overlaps with areas of high value to biodiversity, can help identify places where greater attention should be given to minimize and mitigate the effects of development or, in some cases, areas where development should be prohibited.

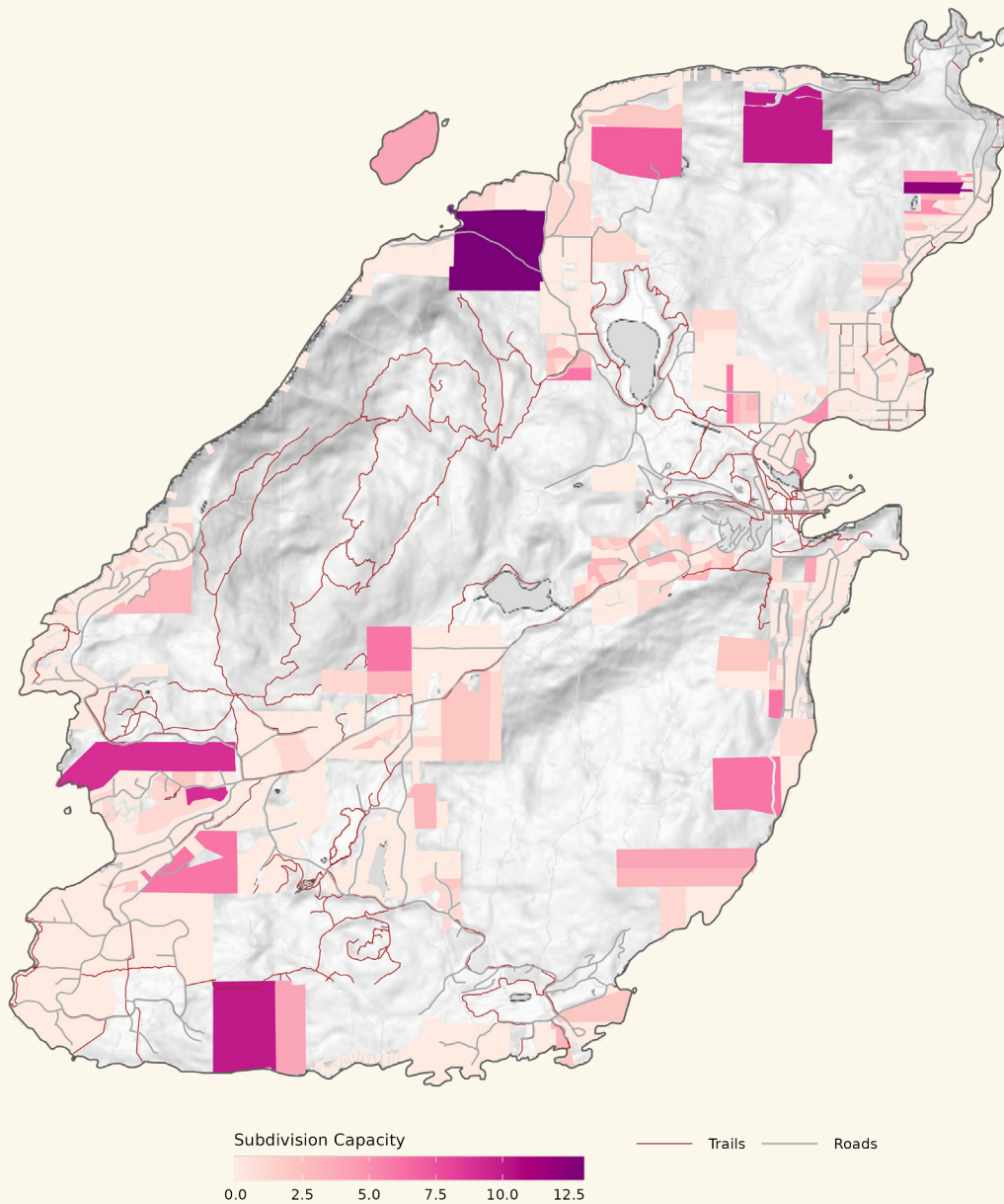
These are complicated and controversial topics. No individual can know the best way to balance the rights of property owners with those of nature. Too often, insensitive proposals spark disputes that make conservation progress more difficult. Instead, this plan provides new information and suggests simple analyses that can point out areas where divergent objectives can be addressed collaboratively, and creative approaches to conservation can address concerns before they become conflicts.

The following map (p.31) highlights areas where current zoning regulations permit subdivision. It classifies these parcels according to the number of residential units currently permitted. In the future, areas where denser development is currently allowed could exert greater pressure on biodiversity than areas not zoned for subdivision.

This map does not identify areas where development is currently proposed, nor does it suggest where denser development should be encouraged or discouraged. Instead it provides an index of development pressure in the future that could negatively affect biodiversity. This information can help identify high priority areas that might be acquired for conservation purposes, or areas where greater cooperation and cost-sharing between landowners and conservation interests could lead to improved land management and biodiversity benefits.

As with the map of wildfire vulnerability, this is a simple approach to mapping a complex set of conditions. As more information becomes available, and as public-private partnerships for conservation develop on Bowen, a more accurate and complete map of development pressure may improve conservation planning and habitat improvement efforts.

Human Development Pressure



Pressure from an expanding human population and the conversion of continuous forest into fragmented development parcels poses one of the largest ongoing risks to biodiversity on Bowen Island.

Subdivision capacity in this map represents an estimate of the number of residential units that could be developed for each private parcel, given current rules.



T. Sparling

CONSERVATION ANALYSIS

Approach

The Conservation Values map sits at the centre of all subsequent analyses presented in this Biodiversity Plan. It displays the relative biodiversity value for each of the island's approximately 6,350 hectares. For simplicity, we use the top 30% of conservation values for these analyses, which inform the planning recommendations presented below. However, it is important to recognize that Conservation Values exist for every hectare of Bowen Island (p.25), and can be shown using whatever threshold is most helpful in answering a particular question or visualizing a planning scenario. With this understanding, maps become dynamic, versatile tools for tailoring planning efforts to diverse needs and opportunities, and developing management approaches that convey the greatest conservation benefit for a given level of protection.

Among the simplest and most informative spatial analyses employed in planning are data overlays, where a map of one variable of interest, for example all lands currently protected, is stacked on top of another, such as the top 30% of biodiversity values. Each layer represents a different data type, and overlaying them allows us to see how these features overlap in space.

In this example, the overlay illustrates which of the most valuable areas for biodiversity are already protected, allowing us to focus planning on more vulnerable areas (see example, p. 33). Geographic Information Systems (GIS) make overlay analyses simple and efficient, even when they are much more complex than the example outlined here. They can quickly summarize quantitative measures, at the scale of the entire island, and make even complex computations repeatable. We also can extract information from each pixel in the mapped landscape and examine statistical relationships among variables.

On the subsequent pages we present maps, statistics, and interpretations of five overlay analyses that underpin many of our key recommendations for protecting biodiversity into the future: 1. intactness, 2. private land, 3. existing protected areas, 4. wildfire vulnerability, and 5. human development pressure. These analyses demonstrate the flexibility and power of the data and tools now available through the Bowen Island Biodiversity Plan. These data are available upon request (see p. 55).

Overlay Analysis



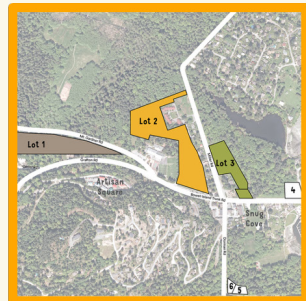
INTACTNESS



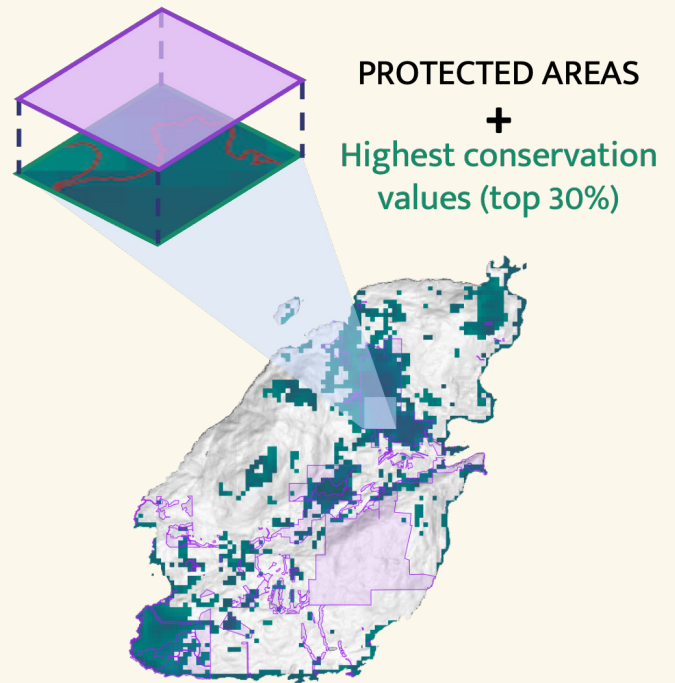
PRIVATE LANDS



WILDFIRE RISK



DEVELOPMENT

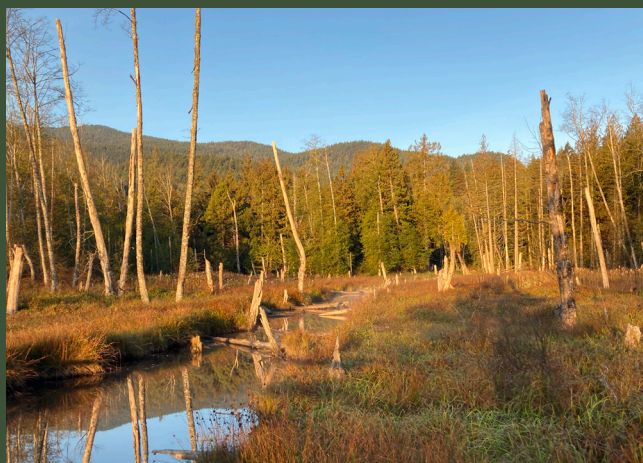


Above we illustrate the overlay of the top 30% highest conservation values (p.27) with five layers of interest that will allow us to explore conservation opportunities on Bowen Island.

The maps that follow show how intact these place are (p.35), how they overlap with private land (p.37), what proportion occur within the network of protected areas (p.39), and how they map onto two current and future threats to biodiversity: wildfire vulnerability (p.41) and human development pressure (p.43).



B. Lyne



W. Husby

CONSERVATION ANALYSIS

Highest Conservation Values & Ecological Intactness

Overlaying our map of high conservation value areas (top 30%) with information on ecological intactness helps distinguish between two kinds of priorities: places where conservation goals can be achieved primarily through protection (higher intactness), and places where active management may be needed to restore habitats and strengthen biodiversity benefits (lower intactness).

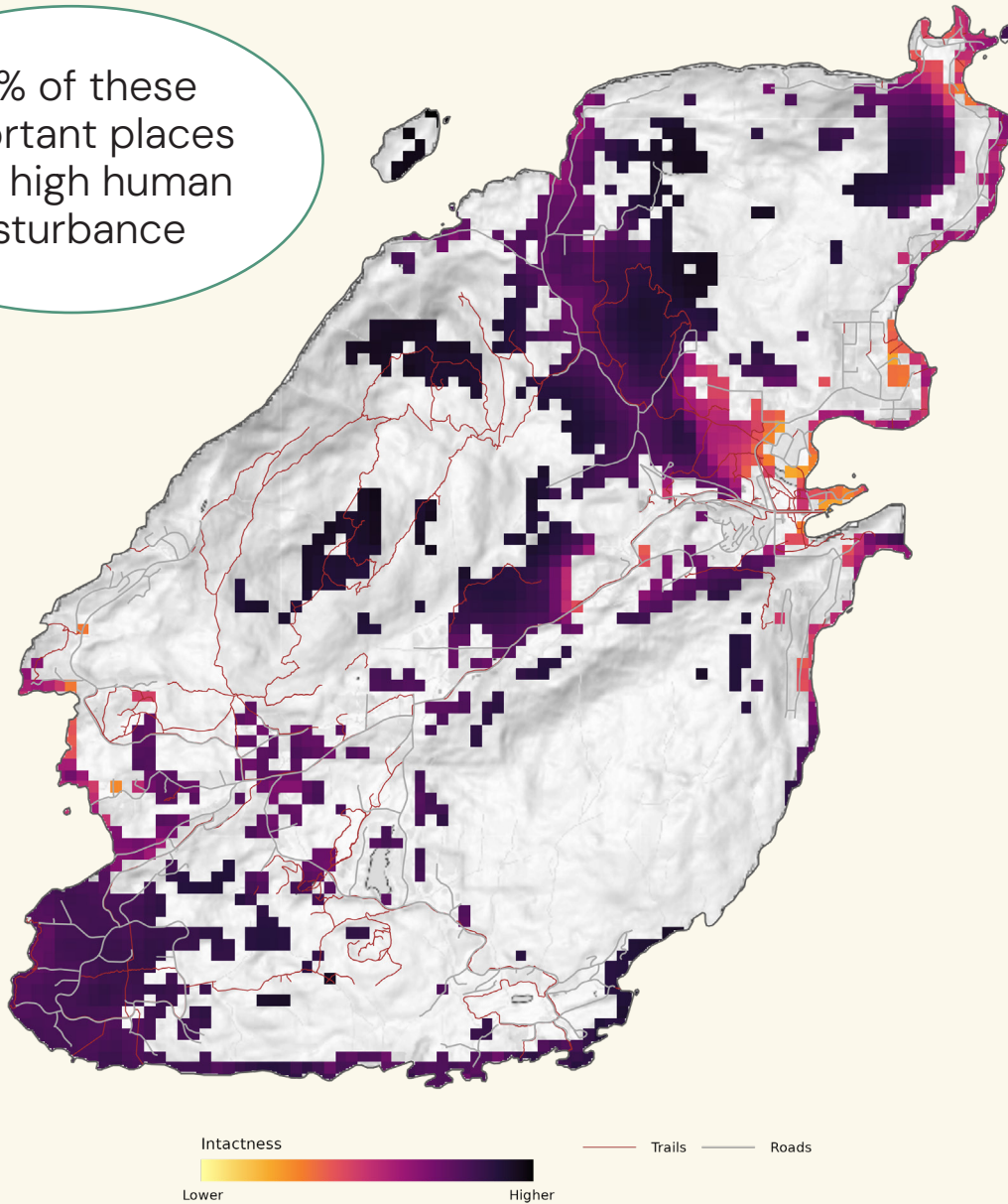
The following map (p. 35) shows the areas identified in our analysis as having high conservation value (top 30%). These areas are coloured by intactness: more intact areas appear in purple, and less intact areas in yellow. Less intact areas are places where multiple human pressures have altered habitats and likely reduced their overall conservation value. They can still be important conservation targets -- often because they should support high species and habitat richness -- but may require thoughtful management and habitat restoration.

Intactness, however, should not be read as 'undisturbed' or 'pristine'. More than a third (36%) of the island's highest-value conservation areas also show high human disturbance compared with all lands included in the Human Footprint analysis. Virtually all of Bowen Island was logged during the twentieth century, and many forests are still recovering.

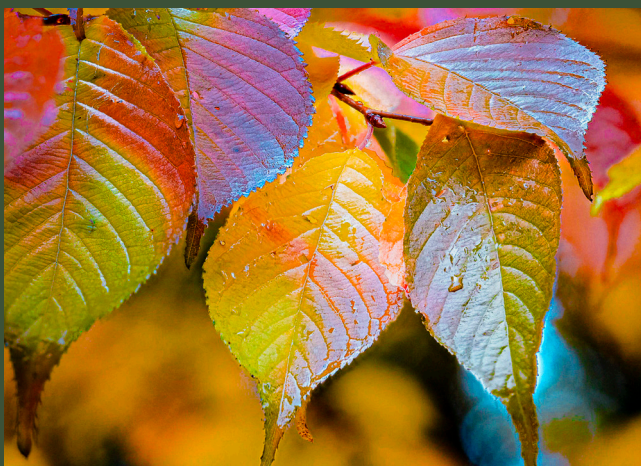
Areas that were lightly logged -- where some large trees were left behind -- show up as pale yellow pixels on the steeper slopes of Mt. Gardner and Mt. Collins. The same is true for intact wetlands around the larger lakes and in smaller pockets across the island. Interestingly, parts of the southern coastline remain largely intact, while many coastal areas in the north and west are more modified. The coast around Cape Roger Curtis, once targeted for development, remains comparatively intact and now forms the island's largest private nature preserve.

Overlap of Conservation Values & Ecological Intactness

36% of these
important places
have high human
disturbance



Pressure from an expanding human population, and especially the disturbance to freshwater habitats and the conversion of continuous forest into fragmented patches, poses perhaps the largest ongoing risk to biodiversity on Bowen Island.



L. Gilday

CONSERVATION ANALYSIS

Highest Conservation Values & Private Lands

A little less than half (42%) of Bowen's highest value conservation areas occur on private land, and a similar amount occurs on public lands managed by several jurisdictions. Most of the high conservation value areas on public land occur in large tracts around Killarney and Grafton lakes, and on the slopes of Mt. Gardner and Mt. Collins. Those on private lands are scattered throughout the central part of the island, clustered along the southern coast, and in large tracts on Hood Point and Cape Roger Curtis.

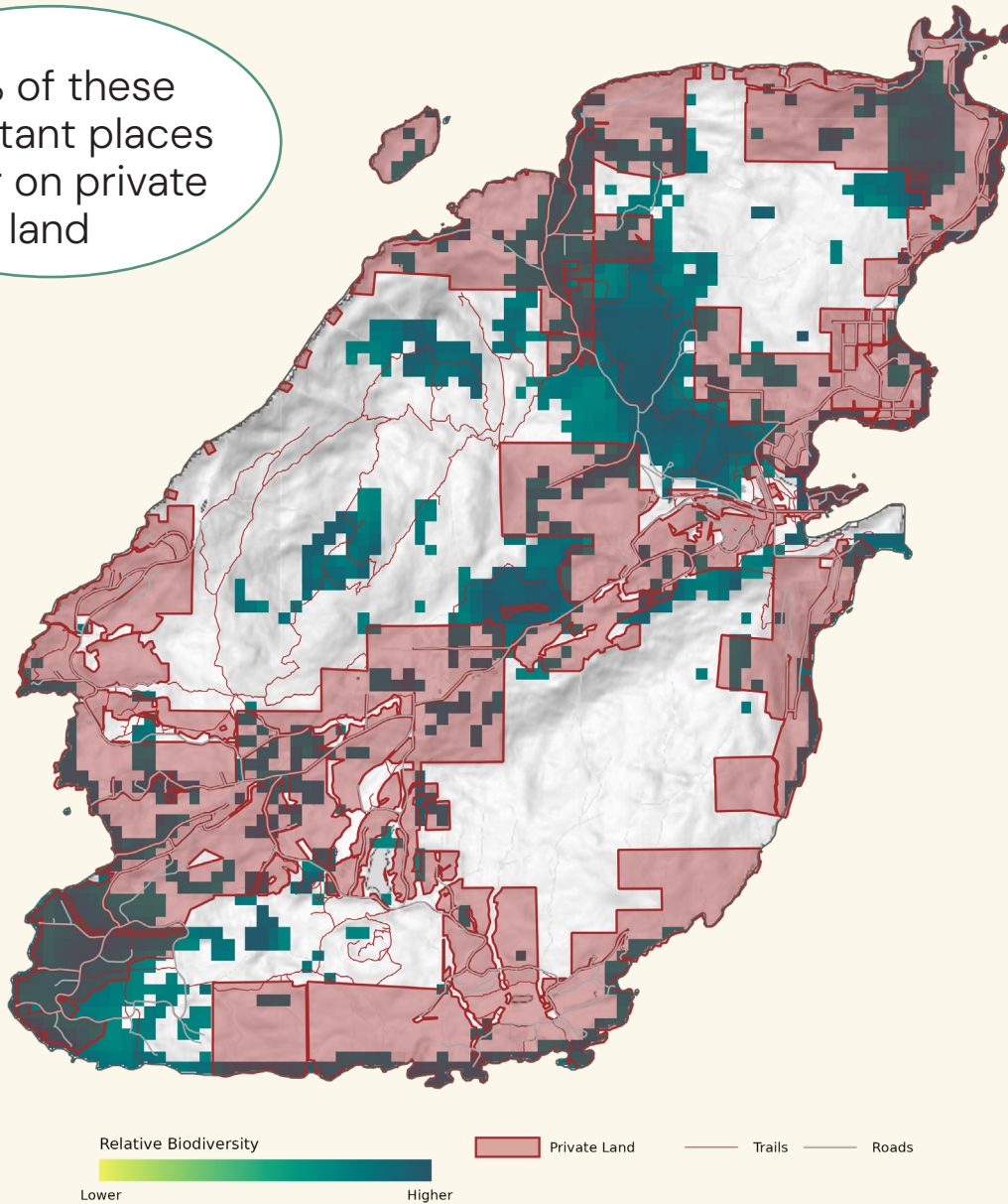
This map shows that effective biodiversity conservation on Bowen Island will require a mixed strategy that accounts for the different tools available for advancing conservation on public versus private lands. Protection of large areas typically involves one of two approaches: changing the designation of public lands or acquisition of private lands by conservation organizations. Both strategies have proven to be successful on Bowen Island.

Conservation on smaller tracts of private land emerges more often from partnerships and incentives for voluntary landowner participation. However, too often on Bowen these approaches go unnoticed or unrecorded, making it difficult to appreciate or reward private management that benefits biodiversity.

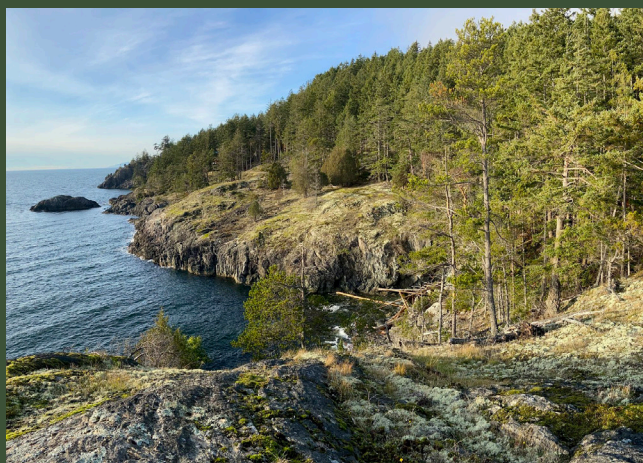
Because many landowners value privacy and oppose activities that might be seen as challenging to property rights, conservation planning should proceed in a transparent manner that acknowledges the concerns and requests of landowners, while creating opportunities for integrating conservation objectives with other land uses.

Overlap of Conservation Values & Private Lands

42% of these important places occur on private land



This map illustrates that private landowners must be key partners in efforts to ensure biodiversity continues to thrive on Bowen Island for generations to come.



O. Plowman

CONSERVATION ANALYSIS

Highest Conservation Values & Protected Areas

Our analysis finds that only 22% of the highest value conservation areas occur within Bowen's existing network of protected areas, suggesting that there is more work to do to ensure the persistence of biodiversity into the future.

Importantly, current protection of these special places include low-elevation areas surrounding the island's largest lakes (Killarney, Grafton). Similarly, the newly protected areas of Cape Roger Curtis, including the Wild Coast Nature Refuge and adjacent conservation lands owned and managed by the Bowen Island Conservancy, provide protection for unique coastal habitats and bluffs found on the southwestern margin of the island.

In contrast, valuable areas for biodiversity associated with the remaining mature forest stands and unique wetlands on Crown land are largely unprotected on the slopes of Mt. Gardner and Mt. Collins. This despite their status as popular recreational destinations assumed by many to be permanently protected from logging and other extractive uses.

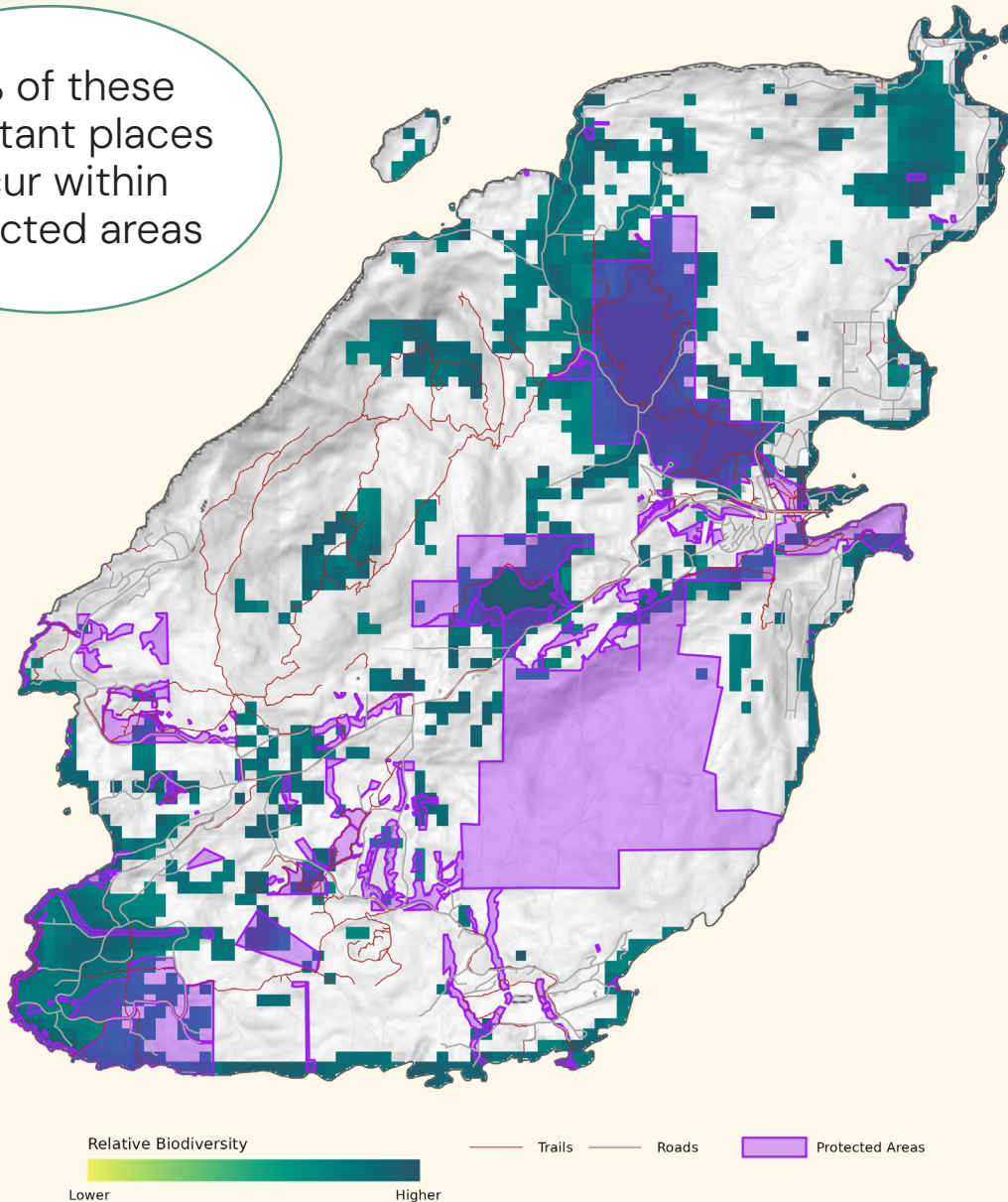
In addition, some important protected areas did not emerge among the top 30% of conservation values, due to relatively low species and habitat richness. Most prominently, Bowen's Ecological Reserve is a large, intact protected area whose higher elevation and lack of remnant old forest stands, as identified in Metro Vancouver's Sensitive Ecosystem Inventory, result in an intermediate conservation value.

While some of Bowen's biodiversity hotspots have been protected through public and private action, reaching the national '30 by 30' commitment, or the more ambitious 'Nature Needs Half' movement, will require concerted effort over the next five years and beyond.

This science-based plan to protect biodiversity provides both the rationale and tools to support a strategy for adding lands to Bowen's protected areas network that will emphasize biodiversity conservation, as well as recreation, aesthetics, and other values driving land and water conservation.

Overlap of Conservation Values & Protected Areas

22% of these
important places
occur within
protected areas



Parks and protected areas on Bowen have been created for a wide variety of reasons that don't always reflect priorities for biodiversity, but existing protected areas do overlap with some of the highest value areas.

Adding to the protected area network is a key recommendation of this plan.



W. Husby

CONSERVATION ANALYSIS

Highest Conservation Values & Vulnerability to Wildfire

The influence of fire is changing around the world, as climate warming and prolonged drought create unprecedented conditions that favor larger, hotter, and more frequent burns. Biodiversity that did not evolve with fire is at heightened risk as conditions change and fires reshape ecosystems, including the western hemlock and coastal Douglas fir forests that predominate on Bowen Island. In contrast, other ecosystem types adapted to fire may benefit from its effects.

Fire itself is not a threat, but ongoing climate change transforms natural fire from a benign force into a powerful change agent that can quickly transform habitats and eliminate rare species that are unable to survive post-fire conditions.

Overlaying Bowen's top conservation values with our index of vulnerability shows that approximately a quarter of priority lands for biodiversity are highly vulnerable to fire. The map (p. 41) shows where high fire vulnerability occurs among the highest value areas for conservation. Most of the larger blocks of high fire vulnerability are on steeper slopes, many with southerly or westerly exposures, where increased solar radiation can dry soils and fuels, resulting in hotter and/or longer-burning fires with greater biodiversity impact.

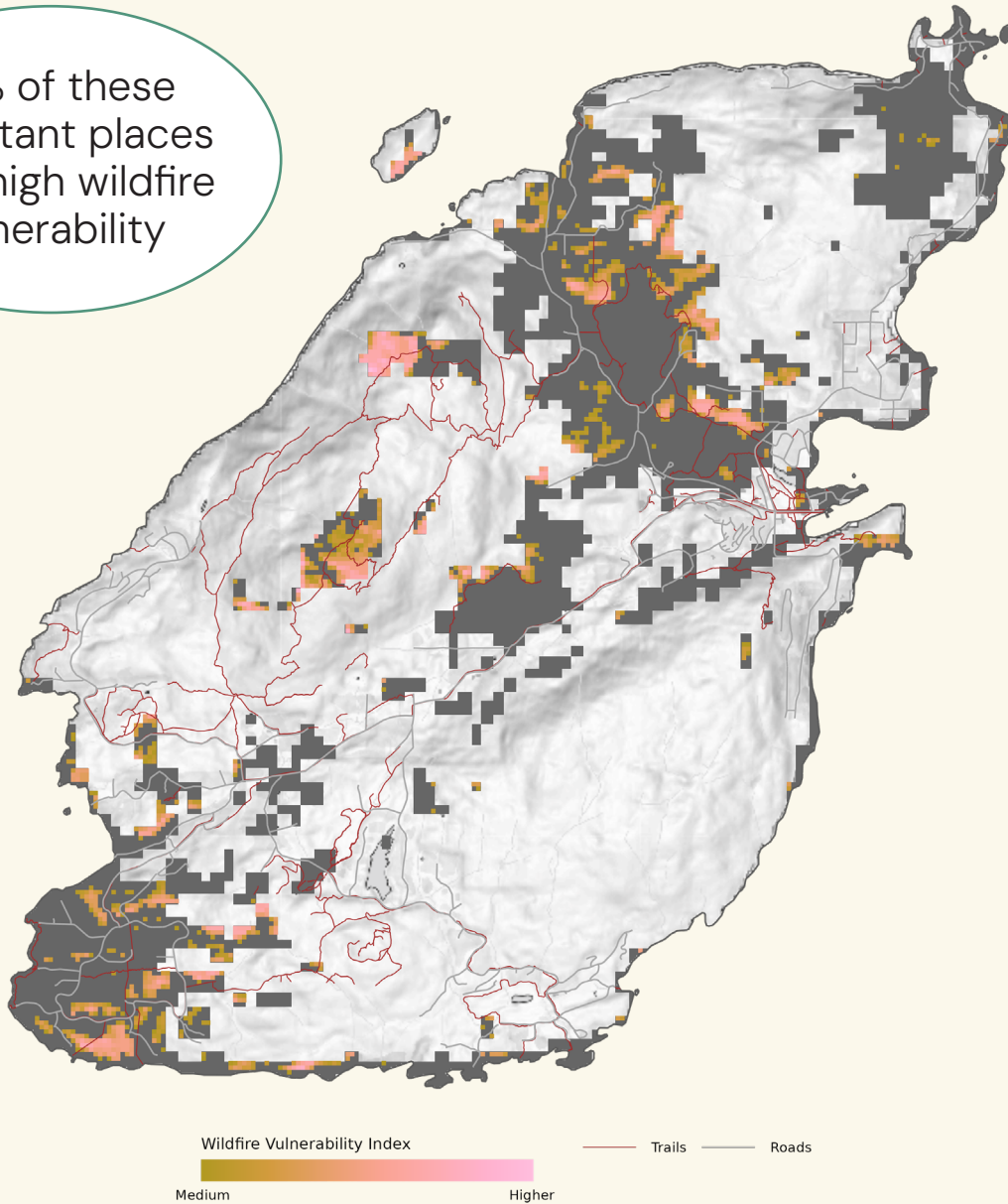
Fires also spread faster when burning up steeper slopes, because fuels are 'stacked', allowing fires to run up-slope more quickly than they spread across flatter areas.

Our index of fire vulnerability cannot predict when or where a fire may start, but history tells us that, in these ecosystems, ignitions are most likely along roads, trails, and areas frequented by humans. Therefore, whether planning for conservation or fire preparedness, we would be wise to pay close attention to locations where high vulnerability to fire intersects well-traveled routes and locations where people often congregate outdoors. Forest ecologists and natural history buffs might also want to examine the overlap between fire vulnerability and patches of remnant old growth forests or other rare or sensitive habitats.

Fire will continue to reshape Bowen's ecosystems as climate change advances. Anticipating its effects allows us to adjust land use decisions and management practices to protect biodiversity and natural values as we safeguard human lives, homes, and infrastructure.

Overlap of Conservation Values & Biodiversity's Vulnerability to Wildfire

26% of these
important places
have high wildfire
vulnerability



Evaluating biodiversity's vulnerability to wildfire can inform policies that anticipate climate warming and its implications for the future.



W. Husby

CONSERVATION ANALYSIS

Highest Conservation Values & Human Development

In the midst of the ‘sixth extinction’, it is worthwhile to explore how the human footprint is likely to grow on Bowen Island, what changes might result, and how residents can help guide future development to protect the natural values that they have consistently identified as preeminent. Similar considerations have influenced development and generated tensions on Bowen since its early heyday as a tourist destination, when steamships brought Vancouver residents to enjoy a relaxed weekend, while timber harvest carved away the natural environment that still underpins Bowen’s tourism economy.

In the latter 20th century, weekend cabins were increasingly converted to primary residences and rental properties. New construction added more year-round housing at a brisk pace that quickened after the COVID-19 epidemic. Today, ongoing development favours higher-end homes and development policies are the subject of considerable debate. As the built environment pushes into natural spaces, affecting groundwater, wetlands, and free-flowing creeks, it is appropriate to ask where future development is most likely to occur and what are the consequences for biodiversity.

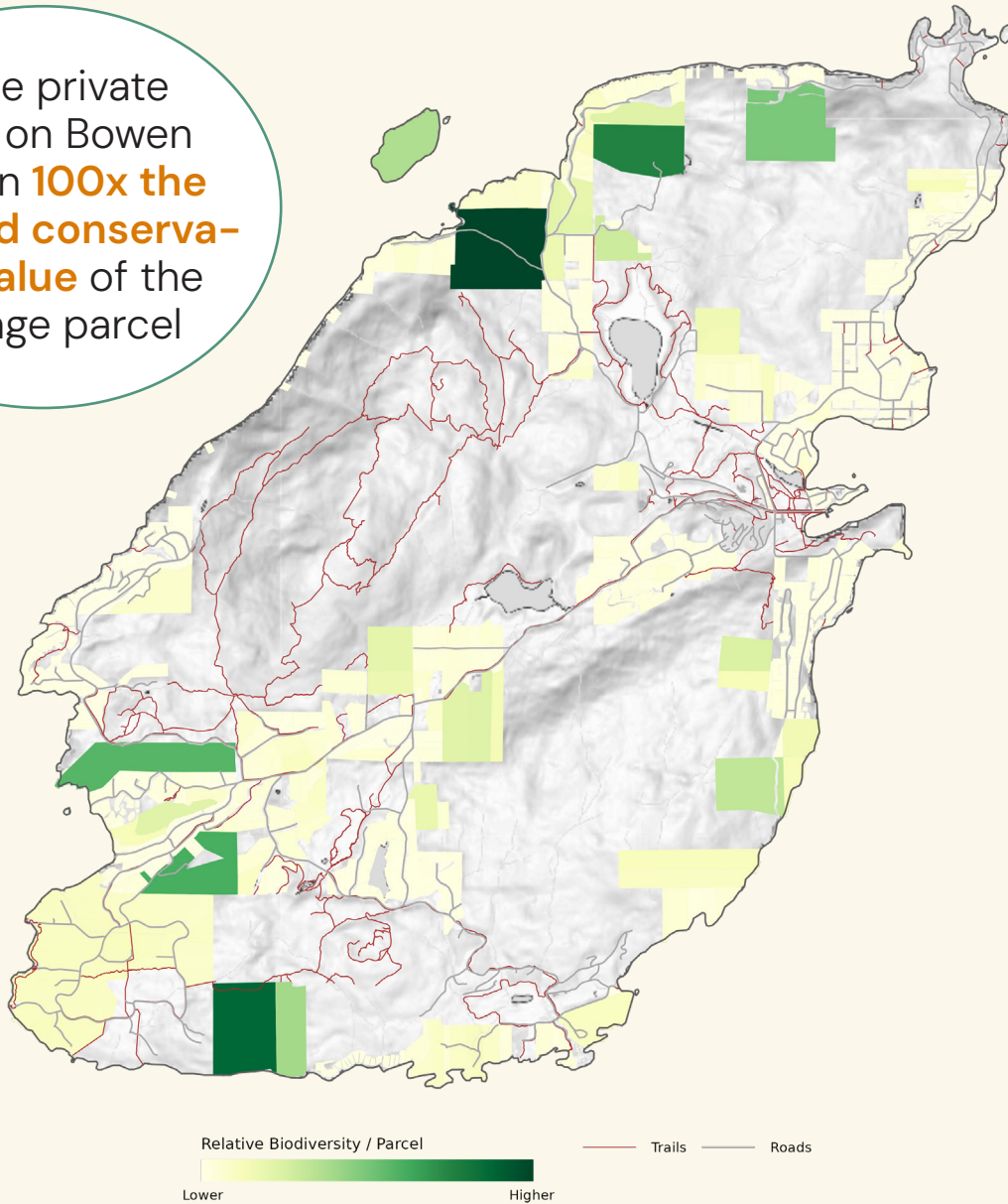
We overlaid our map of development pressure on the map of highest conservation values to see where allowable subdivision and future construction might coincide with biodiversity hotspots. We simplified the depiction of biodiversity value to reflect an uncertain estimate of development pressure. We summed the conservation values of all pixels within a given land parcel, then assigned that value to the entire parcel. The resulting map shows where developable lands overlap with higher conservation values. It is important to note that there is no suggestion here that development is imminent, or that development is necessarily incompatible with biodiversity conservation.

This map can, however, identify areas on Bowen Island where those working to advance conservation might be wise to invest in communication and cooperation with landowners and developers, so that the future of these lands can continue to benefit biodiversity. Respectful relationships have resulted in meaningful conservation outcomes in the Grafton Lake area, Cape Roger Curtis, and elsewhere.

There is reason to believe that, while poorly conceived development of natural habitats poses serious threats to biodiversity, the sharing of information can lead to collaborative planning, important conservation gains, and improved outcomes for Bowen landowners and the community.

Overlap of Conservation Values & Human Development

Some private lands on Bowen contain **100x the summed conservation value** of the average parcel



Areas of potential residential development on Bowen have a wide range of importance to biodiversity when we consider both parcel size and conservation value.



L. Wiljer

PLANNING FOR A BIODIVERSE FUTURE

Candidates for Protection

We used conservation planning algorithms to identify several parcels of Crown Land that could substantially improve Bowen's network of existing protected areas. While this map is provisional and represents an illustration rather than a finished set of objectives, it is clear that expanding protections around Fairy Fen Nature Reserve, high-value areas of Mt. Gardner, and wetlands on Mt. Collins, should be priorities for biodiversity, while enhancing connections to Killarney Lake and Cape Roger Curtis should also receive serious attention.

This map (p. 45) does not provide guidance regarding private or municipal lands, but it illustrates how habitat connectivity among large 'core areas' and other smaller conservation parcels will necessitate engagement with landowners and coordination with the municipality's planning office. Connectivity among 'core areas' ensures that plants and animals have the ability to disperse freely between large blocks of protected habitat.

Creating corridors and reducing barriers to movement increases the conservation value of protected lands by allowing wildlife populations to persist in patches of habitat that, by themselves, are too small for their long-term persistence.

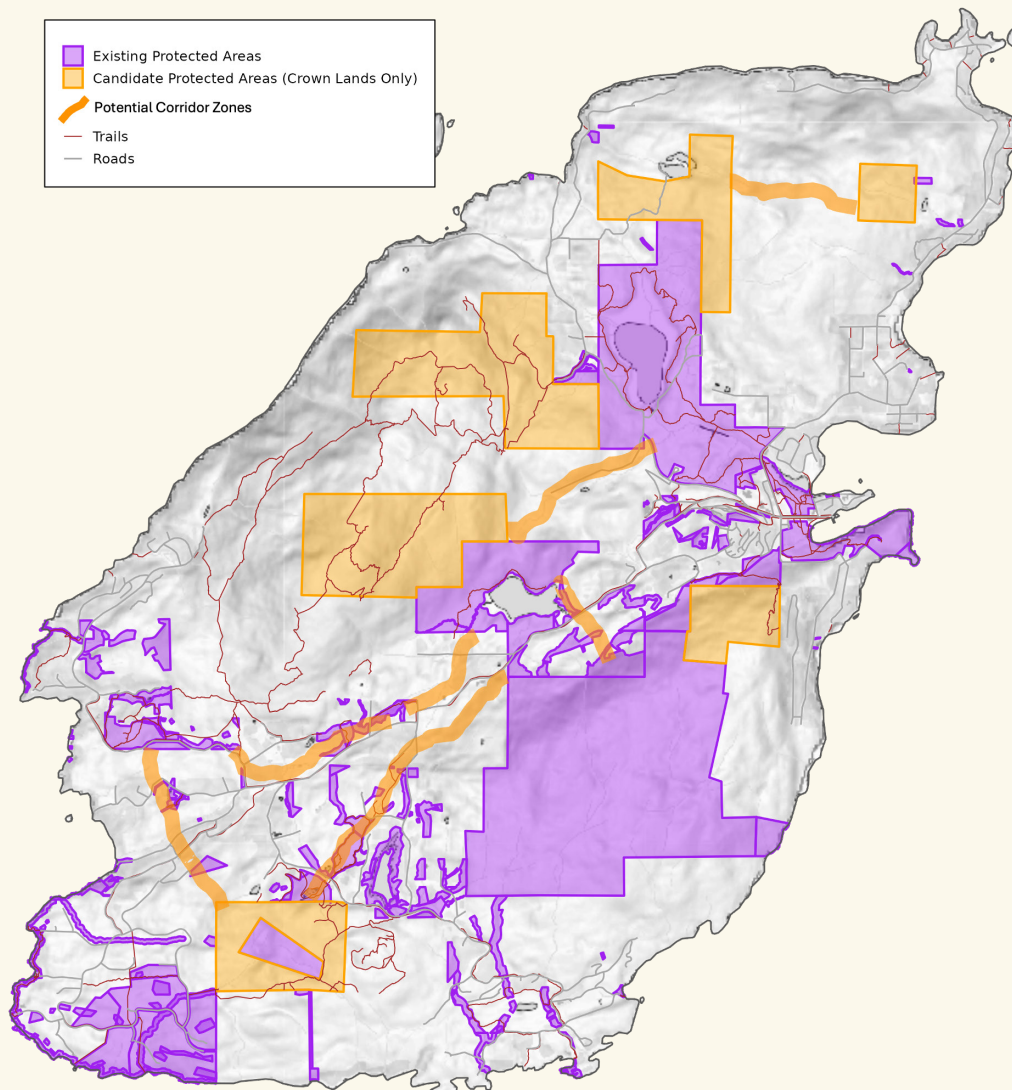
Movement among patches helps sustain biodiversity but, at the same time, steps must be taken to reduce the establishment and spread of undesirable invasive species that might use the same corridors.

These considerations highlight the importance of working directly with landowners, who have the local knowledge and understanding to link stewardship with ambitious conservation goals. Too often, conservation relies on restrictions and set-asides, to the exclusion of local knowledge and broad engagement of the community.

On Bowen, we have the opportunity to build this network from the ground up -- engaging with those who know the land best. At the same time, local groups can coordinate with the Municipality and senior levels of government to advocate for shared conservation goals.

To use one example, connectivity between Killarney and Grafton Lakes is largely intact, but protecting these habitat corridors will involve multiple landowners and the Municipality. Enhancing connectivity from Grafton Lake to the Ecological Reserve and Fairy Fen, and on to the newly protected lands at Cape Roger Curtis is a more complicated objective that will require community engagement as collaborative approaches build trust among private landowners.

Provisional Map of Protected Area Network (30% Goal)



A key benefit of this biodiversity plan is that it identifies places deserving of extra attention and provides evidence to support their protection.

Candidate protected areas shown above are restricted to Crown lands. These candidate Crown land areas and potential corridor zones are intended to illustrate one of many possible conservation outcomes.



D. Huth

PLANNING FOR A BIODIVERSE FUTURE

Stewardship Responsibility

Given the spatially explicit depiction of conservation priorities, it is important to recognize types of land ownership and the different stewardship responsibilities that arise from them. We drew on public data to map ownership and protection status (private, public, protected) for the top 30% of Conservation Values, highlighting the need for cooperation among the people and organizations that hold rights and responsibilities for different areas. Bringing a biodiversity plan to fruition will involve working with all parties to realize the conservation potential of these priority lands and waters.

Crown lands have been managed by the province, in consultation with municipalities and the public, for many years. The Squamish Nation holds rights over its traditional territories, including Bowen Island, and efforts to enhance protections on priority public lands must be guided by their authority as well as that of the province. Crown lands provide the greatest opportunity for the conservation of large areas, as well as for advancing reconciliation while improving sustainability and stewardship. Sharing information is one important way to demonstrate the values held by Bowen residents and our desire to work respectfully on efforts to care for nature across public lands.

Many high value areas for conservation occur on private lands. While smaller, on average, than Crown or other public lands, these parcels are often key pieces in completing the conservation puzzle. The productivity of lowland habitats typically benefits from deeper soils, year-round moisture, and warmer temperatures, making them desirable to both wildlife and people. Where productive habitats remain intact, they can facilitate movement and dispersal of animals, seeds, and spores, connecting larger protected areas and enhancing their conservation value. Many private lands can be managed in ways that increase the value of adjacent conservation areas by buffering the effects of development and providing additional habitat.

Some landowners may choose not to participate in cooperative conservation, while others will embrace opportunities to protect nature, often enhancing property values in the process. This Biodiversity Plan aims to provide a vision and opportunity for parties to work together to implement practical conservation projects that safeguard biodiversity. History shows clearly that these are the kind of initiatives that inspire communities to act boldly by bringing people together around shared values.

Top 30% Conservation Values & Land Designation

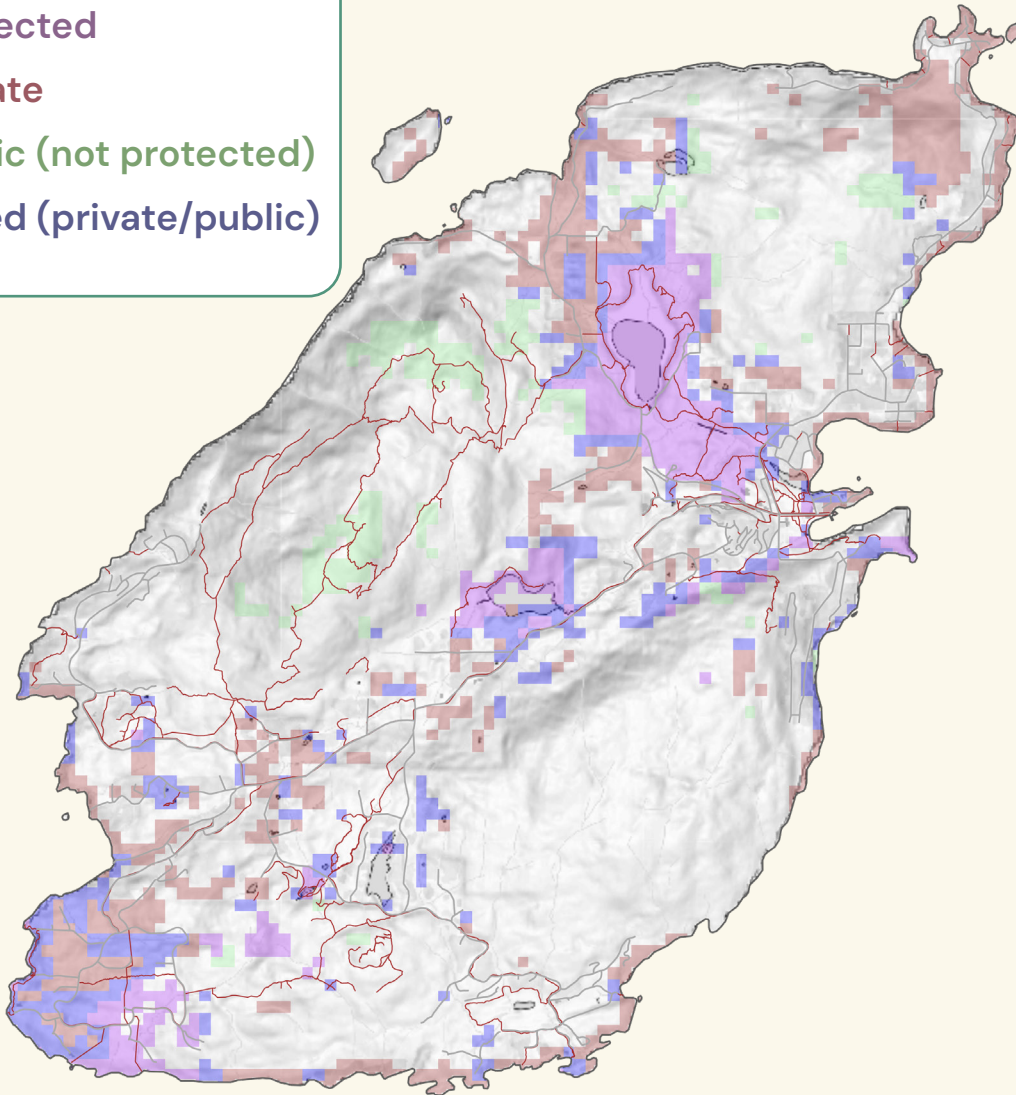
Land Designation:

22% **Protected**

42% **Private**

11% **Public (not protected)**

25% **Mixed (private/public)**



This map illustrates that the future of biodiversity conservation on Bowen Island will be a responsibility shared by the public, private landowners, and government.



L. Gilday

RECOMMENDATIONS

Biodiversity Assessment

This biodiversity assessment has leveraged the best available data to inform the first generation of maps of species richness, threats to biodiversity, and relative conservation values for all lands on Bowen Island. This work has been inspired by public input at a series of structured meetings and workshops held on the island over the past 18 months. Guidance regarding the scientific approach and sharing of data, and feedback on preliminary results have led to a host of findings relevant to the development of an effective, publicly supported conservation strategy for the island. These findings can be organized under three overarching planning recommendations.



1. Adopt Findings in Land Use Planning

Publicly informed scientific analysis, including but not limited to the work presented here, should be recognized formally by the Bowen Island Municipality, Islands Trust, and other governmental entities and nongovernmental organizations as a legitimate and constituent part of all land use and management planning efforts.



2. Advocate for New Protected Areas

Biodiversity planning should use the best science to advocate for new protections on Crown and other public lands that would strengthen the conservation network on Bowen Island. These lands might secure new, high-value habitats, or expand the size and coverage of existing protected areas.



3. Focus on Connectivity

A new effort to secure and enhance connectivity among the larger 'core areas' of habitat will ensure that the network of protected areas achieves maximum conservation value. Connectivity will provide some additional habitat, but its main value is in providing the means for dispersal that allows populations to persist in a network of habitat patches.



T. Sparling

Details provided on the following pages reflect more specific actions through which these three planning recommendations might be achieved.

The Bowen Island Biodiversity Plan strives to provide science-informed guidance to support public deliberation and planning processes that explore multiple scenarios for achieving common conservation goals, most of which have been long-appreciated and established through surveys, meetings, and more general planning efforts, developed over many years by the Bowen Island community.

By developing flexible, collaborative approaches to meet common goals, conservation planning can build trust and a breadth of engagement that matches the diversity of the Bowen community. We are well on our way. Creating a shared vision for the island, and providing the tools for exploring multiple scenarios for advancing that vision, will encourage people to engage in the stepwise process needed for expanding protections and ensuring linkages that will benefit biodiversity as a whole.



T. Sparling



Proposed Actions Recommendation 1:

Adopt Conservation Values maps and related scientific findings into future land use and management planning efforts.

- Incorporate the Conservation Values map as a scheduled map in the forthcoming Official Community Plan (OCP).
- Adopt formal language in the OCP and elsewhere that prioritizes conservation and formalizes Bowen's commitment to protecting biodiversity.
- Commit to incorporating biodiversity data, including but not limited to that provided through this biodiversity plan, in future zoning, land management, and visioning processes.
- Establish a Municipal Biodiversity Database that includes all relevant data from this report and other sources, or secure access through permanent data and map repositories.
- Bolster relationships with regional ecologists and natural historians to facilitate information transfer and scientific review, on an as-needed basis.
- Promote and sustain Bowen Island's stature as a municipality that is acting on its commitment to conserve biodiversity and contribute to regional, provincial, and national conservation programs.

RECOMMENDATIONS

Actions for Implementing the Biodiversity Plan



Proposed Actions Recommendation 2:

Identify and advocate for new protections on Crown Lands that would strengthen the conservation network on Bowen Island.

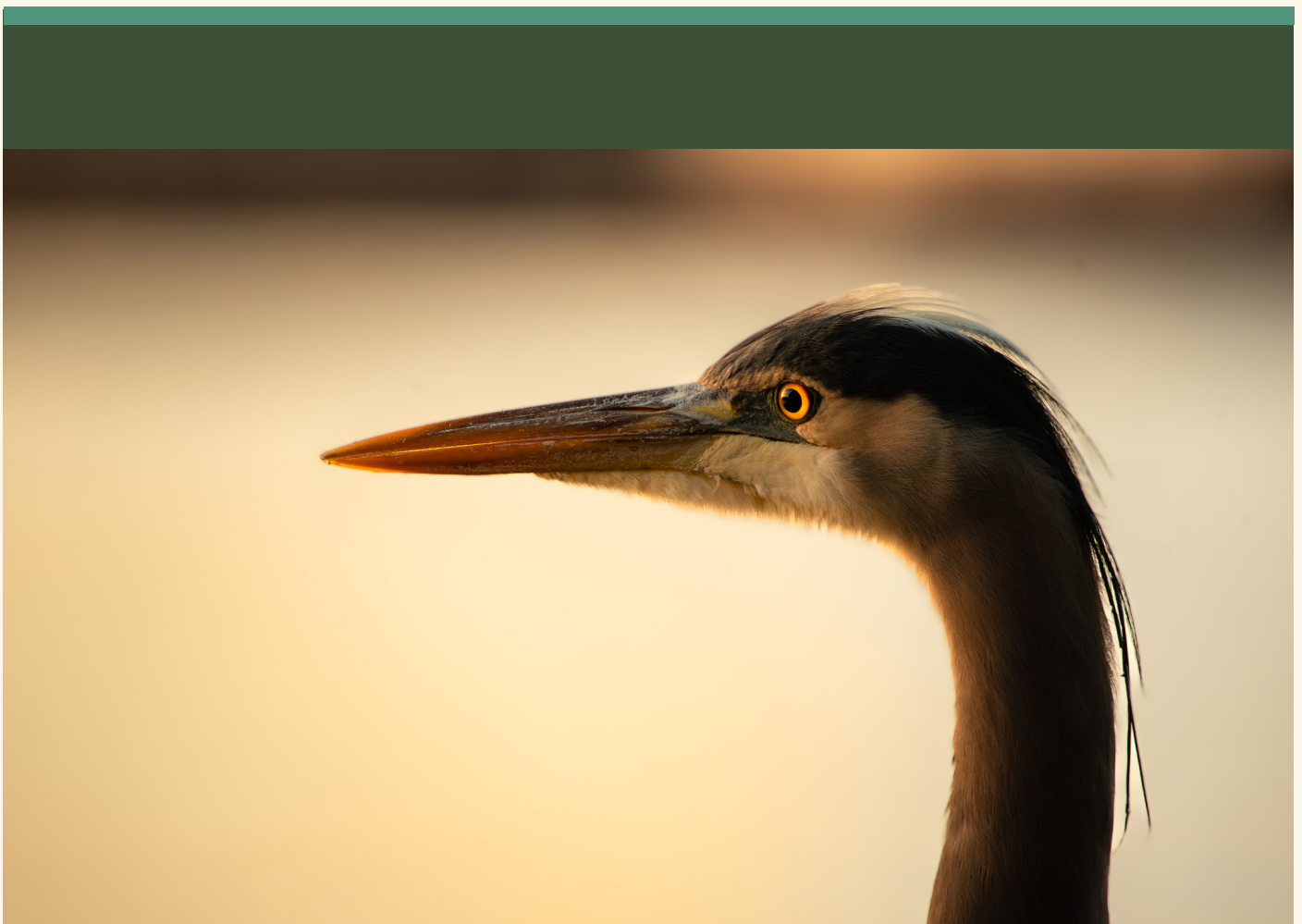
- Work with the province to remove high-value habitat, as identified in our analysis of Conservation Values, from the BC Timber Sales, and pursue land designations that would offer permanent protection.
- Identify high-value lands adjacent to existing protected areas and work toward their inclusion in protected parks and conservation areas.
- Propose protection for new, large blocks of land that are critical for biodiversity, including the remnant old growth and mature forests on Mt. Gardner and Mt. Collins.
- Identify and prioritize protection for perched wetlands on Mt. Collins, and other permanent and ephemeral wetlands across the island.



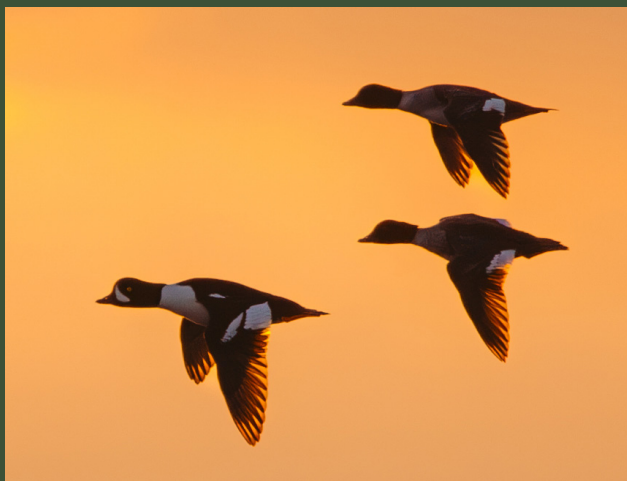
Proposed Actions Recommendation 3:

Enhance and protect habitats that provide connectivity among the island's larger 'core areas' of habitat to increase the value of the conservation network as a whole.

- Identify and map habitat corridors, such as areas along waterways, ridgetops, and remnant forest that link larger protected areas.
- Locate potential barriers to animal movement that degrade connectivity.
- Build community involvement in improving connectivity, focusing on the values, concerns and needs of private landowners who are the stewards of many of these potential wildlife corridors.
- Develop support and incentives for landowners to partner with the municipality and community organizations on agreed-upon actions to enhance connectivity.



T. Sparling



T. Sparling

A FINAL WORD

It's surely our responsibility to do everything within our power to create a planet that provides a home to not just us, but for all life on Earth

-- David Attenborough

This Biodiversity Plan for Bowen Island is a living document rather than a final product. The maps and analyses presented here are grounded in the best data currently available, analyzed using statistical techniques that make the most of this information. The underlying scientific effort benefitted from collaboration among teams of researchers and naturalists willing to share data and provide input at multiple steps in the plan's development. This cooperative spirit is baked into an analytical approach that allows new information to be incorporated with relative ease, making future analysis faster and more informative. The objective is to provide detailed information that is accessible to all, in a format that facilitates mobilizing the best data to address the most important challenges, now and in the future.

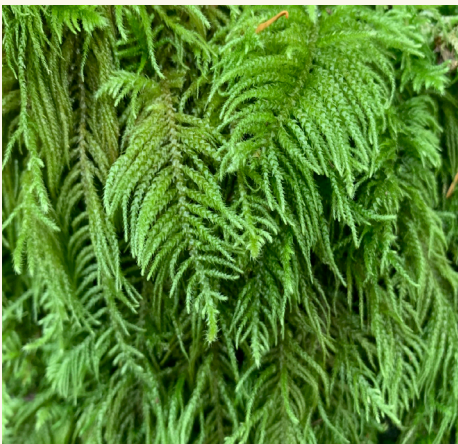
To this end, we have built alongside this plan, a digital data atlas. This public resource makes maps and data available to all (see p. 55), and analytical tools make overlays easy. In combination, the biodiversity plan and data atlas provide transparency and invite new questions, diverse perspectives, and deeper deliberation of conservation planning. In this way, science can inform public discourse and encourage collaborative approaches to conservation planning.

The residents of Bowen Island have continuously voiced their commitment to protecting nature. It is why people visit our island. It is why we live here. Protecting nature should not be controversial. It should not pit one interest group against another, or incite fear or uncertainty about the future. Instead, conservation efforts should bring people together around shared values and empower them to find acceptable tradeoffs and creative solutions to common challenges.

This document cannot provide explicit solutions, and it does not advocate for a prescriptive policy for conservation. It does illuminate patterns, provide facts, and supply the ecological context for adopting a plan that will bring biodiversity values into consideration alongside other public priorities. Biodiversity deserves action as well as acknowledgement. Conservation is an elusive goal that evokes our highest values. Sustaining the diversity of life on our small island requires more than hope or a paper plan; it demands actions guided by inclusive decisions that are informed by our shared values and the best information available.

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A. Williams

Red-breasted Sapsucker, *Sphyrapicus ruber*