

Healing Harmoniously through a Community-Based Ecosystem on Cape Breton Island, Nova Scotia

by

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Dalhousie University is located in Mi'kmaq'i,
the ancestral and unceded territory of the Mi'kmaq.
We are all Treaty people.

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Contents

Abstract	iv
Acknowledgements	v
Chapter 1: Introduction	1
Anthropocentrism	1
A Shared Stewardship	6
Two-Eyed Seeing	9
Thesis Objective	14
Chapter 2: Island Individuality	15
Cape Breton Island (Unama'ki), Nova Scotia	15
The Cabot Trail	17
The Margaree River	20
Sugarloaf Mountain Wilderness Area	22
Ethnographic Approach	24
The Local	24
The Student	24
The Visitor (Tourist)	24
The Resident (Patient)	24
The Support	25
The Animal	25
Representing the Island's Vernacular	28
Roof Form, Slope, and Assembly Information	29
Foundation Types	31
Materiality Explorations	32
Sliding Barn Door and Window Coverings	33
Chapter 3: The Wellness Center	34
Situating Site	34
Biophilic Design	37
The Central Hub	41
The Crafting Barn	43
The Community Kitchen	47

The Animal Sanctuaries.....	52
The Central Animal Barn.....	52
Moose and White-Tailed Deer	57
Freshwater Wetland.....	62
Black Bear and Lynx.....	64
The Forest Bathing Complex.....	66
The Clustered Cabins.....	69
Hiking Trails and Overnight Refuge.....	71
Seasonal Variation.....	74
Chapter 4: Conclusion	76
References	77

Abstract

In Western and industrialized societies, cities, buildings, and industries are often more valued than the natural world. This is an unfortunate legacy of anthropocentrism. The industrial era has only exacerbated the human-nature divide, separating the human from natural rhythms by accelerating the speed and intensity of living through the use of fossil fuels, while subjecting to stress and anxiety from urbanization. Today, people look to the wilderness for inner peace that is difficult to find in a city. This project proposes a Wellness Center on Cape Breton Island designed as a community where humans, animals, and nature may coexist in harmonious relation. Using the concepts of Shared Stewardship, Two-Eyed Seeing, and Biophilic Design, this thesis looks to heal the human-nature divide through design as an ecosystem comprised of human, animal and plant communities. The program's core elements are to learn, grow, teach, and heal in harmony with our natural surroundings.

Acknowledgements

I am not of Mi'kmaq descent. However, this thesis incorporates knowledge and an appreciation for Indigenous culture, spirituality, and tradition specifically related to Unama'ki, Nova Scotia. Thank you for allowing my research objective to be influenced by and closely connected to the natural world.

I would first like to thank my thesis committee, Christine Macy and Peter Austin-Smith, for their constant curiosity, in-depth knowledge, and determination throughout this thesis project. Your constant commitment and excitement for not only architecture, but nature alike, created a flexible space to explore my research to its fullest capacity.

Thank you especially to my parents for their endless love throughout my university journey. You were able to make the toughest of times feel safe, while never doubting who I am in the world of creativity. I am and always will be extremely proud of the both of you.

Chapter 1: Introduction

Anthropocentrism

Contemporary Western and industrialized societies in cities, buildings, and industries is often valued more than our natural surroundings; viewed solely from a human-centered perspective, known as anthropocentrism.

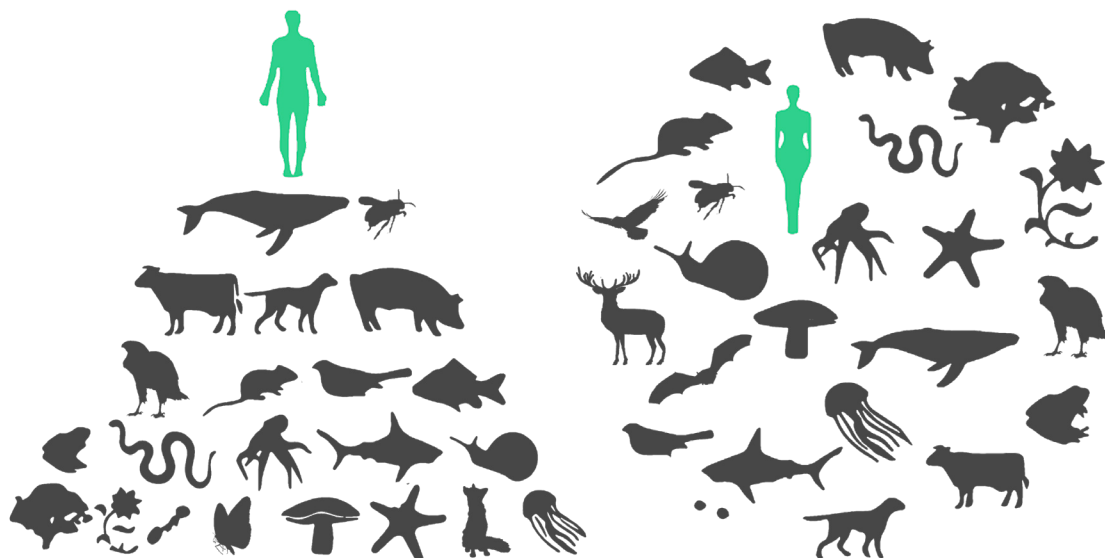
In traditional societies more closely tied to the rhythms of the natural world, architecture was often conceived of in relation to nature – made of local materials, oriented to the movement of celestial bodies, and utilizing the force of water, wind, and gravity for functionality and durability. This thesis argues that such an approach similarly promotes well-being, encourages spirituality, and is connected to symbolic beliefs.

Currently,

we are not only living separate from a sense of unity with nature, but in a time of multiple interconnected crises – economical, political, and environmental. Our outer lives exist in a world that is unraveling around us in all directions, leaving us tired, confused, and uncertain of what the future holds. (Van der Ryn 2013, 124)

When did we agree that diminishing the power of nature was acceptable?

Now more than ever, we must encourage the use of nature-centered values, known as ecocentrism. An ecocentric lifestyle imagines architecture and nature as equal players in the world of design.



Anthropocentric (left) versus ecocentric (right) diagrams as a comparative research analysis

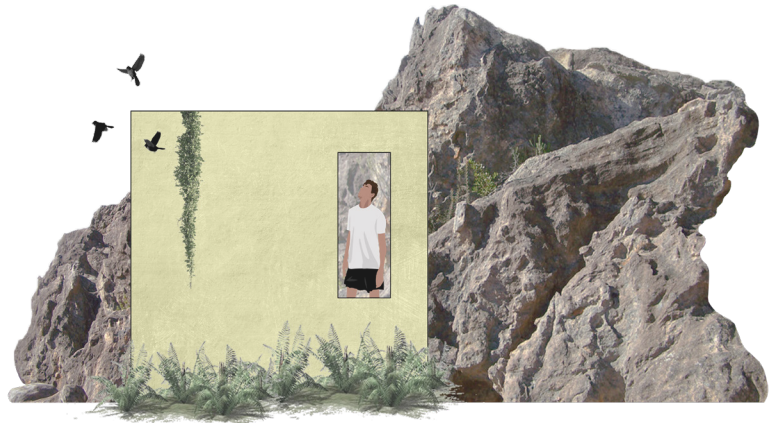
Modern society continuously disconnects us from nature. A rushed lifestyle, the prioritization of work over play, industrial cities reliant on fossil fuels, the focus on technology, and the constant push for social media interactions have all contributed to significant mental health problems, including loneliness, anxiety, and depression.

As humans, we are subconsciously trained to not be weak, and that success is the pathway to a good life. Unfortunately, the build-up of pressure makes our mental health and well-being fragile, affecting our mind, body, and soul. More than often, we must take a step back from reality to breath, reflect, meditate, and heal.

Denis Cosgrove believes that

humans were created to live in nature, and that nature was designed to teach them how to properly do so. We intervene with the on-going growth of the world, and for our natural environments to maintain their beauty and harmony, we must oblige humbly to observe the signs and symbols written into nature. (Cosgrove 1998, 247)

Since the beginning of the industrial era, humans have searched for inner peace that is difficult to find in a city atmosphere. This continues today as people are constantly looking to the wilderness for relief of stress and anxiety.



Initial thesis wish image collage

We need nature to nourish ourselves, to bathe, build, learn, forage, and survive. To support well-being in a community, architecture must incorporate and work with the knowledge of what nature possesses in shaping the built environment.

Architecture too, can be explored to cultivate and nurture well-being by directly incorporating the use of nature into the overall context for the design.

Yet, architect Juhani Pallasmaa reminds us

that the ultimate meaning of any building is beyond architecture; it directs our consciousness back to the world and towards our own sense of well-being. Significant architecture makes us experience ourselves as complete embodied and spiritual beings. (Pallasmaa 2012, 11)

National and Provincial Parks, nature preserves, and designated Wilderness Areas attract tens of millions of visitors annually, seeking release from negative emotions.

In the Maritimes alone, these Parks attract more than 1.5 million visitors each year, making them a significant asset, economically, environmentally, and socially.

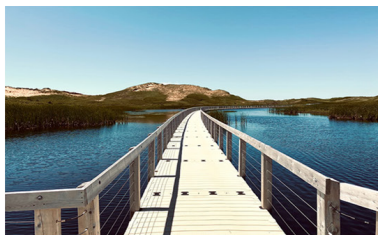
While an important goal of these natural areas is to conserve biodiversity, all too often, visitors' ignorance of natural ecosystems and sometimes, their lack of respect for it, causes a domino effect of ecological damage.

Christine Macy and Sarah Bonnemaïson explain in *Architecture and Nature* how unfortunately, "these parks are primarily set aside for the enjoyment of the people. And as people assume control, these natural environments become giant playgrounds for urbanites, who desire contact with the wilderness – a contact expected to take place within a safe, controlled, and protected setting" (Bonnemaïson and Macy 2003, 71).

Recognizing that ecosystems and organisms continuously change and evolve over time, architecture too, should be adaptive in its detail and construction to self-heal, self-organize, and self-evolve. For this type of architecture to be established, empathic design must be used from beginning to end for the project's entirety.

Designing with empathy implies that we as architects must keep all users in mind throughout the design process. *Culture, Architecture and Nature: An Ecological Design Retrospective* by Sim Van der Ryn, indicates that empathic design in relation to architecture and landscape, must begin with the particularities of place; culture, history, climate, topography, water, vegetation, and ecology (Van der Ryn 1996, 92; 2014, 9).

Expectations (eco)



Reality (ego)

Human hierarchy

Ecosystem disruption



(Guardian News 2022)



(Salt Lake Tribune 2021)



(Sandler, Howard)



(Guardian News 2022)



(Nottingham University 2022)



(Learn 2013)

Species endangerment



(Conserving the Nature of the Northeast 2019)



(InsideHook 2022)

Damage to natural surroundings due to humans' lack of knowledge of or empathy for ecosystem adaptation

Stephen R. Kellert thoroughly explains how architecture should be influenced by nature:

to consider the service of architecture as something other than human seems contradictory to its very inception, for it was human-nature that first gave form by compelling the human to build. If we are to consider whom architecture should serve and re-establish the relationship between architecture and humanity, then we must consider the essence of human-nature and grasp how human beings came to create varieties of structures. (Kellert 2008, 65)

A Shared Stewardship

Peter Austin-Smith, for many years a wildlife biologist with Nova Scotia's Department of Natural Resources (NSDNR), describes a shared stewardship as "maintaining control and conservation for natural resources in a way that takes a comprehensive balanced approach for the interests of society, community, culture, generational growth and species development" (Austin-Smith 2018, 3).

In 2011, the NSDNR introduced five goals as an initiative towards balancing the province's future (NSDNR 2011):

1. to collaborate, create, and innovate a mutual accountability between all independent allies,
2. to strengthen our capacity to learn by sharing research and knowledge,
3. to educate the visitor to deepen their understanding of culture and habitat as an appreciation,
4. to (re)-create nature-based facilities providing healthy methods of research and exploration, and
5. to protect natural surrounding resources and heritage.

The Nova Scotia's Department of Natural Resources suggests that people must do more than advocate for their own interests; they need to collaborate to find common

ground and achieve a healthy balance in the choices they make and the actions they take.

Stewardship can only be achieved if this is a shared vision – between government, settler, Indigenous communities, local industries, and visitor – committed to work together in collaboration (NSDNR 2011, 16).

In doing so, stewardship will improve our understanding of how to do better, as well as our ability to directly improve ecosystems, wetlands, forests, biodiversity, habitats, protected wilderness areas, and wildlife zones. By healing the earth, we are healing ourselves, and often the participants will additionally experience spiritual satisfaction when nature is restored to its fullest.

How might architecture establish a relationship with not just humans, but with every living being?

The Native Council of Nova Scotia advises that in order to “exist and survive in harmony with the universe, we believe that it is essential to have all-encompassing relationships with the universe and an understanding and respect for all living beings” (Native Council of Nova Scotia 1994, 7).

Unfortunately, harmony between human and non-human life has been damaged by Western society’s intellectual heritage of dualism, anthropocentrism, and colonialism; all of which impede its willingness to learn about the interconnected and reciprocal dependencies of the natural ecosystem.

For the Mi’kmaq, land and life are not commodities to exploit; in fact, heritage, community, and knowledge are constituted through harmonious co-existences with the Earth, its material substance, and its living creatures.



Collage exploration of a shared stewardship and two-eyed seeing working in-tandem

Two-Eyed Seeing

In 2004, Mi'kmaq Elders Dr. Albert and Murdena Marshall coined the term *Etuaptmumk*, which in English translates to Two-Eyed Seeing. From the Aboriginal community of Eskasoni in Unama'ki, Albert Marshall has been a key contributor to both the Unama'ki Institute of Natural Resources and the Unama'ki College at Cape Breton University (CBU).

The Marshalls describe two-eyed seeing as the gift of multiple perspectives; using one eye to see the strengths of Indigenous knowledge, while using the second eye to see the strengths of Western (mainstream) knowledge. Weaving together the ways of knowing for these 'two-eyes' will create a deeper and more regenerative perspective on research, tradition, culture, science, and education.

Seven 'Lessons Learned' were introduced at an international science conference in 2008 by the Marshalls and Cheryl Bartlett (professor at CBU) as a template for successfully combining Indigenous and mainstream knowledge (Bartlett, Marshall and Marshall 2012):

1. Acknowledge that we need each other and must engage in a co-learning journey,
2. be guided by the beliefs of Two-Eyed Seeing,
3. view 'science' in an inclusive way,
4. be creative,
5. put values, actions, and knowledge in front of us for proper examination and discussion,
6. weave back and forth between our separate worldviews,
7. and develop a community of willing and knowledgeable members, drawing from both educational institutions and Indigenous traditions.

Marilyn Iwama, of Metis and Mennonite descent, explains in *The Canadian Journal of Native Education* that

two-eyed seeing adamantly, respectfully, and passionately asks that we bring together our diverse ways of knowing to motivate Aboriginal and non-Aboriginal people alike. To use all of our understandings so that we can leave the world a better place, and to not compromise the opportunities for future generations to come. (Iwama, Marshall and Marshall 2009, 5)

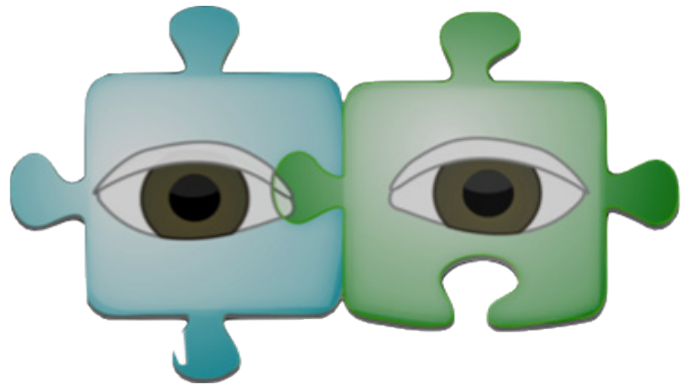
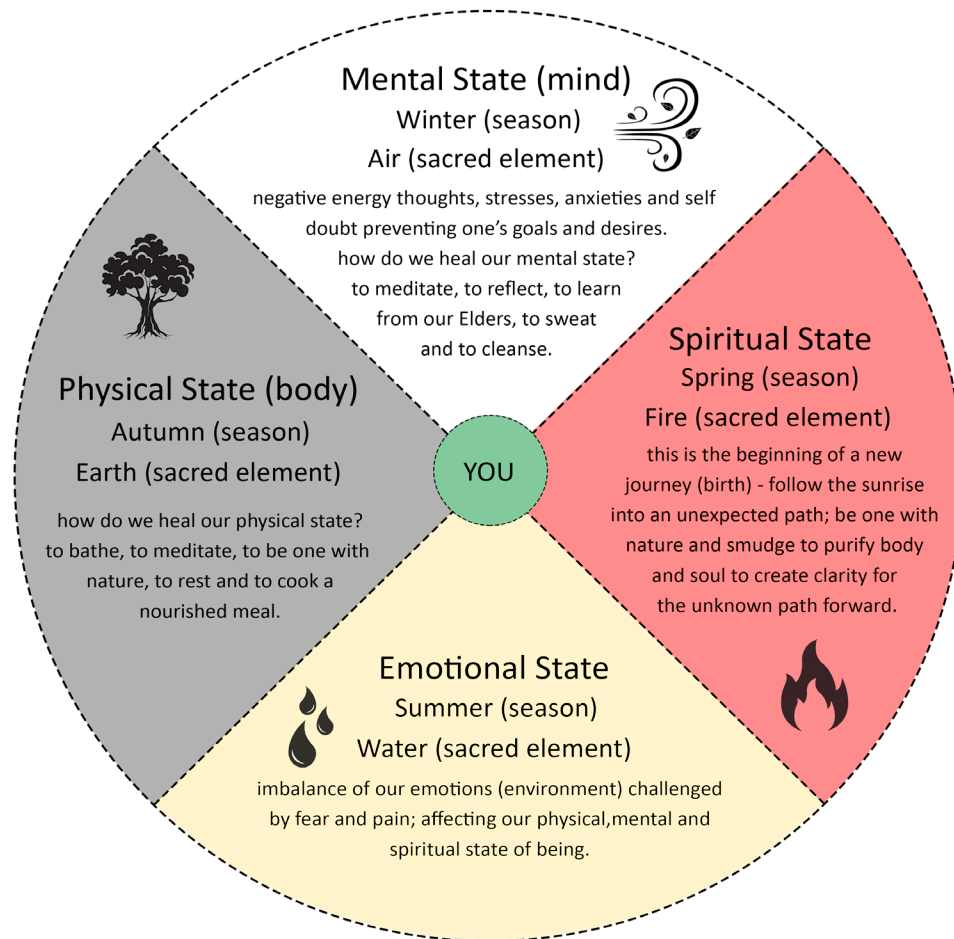


Image by Basma Kavanagh of two-eyed seeing (Institution for Integrative Science and Health n.d.)

Albert Marshall recognizes that the privilege of Western Science tends to de-emphasize the elements of human and animal, however, its technologies are crucial to maintaining our modern ways of living. Nevertheless, science needs to learn to factor both the human and animal throughout its research and technologies as a way to rediscover our humility as but one species on this planet (Institution for Integrative Science and Health n.d., 4).

When merging Indigenous and traditional (western) ways of knowing and being, co-existence, interconnectedness, and community spirit are key concepts introduced for understanding how to create relationships and an overall well-being between all species and our Earth.

For the Mi'kmaq, an example of well-being through Etuaptmunk is the medicine wheel, offering reason for integrating indigenous knowledge as part of the mainstream healthcare profession as it provides innovative qualities that are not typically suggested for patients with mental, physical or addiction concerns. The medicine wheel is a cyclical, holistic tool used throughout Indigenous communities across North America as a healing practice encompassing all aspects of life, mind, body, spirit, and emotion – creating a balanced self. Love, honesty, humility, respect, truth, patience, and wisdom are the seven sacred gifts that must be utilized in order to redeem balance.



Medicine wheel interpretation as a holistic tool in combination with Indigenous knowledge and traditional knowledge; information sourced from Butch Thunderhawk's video lessons (Thunderhawk 2009).

Stress is something all humans experience, affecting the physical, mental, and emotional. This issue creates a significant impact towards a person's overall health. The four quadrants of the medicine wheel define each independent phase of mental rehabilitation (Tribal Trade 2021).

Artist Butch Thunderhawk states that

our Creator made elements of nature to be in the form of a circle or to move in a circular path. A circle connects animals, humans, and spirits as one. This shape represents unity and strength – no beginning or end, but a continuous path for knowledge and understanding. (Thunderhawk 2009)

The proposed Wellness Center will harvest resources without jeopardizing the integrity, diversity, or productivity of the island's environment through architecture. Combining the philosophies of stewardship and *etuaptmumk* will provide a space to share knowledge of and devotion to protect, preserve, and promote the earth with a two-eyed approach, mobilizing a connection between Western scientific ways of knowing and Indigenous holistic knowledge as an ethical responsibility.

Elder Dr. Albert Marshall specifies that “there is a constant need to (re)-awaken our human consciousness in order to understand that the health and rehabilitation of humans is directly tied to the well-being of our Earth Mother” (Iwama, Marshall and Marshall 2009, 4).

Seven Characteristics for a Relevant Empathic Design Today (Van Der Ryn 2013)

1. Move Away from a totally Human-Centered View of the World
2. Understand the Synergy between Nature and Human Nature
3. Appreciate the Interconnectedness of the World
4. Use Principles of Living Systems in Architecture Projects
5. See Ourselves as Continual Learners and Avoid Hubris (excessive pride)
6. Encourage Dialogue and Ask Deeper Questions of Thinking and Doing
7. Recognize the Role of Spirit and Love in Everything We Accomplish

Ten Western Worldviews for a Place-Based Relationship (Kellert, Heerwagen and Mador 2008)

- | | |
|-----------------------------------|---------------------------------------|
| 1. Geographic Connection to Place | 6. Historic Connection to Place |
| 2. Ecological Connection to Place | 7. Cultural Connection to Place |
| 3. Indigenous Materials | 8. Landscape Orientation and Features |
| 4. Landscape Ecology | 9. Integration of Culture and Ecology |
| 5. Spirit of Place | 10. Avoiding Placelessness |

Seven Two-Eyed Seeing (*etuaptmumk*) Characteristics (Bartlett, Marshall and Marshall 2012)

1. Acknowledge that we need each other and must engage in a co-learning journey,
2. be guided by the beliefs of Two-Eyed Seeing,
3. view 'science' in an inclusive way,
4. be creative,
5. put values, actions, and knowledge in front of us for examination and discussion,
6. weave back and forth between separate worldviews, and
7. develop a community of willing and knowledgeable members.

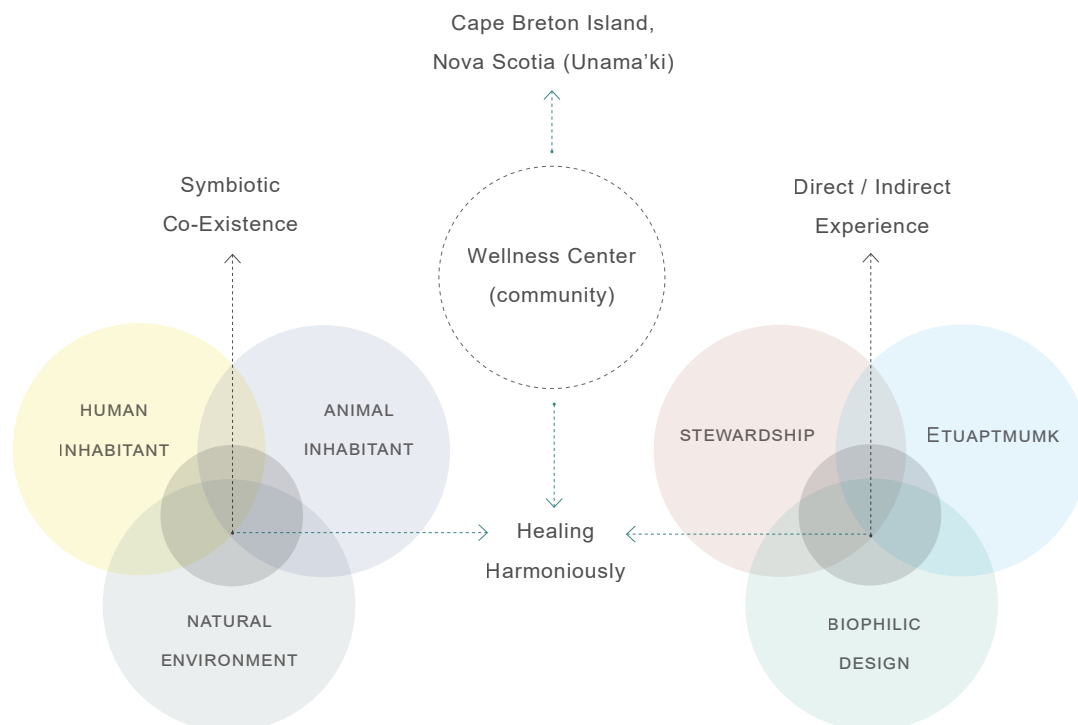
Five Goals for Maintaining a Shared Stewardship (NS Department of Natural Resources 2011)

1. to collaborate, create, and innovate a mutual accountability between all allies.
2. to strengthen our capacity to learn by sharing research and knowledge.
3. to educate the visitor to deepen their understanding of culture and habitat.
4. to (re)-create nature-based facilities providing healthy methods of research.
5. to protect natural surrounding resources and heritage.

A comparison of Empathic Design, Place-Based Relationship considerations, Two-Eyed Seeing characteristics, and a the concept of a Shared Stewardship

Thesis Objective

Healing is a process which all beings experience, but the path to well-being is more difficult to achieve. This project proposes a Wellness Center on Cape Breton Island as a model for a community of symbiotic co-existence for humans, animals, and nature, to promote the health, wellness, and growth of all. Incorporating Nova Scotia's Department of Natural Resources' concept of a "Shared Stewardship" as the basis for this project, to create a connection between all island inhabitants, their culture, traditions, and contributions towards conserving the natural. The key design principles explored are Elder Dr. Albert Marshall's concept of "Two-Eyed Seeing" and Stephen Kellert's concept of "Biophilic Design." These philosophies suggest an approach to creating a community-based ecosystem as a path to learn, grow, teach, and heal harmoniously with our natural surroundings.



Representative diagram indicating the possible connection between island inhabitants, the philosophies explored, and overall design characteristics

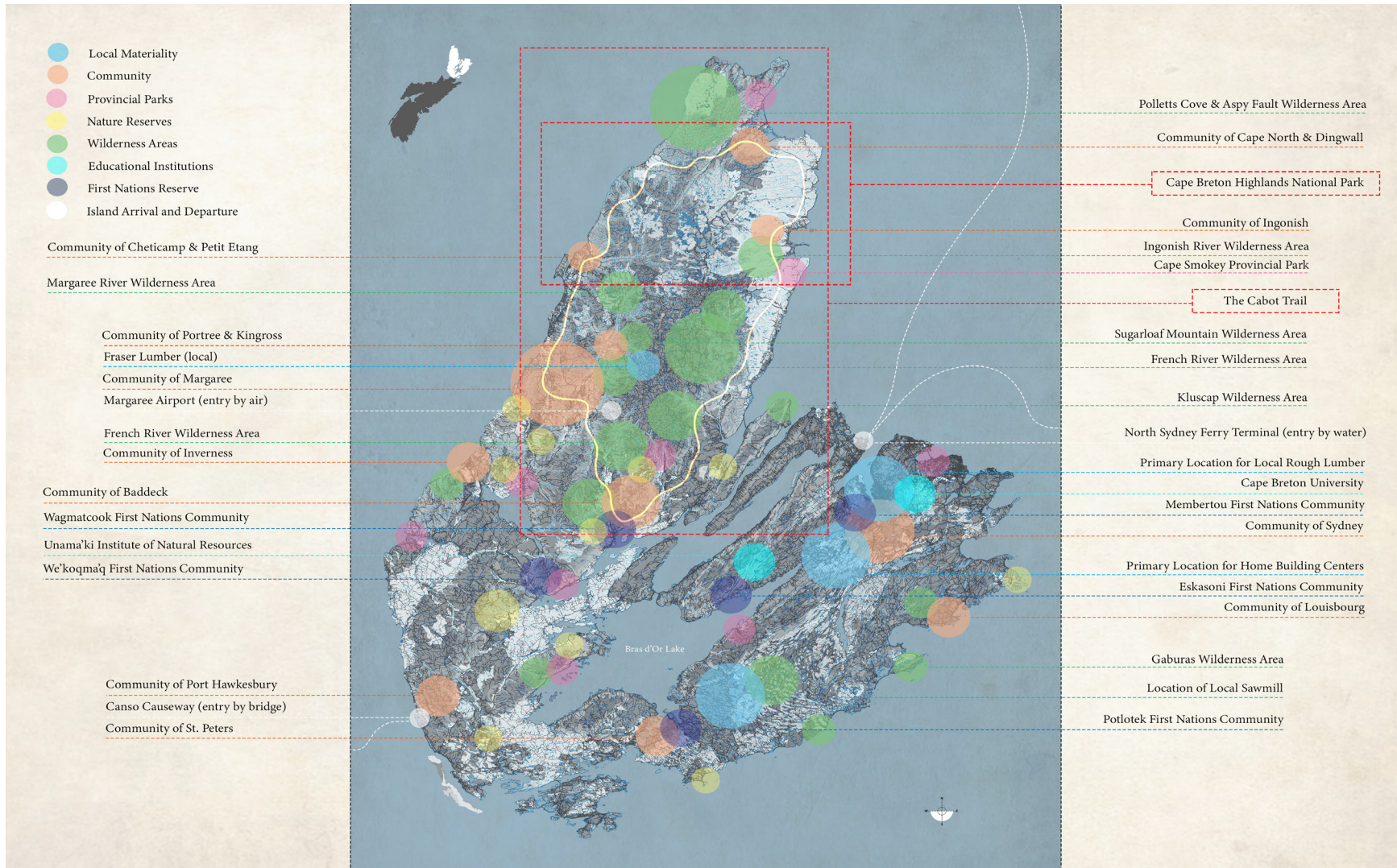
Chapter 2: Island Individuality

Cape Breton Island (Unama'ki), Nova Scotia

Cape Breton Island, the Mi'kmaq district of Unama'ki, is situated at the easternmost point of Nova Scotia. The natural aesthetics of this island is a combination of dramatic coastal views, rocky shores, rolling farmlands, glacial valleys, meandering highlands, and cultural awareness; but most specifically, for the world-renowned Cabot Trail. The phenomenological attributes of the island's biodiversity are extremely important to maintain local, tourist, and wildlife growth.



Overview mapping of Cape Breton Island, Nova Scotia; created on ArcMap, using ArcGIS datasets (Government of Nova Scotia 2021)



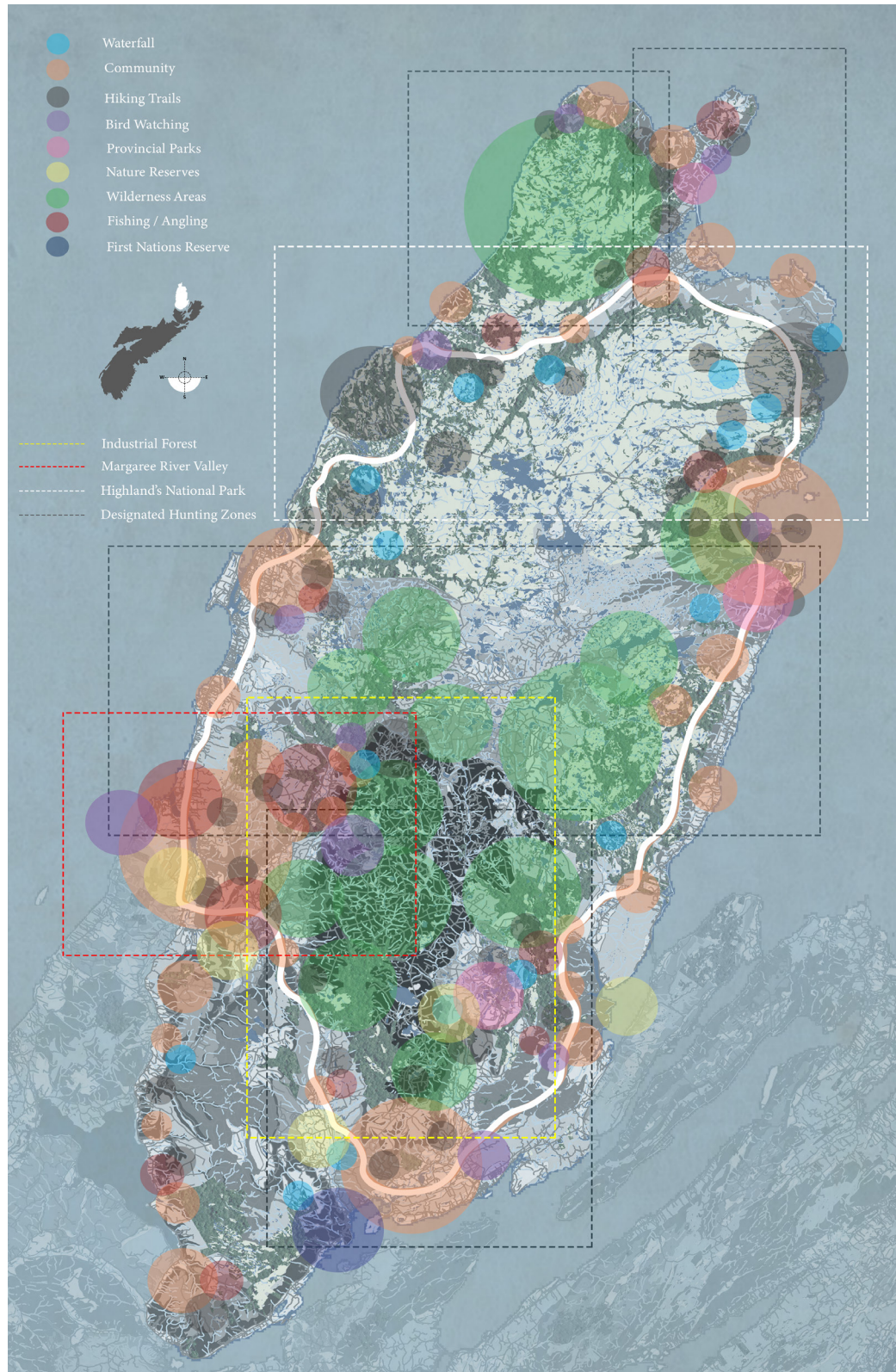
Mapping the overview of essential designations on Cape Breton Island; including National and Provincial Parks, protected wilderness areas, communities, points of arrival, wildlife zones, and reserves; created on ArcMap, using ArcGIS datasets (Government of Nova Scotia 2021)

The Cabot Trail

The Cabot Trail is a 300 km road that circumnavigates the north-western tip of Cape Breton Island, passing through fishing villages, natural phenomena, historic communities, and the Cape Breton Highlands National Park - attracting over 300,000 visitors annually. Establishing a diverse combination of tourist, local and animal will provide clarity for determining a proposed site for the Wellness Center; directly on or in close proximity The Cabot Trail.

Therefore, a finer-grained mapping analysis was undertaken to identify the zones and concentrations of a variety of land uses and activities, including community centres (villages), scenic sites (such as waterfalls), and points where human seek out encounters with nature (such as bird watching, fishing, angling, hiking, and hunting).

The objective was to identify independent zones where diverse uses overlap, so that the design of a Wellness Center could explore the potential to mediate or negotiate between different, sometimes oppositional, uses. The area resulting in the most overlap is located south-west of the island, known as the community of Margaree River.



Mapping the overview of essential designations for The Cabot Trail; Mi'kmaq reserves, communities, National and Provincial Parks, protected wilderness areas, natural features, wildlife interactions, and industrial forests; created on ArcMap, using ArcGIS datasets (Government of Nova Scotia 2021)



(Moffatt 2019)

(Tourism Nova Scotia 2020)



(Tourism Nova Scotia 2021)

(Live Life in Tents n.d.)



(Iron Lodge and Wilderness Cabins 2022)

(Destination Cape Breton Association Inc. 2022a)

Place-Based Relationships; The Cabot Trail, Cape Breton Island, NS

The Margaree River

The Margaree River stretches 120 km between three individual natural settings: harbour, valley, and highland. These distinctive locations were categorized based on character, culture, and climate. Designing a community-based ecosystem requires an adaptive natural environment as diverse as possible. Towards the upper reaches of Margaree, where the valley begins to be enclosed by the highland, is Sugarloaf Mountain Wilderness Area, situated adjacent to the small village of Portree.



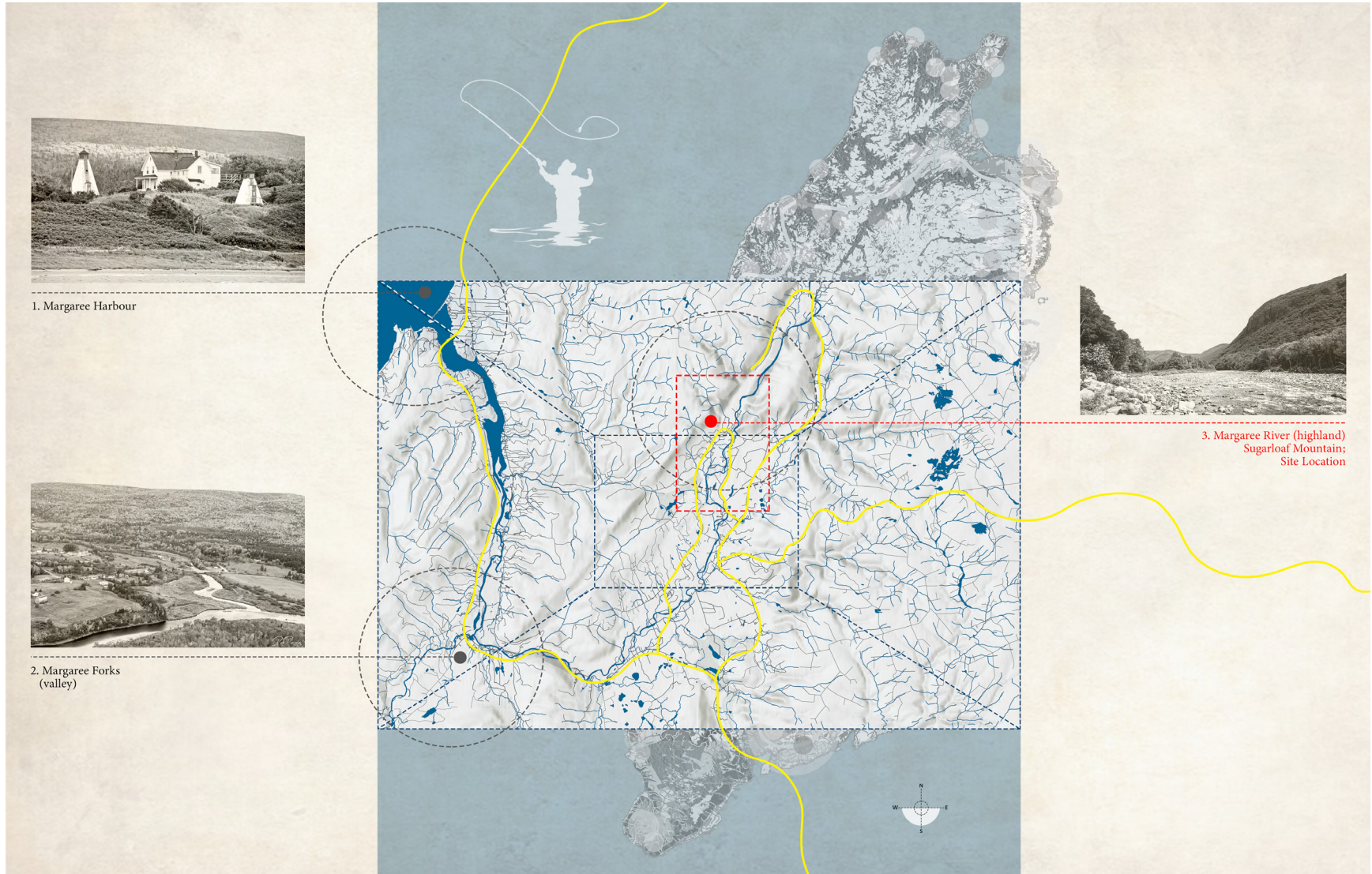
Cape Clear Lookoff (Pettersson 2019)



Margaree River Valley (Moffatt 2019)



Margaree River Salmon Pools (NovaScotia.com 2021)



Mapping the overview of the Margaree River as three separate site categories: the harbour, the valley, and the highland

Sugarloaf Mountain Wilderness Area

Sugarloaf Mountain Wilderness Area perfectly meets the objective's expectations as a threshold between wildlife, woodland, water, lowland, upland, and community. Here, island inhabitants, with widely diverse activities and worldviews, are drawn together — all by the pull of nature, including animals.

There are foresters, hunters, and fishers; scientists, ecologists, and students; locals who operate seasonal retreats and the tourists that visit; and of course, people of Mi'kmaq heritage or descent. Because this site attracts so many diverse activities, it could be seen as a "conflict zone", where the growth and development of one activity might be at the expense of another.

However, this thesis takes a different approach.

It suggests that careful design might be able to accommodate such diverse activities, creating a kind of "buffer zone", where interactions between humans, animals and the natural ecology might actually foster healing and rehabilitation of each, and possibly even the potential for a collaborative community, to share knowledge and promote mutual understanding, well-being, and biodiversity growth.

The Wellness Center will challenge each independent inhabitant to work together as allies, providing a distinctive set of skills for sharing and collaboration, strengthening the island's weakening ecosystem.



This site overview: located in the village of Portree, adjacent to Sugarloaf Mountain Wilderness Area

Ethnographic Approach

The human has been categorized based on island agency into seven individual inhabitants.

The Local

1. Description: Mi'kmaq Community, Unama'ki.

Agency: Healing, Hunting, Fishing, Crafting, Foraging, Gathering, Meditating, Cooking, Cleansing and Teaching.



2. Description: Neighbour

Agency: Snow Removal, Fishing, Angling, Teaching, Farming, Artistry, Gardening, Woodworking, Hunting, Socializing, Bird Watching, Photography.



The Student

3. Description: Unama'ki Institute of Natural Resources, Unama'ki College, Cape Breton University, Local Consolidated, Intermediate and High Schools, Etc.

Agency: Learning Direct Knowledge - Based on Profession Interest; such as Health Care, Indigenous Studies, Natural Resources, Researching, Etc.



The Visitor (Tourist)

4. Description: The Visitor (tourist).

Agency: Bird Watching, Photography, Astrology, Kayaking, Angling, Fishing, Hiking, Hunting, Exploring and Learning.



The Resident (Patient)

5. Description: The resident's agency is to heal, reflect, learn, meditate, grow, cleanse, and communicate with the Wellness Center's community.



The Support



6. Description: Nature Expert – National and Provincial Parks Services, Unama'ki Institute of Natural resources, Forestry, Aquatics and Wildlife Rehabilitation (on-site year-round).

Agency: Guiding (hiking), Teaching, Foraging, Fishing, Researching, Hunting and Communicating.



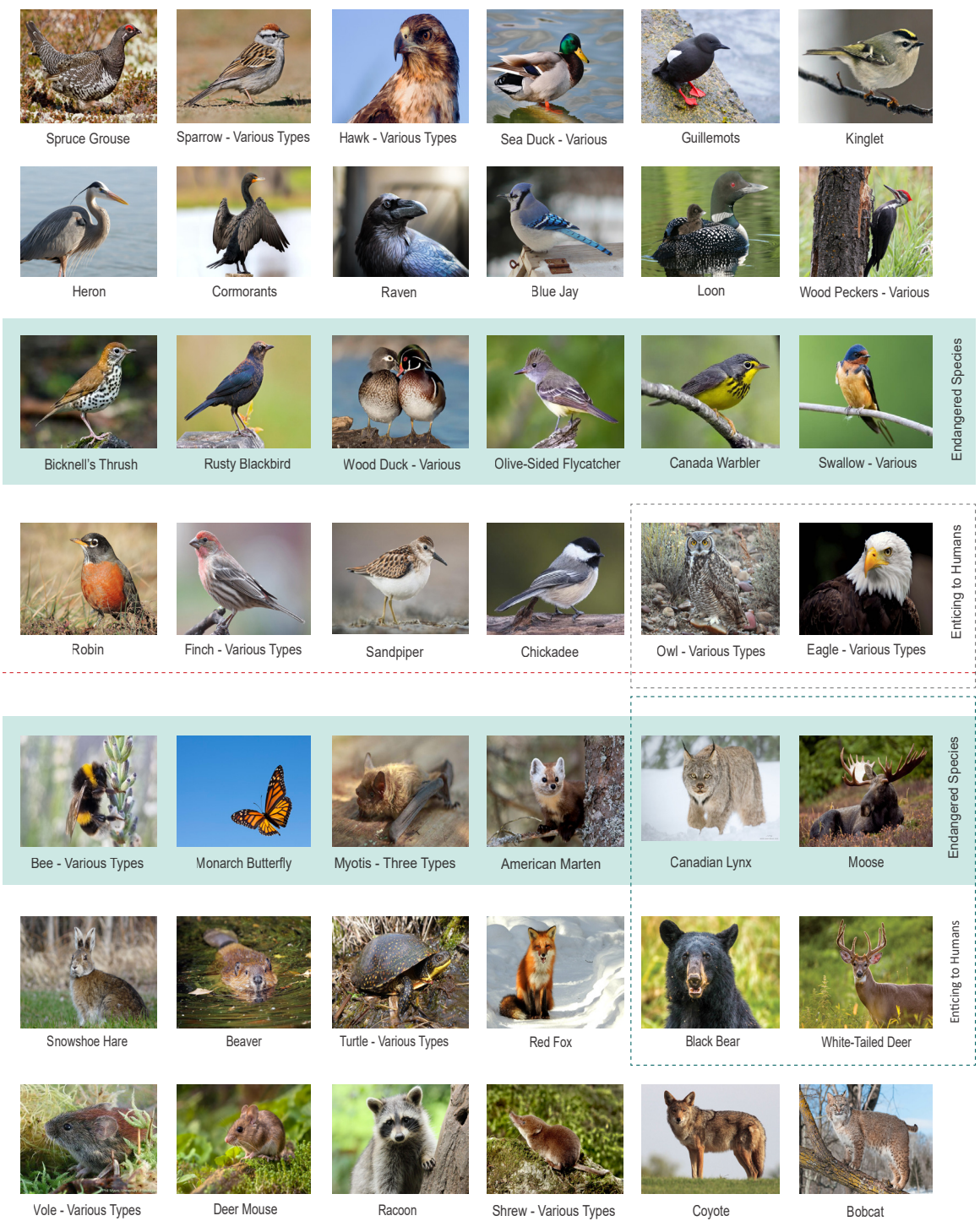
7. Description: Wellness Expert (Professional and Student) – Cape Breton University School of Nursing and School of Education and Health; such as Doctor, Phycologist, Therapist and Veterinary.

Agency: Healing, Rehabilitating, Teaching, Studying, and Adapting.

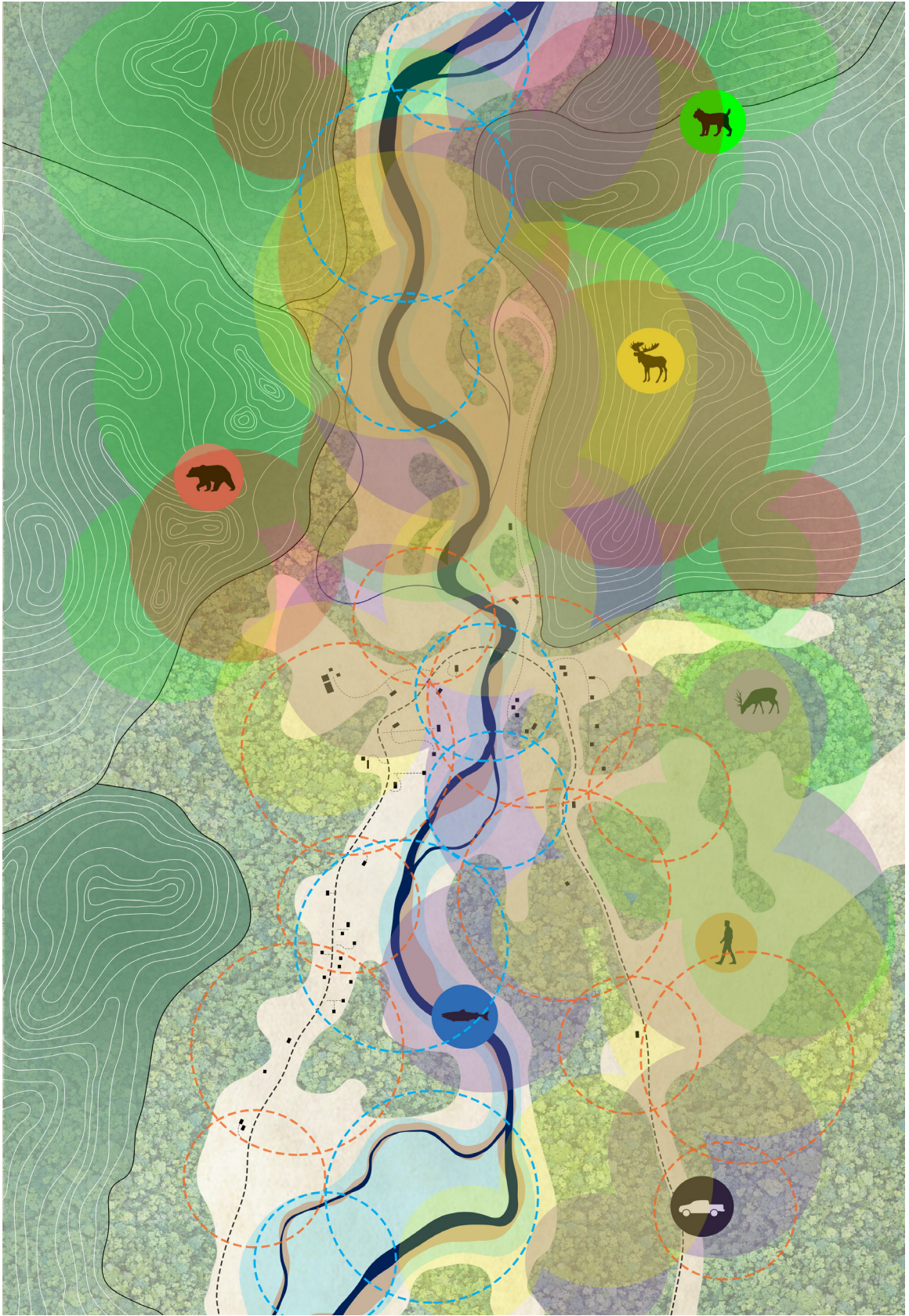
The Animal

Fourteen local animals have been selected to help strengthen and collaborate within the Wellness Center. Twelve of these species are endangered across Nova Scotia, four are enticing for the human's encounter, while half are considered to be spiritual allies in Indigenous cultures.

These animals include Canadian lynx, moose, black bear, white-tailed deer, American marten, myotis (tri-coloured, northern and little brown bat), monarch butterfly, bee (yellow banded and gypsy cuckoo bumble bee), barn swallow, warbler, olive-sided flycatcher, wood duck, rusty blackbird, and Bicknell's thrush. Architectural structures will be incorporated at a scale of macro to micro, camouflaged into the overall design in hopes to promote well-being, species growth, and habitat development for each of the independent species researched.



Wildlife found on Cape Breton Island, Nova Scotia; categorized based on human enticement, species type, spiritual meaning, and endangerment throughout the island



Mapping the human and animal individualities as overlapping uses for the proposed site

Representing the Island's Vernacular

When admiring cotemporary architecture being built on Cape Breton Island, one question comes to mind:

What traditional design features of the past are present in the adaptive vernacular of the now?

These new structures incorporate traditional design elements from the barn; an important program for an agricultural community.



(BoutiqueHomes 2022a)



(One Kindedesign 2022)



(Omar Gandhi 2022)



(McCagg Architects 2022)



(KMBR Architects 2022)

Representing the adaptive local vernacular from past to present on Cape Breton Island

Similarly, this thesis employs the barn as a design precedent. In doing so, the Wellness Center's architecture becomes a communicative space of knowledge and tradition, directly influenced by and built using locally-sourced materials and construction methods. Supporting local trades and craftsmanship not only benefits island communities, but it also reduces construction costs.

This section explores the individual components of barn architecture as a way to better understand what traditional construction methods are best suited for the overall design based on site, climate, and character.

Roof Form, Slope, and Assembly Information

Three roof types are used in barns across Cape Breton: steep slopes (12:12) prevent snow accumulation by quickly shedding it, this also prevents ice dams and water retention, prolonging the useable life of the roof. Such steeply sloped roofs are traditionally clad with wood shingles, but they can also be clad with asphalt shingles or sheet metal. Standard slopes vary from 5:12 to 3:12 and are less expensive to build, using prefabricated trusses. These shallower slopes perform less well with shingles, and usually require more robust waterproofing and sheet metal options.

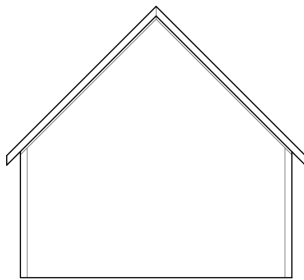


(Radio New Zealand 2022)

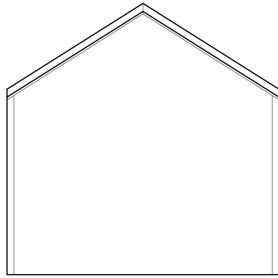


(Lockwood 2013)

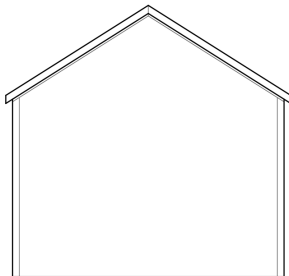
Precedent images for barn architecture found throughout the Maritimes



1. High peak method,
average overhang.

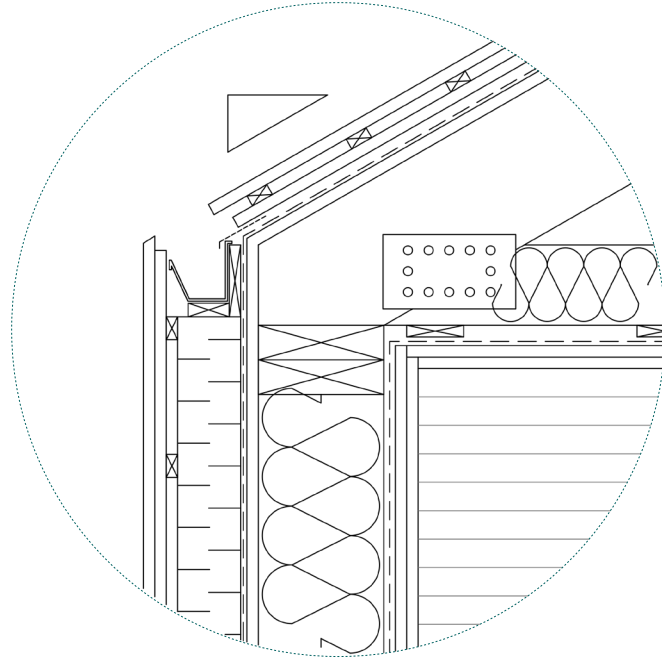


2. Standard slope,
no overhang.



3. Standard slope,
minimal overhang.

Roof form, slope, and
assembly iterations of
barn architecture



Built-In (hidden) gutter system detail

Cliff, highland, and valley locations are easily affected by strong winds. Large overhanging eaves in these locations are vulnerable to wind uplift, compromising the structure. Externally mounted eavestroughs can separate from the roof completely, causing overall water damage. Contemporary architects in Nova Scotia have developed a built-in (hidden) gutter system that can be combined with traditional roof lines.

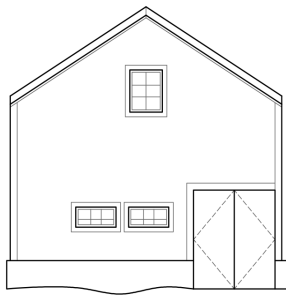
This thesis will use an in-between approach combining the high peak and standard method with a slope of 8:12 for all structures that house an inhabitant, such as the cabins, animal sanctuary, and central hub. Little to no overhangs with a built-in gutter system will be used on all buildings, directing rainwater to bioswales that will eventually feed back into the Margaree River.

Foundation Types

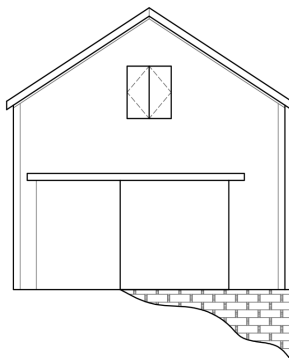
Foundation types in Cape Breton's vernacular barns vary depending on site and soil conditions, slope and hydrology, and cost. The oldest foundation type is stone masonry and is still employed when more modern materials are unavailable. All foundations must extend below the frost line to prevent upheaval during the annual freeze-thaw cycle. Traditionally, such deep foundations were used to accommodate a cellar, often accessed by an external stair. With the increased availability of concrete, slab on grade with frost wall footings has replaced perimeter footings for most farm buildings, primarily because of their ease of installation and low-cost amounts.



1. Slab on grade foundation type.



2. Concrete curb wall addition to perimeter.



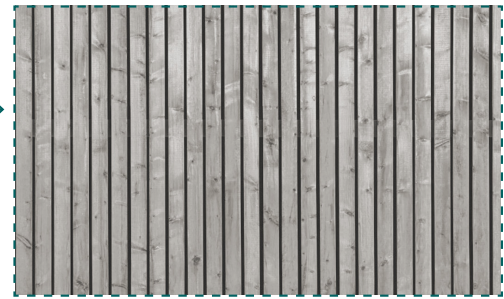
3. Stone (masonry) foundation type.

Foundation iterations based on vernacular research for barn architecture on Cape Breton Island, Nova

This thesis adds block or concrete curb walls above the slab as an addition to raise the wood framing above the snow-melt line and varied seasonal floodplain. This extra measure protects the cladding and wood-framed structure from water damage when the snow melts, as drifts can accumulate and reach up to 5 meters in height. This additional method will be used at all structures with a slab on grade foundation situated throughout the open valley, including all animal enclosures, the central barn, community kitchen, and crafting barn.

Smaller outbuildings located in or near the flood plain, are built on concrete piers, so that water and wind can pass by without damaging the building's assembly. The cabins, observation areas, and seasonal facilities, such as forest bathing and refuge, will benefit from platform construction; limiting the amount of ecological damage by minimizing the use of concrete. Platform construction with concrete piers provides a designated space for architecture to be assembled and dismantled depending on seasonal variations.

Materiality Explorations

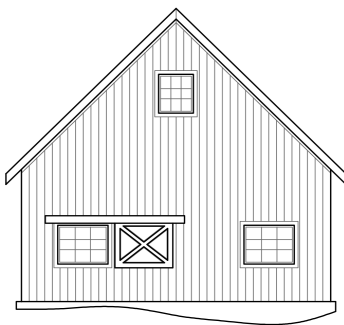


Reverse board and batten siding

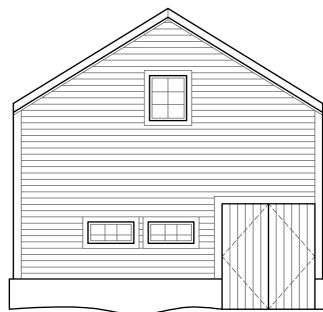
Precedent for reverse board and batten facade assembly on Cape Breton Island (Omar Gandhi 2022)

Cape Breton’s building culture has always relied on local materials, usually wood. More recently, vernacular buildings incorporate manufactured products made in the Maritimes. Cedar shakes and shingles continue to be preferred cladding types, although some species, like eastern white cedar, have recently been categorized as vulnerable across the island.

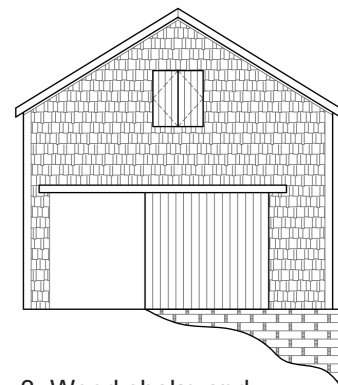
Because the Wellness Center is based on an ethos of ecosystem health, the sustainable use of local materials and non-destructive construction methods is a fundamental tenet for this project. For this reason, building materials proposed for all buildings are: a combination of locally sourced spruce and pine for the structure, hemlock where water protection is essential, wood siding, and wood shakes for the roofs.



1. Board and batten material type.



2. Horizontal (or vertical) wood siding material type.



3. Wood shake and shingle material type.

Materiality explorations based on vernacular research for barn architecture on Cape Breton Island, Nova Scotia

Reverse board and batten siding is an energy-efficient cladding type for walls in cold and damp climates. For roofs, pressure treated wooden shakes have been shown to be decay-free for 30 to 40 years, withstanding high winds and humidity. All cladding systems will be protected with a hybrid stain of wax and linseed oil (derived from flax seeds). These protective coatings release less volatile organic compounds (chemical or gas) than the conventional acrylic or urethane stains, maintaining air quality, ecosystem, and human health.

Sliding Barn Door and Window Coverings

In landscapes of significant winter snow accumulation, sliding doors have a distinct advantage over swinging ones, as they can be opened even when closed in by the drifts. Sometimes, they are installed over the threshold to protect from strong winds, snowfall, rainfall, or ice pellets. The ability to tightly close up a building is also an important consideration for seasonal structures, as a protection from weather and also from theft. For the Wellness Center, the traditional barn door is used in most threshold conditions: as a threshold between humans and animals, between the inside of a building and the outdoor environment, as a way of controlling sunlight and ventilation, and as a protective barrier for off-season storage.



Sliding door protection precedent on Cape Breton Island (BoutiqueHomes 2022b)



Threshold protection for barn architecture (Destination Cape Breton Association 2022b)

Chapter 3: The Wellness Center

I like to build places
where nature is the foreground,
that cannot be overpowered
by our temporary creations.
I use geometry not only
to organize space, but to mark
the social interactions within;
but also, to resonate with
the landscape directly.
The building is not a fixed
object, but part of the larger
pattern that flows with change.
Some would say,
a permeable living membrane
responding to change.
Architecture is part of the process
of 're-membering' – putting back
together our collective dreams.
I like to design buildings that are
places for learning, healing, & reflection.
The building(s) should tell a story
about people and place
as a pathway of understanding
ourselves within nature. (Van der Ryn 2014, 6)

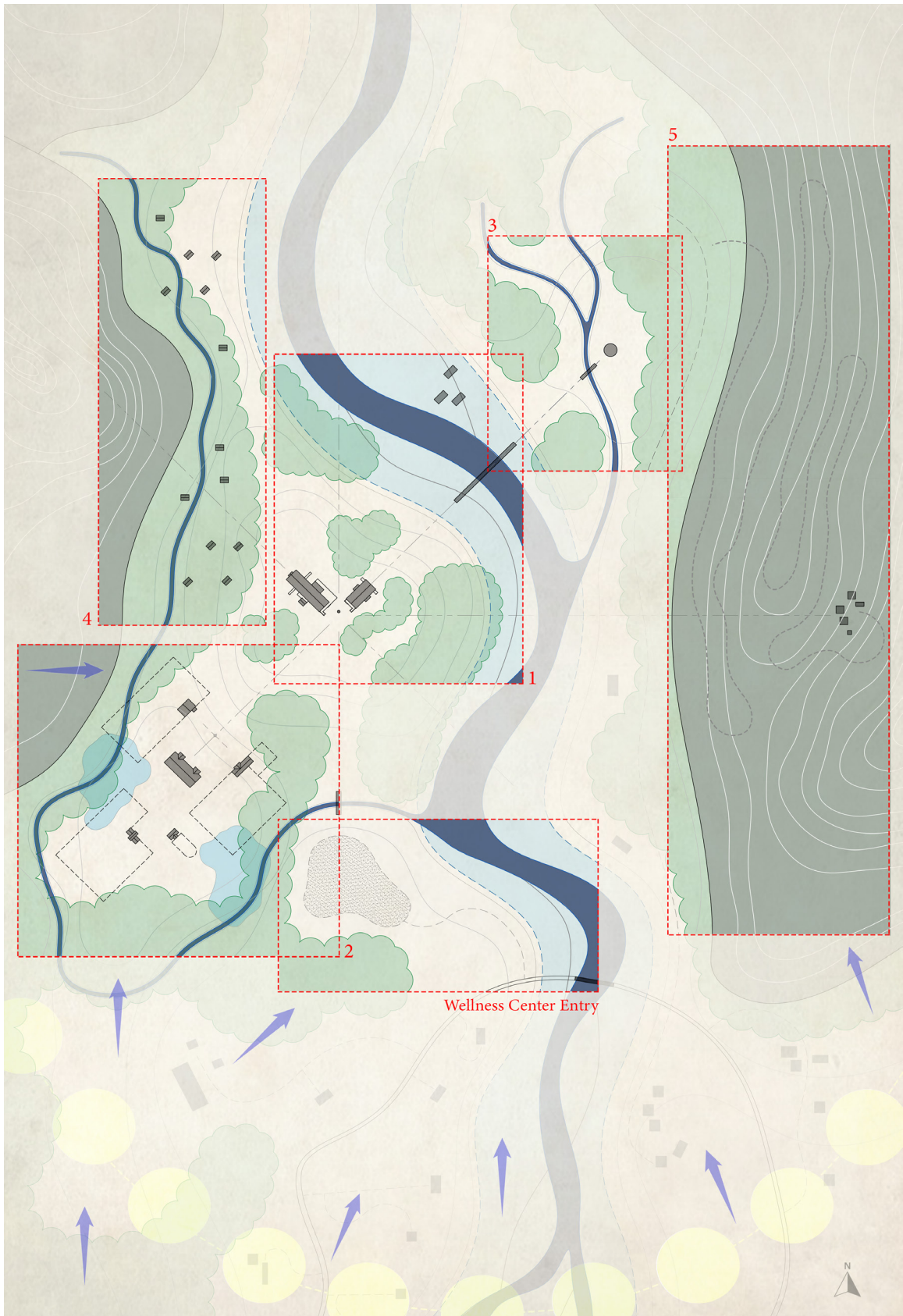
Situating Site

The outcome for this design is to increase sensory awareness by limiting the use of built boundaries, creating both a physical and psychological sense of freedom – otherwise known as the wild. Natural patterns, processes, and vernacular are features found throughout the island's organic environment, creating an on-going sense of visual adaptation to directly balance and stimulate the communities' architecture (Heerwagen 2008, 230-235).

The Wellness Center's individual programs are situated throughout the site as a representation for traditional community planning across the island. As an example, the village of Portree, situated south of the Center, adequately represents that community is not about the immediate connection between inhabitants, but the unique spaces given to create microclimates in-between each individual destination.

These areas of in-between create a balanced connection among inhabitants, their talents, culture, and the natural environment as a way to share knowledge to promote overall well-being and ways of life development.

The designated parking area is located south of the Center's entrance, adjacent to the well-known bridge in Portree; situated at the village's highest point. This gravelled parking area is the final destination for vehicle transportation as the site is solely dedicated to on-foot exploration as a way to fully embrace the natural elements around us.



Five focal areas of program individuality for the proposed Wellness Center

This thesis is categorized into five focal areas:

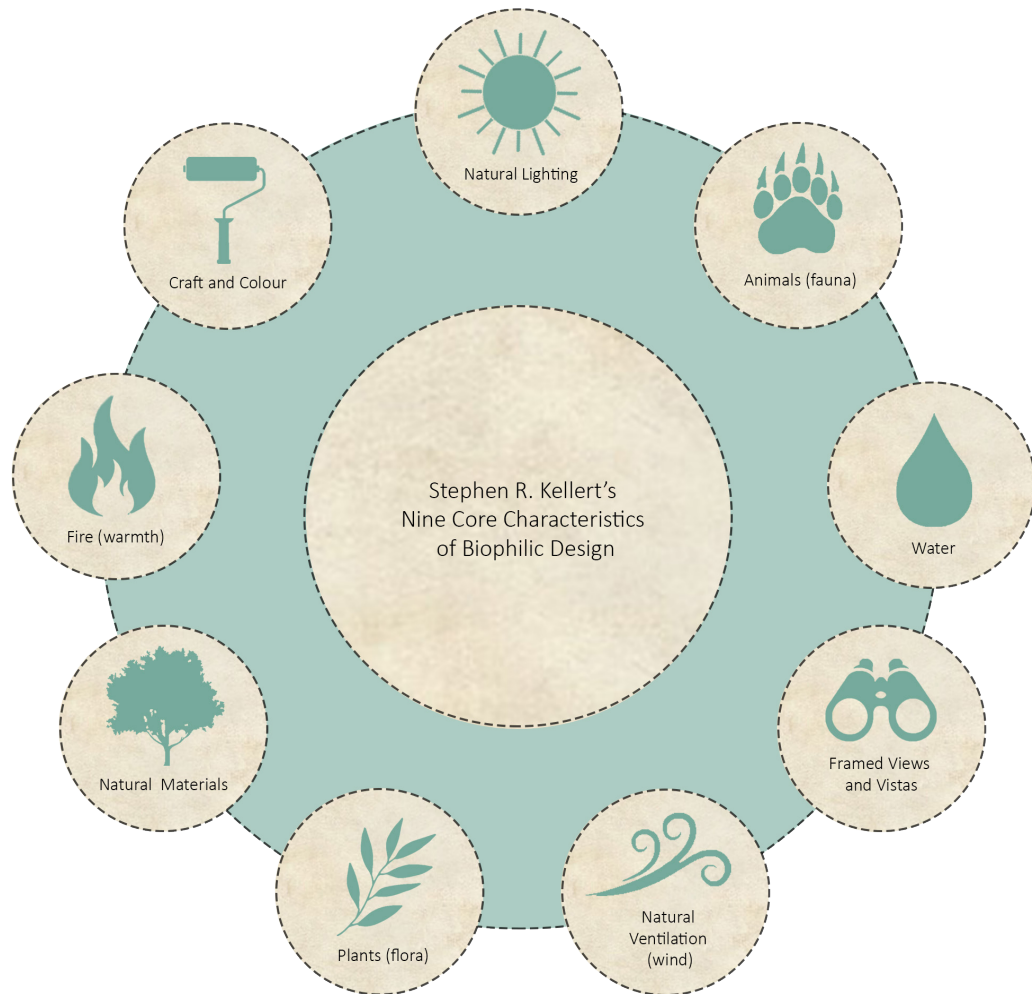
1. On entrance and through the woods, we arrive to the Center's core, where two traditional buildings in an L-shaped formation house the Community Kitchen and Crafting Barn.
2. Below this, and to the left are independent animal sanctuaries – for moose, deer, black bear, and lynx. Here, the injured or sick animals are comforted, rehabilitated, and provided space to recuperate before returning to their usual habitat.
3. On the upper right and across a tributary of the Margaree River, situates the sweat lodge and forest bathing complex.
4. On the far left, meandering cabins for overnight stay are scattered throughout the forest, following the stream's natural pattern and processes.
5. And finally, on the far right, hiking trails climb up the highlands, leading to a camouflaged retreat for overnight refuge.

These five areas individually represent the Wellness Center's core values of focus: to learn, grow, rest, teach, and heal harmoniously with our natural surroundings.

Biophilic Design

As the Wellness Center celebrates the extraordinary healing powers of nature, its design must strive for an equilibrium in the operations of the center and the ecology of place. For this purpose, Stephen Kellert's nine core characteristics of Biophilic Design will form the basis of this project; at the scale of site, to the programming and functionality of all buildings.

These characteristics include, natural lighting, ventilation and materiality, framed views, flora, fauna, water, fire, and craft.



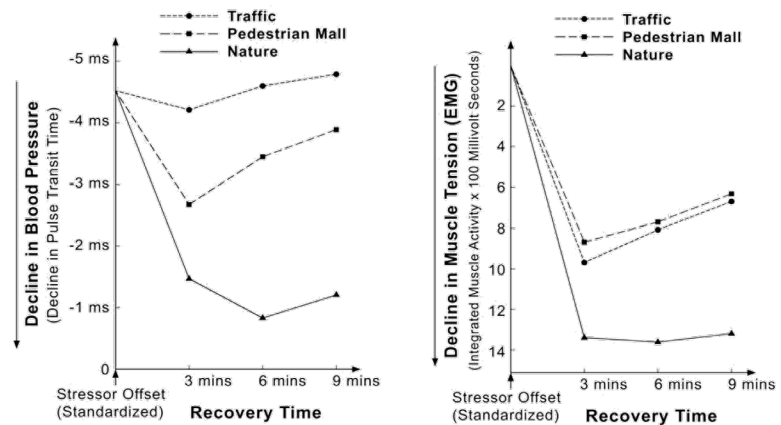
Stephen Kellert's nine core biophilic characteristics from *Elements of Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life* (Kellert, Heerwagen and Mador 2008)

Biophilic design recognizes that the human is biologically an animal, and that architecture should be used to create a healthier habitat for survival – connecting us to previous attributes of existence throughout the natural. Animals should be our neighbour, and nature must be our “metropolis” (Kellert, Heerwagen and Mador 2008, 3). This design concept must think of architecture as an organism, rather than a stagnant object.

Ian McHarg acknowledges that

a human's life, in sickness and in health, is bound up with the forces of nature, and that nature, so far from being opposed and conquered, must rather be treated as an ally and friend - whose ways must be understood, and whose counsel must be respected. (McHarg 1971, 5)

For this exact reason, Kellert's "recovering time graph" reveals that human biometric variables (such as blood pressure, heart rate, and muscle tension) will recover at a quicker pace when in a setting that utilizes such experiences associated with the nine core characteristics of biophilic design – as opposed to a routine atmosphere; such as an office, in dense traffic, university, or a shopping center.



Recovery time graph representing a natural versus stress inducing situations sourced from *Elements of Biophilic Design: The Theory, Science, and Practice of Bringing Buildings to Life* (Kellert, Heerwagen and Mador 2008)

Natural architecture can be divided into three categories based on the inherent imagery of the project's natural surroundings: direct, indirect, and symbolic experience (Kellert, Heerwagen and Mador 2008, 6).

1. Direct experience refers to the unstructured sense of nature as an element of sensory to self-sustain. Direct features of the natural environment include daylight, wind, vegetation, wildlife, habitat, and ecosystems.

2. Indirect experience involves a physical contact to nature that required on-going human input to sustain and survive. Indirect features include potted plants, water fountains, an aquarium, rainwater collectors, etc. These features could not be possible without the connection of nature to human and vice versa.

3. Symbolic experience involves no actual contact with nature directly, but rather representationally or metaphorically throughout the design. Symbolic features include paintings, photography, sculptures, woodworking, and videos.

By incorporating these three experiences into architecture, the future of design will be filled with structures that generate their own light, recycle their waste, collect and reuse rainwater, breath through natural ventilation, and incorporate interior vegetation to absorb carbon while producing more oxygen (Van der Ryn 2013, 50). When evaluating the center's site, we see that the architecture must consider the significant natural dynamics at work in relation to the researched biophilic design characteristics as both an indirect and direct experience – including,

1. The sun's path and orientation,
2. the adjacent highland's shadow cast onto the valley,
3. seasonal variation in river level and the extent of its correlating floodplain,
4. the direction of prevailing summer and winter winds,
5. snowfall accumulation during the winter season,
6. the opportunity for special views and panoramas,
7. and the sight, smell, sound, and touch of the surrounding natural phenomena.



Establishing the location of these natural features between the site and the architecture itself, will provide clarity and an understanding for the relevance of vernacular research; previously mentioned in terms of form, scale, detail, and materiality for all of the Center's individual programs.

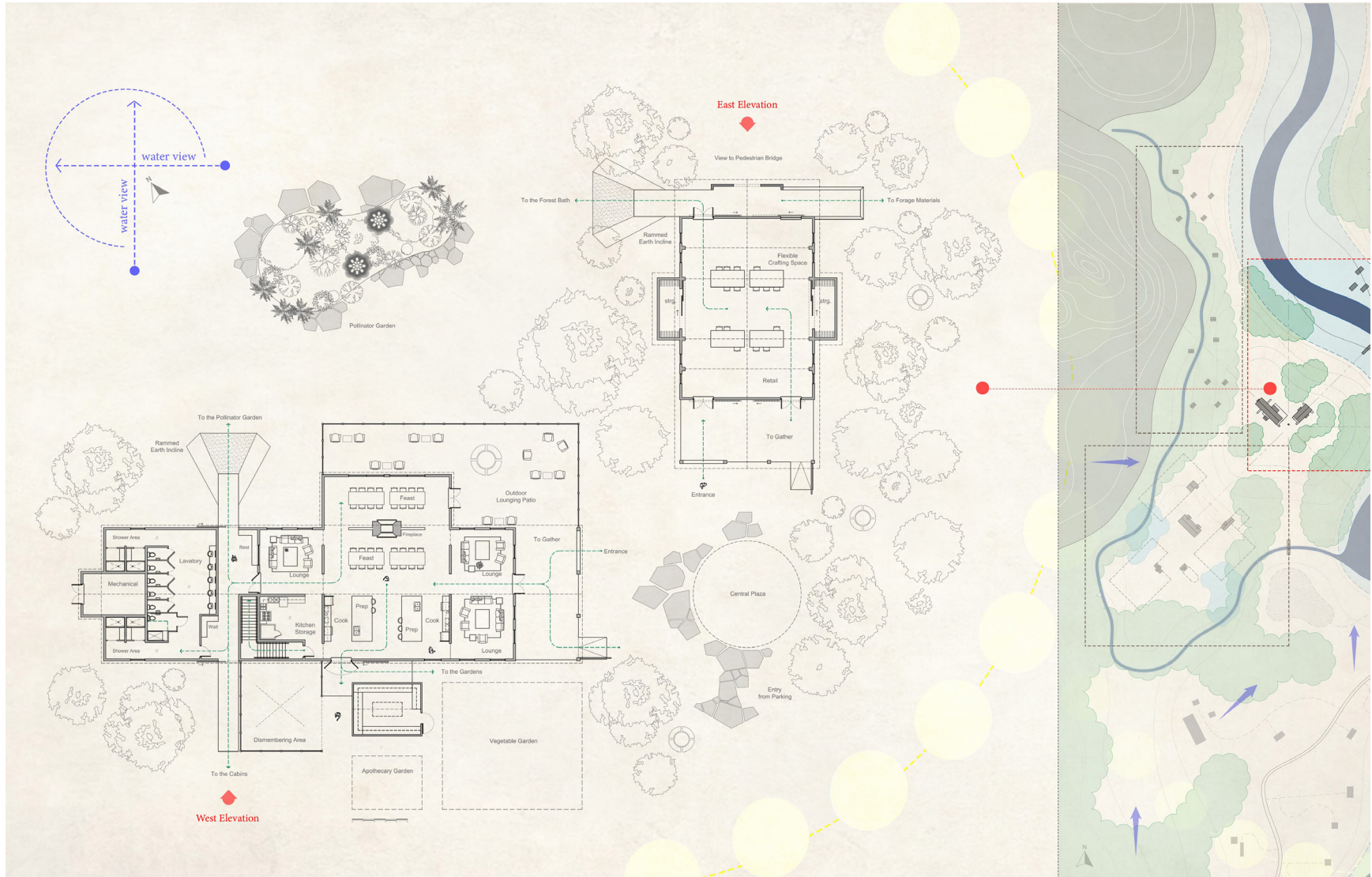
The Central Hub

Situated at the peak of Portree, the Community Kitchen and Crafting Barn are centered between forest and water. On entry, a mixture of hardwood and softwood trees are planted south as a windbreak (shelterbelt) to protect against prevailing winds.

Recognizing immediately the direction of summer and winter winds is a crucial starting point for integrating additional (both natural or artificial) components into the overall design concept (Kellert, Heerwagen and Mador 2008, 7; Kellert 2012, 29-45).

Windows and doors open for natural ventilation, enhancing the resident's experience of nature in the valley – through touch, smell, sound, and movement. Oriented toward the south and the west, a courtyard plaza, greenhouse, and gardens, that take full advantage of the sun's path, while avoiding the morning shadows cast by the highlands.

The buildings are situated for views of the river, while their L-shaped arrangement forms two outdoor community spaces for events, gatherings, and traditional ceremonies. Slab-on-grade construction is used for all building foundations throughout the site; therefore, when natural contour descends at an entry point, a rammed earth incline is introduced for effortless accessibility.



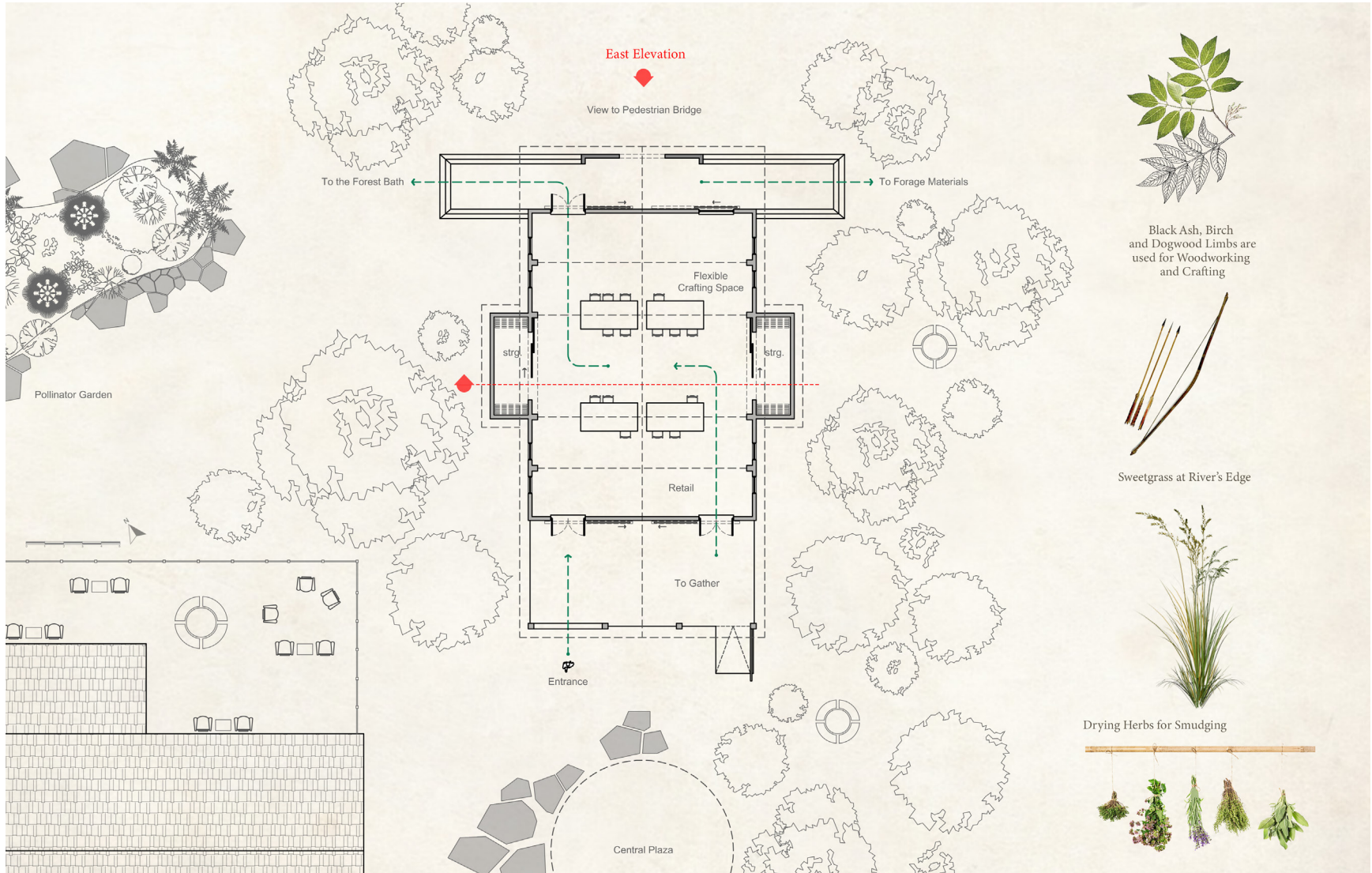
The Central Hub (to teach and to learn) overview

The Crafting Barn

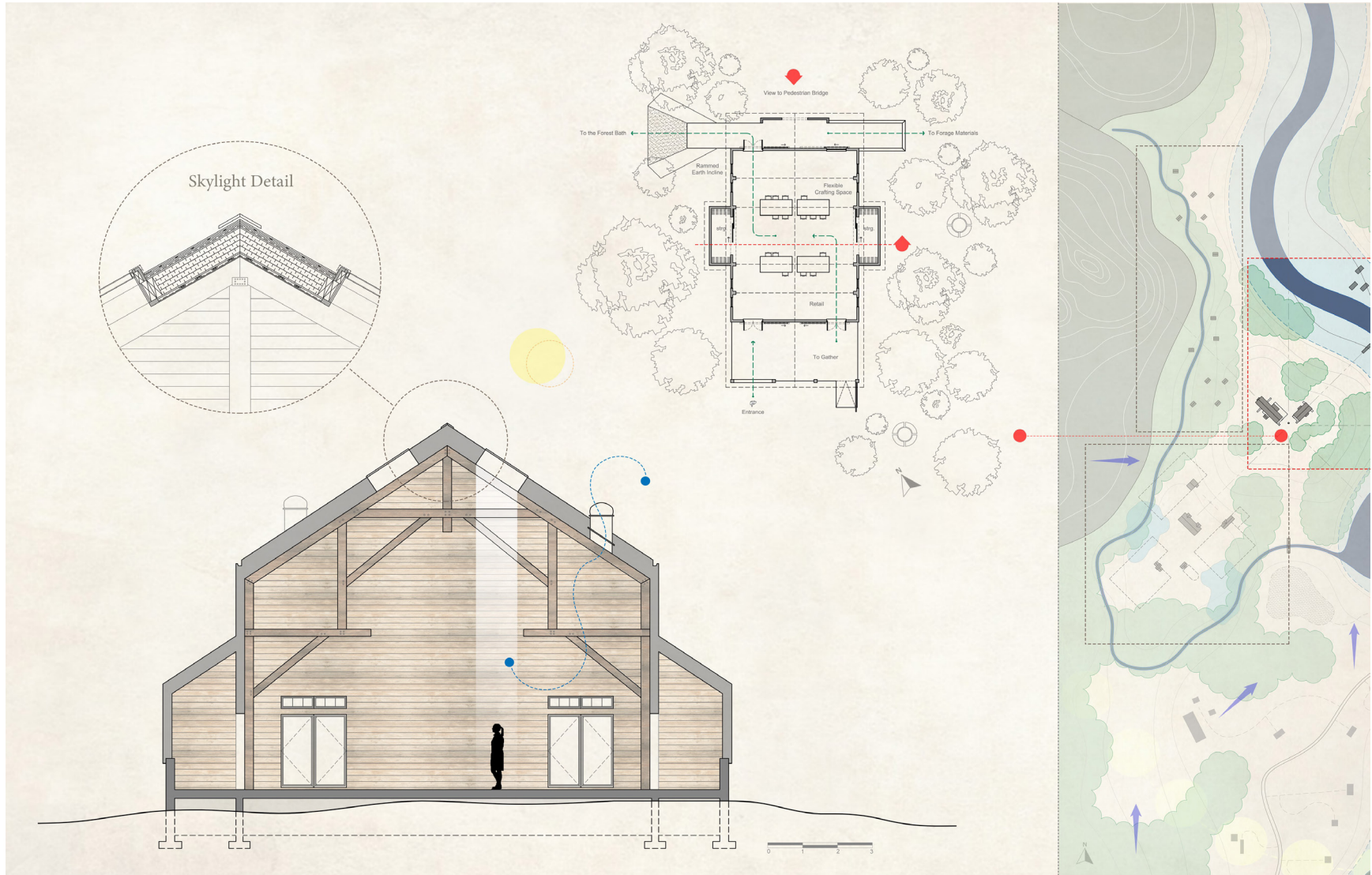
Craft is the conduit that keeps a culture strong, a lived tradition that is passed down through generations. For the Mi'kmaq, craft is an artistic expression, a skill for survival, and an opportunity for exchanging knowledge throughout a community setting. Art and craft are also an important bridge between people of different cultures and experiences, doubling as a focused application for mental health and overall well-being.

The Crafting Barn is designed as an indoor-outdoor flexible space, including storage areas for equipment and materials, and a south facing deck for outdoor activities. The materials used by inhabitant in the Crafting Barn are foraged from the immediate natural surroundings. Sweetgrass is found near the riverbanks – used for basket weaving, hat fabrication, medicine, and smudging. Black ash, mountain ash, and birch trees are traditionally worked and carved into art, tools, bows, utensils and more. As black ash is considered an endangered species in Cape Breton, new plantings are cultivated on-site regularly.

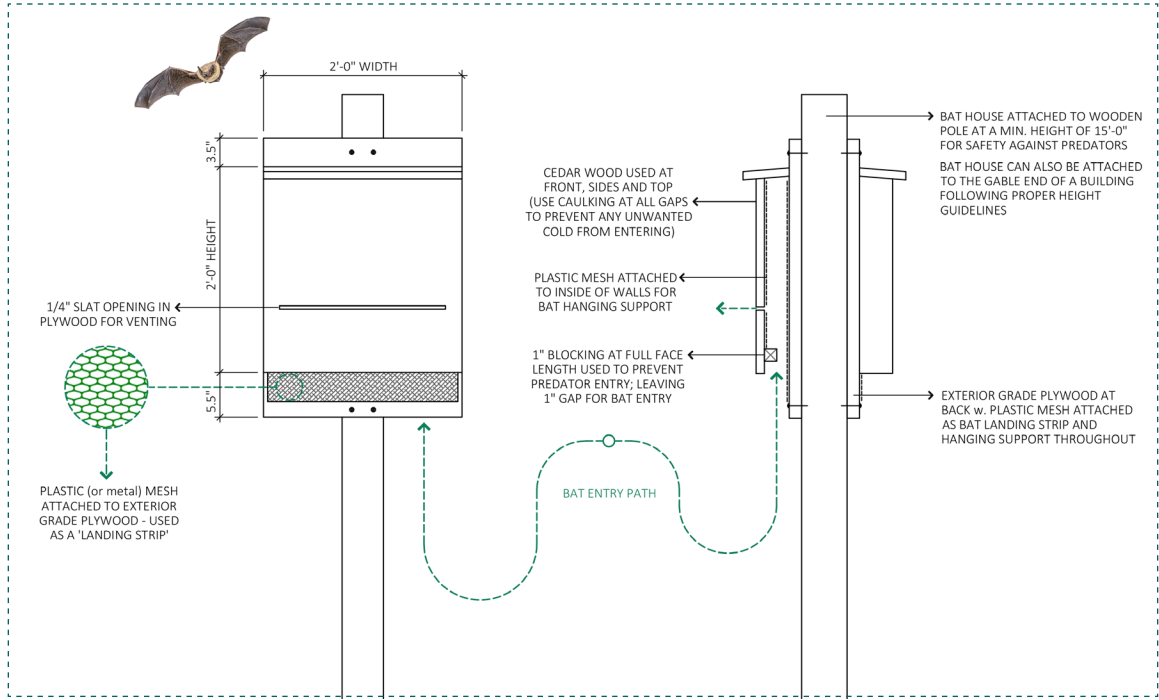
Lastly, periodic events of storytelling, dancing, singing, or drumming are accommodated around an outdoor fire circle at the plaza's core. Fire, for humans has always been not only a practical necessity, but a powerful component to enhance imagination and creativity. In the built environment, fire is typically associated with heating and cooking; however, it should be explored further for its ability to convey comfort, protection, culture, refuge, performance, gathering, and sensory delight (Kellert, Heerwagen and Mador 2008, 8; Kellert 2012, 49).



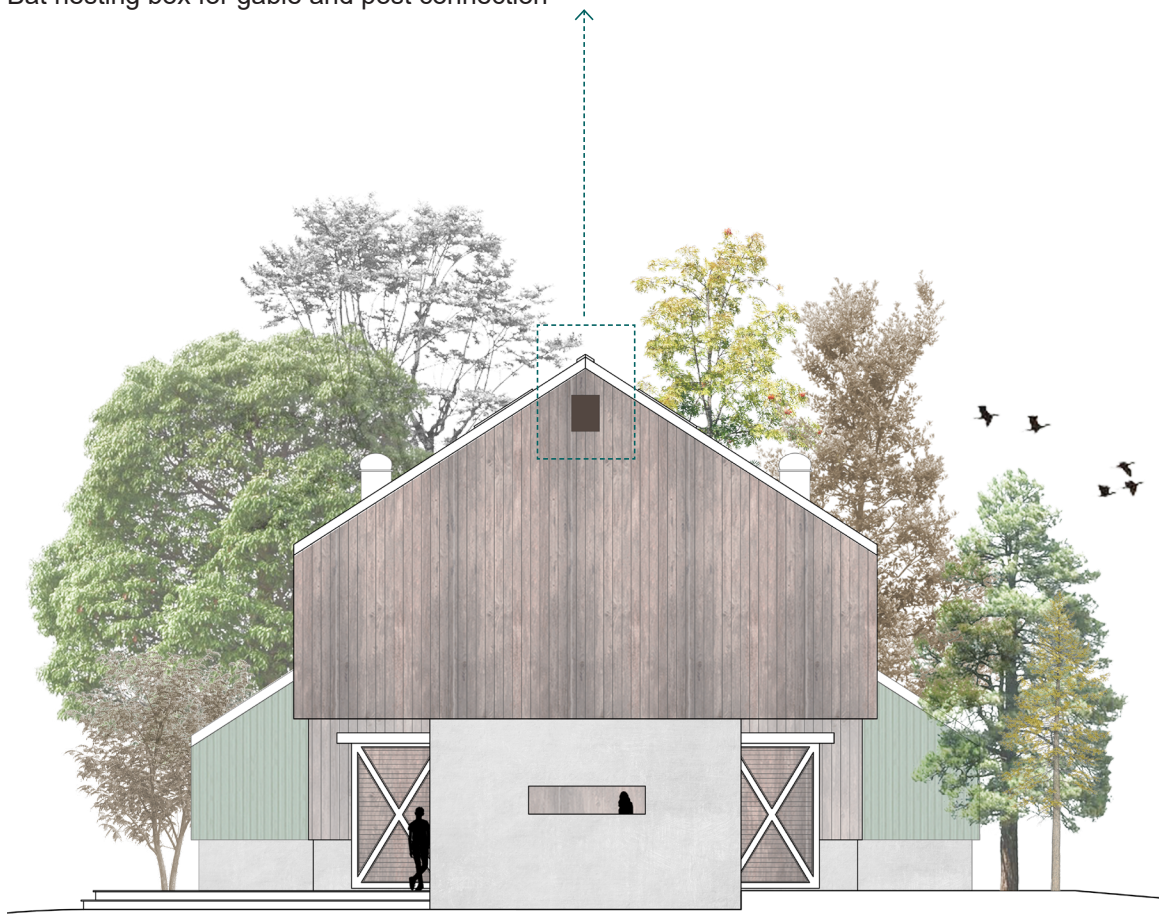
The Crafting Barn floor plan and surrounding foraged materials



The Crafting Barn floor plan and correlating building section iteration



Bat nesting box for gable and post connection



Crafting Barn east elevation overlooking the pedestrian bridge



The Community Kitchen

The ground floor of the Community Kitchen is organized around its three principal uses: cooking, feasting, and resting. Cooking is at the heart of the building; it is a space for people to learn from each other about how to source and prepare healthy local food, bringing their skills of hunting, foraging, gardening, and fishing to the table.

Two prep kitchens mirror one another, creating a substantial area to teach, peel, wash, cook, season, and communicate as a team when preparing the evening's meal. Large communal tables surround a centered fireplace as a space to socialize, but most importantly, as a surface to feast and enjoy the meal made jointly by all independent users. Visitor, patient, and overnight guest's lavatory and bathing facilities are separated by corridor from the Central Hub's public area; creating an independent room to further promote privacy.

On the exterior, a walled court close to the kitchen, hard-surfaced and well-drained, is for dressing game. The aim is that the complete hunted animal will be dismembered and treated in either cooking or creating, with little to no wasted parts; educating and adapting from the traditional techniques of *Netukulimk*.

Netukulimk is the Mi'kmaq concept of harvesting natural resources without jeopardizing the integrity, diversity, or productivity of the native surrounding environment, limiting waste and an ignorance for what Mother Earth (*Wskitqamu*) has offered to us. It governs the emotional, cognitional, spiritual, and physical relationship a human has with nature; including land and all living beings (Native Council of Nova Scotia 1994, 7).

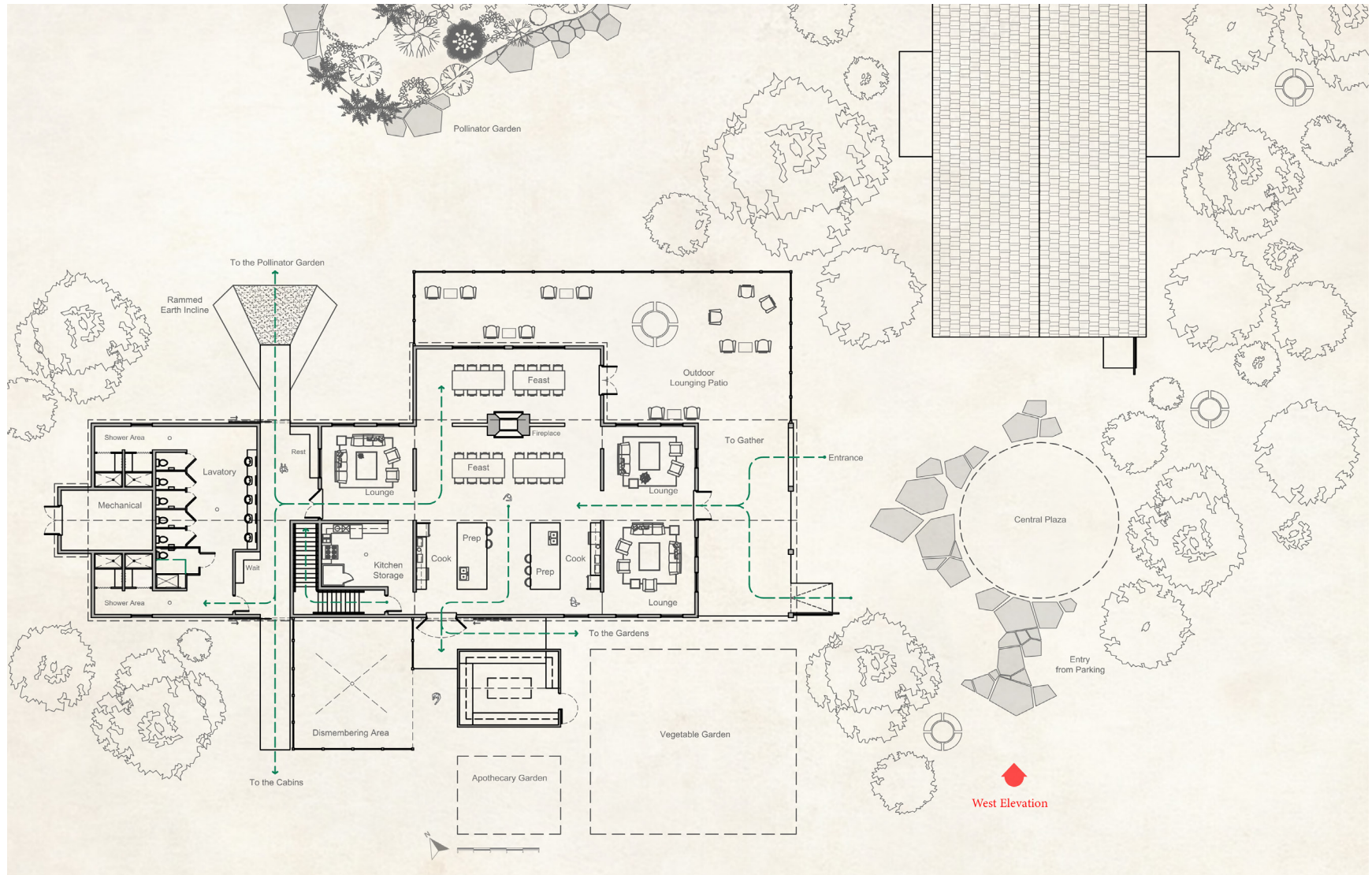
Elder Dr. Albert Marshall explains that “no one being is greater than the next, that we are part and parcel of the whole, we are equal, and that each one of us has a responsibility to balance the natural gifts we were given” (Government of Nova Scotia 2020, 1).

To the south and adjacent to the greenhouse is an apothecary garden, where people can learn about the health-giving and healing properties of plants.

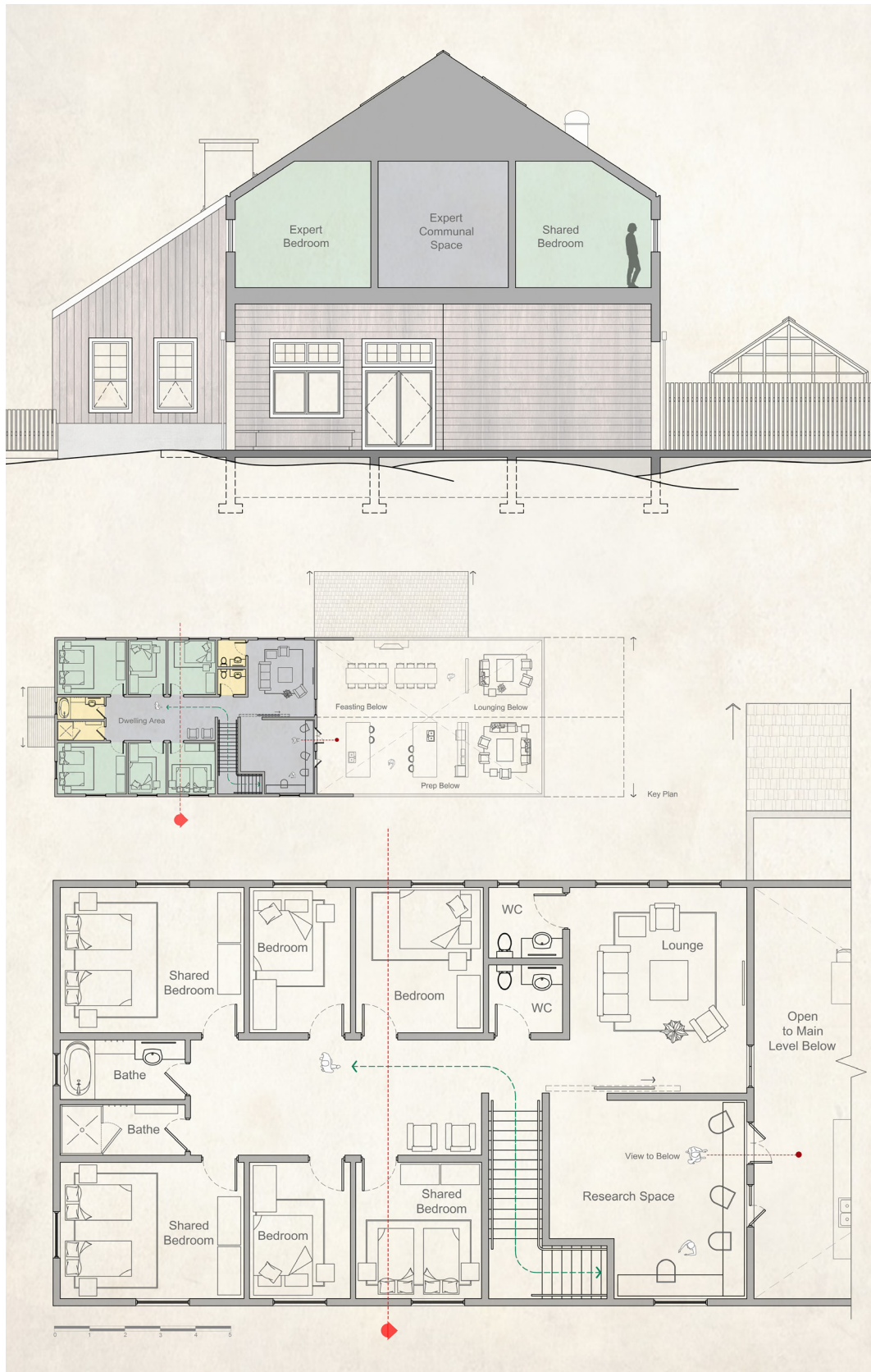
To the right is a large vegetable garden, providing access to supplements for the protein that was foraged, hunted, or fished during the day. Between kitchen and river is a pollinator garden, attracting not only humans, but endangered monarch butterflies and bees as a safe space and a source of survival.

Plants are fundamental to human and animal survival – providing food, fiber, and fodder. The benefit of integrating plants into the built environment is well-established, for human comfort, healing, emotional equilibrium, and productivity. For centuries, vegetation has been used as a therapeutic element in ceremonies and sacred spaces, hospital and hotels, weddings, and funerals (Kellert, Heerwagen and Mador 2008, 7; Kellert 2012b, 33).

The upper level of the Community Kitchen is a private dwelling space dedicated to the experts that remain on site year-round as a full-time position. Six flexible bedrooms (shared or single) for rest and privacy, two water closets for release, two bathing rooms for relaxation, a lounge for conversation, and a dedicated workspace for research. Operable glazing separates private and public in the workspace as an observation point for the expert to have full viewing access to the area below.

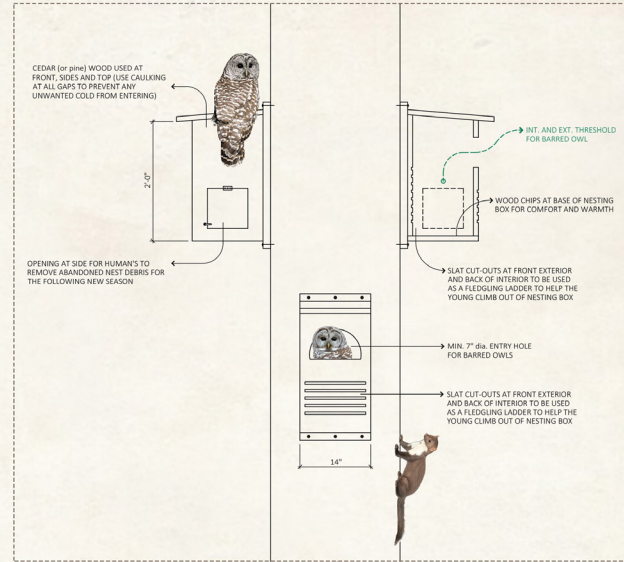


The Community Kitchen main floor plan and correlating landscape information



Seasonal dwelling for experts on the second storey of the Community Kitchen

Barred Owl Nesting Box
Versatile as American Marten Nesting Box



Black Ash, Birch and Dogwood Tree Limbs for Traditional Woodworking and Crafting



The Community Kitchen and Crafting Barn inhabited west elevation



The Animal Sanctuaries

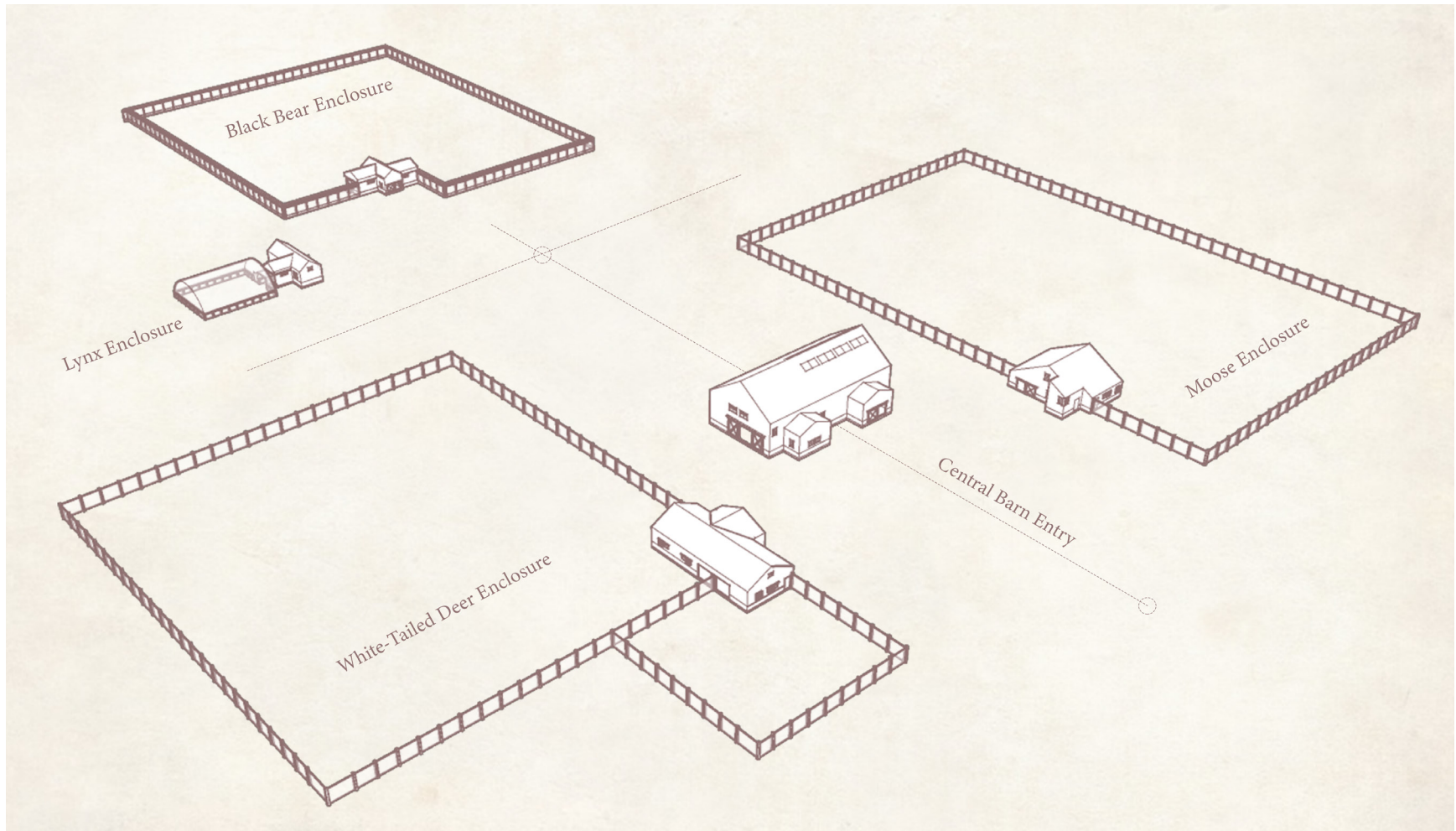
Human fascination with animals is embedded in our biological heritage. A connection between human and animal provokes satisfaction, pleasure, compassion, and inspiration – in short, it contributes to emotional well-being. The concept of a zoo, aviary or aquaria offers established guidelines on balancing direct requirements between human and animal; however, this thesis explores the concept of wildlife reserves and animal sanctuaries as preferred precedents to properly benefit the animal’s overall health and safety.

These latter precedents utilize the existing landscape to contain animal movement while maintaining a varied and stimulating habitat; including constructed wetlands, careful landscape features, natural materials, gardens, beehive huts, nest boxes, and spaces for protection or rest (Kellert, Heerwagen and Mador 2008, 7; Kellert 2012b 37).

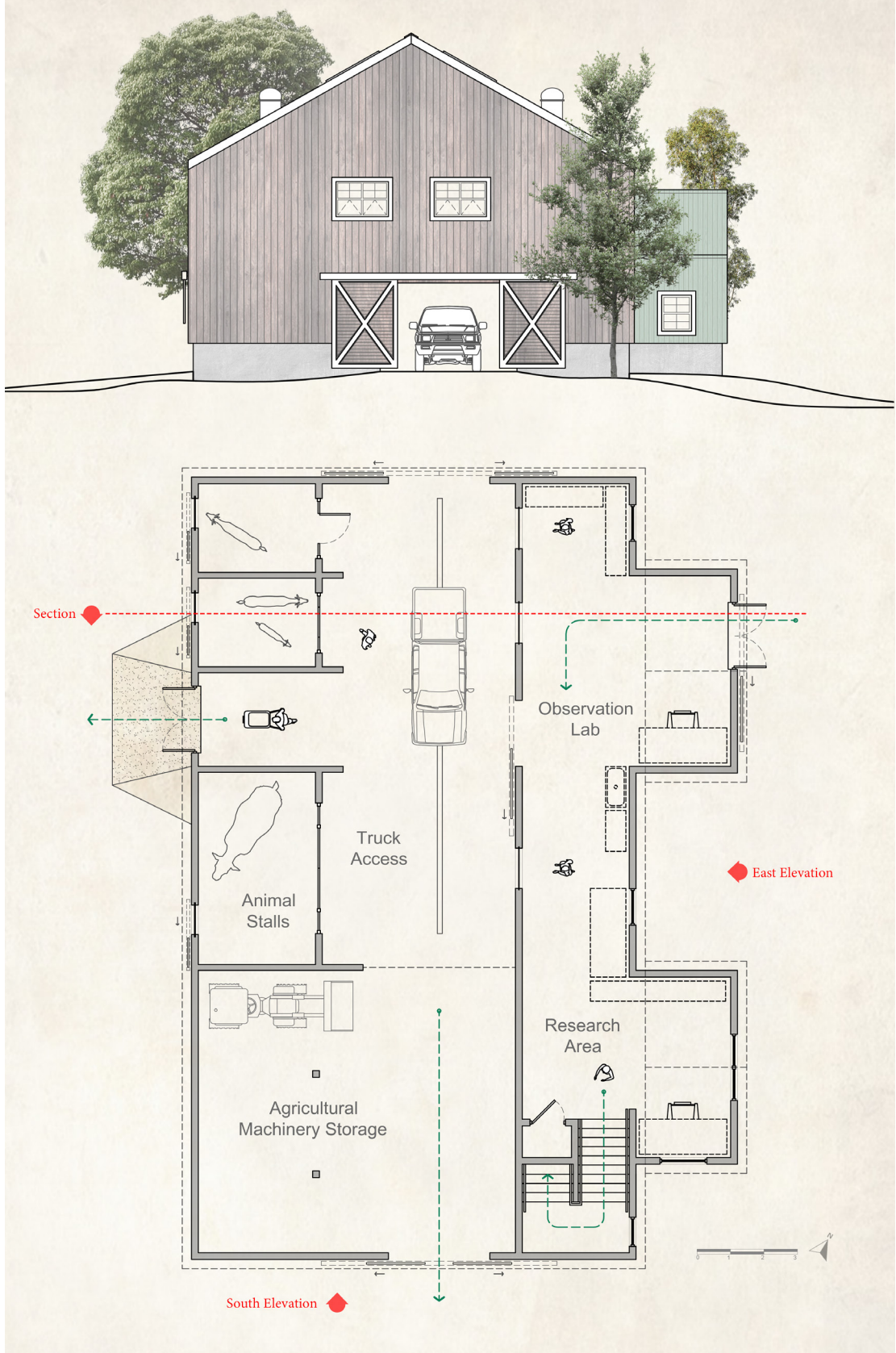
The Central Animal Barn

The central barn, located between all independent sanctuaries, is the place where injured animals first arrive at the Wellness Center. This structure is divided into four quadrants: transport, animal, observation, and storage.

Truck access follows the barn’s spine as an accessible path of transportation for the injured animal on immediate arrival. Here, the animal is quickly placed into an independent stall, via expert or hoist, as an introductory safe space for initial assessment by expert; prior to transitioning onto a more permanent sanctuary for their complete recuperation.



Situating the individual enclosures for the Animal Sanctuary

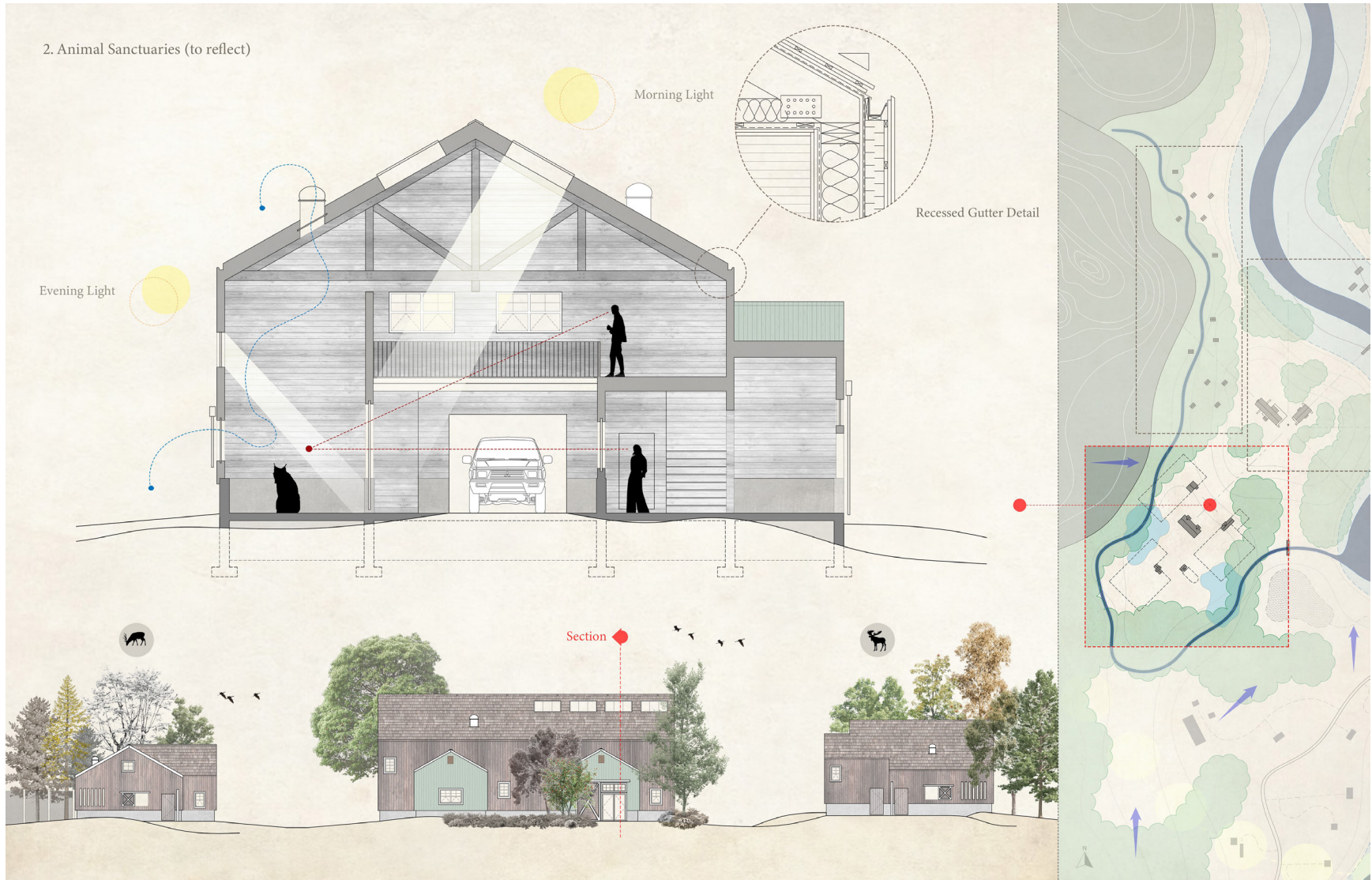


The Central Animal Barn floor plan and south elevation

A modest observation lab, positioned east of the truck access, creates privacy between expert and animal as a space designated for research, evaluation, and training purposes. Here, stainless steel assessment utilities and correlating medical instruments are stored, prepped, and sanitized. Secluded viewing panels are located directly opposite each stall as a way to maintain constant observation towards the animal. On the main level, the barn's secondary half is used as a storage space for everyday agricultural machinery.

On arrival, these animals may be stressed, tired, or confused, so providing a comfortable space, as natural-feeling as possible is key. Sunlight streams down the walls, with natural ventilation throughout and a breezeway at its core; all effectively sheltered by natural materials. When incorporating natural lighting in biophilic design, architecture must be oriented according to the sun's path. The placement of openings must consider preferences for morning and evening light, direct and indirect light, light intensity, and warmth. Perforations, clerestories, skylights, and atriums are design features used to incorporate and enhance the use of natural lighting (Kellert 2012, 28).

The Central Barn's second storey is used primarily as a storage space for specific animal necessities, such as straw (bedding), hay (feed), and fodder. However, the second storey does not cover the independent stalls or adjacent truck access. For the animals, this provides more depth, lighting, and natural ventilation for their overall comfort. For the truck access, stored materials can be easily retrieved by hoist from top to bottom, down to the barn's core via mezzanine above. Following the barn's spine, a trench drain is incorporated into the slab-on-grade foundation, creating an ease of upkeep and drainage for the animals.



The Central Animal Barn section and inhabited east elevation; centered between the moose and deer enclosures

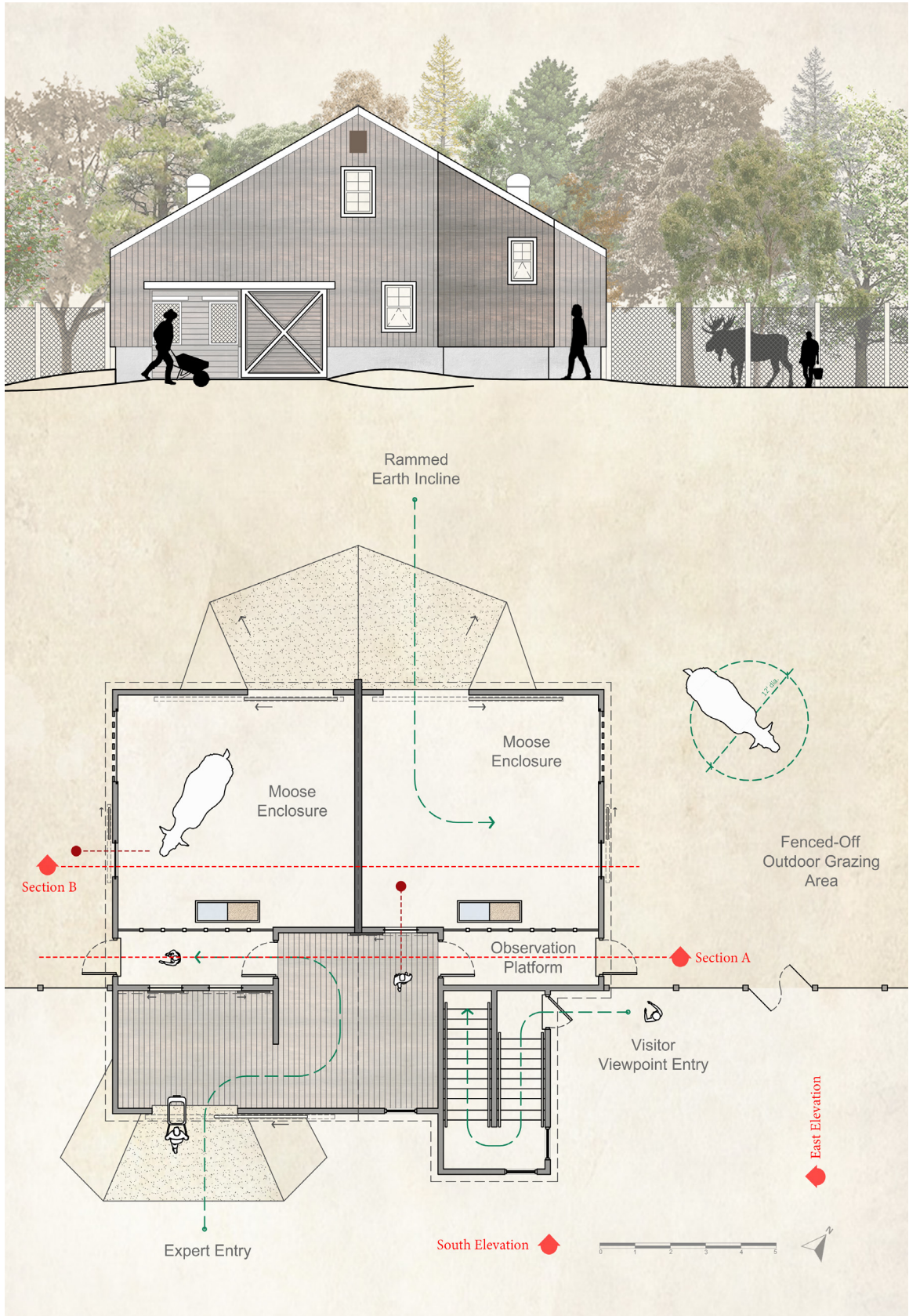
Moose and White-Tailed Deer

The Wellness Center provides animal sanctuaries for four species. The first building type houses two of them: the Moose and the White-Tailed Deer. The moose represents power, endurance, and balance. The deer represents compassion, kindness, and healing. These hoofed mammals are a draw for many visitors, even while their natural habitats are increasingly encroached upon.

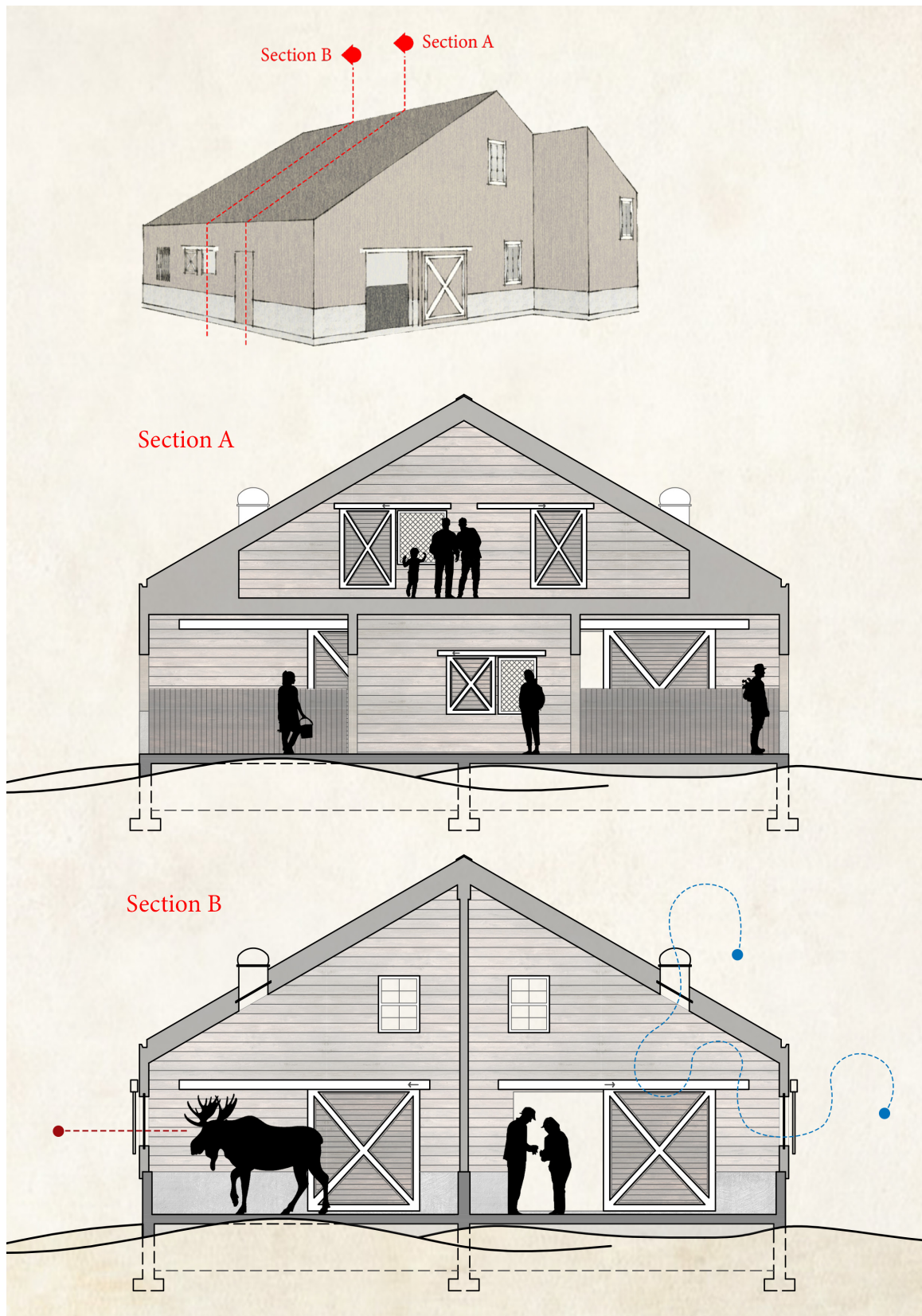
The size, location, and amount of perforation added throughout the cladding was determined based on how these species react to their natural surroundings. Slatted assemblies are incorporated to the façade as a way to disperse minimal sunlight to the interior, while all other exterior openings are operable via sliding covering, providing an abundance of ventilation to enter. Perforated metal screens are incorporated for safety at all public observation and viewing panels as a threshold between the human and wounded animal. Hay and wood shavings from fallen trees blanket the concrete slab, making it more comfortable for the animal and easier for the expert to clean.

All sanctuaries are designed to use architecture as a communicative element between animal, expert, and visitor.

For the moose, slab-on-grade foundation is used for the base of the animal portion, while an elevated structure is incorporated for the expert portion as a way to intentionally direct the inevitable flooding that descends from the highland's slope. A viewing area found on the second storey is dedicated for the visitor, not only as a discreet location to reflect on and admire the magnificent creature, but also as a way to not interfere with the expert's roles and responsibilities.

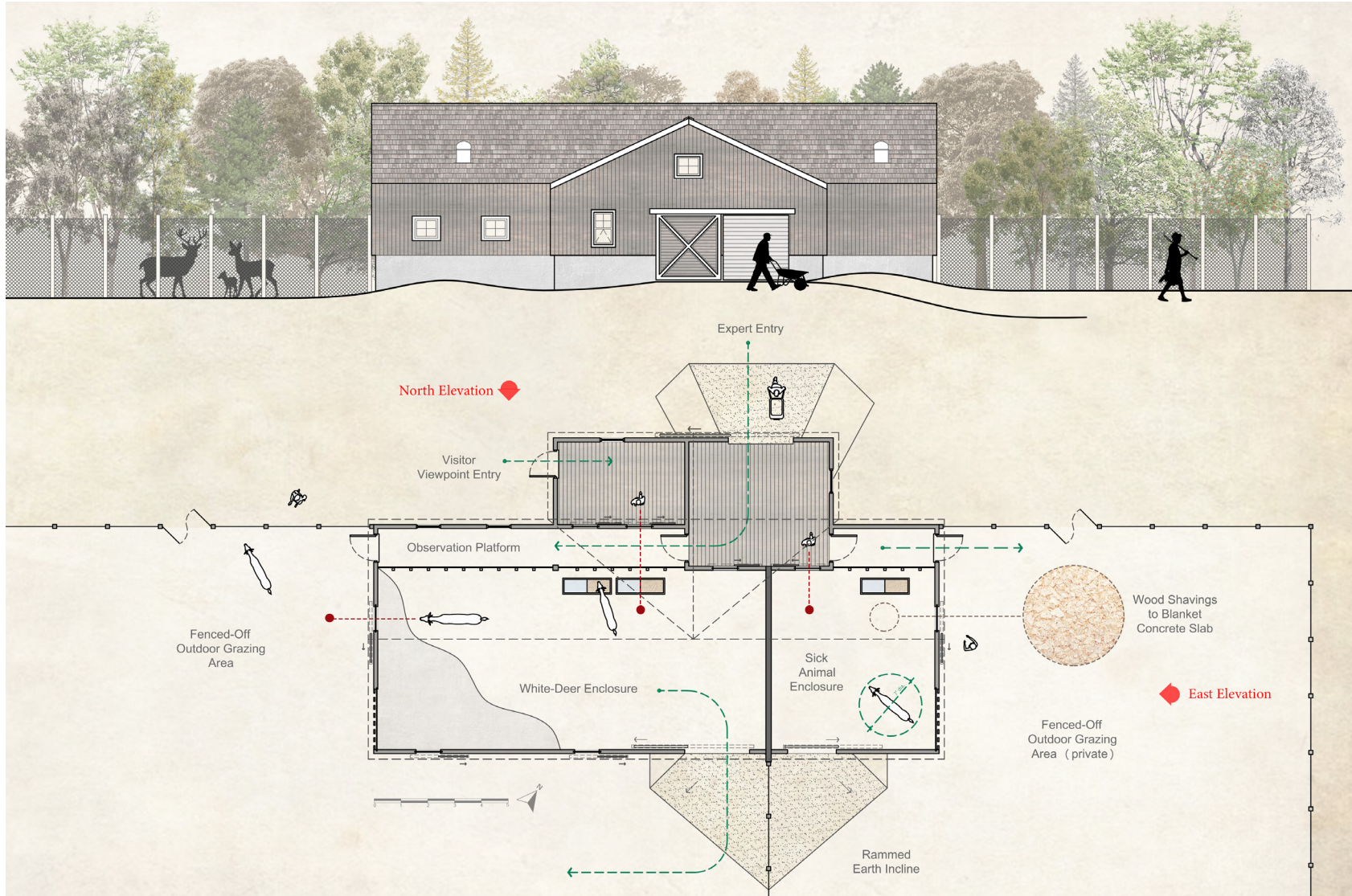


Moose enclosure plan and south elevation



Moose enclosure section iterations; Section A cuts through the expert working areas (main level) with guest observation located above, while Section B cuts through the moose enclosure below

The deer enclosure closely mimics that of the moose, though smaller in scale due to species size. Because of this, the visitor's viewing area is situated parallel to the enclosure itself. White-tailed deer have the potential to carry and pass along brainworm (*parelaphostrongylus tenuis*), a parasite fatal to the neighbouring moose. Therefore, its enclosure is located downstream as a way to not spread disease. Fenced-off outdoor grazing areas keep the animals secure, with two freshwater wetlands created near the feeder stream; so that the deer can drink and the moose wallow in mud.



Deer enclosure plan and north elevation

Freshwater Wetland

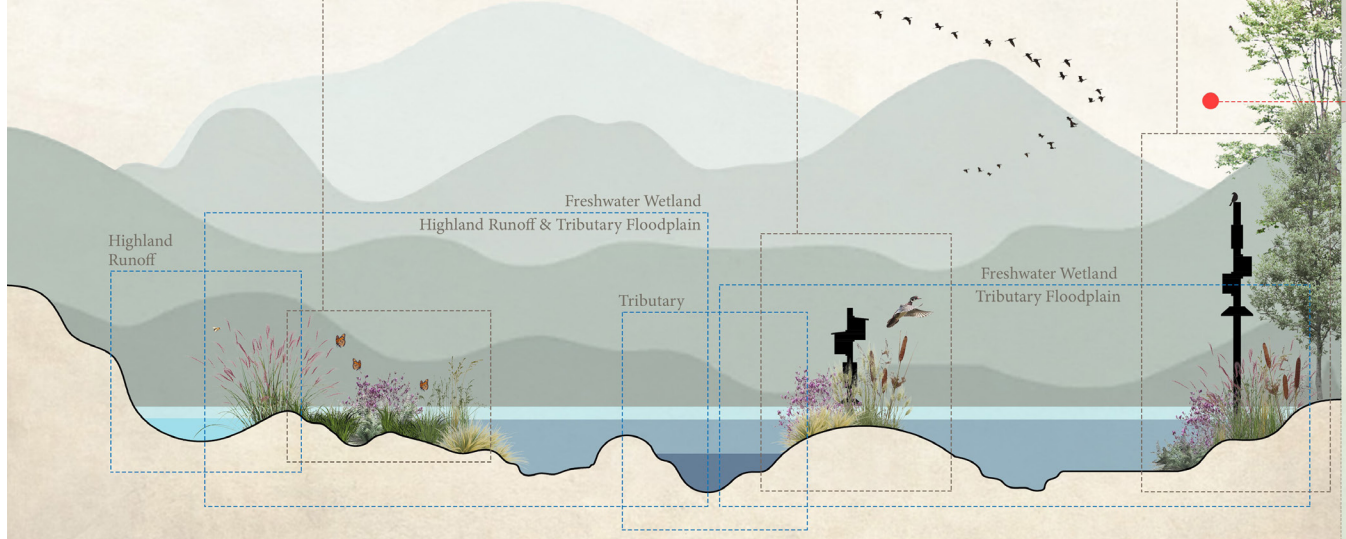
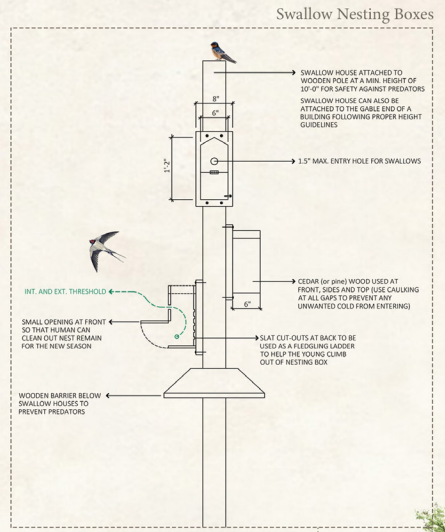
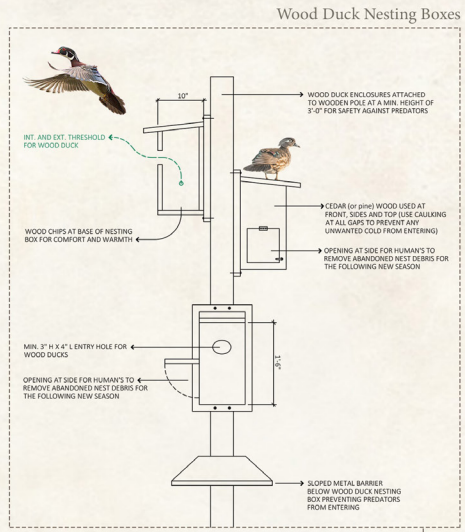
Adding two freshwater wetlands to the Wellness Center's overall climate not only offers a space of familiarity for the injured animals, but it is considered one of the most biologically diverse of all ecosystems, offering extreme comfort and an overall well-being to both human and animal.

Introducing this highly biodiverse ecosystem to the Center will promote opportunity for unique flora and fauna to grow, attracting endangered species as a safe space to develop and adapt accordingly. 10-20% of all bird species are dependent on wetlands. Nesting boxes for the endangered blackbird, wood duck, flycatcher, warbler, swallow, and thrush are introduced and camouflaged throughout as a way to benefit their overall life cycle.

Drainage for all animal sanctuaries will be directed towards each wetland, considered as earth's natural sponge, soaking up excessive amounts of water due to the seasonal floodplain variations, melting snow, accumulated rain, and highland runoff (Geodiode 2021).

Constructed Freshwater Wetland Habitat and Biodiversity (mitigates the river's floodplain and controls the highland's water runoff)

Swamp Milkweed (egg deposit location)

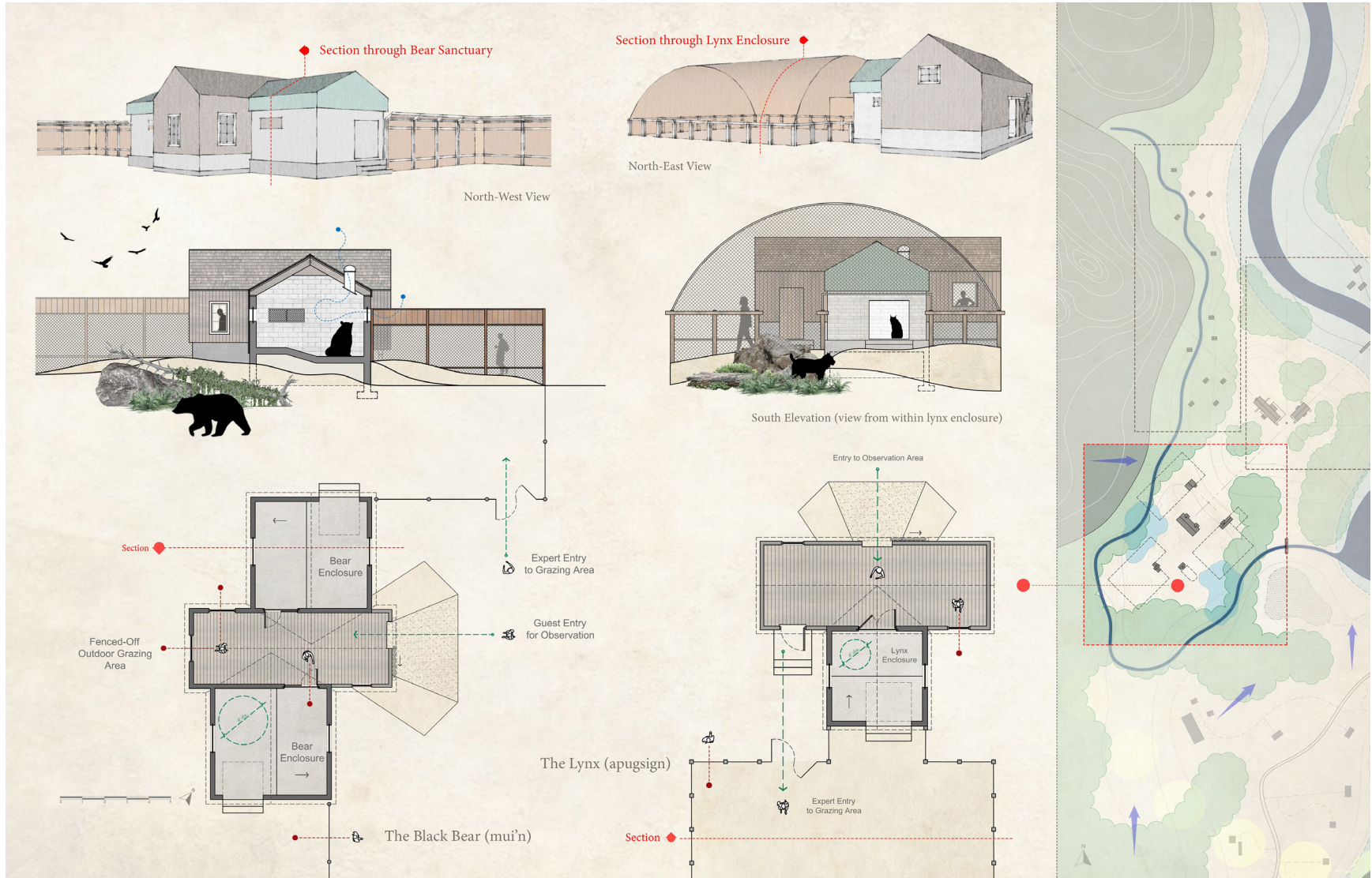


Freshwater wetland inhabited site section exploration and correlating natural inhabitants

Black Bear and Lynx

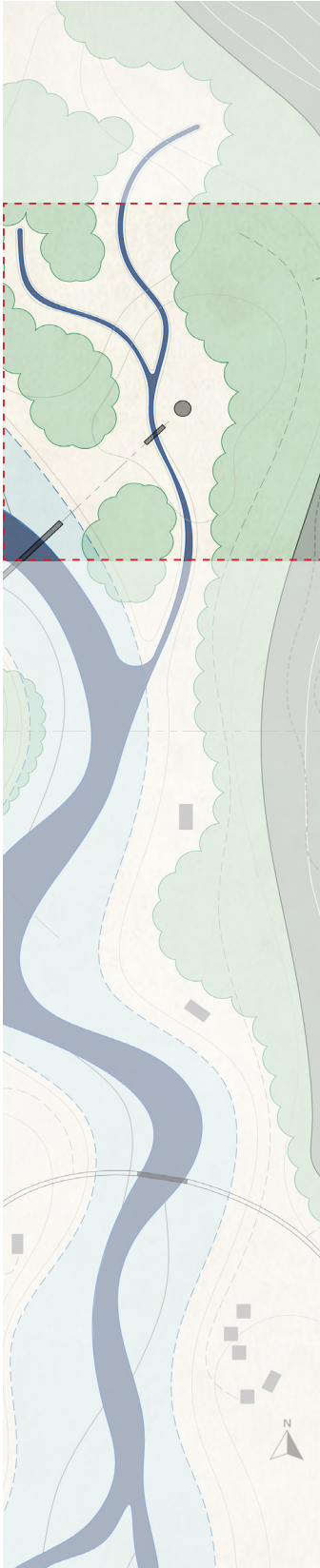
The second type of animal sanctuary is designed for the Black Bear and the Lynx. The black bear represents strength, solitude, and understanding. The lynx represents observation and imagination. This type of program requires less space for the expert as the bear and lynx are considered foragers. Therefore, to provide proper rehabilitation, the experts will place the animal's food throughout the fenced-off areas as to not deter away from their natural survival skills.

Observation outposts will be shared between the expert and the visitor, including multiple designated viewpoints facing the grazing areas, while one view is solely directed into the concrete enclosure itself; covered for privacy and noise considerations when necessary. Rehabilitation is only feasible when the animal feels comfortable in their natural surroundings. These mammals feel safe and secure when housed in a solid, cool, and dark environment. Here, concrete block perimeter walls attached to a sloped slab-on-grade surface, with a wooden truss system, and minimal openings for ventilation are used to create an atmospheric space – similar to that of a den.



Black bear and lynx enclosure plans, sections, and correlating elevations

The Forest Bathing Complex



Water is a unifying element in nature as its meandering motion connects all aspects of a given landscape. In biophilic design, water can be integrated through rain chains, reflecting pools, fountains, outdoor showers, aquaria, and forest bathing (Kellert, Heerwagen and Mador 2008, 44; Kellert 2012b, 30). This outdoor complex introduces forest bathing as an opportunity to bridge the gap between human and nature, rejuvenating mind, body, and spirit.

This type of cleansing property offers significant mental and physical benefits, such as increasing stamina, relieving tension, and improving critical thinking skills and creativity. Recently recognized as a holistic preventative healthcare approach, forest bathing has the opportunity to increase vigor, while decreasing anxiety, depression, and aggression.

Engaging the senses of sight, sound, touch, and smell throughout an immersive heat-cool-rest experience, surrounded by endless forest, is an unforgettable phenomenological experience; one that people will return to again and again.

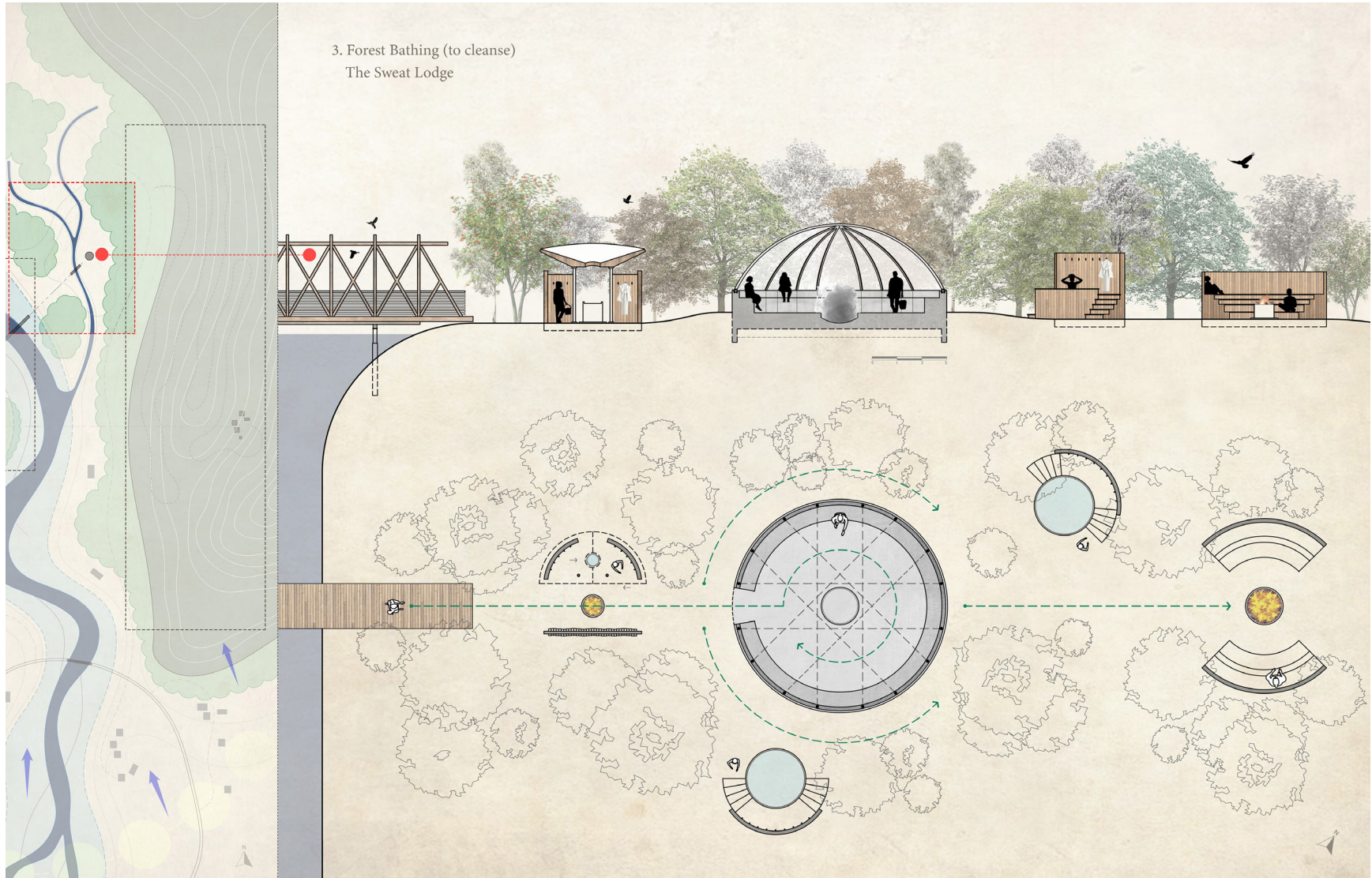


Connecting bridge as a threshold between the Central Hub and the Forest Bathing Complex

To enter the bathing complex, one must first cross a wooden bridge over a stream and head into the forest. Soon, the individual finds a courtyard centered between natural elements of fire, water, wood, and steam.

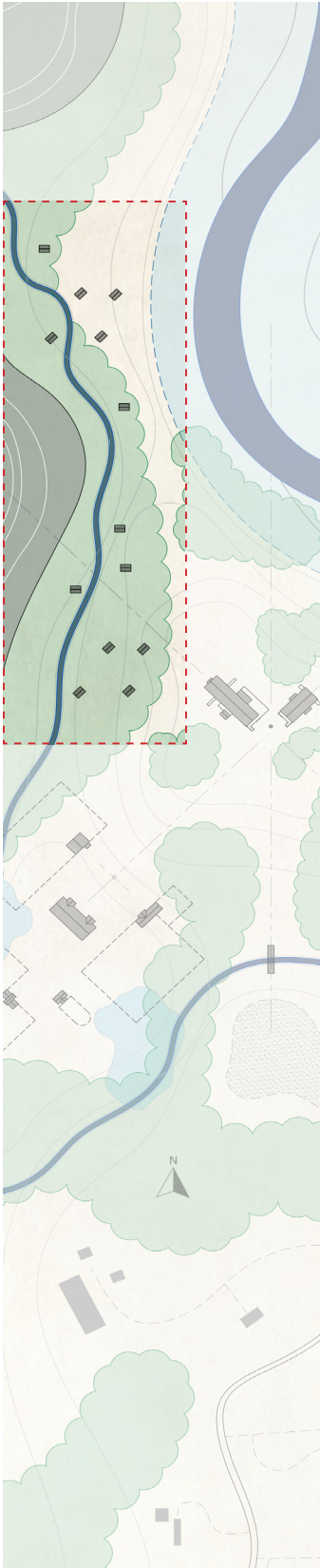
Two vessels are found nearby – one with accumulated rainwater, and the other for carrying stones heated by the exterior fire. Both of these elements play a role in the sweat lodge, where people come together to cleanse and purify themselves via clouds of steam, mixed together with the fresh scent of smudging.

As an important component to Mi'kmaq culture, the sweat lodge is designed to provide a safe, sacred space for participants to spiritually cleanse amongst earth, air, fire, and water; built new each year under the guidance and teachings from those with medical knowledge, shadowed by the community Medicine Man (Gadacz 2006).



The Forest Bathing Complex plan and correlating sweat lodge inhabited elevation

The Clustered Cabins



The cabin area provides an intimate space as a miniature community for experts, locals, and visitors alike to rest, socialize, and tell stories about their explorations and research that occurred throughout the day. Elevated platforms are used as the structure for each cabin, with a determined height referenced from the correlating contours of the highland's base, while also addressing to avoid any damage that could potentially occur from seasonal water accumulation.

Each cabin is positioned specifically as to not interfere with their neighbour's view of the Margaree River, while also being able to appreciate and enjoy the morning sunrise. The meandering stream provides a connection as a pathway between all independent cabins, with the element of fire introduced at each courtyard as a designated space to gather freely.



Clustered cabin community, camouflaged throughout the boreal forest

Hiking Trails and Overnight Refuge

Hiking trails lead the visitor into the nearby highlands, so that they may enjoy a more captivating experience through nature. Setting out from the heart of the Wellness Center, residents are guided by experts in day-long excursions through the forest and into Sugarloaf Mountain Wilderness Area. Here, they come upon an overnight refuge.

Prospect and refuge are two complementary biophilic design attributes that speak to the human's evolutionary preferences for spatial conditions. Prospect focuses on the perception of long distance, whereas refuge provides enclosed spaces that afford greater intimacy, protection, observation, and security as a designated space of shelter. (Kellert 2012b, 91)

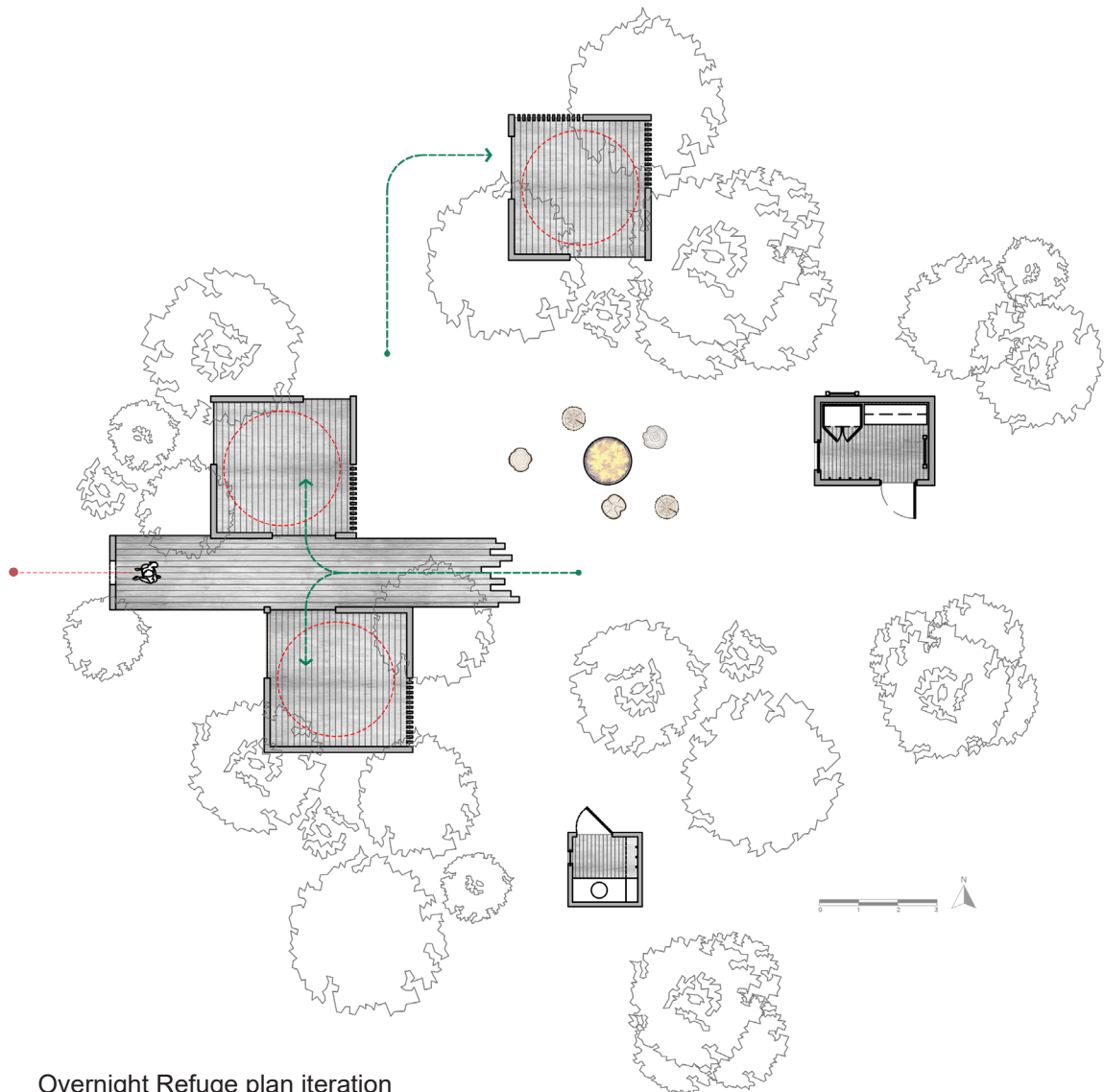


Rendering representing the overnight refuge pavilion where camouflaged camping pods are scattered throughout the taiga foliage, overlooking the Wellness Center below

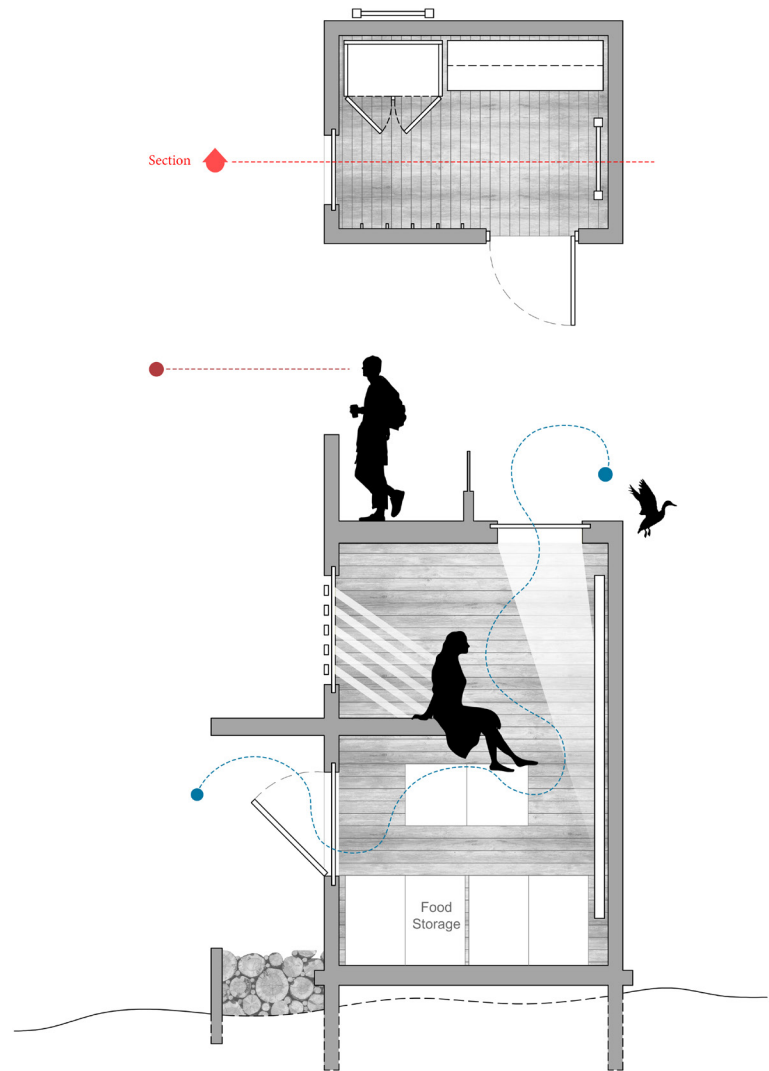
In the minimal and rustic architecture of the refuge, hikers can rest, release, reflect, and regenerate for the next leg of their journey. A pavilion of semi-enclosed platforms, camouflaged by foliage, is the base to set up camp.

Further away, a small outbuilding provides greater solitude.

A third hut serves as food storage, protecting from foraging wildlife – this modest structure doubles as a space of rest in unpredictable weather, and as a lookout for stargazing, birdwatching, and sunset viewings.



Overnight Refuge plan iteration



Plan and section of food storage hut at the Overnight Refuge

Go into the forest, and you will see birch, maple, and pine trees. Then look underground, and you will see that all of these trees are holding hands. We as a community must do the same. (Iwama, Marshall and Marshall 2009, 3)

Seasonal Variation

Spring, summer, and fall are extremely active seasons for locals, tourist, and wildlife across Cape Breton Island. Winter, on the other hand is completely different. Over half of the Cabot Trail loses road access, seasonal residences leave, Parks and Wilderness Areas close, and local amenities decrease in capacity. However, the Wellness Center has been purposefully located in close proximity to the base of the trail where winter traffic and access will remain. Therefore, utilizing the Center all year round will give opportunity for tourists to seasonally experience a new understanding and perspective on nature.

As less visitors and experts will be on site during the winter season, certain focal areas clustered north of the Center's core will not be used or will be decreased in size. Winter activities for experts to guide and tourists to discover include moose harvesting via archery, snowshoe hare hunting, ice fishing for trout at adjacent communities and cross-country skiing opportunities meandered around the snowy highlands.

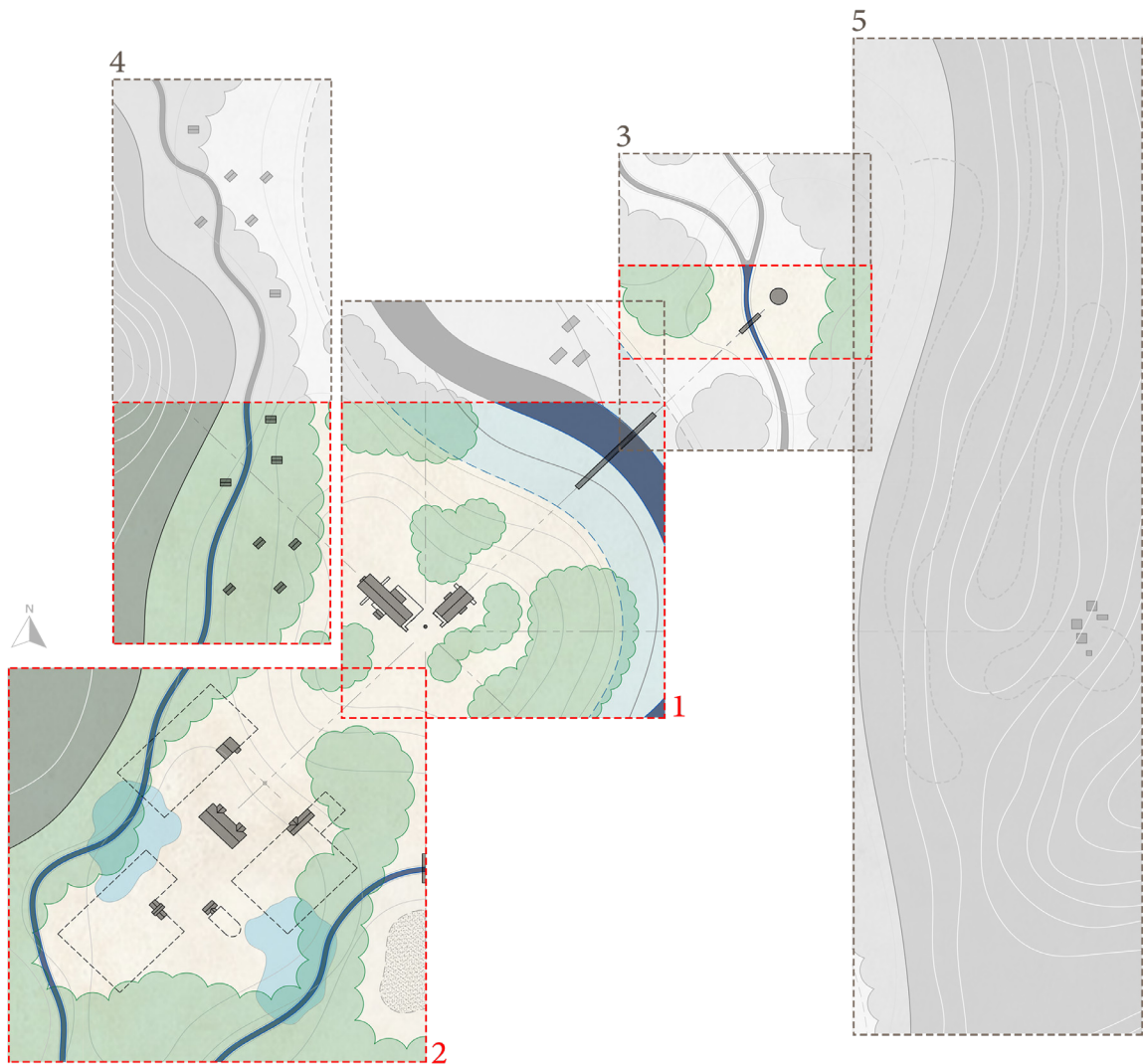
1. The Central Hub will remain as the designated center point for communication and creation, but in a more intimate setting between expert and guest. As less experts will be on-site during the off-season, guests have the option to share housing facilities on the dwelling level above. River activities, such as fishing and angling on the Margaree River, will come to an end until the new licensed season begins.

2. The Animal Sanctuary is a crucial space to maintain year-round. Moose, black bear, and lynx are comfortable creatures during the winter season, while deer are semi-comfortable. Sliding barn doors and protective window coverings are key for creating comfort, protection, and warmth.

3. The Forest Bathing Complex will decrease in size. Cold plunge, meditation, and resting areas will be covered or dissembled. The sweat lodge will remain for ceremonial intent, until a new one is built by the community come spring.

4. The Cabins will decrease in size. Half will be unoccupied and stored accordingly, while the other half, in close proximity to the Central Hub, will remain for the guests.

5. The Overnight Refuge will not be used or maintained during the winter season as a precaution.



Five focal areas of program individuality for the proposed Wellness Center categorized based on seasonal variation for winter across Cape Breton Island, Nova Scotia

Chapter 4: Conclusion

This thesis attempted to create a connection between the human, animal, and natural environment on Cape Breton Island, Nova Scotia. As most humans rely on the atmospheric attributes of nature to help balance their mental health and overall well-being, often ecosystems are neglected and abused throughout the process. Unfortunately, the specific knowledge and traditions of local inhabitants, especially the Mi'kmaq community, are often overlooked when new National and Provincial Parks are introduced. Fortunately, the Department of Natural Resources has introduced the concept of a Shared Stewardship as a way to prioritize tradition and species development for new builds across the island.

This project argues that designing a Wellness Center among nature does not have to be human centered, but equally matched to all other species. Providing a connection, not a barrier, between independent species has the opportunity to spread knowledge and practice that is often forgotten.

The concept of Two-Eyed Seeing was introduced to create a foundation for the Center, linking vernacular architecture with biophilic design strategies, conflicting buffer zones to microclimates, and typical anthropocentric ways to ecocentric possibilities. Holistically, this project explored an initial first glance for how architecture and landscape can be used equally between all inhabitants as a way to learn, educate, heal, and observe. However, for a project of this kind, we need to realize and remember that nature is continuously adapting, therefore, the future of architecture itself must also be willing to continuously adapt.

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