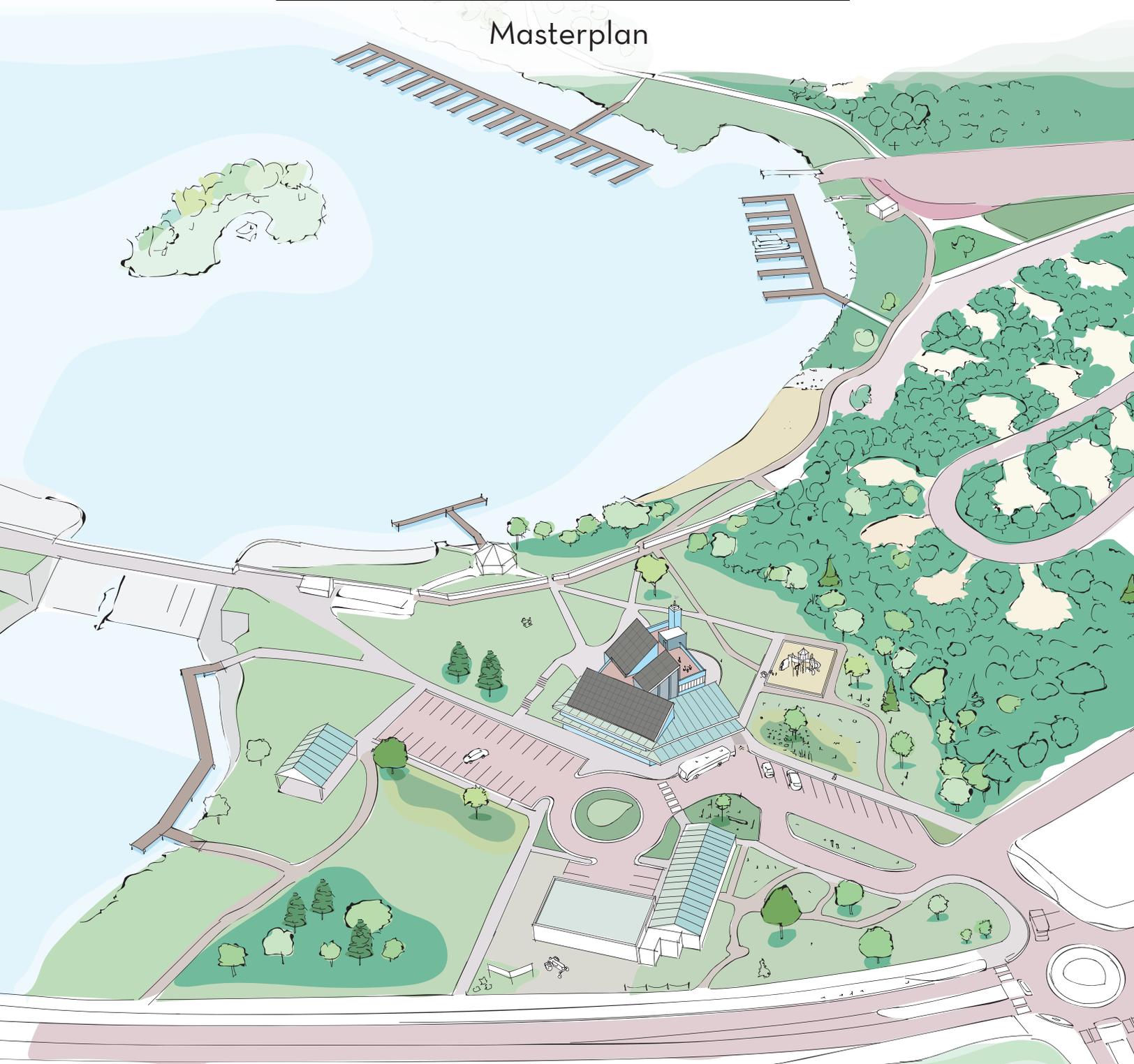


NATIONAL LOON CENTER

CROSSLAKE, MINNESOTA

Masterplan



NATIONAL LOON CENTER MASTERPLAN

CROSSLAKE, MINNESOTA

Final Report
February 2018



DESIGN AND REPORT DEVELOPMENT

Virajita Singh	Assistant Vice Provost, Office for Equity and Diversity, Senior Research Fellow, Center for Sustainable Building Research
Joe Polacek	Master of Urban and Regional Planning '18, Humphrey School of Public Affairs Graduate Research Assistant, Center for Sustainable Building Research

PLANNING TEAM

Molly Zins	Executive Director, Central Sustainable Development Partnership, UMN
Jim Anderson	President, National Loon Center Foundation
Leah Heggerston	Vice-President & Treasurer, National Loon Center Foundation
Carla White	Secretary, National Loon Center Foundation
Eleanor Burkett	Extension Educator, Fisheries, Wildlife and Conservation Biology, UMN
Holly Larson	Outdoor Recreation Planner, National Park Service, RTCA
Kevin Woizeschke	Nongame Wildlife Biologist, Department of Natural Resources

PHOTOS IF NOT OTHERWISE CREDITED, FROM:

Virajita Singh, Joe Polacek, Carla White

CONTENTS

Partners _____	5
Acknowledgments _____	7
Executive Summary _____	9
Section One: Introduction _____	13
Section Two: Research & Precedents _____	25
Section Three: Community Engagement _____	35
Section Four: Design _____	63
1. Enhance loon habitat, protect shoreland, address water quality and invasive species _____	83
2. Create a place for community gathering and education _____	85
3. Use architecture and landscape design for pedagogy _____	87
4. Aim to create a zero energy building and use sustainable building design guidelines and regenerative design principles, and RFP language that supports these goals _____	89
5. Integrate ‘up North’ and modern character in design _____	93
6. Address street access and connectivity, parking of cars and boats _____	95
7. Create inclusive cross-sector collaborative partnerships for the long-term _____	99
Section Five: Summary of Recommendations & Priorities _____	103
Resources _____	107
References _____	113



PARTNERS



Central Regional Sustainable
Development Partnership

UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

The Central Regional Sustainable Development Partnership connects community ideas with University of Minnesota resources for economic, social and environmental sustainability of the region.

We aim to further sustainable development through fostering community-University partnerships that promote inclusive communication, advance innovative ideas, capitalize on opportunities, and affect change.

NATIONAL
LOON CENTER
FOUNDATION

The National Loon Center Foundation is a 501(c)(3) tax-exempt non-profit organization with its primary purpose being to support funding and donations through its non-profit status. The foundation works with many partners in the Whitefish chain of lakes area and beyond to make the community vision of the National Loon Center a reality.



BRAINERD LAKES
Chamber of Commerce

The Brainerd Lakes Chamber of Commerce mission is to strengthen businesses that strengthen our communities.

Our vision is to stand tall as the most celebrated and successful lakes region in America

Our values are leadership, teamwork, tenacity, optimism



**COLLEGE OF
DESIGN**
UNIVERSITY OF MINNESOTA

The Center for Sustainable Building Research (CSBR) is working to transform the built environment in ways that provide for the ecological, economic, and social needs of the present without compromising those of the future.

CSBR's Design for Community Resilience program works with Minnesota communities to offer place-based, integrated solutions that is based on the state-of-the art sustainability and regenerative design research addresses economic, social and environmental dimensions at multiple scales.



The National Joint Powers Alliance provides member-centered solutions that enable Government, Education, and Non-Profit agencies to work more efficiently and leverages its resources to effectively re-invest in the communities we serve as an invaluable Service Cooperative partner.

NJPA's mission is to build valued relationships, deliver innovative solutions with integrity, and exceed the expectations of our members.

Additional Partners

Minnesota Design Team	U.S. Army Corps of Engineers
Brainerd Lakes Area Economic Development Corporation	U.S. Congressman Rick Nolan
City of Crosslake	U.S. Fish and Wildlife
Crosslake Area Historical Society	Audubon Society
Crosslake Community School	Whitefish Yacht Club
The Crosslakers	Ashley Martel/WSN
Initiative Foundation	MN Backyard Birds
Minnesota DNR Nongame Wildlife Program	Crow Wing County Soil and Water Conservation District
National Park Service	Crow Wing county Lakes and Rivers Alliance (LARA)
State Senator Carrie Ruud	Crosslake Art Club
The Train Museum	Minnesota United FC
Mike Angland, AIA	Private Donors
Ashley Martel, AIA/WSN	

ACKNOWLEDGEMENTS

We express sincere thanks to all those who contributed to the project and to the design process for their participation and contributions to the vision of the National Loon Center. While the specific community members participating in Community Meeting 1 are noted below we also sincerely thank the many community members participating in Community Meetings 2 & 3 whose names were not documented.

National Loon Center Foundation

Jim Anderson Leah Heggerston Carla White Matt Killian

Army Corps of Engineers

Corrine Hodapp Jason Hauser

Contributors of Research Input

Kevin Woizeschke, MN DNR	Cindy Myogeta, CL Chamber of Commerce
Caroll Henderson, MN DNR	Mike Schwieters, WALA, Chamber
Heather Baird, MN DNR	Beth Hippert, Crow Wing SWCD
Heidi Lindgren, MN DNR	Eleanor Burkett, UMN Extension
Mark J. Harlow, Photographer	Molly Zins, UMN CSDP
Jon Kolstad, City of Crosslake	Holly Larson, NPS
Matt Killian, BL Chamber of Commerce	Jim Anderson, NLC Foundation

Attendees of Community Meeting 1

Gary Phillips	Keith Acker	Bill Randall
Rod Herman	Cindy Myogeta	Sandy Holm
Ruth Nordby Schwieters	Mike Myogeta	Jon Grothe
Maxine Nordby	Linda Randell	Dixie Grothe
Roger Schwieters	Jeff Ubl	Dick Elmquist
Nancy Schwieters	Pat Netko	Sharon Elmquist
Jason Brunkhorst	Tim Schalow	Judd Brink
Kista Brunkhorst	Bubbie Roegge	Joel Knipple
Dennis Taylor	Jim Roegge	Linnea Anderson
Jerry Crosby	Dave Nevin	Mary Blegen
Pat Crosby	Nancy Nevin	Jay Blegen
Patty Norgaard	Tom White	Gary Heacox
Jerry Norgaard	Dan Heggerston	Sue Heacox
Beryl Roe	Carrol Henderson	Rick Shuler
Steve Roe	Ashley Martel	Katie Nordstrom
Chris Monroe	Gary Olson	Jayne F Franta
Mike Schwieters	Craig Sauer	Sandy Anderson
Mike O'Connell	Donna Balzer	Leddi Nelson
Todd Lyscio	Jerri Keller	Sue Skajewski
Matt Killian	Susan Koering	Fred Gridley
Tim Kulseth	Chuck Cole	Jim Funk
Eileen Kulseth	Cheryl Cole	Camille Gridley

Members of the Press

Theresa Bourke	Bill Monroe	Tony Kennedy
Pine and Lakes Echo Journal	Northland Press	Star Tribune



EXECUTIVE SUMMARY

The National Loon Center (NLC) is a community-driven project led by the National Loon Center Foundation, a 501(c)(3) tax-exempt non-profit organization, and its many partners in Crosslake and the Whitefish Chain of Lakes area. The project focuses on loons and their unique relationship with the shared freshwater ecosystem in the area, fish and wildlife management, environmental stewardship, trails, tourism, recreation, education, and long-term sustainability.

Section One (Introduction) of this report sets the context for the project with history of the site and surroundings, description of ecology and habitat of the region, site selection criteria and the design brief.

The NLC project has three goals. First, from an environmental perspective, the project seeks to improve on the co-existence of humans and loons in a shared natural habitat. While the Whitefish Chain of Lakes includes some of the state's healthiest lakes, there is evidence that water quality and loon habitat in the area are under threat. The NLC wishes to set a good example of the importance of stewarding of loons and of natural resources and waterways through careful development and educational programs, working in partnership with other agencies such as the MN DNR. Second, from an economic perspective, the goal of NLC is to create a place of year-round attraction that will not only help promote water resource and wildlife protection but also serve as a significant economic driver in the area by being a hotspot for educational tourism in an area that already significant recreational tourism. It hopes to achieve the economic goal in partnership with entities such as the Brainerd Lakes Chamber of Commerce and the Crosslake Chamber of Commerce. Third, from a social perspective, the goal of NLC is to become a community hub for local residents and visitors and a place where the intergenerational community gathers, learns, socializes and celebrates events.

The research and community participatory design process conducted from August 2017 to January 2017 documented in this report was facilitated by the Design for Community Resilience program in the Center for Sustainable Building Research, College of Design, University of Minnesota - Twin Cities campus. It was funded by the Central Regional Sustainable Development Partnerships (CRSDP) and the National Joint Powers Alliance (NJPA).

The site of the Pine River Dam and campground is a popular destination for recreation which is visited by nearly 200,000 thousand visitors annually. Because it is already frequented by visitors and tourists, and located in downtown Crosslake with close proximity to the lake shore, public beach and other amenities it is a promising site for locating the National Loon Center.

It is proposed that the National Loon Center (NLC) will provide education, programming, and activities related to loons and their habitat in central Minnesota and serve a local, regional and national audience/stakeholders. It's three areas of focus will be:

- Protecting loon habitat, shoreland, water quality and addressing invasive species
- Landscape and architecture as pedagogy/teaching about regenerative design
- Social and economic viability

The National Loon Center Foundation will partner with the community stakeholders in Crosslake and surrounding communities, state and federal partners in planning, development and operation of the facility.

Section Two (Research & Precedents) describes some of the projects and additional research that informed the development of the National Loon Center project.

Section Three (Community Engagement) documents community participation and input given by community members to the National Loon Center vision and design in three meetings held in Crosslake from August to December 2017. Also documented are research input sessions with experts and examples from an art project on the theme of loons facilitated by the art teacher at the community charter school over the same time period.

Section Four (Design) documents design paradoxes, design approach for the project, design features of the site masterplan, building design and design recommendations. The Site Design - Masterplan and Building Design are outcomes of the design process from August 2017 to December 2017 including community meetings and input from the Planning Team and other experts. The vision is for the building to follow the seven design recommendations, their phases for consideration, and priority levels as indicated below. The Phases indicated assume three phases of the project, with the first phase currently underway. The Priority Level assumes two levels of priority, high and low. Almost all recommendations are of high priority with work towards achieving the design recommendation expected to cycle through most phases of the project.

Design Recommendation 1: Enhance Loon Habitat, Protect Shoreland, Address Water Quality and Invasive Species. (Phase 1,2,3; Priority Level 1)

- Make loons and their habitat the focus of interpretive exhibits.
- Use technology and boat tours for live loon viewing.
- Develop shoreland protection zones.
- Build on the work of existing committees.

Design Recommendation 2: Create a Place for Community Gathering and Education. (Phase 1,2,3; Priority Level 1)

- Serve Intergenerational communities with diverse interests.
- Create a focus on environmental education.

Design Recommendation 3: Use Architecture and Landscape Design for Pedagogy (Phase 1,2,3; Priority Level 1)

- Use architecture and landscape architecture to teach.
- Highlight places in building and on site that can teach.

Design Recommendation 4: Aim to Create a Zero Energy Building and Use Sustainable Building Design Guidelines and Regenerative Design Principles, and RFP Language that Supports These Goals. (Phase 1,2,3; Priority Level 1)

- Aim to create a zero energy building.
- Use Sustainable Building Guidelines.
- Use RFP language for building project for design and construction that clearly establishes targets.
- Select experienced professionals with demonstrated sustainable and regenerative design expertise.
- Plan on a RFP for consultants that indicates expertise in sustainable and regenerative design.

Design Recommendation 5: Integrate ‘Up North’ and Modern Character in Design. (Phase 2, 3, Priority Level 1)

- Incorporate ‘Up North’ character in the design.
- Seek modern place-based expression through the design.

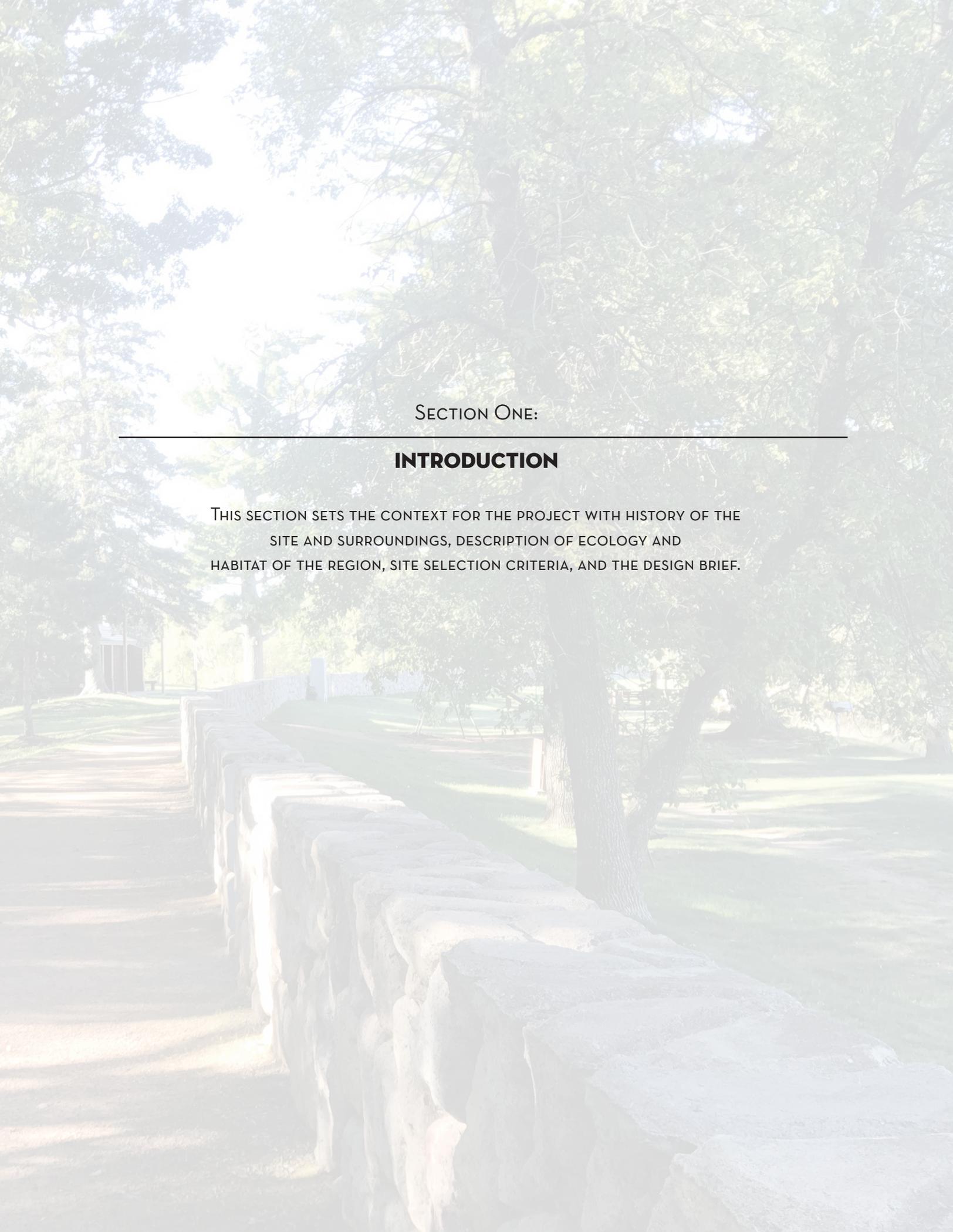
Design Recommendation 6: Address Street Access and Connectivity, Parking of Cars and Boats. (Phase 2, Priority Level 2)

- Connect the ‘three districts’ of Crosslake.
- Implement some of the short-term initiatives suggested by the Walkable Crosslake report.

Design Recommendation 7: Create Inclusive Cross-sector Collaborative Partnerships for the Long-term. (Phase 1,2,3; Priority Level 1)

- Foster collaboration.
- Implement best practices of cross-sector collaboration.
- Include individuals and groups from underrepresented minorities in the collaborations.
- Create a plan for maintaining facility and site in partnership.



A photograph of a stone wall in a park-like setting. The wall is made of large, rectangular stones and runs along a path. There are many trees in the background, and the scene is brightly lit, suggesting a sunny day. The image is slightly faded, making the text overlaid on it stand out.

SECTION ONE:

INTRODUCTION

THIS SECTION SETS THE CONTEXT FOR THE PROJECT WITH HISTORY OF THE SITE AND SURROUNDINGS, DESCRIPTION OF ECOLOGY AND HABITAT OF THE REGION, SITE SELECTION CRITERIA, AND THE DESIGN BRIEF.



PROJECT INTRODUCTION

THE NATIONAL LOON CENTER

The National Loon Center (NLC) is a community-driven project led by the National Loon Center Foundation, a 501(c)(3) tax-exempt non-profit organization, and its many partners in Crosslake and the Whitefish Chain of Lakes area. The project focuses on loons and their unique relationship with the shared freshwater ecosystem in the area, fish and wildlife management, environmental stewardship, trails, tourism, recreation, education, and long-term sustainability.

The common loon (*Gavia immer*) is the state bird of Minnesota adopted as such in 1961. With the largest population of common loons on the conterminous U.S. present in Minnesota, approximately 12,000 in number annually, the common loon instills awe, wonder, and a sense of place for Minnesotans and out-of-state visitors alike. Surveyors of the Whitefish Chain of Lakes from the Minnesota Department of Natural Resources (DNR) have identified common loons as one of the many species of greatest conservation need in the area.

The NLC is intended to promote research and educational tourism and help visitors learn about loons and their habitat, water resource protection, and the responsibilities to protect Minnesota's natural assets for generations to come. The NLC aspires to be a distinctive facility in terms of its architecture and landscape that will connect the City of Crosslake with the local waterway system and act as a community hub for local residents and visitors.

NATIONAL LOON CENTER GOALS

The NLC project has three goals relating to environmental, economic, and social factors. First, from an environmental perspective, the project seeks to improve on the co-existence of humans and loons in a shared natural habitat. While the Whitefish Chain of Lakes includes some of the state's healthiest lakes, there is evidence that water quality and loon habitat in the area are under threat. The NLC wishes to set a good example of the importance of loon habitat and of stewarding natural resources and waterways through careful development and educational programs, working in partnership with other agencies such as the MN DNR.

Hundreds of loons migrate to the Whitefish Chain every season returning year after year. DNR's Nongame Wildlife program has identified loons as a good indicator of water quality because loons need clean, clear water to observe and catch food, and they are sensitive to disturbance by lakeshore development and are indicators of the effects of contaminants like mercury and lead in the environment or the impacts of disastrous events like the British Petroleum (BP) oil spill where many Minnesota loons migrate each year. Every year hundreds of volunteers serve on DNR's Minnesota Loon Monitoring Program to observe and track loons. The new NLC facility is also intended to be the premier loon and freshwater research center in the area, providing



Image from Minnesota Historical Society

year-round and state-of-the-art support services in partnership with entities such as the University of Minnesota, DNR, U.S. Fish and Wildlife Service, and the United States Army Corps of Engineers (USACE).

Second, from an economic perspective, the goal of NLC is to create a place of year-round attraction that will not only help promote water resource and wildlife protection but also serve as a significant economic driver by being a hotspot for educational tourism in an area that already sees regional recreational tourism. It hopes to achieve this economic goal in partnership with entities such as the Brainerd Lakes Chamber of Commerce and the Cross-lake Chamber of Commerce.

Third, from a social perspective, the goal of NLC is to become a community hub for local residents and visitors, and a place where the intergenerational community gathers, learns, socializes and celebrates events.

NLC PROJECT - PARTICIPATORY PREDESIGN

The research and community participatory design process conducted from August 2017 to January 2018 documented in this report was facilitated by the Design for Community Resilience program in the Center for Sustainable Building Research, College of Design, University of Minnesota - Twin Cities campus. It was funded by the Central Regional Sustainable Development Partnerships (CRSDP) and the National Joint Powers Alliance (NJPA). Design for Community Resilience program works with Minnesota communities to offer place-based, integrated solutions that is based on the state-of-the-art sustainability and regenerative design research that addresses economic, social and environmental dimensions at multiple scales. Sections Three and Four of this report include outcomes of community engagement and design as a result of this process. The next phase of the project, to be conducted in Spring 2018, is a feasibility study that will be led by the University of Minnesota Department of Applied Economics.

CONTEXT

HISTORICAL SIGNIFICANCE OF THE PINE RIVER DAM AND SURROUNDING AREA

Historical significance of the Pine River dam and surrounding area
In Minnesota's Crow Wing County, in the City of Crosslake where the Pine River crosses the Whitefish Chain of Lakes lies the site of the Pine River Dam managed by the USACE. The Pine River enters the Chain at the western edge of Upper Whitefish, exiting at the dam at the southeast corner of Cross Lake. Regarding the Pine River itself, according to the DNR, there are a number of dams that require portaging with large drops occurring at the dams at Pine River and Cross Lake. The watershed covers 562 square miles (1,456 square kilometers) and the water level generally peaks in mid-to late-May and falls during the summer until September and October when the river has an increase, peaking again in mid-October.

The Pine River dam was installed by the USACE, constructed in the period of 1884 -1886, reconstructed in 1905 - 1907 replacing the original timber structure with a concrete infrastructure. No significant renovations were made to the dam after that until a major renovation was completed between 1999 and 2003, fully automating the opening and closing of the gates.

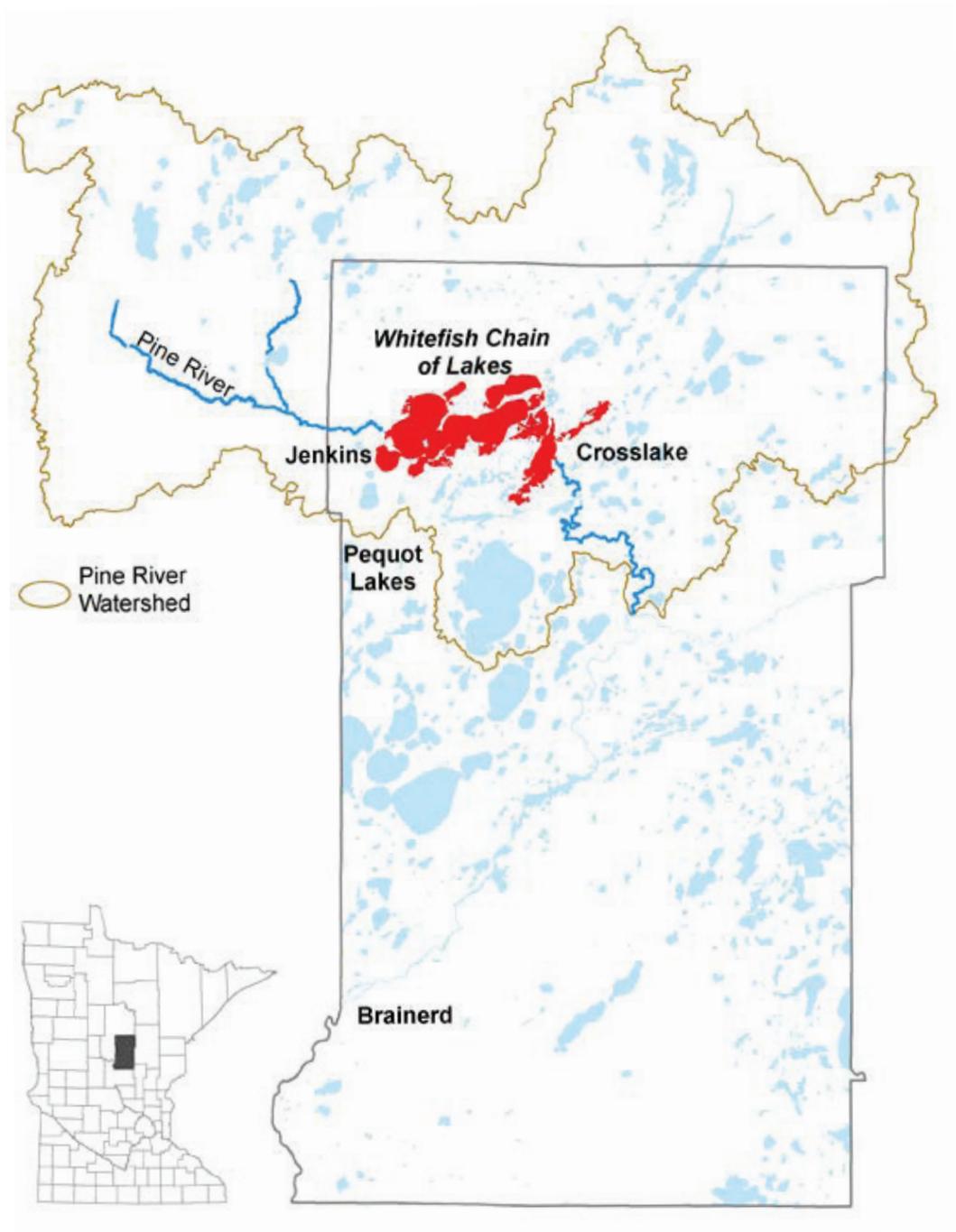
Historian Dr. Jane Lamm Carroll notes in the Historic American Engineering Record (HAER):

“The Pine River Dam is one of six Mississippi River Headwaters Reservoirs dam sites that are historically significant for their association with navigation, commerce, tourism, the Ojibway Indians, and U.S. Indian policy in Minnesota in the late 19th century.

By providing a consistent flow of water throughout the navigation season, the Pine River Dam enhanced navigation and aided in the commercial development of the Upper Mississippi. River and the surrounding region. The dam site was also one of the earliest non-Indian settlements in the region and by the late 19th century was attracting some of the first tourists to the area.”

Regarding Native American presence in the region, Carroll documents: “The Mississippi Headwaters project precipitated a century-long conflict between the tribe and the U.S. government over the damages resulting from the inundation of tribal lands and property.” She also notes: “Pine River is the least significant of the dam sites in relation to the Minnesota Ojibway. Unlike the five other dam sites, Pine River was not close to any permanent Ojibway villages. Although the tribe used and occupied the lands around the Whitefish Chain of Lakes until the mid-19th century for temporary encampments and hunting, the Ojibway did not permanently settle in the vicinity.”

The Pine River dam was the fourth dam site in the Headwaters reservoirs system. By the time the dam was built, the lumber industry was already well-established in the vicinity and sluicing logs was a part of the dam tender's daily routine. This dam played an important role in enhancing navigation on the Upper Mississippi and affected regional commerce. Brainerd, then a small



"Location of the Whitefish Chain of Lakes in Crow Wing County." Image: MN DNR

lumber town, was located 20 miles south of the dam site.

Tourists began visiting the Brainerd area in the early 1900s and by the 1910s, Cross Lake and the other lakes in the Whitefish Chain had become increasingly popular as sites for summer cabins and resorts, with the region advertised extensively by the Northern Pacific Railroad. The Pine River Dam specifically attracted both fishermen and tourists, and eventually became the most popular recreation area of the six dam sites.

A complex of seventeen buildings was erected by the Army Corps in 1884 of which no structures remain. Carroll writes: "The original dam site complex included a dam tender's house, laborer's quarters, engineer's quarters, a dining hall, an office building, an officer's house, a wood shed, a chicken coop, a barn, a warehouse, a sawmill, a carpenter shop, and a blacksmith shop. These were frame buildings covered with rough boards. After construction was completed, the Corps removed most of these buildings except for the dam tender's dwelling and a few other support structures. In 1911, the Corps built a new house, office, and barn at Pine River. After fire destroyed the house in 1921, the Corps built another dwelling the next year. A 1937 photograph of new house indicates that it had a stucco exterior, asbestos cement shingle roof, and a simple bungalow design.

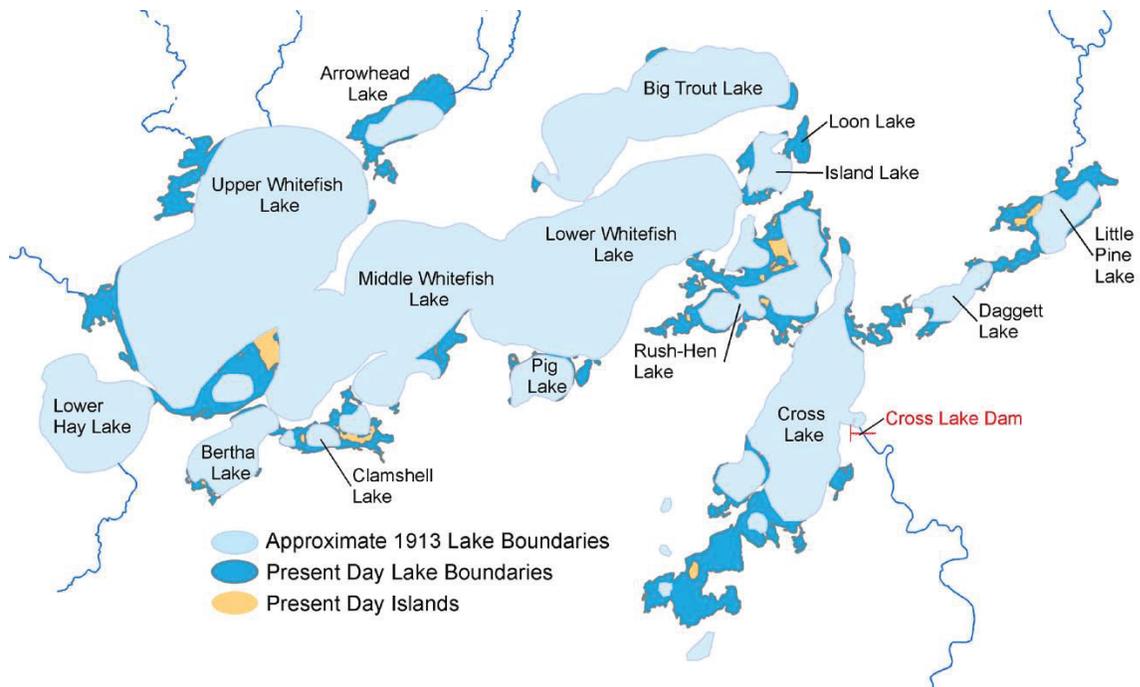
A 1929 map of the Pine River Dam Site shows a house, office, a barn, a carpenter shop, a blacksmith shop, two warehouses, a wood shed, and a chicken coop. After the fire destroyed the second house in 1959, the dwelling was not replaced. Due to the extensive redevelopment of the Pine River Dam Site for public recreation, there is no visible evidence of any of these structures."

CITY OF CROSSLAKE

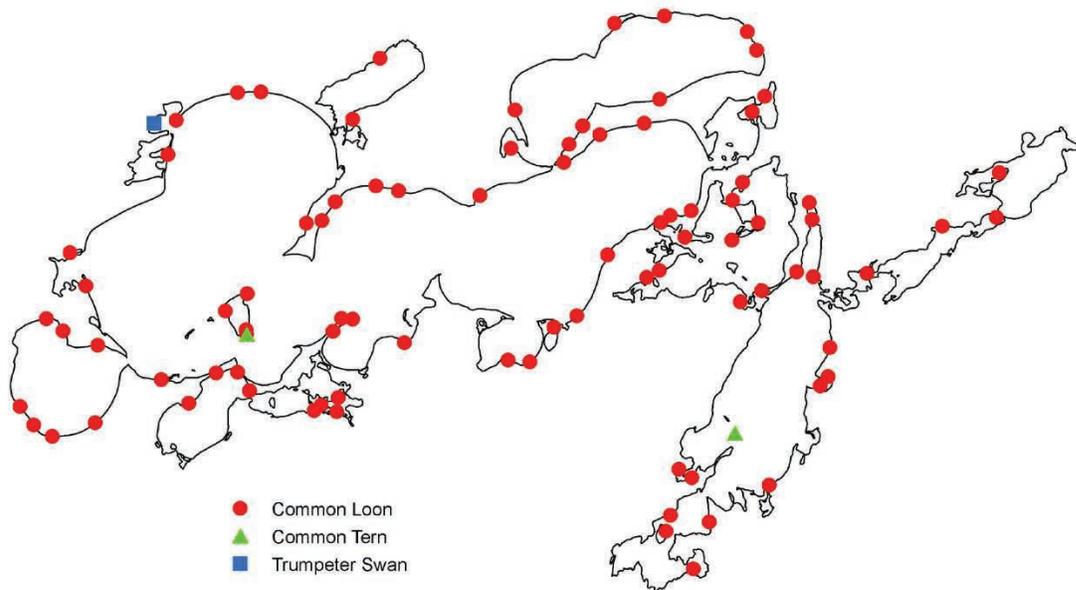
Crosslake is located in Crow Wing County, Minnesota with a population of 2,030 and a median age of 59.5 years. In 2015, the median household income in Crosslake was \$64,012, a 3.28% growth from the previous year. Also, in 2015 there were 877 residents in Crosslake, MN with jobs, a 3.54% growth over 2014.

The demographics of Crosslake residents recorded by the American Community Survey (ACS) documents 99% of Crosslake residents were US citizens in 2015, a number higher than the national average of 93%. The most common country of origin for those not born in the US was Mexico. Crosslake has 2,004 White residents and 13 Native residents. 0.76% of Crosslake residents are native speakers of a non-English language.

The median value of a property in Crosslake was \$366,100 in 2015, and the largest share of households pay taxes in the \$3k+ range. Also, 84.9% of housing units are owner-occupied, higher than the national average of 63.9%. The most common method of travel in Crosslake is by car, with an average commute time of 22.2 minutes.



“Historical map of the Whitefish Chain of Lakes (as interpreted from 1913 hand-drawn map).”
 Image: MN DNR



“Distribution of aquatic habitat-dependent bird species of greatest conservation need documented on the Whitefish Chain of Lakes during point-count surveys, May - June, 2010 - 2011.”
 Image: MN DNR

LANDSCAPE ECOLOGY AND HABITAT IN THE AREA

WHITEFISH CHAIN OF LAKES

The Whitefish Chain of Lakes is located in the Brainerd Lakes Area in Northern Minnesota. The Whitefish Chain, as residents and visitors know it today, was a result of the construction of the dam which raised the water level by 10 feet creating the channels between what were once individual lakes. Thirteen lakes make up the Whitefish Chain: Whitefish, Arrowhead, Bertha, Big Trout, Clamshell, Cross, Daggett, Hen, Island, Little Pine, Lower Hay, Pig and Rush.

LANDSCAPE, ECOLOGY AND HABITAT

According to the DNR, most of the Pine river flows through essentially undeveloped, natural forested "Jack Pine Hills," interrupted occasionally by swampy areas such as Ding Pot Swamp or open, quiet water such as Norway Lake. The City of Pine River and the Whitefish Chain are the only areas where concentrated development occurs. Lake and hill country, through which most of the river flows, illustrates classic glacial landforms. The stream itself is mainly gravel-bottomed with occasional boulders.

A great diversity of fish species are found along the Whitefish Chain route including walleye, northern pike, bass, crappies, sunfish and whitefish. There are northern pike, walleye, large and smallmouth bass in the lower Pine River below Cross Lake. Lake trout are also found in Big Trout Lake on the northeast end of the Whitefish Chain. Wildlife includes white-tailed deer, beaver, muskrat and mink. Along the river there are various songbirds and waterfowl, an occasional bald eagle or osprey and common loons.

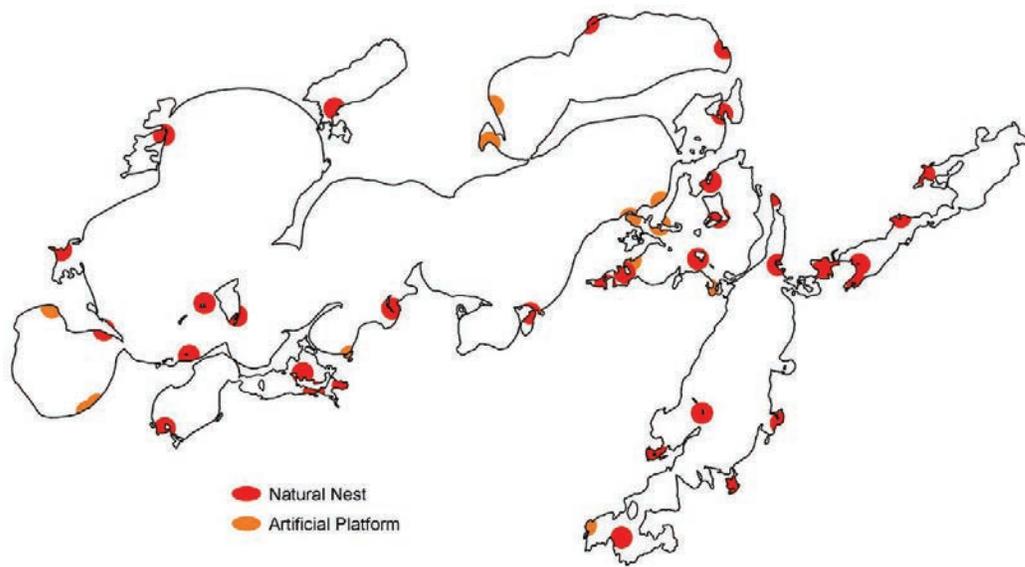
COMMON LOONS IN MINNESOTA AND THE WHITEFISH CHAIN OF LAKES

MN DNR's 2012 'Final report on the sensitive lakeshore surveys for the Whitefish Chain of Lakes, Crow Wing County, MN' identifies Common loons (*Gavia immer*) as: "...one of Minnesota's most recognizable birds. They are found from northeastern to central Minnesota, and numbers are higher here than in any other state except Alaska. These large diving birds possess red eyes and a large, dark pointed bill that is well-adapted for catching fish. Loons spend most of their time in water, and go ashore only to mate and incubate eggs. Summer plumage is spotted black and white, while in winter the colors are gray above and white below. Loon populations are closely monitored in Minnesota; however, these birds still face threats, particularly in the form of human disturbance and lead poisoning."

Surveyors also identified and reported 22 species of greatest conservation need on the Whitefish Chain of Lakes. The common loon was by far the most commonly recorded species of greatest conservation need and was documented at 87 survey stations. Over 40% of the stations on Lower Hay Lake included loons, as did over 20% of the stations on Bertha, Big Trout, Pig, and Whitefish Lakes.

Every year, hundreds of adult loons establish breeding territories on the Whitefish Chain of Lakes, where they find abundant nesting habitat and forage fish, including yellow perch, sunfish, and cisco. Oily, high-calorie ciscoes live in the coldest portions of deep lakes, where oxygen levels are locked in for long periods. Wildlife researchers are concerned about safeguarding these special feeding areas for the loons such as deep water lakes where loons seem to congregate to feed on highly nutritious ciscoes. There are about 650 cisco lakes in Minnesota and proof of their importance to loons could elevate them as candidates for restoration and preservation. Lake biologists worry that runoff from increasingly developed watersheds will cause unwanted weed and algae growth. When the excess plants die, they drop to the lake bottom and soak up dissolved oxygen vital to the survival of ciscoes.

Loons have exceptional abilities in diving and flight. A loon expert for the U.S. Geological Survey (USGS), Kevin Kenow, “has proved previously with pressure-sensing leg bands that Minnesota loons that visit Lake Michigan during annual migrations to the Gulf dive 140 feet deep. There, they forage on bottom-dwelling bait fish as part of their fall migration. Their dives last as long as 2.5 minutes and their subsequent flights to the Gulf have been clocked at 70 mph, fast enough for nonstop trips when aided by good weather.” In 2015 researchers documented aggregations of 100 loons on Lower Whitefish and 40 loons on Lower Hay. Big Trout, another deep lake in the Whitefish Chain, also attracted crowds of loons. It should be noted that loons can be maintained in captivity for only relatively short periods of time (e.g., for research and rehabilitation purposes). Their susceptibility to aspergillosis, a fungal disease of the respiratory tract, precludes them being held captive for long periods of time. This is significant because it rules out the possibility of integrating live loons in NLC’s programming.



“Location of natural loon nests and manmade loon platforms recorded on the Whitefish Chain of Lakes between 1987 and 2011.” Image: MN DNR

DESIGN BRIEF

It is proposed that the National Loon Center (NLC) will provide education, programming, and activities related to loons and their habitat in central Minnesota and serve a local, regional and national audience and stakeholders. The NLC's three areas of focus will be:

- Protecting loon habitat, shoreland, and water quality, and addressing invasive species
- Landscape and architecture as pedagogy/teaching about regenerative design
- Social and economic viability

The National Loon Center Foundation will partner with the community stakeholders in Crosslake and surrounding communities, state and federal partners in planning, development, and operation of the facility.

SITE SELECTION

The proposed location for the NLC is on USACE land at the site of the Pine River Dam. For many decades, the USACE has brought value to the Crosslake area through their water and land usage, environmental stewardship, fish and wildlife education, outdoor recreation, and flood risk management. While the possibility of other sites was brought up in the community meetings including the South Park site also on USACE land, it was determined by the planning team that the current site best served the three goals of environmental focus, economic viability and social community presence that would be critical to long term success. management and sustainability of the project.

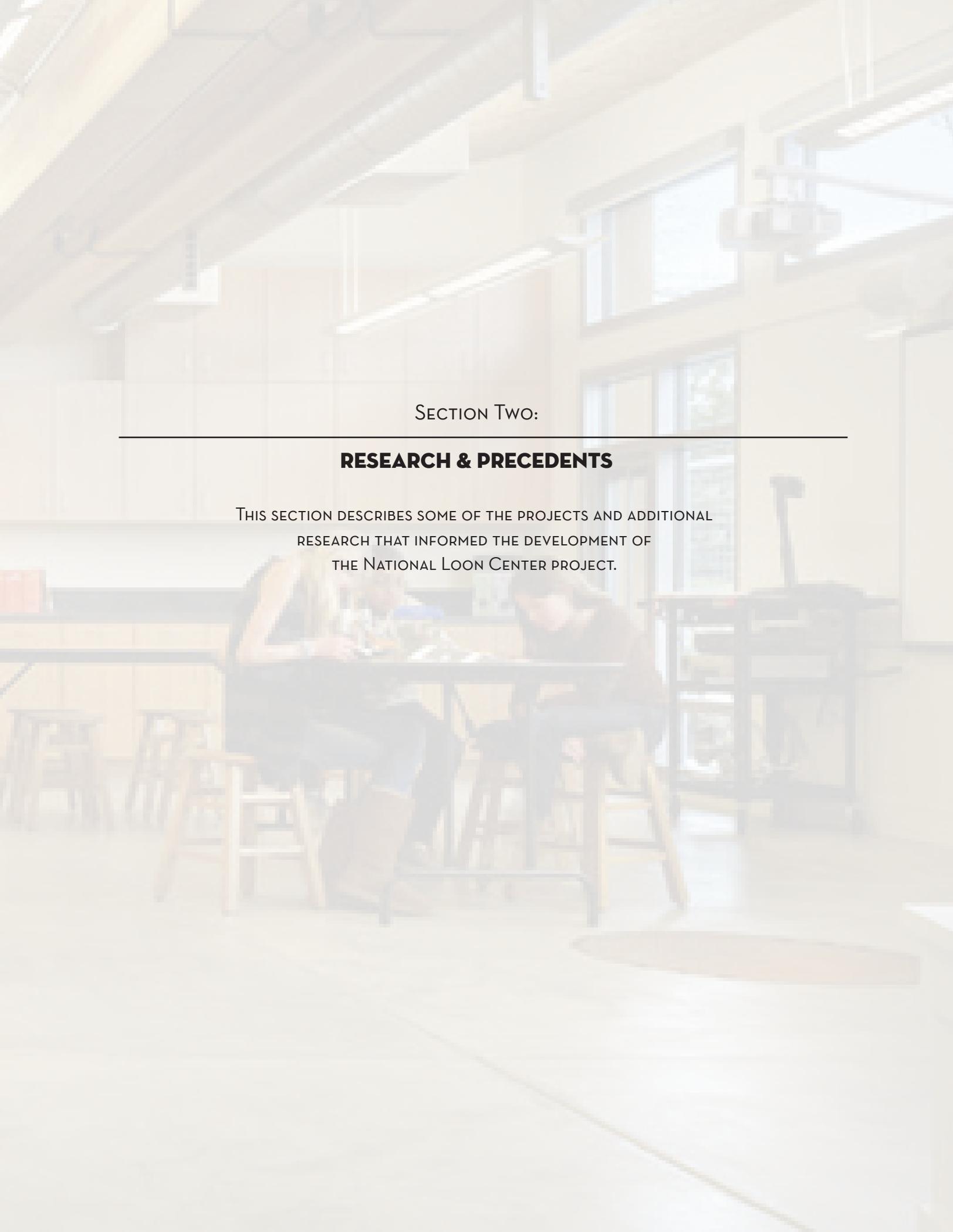
NATIONAL LOON CENTER SITE

The site of the Pine River Dam and campground is a popular destination for recreation which is visited by nearly 200,000 thousand visitors annually. Because the site is already frequented by visitors and tourists, and is located in downtown Crosslake with proximity to the Lake shore, public beach and other amenities it is a promising site for locating the National Loon Center.



Tracking a juvenile loon's 2015/16 journey from the Whitefish Chain of Lakes to the Gulf of Mexico and the Eastern seaboard. Image: USGS





SECTION TWO:

RESEARCH & PRECEDENTS

THIS SECTION DESCRIBES SOME OF THE PROJECTS AND ADDITIONAL RESEARCH THAT INFORMED THE DEVELOPMENT OF THE NATIONAL LOON CENTER PROJECT.

NATIONAL EAGLE CENTER

The National Eagle Center, designed by LHB, Inc., opened in 2007 on the banks of the Mississippi river in Wabasha, Minnesota. The founding group was formed in 1989 as Eagle-Watch, Inc., a group of volunteers that showed visitors views of bald eagles from an observation deck. Today, the center also allows visitors to see non-releasable eagles close-up.

The Eagle Center includes 15,000 square feet of covered space. It offers educational programs for groups and schools. It also has outreach programs to bring lessons out of the center to communities and lesson plans for school teachers. A focus of the Eagle Center is to educate about the species and its habitat. The Eagle Center has four resident eagles that serve as “ambassadors” to the visiting public.

The National Eagle Center can inform many decisions to be made in the creation of the Loon Center. In a small town, the Eagle Center manages to attract visitors year-round. With off-site parking, the Eagle Center maintains a walkable entrance, a concept that can help the Loon Center to preserve natural surroundings. The size and exhibits of the Eagle Center can serve as inspiration in the continuing development of the Loon Center.

Image: (left) LHB Architects, (top) pumasbluff.com, (bottom) LHB Architects



INTERNATIONAL WOLF CENTER

The International Wolf Center, designed by Thorbeck Architects, Ltd. is located in Ely, Minnesota with a satellite location in Brooklyn Park in the Twin Cities metro area. The mission of the Wolf Center is to educate the public in order to advance the survival of wolf populations. They do so by teaching about wolves, their dependence on wildlands and the role of humans in their future. The vision of the Center is to support distributed populations of wolves living on their native ranges. They strive to open dialogue about the conflict between wolves and humans.

The Wolf Center provides a variety of programs including canoe trips to the Boundary Waters, webinars, and merit badge achievements for Boys and Girl Scouts. The Center's "ambassador" wolves on location serve to create a tighter connection between those that visit and the species that they work to protect.

The Wolf Center can serve as a model to inform the variety of programming that could be offered at the National Loon Center. Like the Wolf Center, adventure programs that have a home at the NLC could help inspire environmental stewardship. Young children and older adults could come to NLC to share an experience that helps them understand the environment around them. The NLC could develop as an inspiring gateway to the outdoors on the lines of the Wolf Center.

Image: (top) UMN College of Design, (left) Ely Chamber of Commerce, (right) KFAI radio



BERTSCHI SCHOOL

The Bertschi School, designed by KMD Architects, and developed by applying Living Building Guidelines demonstrates passive energy systems that teach students the value of environmental systems. A 12-kilowatt photovoltaic system produces all of the electricity for the building and allows students to participate in real-time monitoring of the buildings energy use and photovoltaic production.

All water needed for the building is collected and treated on site. This is done through a variety of methods including cisterns for storage, an interior green wall of tropical plants which treats greywater, and a composting toilet to treat black water. An ethnobotanical rain garden treats all stormwater and provides food for the building. Students have crafted paints and paintbrushes from the garden plants and prepared salads and soups.

The Bertschi School is an excellent example of architecture used for pedagogy. The building plays an active role in teaching students about the natural processes happening around them and how humans take part in greater system. The NLC can play a similar role in teaching students and visitors about processes happening around them, from water processes to shoreline protection using the building and landscape to engage and teach.

Image: (left) Arch Daily, (top) livingfuture.org, (bottom) Bertschi School



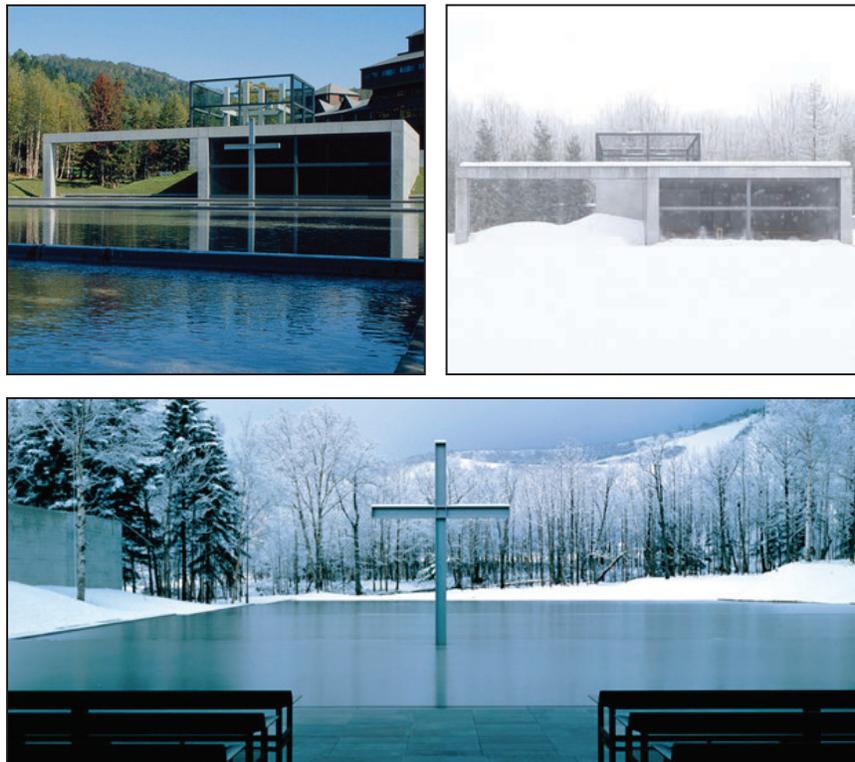
CHURCH ON THE WATER

This church, designed by architect Tadao Ando, highlights the relationship between exterior and interior spaces. Its simple, linear forms create a clear view to a picturesque outdoor scene from the interior chapel. From the outside, the simple modern forms juxtapose the natural elements of the trees and mountains in the background.

The water serves as a connection, drawing the space from the edge of the chapel floor to the expansive outdoors. The view looks over a rectilinear plane of water that users can see without making physical contact. Beyond is a small forest of birch trees and a stream that flows through.

This precedent serves as an example of how the National Loon Center might frame views of the outdoors and the island in the bay which houses a loon platform explained further in the Section 4 of the report. Similar to the treatment of the rectilinear pond outside the church, the island can be viewed but not touched. The simple, modern forms used in this project serve as inspiration and demonstrate how such forms might be experienced in a northern climate.

Image: (left) Pritzker Prize, (right) Aldo Garcia - aldogarcia.mx, (bottom) thetalks.com

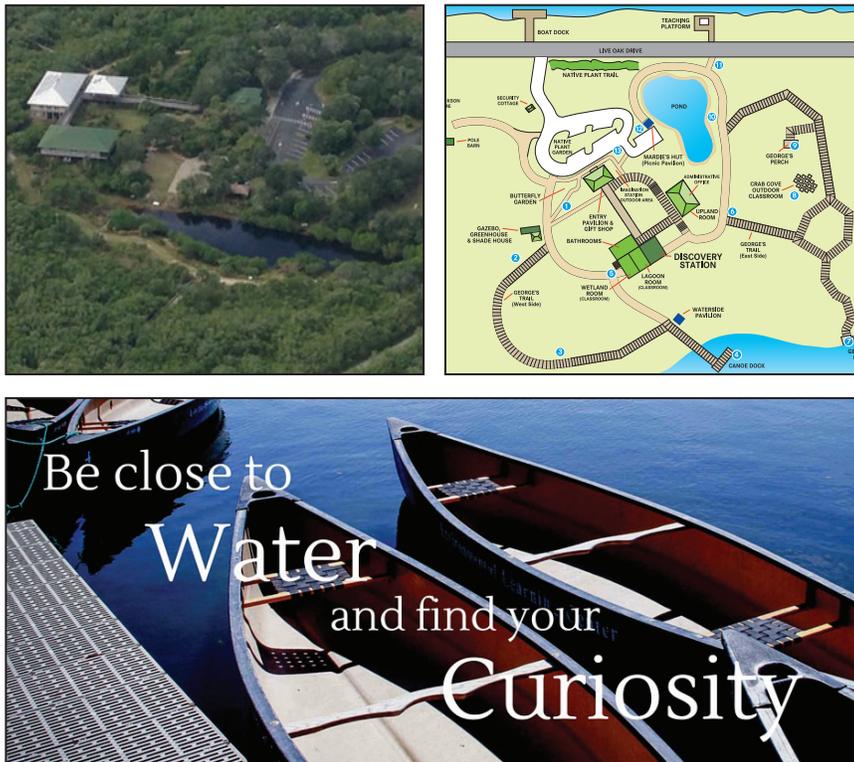


ENVIRONMENTAL LEARNING CENTER

The Environmental Learning Center is set in a natural habitat for birds, fish, crustaceans, and mammals of many kinds in the Indian River Lagoon, which is home to more than 4,000 different species, 36 of which are endangered or rare. Designated by the Environmental Protection Agency as an Estuary of National Significance, the Learning Center's site features include: Discovery Station Interactive Museum with aquariums; 145-gallon touch tank, and hands-on exhibit; Native plant gardens including plants that attract butterflies; Waterside Pavilion - a screened in covered viewing area perfect for reading, reflection, or a yoga practice; Picnic facilities; Visitor's center and gift shop; 1 1/2 miles of elevated wooden boardwalks, nature trails; Air conditioned Classrooms for lectures, meetings, family gatherings and events complete with adjacent full size kitchen for catered events; Canoe Launch; Pontoon Boat available for private rentals and EcoAdventure programs.

This Center illustrates ways to inspire its users by framing the beauty that is already on site and offering services and programming to meet the interests of many different audiences. With the right facilities, the National Loon Center could spark interest in the environment and help users connect with the nature that surrounds them in Crosslake.

Image: Environmental Learning Center (discoverelc.org)



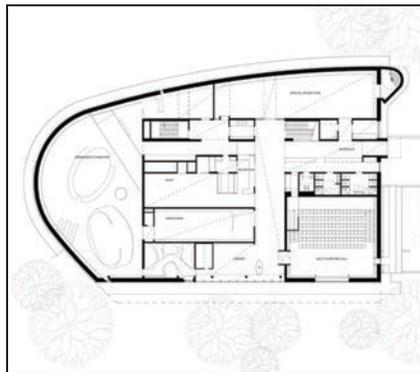
FINNISH NATURE CENTER HALTIA

This nature center, designed by Lahdelma Malamäki Architects is located on the shore of a lake, next to a national park, miles away from the capital city of Helsinki in Finland. It is about 11,500 square feet in size and hosts an estimated 200,000 visitors per year, providing versatile space for exhibition, restaurant, and conference programs.

Haltia Nature Center has been designed to relate to its surroundings on multiple levels. The building is set into a sloped site, giving access the outdoors from every level. The building materials were also selected to relate to the surroundings. With the exception of the basement, wood products was used to construct much of the building from the structural system to walls and roof.

Natural surroundings are critical to the culture and economics of the region surrounding the National Loon Center, as with Haltia. The Haltia Center can be used as inspiration for the NLC as it provides a variety of services from environmental education to business conferences. The combination of rectilinear and curvilinear forms can be used to inspire a strong relationship between the natural and constructed elements for the future NLC.

Images: Arch Daily; Mika Huisman





MISSISSIPPI WATERSHED MANAGEMENT ORGANIZATION

The Mississippi Watershed Management Organization (MWMO) is a partnership initiative between communities whose lands drain into the Mississippi river from south Minneapolis to Columbia Heights, Minnesota. Its mission is to foster environmental stewardship through civic engagement in order to protect and create more diverse ecosystems around the Mississippi.

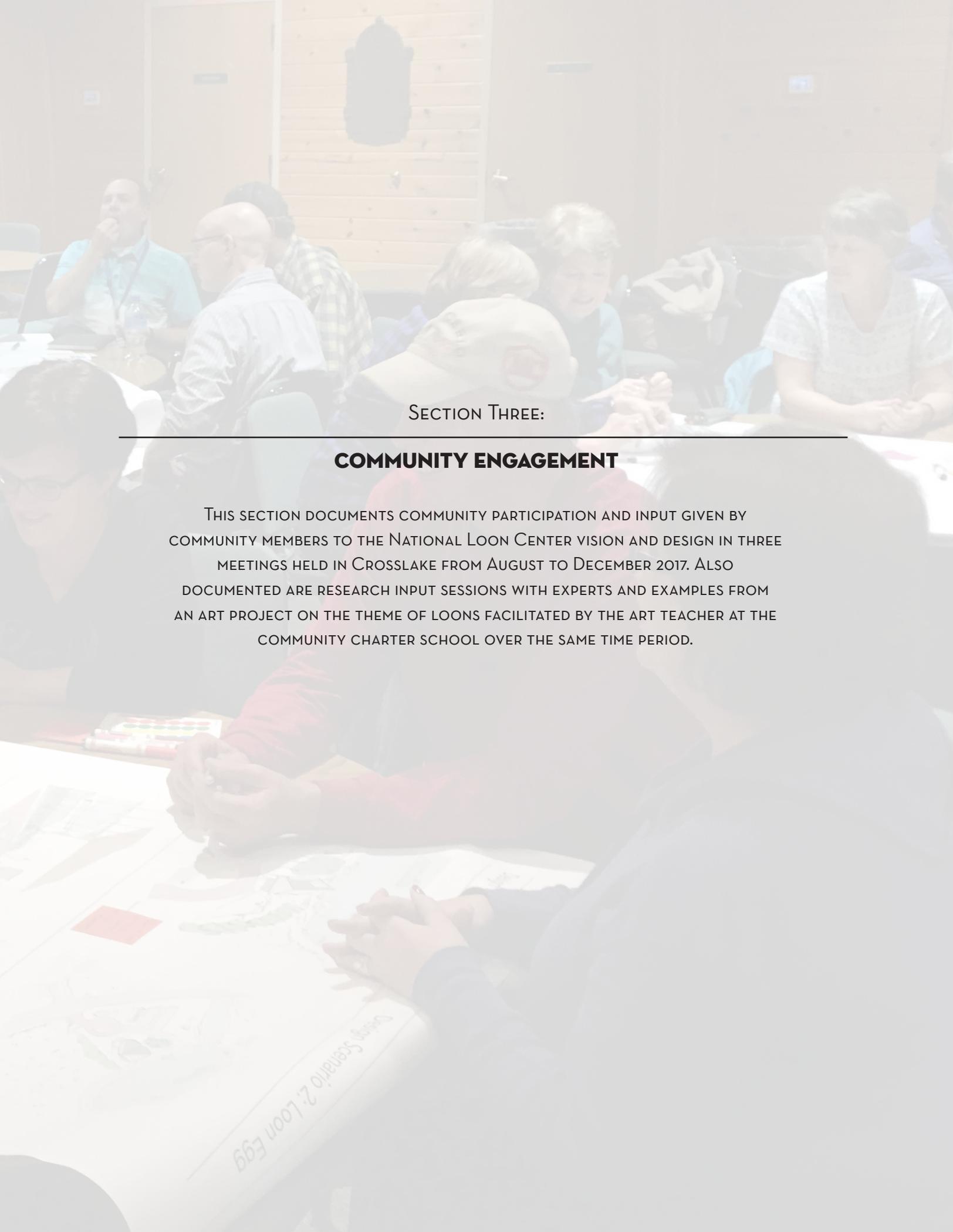
The MWMO was built on a former industrial site on the banks of the Mississippi in northeast Minneapolis. The building includes conference and gallery space, education facilities, organization offices, green roof and solar installation, as well as outdoor spaces with direct connections to the watershed. At various points throughout the grounds, water infiltration processes are expressed through demonstration with educational information alongside.

This project has many parallels with the National Loon Center in terms of the size of the building, its programming, and its mission of environmental education. From a site perspective, proximity to the river from the MWMO site is similar to NLC's access to Cross Lake. Spaces for teaching, demonstration and gathering and a kitchen for community use are also similar to NLC's programmatic needs. Demonstration of green building approaches through passive and active energy systems including the use of Structural Insulated Panels (SIP) and solar photovoltaics, rainwater and stormwater management infrastructure that are used in the visitor's interpretive experience make it a particularly strong reference project for NLC.

Images: Authors







SECTION THREE:

COMMUNITY ENGAGEMENT

THIS SECTION DOCUMENTS COMMUNITY PARTICIPATION AND INPUT GIVEN BY COMMUNITY MEMBERS TO THE NATIONAL LOON CENTER VISION AND DESIGN IN THREE MEETINGS HELD IN CROSSLAKE FROM AUGUST TO DECEMBER 2017. ALSO DOCUMENTED ARE RESEARCH INPUT SESSIONS WITH EXPERTS AND EXAMPLES FROM AN ART PROJECT ON THE THEME OF LOONS FACILITATED BY THE ART TEACHER AT THE COMMUNITY CHARTER SCHOOL OVER THE SAME TIME PERIOD.

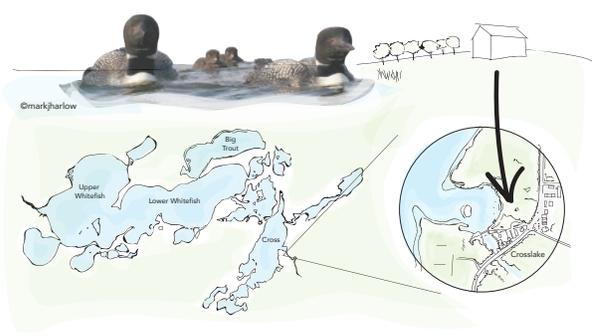
OVERVIEW AND GOALS

This community engagement on the project was critical to the project process and outcomes. Fostering partnerships between various entities involved in the project such as the National Loon Center Foundation, US Army Corps of Engineers and the Chambers of Commerce in Brainerd and Crosslake among other key stakeholders and authentic input to the site and building design development were goals of the process.

There were three levels of community engagement - one, with the Planning Team on a weekly basis throughout the project; two, with specific individuals or teams whose input was relevant to the project; three, with community stakeholders in three public meetings held on September 7, 2017, October 17, 2017 and December 5, 2017.

The National Loon Center NEEDS YOUR INPUT

What do *people* need? What do *loons* need?



We will be presenting design concepts focusing on loon habitat, water quality, shoreline restoration, and community and economic vitality.

Please join us for an interactive discussion:

TUESDAY OCT. 17 - 6:30pm
Crosslake Lutheran Church, 35960 County Road 66, Crosslake

Kids are encouraged to join the discussion!



Central Region Sustainable
Development Partnership
UNIVERSITY OF MINNESOTA
Drive to Discover



BRainerd LAKES
Chamber of Commerce



UNIVERSITY OF MINNESOTA
EXTENSION



COLLEGE OF
DESIGN
UNIVERSITY OF MINNESOTA



CSBR
Center for Sustainable Building Research

Poster announcing Community Meeting 2

COMMUNITY MEETING 1 - CONCEPT DEVELOPMENT

The first community meeting was held to get a general understanding of community ideas for a loon center. Approximately 74 local residents including business owners and community members attended the meeting. First, the Planning Team introduced the project and its context including the reasons a Loon Center is being proposed in Crosslake, and shared some precedent examples of facilities the Design Team might look to for inspiration. Finally, the participants worked in groups of 4 to 8 people to answer the following questions: (1) Why is the Loon Center important to you?, (2) What are the opportunities and barriers for a Loon Center in Crosslake? and, (3) What are your dreams and aspirations for a Loon Center? Below are participants' responses to the questions:

QUESTION 1: WHY IS THE LOON CENTER IMPORTANT TO YOU?

HIGHLIGHTS

- Create identity for Crosslake
- Educational opportunity about Loon and habitat
- Intergenerational experiences
- Bringing attention to water quality and shoreline
- Bringing year round jobs and visitors
- Lake access for everyone, visitors and locals

FULL LIST

- We have such a beautiful natural asset with all the lakes surrounding Crosslake - not only the waters but also the woods
- Brings tourism to the area
- Education
- 3 Crown jewels: environment, education, tourism. Plus worldwide opportunities
- To share with others the fantastic "Loon" opportunity this area has to offer
- Education about "Loony" life
- To make sure that we conserve important wildlife
- Tourist attraction - national scope
- Love to watch and listen to the loons
- The Whitefish Association has been involved in Loon habitat for many years and has been instrumental in various research projects
- Our area has so much to offer - more natural resources than any other part of the state
- It has tremendous tourism potential. I can envision visitors from all over the states as well as international
- Loon education / research
- Community partnerships

(continued)

-
- Create a common goal w/ recreation and preservation
 - Workforce development
 - Diverse jobs seasonal and year round intern experience
 - Preservation of a natural resource
 - Inter-agency collaboration
 - Elevates Crosslake reputation
 - Community pride
 - Statewide notoriety
 - Education / school and community
 - Inter-generational opportunities
 - Year-round attraction
 - National tourism exposure
 - Celebrate the importance of Loons to the area
 - Learn more about loons
 - Invigorate new interest in this area
 - It would unify those with lakeshore with those who don't
 - Provide another attraction
 - It would give value to the loon
 - Make Crosslake the loon "destination"
 - The lake is often seen as a playground rather than an ecosystem
 - Loons important to community - add beauty to Crosslake
 - Adds to the tourism of Crosslake
 - It symbolizes conservation and is an iconic symbol of Minnesota
 - Educational: learn about Loons / Learn about our environment / provide hands on experiences / bring educational honor to the Crosslake area
 - Will drive economic vitality in Crosslake year-round
 - Puts us on the map with a center for an iconic bird / symbol of MN
 - Creating a top shelf tourist destination
 - Stimulate local economy
 - Make Crosslake more of a destination
 - To protect the loons
 - Build it and they will come - growth
 - Teach people to respect and interact with nature
 - Understanding Loons and Loon Habitat
 - Education for future generations
 - We need to educate people about all aspects of the lake ecology the Loon center can do that
 - Protecting loons means protecting water
 - Connecting community to the lake and the lake to the community
 - Shoreland restoration creates habitat for all shoreland wildlife
 - Protecting loons will also protect our local economy
 - Coexistence - find a good way to maintain all lifestyles
 - Bring knowledge about the loons to public and enrich their livelihood
 - Strengthen community identity and pride
 - Environmental education and consciousness
 - To bring people to the community to enjoy all of nature Crosslake has to offer

(continued)

- To preserve and enhance the native habitat the need to survive
- To honor and educate the public on the state bird
- Important not in Crosslake due to more stress for Loons
- Expresses our area in MN
- National exposure
- They are such a beautiful bird and great sound!
- It would provide the perfect venue to promote loon education and conservation first hand in existing loon habitat
- Loons are natural in this area - everyone "oo's" and "aah's"
- To protect the species and further educate the public
- Increase awareness of environmental impact on Loons
- Have been here on Trout Lake since 1936 - have always had a loon family in our bay - people are now eroding the bay and definitely disturb the loons - need a center to educate
- Puts other lakes in the area also on the map (Pelican)
- Close to home
- Educational - protective of ecosystem, including loons
- Education about and preservation of loon
- Loon preservation
- Water quality
- Tourism
- Educational for citizens & visitors
- Provides new, unique education, enjoyment experiences for all
- An opportunity to educate on the importance of our environment, how to relate and protect it
- Increase commerce
- Helpful for the preservation of the loon
- Tourism
- Income for the city
- Preservation of Loons
- Possible draw for new residents
- Clean water w/Loons
- Sharing the area with others
- Educational aspect for our children
- Protection to save the loon
- We need to elevate loon appreciation so people will protect them
- Top promote the preservation and knowledge of the loon and loon habitat
- Knowledge
- When children are taught about wildlife they will grow up to be stewards of the environment
- Bring business. Tourism, and loon education to Crosslake
- Great introduction to youth for wildlife education and preservation of environment

QUESTION 2: WHAT ARE THE OPPORTUNITIES AND BARRIERS FOR A LOON CENTER IN CROSSLAKE?

HIGHLIGHTS

- Opportunity to help educate people to protect loons and habitat
- Opportunity to create jobs and serve as economic engine
- Funding might be a barrier
- Will people want more visitors to Crosslake?

OPPORTUNITIES - FULL LIST

- Co-work with the local school district and charter school
- To have the U of M there
- Bring more people to our city
- More tourism dollars coming into the area
- Educational opportunities ie: field trips from schools outside the area
- We have not only the beauty of the natural assets but also the accommodations to house them right here
- National/international Loon calling competitions - additional Loon rehabilitation center close to "Loon Central"
- If parking limited, how to move people in a fun, practical way
- Tours on water for youth groups, seniors, visitors
- Remote classroom for Crosslake charter school
- Community employment
- Loons are the canary in the mine
- Tourism, education, economic plus
- Environmental vitality
- Economic impact
- Educational resource
- Educational opportunity for children
- Income generator
- Community identity
- Jobs
- Education resource
- Laboratory
- Extension of Crosslake Community Charter School
- Environment
- Educational resource
- Research center
- Economic impact
- Tourist attraction
- Income generator
- jobs
- Awareness
- Partners - U of M, C of C
- Every barrier is also an opportunity
- Business sponsorships
- Work with boy scouts and girls scouts create a "Loon Merit Badge"

(continued)

- Field trip opportunity schools and clubs
- Brings people together around a popular project
- Create guided pontoon tours for purchase
- Location at Army Corps. Property?
- Sustained enthusiasm
- Current development creates energy
- Housing is being added
- Unite community with the cause
- For those who don't live on the lake, they would have access to see the loons
- Collaborative process
- New revenue
- The ACE campground is already a beautiful area to put the Loon Center
- School attraction
- MN legacy fund should be a natural to create and maintain Center for the state bird major opportunity!
- Bring people to Crosslake who are interested in science/ water conservation / Loon preservation
- Gives Crosslake an identity as a destination for education and fun!
- Symbol of conservation and sustainable design
- Iconic architectural expression
- Economic vitality for community
- Education contribution to habitat of loons
- Increase local economy by bringing in visitors.
- Help our lakes
- Regionally or nationally known facility!
- Positive economic impact
- Community involvement
- Funding
- All the entities that will create momentum for the center
- Ecology research opportunities
- Unique ecology of this chain of lakes
- For research to preserve our sensitive ecology
- Educational tourism
- To truly highlight all Crosslake has to offer!
- Improve connectivity
- Beautiful natural environment
- Fired-up advocates
- Promote tourism throughout region
- New employment opportunity
- Fills an educational void within audobon world
- Could provide a venue for public and private functions
- Educational
- Local enthusiasm for loons is high
- Popular destination for people on vacation
- Public and community beginnings
- Lots of shoreline
- Lots of local support
- The economic impact to this community will be great!
- Education
- Tourism and education
- Bring more people interested in environment
- No barriers!!! Many opportunities to educate
- Visitor income

(continued)

-
- Lake access - rescue and restore loon health and population
 - Visitors
 - Tourist attraction
 - Tourism hotspot loons and habitat
 - Good for retail business
 - More consistent - vibrant economy year around
 - Lots of Loons
 - Supportive network of people
 - Land/space is available
 - Loon calling contest
 - Economic generation
 - Extend the tourist season
 - Tourism funds
 - Safe speed zones on 66!
 - Shoreline preservation
 - Education
 - Economic growth

BARRIERS - FULL LIST

- I see no barrier once we have a site location - the rest will follow
- Funding
- Some people may not like all the visitors
- More traffic
- Location - parking is ample?
- Is there enough land at the corp. to build on?
- Oil pipeline impact / leak every 30 miles every year
- Parking
- Congestion
- Crime
- Traffic
- Money
- Negativity
- Staffing
- Location
- What is the population of Ely, Wabasha?
- Operating hours and funds
- Infrastructure needs
- Reluctance to change or grow "Leave as is"
- Location at Army Corps. Property?
- Keep exhibits and experience fresh/new
- Money
- Lack of workforce
- Migration and winter
- People may say they don't want more people in town
- Loon availability
- Workers - paid volunteers / funding / development
- Red tape regulations
- Fed govt red tape
- Winter! / Volunteers or staff?
- Cost (investment)
- On-going operations and expenses
- Naysayers (people that don't want to change)
- Parking
- Federal govt. Corp. land use
- Putting it on Corp. land
- People who resist change
- Traffic/connectivity
- Major funding
- Community inertia
- Will it support its overhead?
- Will it need continuous funding?
- Stress on loons due to people on lake wanting to get closer to see and take pictures. Are we interested in loon or more economic impact?
- Funding source
- Location
- Size
- Money

(continued)



Community
Phosphorus
Create a
Community
at Reservoir
Reservoir

Diverse Job
Opportunities
Year-Round
Local Economy

Historical
Natural
Resource

Local
Employment
Opportunities

Community
Pride
Statewide
Notoriety

Educational
School
&
Community

Year-Round
Historical
Natural Resource

Attract
New
Visitors
to Gosport

Build a
New
Project

Individual
Needs

810
Community
at Gosport

Current
Development
Needs
Exhibit

Keep
exhibit
experience
fresh/new

Care of
Duck Pond
Housing
is being
addressed

Create
Guided
Tours
for
Reservoir

Reluctance
to Change
or Grow
"Leave as is"

Sustained
Enthusiasm

A Building
That
Teaches
Lessons
All
By Itself

FOR THE
OF M
to
open a
Water
Institute
in Center

Under-
Water
Viewing
STATION

"Loan-
Cams"

Raise
Funds
By
Sponsoring
NEES

Sisk
in Center

THE NATIONAL LOON CENTER
COMMUNITY IMPROVEMENT
PROJECTS BY SPONSORING NEES



-
- The entrance to the Army Corps of Engineers
 - Will it increase lake traffic?
 - Increase people looking for loons in the bays too much road traffic?
 - Building costs
 - Infrastructure
 - Money
 - Many tourists tend to stay on the lake boating and fishing
 - Infrastructure
 - Lodging
 - Infrastructure of the city may have to change to accommodate visitors
 - Funding and sustaining
 - Small community
 - Need large tract of land to accommodate center
 - Traffic
 - Location
 - Infrastructure within the city to accommodate extra tourists
 - More sheriff and DNR Water patrolling needed
 - Traffic
 - Funding
 - Not tying Comprehensive Plan to loon center
 - People may poke around shores and disturb the loons
 - Not getting it done soon enough

QUESTION 3: WHAT ARE YOUR DREAMS AND ASPIRATIONS FOR A LOON CENTER?

HIGHLIGHTS

- To be national asset while small and charming
- To have boat tours and lake access for everybody
- Loon calling competitions
- Bring unity for Crosslake
- Innovative ways to connect with loons
- Sustainable structure and year-round programs

FULL LIST

- To have the Center known nationwide as the place to go for water quality and the best information on loons
- Miniature electric trolley on rail at the door connecting to town square and community center - think fun!
- Bus tours from all over flooding into Crosslake
- 3 day educational learning courses with accommodations provided
- Command center with multiple nesting cameras for viewing and research
- Weekly loon calling competitions!

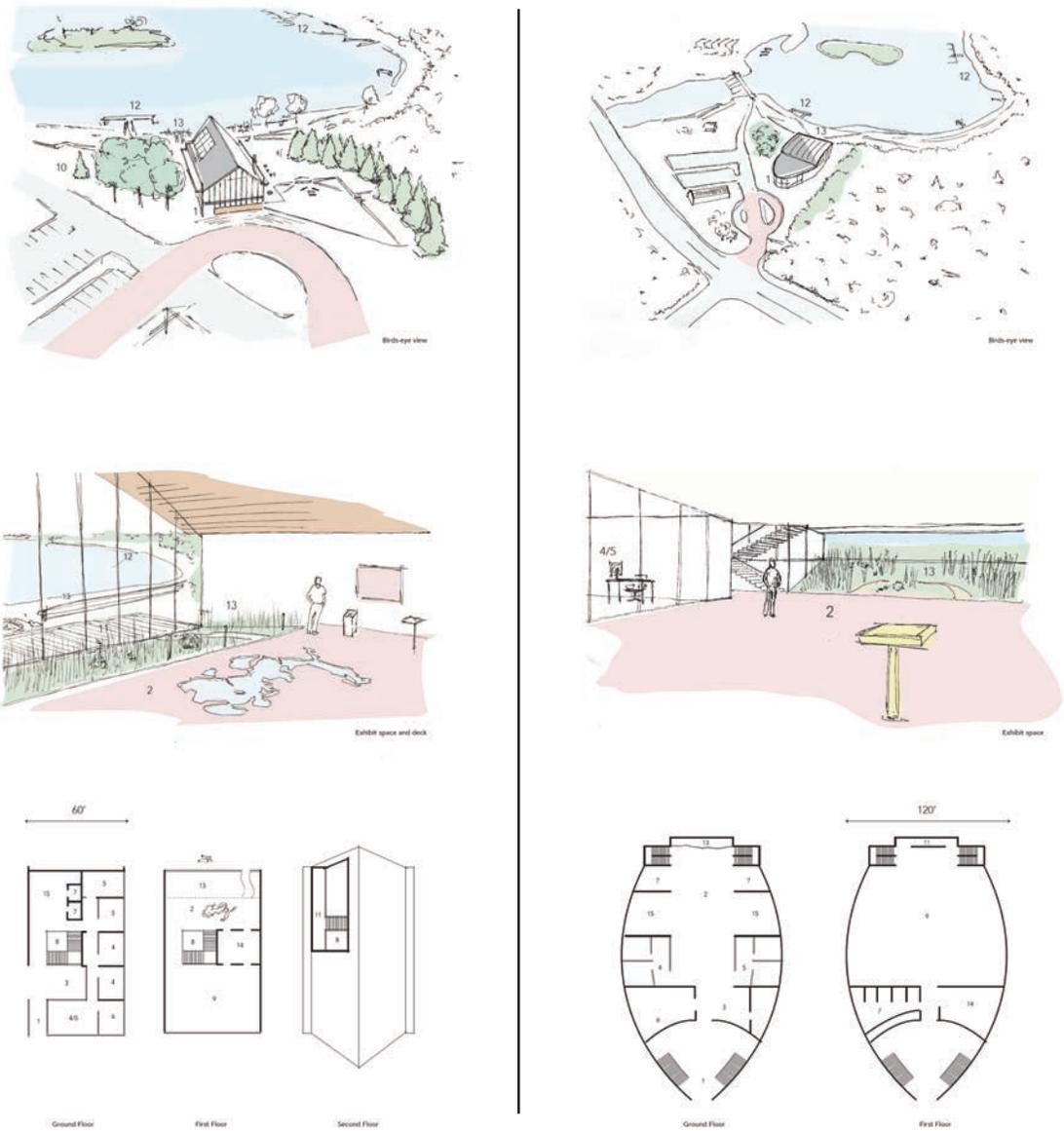
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- Underwater loon viewing tunnels
- World wide Loon or “Looney” day!
- Crosslake identity
- Hard water quality actions
- The “go to” place - but stay small and charming!
- Put Crosslake on the map
- Child friendly
- Walking learning experience
- A building that teaches lessons all by itself
- For the U of M to open a “Freshwater Institute” inside
- Attract new visitors to Crosslake
- Underwater viewing station example: St. Thomas Coral World Ocean Park
- Satellite at MN State Fair
- “Loon-Cams”
- Sister-center in Gulf of Mexico
- Raise funds by sponsoring nests
- Int’l Loon Festival
- To build a site that would attract people to the area
- To bring unity to Crosslake
- A cold weather net-zero building - new interpretation of North Woods design
- Nothing sounds like Jurassic Park like prehistoric call of the Loon. It resonates with everyone and should be a prominent feature
- Economic impact and vitality to community
- Focus on education
- Self sustaining
- Water tours
- Observation deck
- Dockage
- Tie the town together via the chain
- Have a facility that will be self-sustaining
- It needs to be 1st class
- It needs to be creative
- It needs to be changeable
- It needs to be intergenerational (something for everyone)
- It needs good public relations
- It needs to be affordable
- It needs to be handsome
- It needs to be acceptable to the local community
- To be self-sustaining
- To have U of M researches based here and have a loon hospital here
- To have many interactive things to do - change exhibits regularly
- Crosslake will be a national destination!
- Help with loons educate people
- Build loon house!
- That it turns into a year round attraction
- Dream that a NLC will bring a positive impact to our children, our economy, and our ecology
- Helps inform people about their actions they can take to protect loons (and the wildlife)
- To build it soon
- Connects residents and visitors to the lake
- I hope this isn’t too little, too late. The water quality is declining fast. If the food source leaves, so will the loons. The center needs to be here now!
- Center located elsewhere
- Make Crosslake a thriving community for visitors and citizens to enjoy year round

(continued)

-
- Crosslake becomes a destination to visit NLC which will help stimulate local economy
 - Engage seasonal owners/visitors / excited community
 - Help educate tourists and home owners on awareness of Loons, boatspeed 50' from shore jet skis and surfing boats
 - I have been a Loon observer for 20 years. I hear tourism and impact but not what is for loons
 - To see a loon up close / to have a national show come here to produce a program from Crosslake
 - To have the loon center be a destination hub. A building that would be innovative
 - Natural architecture that blends in with the natural environment / A center that succeeds in the efforts to maintain and restore population
 - That it becomes a reality and the center for knowledge about the species
 - All want to come here / speaking as a local here - about the center / experiment making new experiences to share - love to do putting Crosslake on the map / Educating all about loons
 - Aspire to meet like-minded people concerned w/clean environment / No GMO's, no chemical fertilizers/pesticides
 - Be a "Green building" / green roof, native plants, solar power, geothermal, bird safe glass, low impact building materials
 - To become a destination
 - To eliminate lead tackle
 - To have loon nests on all lakes
 - Video attached to loon in migration to follow through seasons
 - Solar powered building
 - An informational center for the conservation of the environment and people
 - Introduce more people to the great Crosslake area
 - Train and Loon Center together
 - Self sufficient in the future
 - Draw international guests to our area for the love of loons
 - Teaching center
 - Educational opportunity for all ages / research center
 - State of the art, sustainable education center that brings together the community and tourists
 - Tying together environment, water, loons, and realizing completion
 - Some sort of seasonal (winter) activity to fill in while loons have flown south

Two building scenarios shown below were presented - one, called Loon Box and the other, Loon Egg. The Box scenario featured a lodge-style roof and rectilinear spatial forms. The Egg scenario featured curvilinear spatial forms and large, open spaces.



Legend														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Entry Lobby	Loon exhibits	Gift shop	Office Chamber of Commerce	Office USACE	Conference room	Bathrooms	Elevator	Event space	Rain garden	Deck	Docks and boat ride station	Shoreline restoration demonstration	Kitchen	Flexible Exhibit Space

COMMUNITY MEETING 2 - CONCEPT DEVELOPMENT

The second community meeting was held to get a better understanding for the types of building forms and design features that the community was looking for in a Loon Center. Approximately 72 community members attended the meeting. Two different building scenarios were presented and participants were asked to vote on their favorite scenario as well as note individual elements they liked or disliked as a way to provide the Design Team input for developing the final design. Below are participants' responses to the questions:

HIGHLIGHTS

- Winner: Egg (32 votes) vs. Box (20 votes)
- Support for an open floor plan -
- Dislike closed-off spaces, especially offices
- Desire for "Up North" feel
- Also desire for distinctive design
- Would like to have sightlines of the bay

"LOON BOX" - FULL LIST

- Need the interior to feel more open
- Box looks like office building
- A lot of stairs / but want to get high vantage point
- Use for school
- Love the glass, make exterior rustic, too close to lake, watch for too much pavement
- Solar?
- Looks like Minnesota lodge
- What about the winter? Make a pool
- Fits into design of area, cut down on cost put money elsewhere in project
- Open year round - "winter" theme - Loons not here?
- Movie theater mixed w/ Loon dive video
- Will there be an "entry fee" or donation?
- Make movable walls - too boxy this way
- Concerns - number boat docks
- Keep nature influence - what Crosslake is all about!
- Rustic look bldg - blends into environment
- Good lake model! Keep in floor
- Too churchy - commonly done elsewhere
- Put public spaces on the lake side instead of offices
- Chamber may need counter & brochure space
- This layout may not work
- Does this have enough exhibit space?
- Wrap deck around for view of lake from top floor

(continued)



-
- Pervious pavement for parking w/stormwater retention strips
 - Look at Itasca state park - 3-d views
 - Prefer this design concept
 - Glass and wood structure
 - Lower profile design - is that possible?
 - Is the current parking adequate?
 - (dots on inset lake on floor)
 - Make it like an "old lodge" w/ full timbers
 - Interactive map to show loon nest on the whitefish chain
 - Loon cam, loon tours, interactive exhibits, map live tracking loons
 - Do not undersize the building!
 - 60' seems understated and compartmentalized
 - Like an office building/church, not as connected to the outdoors
 - Lighthouse 360-degree views, could incorporate dive depths
 - Entry- should be more open w/ exhibits visible
 - Exhibit of train museum
 - Exhibit of historical society
 - Look out tower
 - Want to see the lake when I walk in
 - Need restaurant and coffee shop
 - Incorporate outdoor kid-friendly exhibits or natural play spaces?
 - Do we need lab space? Classroom space?
 - Indoor exhibits have to be hands-on & kid friendly
 - Traffic flow - parking areas
 - Can be used as venue for hire? I.e. weddings?
 - This is too commercial, not enough emphasis on Loons & nature, i think this would be a disappointment to visitors
 - Linear design looks better with nature
 - More rustic good
 - Like the whitefish chain in-lay in the floor on chalet style

"LOON EGG" - FULL LIST

- More attractive, More nature, we have a lot of pull barns
- Love adopt a loon
- We want to make sure that no tax dollars are used
- The larger unique spaces
- Unique shape of the exterior would be a draw
- Add elevator
- Like the lake design in the floor of the Loon Box
- Sight line to lake through building
- Lodging - yurts - low impact cost lodging
- Groundwater heat? Solar?
- Web cam
- Video wall 8' x 12' (+) 10' x 16' Loons diving to feed! + more!
- Local building materials - wood carving stone/rock
- Rescue/rehab center (Garri-son clinic)
- Windows along walls
- Naturalist programs for school children during winter
- Bathrooms are in awkward place - put closer to entrance
- Stairs in from waste space that could add more space to view the lake

(continued)

- Need outside entrance to restrooms for when building is closed
- Need elevator to meet ADA guidelines
- U of M. research rooms
- Why so many staircases?
- Fish tanks?
- Where would educational classes be held?
- Location for children's' learning areas?
- Make larger deck?
- 2 stairs take up space that could be used for exhibits
- Not filling the up north feel - especially w/seeing it as you enter town
- Make sure building blends in w/north woods feel
- Are all the offices necessary - could it be smaller?
- Traffic requiring expensive design and construction
- Up north design?
- Ramp rather than stairs: think guggenheim
- Need to stick to the Loon theme - & those things "frogs" that relate "ciscos"
- No elevator - no observation deck
- Small but focused viewing. Less straight lines. Needs 2nd and 3rd floor
- Tier the egg - bird watch - 3x the size
- Location? Move overflow camping to south park?
- Concerns, traffic/parking, walking, location, impact to the campers
- Can the lake layout be used on this design?
- Interior is open layout inviting seems like a museum learning center
- Loon cams
- Adopt a loon to track
- Dive depth exhibit
- Nesting exhibit - constructive
- Natural light outside/inside grand see through, more windows
- Must find a design to make a weather safe harbour on the lake side, there is a practical reason the existing harbour is in the bay
- 150 year old white pines in the main view
- More square footage
- Unique
- Feels grand where you can see exhibits
- Incorporate a lookout tower
- Offices don't have to be walled off (no walls?)
- Like the openness
- Third floor lookout good idea for egg too
- Opportunity for a picnic grounds on either plan
- Minn. Senators support this?
- Tie-in with historic village via tunnel (like Nisswa) or pedestrian bridge?
- Round theme most attractive of architectural choices!
- Entry hall needs multi-use (exhibits, welcome booth) flyers, info.
- Synonymous w/Loon
- Add another floor
- Have a simple platform for people to see how to make one
- Have a separate video room. Do we need 2 offices & a conference room?

(continued)

- The whole exhibit should be education focus. Loon platform, natural nesting, migration video, adult and juvenile, dive chart, loon territory, food, calls
- Have more actual exhibit space, that people can tour through. Can the egg have 3 stories?

GENERAL COMMENTS

- Don't reduce size of beach for shoreline restoration
- Pick a design that demonstrates good sustainability concepts - solar water etc.
- (Dot on south side of dam) Parking
- Docks are a must
- Going to Loon Center via boat is a plus for families
- Priority on boat traffic not interfering with loons a must
- Smaller meeting rooms, conference rooms
- Decks off of event space
- Highlight shoreline restoration
- Highlight where loons live
- Good long range
- Shut old/present entrance



(Top) community members give feedback on designs. (Bottom) core planning team.



COMMUNITY MEETING 3 - SITE AND BUILDING DESIGN

The third community meeting was held to get feedback on the final design scenario with the site and building design developed with input received from the first and second community meetings and with ongoing weekly input from the Planning Team and other experts advising the project. Approximately 45 local residents including business owners and community members attended the third meeting. This time, attendees were asked to discuss the design in small groups, then to write feedback on the site design, building design, and any other aspects of the project. Below are participants' responses:

FULL LIST

- Historical Society - no need for office space, would have an exhibit
- Treat this [road to boat launch] like a mall
- Crossing here [Swann Dr.], no crossing allowed [at 66 & 3]
- Parking [across dam] simply expand existing parking lot
- Lots of \$ into restoration ???
- Seems to conflict w/ Corp. ops.
- One-way the streets
- Roundabout at intersection
- Boat parking traffic and loons mix?
- Car traffic on 66 will get big!
- Roundabout
- More car parking??
- South Park location better for Loons! - Here good commercially
- Environmental vs commercial pros vs cons
- Bus access needed
- Docks off wetland a concern
- No wake zone
- Docks obstructing access to launch?
- Larger rain garden
- Center needs to stand alone?
- Observe loon nest from above
- 30 acres in South Bay
- Bus parking off site - Bus drop off
- Move docks away from loon island
- Too busy near loons
- Bird friendly glass in windows
- Large windows to observe
- Number of available boat spaces x camper needs x resident needs
- Buoy and water quality information in lobby
- Whitefish Area Property Owners Association (WAPOA), Whitefish Chain Yacht Club (WCYC), Paul Bunyan Scenic Byway
- Sauna? May actually take up ice fishing if that was there
- The site has a nice flow
- Appreciate kayak/paddle board drop off
- Separate entrance for campground possible off highway?
- Great views!
- Accessible access to both showers/ bathrooms from interior?
- Love all atrium spaces and multi levels but may be cumbersome for those with difficulty w/ stairs
- Surrounding terrace
- Underground parking?
- Love the whitefish map artistic representation/map
- Passive gain, great site!

(continued)

- Happy Dancing Turtle, see green roof
- Fireplace and reading in lobby
- Concerns:
 - Showers for the beach
 - Is there a screen to use for viewing?
 - Traffic control
 - No wake area around island
 - Storage
 - Fish cleaning
 - Storm shelter for campground
 - Will museum go in new building?
 - Parking for large vehicles
- Enhancements:
 - Fireplace and seating area
 - Optimal picture taking spots
 - Binocular station
 - Aquariums - loon habitat - what are Cisco's
 - Coffee center
 - Vending machines - sandwiches - candy - etc.
- Picnic tables
- Loon displays like Itasca
- Amount of exhibit space
- Educational opportunities
- This concept is better than the egg shape
- Height of the building for water viewing
- Use the school for educational opportunities
- Control parking on boat docks
- More bus parking off-site for adult tours
- Parking not adequate (need to vein busses and RV's into turn around)
- Dock space too far from loon center
- Alternative pump station at old chamber site and decontamination station
- How is public docks space monitored?



Planning team taking tour of Whitefish chain of lakes.

WORK SESSIONS - SHORELAND AND WATER QUALITY

Three work sessions with experts on shoreland protection, water quality, zoning, and loon habitat were conducted to receive targeted research input on design ideas. Two of these meetings were held at the Brainerd University of Minnesota Extension office and connected via video conference to the Center for Sustainable Building Research office on the University of Minnesota's Twin Cities campus and the third meeting was held by conference call.

HIGHLIGHTS

- Development of ecological zones and plant lists
- Identification of educational opportunities
- Maintenance criteria
- Park design
- Zoning ordinance considerations

SHORELINE NOTES

- System thinking / education (ice heaves are a natural process)
- Carbon storage, filtering, water temp
- Tie back to loons and how they benefit
- Wetland - will determine plants - Needs people mgmt - boardwalk (foot traffic) over wetlands
- Protect fringe area - at risk of erosion - Wood plants, burrito, toe wood
- Aquatic plants too tough to establish [focus on shoreline planting]
- Protect wetland
- Herbaceous perennial upland
- Woody veg near waters edge
- Floating docks
- Ice berms are natural systems

(continued)



Left, right: Two sides of the work session video stream.

- Telescope + binocs to see Loon Island
- Buoys to keep people at a distance
- Protecting this as natural loon habitat should be an outreach point to public

LOON HABITAT NOTES

- Consider dock design for less shoreline impact / footprint [two piers jutting out with perpendicular slips, or two piers at 45 degrees from shore]
- New parking, trails and other impervious surfaces should ideally be as pervious as possible (i.e. pervious pavers) to help curb runoff and to use as an educational tool for visitors (include signage and/or highlight these best practices in the center)
- Link to water quality educational information
- Loon habitat = [water] quality = nesting habitat = fish (food) = emergent aquatic plants
- Cisco = high fat food source that loons eat especially before migration
- Cisco needs high [water] quality (low temps, good O₂)
- Can we include educational signage and the docks and other shoreland rec. Areas to help inform watercraft users about how to mitigate their impact on the loons (i.e. low or no wake, minimum distance away from loons, etc)
- Runoff from developed lots, through impervious surfaces
- Phosphorus [up] = O₂ for cisco's [down]
- Reconfigure
- Conservation easements to protect watershed forests
- Are the docks too close to the loon nesting area on the island?
- Can we include informational signage or exhibit inside the center featuring why the island is idea loon habitat, highlighting the natural features (i.e. aquatic plants, shoreland plants, disconnected from other land/predators) that loons select for their optimal habitat and how people can protect these features
- [loon center notes] restoration demo [between NLC and shore]
- [levy wall notes] "get the lead out" non-lead fishing tackle
- [current dock] illegal dock configuration?
- Move to other side of boat-house (move) remove and save area for loons)
- Dock/location out of site from loon nesting site at island cove
- [loon island]
- Add buoys / floats to keep boats out of restoration area between docks and launch
- Add "loon nesting area" buoys to keep boats at a distance
- Add natural vegetation to platform for screening to protect loons from eagles [boat landing]

(continued)

-
- No wake zone
 - Loon buoys
 - Positives
 - Number of dock slips reduced from earlier designs
 - BMP's on shoreline properties
 - [entire site notes] roylan buoys

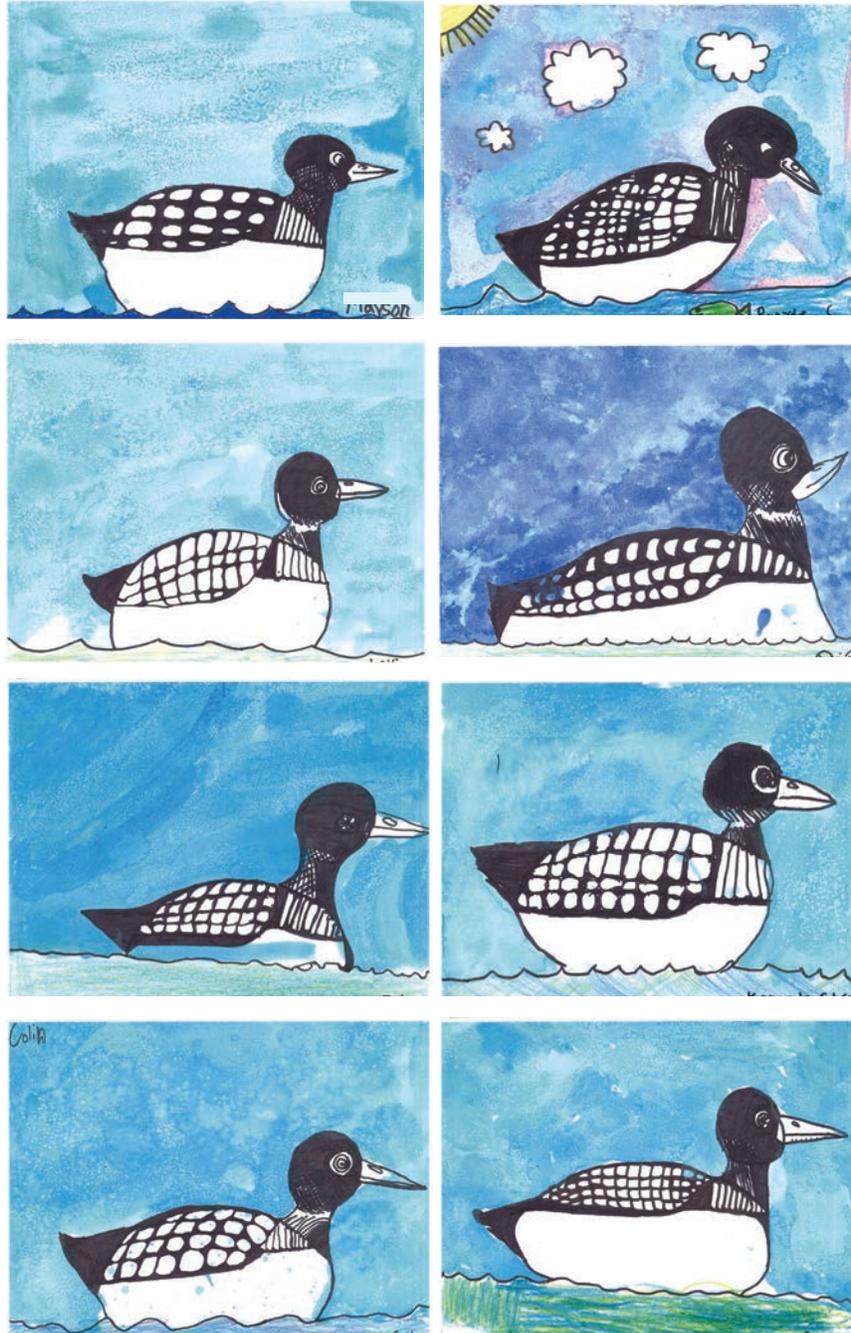
DOCK & IMPERVIOUS PAVEMENT NOTES

- City zoning requirements - Shoreland - Setbacks, Impervious %, # of parking spots
- Floodplain - Amount of fill allowed - Maybe docks
- What is the purpose of the levy wall - flood and dam safety requirements
- Docking - How many boats use the area now? Will there be more boats w/the NLC? what is the need?
- Check w/dock companies for advice and maybe Paul Radomski w/DNR
- Where are people going? what are they doing who currently beach boats - should they be going elsewhere?
- Must follow DNR requirements & city if applicable
- Parking - back in angled parking - pull-through parking for trailers
- "Pave's Drain"
- Show school lot (June, July, Aug)
- Pervious pavement - sidewalks, parking lots, tree boxes
- Green roofs
- Infiltration basins to manage stormwater runoff
- Education - natural systems, pollutant removal
- [dividing line on bay] people north, loons south
- "Loon watch" buoy
- Boatride docks
- Fishing dock [moved to "inner bay"]
- Loon nesting area buoys (stay back)
- Cisco + invasive species outdoor exhibit [at shoreline / gazebo]
- "Get the lead out" fishing pier" - move north
- [Secoded on dock under dam]
- Kayak launch [north of beach
- Screening [backside of ACE building] w/evergreens
- [Narrowing intersections, visible crosswalks]
- Ride boats / tours from inner bay
- New fish pier
- Kayak docks
- 40 stalls on dock
- Minimize shoreline footprint [pier configuration, angled?]
- Use recycled plastic docks & floating docks to minimize environmental impact
- Buoys / floats to keep boats off shoreline
- [angled] orientation? Max. boats in least space use docks to protect shore?
- Wave break dock on lakefront
- Campers only on lakefront
- Built loon platform
- Need permit?
- Cover loon platform
- Anchor loon platform
- How do you know where to locate?
- When to launch?

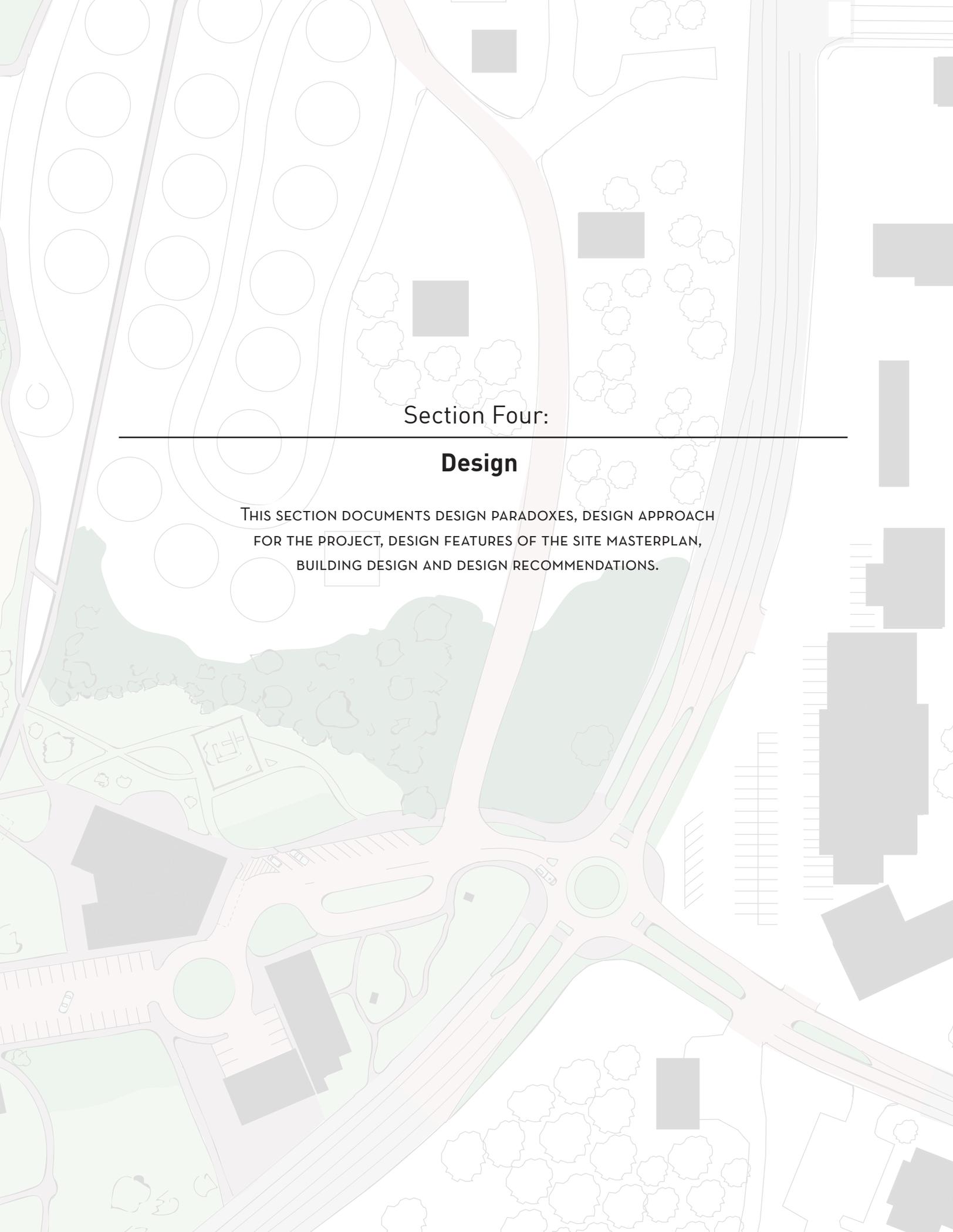


ART PROJECT

Fifth and sixth graders in the Crosslake Community Charter school drew loons as part of their class art project facilitated by the school's art teacher in response to community's focus on the National Loon Center.







Section Four:

Design

THIS SECTION DOCUMENTS DESIGN PARADOXES, DESIGN APPROACH FOR THE PROJECT, DESIGN FEATURES OF THE SITE MASTERPLAN, BUILDING DESIGN AND DESIGN RECOMMENDATIONS.



DESIGN PARADOXES

Any design proposal proposes design solutions and choices within a context of constraints. The design solution evolves based on the design team's understanding of the context and/or constraints and the input of ideas from participants included in the design process. In the case of the National Loon Center project, at least three paradoxes came to the fore. They are:

- Preserving nature and loon habitat vs. Meeting current and future human needs
- Focusing on design ideas and sustainable materials vs. Addressing maintenance and cost
- Keeping a traditional 'up North' character vs. Creating a modern building that serves the future

With each of these paradoxes it seems possible to take a 'both/and' approach and arrive somewhere in the middle. For example, to address the first paradox of 'Preserving nature and loon habitat vs. Meeting current and future human needs' the proposed design chooses a site that is already in town, has thousands of visitors every year and is managed by the USACE. This is likely preferable to disrupting another pristine or less developed site and adding more infrastructure to access the site as would be the case with the South Park site that was suggested by some in community meetings.

To address the second paradox 'Focusing on design ideas and sustainable materials vs. Addressing maintenance and cost' it is proposed that maintenance issues always be taken into consideration as choices are made in the design as maintenance is an integral aspect of any truly sustainable design.

To address the third paradox, 'Keeping a traditional 'up North' character vs. Creating a modern building that serves the future' it is suggested to refine the interpretation of 'up North' to be more urban, given site location and its proximity to landmark infrastructure of the Pine River dam, and draw from a modern design sensibility informed by Scandinavian design influences. Development and operational costs must be kept at reasonable levels, balancing with the desires for high quality design and sustainable materials, so that the project is economically feasible for the government and non-profit partners who will own and manage it.



DESIGN APPROACH - REGENERATIVE DESIGN AND SUSTAINABILITY

Regenerative design proposes the notion of 'people' and 'place' as interwoven stories and actions shaping each other over time. Regenerative design is a process-oriented systems theory-based approach to design. The term 'regenerative' describes the processes that restore, renew, or revitalize their own sources of energy and materials, creating sustainable systems that integrate the needs of society with the integrity of nature, humans, and other species. It also includes approaches to community resilience that integrate aspects of community, adaptability, and systems thinking.

A sustainable design approach keeps in mind the long-term sustainability of the project with three lenses in mind: Environmental sustainability, Social sustainability and Economic sustainability. Without engaging all three aspects it will be difficult to attain the goal of long term sustainability.

Environmental sustainability suggests that keeping in mind the impacts of the project as they are expressed in topics of Site, Water Use, Energy Use, Materials, Interior Environmental Quality, and Waste. Social sustainability or equity aspects of sustainability suggest keeping in mind the social and equitable impacts of the project as they are expressed in who has access to the site, its amenities and programs, and to expand access beyond the needs of the majority to individuals and communities from marginalized identities including diverse races and ethnicities, genders and sexual orientation and socioeconomic backgrounds, people with disabilities, and others. Finally, Economic sustainability is critical for the viability and survival of the project and is also about new ways to engage economics in service of environmental and social goals while also negotiating constraints between cross-sector partners, non-profit, federal and local government, and private sectors.



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SITE DESIGN - MASTERPLAN

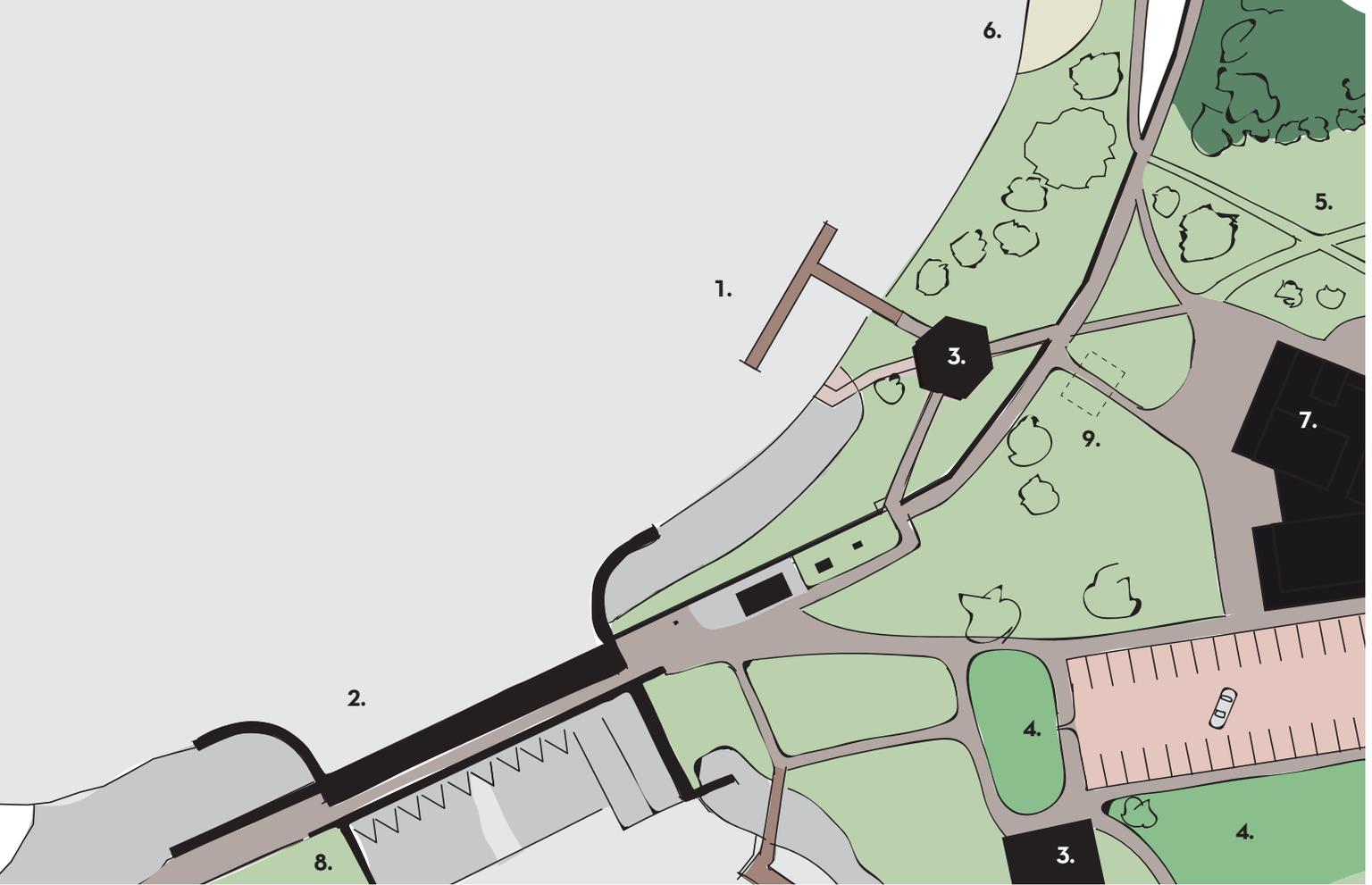
The Site Design - Masterplan is the outcome of the design process from August 2017 to December 2017 including community meetings and input from the Planning Team and other experts. Detailed features are further described in the legend included below. Specific areas, or Microcosms, as highlighted and shown on the following pages and with details described in accompanying legends.

MICROCOSMS (DETAILED ON FOLLOWING PAGES)

- A. **Levee Wall - Pine River Dam to Beach**
- B. **Inner Bay and Boathouse**
- C. **Public Docks and Loon Island**
- D. **Lake Front**
- E. **National Loon Center and Surroundings**

LEGEND

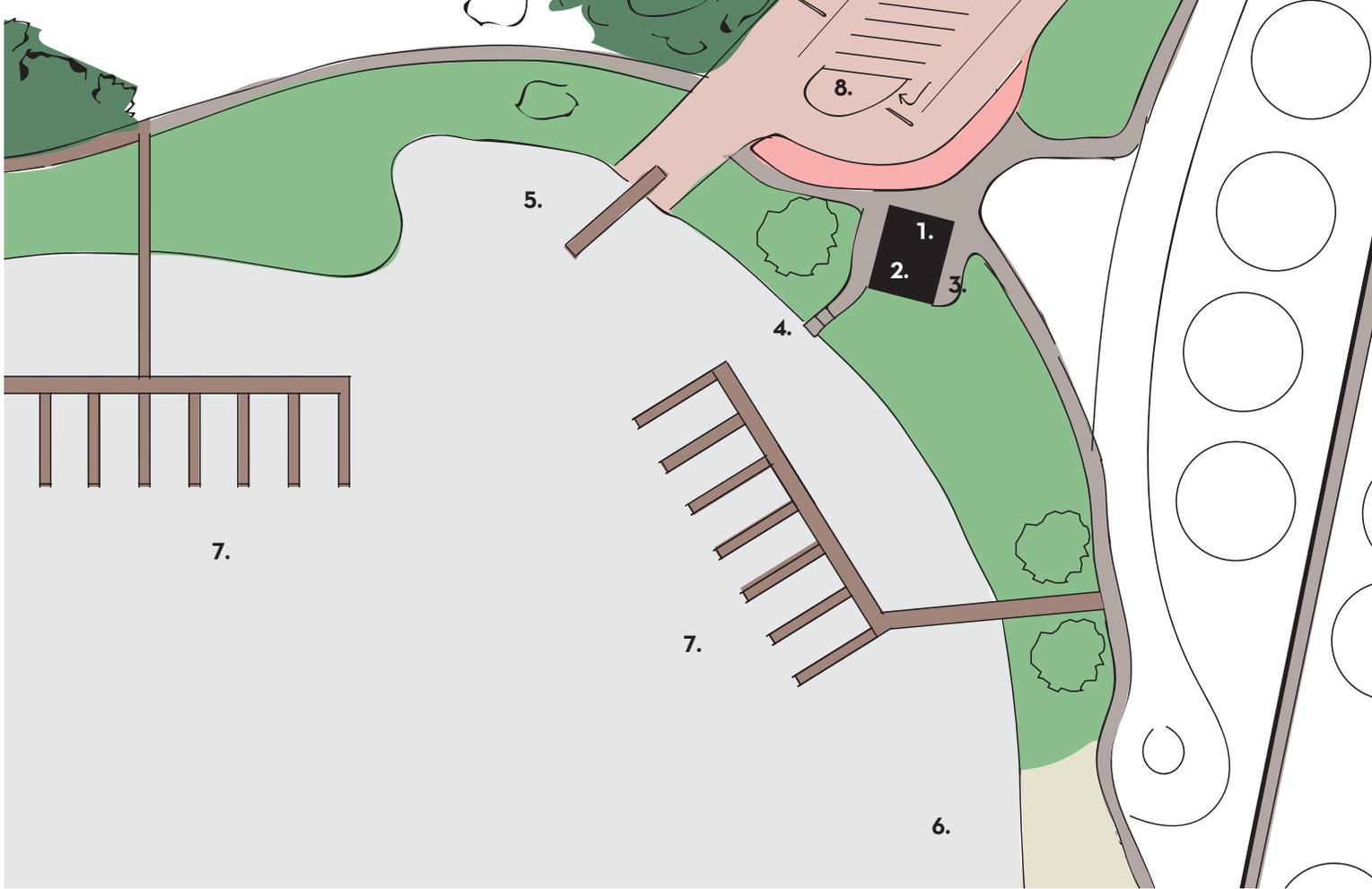
1. **U.S. Army Corps of Engineers Office:** The current office and main shop of the USACE on the Whitefish Chain is a one-story structure with primary entrances on the northeast and southwest sides of the building. The large garage doors are on the south end of the building on the southwest-facing facade.
2. **Shop addition:** Proposed new structure is intended to extend from the existing garage doors of the USACE office. Some indoor storage and maintenance, some outdoor storage and maintenance space currently exists. The surrounding yard space shown can be used for staging and seasonal displays.
3. **National Loon Center:** This is the proposed site for the NLC. It is oriented based on elevation changes to face the lake, street, and existing pathways. The building will have to be located a minimum 50' from Levee structure (toe). The building as shown is approximately 100' from Levee structure (toe).
4. **Loon Island:** This is a key focal point to be viewed from the proposed NLC. It has been a location for a pair of loons and is the location of a proposed nesting platform.
5. **Pine River Dam:** The dam infrastructure that dictates water levels for the Whitefish Chain of Lakes.
6. **Beaches:** There are two beaches on the site. The public access beach in the Inner Bay and the beach on the north Lakefront by the campground.
7. **Large buoy:** A "No Wake Zone" should be clearly established at the entrance to the bay for Loon health and shoreline protection. Consider providing a sign at this location and additional buoys may be needed to keep boat traffic away from Loon Island. Consider adding an educational panel on land near the docks about the purpose of the no-wake zone.
8. **Playgrounds:** Existing play infrastructure
9. **Boathouse:** See page 71
10. **Nature-based Play Space:** See page 70
11. **Kayak launch:** See page 71
12. **Boat launch:** See page 71
13. **Docks:** See page 72



A LEVEE WALL

1. **Fishing Dock:** This dock is proposed at the existing dock location either by adapting current dock or providing a new one as per dock regulations. Maintain handicap-accessibility and add the theme “Get the Lead Out!”. Educational panels can teach about native plants, fish, water quality, etc. in this area.
2. **Pine River Dam:** see page 69
3. **Picnic Pavilions:** Existing structures for gatherings.
4. **Rain Gardens:** Infiltration ponds should be planted in all areas around parking lots, near impervious sidewalks, and buildings. The City of Crosslake asks that a 1” rain event be handled on-site. Each rain garden is opportunity for an educational panel.
5. **Nature-based Play Space:** Proposed new group of nature-based play equipment that is built from and based on materials found in the nearby forests, lakes and rivers.
6. **Beach:** Public access beach that is most popular and nearest downtown Crosslake.
7. **National Loon Center:** The building will have to be located a minimum 50’ from Levee structure (toe). The building as shown is approximately 100’ from Levee structure (toe).
8. **Reserved:** Potential site for volunteer camping in the future.
9. **Existing bathrooms location:** This is where the current bathroom structure is located (prior to the construction of the proposed NLC).

See Planting List in the Resources section later in the report.



B INNER BAY

1. **Boathouse:** A small proposed structure 20' from the shoreline that includes space to store small boats, a sauna, and outdoor showers. This could be space that a private venture uses to rents kayaks and paddleboards.
2. **Sauna:** Proposed inclusion of sauna into the boathouse. Create and maintain a path between sauna and lake as people like to run in between.
3. **Outdoor Showers:** Proposed for use by beach-goers, campers, boaters, etc. with no soap use.
4. **Kayak Launch.** A small proposed launch that is easy to portage and has access to the water with drop-off area in closest area of parking lot. Gradual steps or a small dock is suggested for paddleboard, kayak, canoe access, etc.
5. **Boat launch:** The boat launch location and angle shown in diagram are as-is. The parking lot and launch may need to be expanded as per final needs and it is suggested to maintain perpendicularity to the water's edge.
6. **Beach:** This is the public access beach in the Inner Bay.
7. **Docks:** See page 72
8. **Parking lot:** See page 73

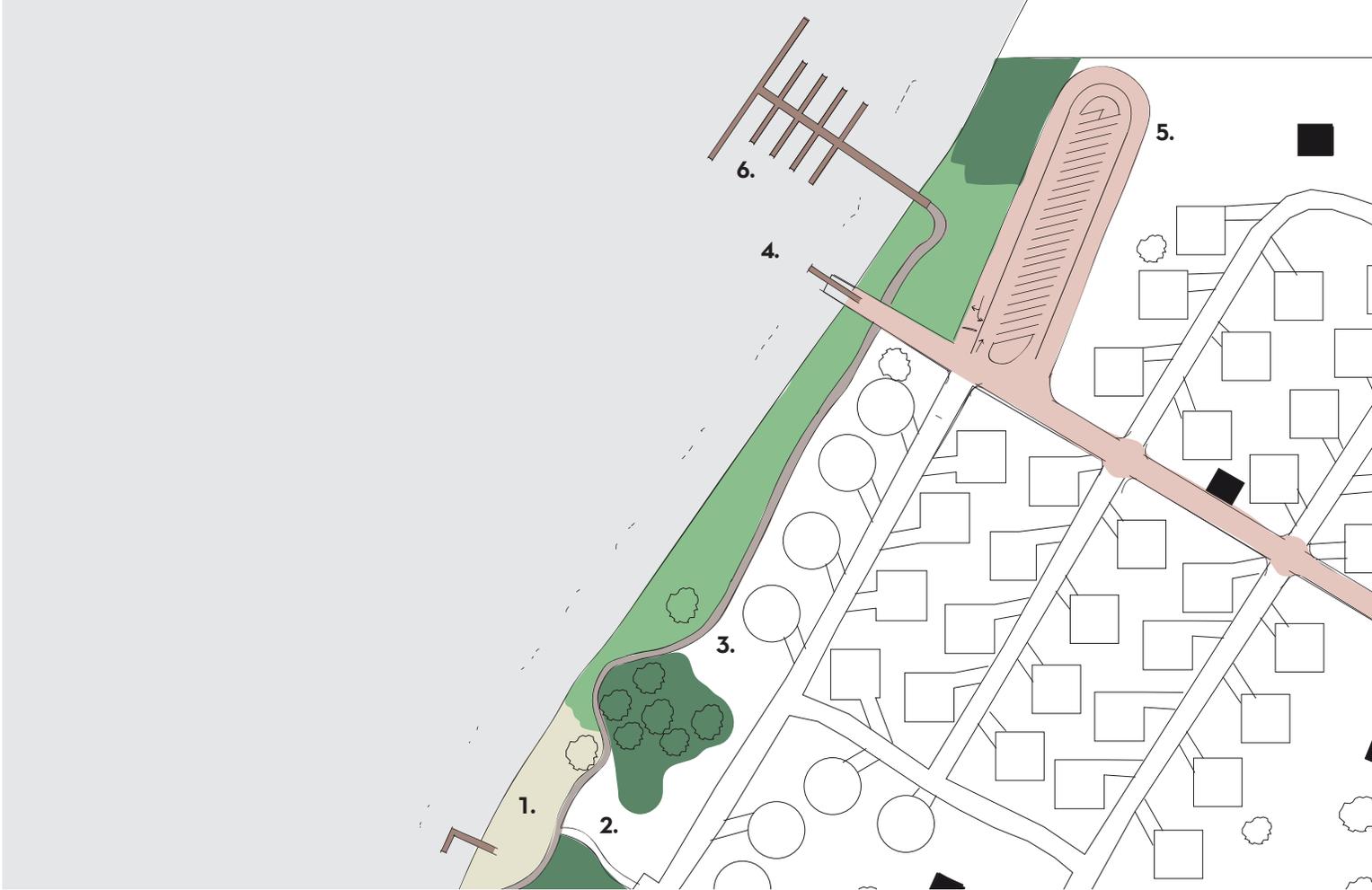
See Planting List in the Resources section later in the report.



C DOCKS AND WETLAND POINT

1. **Wetland:** Existing wetland near the tip of the Inner Bay.
2. **Boardwalk:** Proposed addition or rebuilding of a raised walkway connecting the bay to the lakefront around the wetland.
3. **Loon Island:** See page 69
4. **Loon platform:** Placement of a covered loon nesting platform is suggested here. Visible through binoculars or live-stream in the NLC building for loon behavior observation, this platform can also demonstrate and educate visitors about how to build a platform on their own properties.
5. **Shallow waters:** Extending from the wetland point to southwest area.
6. **Large buoy:** See page 69
7. **Docks:** Public docks are necessary to manage an influx in boat traffic to the site and they also protect against shoreland erosion and invasive species. Consider time limit regulations and accessibility for each stall individually, as well as boat parking fees if appropriate. Camper docks are a critical amenity for campground users and it is important that they continue to be provided. Signage for parking regulations and ecological education would be helpful. When sizing this dock, the potential of increased boat traffic within the bay should be weighed against maintenance challenges of docks located outside of the bay. Angled stalls may improve access. Include educational panels on all docks to reference and explain the surrounding ecology, dock design, etc.

See Planting List in the Resources section later in the report.



D LAKE FRONT

1. **North Beach:** This beach has larger waves and is less populated than the public access beach in the Inner Bay. Although currently used by day visitors, it is more accessible to campers in the northern part of the campground.
2. **Playground:** Existing play infrastructure
3. **Path:** Connects Inner Bay and Lake Front and takes the form of a boardwalk in sections.
4. **Boat launch:** Existing access-point on the north side of the site, susceptible to wind and ice damage.
5. **Parking lot:** The parking lot shown has been rearranged and rotated from its current situation. Keeping simple forms is suggested for maneuvering truck and boat-trailer. A long driveway, perpendicular to the water's edge is preferable for backing a boat into the water. Space is also necessary to stage, and clean boats on trailer. This parking lot may be used less than that in the Inner Bay due to its location.
6. **Camper Docks:** This proposed set of docks are likely to be less popular by users than docks in the Inner Bay due to wave action on main lake. A wave attenuator may reduce waves from lake. It is suggested to locate it at a distance from nearby campsites.

See Planting List in the Resources section later in the report.



E NATIONAL LOON CENTER

1. **U.S. Army Corps of Engineers Office:** See page 69
2. **Shop Addition:** See page 69
3. **National Loon Center:** See page 69
4. **Intersection:** This is the intersection between Highway 66 and Highway 3. An intersection safe for pedestrians, bikers and drivers must be established for visitors to reach the site.
5. **Bus Drop-off and Turn-around:** Large vehicles must be able to enter, drop passengers, and exit the facility.
6. **Dump station:** The existing sewage dump station for campers is located here. Consider the current Chamber of Commerce office across the highway as a replacement location.
7. **Existing Bathrooms Location:** This is where the current bathroom structure is located (prior to the construction of the proposed NLC).
8. **Rain Gardens:** See page 70
9. **Garden:** This is an existing garden constructed by the USACE and local partners and a focal point of entry that is used seasonally to engage and educate visitors on site.
10. **Outdoor Classroom:** The NLC building can be used as a partial enclosure for an outdoor room that can serve as a class, meeting point for tours, or other purposes. This room can have carefully curated edge between building and nature.
11. **Nature-based Play Space:** See page 70

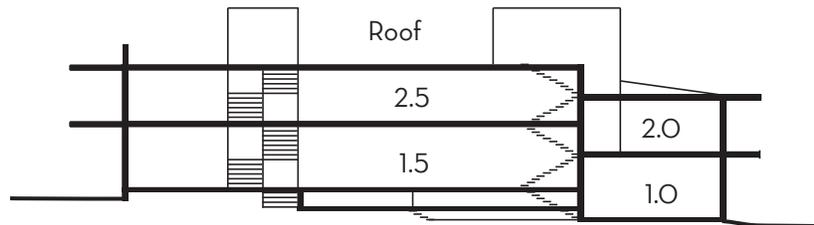
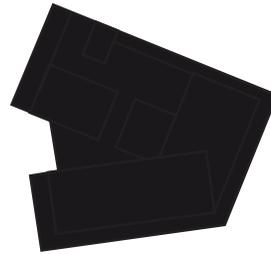
See Planting List in the Resources section later in the report.

BUILDING

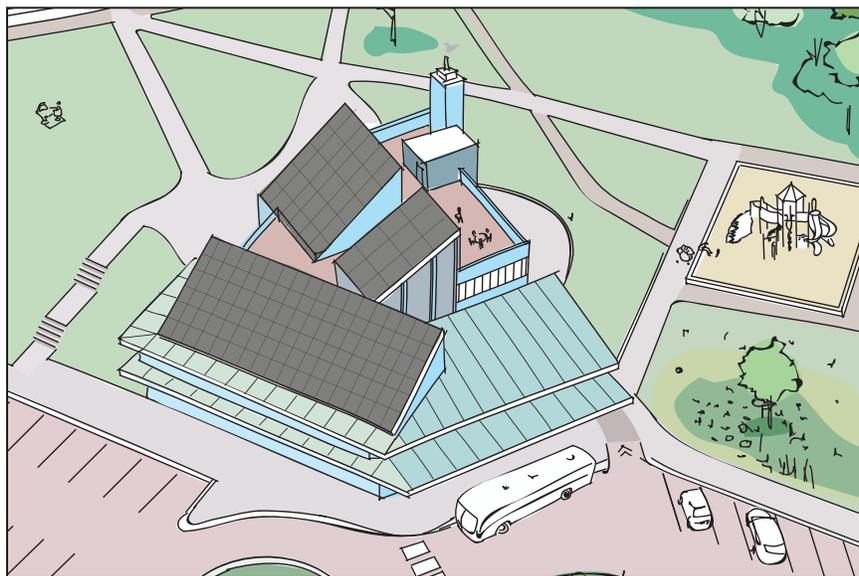
The Building Design is the outcome of the design process from August 2017 to December 2017 including community meetings and input from the Planning Team and other experts. The vision is for the building to follow the seven design recommendations proposed later in the report. Detailed features are further described in the legend included in the following pages. Specific areas, or Floors, are highlighted and shown on following pages and with details described in accompanying legends.

LEVELS (DETAILED ON FOLLOWING PAGES)

- 1.0. Entry, Offices**
- 1.5. Exhibit Space**
- 2.0. Classroom, Lab**
- 2.5. Exhibit, Offices**
- Roof, Solar Panels**



Building section indicating split-level format

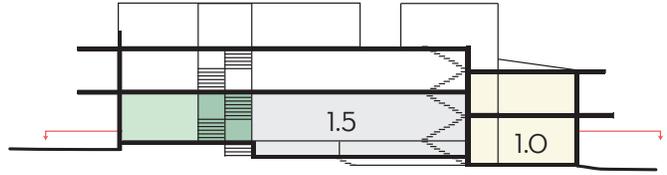


Birds-eye view of proposed National Loon Center building including bus drop-off

1 1.5 GROUND FLOORS - LEGEND

- 1. Main Entry:** This is the proposed primary access to the building. It may be important to maintain a single entry point for visitor traffic and possible entry fee transactions.
- 2. Lobby and Check-in:** The lobby is proposed to be open and welcoming with an attractive feature such as a sculpture or a living machine at the entrance to the building.
- 3. Gift Shop:** The Chamber of Commerce may consider setting up a store selling local souvenirs from the site. For security of goods, consider lockable counters and/or sliding gates rather than constructing additional walls that would interfere with the open feel of the lobby.
- 4. Kitchenette:** A small or larger kitchenette may suffice based on determined need as a place to host local caterers or to sell local concessions.
- 5. Chamber Display:** This display is proposed to be a wall space that is visible from the entry to display materials from the Chamber of Commerce to advertise tourism and points-of-interest in the area.
- 6. Chamber Lobby:** This space is proposed as a small waiting area to serve as a buffer between the main building lobby and the Chamber of Commerce offices.
- 7. Elevator:** Accessibility must be maintained at every level. In a split-level building, the elevator will need to have doors on two sides.
- 8. Aquarium:** A large aquarium is proposed to be a focal point of the Loon Center featuring Cisco, one of the main types of fish on which the Loons feed in the Whitefish Chain of Lakes. A two-story aquarium would begin to show the depths to which Loons dive in order to find these oily fish.
- 9. Exhibit Space:** Versatile large and small exhibit spaces are proposed for a variety of regular and rotating exhibits.
- 10. Fireplace:** Gas fireplaces are proposed at different levels to create 'hearths' that will attract community gatherings and create an 'up North' feel.
- 11. Storage Space:** The Loon Center will need a large amount of storage space for different exhibits and other educational materials. Consider providing double-doors or a garage door from the exterior for easy loading and unloading of materials.
- 12. Bathrooms:** Bathrooms must be accessible by users of the Center through daytime hours and users of the campground around the clock. Consider a line of fully closed-off, individual, unisex bathrooms with full walls and doors to improve privacy for all users. A single line of sinks outside the bank of closed bathrooms conserve space and need not be as private.
- 13. Outdoor Classroom:** An outdoor space for classes or groups is proposed to congregate and learn about the surrounding environment.

GROUND FLOORS



2 2.5 TOP FLOORS - LEGEND

1. **Open Below**
2. **Elevator:** Accessibility must be maintained at every level. In a split-level building, the elevator will need to have doors on two sides.
3. **Classroom:** The classroom is proposed to be used for educational programming for local schools and other visitor groups as well as for rental purposes. The design of the classroom opens to two-story aquarium between class and exhibit space. Views to dam, street, and forest are available. There is direct access to lab space and (stairway) to lower exhibit area.
4. **Aquarium:** A large aquarium two stories tall, down to the first floor is proposed to be a focal point of the Loon Center featuring Cisco, one of the main types of fish on which the Loons feed in the Whitefish Chain of Lakes. A two-story aquarium would begin to show the depths to which Loons dive in order to find these oily fish.
5. **Laboratory Space:** This is proposed to be a space to study water quality, ecology, invasive species, etc. Views of the campground, forest and down-town Crosslake would be available from this space.
6. **Balcony:** The proposed indoor and outdoor balcony spaces connects the classroom space with the Laboratory space and overlooks the entry lobby, or are available on the side and west side of the building.
7. **Bench:** Benches are proposed in balcony areas for building users to enjoy the views.
8. **Exhibit Space:** Versatile large and small exhibit spaces are proposed for a variety of regular and rotating exhibits.
9. **Fountain:** Create a sculptural education panel that also functions as a drinking fountain. This can teach kids the importance of water quality relating drinking water quality to the health of the fish in the aquarium and lake in the map below.
10. **Office Space:** This space is proposed for USACE use. It includes a reception area, two standing-height work areas, and two enclosed offices.
11. **Bathroom:** This unisex bathroom is proposed for office and visitor use.
12. **Conference Room:** The conference room is available for use by office as well as by community upon request.
13. **Fireplace:** Gas fireplaces are proposed at different levels to create 'hearths' that will attract community gatherings and create an 'up North' feel.
14. **Roof:** No access is available to the roof at this level.

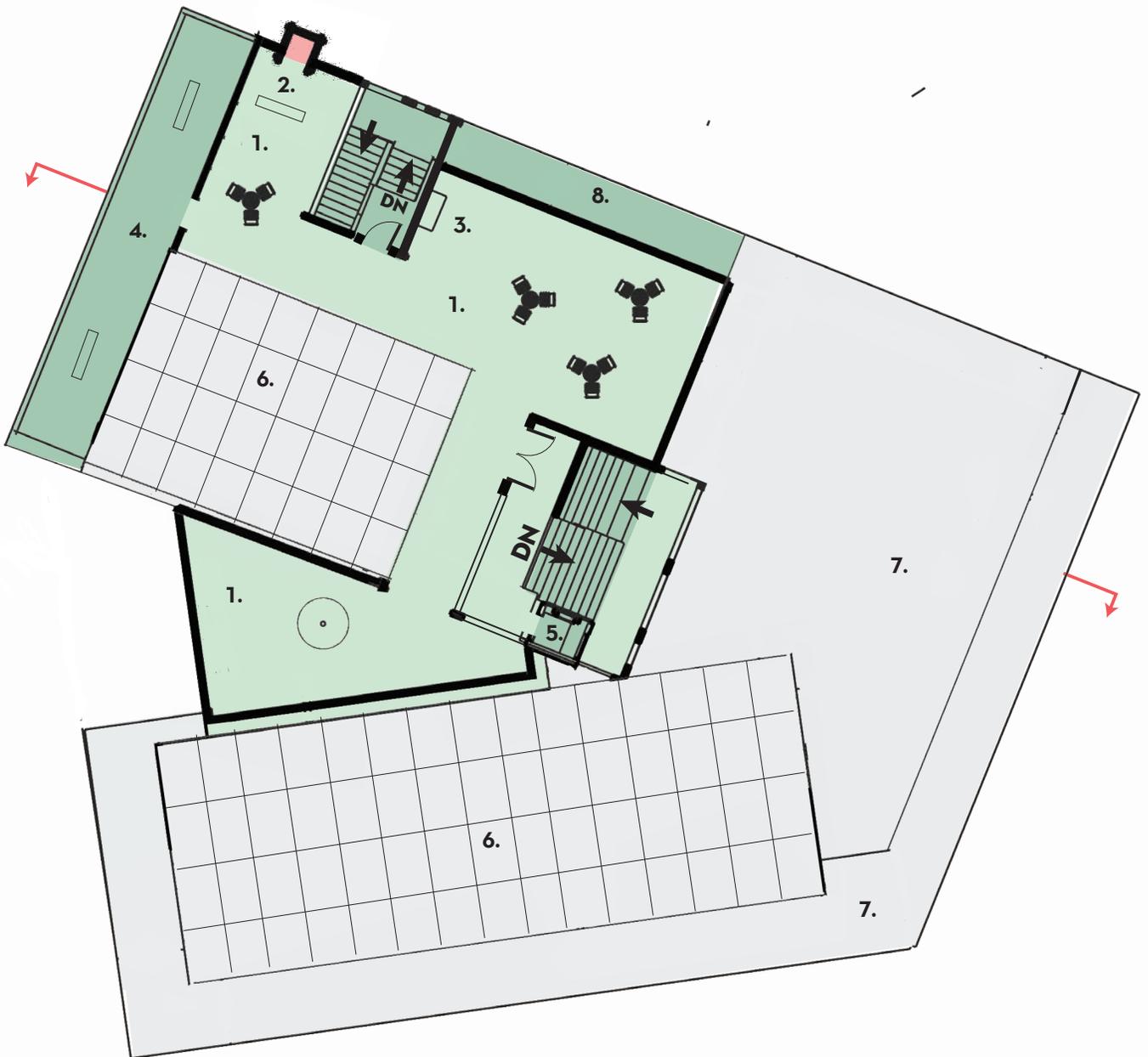
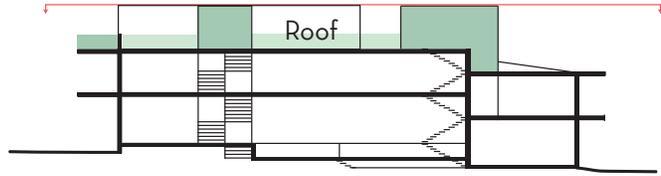
TOP FLOORS



R ROOF - LEGEND

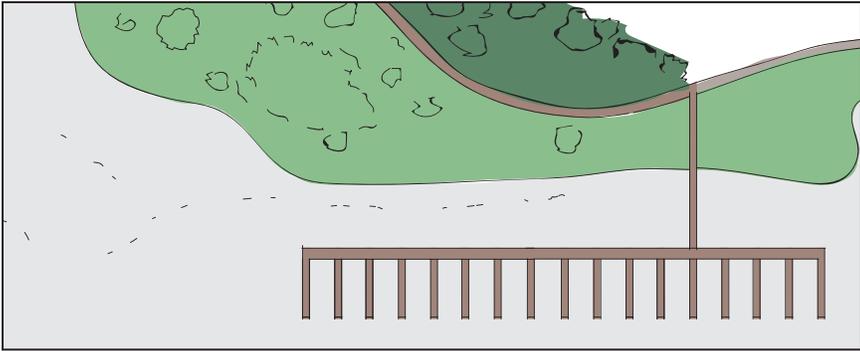
1. **Outdoor space:** build flexible space for exhibits and community events. Triangular space near the solar panels can be used to educate visitors on energy use, construction methods, etc.
2. **Fireplace:** Gas fireplaces are proposed at different levels to create 'hearths' that will attract community gatherings and create an 'up North' feel. This fireplace will have an outdoors/rooftop presence.
3. **Wet bar:** Plumbing hook-up is proposed for rooftop bar to host community events.
4. **Balcony:** The proposed indoor and outdoor balcony spaces connects the classroom space with the Laboratory space and overlooks the entry lobby, or are available on the side and west side of the building, and in this case at the roof level.
5. **Elevator:** Accessibility must be maintained at every level. In a split-level building, the elevator will need to have doors on two sides.
6. **Solar Panels:** The solar photovoltaic installation is proposed for southern exposure to meet the larger goal of zero energy building.
7. **Roof:** No access is available to the roof at this level.
8. **Open Below**

ROOF LEVEL





Two-level aquarium teaches about cisco fish, water quality and ecology.



Public docks protect the shoreline from parking of boats and subsequent erosion.

ENHANCE LOON HABITAT, PROTECT SHORELAND, ADDRESS WATER QUALITY AND INVASIVE SPECIES

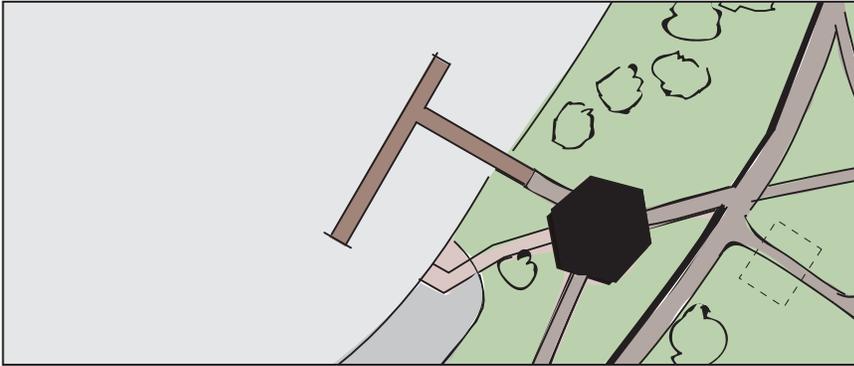
Loon habitat, shoreland and water quality are all affected by human activity. Education and demonstrated action on these topics could be the main focus of the NLC site and building design.

Make loon habitat the focus of interpretive exhibits. Specifically, the loon habitat would be the focus of interpretive exhibits in the NLC exhibit areas, aided by a loon platform in view of the NLC facility on or near the island directly west of the building site. In addition, loon viewing through cameras could be considered. It should be noted, as indicated by DNR experts during the design process, that loons do not survive well in captivity. Therefore, unlike in some similar facilities such as at the National Eagle Center in Wabasha, Minnesota, or at the Raptor Center on the University of Minnesota, St Paul Campus, which have a few eagles and raptors in the facility that are used in visitor education, the NLC will not have live loons inside the building. On the other hand, an indoor aquarium featuring ciscoes, fish in the area on which loons feed, could be an excellent interpretive exhibit and is proposed in the design.

Use technology and boat tours for live loon viewing. The main ways that loons will be included in the programming are through taxidermic installations/dioramas, loon viewing cameras, and potential seasonal boat tours that take visitors to the places on the Whitefish Chain where loons congregate on the water. Other important educational activities will be around lead fishing tackle and its negative impacts on loons, demonstrated on the “Get the Lead Out!” fishing dock west of the building on Crosslake. In addition, lead-free alternative tackle could be available for sale in the gift shop.

Develop shoreland protection zones. Specific shorelines, zones, or microcosms, identified in the Crosslake bay and the north lakefront on the USACE site, would be used as shoreland protection sites and included in demonstration and interpretation activities on site. Detail plant suggestions have been made by experts from Extension and the Soil and Water Conservation District (SWCD) as part of the design process and listed later in the report under Resources section.

Build on the work of existing committees. Specific programming would address the topics of invasive species and water quality issues which are being addressed by local community members as part of specific committees.



The fishing dock can teach people about disposal of lead tackle.



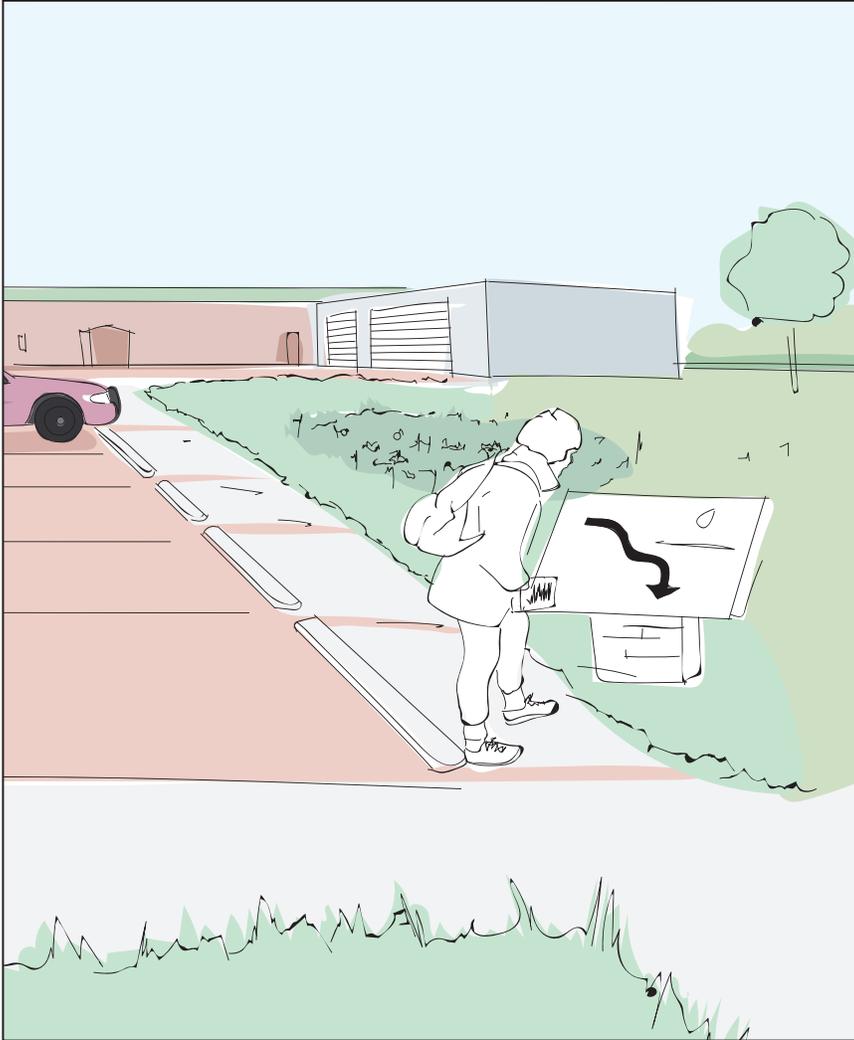
The classroom can be used by all ages and has views of the dam, river, and indoor aquarium.

CREATE A PLACE FOR COMMUNITY GATHERING AND EDUCATION

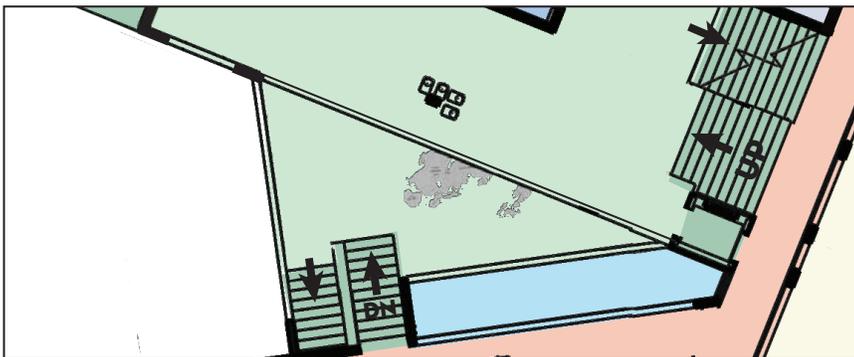
The NLC has a strong potential for becoming a hub in the area for local and visitor community due to its focus as well as due to its location right in heart of Crosslake and on the USACE site that already boasts of almost 200,000 visitors per year.

Serve Intergenerational communities with diverse interests: The project could be a place that gathers people of all ages with a variety of interests. For example, the project may attract residents of Crosslake and surrounding communities, the outdoors/recreation enthusiasts who are already drawn to Brainerd area and the Whitefish Chain of Lakes, or environmental buffs who are interested in natural habitats and wildlife species, or people from across the state who are curious and want to learn more about loons as the Minnesota state bird, local residents, and tourists and annual visitors to the USACE site for camping or visiting the Pine River Dam, using the beach and the playground. As a high quality venue that is available for rent, the NLC could attract people wishing to host personal or community events in a beautiful natural setting.

Create a focus on environmental education: The NLC would provide environmental education on loon habitat, shoreland protection, and water quality as mentioned above. In addition, it will provide specific spaces for exhibits and learning and recreation such as the main lobby, classroom, auditorium and displays, beach, gazebo and picnic shelter, dock house, docks for boat tours. Extended communities of the Paul Bunyan Scenic Byway (PBSB), Brainerd Lakes and Crosslake Chambers of Commerce, DNR, SWCD and others, may be drawn to visit this facility as a result to the above mentioned amenities at the NLC.



Signage next to rain gardens and elsewhere can teach people how to incorporate sustainable practices into their own properties.



The drinking fountain, lake map, and aquarium can together teach importance of water quality.

USE ARCHITECTURE AND LANDSCAPE DESIGN FOR PEDAGOGY

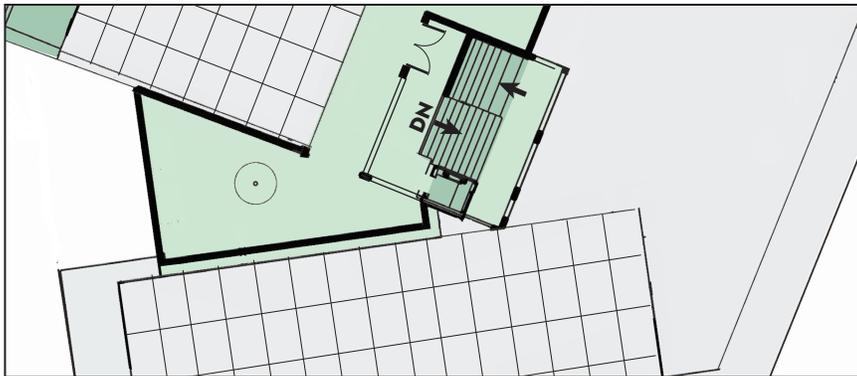
Architecture and landscape design are more permanent exhibits on the site and are excellent opportunities to teach about a variety of topics including about environmental issues. The notion of ‘architecture as pedagogy’ has been discussed and written about in sustainable design field for a long time. This approach can be seen in precedents such as the Bertschi School and the Mississippi Watershed Management Organization (MWMO) described in an earlier section.

Use architecture and landscape architecture to teach: Visionary environmental educator David Orr, in his 1993 article elaborates on the value of architecture as pedagogy and suggests five points. One, he points out that “... the process of design and construction is an opportunity for a community to deliberate over the ideas and ideals it wishes to express and how these are rendered into architectural form.When they are so decided, the design of buildings fosters civic competence and extends the idea of citizenship.” Two, he suggests “... the architectural process is an opportunity to learn something about the relationship between ecology and economics.” Three, he points out that the buildings around us raise questions of ethics and cause us to understand their implications. Four, “...within the design, construction, and operation of buildings is a curriculum in applied ecology. Buildings can be designed to recycle organic wastes through miniature ecosystems which can be studied and maintained by the users. Buildings can be designed to heat and cool themselves using solar energy and natural air flows. They can be designed to inform occupants of energy and resource use. They can be landscaped to provide shade, break winter winds, propagate rare plants, provide habitat for animals, and re- store bits of vanished ecosystems. Buildings and landscapes, in other words, can extend our ecological imagination.” Five, he suggests buildings “can also extend our ecological competence. The design and operation of buildings is an opportunity to teach students the basics of architecture, landscape architecture, ecological engineering for cleaning wastewater, aquaculture, gardening, and solar engineering. Buildings that invite participation can help students acquire knowledge, discipline, and useful skills that cannot be acquired other than by doing.” Orr indicates that “good design can extend our imagination about the psychology of learning.”

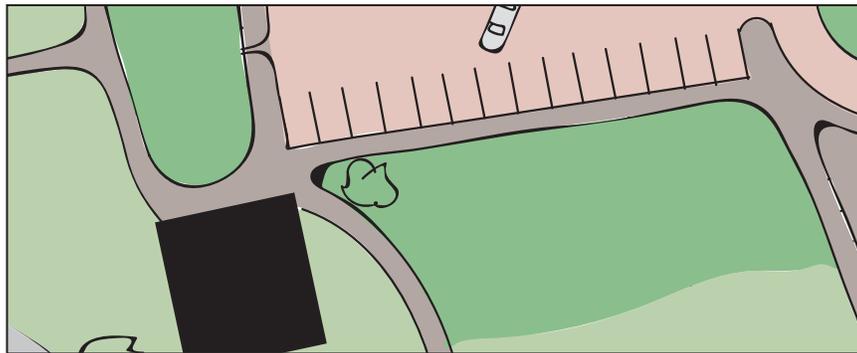
Highlight places in building and on site that can teach: Specifically, the NLC building and landscape has many education and interpretive opportunities to teach about landscape design and shoreland restoration and about regenerative design practices outdoors and indoors (specific mention of spaces of environmental education).



Use sustainable construction methods for passive heating and cooling of the building.



Use solar panels on south-facing roofs to power the building.



Create rain gardens to capture rain run-off and showcase infiltration.

AIM TO CREATE A ZERO ENERGY BUILDING AND USE SUSTAINABLE BUILDING DESIGN GUIDELINES AND REGENERATIVE DESIGN PRINCIPLES, AND RFP LANGUAGE THAT SUPPORTS THESE GOALS

A project like the NLC with its environmental and economic focus is a natural candidate for using the state-of-the-art goals of building that have been making steady and significant advances both nationally and in Minnesota over the last many decades.

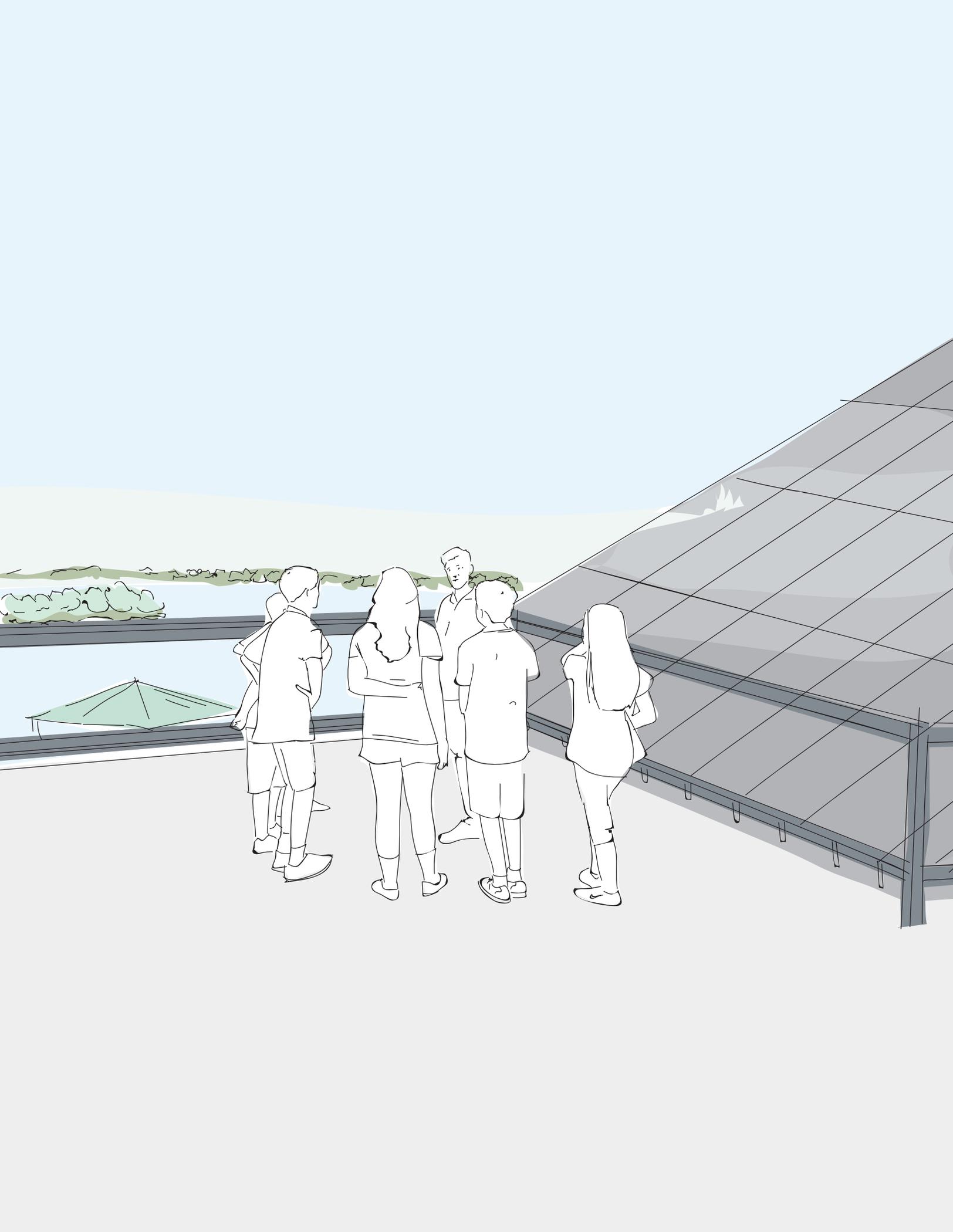
Aim to create a zero energy building: According to US Department of Energy's report on zero energy buildings: "A zero energy building (ZEB) produces enough renewable energy to meet its own annual energy consumption requirements, thereby reducing the use of non-renewable energy in the building sector. ZEBs use all cost-effective measures to reduce energy usage through energy efficiency and include renewable energy systems that produce enough energy to meet remaining energy needs. There are a number of long-term advantages of moving toward ZEBs, including lower environmental impacts, lower operating and maintenance costs, better resiliency to power outages and natural disasters, and improved energy security." Setting goals for zero energy and achieving them will enhance the significance and visibility of the building and attract support of people who are committed to environmental action.

Use Sustainable Building Guidelines and Sustainable Materials: The B3 Building Guidelines and Living Building Challenge are two state-of-the-art sustainable building design guidelines that the NLC building could be required to comply with to meet the project goals of sustainable design. This would ensure that the design outcomes and process move towards desired goals with metrics that can be reported on as part of the interpretation of the building. In terms of materials, wood construction with Structural Insulated Panel (SIP) use for energy efficiency, thermally-treated locally-sourced wood on the exterior combined with metal roofing for non-toxic water run-off are suggested.

Use RFP language for building project for design and construction that clearly establish targets: Planning, designing and achieving green buildings is a complex and detailed project that requires commitment and buy-in from all partners on the project towards the goals including client, owner's representative, design team, contractors and others. It is recommended that Building Performance Requirements, Substantiation of Energy Performance Target, Measurement and Verification Plan Overview and Intent, be set before the project is launched. Below is sample language that would be included with technical specifications of goals to achieve:

"Mission critical goals are project requirements, and must be met by all responders for a successful proposal. Highly desirable and If possible goals should be attempted, in that order, where the responders are able to achieve them to improve the chances of success in the proposal."

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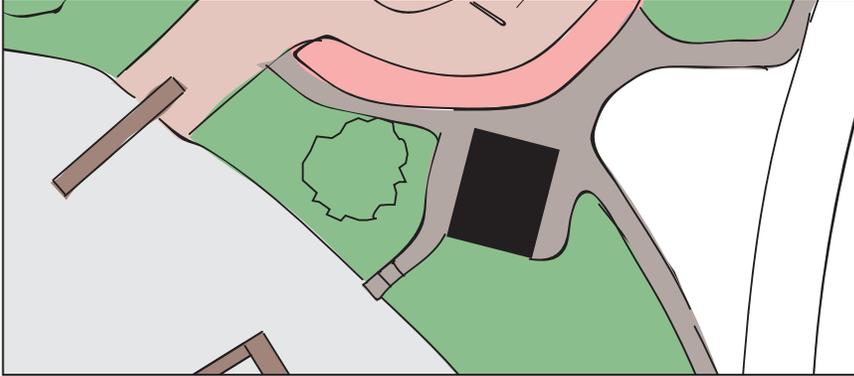
“This project shall meet at least the site Energy Use Intensity stated in the project goals list. This requirement shall be delivered by the design and construction teams through the use of any variety of permanent energy efficiency measures utilizing on-site equipment.”

“A measurement and verification plan will be crucial in later phases to demonstrate that the building meets the performance goal and to maintain high levels of performance over the life of the building. An M&V narrative is required for the Final Plans.”

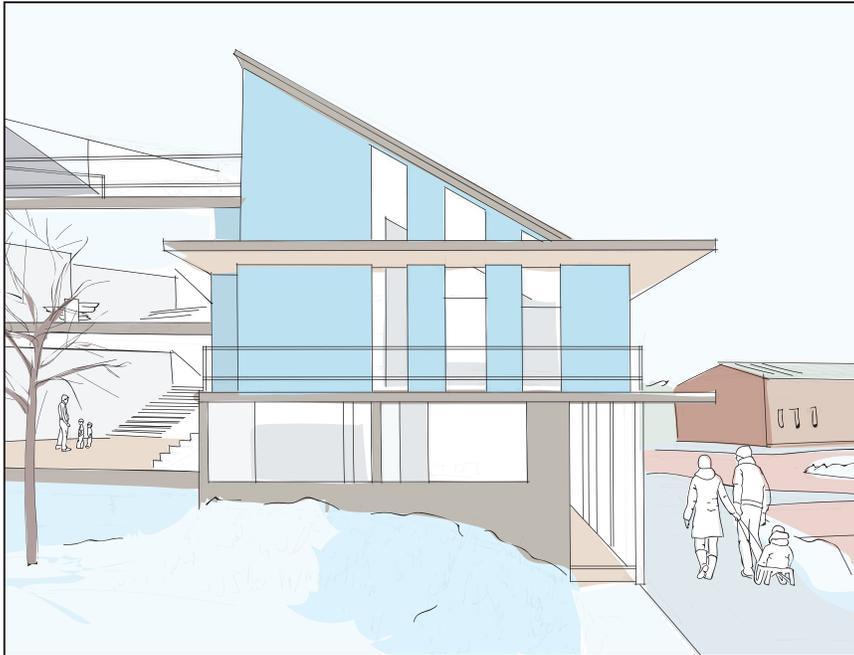
Select experienced professionals with demonstrated sustainable and regenerative building design expertise: It would be important as the project proceeds to put criteria in place for Architect selection and include language in the Request for Proposal that invites the best and experienced architecture and landscape architecture expertise to achieve an exemplary building that meets the best current environmental standards.

Plan on a RFP for consultants that indicates expertise in sustainable and regenerative building design building design: Having language in the RFP for consultants will be important to draw firms to the project with the best talented and demonstrated experience in sustainable and regenerative design. The Center for Sustainable Building Research can help with developing the language for this purpose in partnership with the National Loon Center Foundation and other partners.

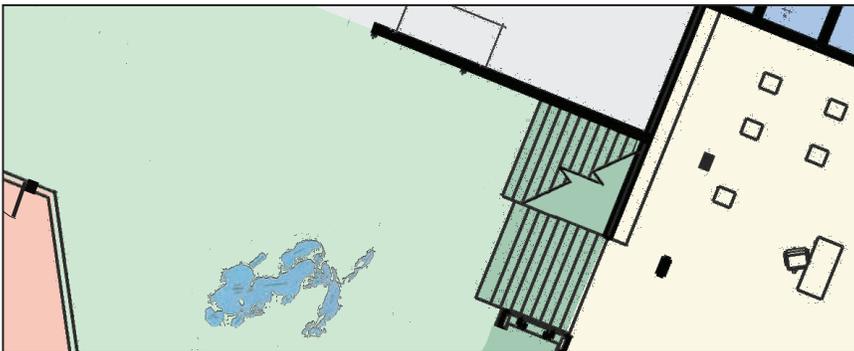
Opposite: kids learns about solar panels on the roof of the Loon Center.



A sauna with proximity to the lake can keep the community warm year around.



Consider winter-time needs in combination with modern expression.



Create open spaces that are versatile over time for changing programming.

INTEGRATE “UP NORTH” AND MODERN CHARACTER IN DESIGN

The character and feel of an architectural design are complex to describe and discuss. As demonstrated by the feedback received in the design process it seems that a more modern character will be more appropriate for the project while incorporating elements of the ‘Up North’ feel.

Incorporate ‘Up North’ character in the design: The “Up North” character of Minnesota North also brings with it images of wood buildings and log cabins, outdoors recreation and more. In his book of essays ‘Up North’, Duluth-Tribune outdoors writer Sam Cook portrays the enchanting North Country as a state of mind as much as a geographical area with its mystic moods, seasonal subtleties, and colorful characters that fill the region from the Minnesota canoe country to the vast expanse of the Northwest Territories. Use of sustainable wood on the exterior and interior balanced with other materials such as glass and metal may contribute to an ‘Up North’ character for the NLC.

Seek modern place-based expression through the design: While the notion of ‘Up North’ suggests a rustic kind of architecture and building type over the last many decades there are many remarkable examples of architecture that embodies the northern character and a modern sensibility from Minnesota, Canada and Europe. Contrast and connection to nature in architecture and urban and remote context is expressed in many of these place-based examples.

It is suggested that seeking an integration of the northwoods feel with a modern expression that suggests state of the art in technology and future vision would be appropriate for the NLC. Its presence with proximity to the dam infrastructure and the town of Crosslake further enhances the need for a hybrid vision.



Roundabouts can prioritize pedestrians by narrowing traffic lanes and tightening turning radii.



Fewer turn-lanes and a narrowed road create a safer crossing.

ADDRESS STREET ACCESS AND CONNECTIVITY, PARKING OF CARS AND BOATS

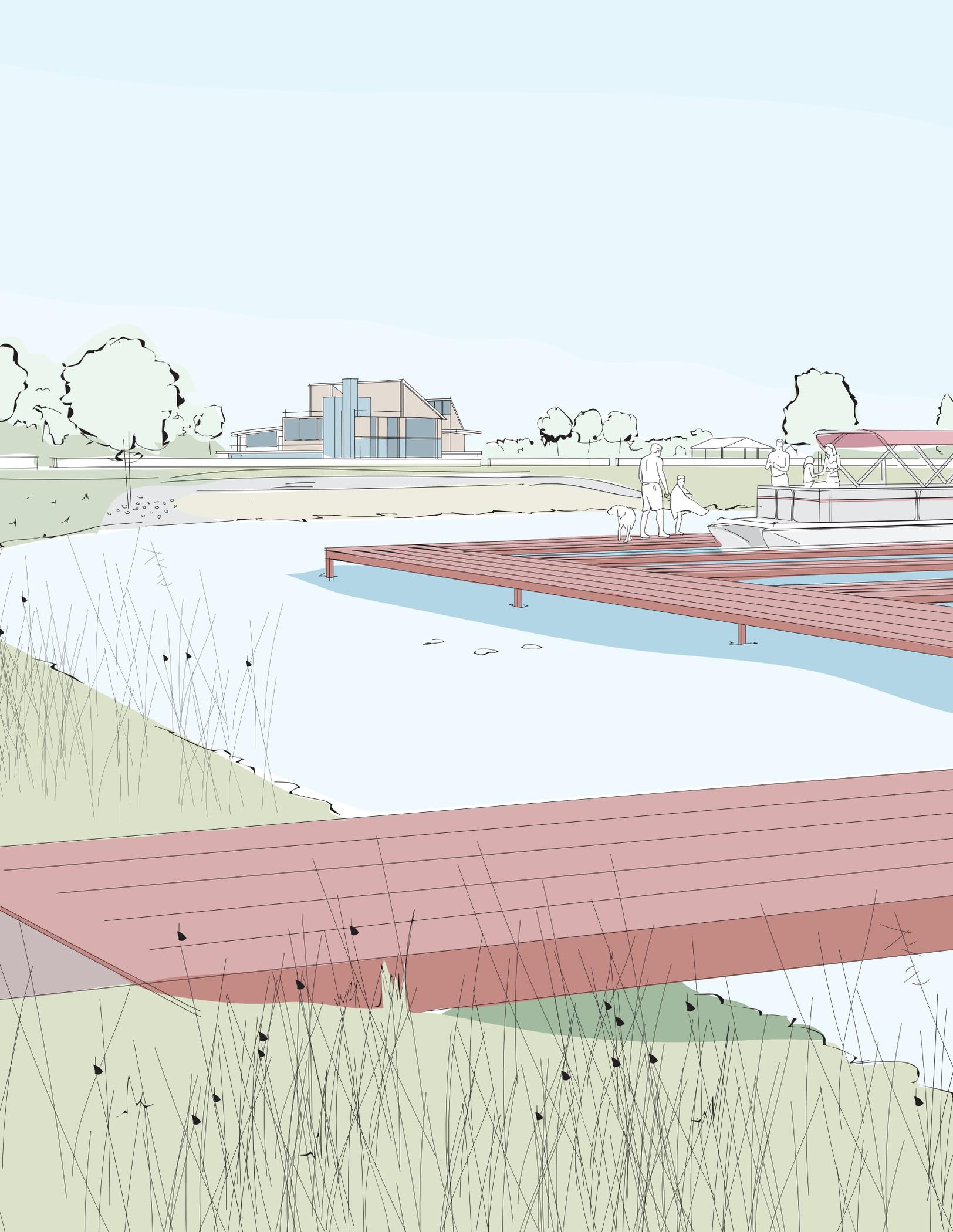
Access to the NLC site is at the intersection of CSAH 66 and County Road 3. The Crosslake community has been exploring options for safe streets and connectivity through multiple efforts and studies including the Traffic Study related to the planning of Crosslake school and the recent GLAR-Blue Zones report on Walkable Crosslake. The Walkshop organized as part of the GLAR-Blue Zones focused on connectivity, and specifically on how County Road 66 can be transformed, over time, to better support all modes—people walking, biking, driving, using golf carts, or trolley—and businesses by focusing on placemaking and walkability.

Connect the ‘three districts’ of Crosslake: According to the Walkable Crosslake report “three districts exist: “old town,” “mid-town,” and “downtown or new town.” Crosslake lacks gateways –a sense of arrival or welcome—and signs of entering into these new districts. In September of 2016, Minnesota Design Team (MDT) led a community planning and visioning session, identifying a need to connect the three districts together with trails, sidewalks and pathways.”

Implement some of the short-term initiatives suggested by the Walkable Crosslake report: These are of relevance to the NLC project and a specific selection is included below. These initiatives would need collaboration with MN Department of Transportation (MNDOT) and other relevant agencies.

- Paint Ladder-Style (or Piano Key) High Visibility Cross-walk Markings. Locations that were identified include across County Road 66 at Lake Country Crafts and Dairy Queen, and Swann Drive and Hwy 66 and County Road 3.
- Address Complex Intersections: Adopt a “Roundabouts First” Policy and Consider A Roundabout at:
 - County Road 103 and County Road 3
 - County Road 66 and County Road 3
 - Narrow Travel Lanes: Set Default Lane Width to 10-Feet
- The grand demonstration project is to right-size County Road 66. All participants agreed that the target speed – the speed in which motorists actually drive—should be 25 mph. To achieve the target speed participants began to discuss the potential for the following street-making tools:
 - Narrow travel lanes to 10 feet
 - Along some sections consider on-street and trail connectivity
 - Create a walkway on the Northbound side, ideally buffered by a landscape strip with street trees

(continued)



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- Mark shoulders as bike lanes or buffered bike lanes
 - Create gateways with tools like roundabouts and landscaped medians

Create docks to serve new NLC traffic and existing campground traffic:

Docks are necessary to manage an influx in boat traffic to the site and they also protect against shoreland erosion and invasive species. Consider time limit regulations and accessibility for each stall individually as well as boat parking fees if appropriate.

Camper docks are a critical amenity for campground users and it is important that it continue to be provided. Signage for parking regulations and ecological education would be helpful. When sizing this dock potential of increased boat traffic in the bay with maintenance challenges that come with docks outside of the bay should be considered. Angled stalls may improve access.



An example of high-traffic boat-launch on Gray's Bay in Lake Minnetonka. Image: Apple Maps



CREATE INCLUSIVE CROSS-SECTOR COLLABORATIVE PARTNERSHIPS FOR THE LONG-TERM

For the NLC project to succeed over the long-term partnerships will be essential from the very beginning.

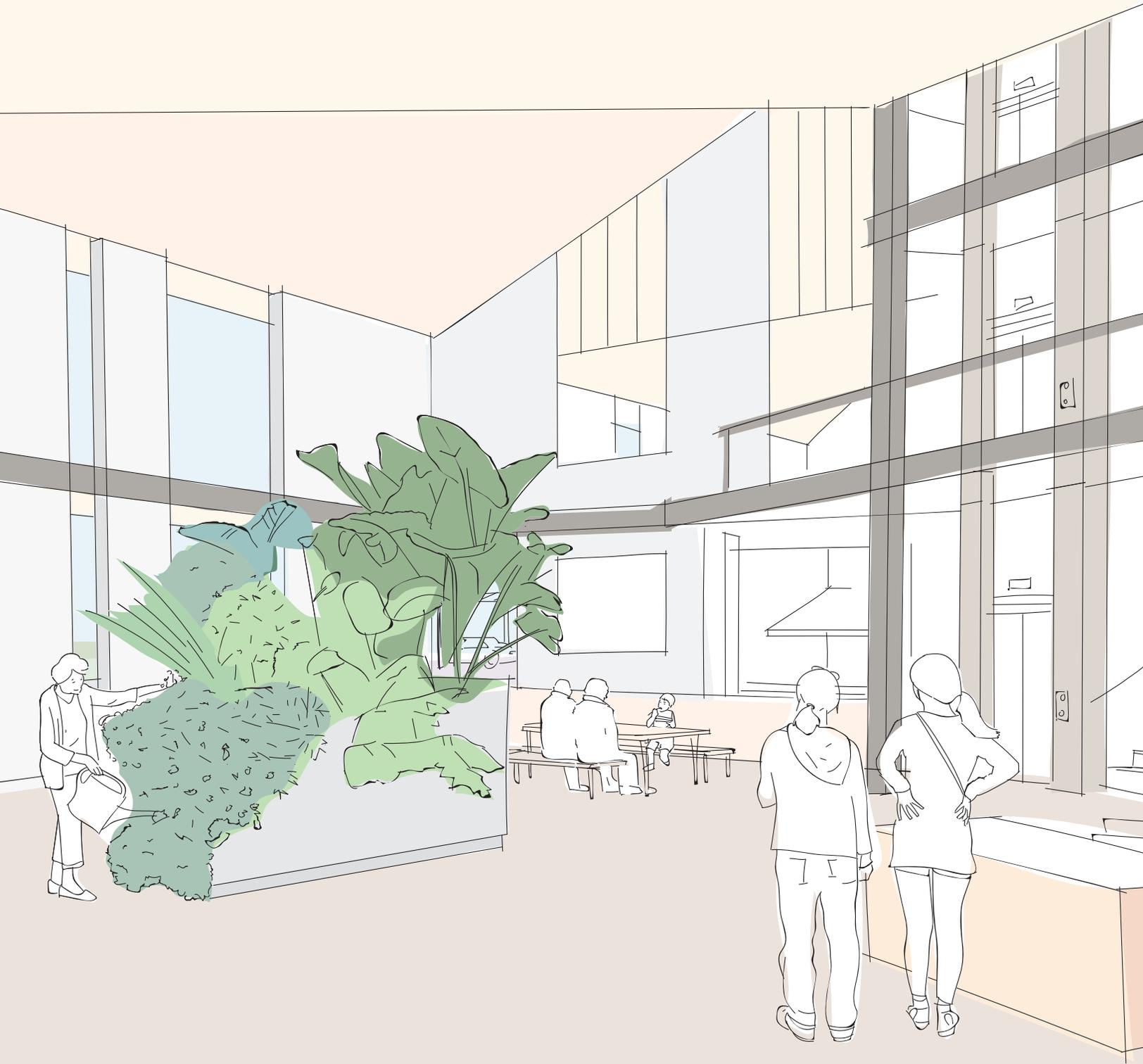
Foster collaboration: The design principles above can be best implemented with the engaged, enthusiastic participation of the community and authentic collaboration from the various partners. Specifically this project involves partners from many sectors such as the federal government (USACE), local government (MNDNR), non-profits (National Loon Center Foundation, Brainerd Lakes Area Chamber of Commerce, Crosslake Chamber of Commerce) and citizens from the Crosslake community and beyond. It is suggested that the community members interested in implementing the design be invited to the table and form smaller teams that address different aspects of the master plan. These teams can be organized around the above design principles or by other criteria that seems to organically fit the needs of the project.

Implement best practices of cross-sector collaboration: Cross-sector collaborations are a source of strength of a project but can also be simultaneously challenging. University of Minnesota Professors Bryson, Crosby and Stone from the Humphrey School of Public Affairs in their article 'Designing and Implementing Cross-Sector Collaborations: Needed and Challenging' identify points for practitioners of cross-sector collaborations.

- Make sure there is a clear collaborative advantage to be gained by collaborating, meaning that collaborators can gain something significant together that they could not achieve alone. Make use of windows of opportunity to advance the collaboration approach.
- View collaborations as complex, dynamic, multilevel systems.
- Collaborating parties should take a design approach to cross-sector collaboration. It means starting as much as possible with the ends in mind and designing processes, structures, and their interactions in such a way that desired outcomes will be achieved and required accountabilities met. Build ongoing learning into the design, including learning about what goals and performance indicators should be.
- Make sure that committed sponsors, champions, and facilitators are involved throughout.
- Use inclusive processes to develop inclusive structures, which, in turn, will sustain inclusive processes.
- Adopt flexible governance structures that can adjust to different requirements across the life cycle of the collaboration.

(continued)

Opposite: a meeting takes place in the fireside conference room.



Include individuals and groups from underrepresented minorities in the collaborations: In all of the teams and processes going forward continue to expand inclusion of voices of underrepresented groups. Specifically include people from the community with a different socio-economic status and racial-ethnic diversity, sexual orientation, age and disability status than the majority. Engaging Native American community members in the area would be especially relevant given historical Native American presence in the area.

Create a plan for management, maintenance, and safety/security of the facility and site in partnership: Maintenance is often missing from the design vision. That said, conversations about maintenance have the ability to constrain design vision so it is suggested that a troubleshooting mindset be brought along with a maintenance focus where the design vision is the goal and creative ways are found to achieve it. Currently all maintenance on the site is under the purview of and is the responsibility of the USACE and this will likely be the case for most of the site maintenance in the future. Regarding the building facility, it will depend on the lease structure and its terms with regard to details of the responsibilities and maintenance.

Opposite: a movable terrarium can peak interest in the lobby while keeping the space versatile.



An architectural sketch of a landscape. On the left, a person is walking away from the viewer on a path. To the right, a set of stairs leads up a slope. The background features stylized trees and foliage in shades of green and brown. The overall style is a light, hand-drawn architectural rendering.

SECTION FIVE:

**SUMMARY OF RECOMMENDATIONS,
PHASES & PRIORITY LEVEL**

SUMMARY OF DESIGN RECOMMENDATIONS, PHASES & PRIORITY

Below is a summary of Design Recommendations, and suggested potential Phases and Priority Levels. The Phases indicated assume three phases of the project with the first phase underway already. The Priority Level assumes two levels of priority and almost all recommendations are of high priority with work towards achieving the design recommendation expected to cycle through all phases of the project.

Design Recommendation 1: Enhance Loon Habitat, Protect Shoreland, Address Water Quality and Invasive Species. (Phase 1,2,3; Priority Level 1)

- Make loons and their habitat the focus of interpretive exhibits.
- Use technology and boat tours for live loon viewing.
- Develop shoreland protection zones.
- Build on the work of existing committees.

Design Recommendation 2: Create a Place for Community Gathering and Education. (Phase 1,2,3; Priority Level 1)

- Serve Intergenerational communities with diverse interests.
- Create a focus on environmental education.

Design Recommendation 3: Use Architecture and Landscape Design for Pedagogy (Phase 1,2,3; Priority Level 1)

- Use architecture and landscape architecture to teach.
- Highlight places in building and on site that can teach.

Design Recommendation 4: Aim to Create a Zero Energy Building and Use Sustainable Building Design Guidelines and Regenerative Design Principles, and RFP Language that Supports These Goals. (Phase 1,2,3; Priority Level 1)

- Aim to create a zero energy building.
- Use Sustainable Building Guidelines and Sustainable Materials.
- Use RFP language for building project for design and construction that clearly establish targets.
- Select experienced professionals with demonstrated sustainable and regenerative building design expertise.
- Plan on a RFP for consultants that indicates expertise in sustainable and regenerative building design.

(continued)

Design Recommendation 5: Integrate ‘Up North’ and Modern Character in Design. (Phase 2, 3, Priority Level 1)

- Incorporate ‘Up North’ character in the design.
- Seek modern place-based expression through the design.

Design Recommendation 6: Address Street Access and Connectivity, Parking of Cars and Boats. (Phase 2, Priority Level 2)

- Connect the ‘three districts’ of Crosslake.
- Implement some of the short-term initiatives suggested by the Walkable Crosslake report.

Design Recommendation 7: Create Inclusive Cross-sector Collaborative Partnerships for the Long-term. (Phase 1,2,3; Priority Level 1)

- Foster collaboration.
- Implement best practices of cross-sector collaboration.
- Include individuals and groups from underrepresented population groups in the collaborations.
- Create a plan for management, maintenance, and safety/security of the facility and site in partnership.

PLANTING LIST

A LEVEE WALL

Elevation: 1234-36

Purpose: visitor access, open space, wheelchair accessible

Factors for species selection:

low growing, heavy use/foot traffic. Adapted to sandy, droughty, low nutrient soils, deep.

Plant list:

mix of native cool and warm season grasses sprinkled with 3 native forbs

- *Buchloe dactyloides*
- *Bouteloua gracilis*
- *Dalea candida*
- *Dalea purpurea*
- *Festuca subvertucullata*
- *Juncus tenuis*
- *Koeleria macrantha*
- *Campanula rotundifolia*

B INNER BAY

Elevation: ~1230-31 flat

Plant with species listed below and enhance with at least 10 species from DNR plant list indicated below

Plant with species listed below and enhance with at least 10 species from DNR plant list indicated below

1. TOP OF BANK

Purpose: stable access for kayaks and canoes

Factors for species selection:

Low growing ground cover, low maintenance

Plant list:

Add *Carex sprengei* and *Diervilla lonicera* to DNR list labeled "Ice-Ridge plants"

2. FACE OF BANK ~2+FT ABOVE WATER TABLE

Purpose: Enhance veg on ice-ridge

Factors for species selection:

Enhance existing vegetation

Plant list:

Select species from DNR plant list labeled "General" in category of upland moist to dry

(continued)

3. PLANT FROM BANK TOE TO +1 FT ABOVE WATER

Purpose: Protect open soils on bank from erosion. Increase vegetative buffer at shoreline

Factors for species selection:

Increase plant density for erosion protection at toe and on bank

Plant list:

Select species from DNR plant list labeled "Plants for Shoreline Erosion" in category transitional to upland moist

C DOCKS AND WETLAND POINT

1. DOCKS

Elevation: ~1230-31 flat

Purpose: Users will cross wetland on boardwalk to access paved walking path

Factors for species selection:

Enhance and expand veg., area saturated and vulnerable to erosion from wave action. Area around boardwalk must be kept free of woody shrubs/trees

Plant list:

- *Acorus americanus*
- *Anemone canadensis*
- *Asclepias incarnata*
- *Beckmannia syzigachne*
- *Carex bebbii*
- *Carex lasiocarpa*
- *Carex pellita*
- *Epilobium angustifolium*
- *Eutrochium maculatum*
- *Iris versicolor*
- *Mimulus rigens*
- *Potentilla palustris*
- *Schoenoplectus pungens*
- *Spirea alba*
- *Thelypteris palustris*
- *Viola sororia*
- *Sparganium emersum*

2. WETLAND POINT

Elevation: ~1230-1233

Purpose: Protect bay, enhance ecologically diverse biological community that supports & protects water quality, fisheries, and waterfowl.

Factors for species selection:

Point is subject to constant wave action. Focus on species with fibrous root systems, also include rhizomatous, & stoloniferous. Plant at a high density from water's edge to the treeline. Tree layer will be enhanced with installation of bare root tree species listed.

(continued)

Plant list: Forbs, Ferns, Grasses, Sedges

- *Acorus americanus*
- *Asclepias incarnata*
- *Carex lacustris*
- *Carex utriculata*
- *Carex vulpinoidea*
- *Chelone glabra*
- *Epilobium angustifolium*
- *Eutrochium maculatum*
- *Iris versicolor*
- *Leersia oryzoides*
- *Lysimachia terrestris*
- *Mimulus rigens*
- *Onoclea sensibilis*
- *Scirpus atrovirens*
- *Sparganium emersum*
- *Spartina pectinata*
- *Thelypteris palustris*

Plant list: Shrubs

- *Cornus sericea*
- *Salix interior*
- *Spirea alba*

Plant list: Trees

- *Betula allenghaniensis*
- *Acer rubrum*
- *Larix laricina*
- *Picea mariana*

D LAKE FRONT

Maintain natural aesthetic for campers

1. TOP OF BANK

Purpose: Enhance vegetation at crest and on bank.

Factors for species selection:

Natural area, steep 16' bank

Plant list:

Add *Carex sprengelii* and *Diervilla lonicera* to DNR list labeled "Ice-Ridge plants"

2. INSTALL PLANTS ON FACE OF BANK FROM ~ 2+FT ABOVE WATER TABLE TO BANK CREST

Purpose: Minimize overland erosion

Factors for species selection:

Steep bank, sandy soils

Plant list:

Add *Luzula acuminata* to plant list labeled "General"

(continued)

3. INSTALL PLANTS AT TOE OF BANK TO ~ 1+ FT ABOVE WATER TABLE

Purpose: Protect undercut bank, slow rate of erosion from wave action

Factors for species selection:

Coir logs installed may need sedges, shrubs, grasses installed in gap between log and shoreline to establish root mass to prevent erosion and undercutting.

Plant list:

Include at least 3 shrub species from the plant list labeled "Plant for Shoreline Erosion" eg sandbar willow, dogwood, meadowsweet, Winterberry, False indigo

DOCKS: REVISED 2012



Do I need a permit for my dock?*

No permit is needed to install, construct, or reconstruct your dock on shoreline property you own if you comply with the following:

- A dock is a narrow platform or structure extending toward the water from the shoreline. A dock may provide access to moored watercraft or deeper water for swimming, fishing, and other recreation.
- The structure, other than a watercraft lift or watercraft canopy, is **not more than 8 feet wide** and is not combined with other similar structures so as to create a larger structure.
- The dock is no longer than needed to achieve its intended use, including reaching navigable water depth.
- The structure is not a hazard to navigation, health, or safety.
- The structure will allow the free flow of water beneath it.
- The structure is not used or intended as a marina.
- The structure is consistent with the guidelines of the local unit of government.
- Docks placed on rock-filled cribs are located only on waters where the bed is predominantly bedrock.

Restrictions on docks and other structures

You may not place a dock or other structure in public waters if the structure:

- obstructs navigation or creates a hazard;
- is detrimental to fish or wildlife habitat or is placed in a posted fish spawning area;
- is intended to be used for human habitation;
- includes walls, a roof, or sewage facilities; or
- is located on property you do not own or have rights to use.

If you have questions concerning the contents of this brochure, contact your DNR Area Hydrologist. See contact information on reverse side.

**Based on Minnesota Rules, Chapter 6115.0210 and 6115.0211.*

What you should know about docks and other water access structures

Docks and watercraft lifts are commonly used access structures on Minnesota lakes and rivers. If you own waterfront property, a temporary structure that provides access to a lake or river is preferred to a permanent structure. Permanent structures are more likely to sustain ice damage, and a snow-covered structure over the ice poses a hazard to recreational vehicle users.



The blue box to the left lists installation guidelines for docks and access structures like boat lifts. These guidelines are intended to minimize impacts on water resources and shoreline habitat. If you follow these guidelines, no permit is needed from the Department of Natural Resources (DNR). Local units of government may have additional dock rules related to public safety and other local issues and should be contacted.

A shoreline owner may request a permit to install a dock wider than 8 feet. The permit applicant must show a specific need and show that the wider dock represents the minimal impact solution to that need. Docks serving single-family homes or residential planned unit developments generally will not need a dock wider than 8 feet. Public docks and mooring structures that are otherwise not serving as a marina may need to be a wider structure and will be reviewed individually. Docks that have no permit and that exceed the 8-foot-wide limit are subject to enforcement action, including a citation, an order to remove the dock, and fines for both the landowner and the dock installer.

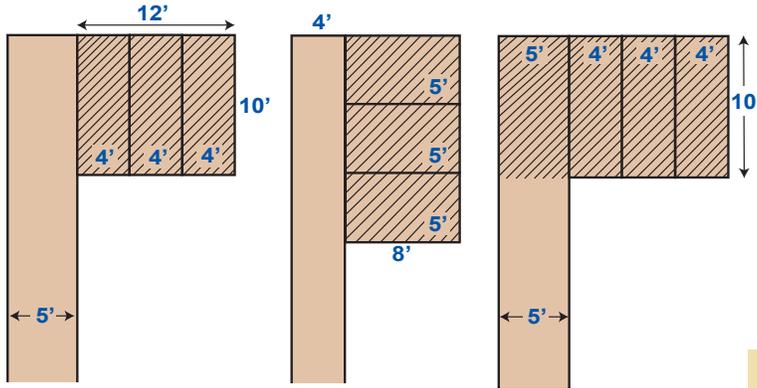
Design and locate your dock and boat lift to avoid interfering with your neighbor's use of the water. Docks and boat lifts should be placed so that mooring and maneuvering of watercraft can normally be confined within the property lines if they were extended into the water.

General Permit 2008-0401

A general permit was issued in 2008 to allow a modest platform at the lake end of a dock under certain conditions. This general permit allows a single, temporary platform up to 120 square feet measured separately from the access dock, or 170 square feet including the area of the adjacent access dock, if the following conditions exist: the access dock must be 5 feet or less in width and the dock must be on a lake with a shoreland classification of General Development or Recreational Development. See typical dock configurations on the next page. Refer to General Permit 2008-0401 at: http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/docks.html for more details.

Docks and Access in Public Waters

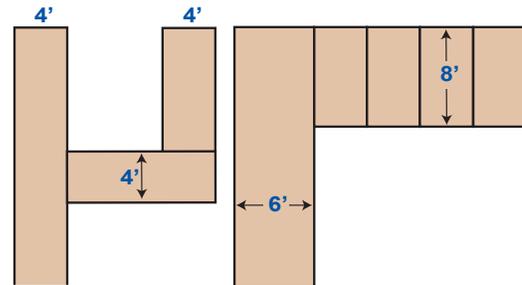
Authorized by General Permit 2008-0401



Platform area (not including walkway) up to 120 square feet.

Platform area (including walkway) up to 170 square feet.

No Permit Required



No area of the dock is wider than 8 feet.

If buying, selling or moving a dock from one body of water to another, owners should make sure all zebra mussels, vegetation or other invasive species are removed and let dry for a minimum of 3 weeks before placing in another water. When using a business to place or remove your dock, make sure that they have a valid Lake Service Provider permit and the staff have an aquatic invasive species training certificate. For more information see: mndnr.gov/invasives

Purpose of the dock rules

Intensive shoreland development causes deterioration of a lake's ecosystem. Dock installations and their associated uses are factors in this deterioration. Studies of lakes in the Midwest show that docks and boat lifts may shade out important aquatic plants and eliminate critical habitat where fish spawn, feed, grow, and find shelter from predators. Shoreline views may also suffer when large dock systems are installed. Also, there is a growing concern about the private use of the water surface if docks and associated structures extend too far, cover too much surface area, or span the entire owned frontage. The proliferation of dock configurations and dimensions is a concern to the DNR, lake associations, anglers, lakehome owners, and others. Finding the appropriate balance between reasonable access and resource protection requires collaboration by all interests.

Another issue of concern is any attempt to control access to a lake bed or water surface. Even when land ownership extends into the lake bed, all who own land abutting the water or gain legal access have the right to use the entire surface of the water. For this reason, a dock configuration should never close off part of the lake to other users.

If the dock is designed and used for access to navigable water depth, a DNR permit will rarely be needed. A dock does not need a permit if it is no more than 8 feet wide, is designed to simply meet the need of reaching navigable depths, and follows the other guidelines on the front of this brochure.



The removal or destruction of aquatic plants is a regulated activity under the DNR Aquatic Plant Management Program. If your shoreline plans include removal of aquatic vegetation, please contact a regional DNR Fisheries office because a permit may be required. Removal of native plants may provide open space for invasive species to take hold.

DNR Contact Information



DNR Ecological and Water Resources website and a listing of Area Hydrologists: mndnr.gov/contact/ewr.html
DNR Ecological and Water Resources
500 Lafayette Road, Box 32
St. Paul, MN 55155
(651) 259-5100

For information about aquatic plant management permits: mndnr.gov/eco/apm

DNR Information Center

Twin Cities: (651) 296-6157
Minnesota toll free: 1-888-646-6367
Telecommunication device for the deaf (TDD): (651) 296-5484
TDD toll free: 1-800-657-3929

Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available regardless of race, color, national origin, sex, sexual orientation, marital status, status with regard to public assistance, age, or disability. Discrimination inquiries should be sent to Minnesota DNR, 500 Lafayette Road, St. Paul, MN 55155-4049; or the Equal Opportunity Office, Department of the Interior, Washington, DC 20240.

This information is available in an alternative format on request.

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