



Tamarack Nature Center

Destination for Discovery

Master Plan



Helping people **celebrate** the human spirit
& **discover** the value of **nature**
through **art**, **play**, **exploration** & **inquiry**....



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Executive Summary

The state of our natural resources and environment is frequently at the forefront of our daily news, yet many children are becoming increasingly disconnected from nature. Nature is thought to be “somewhere out there.” We go into nature as opposed to being a part of nature. This lack of interaction and understanding of our natural environment has grave consequences for individuals and our society. Ramsey County’s Tamarack Nature Center (TNC) has the opportunity to address this deficit by developing a new kind of nature experience—a stage for discovery.

Tamarack Nature Center (TNC), a 320-acre nature area within Bald Eagle-Otter Lakes Regional Park, is in the beginning stages of a multi-year umbrella project entitled Destination for Discovery. The central purpose of this project - as directed by Ramsey County Parks and Recreation - is to redirect TNC away from the traditional role of a nature center toward becoming an essential community resource that integrates personal explorations of nature with art, play, and active investigation. This new vision cannot be achieved unless TNC is transformed into a highly attractive destination offering a wide array of environments and activities for visitors to interact with nature. With upgraded facilities, interpretive trails, programs, and exhibits, TNC will build its capacity to significantly contribute to the region’s quality of life. This plan acts as guide for redirecting TNC into a new Destination for Discovery. This new redirection for TNC is inspired, in part, by Richard Louv’s book, *Last Child in the Woods: Saving our Children from Nature-Deficit Disorder* (2004). According to Louv, evidence on the positive effects of playing outdoors and negative consequences of staying indoors is mounting. Louv indicates that as children’s connections to nature diminish, the social, psychological, and spiritual implications become apparent—depression, obesity and attention deficit disorder have all been associated with indoor, sedentary lifestyles. Nature offers powerful therapy for these maladies.

This master plan includes featured destinations designed to set the scene for open-ended, visitor-driven discovery and to put visitors in optimum places to experience nature. It establishes a blueprint for TNC to upgrade



Tamarack Nature Center will be transformed into a stage for discovery.

facilities and interpretive trails, enhance programs, and add interactive, experience-based places and exhibits. By shifting its orientation to hands-on exploration and by providing new perspectives on nature, TNC will become a place for children and families to connect and reconnect with nature. Ultimately, TNC will be an appealing destination that people choose because it reliably provides discovery at many levels - from a casual walk through the woods with family and friends, to spending time playing in a stream that winds through a nature play area, to attending an intensive week-long nature writing workshop. With the creative design, resources, and commitment of staff, officials, businesses, organizations, volunteers, and the public, the vision of TNC as a new Destination for Discovery can become a reality.

This master plan includes strategic and interpretive plans, site redevelopment and building expansion plans, and concepts for engaging hands-on environments and exhibits (destinations).

Destination For Discovery

Transforming a Traditional Nature Center

Tamarack Nature Center (TNC) is approaching the middle stage of a multi-year umbrella project entitled, Destination for Discovery. The enhanced TNC will provide opportunities for visitors to develop personal relationships with nature through a variety of means. Guided by this master plan and a commitment to responding to our community's needs, the project redefines what it means to be a regional nature center and redesigns facilities, trails, programs and exhibits, to reflect that definition. The master plan recommends an investment of \$8.4 million over a five year period to transform TNC into a Destination for Discovery. In doing so, TNC builds its capacity to significantly contribute to the region's quality of life.

The Transformation

Changing From...

To...

A primary focus on serving the formal education audience (students, teachers).	A primary focus on serving a wide variety of informal (casual visitors, families) non-formal (scouts) audiences.
A central focus on K-6 students with occasional visits to TNC.	A central focus on early childhood environmental education (EE) with frequent experiences at TNC.
Issue-based environmental education with an emphasis on cognitive learning and behavior change.	Awareness-based nature education with an emphasis on affective attachment and attitude development.
A concentration on Tuesday-Friday, daytime program scheduling.	Meeting more demand for weekend and evening programs.
All (naturalist-led) or nothing (walking the trails) EE & interpretation.	A wider variety of "entry points" into EE. (Interactive exhibits, children's play area, outdoor classrooms, self-guided experiences, etc.)
A science-driven EE curriculum.	An integrated curriculum that includes the arts and humanities.
Levy subsidized programming.	Self-sufficient programming.
Heavy reliance on a diminishing volunteer teaching staff.	Paid intermittent teaching staff with support roles for volunteers.
A "best kept secret."	A "must see, gotta go" destination.

Destination For Discovery

Transforming a Traditional Nature Center



From this...



to this.



This...



to this.

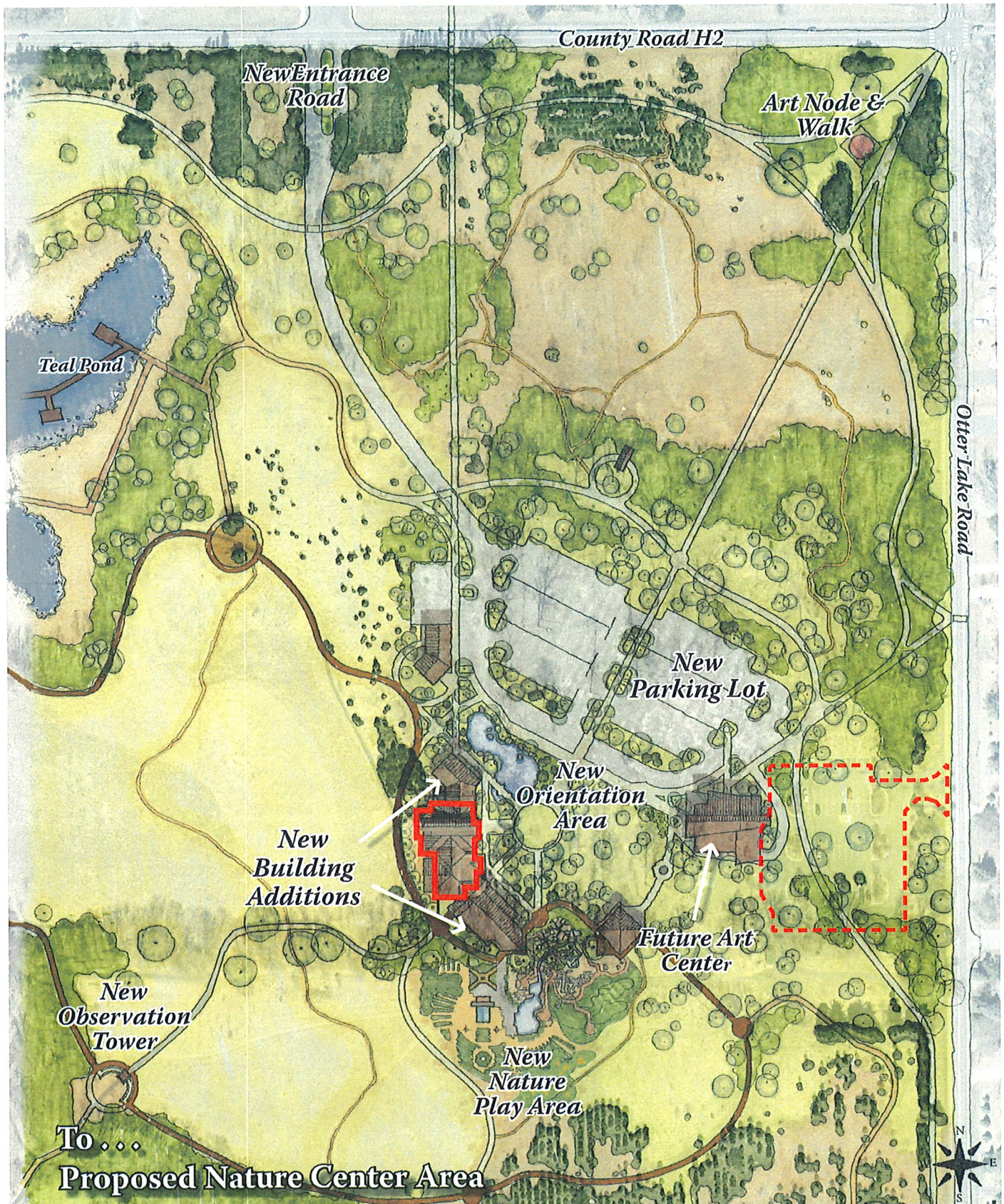


And this...



to this!







Introduction

1.1 Background

Ramsey County Parks and Recreation started its outdoor education community outreach efforts in 1979 when it hired its first director/naturalist. In 1988, the Metropolitan Council through its regional park funding, allocated funds for the design and construction of the Tamarack Nature Center building that would serve as a trailhead access facility and nature center within the 320-acre area of Bald Eagle-Otter Lakes Regional Park in White Bear Township, Minnesota. Wood-chipped paths, paved trails, boardwalks, cross-country ski and snowshoe trails provide year-round access to this diverse natural community. In 2000, the Metropolitan Council provided additional funds to expand the building and add space for classrooms. Indoor spaces currently include a lobby/meeting space, two multi-purpose classrooms, office space, live animal exhibits, restrooms, cross-country ski rental room and an early childhood classroom and exhibit area. Annually, TNC serves more than 24,000 visitors in organized programs and more than 60,000 drop-in visitors.

In recent years, TNC staff have been challenged to lessen their dependence on taxpayer dollars and find new sources of revenue to support programs and services. As a result, staff work closely with community groups, educators, agencies, organizations, businesses, and foundations to promote awareness of TNC's value to the region and encourage their support.

Recognizing that Tamarack Nature Center offers an important opportunity to better connect children and families with nature, Ramsey County developed a vision for reinventing the nature center building and grounds into a creative and interactive Destination for Discovery. This is a bold, new, exciting, and adventurous vision. This document summarizes that vision and serves as a blueprint for the actions that will achieve that vision.

Healing the broken bond between our young and nature is in everyone's self-interest, not only because aesthetics or justice demands it, but also because our mental, physical and spiritual health depend upon it.

— Richard Louv
Last Child in the Woods



Nature is the ultimate common ground.

Reinventing TNC will provide access to every realm of human experience - softening the lines between inside and out, nature and humans, play and learning.

1.2 Why a Destination for Discovery?

The central purpose of the new vision is to redirect TNC away from a traditional center for nature and environmental education towards an active, vital center of regional engagement that uses the arts, humanities and sciences to connect people to nature. Ramsey County envisions a center that provides opportunities for visitors to develop personal relationships with nature through a variety of means. Guided by TNC's strategic plan and a commitment to responding to our community's needs, the project redefines what it means to be a regional nature center and redesigns facilities, trails, programs and exhibits, to reflect that definition. In doing so, we build our capacity to significantly contribute to the region's and state's quality of life.

We believe that nature is the ultimate common ground, and should be accessible through every realm of human experience—be it cognitive, physical, artistic, social or emotional. Through this project, we hope to provide that access, softening the lines between inside and out, nature and humans, play and learning.

This new re-direction for TNC is inspired, in part, by Richard Louv's book, *Last Child in the Woods: Saving our Children from Nature-Deficit Disorder* (2004). According to Louv, evidence on both the positive effects of playing outdoors and negative consequences of staying indoors is mounting. Louv indicates that as children's connections to nature diminish, the social, psychological, and spiritual implications become apparent—depression, obesity and attention deficit disorder have all been associated with indoor, sedentary lifestyles. Nature offers powerful therapy for these maladies. Additionally, environmental education and experiences dramatically improve standardized test scores and grade point averages and develop skills in problem solving, critical thinking, and decision-making. In addition, anecdotal evidence strongly suggests that childhood experiences in nature stimulate creativity.

There is also a parallel and growing contention in the nature-center profession that environmental education's emphasis on cognitive understanding over direct, authentic experience has come at the expense of a lasting connection with nature. Nature centers across the country are questioning a long-held "stay on the trails" mentality that prevents the kind of unstructured exploration and significant experiences enjoyed by previous generations. Professionals are now questioning how formal educational policy and standardized tests were allowed to determine the focus of our programs, teaching methods and commitment to the value of informal experiences. For the first time, professionals are committed to providing places to play in nature. Environmental educators, parents, early childhood professionals, landscape architects, city planners, and

recreation officials are now joining forces to ensure that “no child is left inside,” and are working to recreate opportunities for kids and families to freely play and explore in nature.

Integration of art and nature is a logical step for Tamarack Nature Center. The Center has for some time been the host for art classes and events, often held by partners such as the White Bear Center for the Arts. A heightened emphasis on nature-based art will enhance the sense of discovery and learning and will shape the design of physical improvements at Tamarack.

For decades, environmental educators, conservationists, and others have worked, often heroically, to bring more children to nature. However, in recent decades, America’s children have lost half their time outdoors. They’ve traded in tree climbing and worm-watching for video games, television, and other sedentary activities. The improvements and additions recommended by this master plan will shape self-directed learning, organized recreation, education programs and special events through a focus on hands-on experiences with nature. We learn and grow by doing.

In support of the “no child left inside” initiative, the goal of Destination for Discovery is to create environments and opportunities that inspire visitors to explore nature and discover environmental concepts through a variety of means. It also provides opportunities for inter-generations to gain a new perspective on nature by inviting them into immersive experiences in nature, linking art, the natural environment and engaging interactive exhibits.

1.3 Planning Process

In April 2004, Tamarack Nature Center staff began a self-assessment that included an examination of past accomplishments and setbacks, present issues, and future needs. What emerged from that and subsequent meetings was a portrait of a center with a complex and often undisciplined set of operating methods. Those methods had largely evolved to accommodate staffing constraints and school/bus schedules rather than best practices. In an effort to respond to rapidly changing circumstances in TNC’s environment and to identify the needs of the organization for the next 10 years, virtually every aspect of TNC’s day-to-day operations were assessed and improved. This assessment also revealed the need for this comprehensive master plan to define relationships between structures, activities, land, people and programs. This included structural and aesthetic improvements to the building and trails and innovative interpretive methods that respond to current and future needs of informal



No child left inside.

We learn and grow by doing, not watching.

and formal users. This master plan is based on strategic and long-range plans and will result in improved operations and overall image reflecting the highest quality of learning and leisure activities. The Legislative-Citizen Commission on Minnesota Resources awarded \$95,000 for this project.

In 2006, Ramsey County hired Hoisington Koegler Group, Inc. (HKGi) to prepare a comprehensive plan to turn TNC into a destination for discovery. The HKGi team worked with the TNC Planning Team consisting of representatives of Ramsey County staff and the White Bear Center for the Arts to prepare the comprehensive plan. Input from Center staff, volunteers, peers from other nature centers, the Ramsey County Parks Commission and others was used to shape the plan. The planning process began with the preparation of an interpretive strategy and plan. The TNC strategic plan articulates the mission, vision, goals, guiding principles, and essential experiences for the new Center. The interpretive plan guided the preparation of plans for the physical elements, including the site plan, building plans, and destination concept plans.



Hands on nature exhibits.

The TNC planning process included a review of national and international examples of best practices in nature-based play, learning and art (see Section 3 and Appendix C for visual preference results). This review defined the desired design character and initiated ideas for engaging activities and experiences. A list of desired indoor and outdoor spaces and activities was prepared to help define space needs and relationships. The interpretive plan, visual preferences and site and building needs were used to develop several alternatives for enhancing the site, improving the building and for new exhibits and destinations within the site and building.

The consultants and planning team reviewed and refined the alternatives to arrive at the preferred plans for the site, building and new nature and play destinations. Those preferred plans illustrate a vision for making TNC a “New Destination for Discovery.” This Plan consists of six primary elements: a) Strategic Plan, b) Interpretive Plan, c) Site Evaluation, d) Site Plan, e) Building Plans, and f) Concept Plans for key destinations. These six elements are described in sections two through seven.

1.4 Purpose and Use of the Plan

This plan establishes a clear direction for re-positioning TNC as a destination for discovery and as an accessible regional resource. The site and building plans, destination concept plans and images are illustrative of the vision established by the TNC strategic and interpretive plans. The detailed design of site improvements, play areas, exhibits, building renovation and expansion will be implemented based on funding and

further design and planning efforts.

The Strategic and Interpretive Plans

Redefine the mission and vision of TNC:

- Articulate the goals, guiding principles, and values of TNC;
- Identify audiences, interpretive themes and strategies;
- Describe proposed activities and destinations developed for TNC;
- Provide program direction and emphasis;
- Describe an overarching approach that will encourage repeat visitation.

The Site Plan and Building Plans :

- Guide the future development of TNC's site, programs, and operations;
- Illustrate the physical relationships between the site's structures, land, people, and programs;
- Address life-cycle cost, maintenance, and liability of proposed features;
- Illustrate a revitalized site that includes trails, environments, structures, indoor and outdoor exhibits, program staging areas.

The Destination Concept Plans:

- Describe and illustrate a set of indoor and outdoor experiences that will engage people of varying abilities to explore and see nature with new eyes;
- Identify developmental goals for proposed activities and environments;
- Provide cost estimates for implementation.



Water play is a favorite activity.



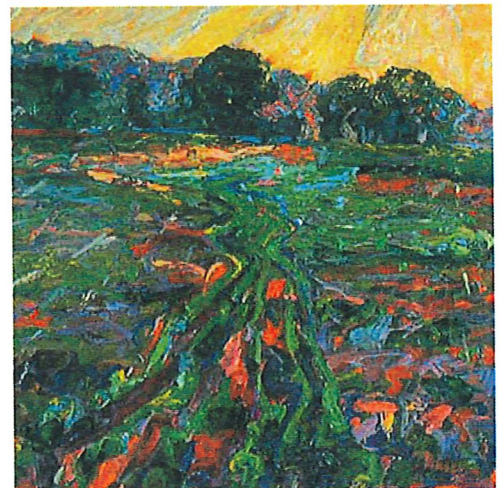
Strategic Plan

2.1 Introduction and Background

The central purpose of this project is to redirect TNC away from the traditional role of a nature center toward becoming a regional resource that integrates personal explorations of nature, art, science and the humanities. With upgraded facilities, interpretive trails, programs, and exhibits, TNC will build its capacity to significantly contribute to the region's quality of life. Ultimately, TNC will become a destination that people choose because it reliably provides discovery at many levels—from finding an insect to revealing a surprising view through the eyes of an artist. This section includes goals, a redefined mission and vision, guiding principles and defines the target audience for TNC.

2.2 Project Goals

- Reposition TNC among new and existing audiences as a regional hub for nature and art events and activities.
- Plan for physical accessibility of all activities and structures.
- Develop a shared vision among TNC staff, visitors, and stakeholders.
- Provide an assessment tool for judging the appropriateness of existing and new initiatives and programs.
- Address issues and opportunities related to sustainable design.
- Plan for visitors' various comfort zones as they explore nature at TNC.
- Produce written materials and visual concepts that will support the development of case-statement for future grant and sponsorship opportunities.
- Create a plan that provides physical and programmatic support for future revenue-generating opportunities.
- Create a plan that will guide future development and program offerings.



*Seeing nature through the eyes of an artist.
"The Hills Melt Like Wax"
by Claude Monet*

2.3 Mission and Vision

Mission

To enrich people's lives by helping them discover the value of nature through art, play, exploration, and inquiry.

Vision

As public awareness of the importance of nature experiences on healthy human development builds, Tamarack Nature Center will increasingly be valued as a first-choice destination for families and children wanting to engage with the natural world.

When the Destination for Discovery Master Plan is fully implemented, Tamarack Nature Center will have become a critical asset for a region that values nature experiences.

Tamarack Nature Center will be a familiar and trusted destination that meets the needs and expectations of people seeking ways to reconnect themselves and their children to nature.

In the eyes of the public, Tamarack Nature Center will be considered as critical to the overall health and well-being of the region as are good schools, libraries, and health-care.

2.4 Guiding Principles

These statements articulate the values inherent in everything TNC does, especially in relation to the audiences served by this site and its programs. They guide master planning and provide direction to future operations. As new programs emerge and old programs are reassessed, these guiding principles will help staff and management choose from among a field of competing priorities.

- The natural world inspires creativity, and experiencing the results of creativity—visual arts, performing arts, and literature—cultivates an appreciation of nature.
- Outdoor play and recreation contribute to healthy human development—physically, mentally, and socially.
- Authentic experiences with nature—those that are open-ended, offer free choice, use real objects and materials, and are true to their context—afford optimum opportunities for self-directed exploration.
- Frequent positive experiences with nature are critical to foster an appreciation for the natural world.
- TNC belongs to a region of citizens who will benefit from a place to gather and discover.

Tamarack Nature Center Mission Statement

"To enrich people's lives by helping them discover the value of nature through art, play, exploration, and inquiry."

2.5 Destination for Discovery Audiences

Potential Audiences

All people in the Twin Cities regional area who are interested in nature, art, and/or outdoor recreational activities. This includes:

- People who visit parks;
- People who participate in and observe art events;
- People seeking nature experiences for themselves or with young children;
- People seeking therapeutic nature experiences for mental and physical health.

Priority Audiences

Children ages two to twelve and their families living in urban and suburban areas. This includes:

- In-house Early Childhood and Family Education (ECFE) /School Readiness Program;
- Drop-in casual visitors, multi-generational families with children;
- Organized groups seeking opportunities to learn about nature and the arts (Scouts, YMCA, clubs, day camps);
- School groups (Kindergarten–6th grade);
- Pre-kindergarten groups (ECFE, Head Start and other formal preschools/daycare);
- Recreational users (trail users);
- Home school cooperatives.



Outdoor play contributes to healthy human development.



Interpretive Plan

Everyone visiting TNC arrives with a different set of knowledge, experiences, skills, and assumptions about the natural world. This interpretive plan provides a roadmap for connecting and reconnecting everyone who visits TNC with the nature that is all around them.

3.1 Themes and Stories

By general descriptions and impressions, potential visitors judge how well TNC aligns with their current needs and interests. Themes and stories serve to distinguish one venue from another, setting particular expectations in the minds of various audiences. The following items identify priority themes and/or stories for the TNC interpretive plan.

Children and Nature

- TNC reliably provides positive early childhood experiences with the natural world.
- Progressive levels of challenge and engagement with the natural world are built into the TNC experience.

Art and Nature

- Nature at TNC provides inspiration for artistic expression.
- Nature provides the materials and settings for creating artworks.
- Artworks can provide new ways of seeing nature.
- Art production can provide new ways of discovering the natural world.
- TNC is a place to explore the intersection between art and local biomes.

Landscape Change

- This place has a unique geological and human history, which is now being restored for nature learning and recreation.
- As the plant and animal communities of TNC mature, they show change over time.
- Seasonal changes bring about new ways to experience the natural world of TNC throughout the year.

3.2 Essential Experiences

These are the experiences that Tamarack Nature Center visitors, over time, must have in order for the site to achieve its mission and for its programs to reach their stated outcomes. For TNC, these experiences are framed by the overarching goal of providing positive and frequent experiences with nature.

Play in Nature

Programs, exhibits, environments invite:

- Young children to interact directly with real nature they discover.
- Children and adults to find ways to express themselves by making art together.
- Children and adults to practice free choice among many subjects and activities.
- Young children to encounter challenges and find their own solutions.
- Children and adults to interact with nature and have the time to engage in open-ended explorations of plant and animal communities.
- Children and adults to follow their own interests and motivations through inquiry-based activities.
- Visitors to find an abundance of materials to play with.
- Visitors to discover special places to be together, where it's comfortable for caregivers to observe their young charges.
- Families to find natural resource-oriented outdoor recreation programs that promote and nurture healthy lifetime leisure interests.

Experience Outcomes related to Play in Nature

- Newly gained self-confidence about being outdoors in nature.
- Young children asking questions and finding their own answers about plants and animals.
- Young children going home with a new curiosity about plants and animals.
- Making things from natural materials.



Interacting directly with natural materials.



Play in nature is a fundamental joy.

- Creating stories while interacting with exhibits and learning environments.
- Return visits to the trails and programs for leisure and recreation.
- Children and families discover a fun and memorable place to recreate.

Find Respite in Nature

Programs, exhibits, environments invite:

- Visitors to discover places to pause and observe nature when walking and cross country skiing.
- Young children and adults to find trails that lead to places of quiet solitude and opportunities to observe nature.
- Hikers and other visitors to encounter artworks that evoke new impressions and memories of a landscape.
- Visitors to relax in safe, comfortable settings.
- Visitors to connect and engage with nature through all the senses and find wonder in the interconnectedness of nature.
- Visitors unobtrusively observe plants and animals in their natural habitat.

Experience Outcomes related to Respite in Nature

- Improved health and well being.
- Return regularly to TNC for exercise and relaxation.
- Planned and spontaneous gatherings at various TNC destinations for social occasions.
- Nature observations from TNC building and trails.
- Gain a new appreciation for nature.

Discover and Study Nature

Programs, exhibits, environments invite visitors to:

- Learn about the plant and animal communities of TNC.
- Connect and engage with nature through all their senses.
- Observe, measure, and record natural processes and phenomena in every season.
- Find opportunities to collect and examine specimens from nature.
- Reveal new views into a familiar landscape.

Experience Outcomes related to Discovering and Studying Nature

- Returning visitors remember the names and characteristics of



Exploring places made with raw materials.



Discovering the wonders of a tree.

local plants and animals.

- Recount the discovery of a remarkable plant or animal adaptation.
- Show a friend an instance of ecological interconnectedness they hadn't seen before.
- Express appreciation for nature, especially in terms of the interaction between humans and the natural world.
- Visitors remark on the artistic qualities of nature and the landscape.

Serve Nature and the Region

Programs, exhibits, environments invite:

- Opportunities to build community by connecting and engaging other people in nature.
- Involvement through volunteering for special events, citizen science, land restoration, etc.
- Opportunities to be a goodwill ambassador for the nature center.

Experience Outcomes related to Serving Nature and the Region

- Feel belonging at TNC.
- Feel valued as a volunteer or community expert.
- Know something about what a naturalist does and consider a career in environmental science.
- Talk to neighbors about the importance of controlling invasive species.
- Help children make bird's nests from twigs and branches.
- Meet people who share common interests, needs, and motivations.



*All generations can serve nature
and the environment.*

3.3 Interpretive Strategy

The exhibits, programs, and landscapes of TNC will provide visitors of all ages, abilities and backgrounds the immersive environments to make essential experiences happen.

- Physical engagement (e.g. walking through a tall prairie).
- Intellectual engagement (e.g. connecting seasonal cycles at TNC to global climate change).
- Emotional involvement e.g. (imaginative play while in an animal costume).
- Social involvement (e.g. working together with new acquaintances to stoke a wood-burning kiln).

The TNC interpretive strategy is built in layers from broad concepts down to specific activities:

First Layer: Create the settings, set the scenes.

The primary goal for interpretation at TNC will be to set the scene for open-ended exploration. For young visitors it's about creating settings in which self-driven inquiry can happen.

Second Layer: Engage visitors in activities that give them easy entry points into unfamiliar territory.

Guided tours into the prairie, community-built sculpture projects, window-mounted viewfinders give visitors non-threatening starting points for nature exploration.

Third Layer: Put visitors in optimum places to experience new perspectives on the natural world.

Draw visitors to places where the views and vistas are revealing. Create attractive destinations—great and small—that help people fuel their curiosity (a vernal pond, a rotting log, an outdoor kiln, a naturalized exhibit of live snakes).

Fourth Layer: Highlighting the moments when new perspectives are best revealed.

It takes a windy day to play with seed dispersal. It takes warm days and freezing nights to make the sap flow in maple trees. Robins fly through TNC in October looking for berries to eat on their way south.

Fifth Layer: Provide the materials for self-directed exploration, theory building, and experimentation.

This can include art materials, a section of living prairie, a pile of rocks, running water, or puppets for imaginative play.

Layers of Experience

The interpretive strategy is built in layers from broad concepts down to specific activities.

3.4 The Benefits of Early Childhood Nature Education

In one of the most comprehensive studies of early childhood environmental education, Wilson (1993) discusses the unique role of the natural environment on childhood development:

"[Environmental education] is... important for the development of the whole child. Environmental education programs can contribute to a sense of self and personal competence. [It] invites the child to experience a sense of his or her wholeness as an integrated physical, mental, emotional and spiritual being."



Early childhood experiences help form positive attitudes and relationships with nature.

Because young children learn through active participation in their environment using the senses and movement, the natural environment provides an inexhaustible supply of stimulation. In an article describing the importance of nature in the healing process, Olds (1989) provides a very thorough examination of the specific qualities of nature that make it particularly suitable for children.

"An outdoor environment of trees, hills, fields, water and dirt probably provides children with all the movement experience they require."

Olds' central thesis, however, is on the therapeutic role of nature. She cites the use of visualizing natural settings in biofeedback research in adults and concludes that "contact with nature during childhood... may be critical both for internalizing healing images and for direct experience with energetic forces that affect physical and psychic well-being" (Olds, 1989). In an earlier article, the same author introduces the soothing effects of natural settings. "The earlier in life and the more often [natural] environments are experienced, the more likely it is that the stress of modern life will not take its negative toll later on" (Olds, 1978).

However, as Prescott (1987) points out:

"Despite the knowledge of children's affinity for the natural world and their delight in experiences with it there is little or no interest in or commitment to providing these experiences. Kakar (1982) in viewing American research on children from an Eastern perspective, has commented that 'The natural aspects of the environment - the quality of air, the quantity of sunlight, the presence of birds and animals, the plants and the trees - are a priori viewed, when they are considered at all, as irrelevant to intellectual and emotional development.'"

Indeed, it doesn't seem that things have improved much in this area since Kakar's observations more than twenty-five years ago.

Attitude Formation

Iozzi (1989) states that, "Research has shown quite clearly that attitudes are established in children at very early ages." It stands to reason that even very young children can and do express like or dislike towards objects or issues. However, the question of this "attitude" enduring over a significant period of time is subject to many outside factors including influence of significant others, increased cognitive knowledge and a change in beliefs.

Even through the complexity of the attitude issue some common themes emerge (Halloran, 1967).

- Attitudes are learned, they develop and are organized through experience.
- They are primarily in the affective or feeling domain.
- All attitudes contain beliefs, but not all beliefs are attitudes. Beliefs generally describe and perceive the object of the attitude.
- Attitudes can be changed.
- Information alone rarely determines an attitude.
- Attitudes are formed more through direct rather than indirect experiences.

The Role of Direct Experience

Central to the issue of attitude formation and how children develop positive attitudes toward the natural world is the role of direct experience. Although the study of attitudes is largely associated with predicting behavior, a significant study by Fazio and Zanna (1978) described the extent of influence direct experience has on a person's attitude and subsequent behavior:

"Subjects who formed their attitudes through direct experience held those attitudes more confidently and behaved more consistently with those attitudes than did subjects who formed their attitudes through indirect experiences."

It would follow that direct experience in the natural environment; walks, hikes, gardening, water play, mud play, tree climbing, etc., would have a greater effect on the development of a positive attitude than indirect experiences such as books or television.

In support of this thesis, Sebba (1991) investigated the environmental preferences and the nature of outdoor experiences by compiling adult recollections and children's actual encounters. The adult aspect of this research is discussed in a later section. Among children's first-hand accounts of experiences outdoors Sebba found that:

At the very moment that the bond is breaking between the young and the natural world, a growing body of research links our mental, physical and spiritual health directly to our association with nature – in positive ways.

— Richard Louv
Last Child in the Woods

"Children experience the natural environment in a deep and direct manner, not as background for events, but rather as a factor and stimulator... An experience in which the child is actively involved with his body, his senses and his awareness is likely to be etched in memory for a long time and... the sympathetic attitude the child displays toward nature is likely to accompany the experience even when recalled in memory".

It is generally acknowledged that most environmental attitudes are formed as a result of "significant life experiences" and that a sense of connection to nature can be traced back to positive experiences in the outdoors (Chawla, 1988; Newhouse, 1990; Tanner, 1980). However, as would be expected, experience in itself is insufficient for holistic learning. "It requires comparison with other experience, both direct and mediated to develop further understanding" (Adams, 1991). It is important to note that this discussion has centered on the possible correlation between positive experience and positive attitude formation. The role of negative experience and its effect on attitude was not explored for the purposes of this review.

Significant Others

As mentioned in an earlier section, Tanner (1980) found that the influence of parents and teachers was significant in forming positive attitudes towards the outdoors. Chawla (1988) in a review of literature on the development of environmental concern writes:

"... children need to be ensured access to natural areas under the guidance of adults who exemplify informed respect."

The natural environment does not in itself inspire children to learn, they must be taught by adult human beings (Tuan, 1978).

Studies of adult recollections of childhood reveal a common need for privacy and solitude when experiencing the natural world (Olds, 1989; Sobel, 1990; Tanner, 1980). The creation of secret hiding places, endless hours of explorations, self-directed play without adult interference all contribute to a sense of connectedness with nature (Prescott, 1987).

"Outdoor settings rich in vegetation give both children and adults natural places to be alone, to be free from distraction, and to have easy control over a bit of one's own turf" (Olds, 1989).

3.5 Early Childhood Programming at TNC

With these factors in mind, Tamarack Nature Center has made early childhood and family nature experiences an educational priority. In March 2005, TNC joined forces with the White Bear Lake Area School District to provide early childhood and family educational services with a natural twist. The original classroom was remodeled into an early childhood nature classroom and TNC has become a satellite site for the districts Early Childhood and Family Education and School Readiness programs. The “My Nature Preschool” collaboration includes pairing a TNC naturalist specializing in early childhood with a district early childhood teacher to team teach four classes of fourteen 3-5 year-olds throughout the 9-month school year. This collaboration requires little to no administrative costs to TNC, has brought in a guaranteed revenue source that covers the half-time naturalist salary and, most importantly, has created a new, regular family audience for TNC. In turn, the school district gets much needed additional space to serve families in need of quality early childhood education and children experience and learn in the richest environment possible—the natural world.

Although children in the program can explore over 300 acres of woodland, prairie and wetland, they have their own natural habitat, in which to play, romp and climb. The Wild Place provides children with much needed unstructured play space and provides adults with a safe contained area to let kids explore nature with freedom and abandon.

Early childhood public programs are burgeoning as well. The parent/child “Frogs and Polliwogs” series fills to capacity each season and has recently been extended to the summer months. A Saturday morning “Nature Alphabet” series fills a demand for weekend programs and a special, non-scary Halloween event welcomes families with children under six.

One of the goals of all early childhood programs is to provide authentic, frequent, positive experiences in nature during the crucial, value-forming years of early childhood and beyond. These experiences form the essential foundation on which affection for and interest in nature is built and they contribute to children’s physical, emotional, social and cognitive development. Also, as an intergenerational project, it nurtures healthy interactions between adults and children through enjoyable encounters with nature.

3.6 Integration of Art and Nature: Function with a Twist

Why the arts?

From prehistoric times, peoples have transformed the environment, shaping their tools from stone, and in their cave wall paintings, megaliths and stone circles, seeking ways to connect with the forces of nature. Since those times, artists and designers have been profoundly influenced by the images, colors, patterns, sounds, smells, structures and systems of nature around them (Adams, 2002).

According to Jan van Boeckel in *Forget your Botany: Developing children's sensibility to nature through arts-based environmental education* (2007), aesthetic environmental education is grounded on the belief that sensitivity to the environment can be developed by artistic activities.

In the beginning of the 1990s, a group of art educators in Finland, aware of the worsening ecological crisis in the society around them, began to ask if art could help in the development of a more profound form of environmental education. According to Meri-Helga Mantere, who first coined the term 'arts-based environmental education' in 1992, it is a method that:

"supports fresh perception, the nearby, personal enjoyment and pleasure (and sometimes agony) of perceiving the world from the heart."

Motivation to act for the good of the environment is based above all on positive and valued experiences which are often of an aesthetic nature. In the view of Mantere, these experiences can be generated by open and immediate contact with nature and the often new and fresh view of such phenomena that art provides. Arts subjects can develop a positive image for a way of life that conserves nature. This requires a great deal of inventiveness, joy and dignity. To Mantere, the connections are obvious:



A functional gate with an artistic twist.

"The early experiences of nature in childhood, the ability as an adult to enjoy these experiences, comprehending the value of the richness and diversity of nature, and the need and energy to act on behalf of nature and a better environment are all interdependent."

Functional With a Twist?

A key aspect of re-envisioning Tamarack Nature Center is integration of art with nature. The combination of art and nature will make TNC more memorable and will enhance visitor's experiences. The emphasis on artistic expression in the physical elements of the site (play areas, site furnishings, exhibits, landscape, etc.) will engage children and adults and offer a multi-layered experience not found in traditional nature centers. The design of the building, site elements, exhibits and destinations is to be done in an artistic manner. The byline for the design character is "functional with a twist." Care should be taken to ensure artistic creative expression in key elements and throughout the design theme of the improvements and additions. Art programs, activities and events should fundamentally have nature as their inspiration and/or be made from natural materials. Merging art in nature in recreation and educational programs will allow people to see nature in new ways and to appreciate the art that is found in nature and inspired by the nature. A proposed focal element to be located near the corner of Otter Lake Road and County Road H2 should be nature-themed art that has a suitable scale and image to act as an identifying feature of TNC. There should be indoor and outdoor sites within Tamarack for creation and display of art with nature. Art can occur in the classroom, outdoors ("plein aire" painting or sketching), at trail nodes or as performance art in the gathering space. This interpretive strategy envisions nature-based art classes, events and activities being held in the Nature Center building and on the grounds and anticipates a future art center building to be an integral part of the re-envisioned TNC.

Integrating art and nature can be accomplished in a variety of ways. Involving artists in the final design of the exhibits, site furnishings and destinations will ensure the desired "functional with a twist" character. Holding art events that have a basis in nature such as stone carving, wood sculpture, landscape painting, photography or drawing exhibits, nature-based theater or dance, etc. will blend art with the natural environment. Temporary exhibits of art inspired by specific features of the TNC landscape can bring about new perspectives. Having an artist-in-residence work hands-on with class participants and visitors of all ages will effectively and comprehensively integrate art into programs and activities. Partners such as the White Bear Center for the Arts and others are vital to the success of integrating art with nature.



This is the place where your every action will be rewarded with a surprising new perspective on the nature around you.



Site Evaluation and Desired Activities

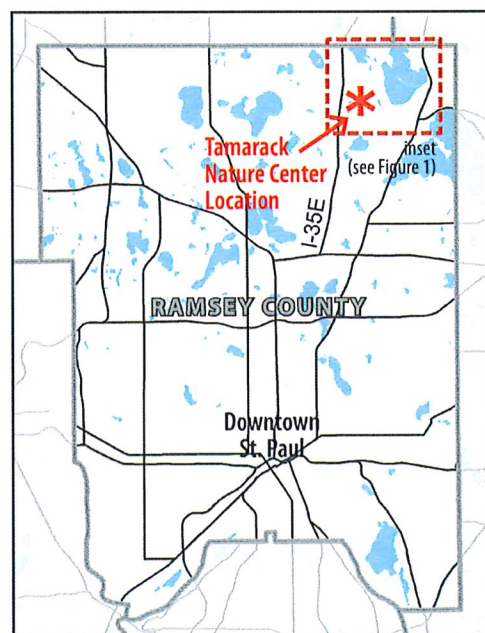
The design team used a variety of methods to gather information, evaluate existing conditions and develop a list and description (development program) of desired uses, experiences and facilities. This work also included defining the character and activities of a revitalized TNC. This was accomplished through walking the site, touring the surrounding area, observing visitors, research, visual-preference surveys, a current-use survey, nature center staff input and interviews and an assessment of the site combined with map and photo analysis.

4.1 Location and Regional Context

TNC is about 20 minutes north of downtown St. Paul, Minnesota and easily accessible from the Twin Cities metropolitan area via I-35E. Although the site is easily accessible and close to the Twin Cities, it lacks any defining elements that put it on the map. It has little regional identity. While Tamarack Nature Center is part of Bald Eagle-Otter Lakes Regional Park, it has no physical connection, and only a minimal relationship, to the greater park area (Figure 1).

TNC's site encompasses an almost-square land mass of 320 acres completely contained by highways and residential streets. It is bounded by Otter Lake Road on the East, County Road H2 on the North, Interstate 35E on the west and Hammond Road on the south. The entire property is used by TNC with the exception of a 10-acre township parcel in the southwest corner and a two-acre residential parcel along the northern boundary. Other portions of Bald Eagle-Otter Lake Regional Park are directly adjacent to TNC off the northeast corner of the site. This is also the terminating point of the Ramsey County Regional Trail system. It has been proposed that the trail system will be extended north into that area in the future and a connection will be made at this intersection.

TNC is situated in an area of diverse land uses including a major highway corridor (I-35E) running along the west side of the site; White Bear Township park and sports field complex, White Bear Township



Site Location

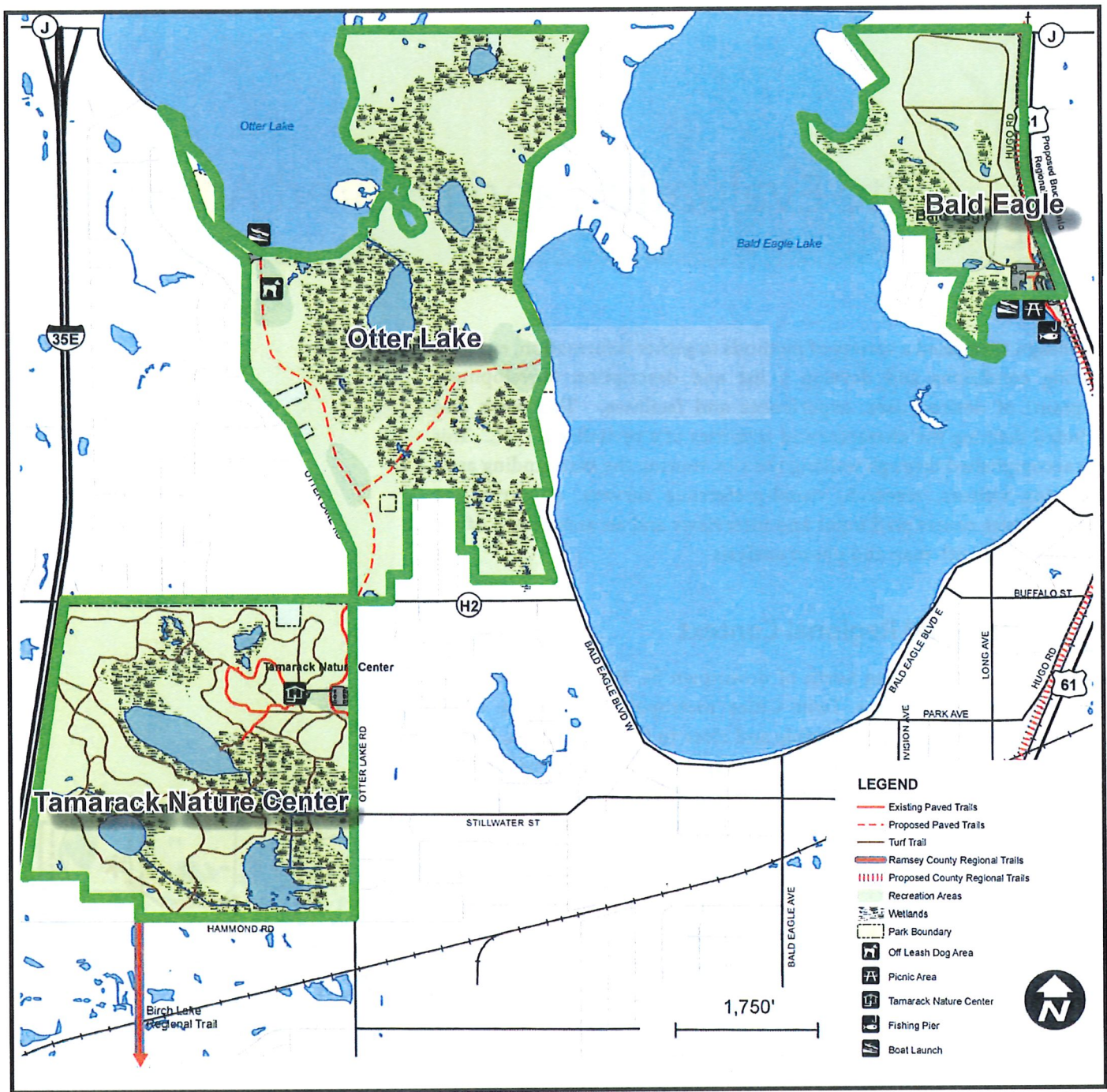


Figure 1. Bald Eagle-Otter Lake Regional Park

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administrative offices, public works facility and water tower to the southwest; a large single story light industrial, manufacturing, corporate office building to the south; single-family housing; Otter Lake Elementary School, sport fields and grounds to the north; and the undeveloped Bald Eagle-Otter Lakes Regional Park across the road to the northeast. The greatest majority of the surrounding land use is single-family homes situated in older, well-established neighborhoods. The larger region surrounding TNC is dotted with numerous recreational lakes and wetlands.

TNC is managed as a natural area within the Bald Eagle-Otter Lake Regional Park. As such, activities prescribed to maintain, enhance and manage the natural resource will be implemented within the context of the overall regional park plan.

4.2 Existing Site Conditions and Analysis

Site analysis was done to gather information and to document the existing characteristics—both physical and ethereal—in and around TNC. This analysis provides the physical foundation on which the project was planned and designed. The site analysis for TNC was done by walking, hiking, and monitoring the site, recording general observations, descriptions, and data pertinent to the project. This was done at different times of the day and also in different seasons. Base maps, surveys, natural resource information and aerial photographs were also secured from the County. The information gathered was assessed on three different levels: regional, total park site, and the inner campus surrounding the nature center building.

Tamarack Nature Center's 320 acres contain a variety of diverse habitats, landscapes, and human elements. The park contains three small lakes, several ponds, extensive wetlands, mature oak and maple woodlands, young pine forest plantings, open meadow areas, and several sizeable, restored prairies. Glaciers left behind a gently rolling topography and a distinctive ridgeline along the southwest corner. There are many areas in the park that provide pleasing views and almost total seclusion from the outside world. Two major external elements impact these areas: I-35E (vehicle noise, emissions, motion) and the water tower located at the southwest corner. Most of the north and east boundaries feature plantings that create dense buffers and privacy from the streets and surroundings (Figure 2).

TNC has few historical landscape or structural elements that are of significant value or potential. The uplands were previously used as cropland and pasture. The primary high-quality woodland is the oak ridge that runs diagonally across the southwest corner of the park. A large portion of the wetlands were tilled and drained and now have been partially restored.



Existing boardwalk to Tamarack Lake.



Figure 2. Site Analysis

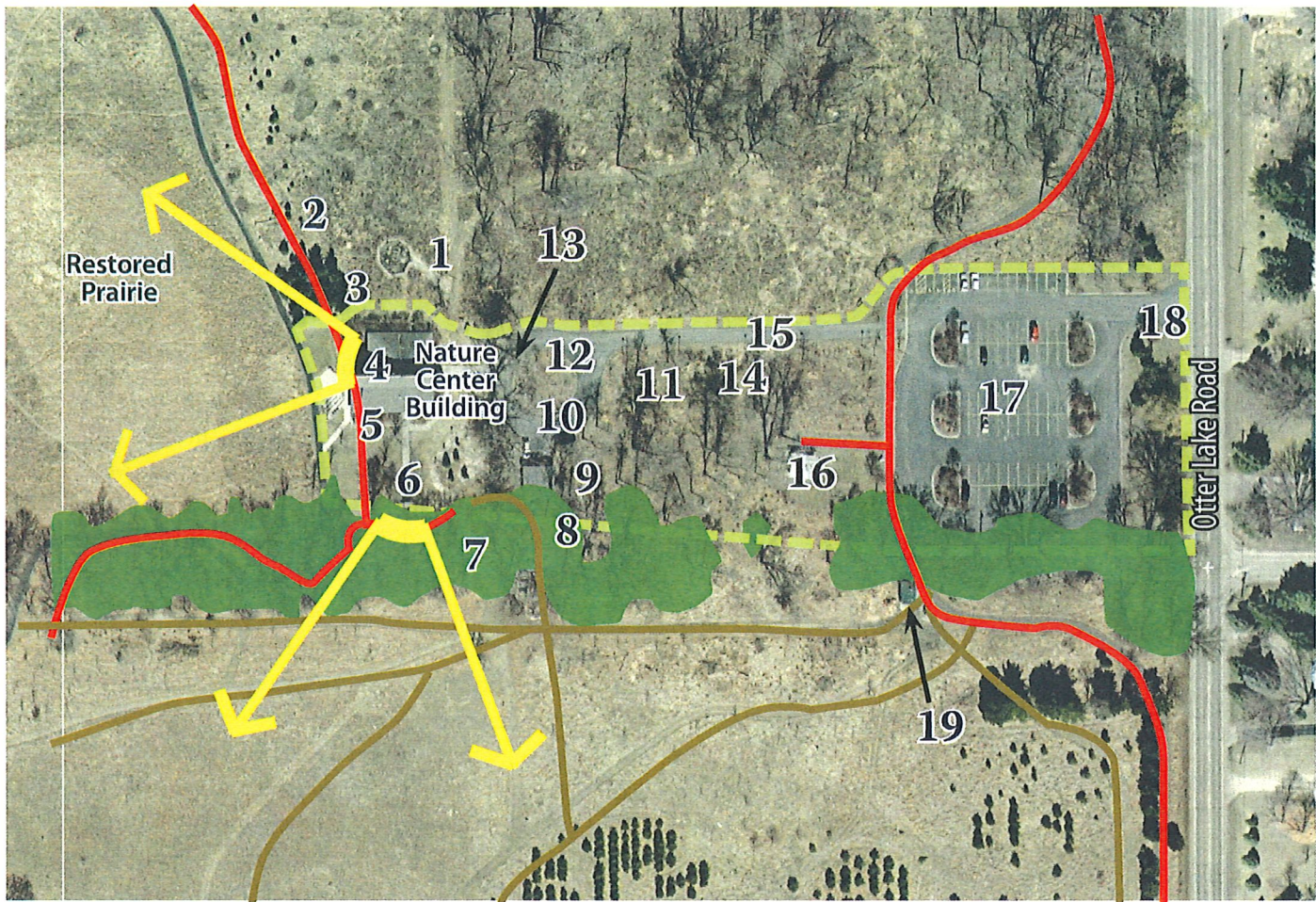
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LEGEND

- | | | | |
|--|--------------------------|--|-------------------------|
| | Existing Paved Trails | | Buffer Area / Park Edge |
| | Proposed Paved Trails | | Buffer Needs |
| | Turf Trails | | Steep Slopes |
| | Park Boundary | | Noise Impact |
| | Existing Bench Locations | | Views |



400'



1. Children's garden is small, hidden from view of entrance and not visually or physically tied to building.
2. Butterfly garden is fenced but not maintained.
3. Falcon is hidden from view by conifers.
4. Great view of restored prairie from Nature Center Building.
5. Amphitheater exposed to sun in summer and cold to sit on in spring and fall seasons.
6. Raingarden could be expanded and interpreted.
7. Hedgerow creates visual and physical barrier from south field. Hedgerow could be interpreted. Prairie could extend through and into old field. Remove young trees from underneath mature oaks.
8. Picnic shelter built by Boy Scouts nicely sited with view of field.
9. Storage building poorly sited for visitors' experience.
10. Bike rack.

11. Gravel HC parking.
12. Drop-off.
13. Sign - first sense of orientation.
14. Large turf area provides little orientation of park character (green dash).
15. Pedestrian entrance shared with cars - straight with no sense of discovery, mystery or orientation of site.
16. Picnic shelter/area - has no relationship to building or entrance experience. Mowed turf reveals entire view to visitor.
17. Parking lot with planted islands - some non-native species - opportunity for raingardens - located far from building entrance.
18. Vehicle entrance provides no sense of mystery, sense of discovery or site orientation. Visitors abruptly arrive at parking lot.
19. Sugar shack poorly sited without maple trees - not an "authentic experience" and too close to parking lot with no relationship to Nature Center Building.

Figure 3. Nature Center Area Site Analysis

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LEGEND

- Existing Paved Trails
- - - Proposed Paved Trails
- - - Turf Trails
- - - Park Boundary
- Views
- Turf Edge





Existing shared walk and driveway leading to the nature center building.



Nature center woodlands.

The habitats of Tamarack Nature Center are being managed towards a mixture of prairies, oak woods, and a variety of wetlands. The wetlands include tamarack swamps, alder swamps, cattail marsh and temporary wetlands. Several other habitats maintained will include pine and maple woods for interpretive programming. These habitats will be created and maintained by planting of native species, prescribed burns and invasive species control. The diverse wildlife community will be managed by proper habitat management, installation of nest boxes, and population control of select species.

TNC features a well-developed trail system with over five miles of paths that provide year round access to most of the park. The current visitor experience, however, is limited by inadequate way-finding. The half-mile, paved trail circling the restored prairie provides access to the George Mack observation deck overlooking Teal Pond. A boardwalk allows access across a wetland and around Tamarack Lake. A dock serves as an overlook and also an outdoor laboratory at Tamarack Lake. A paved Ramsey County trail runs along the south and east edges of the park and connects TNC to the area to the south. Bicycles are currently prohibited on interior nature center trails. Vehicle access and parking is off of Otter Lake Road just South of County Road H2. The entrance is poorly marked and easily missed by drivers. Upon entering the park, visitors immediately find themselves in an asphalt parking lot that has been well landscaped with islands planted with trees and shrubs. The existing access drive is quite short and does not provide the space and time to develop a welcoming, entryway experience. The parking lot accommodates about 80 vehicles and has a drop-off zone for three or four school buses. The parking lot is well screened from Otter Lake Road, which is visually pleasing, but at the same time has created a security problem with frequent vandalism to vehicles. The paved lot has curb and gutter and is in good condition.

The Nature Center building is located directly west of the parking lot. A straight and level, 400 foot long by 12-foot-wide, paved walk/driveway provides pedestrian and vehicle access to the Center. The walk/driveway serves best to move pedestrians and vehicles to and from the building and parking lot directly and quickly. This shared use creates a poor visitor experience and possibly dangerous conditions for both pedestrians and drivers. The 400 foot long walk is an inconvenience to some visitors and makes deliveries or carrying things from parking to the building difficult.

Other elements in the direct vicinity of the Nature Center building include a small children's garden that is hidden and not visually or physically tied to the building and difficult to access (Figure 3). There is also a small butterfly garden that is not well maintained. TNC has a resident bird of prey, a kestrel hawk, but its exterior weathered area is secluded and poorly presented. The indoor area for the bird also seems inadequate.

Other outdoor elements include a small amphitheater/outdoor classroom located on the west side of the building. This location is exposed to the sun and can become hot in the summer. Being constructed of poured concrete it can be cold in the spring and fall and may be damp and uncomfortable for the users. From the amphitheater and the west side of the building there is a pleasant view of a restored prairie and distant woodlands. The outdoor areas surrounding the building are not easily accessible from the building, not well defined and under utilized. Adjacent to this area going south is a small rain garden that could be expanded and interpretation provided about its' purpose.

Parallel and south of the building is a hedgerow of oaks and understory growth. This hedgerow creates a strong visual and physical barrier dividing the expansive open space of the prairie that wraps around the building from the northwest to the southeast. There are a few small open picnic shelters located between the building and the parking lot to the east. They have no significant architectural or aesthetic value. The existing storage building is a two car garage located in this front entry area for convenience. It does not enhance the visitors experience and feels out of place. The large open lawn area located between the parking lot and the building was cleared from out of a former woodlot. The area lacks any sense of a park or community gathering space and it does not provide any orientation to visitors about what is going on at the Nature Center. There is sugar shack (building used for creating maple syrup) located near the parking lot. This placement has no relationship to the Nature Center building and lacks any sense of an "authentic" maple syrup processing experience. There is one orientation sign located adjacent to the main entrance into the building. This is the visitor's first information about the amenities TNC offers. The parking lot, main entry walk, and drop-off area provide no sense of discovery, mystery, or orientation to the site. Visitors abruptly arrive in a parking lot and are then led directly down a straight asphalt walk to the front of the building. The whole experience is nondescript, plain and uninteresting, especially compared to opportunities for nature discovery present in the rest of the site.

4.3 Desired Character and Activities

Visual Preference Surveys

Tamarack Nature Center is one of a growing number of nature-based destinations seeking new alternatives for engaging visitors. The best local, national, and international examples of hands-on nature experiences, nature-based play areas, and integrated art and nature experiences were collected and reviewed in a series of visual-preference surveys. Information from these sessions helped to define the desired activities and character of

		Fit and Appropriate Design Character?	
		Like	Dislike
1)		☐	☐
		Comments: _____	
2)		☐	☐
		Comments: _____	
3)		☐	☐
		Comments: _____	
4)		☐	☐
		Comments: _____	

TNC Destination Discovery Visual Preference Survey
12/2/08

Visual Preference Survey

Visual Preference Survey Results

Preferred Character:

- Water features
- Sculptural play using natural materials
- Natural materials – wood, stone, logs, iron
- Authentic materials
- Earth tone colors
- Artistic quality
- Native landscaping

Preferred Images and Activities:

- Stream water play, pond viewing (interactive/exploratory)
- Hollow stump/crawl tunnel
- Children's nature play (structured and unstructured)
- Children's garden
- Woven branch shapes and places
- Logs and stumps
- Rope spider web climbing element and gate
- Tree arch/gate
- Raised viewing platform
- Bird observation blind
- Indoor climbing tree play element
- Hands-on, indoor exhibits
- Tunnels

the new Tamarack Nature Center. Survey participants were asked to view more than 60 photographs of nature, play, and art environments and select the most appropriate images and activities for Tamarack. The Ramsey County Parks Commission, County staff, Friends of St. Paul and Ramsey County Parks and Trails Board, peers from other nature centers, and others took the survey. The key survey results are summarized to the left and included in Appendix B. Survey results also helped shape the guiding principles used in preparing the site, building, and destination plans.

Desired Site Activities and Uses

A list of physical site and building requirements—desired spaces, areas, and activities—was prepared by Ramsey County staff (see Appendix C). This list helped define size and functional needs for the site's revitalization. Identified site needs include:

- Increased visibility from the roads
- New entrance drive
- Expanded and more convenient parking
- Better drop off area for visitors
- Central outdoor gathering area
- Visitor orientation area
- Unstructured children's play areas
- Nature play area with play stream and pond
- Experiential nature play opportunities
- Children's garden
- Observation shelter for parents
- Art integrated into the design theme
- Sugar shack and cider house
- Paved bike/pedestrian loop around the site
- Expanded prairie area
- Overlooks
- Better connections to the ponds and to the northern portion of the Regional Park.

Building Expansion Spatial Needs

- Dedicated space. Building spaces to emphasize dedicated-use spaces as opposed to multi-use spaces
- Entry Lobby
- Exhibit Gallery (1500 – 2000 s.f.)
- Events/Community Hall (Space to accommodate 75-100 people)
- Early Childhood Program Two classrooms (20 students each)
- Classrooms (expansion space equal to existing 1500 s.f classroom space)
- Arts Studio
- Administrative Offices (two to four times larger than existing 1150 s.f.)
- Volunteer Center
- Kitchen
- Winter Equipment Rental
- Support Space Animal care room (150 s.f.), Storage space
- Parent/Caregiver/Teacher observation area. Related to the primary children's outdoor activity areas.
- Maintenance shop/Storage garage (for outdoor maintenance and programs needs)
- Sugar Shack/Program Shelter/ Cider House



Site Development Plan

5.1 Overall Site Plan

The Interpretive Plan describes guiding principles, interpretive themes, and desired visitor experiences. This information was combined with the site analysis findings to help define the needs and opportunities for revitalization of the site. Precedence examples of nature-based learning, play and art were reviewed and the preferred examples helped define the desired character of the site and exhibits. Several site-plan alternatives were prepared to enhance site circulation, access, function, and aesthetics. The site alternatives and their defining elements gave direction to the spatial and functional reconfiguration of the nature center building. Building expansion ideas were prepared in concert with the site alternatives (see Chapter 6). A preferred site plan was selected and refined to fully meet the interpretive plan objectives and the site opportunities. The site plan was developed at two levels of detail. The Overall Site Plan (Figure 4) shows the proposed re-development of the TNC site encompassing the total 320 acres. The Nature Center Area Site Plan (Figure 5) shows more detail regarding the proposed development of the area surrounding the Nature Center building. The building plans and Destinations for Discovery elements are defined and explained in further detail in chapters 6 and 7.

The Overall Site Plan (Figure 4) is designed to accomplish the following goals and objectives:

- Maintain the existing Nature Center building as a main focal point of the redevelopment.
- Maintain the existing trail system within the park and the regional trail system along the perimeter of the site. Add new trails to support the increased use. Extend and improve existing wetland boardwalks. Add a new paved trail around the perimeter to create a loop trail around the site.
- Develop a stronger and more visible pedestrian connection to Bald Eagle-Otter Lake Regional Park at the intersection of County Road H2 and Otter Lake Road.

- Create a new pedestrian gateway into TNC at White Bear Township Park at the southwest corner of the site. Provide a "gateway" element which includes an interpretive/information kiosk and a paved trail connected to the proposed perimeter trail.
- Create a new entrance to TNC that aligns with Otter Lake Elementary School. Purchase private in-holding property adjacent to this area.
- Create a nature based "artistic" element near the Otter Lake Road/ County Road H2 intersection to announce TNC as a place of destination and peak public interest.
- Develop "respite settings" along the trail system in different biomes and areas of the site.
- Create three new Destinations of Discovery in the outlying areas of the site.
 - Bird Blind in the expansive wetland area at the southeastern corner of the site.
 - Canopy Walk along a steep ridge line in a heavy oak woodland at the southwest corner.
 - Tamarack Lake Raft on Tamarack Lake in the center of the site.

5.2 Nature Center Area Site Plan

The Nature Center Site Plan (Figure 5) shows the more detailed development recommendations for the area surrounding the Nature Center building and proposed new access road and parking areas. This area includes the most significant development elements being proposed for the project. The site plan is designed to accomplish the following goals and provides the following new facilities:

- The Nature Center building is the main "man-made" focal point while nature itself is the main focus of the visitor experience. The proposed site development revolves around the building. The building is sited in an ideal location at the edge of a woodland – prairie ecosystem and along an area of slight topographic change. The building is on a level area which affords easy access and other development opportunities. The earth slopes down and away from the building to the south and west defining the edge of the prairie. This allows the building to act as a transition and link between the passive natural landscape to the west and more active educational based nature play development proposed to the east.
- Expand the Nature Center Building to the north and south to improve the function, add nature exhibits, classrooms and administrative space, to enhance the transition between active

and passive uses and to blend the visitor's indoor and outdoor experiences (see Chapter 6).

- Plan for a new maintenance building that includes vehicle storage, equipment storage, workshop and ski/snowshoe rental shop. Add a screened yard for refuse and recycling containers, outdoor equipment and landscape product storage, and staff parking with convenient access to the Nature Center building.
- Plan a new multi-purpose pavilion shelter that is a partial open-air structure with restroom facilities. The structure includes an observation area overlooking the new nature play area, and a small event and performance stage that is open to the adjacent outdoor gathering area.
- Plant a maple sugar bush area near a new sugar shack/cider house. This structure will serve multiply functions of showing how food is produced from nature with the syrup and cider production as the main focus. Other functions will include a canning kitchen, an outdoor shelter, a small group gathering structure with a wood burning fireplace, and an interpretive trail head kiosk. The existing sugar bush (mostly silver maples) will be maintained and slowly transitioned to a new all sugar maple woodland to enhance the quality and quantity of the sap production. This development will create an "authentic experience" of the sugar maple syrup process.
- Create a strong central entry courtyard - the Orientation Hub. This will be the first-stop, easy-to-find information center for visitors. Create views and pathways leading to various destinations from the Orientation Hub.
- Linked directly to the Orientation Hub is a large Outdoor Gathering Area. This is a park-like area for groups of all sizes to gather. It is green space that connects the Nature Center, a future Art Center site, and parking lot with the multi-purpose pavilion as a central stage for special outdoor events. Located in the center of the area is plaza and fire-pit.
- Create outdoor classrooms linked by trails, boardwalks, and viewing platforms that feature areas for small group gatherings. Also develop areas where visitors can find respite in nature linked by these same trails.
- Enlarge and redevelop the parking lot and drop-off area. The new parking lot is planned to provide convenient access to the Nature Center building and site features. The parking configuration allows safe and easy access to a central walkway leading to the Orientation Hub and Nature Center. The new lot will accommodate up to 160 vehicles (double the existing volume) with overflow parking available at Otter Lake Elementary School. The lot is to be landscaped to

provide shade and a demonstration rain garden to filter storm water run-off. There is a separate drop-off zone that allows visual orientation and safe direct access to the Center. The parking lot has been planned to allow continued use of the existing lot and access from Otter Lake Road until the private in-holding property has been purchased and the new entry drive constructed from the north.

- Develop natural outdoor rooms for small group gathering and picnic lunches adjacent to the parking lot around the sugar shack area. These should be open woodland settings with lawn or mulched areas for informal gatherings.
- Develop an art node in a natural setting of mature pines close to the intersection of H2 and Otter Lake Road as a welcome sign identifying TNC. Also create a strong visual connection and trail link with art installations from the Nature Center to the intersection.
- Redevelop existing nature trails to accommodate new features and destinations. Realign, remove, and add new segments to allow easy safe access for visitors.
- Integrate nature-based artistic elements and interpretation signage at pedestrian nodes.
- Plan and reserve space for a future arts center building.
- Create a front lawn/sculpture garden between Otter Lake Road and the art center location. Develop an open landscape window to the road giving a public presence to the facility and a display area for public art.
- Continue expanding the existing prairie into the open field areas to the north and south making it a stronger landscape element surrounding and anchoring the main building. Thin the hedgerow dividing the north and south sections of prairie. Remove understory shrubs and some canopy trees. Maintain the healthy and mature oak trees.
- Continue a new paved trail loop around the expanded prairie back to the Pavilion and Nature Center. Realign the trail at the new Observation Tower.
- Develop a new entry road to County Road H2 across from the Otter Lake Elementary School driveway. This will require acquisition of an existing privately owned residential property. The new access drive will give TNC a stronger sense of place and public identity. The longer entry road will allow views into the site creating a sense of anticipation, excitement, and wonder about what comes next. The longer entry drive will also disconnect the Center from the grid system of urban life and transport the visitor into a contemplative natural environment. An easy and direct pedestrian link will also be developed to Otter Lake Elementary School.

- Add pedestrian access/crosswalks at street intersections. Develop a stronger connection to the surrounding residential neighborhoods.
- Locate and create the Destinations for Discovery by integrating the interpretive plan and guiding principles with site-specific natural features and the Nature Center building. The most active destinations - the Nature Play Area and the Children's Garden are to be located next to the southeast corner of the Nature Center building. This location creates a visual attraction for arriving visitors and at the same time is buffered from the drop-off zone and parking area by the Nature Center, multi-purpose pavilion, and the outdoor gathering area/orientation hub. The mature oaks and natural topography of the area gives the visitor a sense of being in a natural open woodland with overhead canopy, shade and wind protection from the north and west. This location also provides the necessary topography to achieve the function of the proposed water play elements.
- Create new Destinations at Teal Pond focusing of the experience of water and pond life and an Observation Tower focusing on different views of prairie and forest landscape.
- Create temporary unstructured nature play areas within different settings, woodlands, prairie, meadow, etc. to allow hands-on experience of the landscape.

The proposed site improvements build on the strengths of the site, building and location to propose a new revitalized place for discovery through art, play, exploration and inquiry.

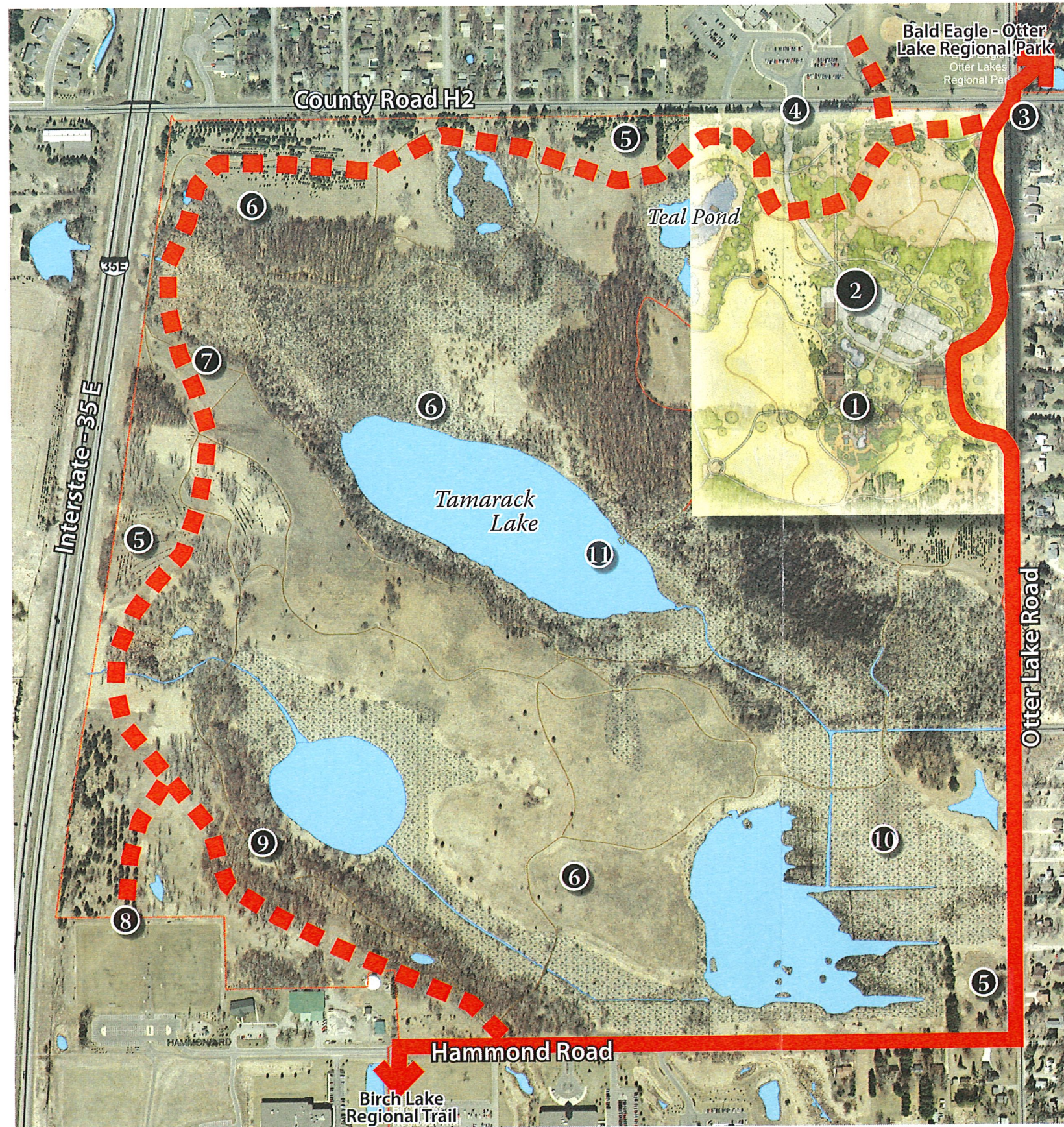
5.3 Land Stewardship

The Master Plan proposes a number of improvements and the creation of visitor destinations which highlight existing or restored natural resource features and habitats at TNC. For example:

- The plan calls for much more of a focus on the existing prairie areas and for expansion of the prairie.
- New destinations will be created to focus on the water resources of Teal Pond and Tamarack Lake.
- A sugar maple "sugar bush" is to be planted to illustrate nature's role in food production (syruping).

These and other proposed improvement focus attention on natural resources and heighten the need for conservation and management. As visitation increases and people are drawn to explore more portions of TNC, the expectation of resource and management quality will increase. The County will need to budget staff and resources accordingly to adapt to

the heightened focus and use. For the TNC master plan to be a success, a corresponding level of increased investment in resource management will need to occur.

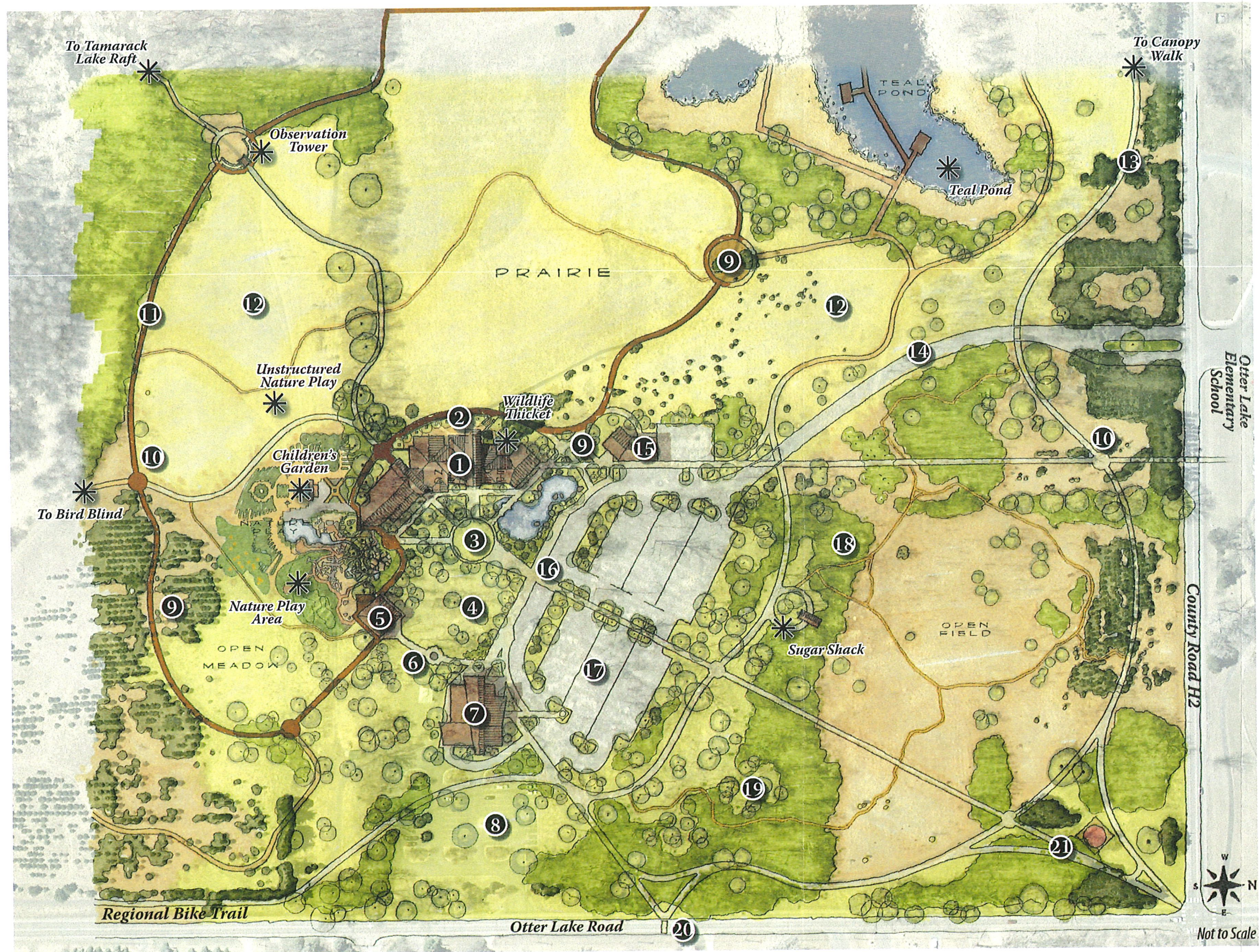


Overall Site Plan - Proposed Improvements

- 1 Nature Center Building
- 2 Nature Center Area Site Plan
- 3 Bald Eagle-Otter Lake Regional Park Connection
- 4 New Entrance Road
- 5 Artistic Elements
- County Road H2
- Interstate-35E
- Old Homesite
- 6 Respite Settings
- Oak and Maple Woods
- High Prairie
- The Fen
- 7 Paved Trail Loop
- 8 Township Park Gateway
- 9 Canopy Walk
- 10 Bird Blind
- 11 Tamarack Lake Raft



Figure 4.



Nature Center Area Site Plan - Proposed Improvements

- 1 Nature Center Building
- 2 Prairie Overlook Terrace
- 3 Orientation Hub
- 4 Outdoor Gathering Area
- 5 Multi-purpose Pavilion
- 6 Fire Pit
- 7 Art Center
- 8 Sculpture Garden
- 9 Outdoor Classroom
- 10 Pedestrian/Art Node
- 11 Prairie Trail Loop
- 12 Prairie Expansion
- 13 Paved Trail Loop Expansion
- 14 New Entrance Road
- 15 Garage Maintenance Building
- 16 Drop-off Area
- 17 Parking Lot
- 18 Sugar Bush
- 19 Picnic Area
- 20 Neighborhood Connection
- 21 Art Node & Trail
- * Destination of Discovery

Figure 5.

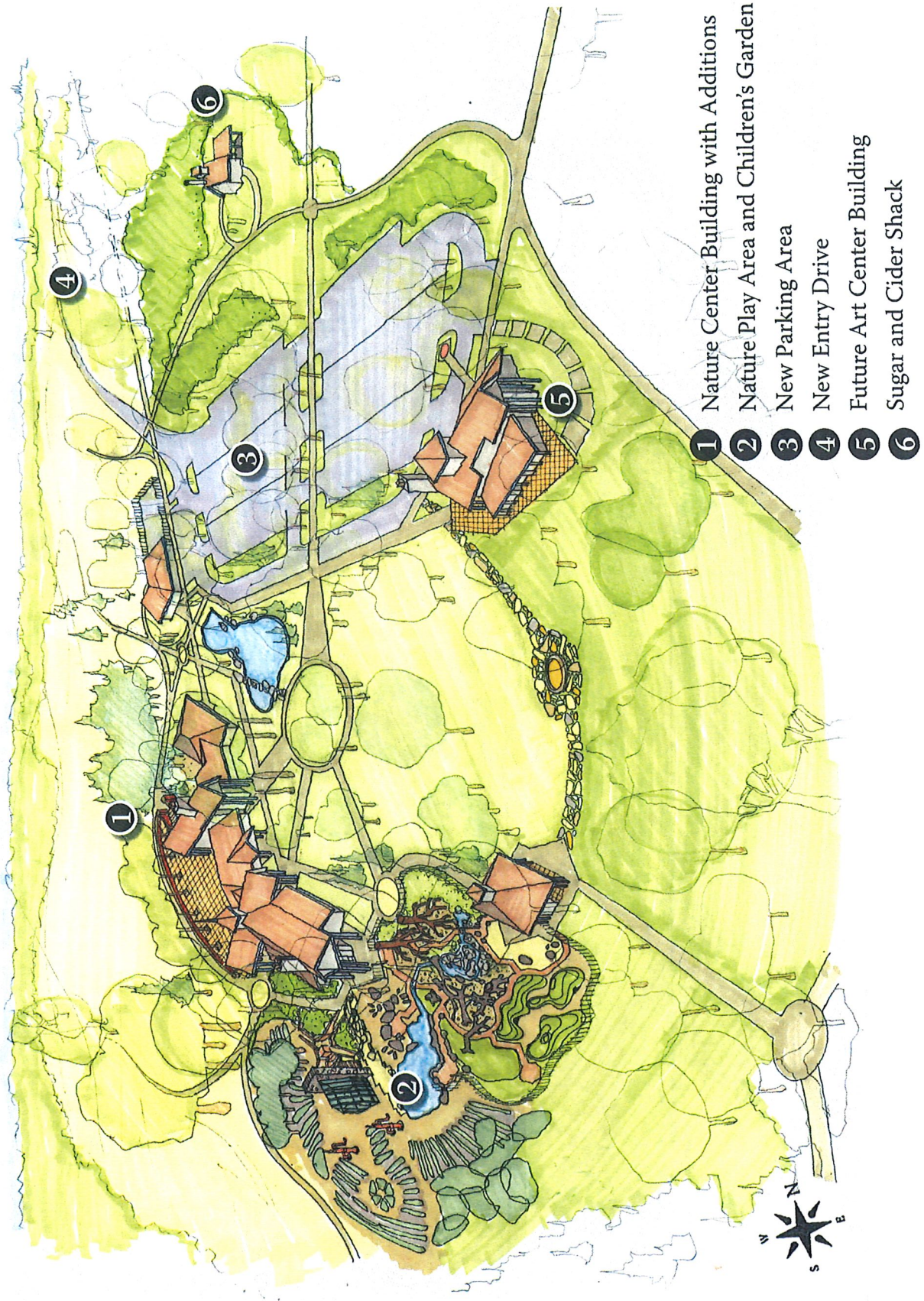
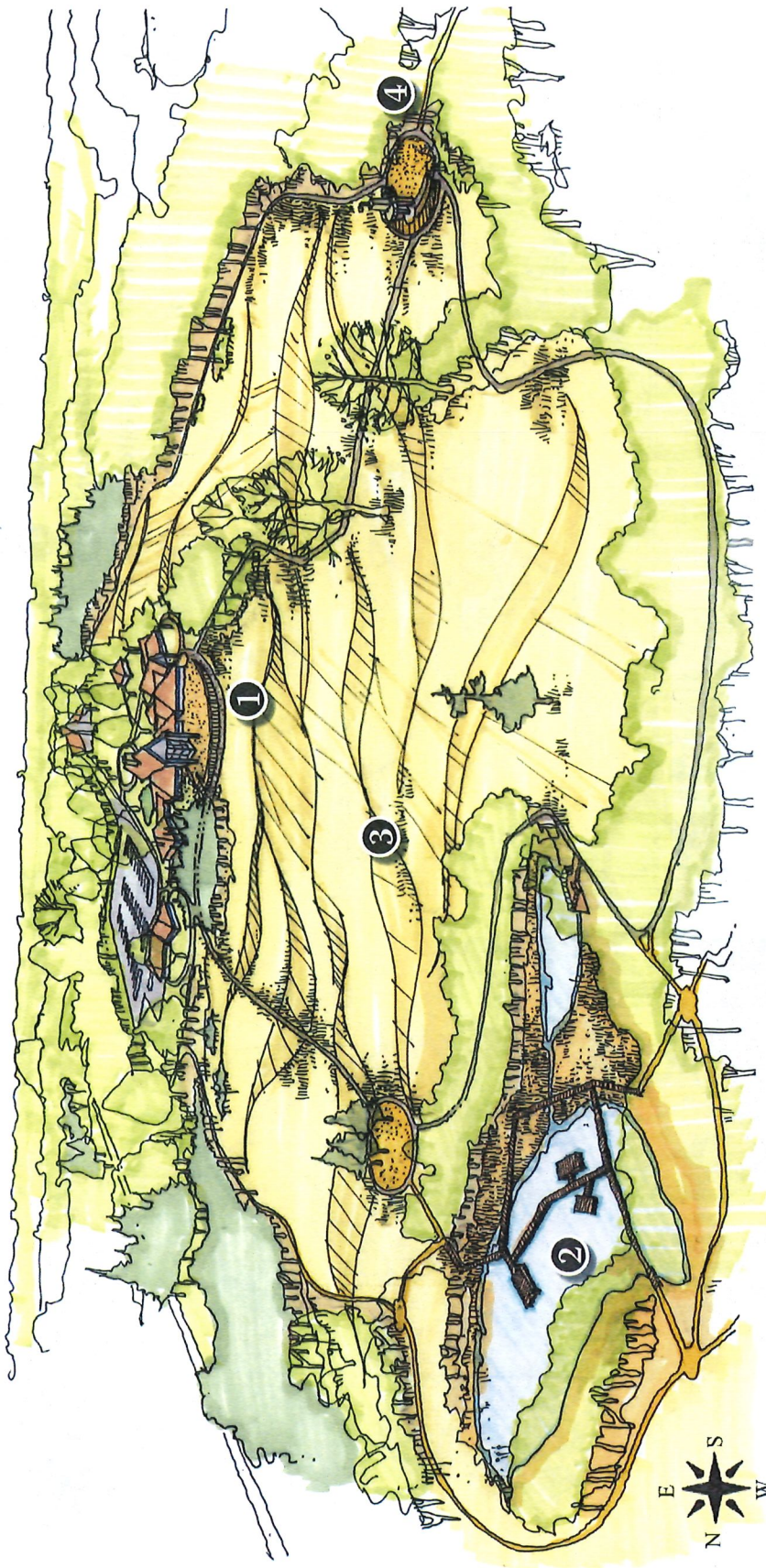


Figure 6. Birdseye View from the East



- ① Nature Center Building with Additions and Terrace
- ② Teal Pond Docks and Boardwalks
- ③ Prairie
- ④ Prairie Observation Tower and Prairie Cut

Figure 7. Birdseye View from the West



Buildings and Structures

The following is a description of the existing structures, their present uses and the intents for their redevelopment. It is important to note that the site design and master plan, along with the vision, was the driving force behind the proposed spatial and functional reconfigurations. The buildings and their spatial uses relate directly to the site, not vice versa. These conceptual ideas for the expansion of the structure are designed to inform the site plan and to set the stage for future architectural design and do not constitute specific architectural solutions.

6.1 Existing Buildings and Structures

Visitors first entering the park are greeted by the Nature Center's main building sitting low in the minimal landscape at the far end of the entry walkway/driveway. The center's low spreading profile and horizontal wood siding is accentuated by a log-supported two and half-story glass entry atrium and exhibit gallery. The buildings blue and gray color scheme adds an interesting twist to the typical earth tone nature center character and gives it a somewhat residential flavor.

The single level 6,650 square foot building is in very good condition, having been renovated and added on to in 2000. The building has great potential for further expansion and modifications. Existing spaces and uses include; entry lobby and meeting area with a stone-faced wood-burning fireplace, two general-use classrooms, an early childhood classroom, exhibit area, kitchen, administrative offices, conference room and resource library, live animal exhibits, animal care room, cross-country ski rental shop, restrooms, workshop maintenance room, and storage and mechanical rooms. The building was built before there was an emphasis on sustainable and "green" building techniques. As such, it is not an example of conservation oriented construction. The center serves as a trailhead and provides recreational and educational opportunities for visitors along with housing the administrative offices for the center and park. Trail users primarily enter the building to use the restrooms and/or access the water fountains. The building is heavily used by the in-house ECFE and pre-



Existing nature center building.

school, adult art and nature classes, special events, elementary school groups, summer day camps, nature study, trail users and by casual visitors. The Center's professional environmental educators and trained volunteers conduct on-site and outreach programs and classes.

Spread along the entry walk to the building are several other accessory structures, a two car garage storage building, open air roofed picnic shelters, and a sugar shack building resembling a small single car garage. These structures are of little value to maintain and preserve. The existing garage storage building is inadequate spatially and has no aesthetic value. The shelters have little or no aesthetic value and are quite small for future requirements. The sugar shack is similar to the rest. All proposed new structures should possess a quality and character along with useful functional space that portrays the vision of this project and enhances the visitor's experience of the park.

6.2 Nature Center Building

Building Evaluation and Needs

The existing building was evaluated and the opportunities and constraints documented (see Appendix A). Goals of the building expansion are to accommodate existing and future space needs, create a dynamic place for nature-based learning, play and arts, enhance indoor-outdoor interrelationships between the building and the site, focus views on the site resources, improve circulation and visitor orientation and create defined spaces for visitors.

The spatial and programmatic needs of TNC were defined by County staff. This list (Appendix C) helped define size and functional needs for the revitalization. In general, the spatial needs for the building focused on more dedicated space and less reliance on multi-use space and opening up the building to the outdoors through the use of indoor/outdoor spaces. Proposed building additions are: a classroom/event hall, a dedicated early childhood education room, expanded exhibit space, maintenance building, and administrative offices. A separate planning process defined the space needs for a potential Art Center building for the White Bear Center for the Arts.

Indoor-Outdoor Revitalization

The revitalization plan focuses on additions to the north and south ends of the existing building. The existing nature center building has a north-south orientation and expansion along this axis will increase its mass and presence, creating a structure that has more visual impact and attraction. This configuration is directly related to the following site development and elements (See Figure 8).

- **Restored Prairie.** An existing restored prairie slopes down and off to the immediate west side of the existing nature center. It is important to respect this topographical change and the prairie and not intrude into this landscape.
- **Coniferous Planting.** A dense planting of coniferous trees is located just off the north corner of the building. This planting is desirable landscape element. It is proposed to be the foundation and screening backdrop for the development of an enclosed outdoor wildlife habitat and sanctuary (wildlife thicket).
- **Wildlife Thicket.** The outdoor wildlife thicket is to be a visual focal point of the indoor exhibition gallery. A large wall section of the building is proposed to be opened up and glazed to allow viewing of this area. The proposed building expansion to the north will help enclose this area further.
- **Maintenance Building Access.** The north addition would extend toward the staff parking area and maintenance and storage building, allowing direct and easy access for staff and maintenance purposes.
- **Main Entrance.** The main entrance to the building is maintained in its present location. The existing level and open landscape area to the east of the building is ideal for the building's entry and the new orientation hub.
- **Drop-off and Parking Area.** The proposed parking area, site access and drop-off areas are located to afford a visual connection and easy access to the main building entrance. All of vehicle access and parking has been planned to create as little impact on the site as possible with the greatest amount of convenience and function.
- **Oak Hedgerow.** The existing hedgerow of mature oaks and other trees, running east and west across the site off the south end of the building, provides the natural setting for the proposed nature play area and the children's garden. This location allows easy access for visitors to and from the outdoor activities and indoor amenities.
- **Observation Plaza.** The main access for visitors to the nature play area and children's garden would be from a new observation plaza. The plaza also acts as a gateway to the site around the backside of the building. The plaza is to be connected directly to an interior observation area.
- **Secondary Entrance.** This entrance will allow direct access to the events hall and early childhood classroom addition without going through the whole building. It also allows access through the building to the site and prairie overlook terrace beyond.

-
- **Screened Outdoor Classrooms.** Screened outdoor classrooms that open into existing classrooms would be created by adding glazed overhead garage style doors.
 - **Prairie Overlook Terrace.** The overlook terrace will be a hard surfaced plaza area, directly adjacent to the building that overlooks the prairie to the west. There will be access points from the building at the classrooms and also the main exhibition gallery. The area is intended for more passive uses and is separated from the more active site elements by the building. The terrace is also to be accessed from both ends around the building with connections to the orientation hub and parking area.
 - **Entry Pond.** The new pond is to be an introduction for visitors to the wonders of water features and an invitation to explore the many site wetlands and natural water bodies. It is to be an aquatic habitat that also functions as a rain garden.
 - **Landscape Planting.** Planting around the perimeter of the building will be naturalized to provide wildlife habitat and food. The plantings will create a base for the building so it does not feel like it is floating in an open lawn or the landscape. Plantings will accentuate the architecture and allow open views from the main interior spaces.



Nature Center Area Detail Map - Proposed Improvements

- 1 Nature Center with Additions
- 2 Main Entrance
- 3 Entry Pond
- 4 Drop-off Area and Parking
- 5 Secondary Entrance
- 6 Observation Terrace
- 7 Oak Hedgerow
- 8 Landscape Planting
- 9 Screened Outdoor Classrooms
- 10 Prairie Overlook Terrace
- 11 Prairie
- 12 Wildlife Thicket
- 13 Coniferous Planting
- 14 Maintenance Building Access

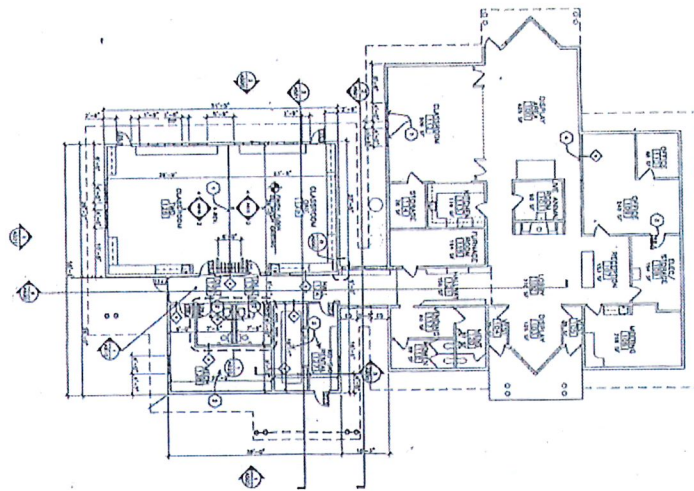
Figure 8.

Building Revitalization

The proposed modifications to the interior spaces to accommodate the exterior developments include the following suggestions (see Figure 9):

- The main front doorways and foyer into the building are to be enlarged to create a greater sense of welcome and also to be in scale with the rest of the building. Views would be developed through the spaces out into the wildlife thicket. Existing entry vestibules are changed to storage or coat closets.
- The entry gathering area with the fireplace would become an entry lobby with orientation information, enlarged reception area, and a model of the site and the outdoor attractions.
- The library conference room would become a gift and coffee shop with a kitchen to be part of the new addition to the north.
- The existing administrative office space would be opened up along with the existing early childhood space to triple the volume of the existing exhibit hall and gallery space. This space would be opened up on the interior with the removal of walls and opened up to the site with enlarged and increased new glazed openings and more prominent and enlarged doorways.
- Existing interior space would be developed into the bird display, care and storage area. An exterior bird weathering and viewing area would be developed next to this between the two main structures. This area would be roofed and enclosed for additional storage.
- The existing classrooms would remain with the addition of screened outdoor classroom space. The new outdoor classrooms would be accessed through glazed overhead garage doors.
- The rental shop could become new office or classroom space when the rental shop is relocated to the maintenance garage.
- The restrooms, storage, shop, and mechanical spaces would remain as is.

The addition to the south would incorporate a new early childhood classroom area and office. It would include additional classrooms that would also function as a community or group events area. A new kitchen and storage room is proposed to service this area. An interior observation area with an adjacent exterior sitting terrace overlooking the nature play area is also proposed. There would be a secondary pedestrian access developed between the addition and the existing building allowing access into the addition separate from the existing building and also access through the building to the outdoor terraces and trails beyond. A gallery



Existing Nature Center Building Floor Plan

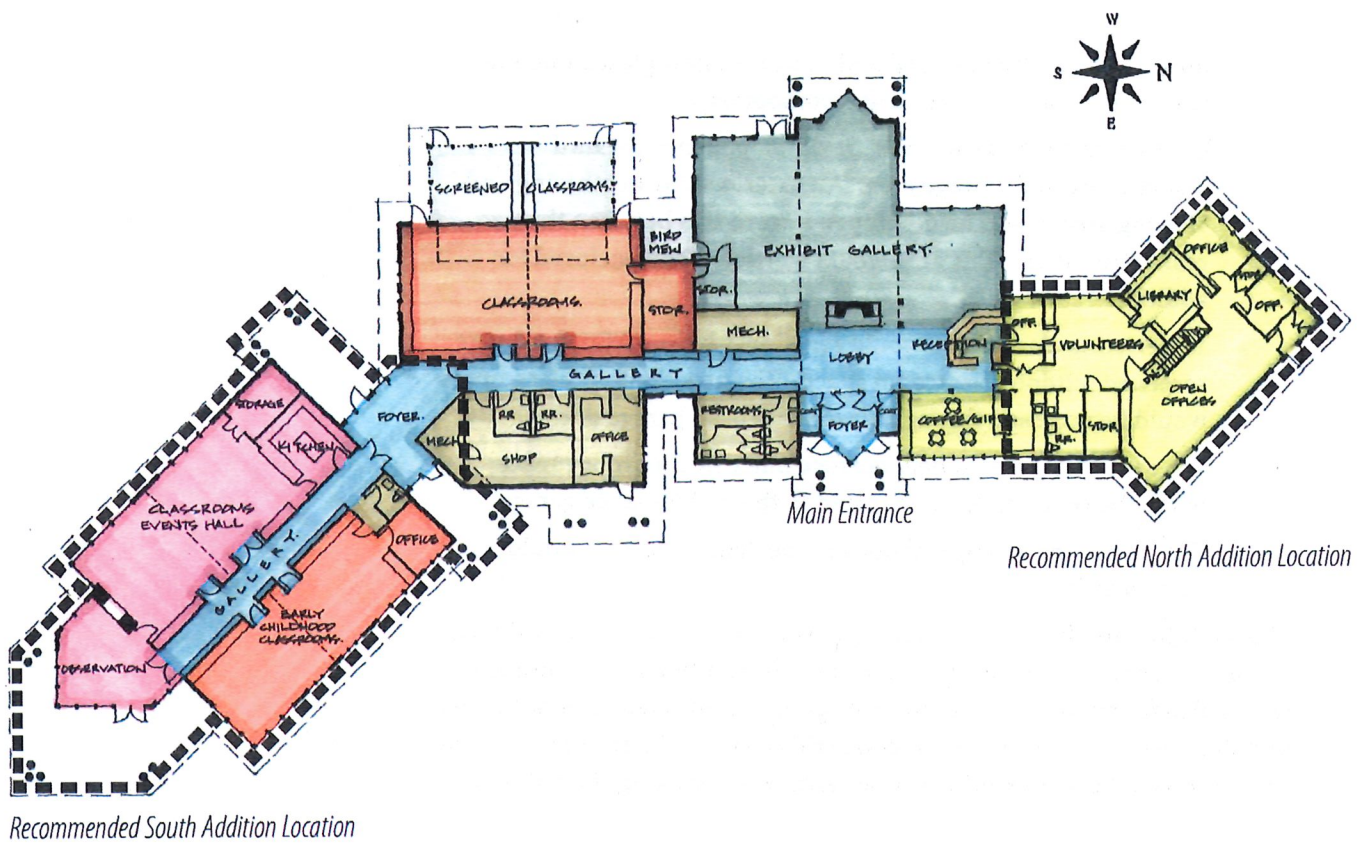


Figure 9. Nature Center Building Expansion Locations

hallway, restroom and storage areas are also proposed.

The addition to the north would house the administrative offices and volunteer center along with areas for support services – conference room, resource library, copy/computer center, kitchenette, restrooms, storage rooms and mechanical space. The addition would have a secondary entrance allowing direct access to staff parking and maintenance/support storage space. There could also be additional storage space located in a lower basement level.

6.3 Other Buildings

Other proposed new Ramsey County Park structures include a storage and maintenance garage, outdoor pavilion, sugar shack and cider house, and a garden potting shed/greenhouse building (See Figure 8). The sugar shack and garden potting shed are described in further detail in Chapter 7.

The garage maintenance building would incorporate parking for County vehicles and canoes, a maintenance shop area, a storage area, ski and snowshoe rental shop, a multi-use room for programs, and a restroom. There would be an exterior terrace adjacent to the multi-use room for small group gatherings and programs and an enclosed storage yard for maintenance equipment, materials and refuse dumpsters. Staff parking would also be adjacent to the building. The building would have easy and direct access to a side entry into the nature center administrative office area.

A new White Bear Center for the Arts (WBCA) building (Figure 10) could anchor the east end of the outdoor gathering space and complete a campus area by closing off the gathering space from Otter Lake Road. The Art Center would be approximately 5,000 square feet and possibly two levels. The building would house all of the WBCA art programs with a carry over of art activities into the Nature Center building. The grounds around the Art Center would be developed into outdoor sitting and classrooms terraces. The Art Center building would create a visual presence to the public on Otter Lake Road. A “front lawn” sculpture garden would also be developed along Otter Lake Road.

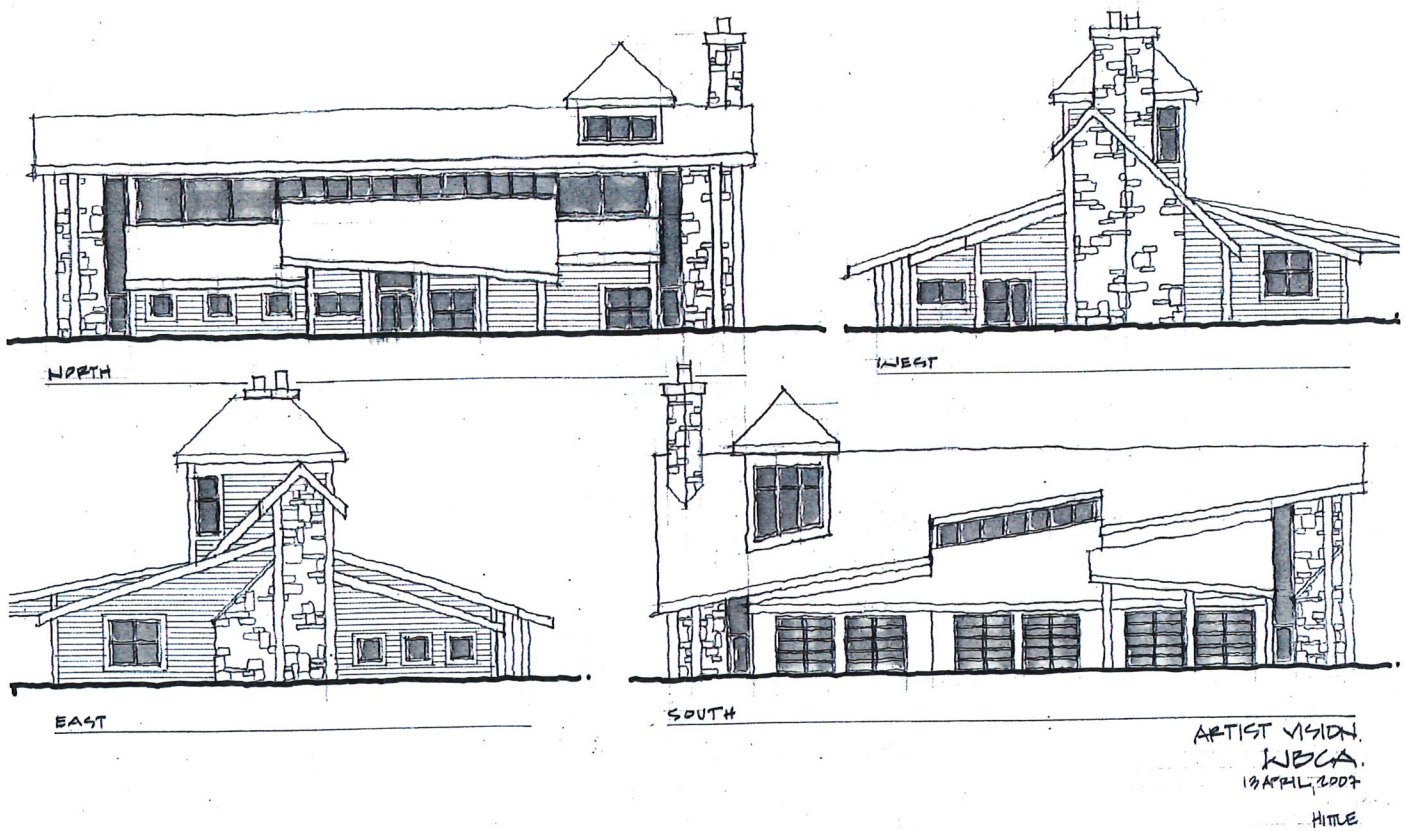


Figure 10. Art Center Concept

7

Destinations for Discovery

The TNC Planning Team used the site analysis, staff experience in nature and art programs, and examples of nature-based learning and art to help select and design new compelling places, experiences and activities for children, and adults. The interpretive plan and guiding principles provided the framework for design of the visitor experience at the new TNC. All of the activities and destinations are designed to be hands-on, self-directed experiences with nature. The most active destinations are located east of and near the building. The more passive and introspective destinations are located west of the building. Many destinations are site-specific, taking advantage of particular natural features to create engaging experiences.

7.1 Outdoor Destinations

The Interpretive Plan developed for Tamarack Nature Center outlines a visitor-engagement strategy that relies on a variety of immersive environments—indoors and outdoors, structured and unstructured. The master plan includes featured destinations (listed to the right) designed to set the scene for open-ended, visitor-driven discovery and to put visitors in optimum places to experience nature.

Throughout the plan there are various opportunities to integrate art and the artistic process into the designs and uses of the destinations. One important role of art at TNC is to provide visitors of all ages with yet another perspective on nature, i.e. bridges and walkways—built to take visitors to special destinations—can become environmental art installations that amuse and draw a new focus on nature.

The destinations at TNC will be linked by trails, boardwalks, and viewing platforms that feature staging areas for gathering small groups. A teacher leading a class, or a naturalist guiding a group of birdwatchers, will find ample opportunities to step off the main path and stop for conversation or to focus on particular points of interest.

Key Destinations

- Nature Play Area
 - Woodland Playstream
 - Boulder Prospect
 - Upside-Down Tree
 - Rolling Hills and Hollows
 - Trunks and Stumps
- Children's Garden
 - Observation Plaza
 - Potting Shed
 - Pond/Stream
- Unstructured Nature Play
- Art Center
- Sugar Shack & Cider House
- Lookout Tree & Wildlife Thicket
- Teal Pond
- Observation Tower
- Animal Exhibits
- 3D Orientation Map



Destinations for Discovery

- 1 Nature Center
 - Indoor Exhibits
 - Lookout Tree
 - Wildlife Thicket
 - Outdoor Classroom
 - Overlook Plaza
 - 2 Nature Play Area
 - Woodland Playstream
 - Boulder Prospect
 - Upside-Down Tree
 - Rolling Hills and Hollows
 - Trunks and Stumps
 - 3 Children's Garden
 - Observation Plaza
 - Potting Shed
 - Pond/Stream
 - 4 Unstructured Nature Play
 - 5 Sugar Shack & Cider House
 - 6 Teal Pond
 - Boardwalk and Docks
 - Floating Platforms
 - 7 Observation Tower
 - 8 To Bird Blind
 - 9 To Tamarck Lake Raft
 - 10 To Canopy Walk
- Additional Outdoor Features:
- 11 Orientation Hub
 - 12 Outdoor Gathering Area
 - 13 Multi-Purpose Pavilion
 - 14 Fire Pit
 - 15 Art Center
 - 16 Art Node
 - 17 Garage Maintenance Building
 - 18 Wildlife Thicket

Figure 11.

Nature Play Area

This gallery of active-exploration outdoor play elements (Figures 12 and 13) is designed for TNC's priority audience—children ages two to twelve and their families.

While in this play area, parents and children should feel a reassuring sense of enclosure, either by fencing or natural boundaries. Gates allow visitor and maintenance access. The activities, all connected by paths, are set among existing oak trees, shrubs, and patches of native grasses and forbs. A small pavilion provides shelter, restrooms and a place for parents to gather and watch their children play. This structure also serves as a program stage for facilitated activities and events. The arrangement of structured-play elements will surprise and delight children and adults with unusual perspectives and multiple physical access points into nature. While the play features are comprised of natural elements, they are marked by an artful and provocative presentation.

The nature play area is a cohesive self-contained space with five main components: 1) Woodland Playstream, 2) Boulder Prospect, 3) Upside-Down Tree, 4) Rolling Hills and Hollows, and 5) Trunks and Stumps. These five components are described further in the following pages.

Developmental Goals

The Nature Play Area will provide:

- Opportunities for children to direct their own play and experience using natural materials in a natural setting;
- Opportunities for children to look at elements of nature from various spatial viewpoints, distances, and directions;
- Opportunities that encourage children's active exploration of nature;
- Materials that children can manipulate, transform, and combine;
- Settings that support and extend children's use of natural materials;
- Materials that encourage children to explore spatial positions, directions, and distance;
- Opportunities for children to construct and share ideas, theories, and thoughts about nature and its processes with adults;
- Opportunities for children to generate their own representation of nature subjects.

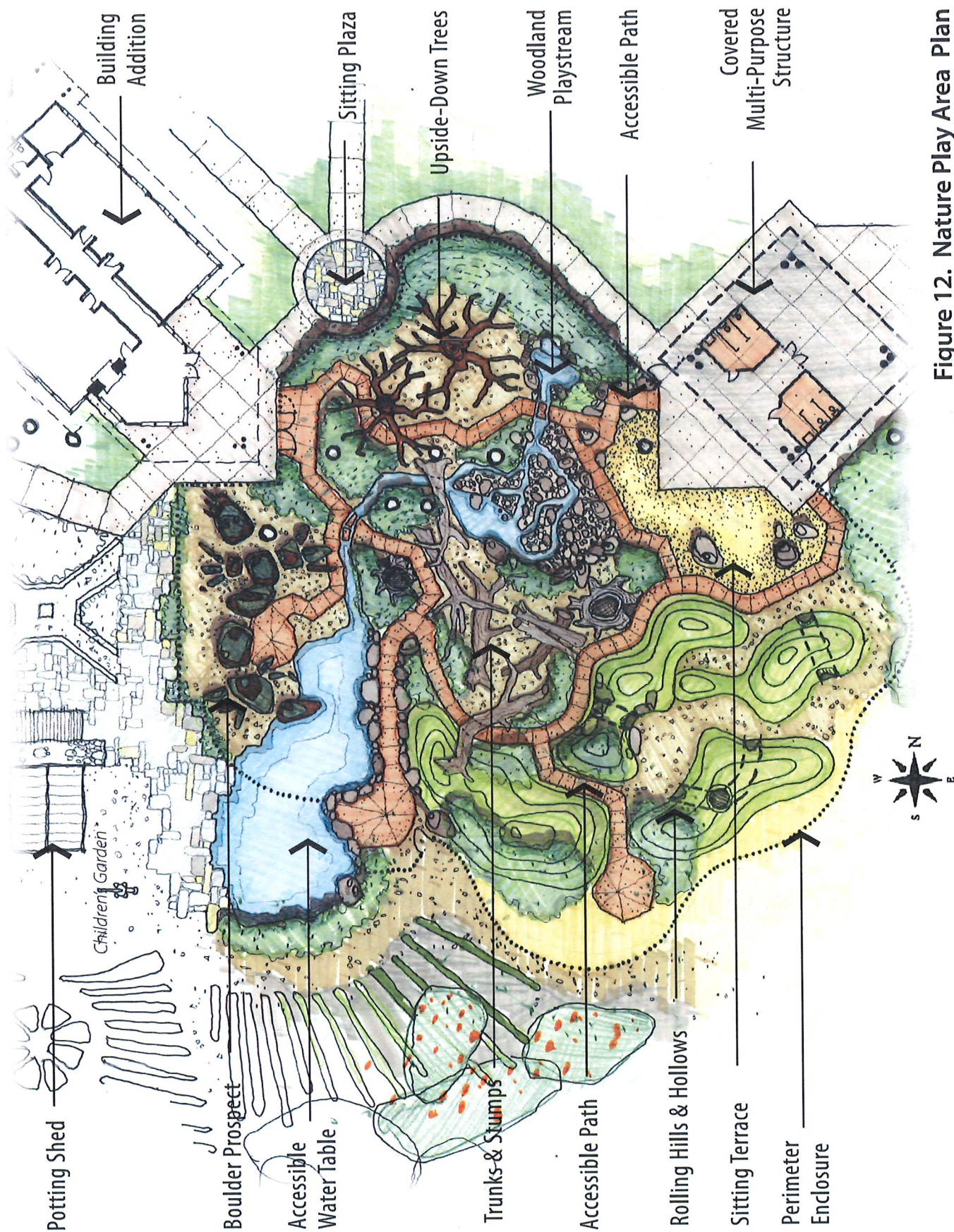


Figure 12. Nature Play Area Plan

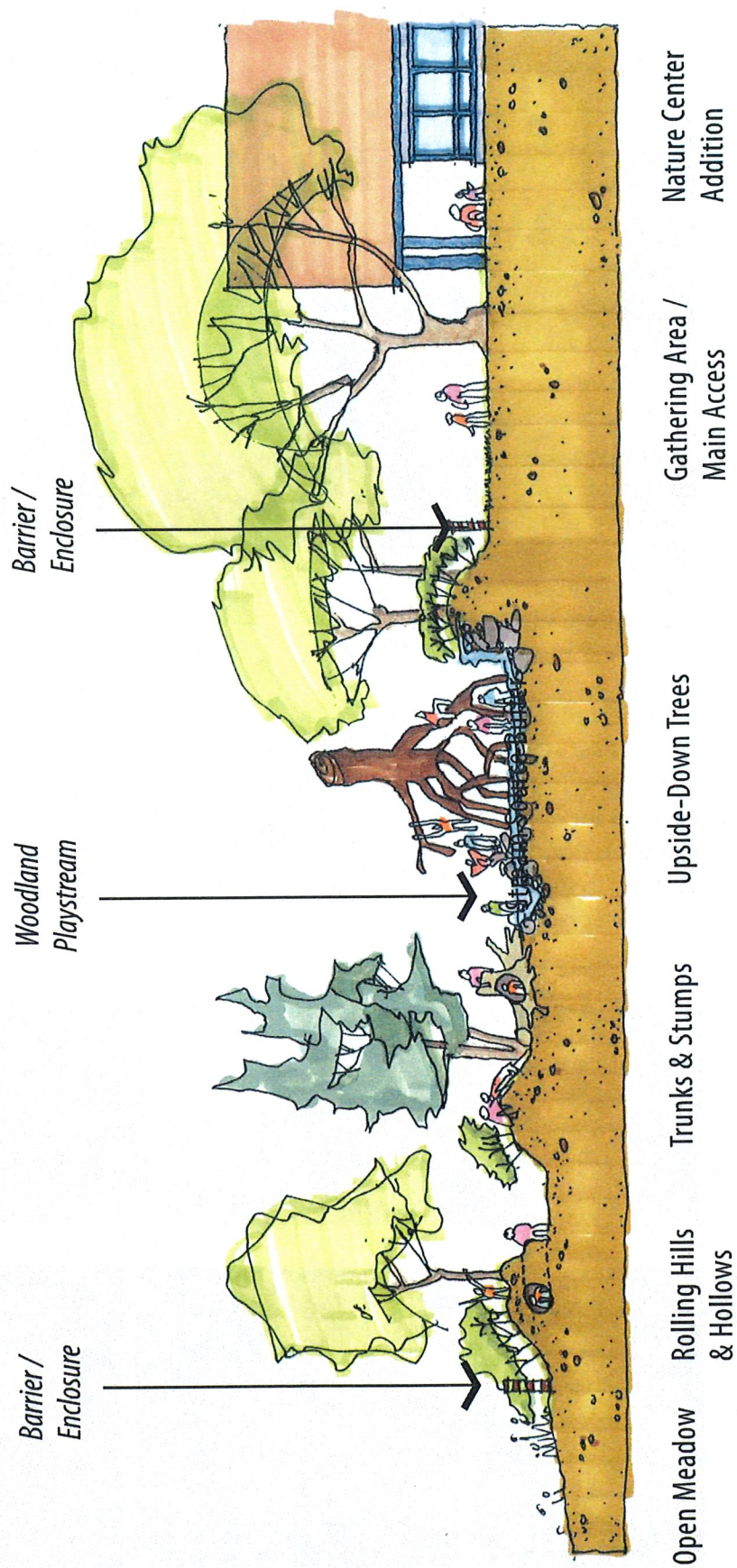
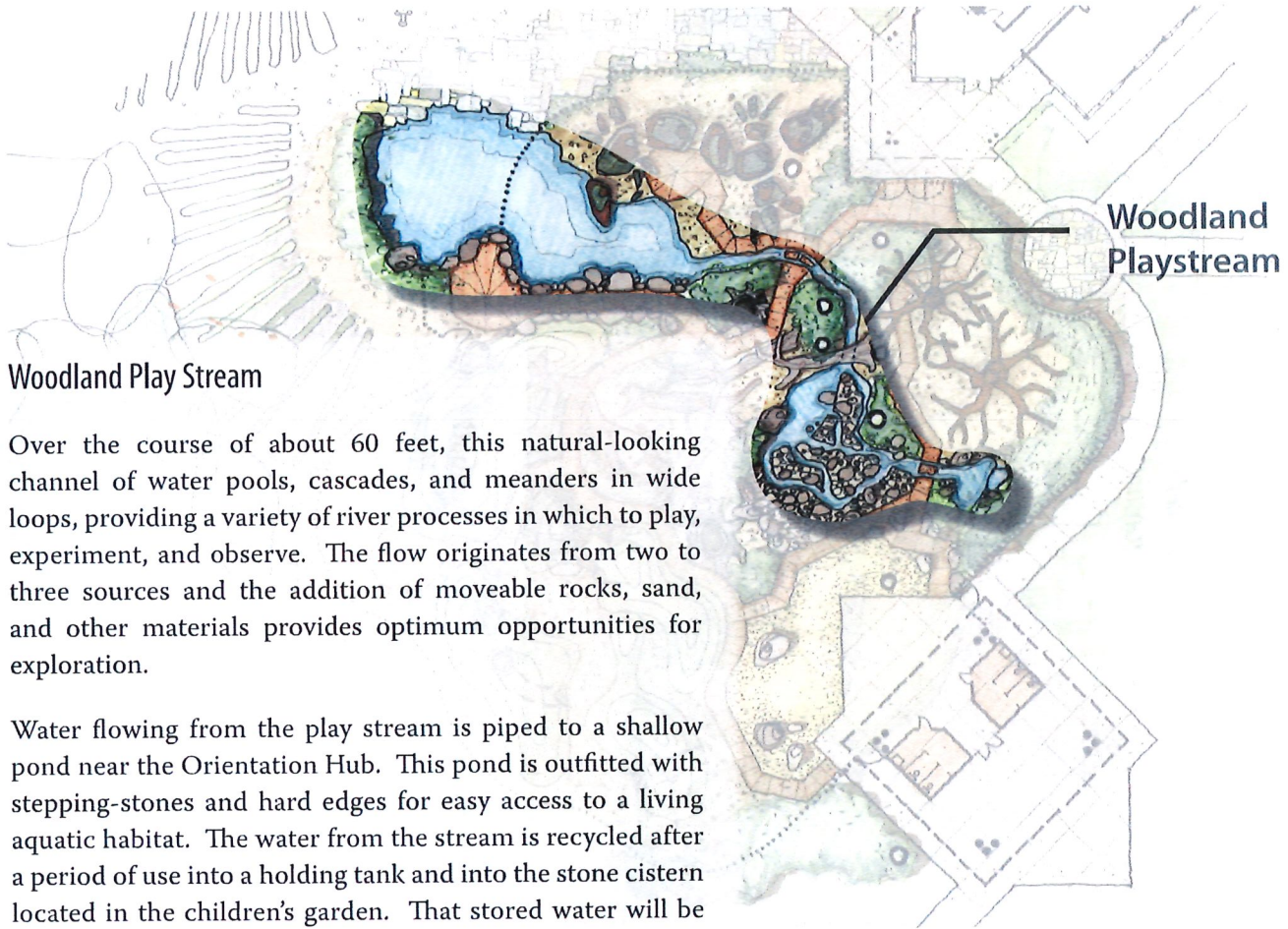


Figure 13. Nature Play Area Cross Section View

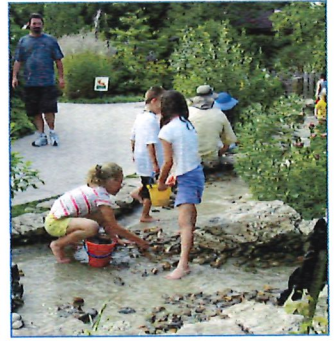
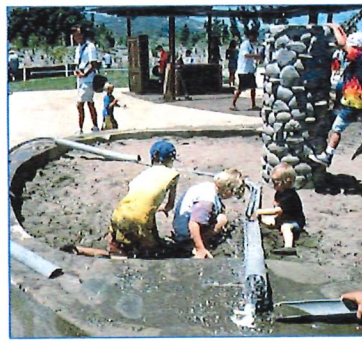
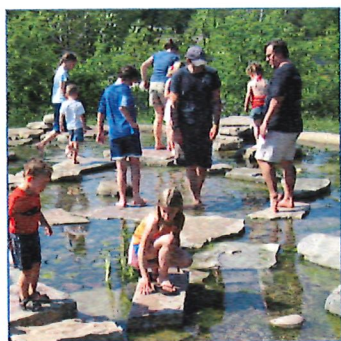
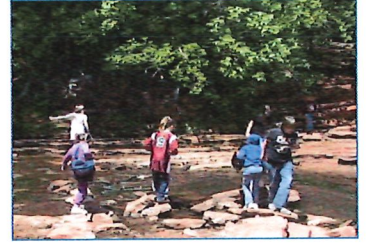
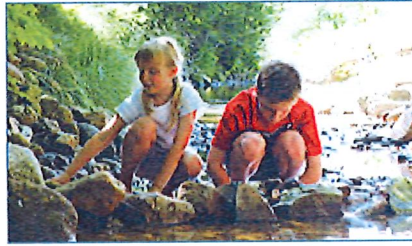
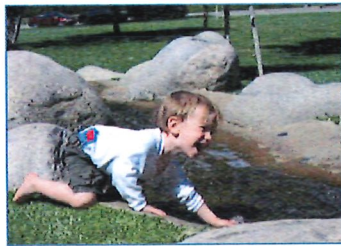


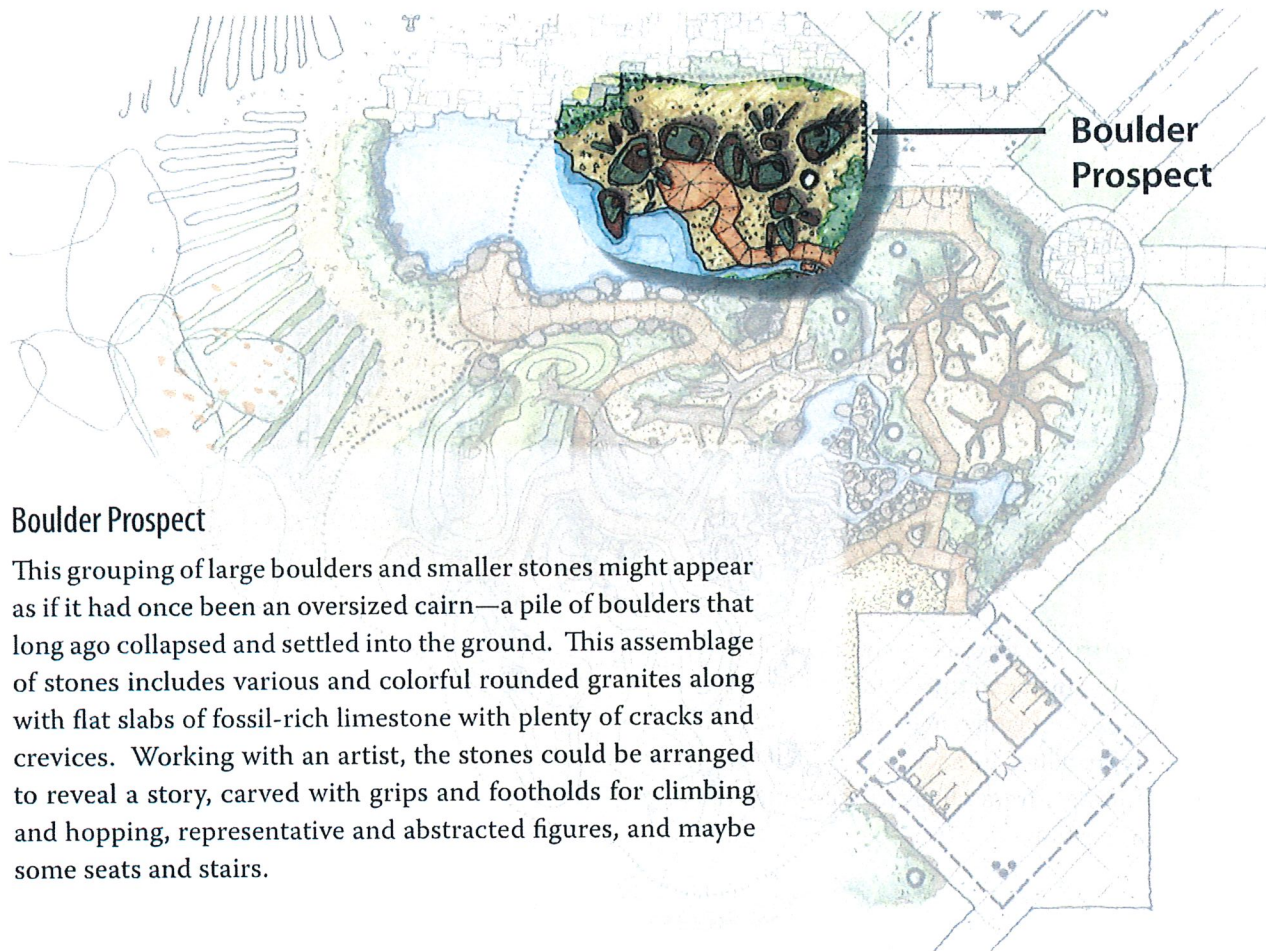
Woodland Play Stream

Over the course of about 60 feet, this natural-looking channel of water pools, cascades, and meanders in wide loops, providing a variety of river processes in which to play, experiment, and observe. The flow originates from two to three sources and the addition of moveable rocks, sand, and other materials provides optimum opportunities for exploration.

Water flowing from the play stream is piped to a shallow pond near the Orientation Hub. This pond is outfitted with stepping-stones and hard edges for easy access to a living aquatic habitat. The water from the stream is recycled after a period of use into a holding tank and into the stone cistern located in the children's garden. That stored water will be used for irrigation and for watering the garden plants.

Example Images

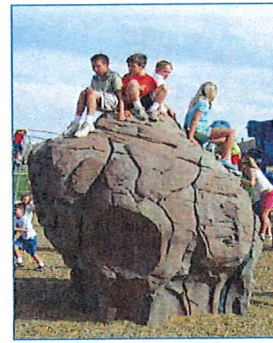
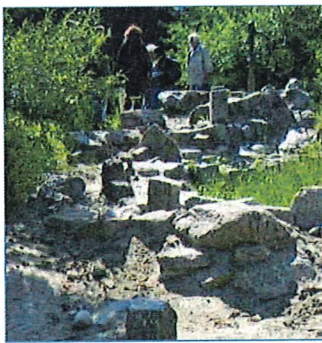
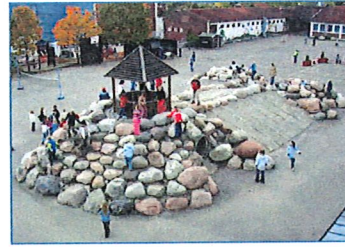
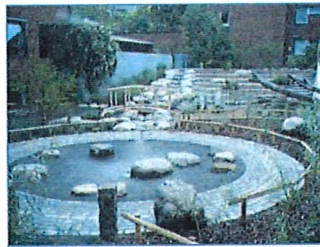
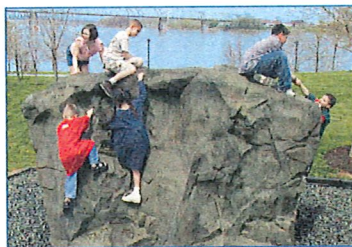
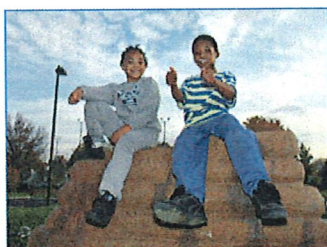


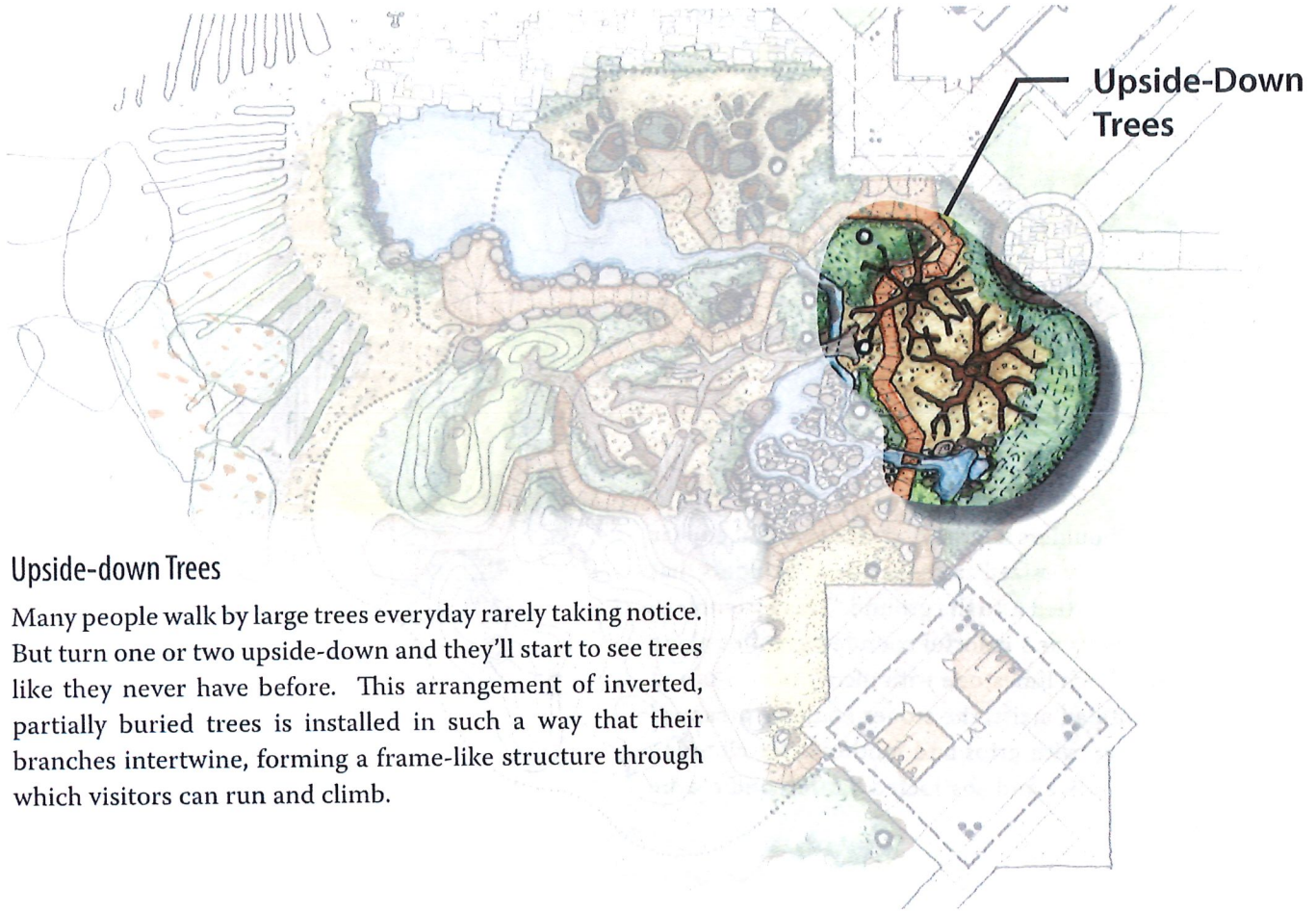


Boulder Prospect

This grouping of large boulders and smaller stones might appear as if it had once been an oversized cairn—a pile of boulders that long ago collapsed and settled into the ground. This assemblage of stones includes various and colorful rounded granites along with flat slabs of fossil-rich limestone with plenty of cracks and crevices. Working with an artist, the stones could be arranged to reveal a story, carved with grips and footholds for climbing and hopping, representative and abstracted figures, and maybe some seats and stairs.

Example Images

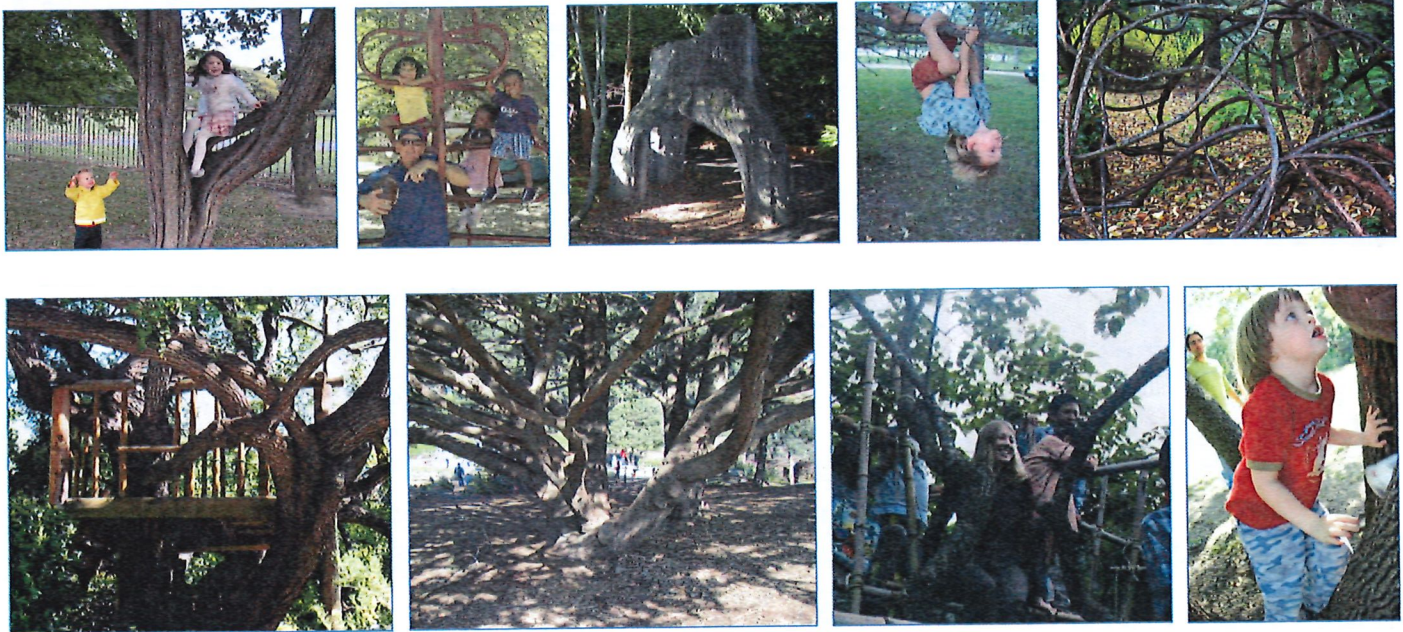




Upside-down Trees

Many people walk by large trees everyday rarely taking notice. But turn one or two upside-down and they'll start to see trees like they never have before. This arrangement of inverted, partially buried trees is installed in such a way that their branches intertwine, forming a frame-like structure through which visitors can run and climb.

Example Images

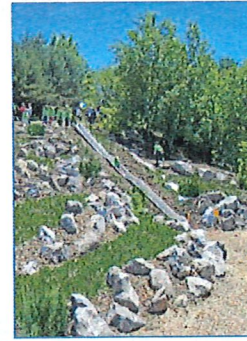
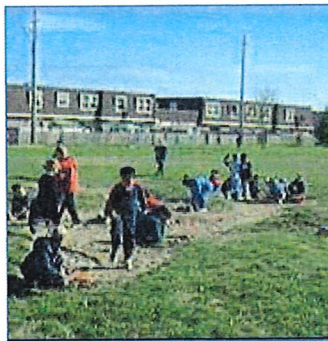
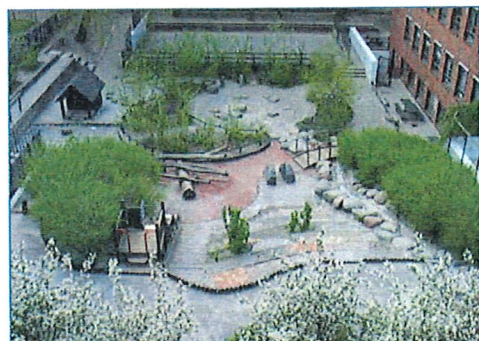
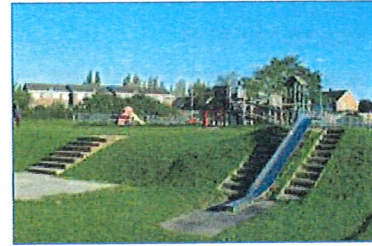
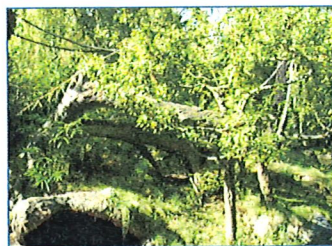
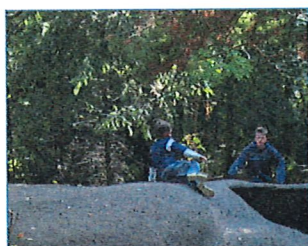


Rolling Hills & Hollows

Rolling Hills and Hollows

With hilltops to stand on and hollows to hide in, this sculpted landscape provides a terrain that's specially scaled for young children's play. Grass-covered humps, ramps, and ravines will mimic the full-scale terrain of the local landscape. Grasses of varying heights will provide relatively soft surfaces on which to run and roll. Short tunnels provide spaces for exploration and stimulate the imagination.

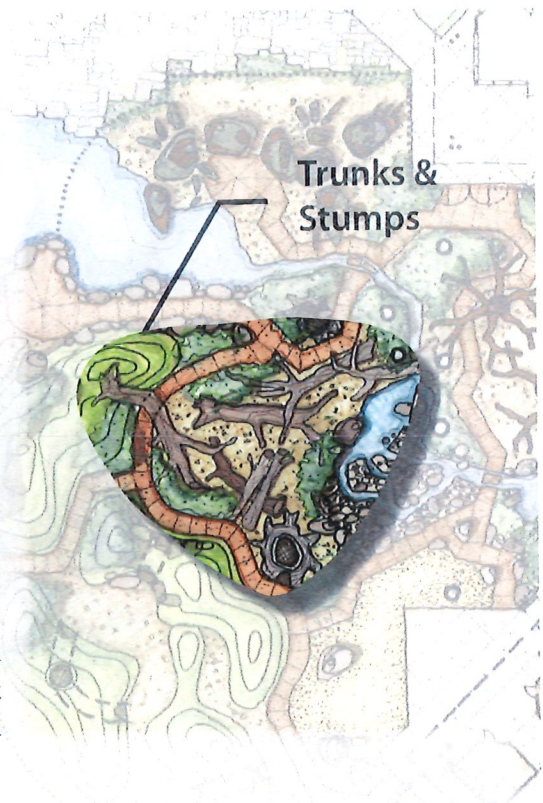
Example Images



Trunks and Stumps for All Seasons

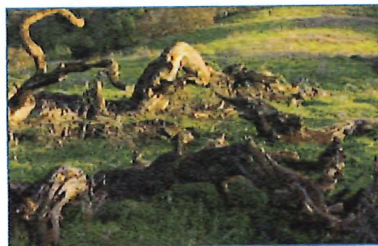
In the central part of the play area, visitors discover a collection of large tree trunks, downed branches, and partially buried stumps in varying stages of decay. While visitors are discouraged from disrupting similar habitats elsewhere on the site, here they can move a rotting tree trunk to see what's underneath or dig around under a stump to build a den for hibernating.

On one edge of this area are two, slightly over-scaled, fabricated tree forms—made with realistic details. One is an upright, hollowed-out trunk of a very large tree. It is open at ground level, looking as if its center has rotted away, leaving a door into a small, round room. The other looks as if it has just fallen, with a tipped-up root ball forming a cave-like den. During the winter these fabricated structures become the hub of a snow cave-and-trail labyrinth. Snow brought in from the parking lots is heaped in and over the tree trunk concealing its summertime purpose. Now it's a cave and the fallen tree trunks and branches provide the outline for an erratic pattern of paths that lead away from the cave. As visitors walk over the paths and pack snow over the dead branches, they begin to form icy walls to walk between.



It's a warm winter day. There's been lots of snow; so a few staff have started to stamp out some trails around the logs and tree trunks. After a while a couple of families arrive and one seven-year old asks what they're doing. "We don't really know yet, want to help?" Right way the older kids in the group start stamping the trails with their feet. "We need more snow!" Before long, the groups have spit up to take on different tasks. Some are getting snow from a pile nearby and others are starting to dig out branches from elsewhere in the play area. "Let's make a fort!" "No, let's make a secret snow city where wild animals live." The kids start to plan a network of paths between the snow caves that others have built into the big tree trunks. They build higher walls along the paths and soon have a maze-like landscape made from snow, brush, and tree branches.

Example Images



Children's Garden

A neighborhood of working gardens will be located adjacent to the nature play area and the south side of the building addition (Figures 14 and 15). Each garden will have its own purpose and character and connected by paths and water. The activities associated with watering and irrigation provide a map-like structure to the overall experience. A hand pump fills buckets that visitors carry down paths to nearby plots. Overflow from the pumping station follows a channel that leads to far corners of the garden where families create ditches that bring water to new plantings. Rainwater from the nature center roof and structured play area stream is collected in a cistern, where visitors use turn and over size spigot to fill buckets and form temporary channels in the dirt. All paths are designed so that visitors can easily drag hoses to specific destinations. With quick release connections that branch out to soaker hoses and pulsing sprinklers, visitors can orchestrate a watering regimen that's different from one day to the next.

A five-year old boy grabs hold of the pump handle and pulls down. To his surprise, a splash of water lands in the bucket under the spout. He and his best friend are here with their moms. They don't have gardens near their apartment, so this is something new. He pulls the pump handle again, but this time his friend lends some muscle to the job. Now they're really pumping water. When the bucket fills and starts to overflow, they stop and look around at what the other kids are doing. One little girl is helping an adult volunteer pull a section of hose down the main path; another is holding a watering can over some watermelon seedlings. It hasn't rained in weeks and the garden is dry. "Bring more water!" she yells, "The plants are thirsty." This gives the boys at the pump an idea. They're going to get their bucket of water down to the watermelon patch before the others can turn on the hose. With one on each side of the bucket they start down the path. When they get there, the little girl points towards the wilting plants, "You got here just in time! Do you like watermelon?"



Santa Fe Children's Garden planting.

Components for the Children's Garden include:

- Rustic potting shed
- Stone water cistern
- Greenhouse
- Apple orchard (4-6 trees)
- Trees and shrubs that produce a variety of edible fruits
- Compost area with bins and piles
- Butterfly garden
- Three sister's garden (corn, squash, and beans planted together)
- Pizza garden
- Corn field, pumpkin patch
- Fragrant plants

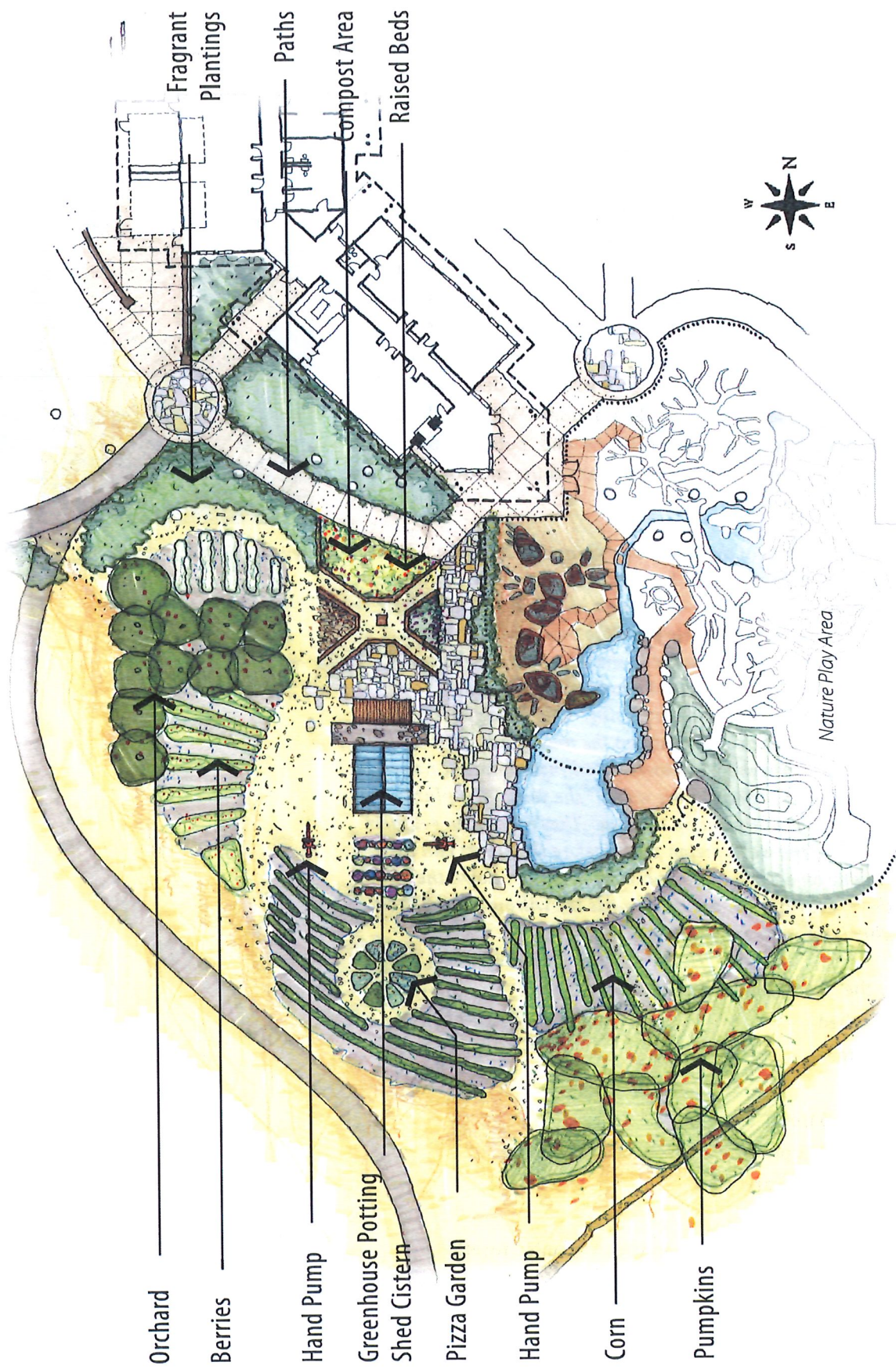


Figure 14. Children's Garden Plan

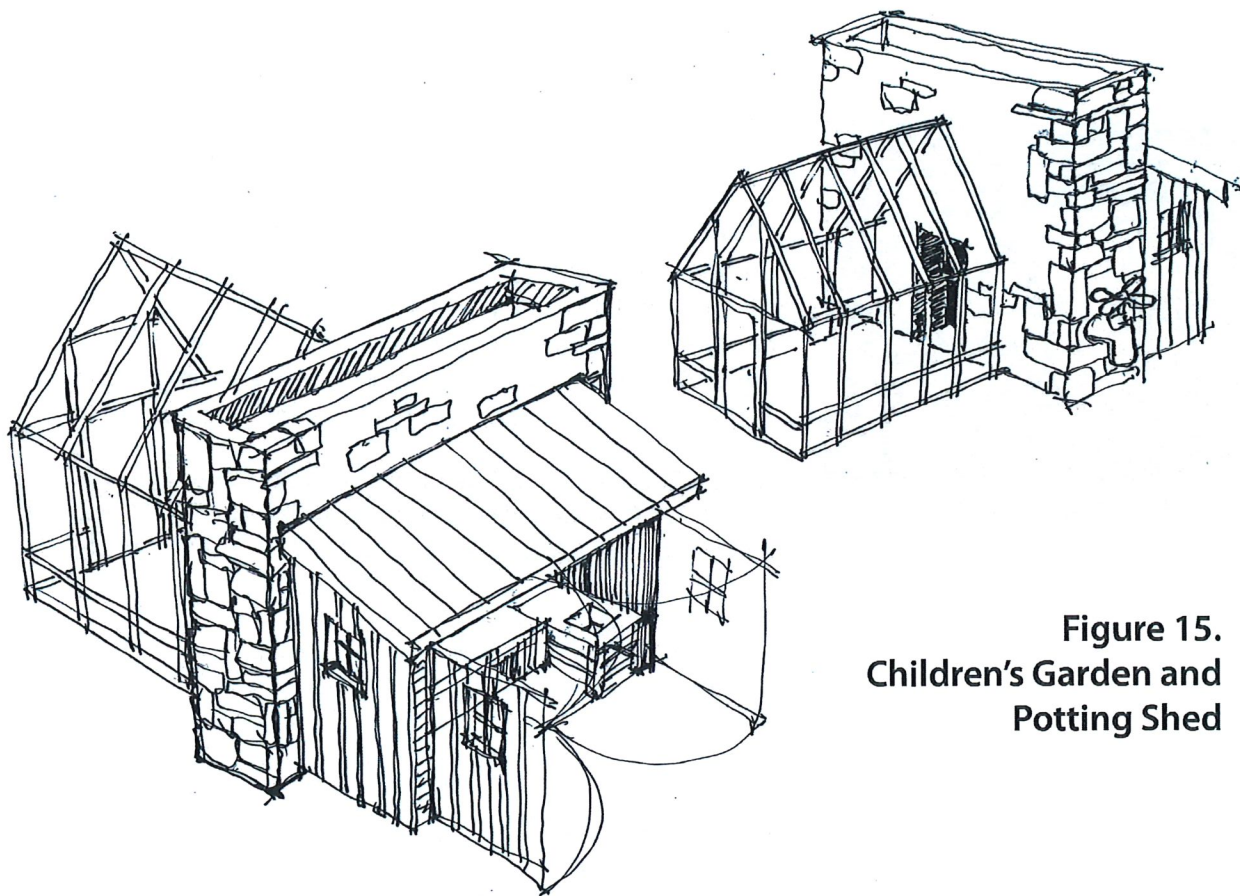


Figure 15.
Children's Garden and
Potting Shed

Developmental Goals

The Children's Garden will provide:

- Opportunities for children to work imaginatively with tools and materials;
- Opportunities for children to experience the growth cycle of plants in a developmentally appropriate timeframe;
- Children with opportunities to care for plants and explore the role that humans play in nurturing plants;
- An experiential context in which children and families together can discover the origins of the food they eat;

Children have opportunities to observe live, ecological connections—between plants, the bugs that eat plants, and the animals that eat plants and bugs.

- Cold frames

Teal Pond



Observing pond life from a floating dock.

Looking towards the northwest from the front of the main building, visitors see a bridge-like structure that rises from the trail to Teal Pond (Figure 16). Walkers and young explorers will sense that there's a destination at the other end of the structure, but won't be able to see it until they've reached the high point of the raised boardwalk. What lies ahead is a rich wetland with open water in the spring and a lush sedge meadow in the summer. A network of boardwalks and a series of docks take visitors through dense vegetation out over the open water and back along the shoreline where they see water on one side and thick grasses on the other.

For one four-year old, this is a new world. She runs ahead of her parents to a place where the tall grasses nearly surround her. When her parents finally catch up to her, she's laying on the dock with her head hanging over the edge looking down into the water. "Look! Spinning bugs on the water! They're dancing together so they don't fall in!" Her parents remain quiet for a moment, they try to draw her attention to a bird perched sideways on a thick reed of grass. She doesn't move, staring down into the water, focusing on something her parents can't see. "I can see all the way to the bottom. There's grass down there too and little fish swimming by. You can't see it, but that's OK, I can." She lies on the dock for a few minutes more. Out loud, she makes a list of everything she sees, and then lifts her head and something farther out on the dock catches her attention. She's up and

Developmental Goals

Teal Pond will provide:

- Opportunities for children and families to observe life that occurs in places that are typically unseen by people, such as under water or deep in a patch of cattails;
- Multi-sensory experiences for children to explore a watery environment very different from their own;
- Opportunities for children to observe natural cycles—birth and death, changing seasons, and changing water levels.

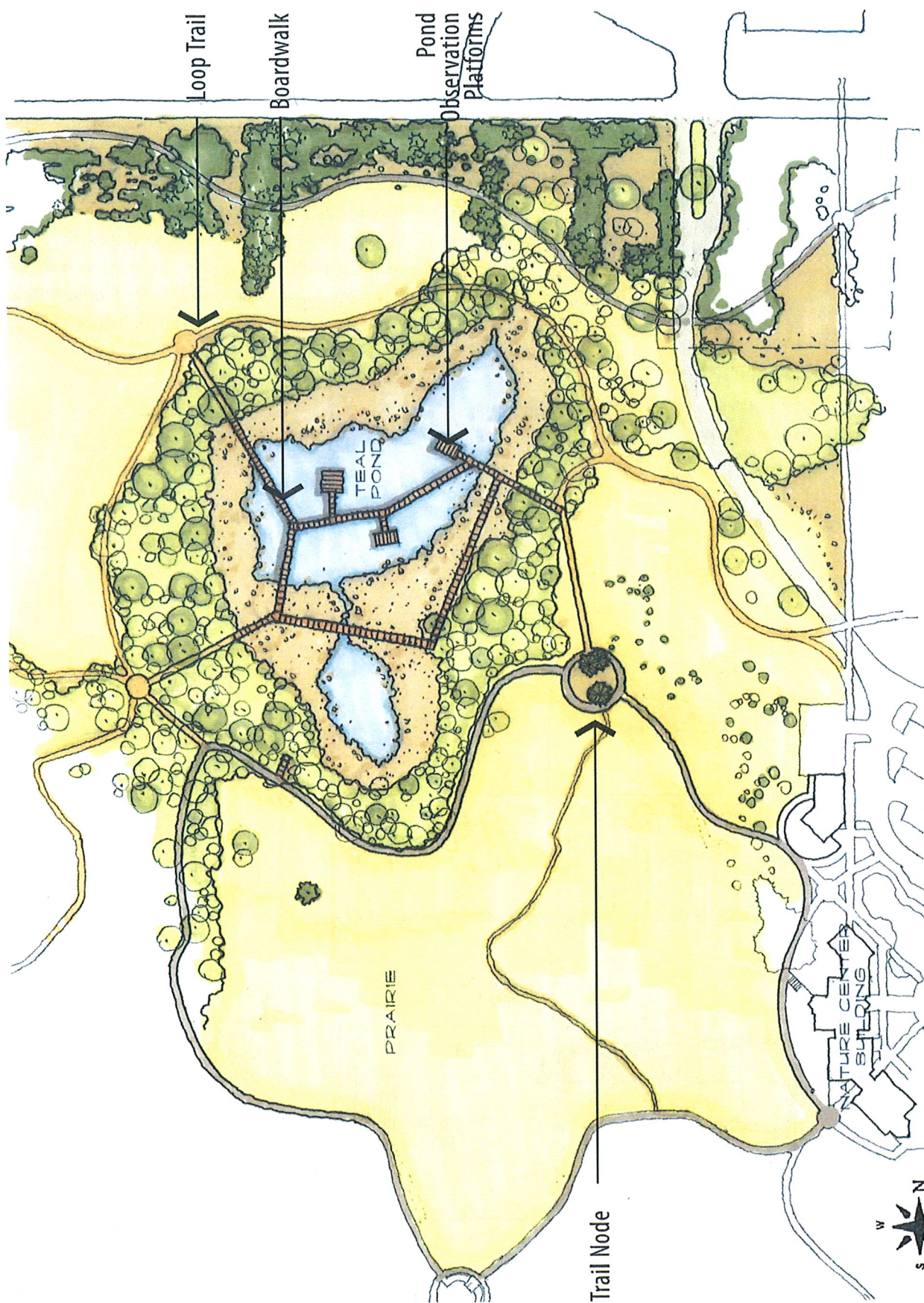


Figure 16. Teal Pond

Developmental Goals

The Sugar Shack and Cider House will provide:

- Opportunities to help transform products of nature into food we eat and drink;
- Opportunities to see trees in a new way—alive and wet underneath the dry bark outside;
- Settings that support and extend children's use of natural materials;
- An understanding of where food comes from.

running again with her parents close behind.

Sugar Shack and Cider House

For a few weeks in the spring and a few weeks in the fall, this curious-looking structure will be the liveliest place on the site (Figure 17). When closed up, the small building looks like a farm shed. But when it's time to invite the public in, the walls swing open and the doors slide away, revealing a stage-like room filled with tools and equipment people don't usually see at a nature center. The Sugar Shack and Cider House will host a variety of activities focused on making food from nature and will be adaptable and functional year-round.

Observation Tower

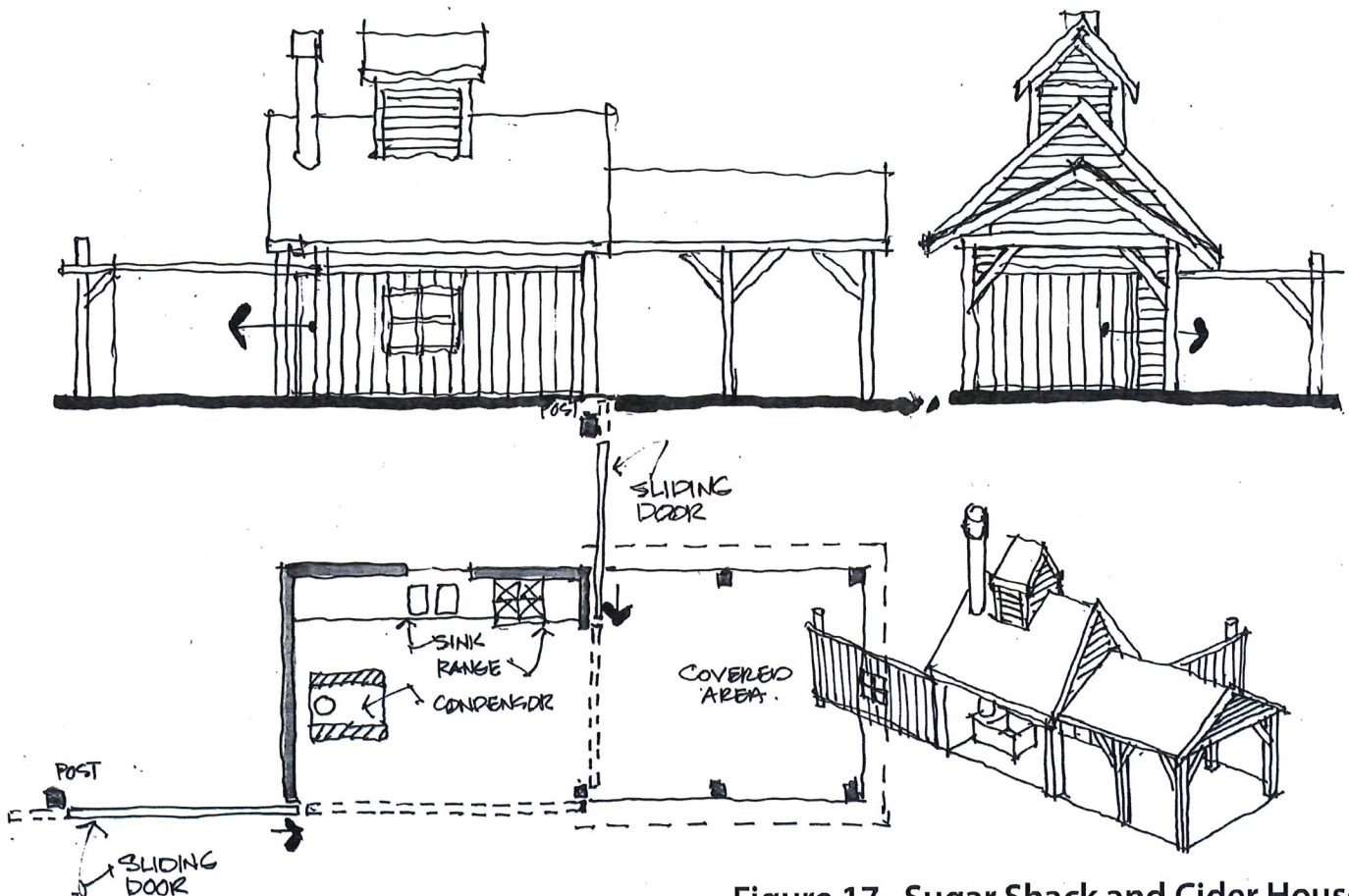


Figure 17. Sugar Shack and Cider House

Even a landscape we know well can appear new and unfamiliar when we see it from a different perspective (Figure 18). From the top of a hill or from deep in the grasses, a prairie looks very different than it does from a groomed trail. The Observation Tower, placed on the edge between woods and grasslands, engages visitors of all ages with nature on a grander scale. Below the tower, a circling trail takes visitors down into the landscape for a gopher's-eye view of the grasses and wildflowers of a Minnesota prairie.

A group of first graders nears the tower, walking so fast they occasionally stumble into a jog. "Race you to the top!" After a long winter indoors, this group has energy to burn. The staff naturalist knows it's best to let the students start on their own, so she gives the release and the entire group runs up the stairs to a platform about one and a half stories above the prairie. "Wow!" "Can you see the school bus from here?" One of the students is standing at the railing looking down into the trees below. "I've never been higher than a squirrel before." Another suddenly sees a large bird off in the distance and calls to his teacher. "What's that?" "Let's watch it and see where it lands." The bird slowly descends in the direction of Tamarack Lake and the naturalist says that it might be a heron going fishing. Only moments before, all of the students were together on the top platform, now they've started to disperse. Some are moving slowly down the stairs, pointing into the woods along the way. Some have even made it all the way down to the sunken prairie trail. Every set of eyes is looking in a different direction until one calls out "I'm a hawk and I can see you down there!" Looking up, the prairie dwellers below scatter as if chased from above.

Additional Outdoor Destinations and Landscape Features

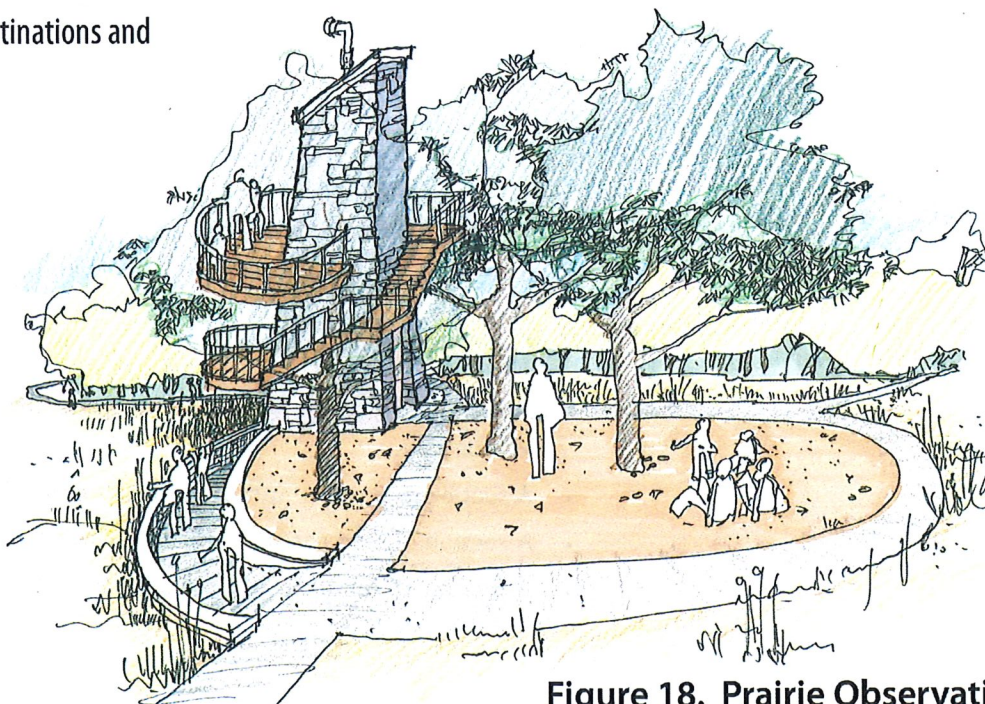


Figure 18. Prairie Observation Point

Developmental Goals

The Observation Tower will provide:

- Opportunities for children to experience nature from a large-scale point of view;
- Opportunities for children to look at elements of nature from various spatial viewpoints, distances, and directions;
- Opportunities that encourage children's active exploration of nature;
- Opportunities for children to construct and share ideas, theories, and thoughts about nature and its processes with adults.

Orientation Hub

There's plenty to see and do at Tamarack Nature Center, and many of the activities and destinations are spread across the site. This is why it's important to provide new and repeat visitors with an easy-to-find, first-stop information center. The Orientation Hub is much like an outdoor room with views and pathways leading to various destinations and trailheads. The interpretive strategy for signage and graphics will rely heavily on photos of people engaged in TNC activities—skiing, climbing on logs, splashing in a stream, bird watching. Photos are proven to aid way-finding, and they give visitors a preview of what they'll find as they strike out across the site's trails and habitats. The Orientation Hub will include a mix of permanent and temporary signage.



Outdoor Classroom

Gathering Area

When Tamarack Nature Center hosts large events and festivals, this will be the primary place where visitors gather. This level and open turf area provides places for tables, tents, and stages. A constructed fire pit—possibly created by an artist—with seating and trail connections offers an attractive focus, especially during winter and evening events. With open sight lines to either the main building or an auxiliary structure, the Gathering Area will, when necessary, function like an outdoor auditorium. Summer camps can gather around picnic tables for lunch and facilitated group activities.

Unstructured Nature Play Destinations

Ideally, families with children and groups of preschoolers would be able to fully explore various habitats in unrestricted and self-directed ways. With time, however, this unrestricted exploration takes a toll on fragile habitats. But if temporary play areas were established in two or three suitable locations around the site, visitors could have full access to defined locations for several months or even a full season. After a section of ground has given what it can to visitors' discovery of nature, the station is relocated and the area is left to recover. These off-the-trail destinations could be marked and celebrated with gates and fences created by artists.

Destinations might include:

- A section of woods in which the invasive shrubs have been cut and left for play;
- A section of prairie expected to produce an abundance of flowers;
- A section of reed canary grass with paths mowed in late summer;
- A section of pond shore or stream bank where the water is shallow.

Canopy Walk

From the ridgeline trail on the southeast side of the Lake, visitors can walk out on a level, dock-like structure that takes them out above the forest canopy. There they can experience life in the treetops.

Art Node

Near the northeast corner of the site, visitors will find a convergence of trails where a nature themed art acts as a welcome sign to the Nature Center. Other artworks are installed for varying periods of time along the art walk trail.

Bird Blind

In the southeastern corner of the Center, near the old farm site, are wetlands that attract a diversity of wildlife. A specially designed enclosure at the edge of the wetlands shelters wildlife from human disturbance and facilitates bird watching by visitors.

Tamarack Lake Raft

This floating platform functions as a dock and a human-powered pontoon boat. While attached to a stationary structure at the water's edge, it serves as an observation platform. When staff or volunteer guides are available, it can be launched out into the lake, powered by people turning paddles. Once out in the lake it functions as a floating laboratory for studying aquatic life.



Bird Blind

Developmental Goals

The Lookout Tree will provide:

- Opportunities to explore unfamiliar subjects in nature from a safe and familiar place;
- Confidence-building experiences that motivate children to go outside and see more;
- Opportunities for children to look at elements of nature from various spatial viewpoints, distances, and directions;
- Recognition activities for specific animals based on how they look, act, and sound;
- Ways to safely explore nighttime life in the woods;
- Opportunities to observe live, ecological connections—between plants, the bugs that eat plants, and the animals that eat plants and bugs.

7.2 Indoor Destinations

For visitors who start their experience in the main building, exhibits and activities can provide an orientation to the site and opportunities to learn and practice nature observation in a comfortable indoor setting. With live animals indoors and wildlife right outside the windows, the new exhibit hall will become a lively destination in which to discover nature (Figures 19-21).

The Lookout Tree and Wildlife Thicket

This multi-level, treelike structure beckons children who like to climb and discover things that others don't yet know about. Built in front of the windows on two walls, this climbing structure provides new perspectives and new reasons to look outdoors that don't otherwise exist inside the nature center. It features various points of discovery where young visitors can find some unusual views on the nature just outside the windows.

The structure looks like a tree that's grown over the wall from the low-ceiling play space up and around to the large expanse of glass at the prairie end of the gallery. It has two levels off the ground and features a climb-into crow's nest at its highest point. An open, stylized branching pattern is constructed from structurally sound branches that have been stripped of bark and smoothed to reveal knots, twists, and branch stubs. A wood ramp leads up to stiff netting to climb on, with steady lookout platforms. Close to the ground, the surfaces are squishy, like a forest floor.

The area outside the windows will be landscaped to attract animals with food, water, and shelter—functioning like a miniature wildlife refuge, off limits to visitors and visible only from indoors.

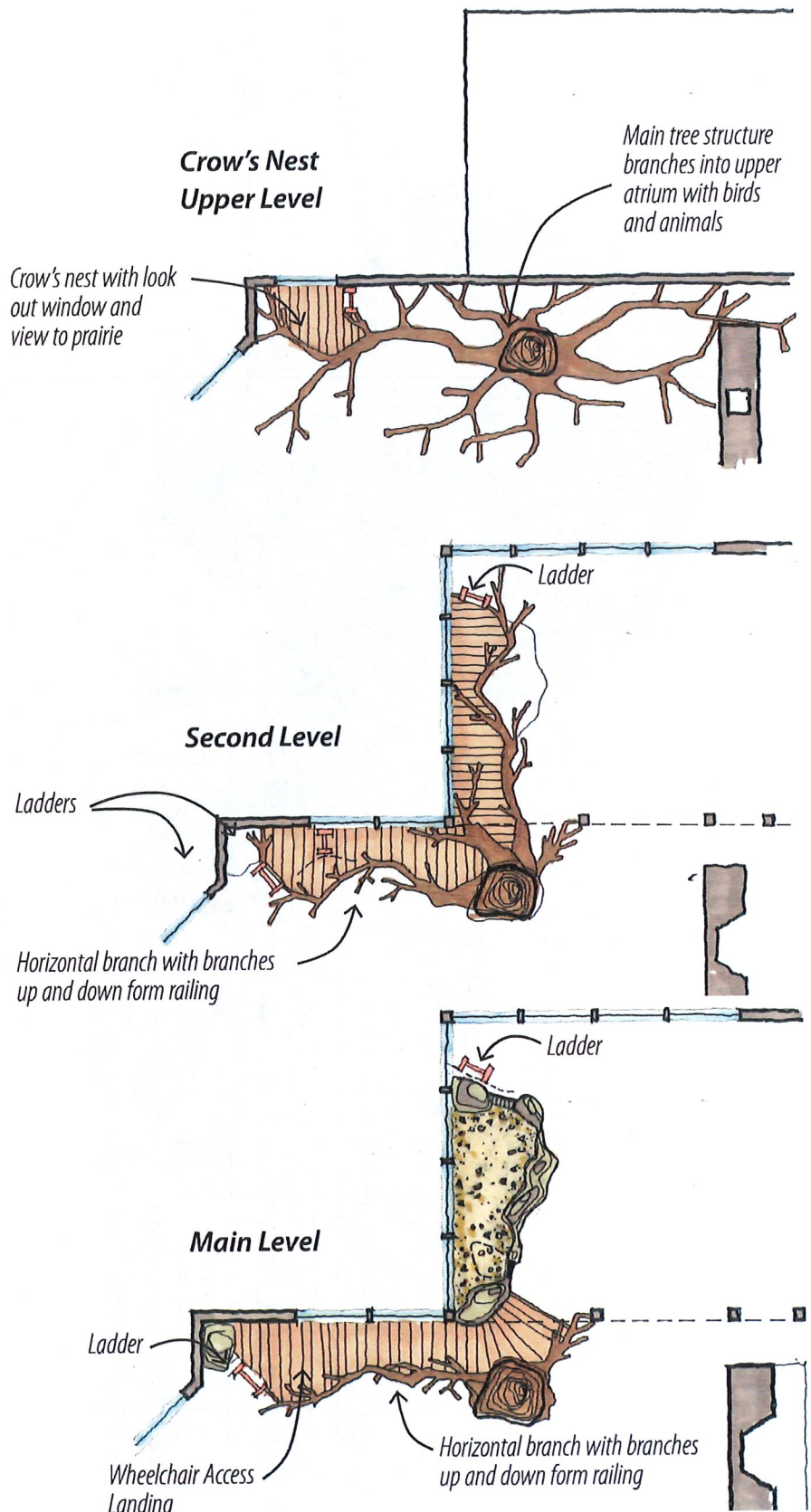
Points of Discovery

- Peer through a periscope that goes through the wall and points down to the pond to get a bird's-eye-view.
- Spotting scopes with characteristic bird images
- Night views, "What happened here last night?" "Who visited the pond?"
- Bird listening, a microphone outside the window and a speaker inside
- Viewfinders (framing devices that mimic cameras, oversized)
- Inside a fox den, down on the ground

A three-year old and his dad come to Tamarack Nature Center every week. As a matter of routine, the boy heads straight for the Lookout Tree. First, he goes to a floor-level animal den that's built into the base of the tree. He looks for the play animals hiding there. This time it's the fox, which he



Figure 19. Indoor Exhibits Plan



**Figure 20. Lookout Tree
Plan Cross Sections**

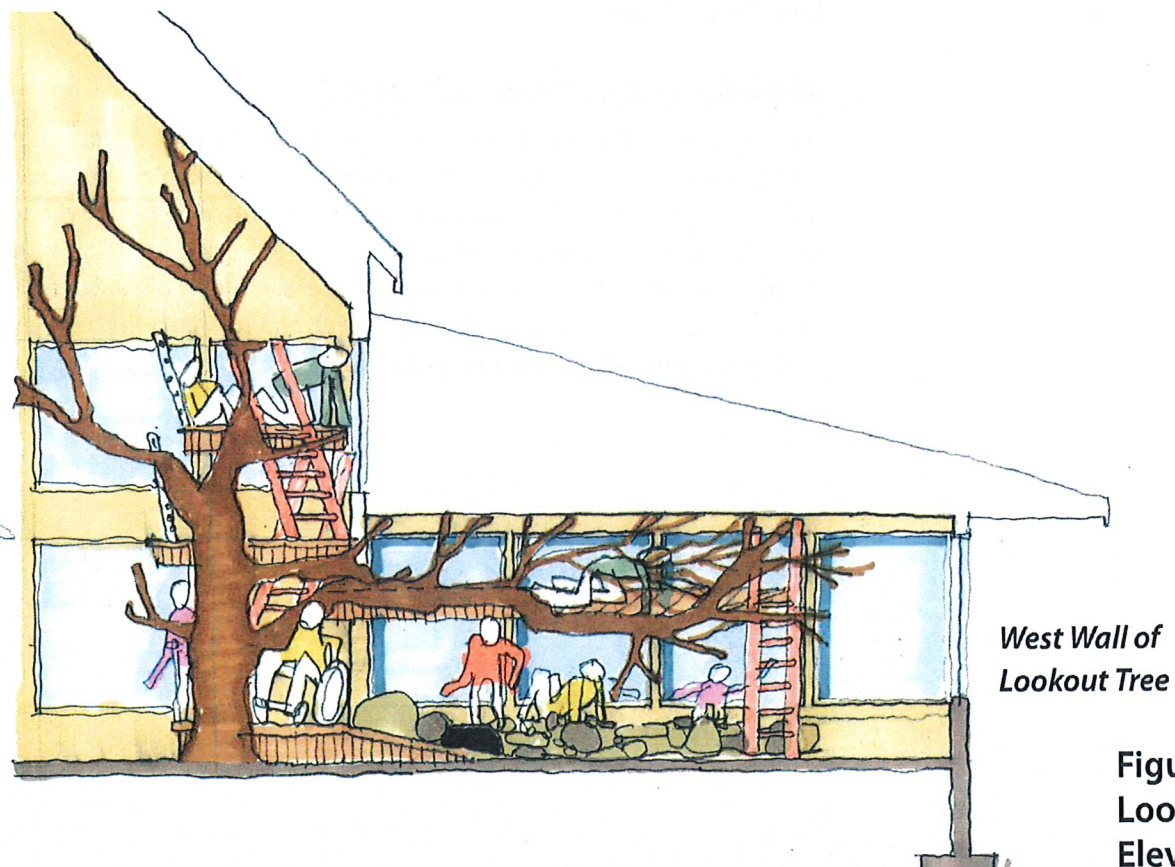
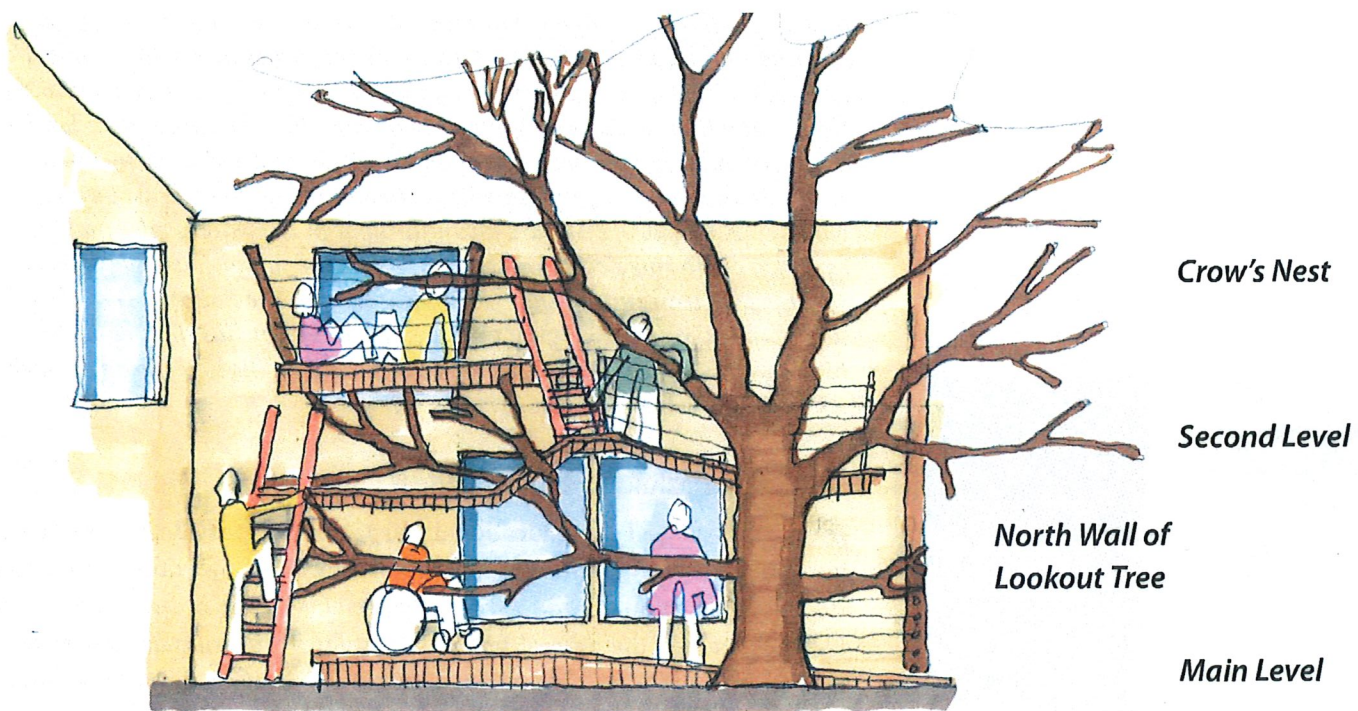


Figure 21.
Lookout Tree
Elevations

promptly tucks under his arm as he starts his climb to the top. He stoops over and walks up a sloping platform. The window is on one side and tree branches on the other. He peers through the branches at his dad. Only a few feet in, he stops to look through an oversized spotting scope, more to try the activity than to see what's out the window. Then he climbs up a ladder to the second level and crawls around the corner to another set of windows. With his hands against the glass he gazes out at small pond just beyond the window. A couple of birds are flitting around at the water's edge making squeaky, chattering noises. He tries to mimic the sounds, listening near a speaker that transmits sounds from outdoors into the Lookout Tree. His next stop is the crow's nest, all the way up. Today, he has the tree all to himself. So when he reaches the top he sits down in the nest facing the high window and watches for squirrels.



Exploring an indoor nature play exhibit at the Minnesota Children's Museum.

Naturalized Habitats for Captive Animals

Animals displayed for educational purposes can provide nature center visitors with extraordinary opportunities for up-close observation that they don't often find outdoors. This experience is enhanced when exhibit habitats include the natural features that allow the animals to behave as they would outdoors. Naturalized habitats also provide important context for early learners to better understand how various animals are adapted to their environments—turtles to shorelines, snakes to underground, and birds to tree branches.

3D Orientation Map of Tamarack Nature Center

As people enter the visitor center, one of the first things they come upon is a tabletop map of site. The colorful, sculpted surface depicts the terrain of TNC. The primary destinations are highlighted with small, but over-scaled models affixed to the map. All of the trails are represented and minimal graphics provide brief descriptions of the site's key destinations. An adjacent panel with changeable graphics announces current happenings, daily programs, and interesting phenology.



Implementation

8.1 Phasing and Construction Costs

The TNC site master plan has been developed to allow phased implementation. The changes to the parking facilities, new destinations, and building additions can happen as funding is available. The new access road to County Road H2 can occur once the residential inholding property is acquired by Ramsey County. That flexibility allows for utilization of the existing parking lot near Otter Lake Road until it needs to be repaved. At that time, the new parking lot should be constructed and the existing parking lot removed and restored with vegetation. The new access drive from County Road H2 can be constructed to utilize either the existing or new parking lots. The remodeling and additions to the Nature Center building should occur as one project for cost efficiency. The naturalized animal habitat and 3-D site map can be constructed without expansion of the building. Expansion of indoor exhibits beyond that scope (i.e. the lookout tree and wildlife viewing) requires relocation of administrative offices into a new wing to free up exhibit space.

The first phase on construction should provide a “wow” experience for visitors and demonstrate the new direction for Tamarack Nature Center. The Children’s Garden and Nature Play area are the most visible example of the new experiential direction for hands-on interaction with nature and art and should be part of Phase One construction. These also offer wonderful opportunities for nature, play and education activities for children and families. A paved turnaround drive and small parking lot near the building should also be constructed in Phase One to provide better access to the building and new destinations.

The preliminary cost estimate (Appendix D) shows a redevelopment cost of approximately \$8.4 million (2007 dollars) to construct the site, buildings and destination exhibits recommended in this master plan and to acquire the inholding property. Phase One redevelopment would be approximately \$1.5 million. This cost estimate is based on the following categories:

*"We know the cost of everything
and the value of nothing."*

Preliminary Cost Estimate

Nature Center Building Additions and Remodeling:	\$2,540,000
Other Buildings and Shelters	\$ 960,000
Indoor Exhibits	\$ 265,000
Site Development	\$2,058,000
Outdoor Exhibits and Destinations	\$1,115,000
Design and Engineering (approximately 10%-15%)	\$ 875,000
Land Acquisition	\$ 500,000
Project Total	\$8,353,000

Construction Phasing Recommendations*

The following site and building improvement priorities are recommended over a five-year developmental period.

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Children's Garden	Maintenance Building	South Classroom Addition	Teal Pond Boardwalks and Docks	Parking Lot – Part 3
Nature Play Area	Utility Relocation	North Administration and Volunteer Addition and Exhibit Hall Remodel	Bird Blind	Remove Existing Parking
Outdoor Pavilion	Paths and Walks and Loop Paved Trail	West Screened Outdoor Classroom and Plaza	Canopy Walk	Entry Drive to County Road H2 Entry Sign
New Part 1 Parking Lot (30 cars) and Turnaround	Gathering Area and Pond	Furnishings	Observation Tower and Prairie Cut	Art Elements, Art Trail and Node
Walkways and paths	Parking Lot Part 2 (50 cars)	Indoor Exhibits	Tamarack Lake Raft	Grading and Restoration
Landscaping and Restoration	Sugar and Cider Shack	Wildlife Thicket and Native Plantings		Prairie Restoration
\$1,356,000	\$1,095,000	\$2,810,000	\$690,000	\$967,000

* Plus 10%-15% Design and Engineering Costs

8.2 Funding and Partnerships

The revitalization of Tamarack Nature Center has the potential to match the goals of many organizations and agencies. Getting children outdoors, more active and engaged with nature is a value shared by many enlightened groups. The merging of nature and art also appeals to many people and groups. Ramsey County should seek corporate partnerships and donations from individuals, service groups and organizations for capital improvements, sponsorships and events. The improvements at TNC are eligible for funding from the Metropolitan Council and the Legislative and Citizen Commission on Minnesota Resources. The linkage of nature and education at Otter Lake Elementary School opens up additional funding options. Ramsey County can designate funds for improvements and matching dollars from outside sources.

8.3 Funding/Operations/Staffing

Potential Revenue Generation

The County has been successful in its initial application for federal, state and foundation grants for this project and will continue to seek grant funds for the development and implementation of the plan. The County, however, should not rely on grants to meet the on-going operating costs of the project, once implemented. Grants are competitive and even if the project meets the criteria, there is no guarantee the project will be funded. In addition, many grants require local match of cash or in-kind services and do not fund on-going operations.

At present, TNC's ability to charge users to cover the cost of programs services and overhead has been limited. Currently fee supported programs, such as, early childhood education programs and summer day camps have been able to generate revenues, covering a majority of direct programs costs, however, building operations and maintenance are supported by County levy. To help support on-going operations of the destinations plan, we anticipate implementation of a user fee for access to special use facilities within the redeveloped site.

Maintenance Costs

It is anticipated that maintenance costs will increase as new facilities and destinations are developed, therefore, it is important that the County plans for increased staff and utility costs, such as electricity, heat, water and operational supplies for additional destinations and exhibit components.

Establishment of a maintenance program is essential. Currently TNC is maintained by one full-time equivalent building custodian, with

support from a park operations district crew for grounds maintenance and repair. As additions and improvements are made, the County must identify maintenance requirements for each developed component and incorporate adequate training for staff to ensure facilities are maintained at the appropriate level.

In addition, a Capital Asset Management Plan should be developed for added facilities/play components, identifying best practice preventive maintenance tasks and including a life cycle replacement plan with funding in the future.

Mobilizing Community Volunteers

It is anticipated that volunteers will be used to support implementation of the destination plan, conducting staff support functions, such as, play aides, naturalist aides, trail guides, animal care attendants, special events and natural resource management projects (i.e. seed collection, removal of invasive species, etc.). In doing so, the County must ensure there is adequate staff capacity for on-going recruitment, training, retention, supervision, evaluation and recognition of this valuable human capital within your community.

Staffing

The Destination for Discovery Plan includes the addition of multiple building and site components, along with the proposed expansion of the highly successful Early Childhood and Family Education (ECFE) programs. Ensuring visitors and program participants have a fun and enjoyable experience and feel safe and welcome, requires an adequate supply of highly qualified staff. Implementation of new program components such as the unstructured nature play areas, children's garden and expanded live animal exhibits may require specialized training in the areas of early childhood and family education, horticulture, animal care, and water systems technology.



Appendix

- A. Building Evaluation
- B. Visual Preference Survey Results
- C. Site and Building Programs and Spatial Needs
- D. Master Plan Construction Cost Estimates
- E. Supportive Research

A Building Evaluation

KODET ARCHITECTURAL GROUP, LTD.

September 8, 2006

Tamarack Nature Center
Ramsey County Parks & Recreation Department
5287 Otter Lake Road
White Bear Township, MN 55110
RE: Evaluation of existing building & site.

The following is an observation to the existing Tamarack Nature Center. The building is in excellent condition and has great potential. The following is to build on what has been accomplished and used to date.

Site immediate to the building:

Upon arriving to the site the existing property sign off Otter Lake Road is not clearly visible from the street. One option is to rotate the sign so it is perpendicular to traffic, making it more visible to passing vehicles. Adding lights to illuminate the sign at night would possibly be beneficial. Most important is a clear set of graphics that provide consistent identification through the site.

The main asphalt parking lot has approximately 81 parking stalls with four of them being handicap accessible. The progression from the main parking lot to the building is by a shared road used for vehicles and pedestrian traffic.

There are obvious concerns regarding safety issues when children and vehicles are using the same path. A shared path also diminishes the visitor experience. A main path to the building should be one that builds up anticipation of entering and using the building.

Consideration should be given to install a staff parking lot off to the side of the building screened by landscaping. The existing path up to the building will become solely for pedestrians only. The path is very long from the main parking lot to front door of the center. Installing exhibits leading up

to the front door of the building would help direct people to travel towards the building and eventually inside, holding the visitors' interest.

An existing garage used for highly needed storage is located next to the front of the building. The garage location does not add to the experience of entering a nature center. Adding landscaping to screen the existing garage or relocating it would create a more seamless visitor experience. The staff complained about not having enough storage space in the garage for program and utility vehicles and other miscellaneous items. Adding additional storage space will require further investigation. Consideration should be given for a maintenance building, maintenance yard, and other support spaces in a location that does not conflict either visually or operationally with the visitor's center.

The trails around the building do not appear to be clearly marked with signs. Consideration should be given to cohesive graphics. Improving the signs along the trails and adding additional benches at key viewing areas would enrich the experience of the visitor, traveling through the site.

A number of the key staging areas around the building do not have the adequate shelter from sun and rain. Adding canopies or extending roof canopies would help protect groups of people visiting the site from rain. Providing a variety of shelter sizes could enhance the visitor experience.

The concrete amphitheater is located in a spot that has a very good view of the surrounding prairie, but the amphitheater is situated to the west of the building and appears to be in shade in the morning due to the building and the surrounding trees. In the afternoon it appears to have direct sun. Consideration should be given to natural or man-made shading.

The existing exterior drinking fountain is not handicap accessible with high/low bubblers. Other minor changes should be considered for accessibility and ease of identification.

Some of the ground covering around the building is showing signs of erosion due to water run off from the roof. Additional drain tile or spillways to the existing rain garden may be needed. Enlarging the existing rain garden and making it more interactive with people may help benefit the experience of learning about nature. Some of the tree lines surrounding the building appear to have a lot of young trees under the mature trees. These could be trimmed to extend the views.

Building:

The building in general is in very good condition except for some windows which may need to be replaced. The existing building is a single story building built in 1988 and has a classroom addition to the south, which

was added in 2003. Entry into the building is not clearly marked from the front of the building. Consideration needs to be given to making the entry more welcoming.

The entry to the building also could be reinforced by an exterior space. The space could be framed by a seating area, landscape, and over all transition space from the exterior to the interior.

Upon entering the building you are brought into a great room with a fireplace and very high ceilings. The lighting in this space is very dark and could be improved to make the space feel warmer. The interior space has a lot of exhibits and miscellaneous items. Organization of the exhibits should be considered. The visitor experience needs to be challenging and rewarding.

The interior of the space needs to be more of a destination. Attractions to visitors and a reason for using the building need to be more compelling and obvious. Perhaps more activities, food, information, and education will enrich the visitor's need to visit and use the building. Additional storage space is also needed.

Additional classrooms could be added to the south of the building to provide more spaces for group activities. Part of the addition could be a three-season porch classroom, which will allow more interaction with nature. Also transition spaces between the interior and exterior should be considered. Circulation should be almost seamless from the interior to the exterior. This will allow activities on the interior to flow outside.

Additional exhibit space could go to the west of the building to provide better interaction with nature. This direction has better views of the prairie. Installing more windows low to the ground will help establish better interaction with the outside. By adding more space and creating a walking path through the exhibits will allow more people to travel through the space and create a better overall experience. Adding an area for concessions may also help draw people to the building.

Additional mechanical and electrical services may be required. With the building nearing twenty years of age there are a number of items that may need major maintenance or replacement depending on the building program. Some code issues need to be considered. For instance, a fire sprinkler system may be required in the next building addition.

Summary :

The main goal of this review is to analyze the existing facility to determine what ideas and considerations can create a more interactive building. The focus needs to be on visitor experience and expectations. The building

and site have a great deal of potential and pose an excellent opportunity to provide programs and explore nature.

In review, I have touched on a number of issues, which will require further discussion and consideration. Clearly Tamarack Nature Center is an exciting opportunity with a great deal of resources. The facility and its environs have served successfully for nearly twenty years. As with any amenity the facility and site need upgrades to meet today's sophisticated visitor.

If you have any questions, please do not hesitate to call.

Sincerely,

John Brandel

KODET ARCHITECTURAL GROUP, LTD.

B Visual Preference Survey Results

Visual Preference Survey Character and Visitor Experiences

Ramsey County is preparing plans to revitalize Tamarack Nature Center (TNC). This effort will change TNC from a traditional nature center to a “Destination for Discovery”.

Mission

As a Destination for Discovery the mission of TNC will be to: “Enrich people’s lives by helping them discover the value of nature through art, play, exploration and inquiry.”

Design & Practice

In general, this means a focus on inquiry and experiential learning with a hands-on approach to engaging young children and families with nature. A key aspect of the planning is to design engaging destinations and experiences at TNC. To establish a starting point, we have identified the following factors:

Key experiences and guiding principles:

- Play In Nature
- Discover and Study Nature
- Finding Respite in Nature
- Serve Nature and Community
- Be in Harmony with the Site.

Design character and criteria:

- Authenticity
- Harmony with site
- Artistic quality
- Natural character
- Utilitarian with a twist
- Experienced based
- Hands-on

Community Input

The next steps will be to translate that Interpretive Plan into a master plan for the site and to prepare concept designs for key exhibits and destinations. Before beginning that work, the TNC Planning Team would like your reaction and opinions about key experiences and design character.

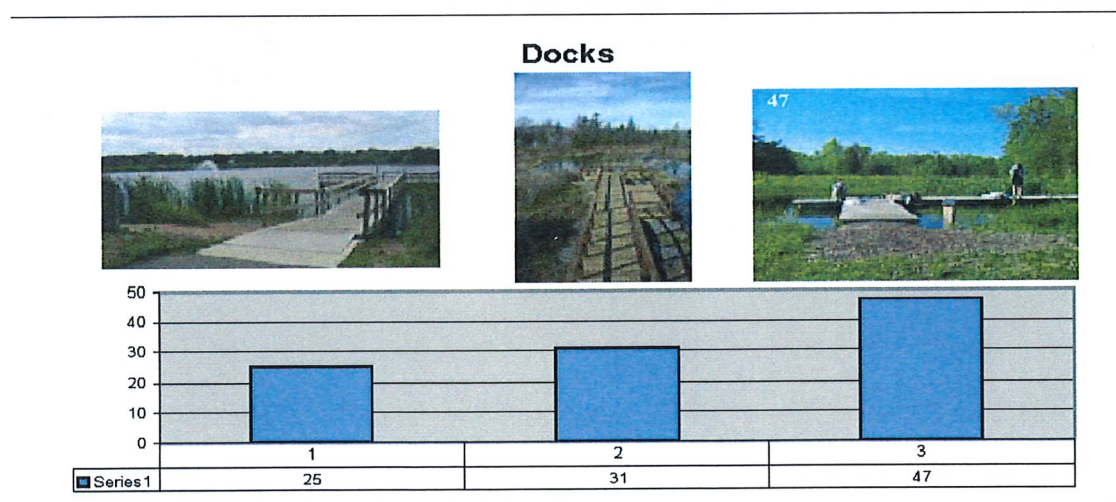
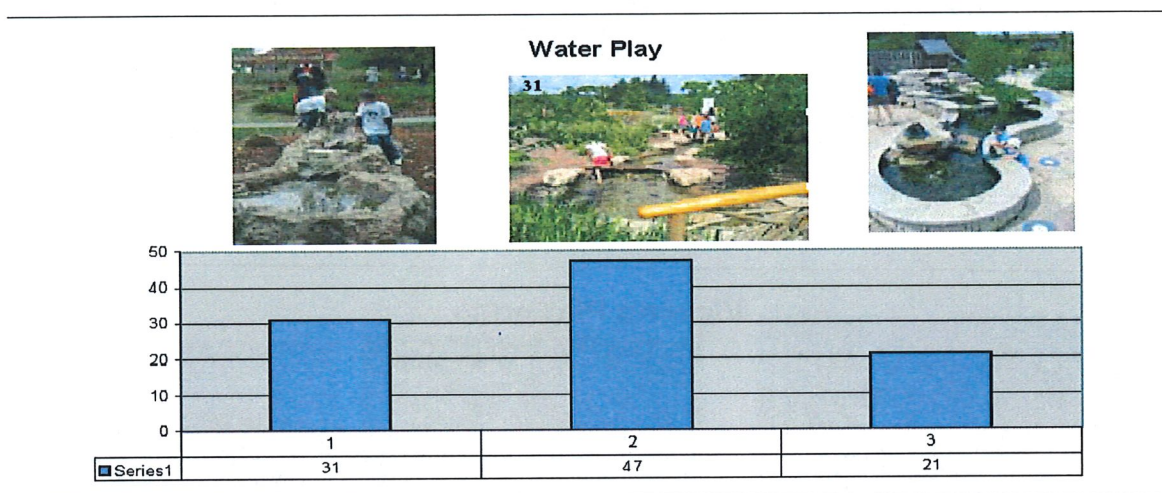
Directions: The following images were collected from facilities throughout the United States to illustrate a range of activities, places and design character.

Rank each of the 3 images in each category (1= least, 3=most) for:

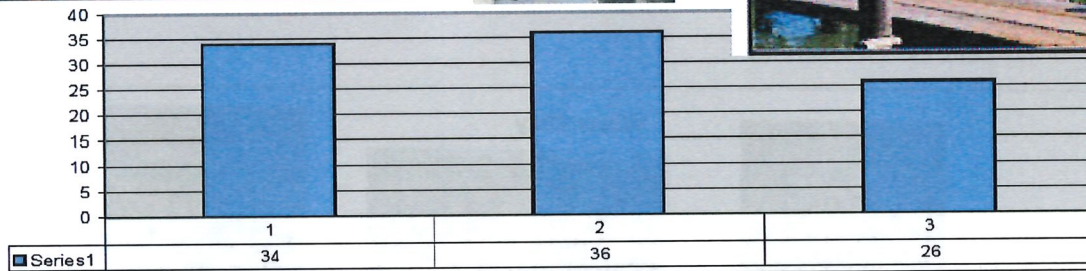
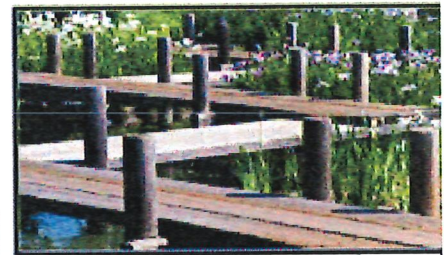
1. How well you feel it fulfills the desired visitor experience and fits with the new mission of TNC as a Destination for Discovery and the design criteria
2. The visual and design character that you feel should occur at TNC (i.e. from naturalistic to fabricated).

The best local, national, and international examples of hands-on nature experiences, nature-based play areas, and integrated art and nature experiences were collected and reviewed in a series of visual-preference surveys. Information from these sessions helped to define the desired activities and character of the new Tamarack Nature Center. Survey participants were asked to view more than 60 photographs of nature, play, and art environments and select the most appropriate images and activities for Tamarack. The Ramsey County Parks Commission, County staff, Friends of St. Paul and Ramsey County Parks and Trails Board, peers from other nature centers, and others took the survey.

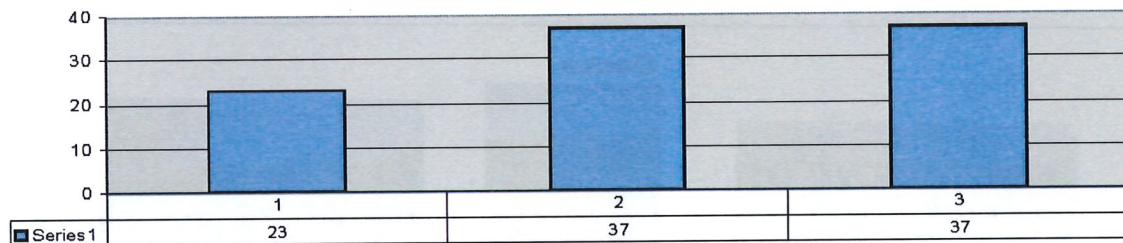
The following charts illustrate the survey respondents' preferred activities and character. Highest ranking elements and activities were incorporated into the master plan.



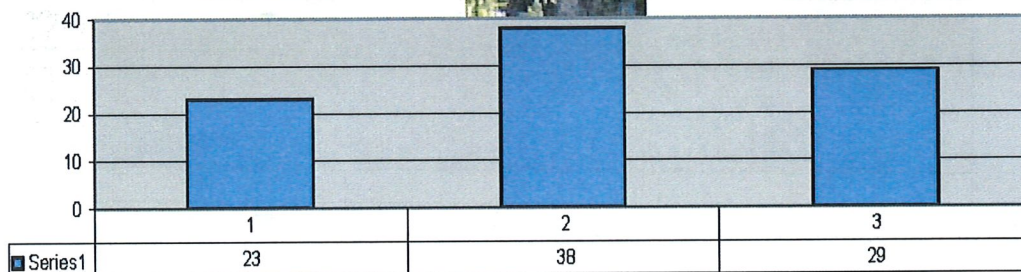
Boardwalks



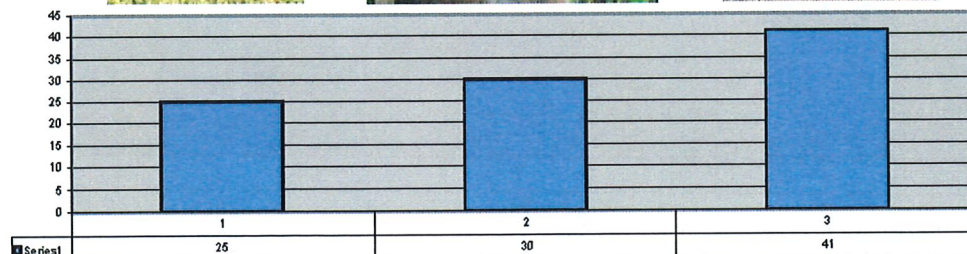
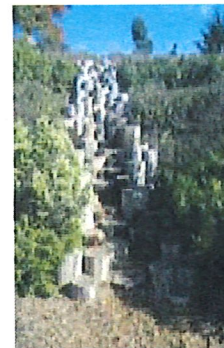
Viewing Platforms



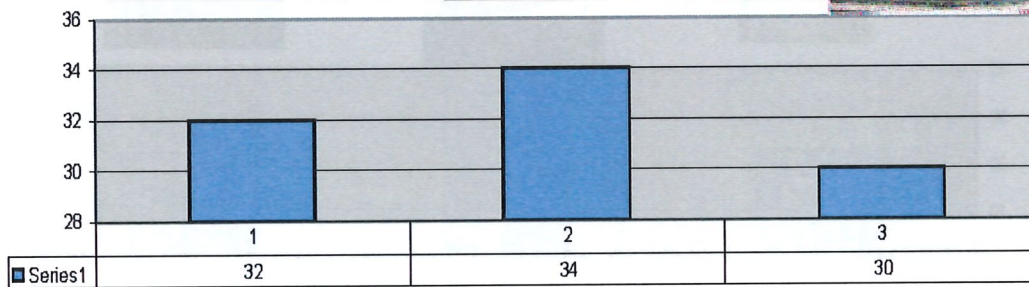
Change in Prospect



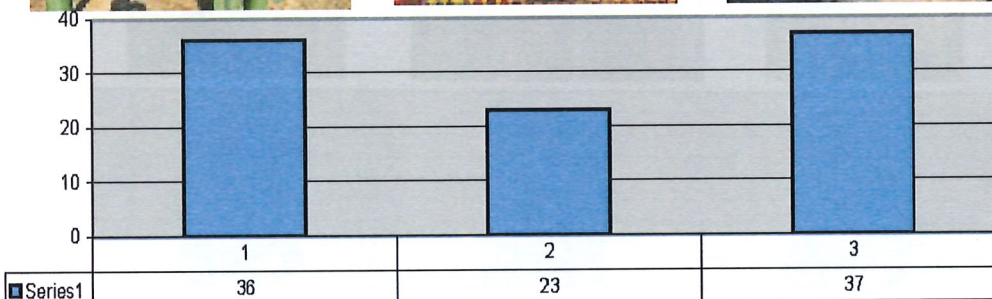
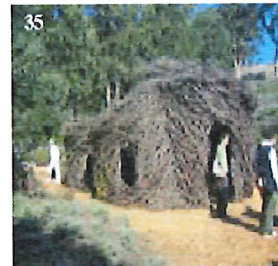
Functional Art



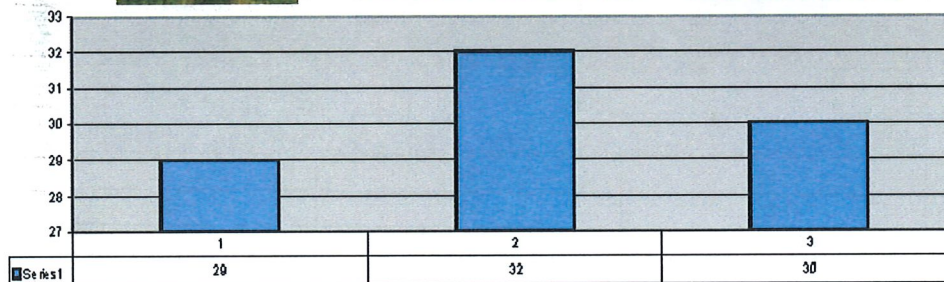
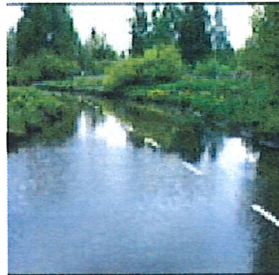
Sculptures



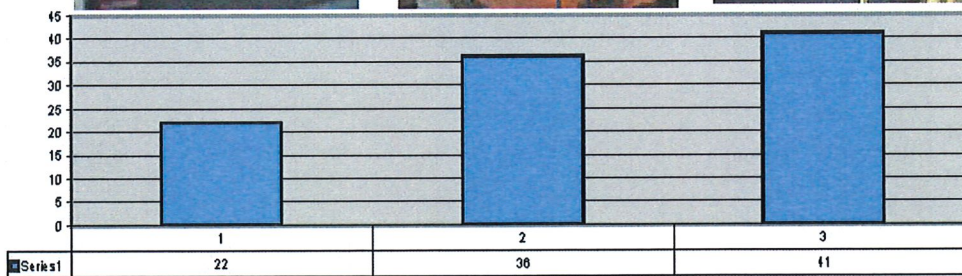
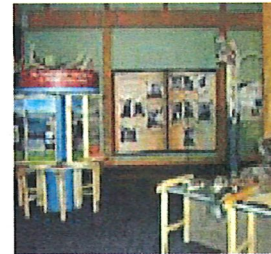
Environmental Art

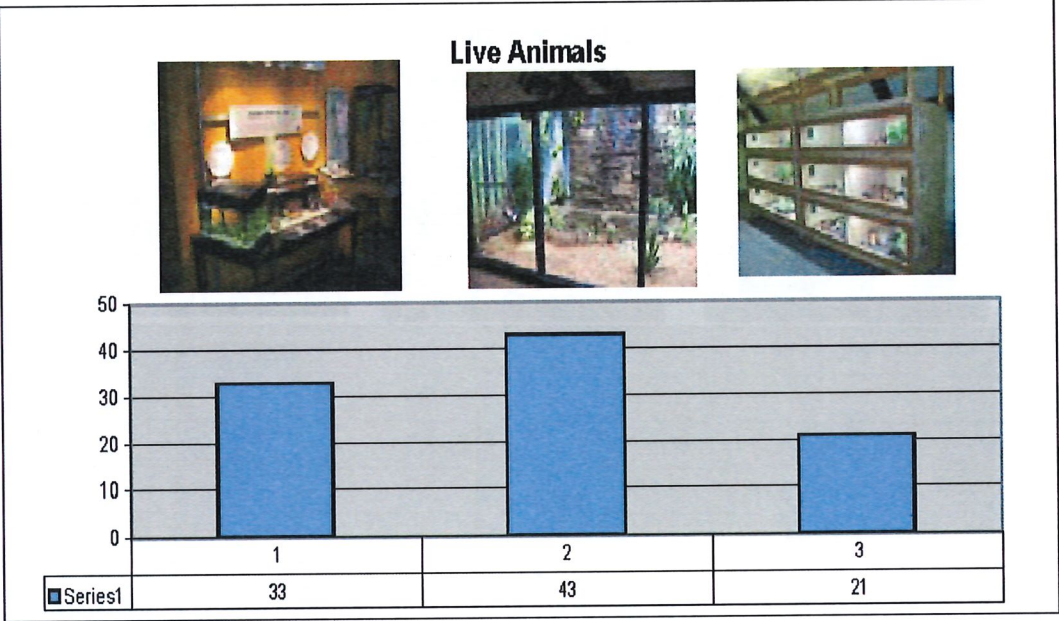
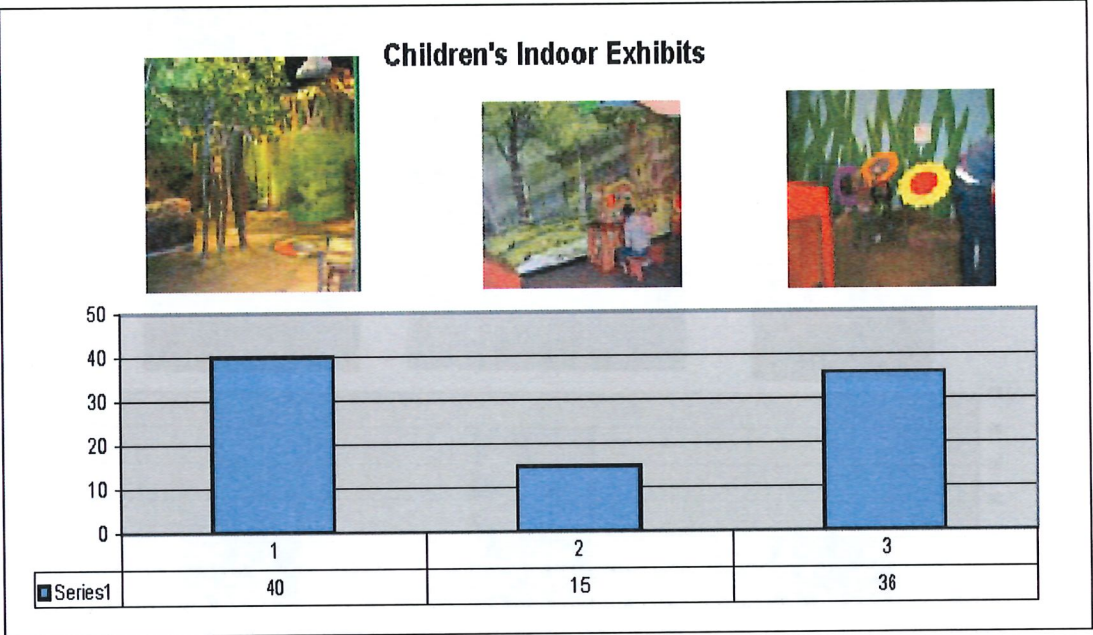


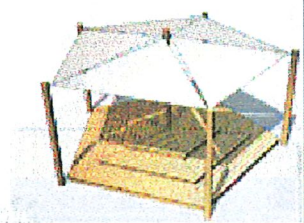
Surprise Encounters



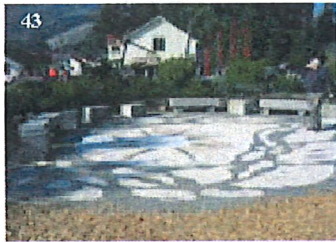
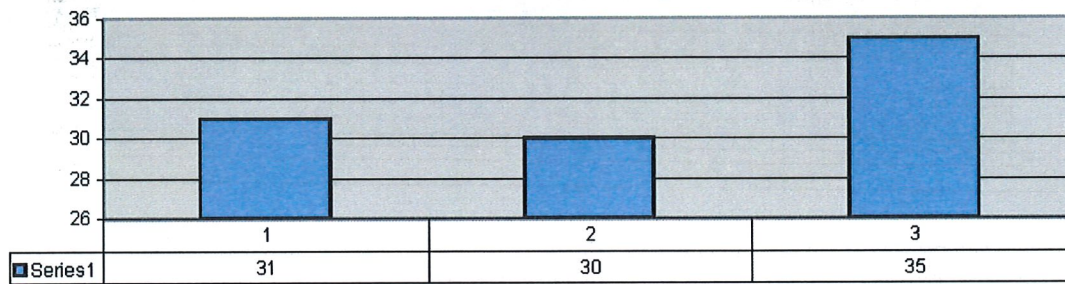
General Indoor Exhibits



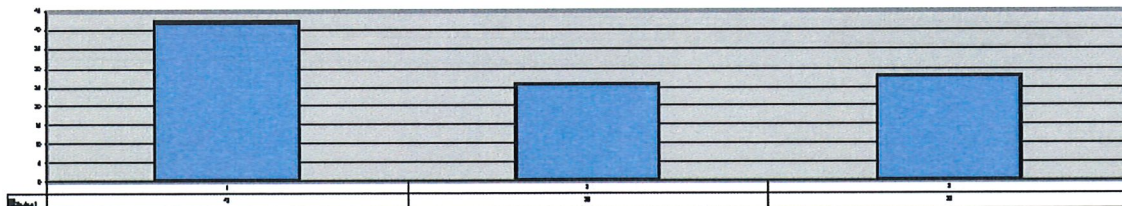
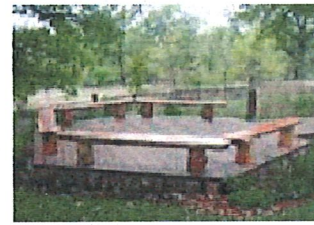




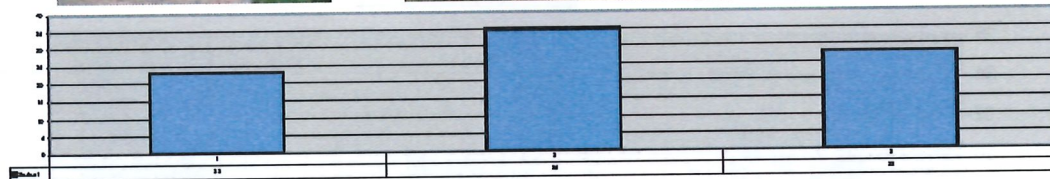
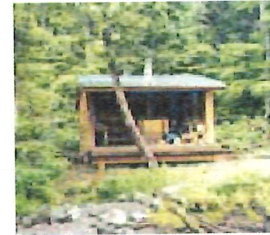
Outdoor Classrooms



Gathering Areas

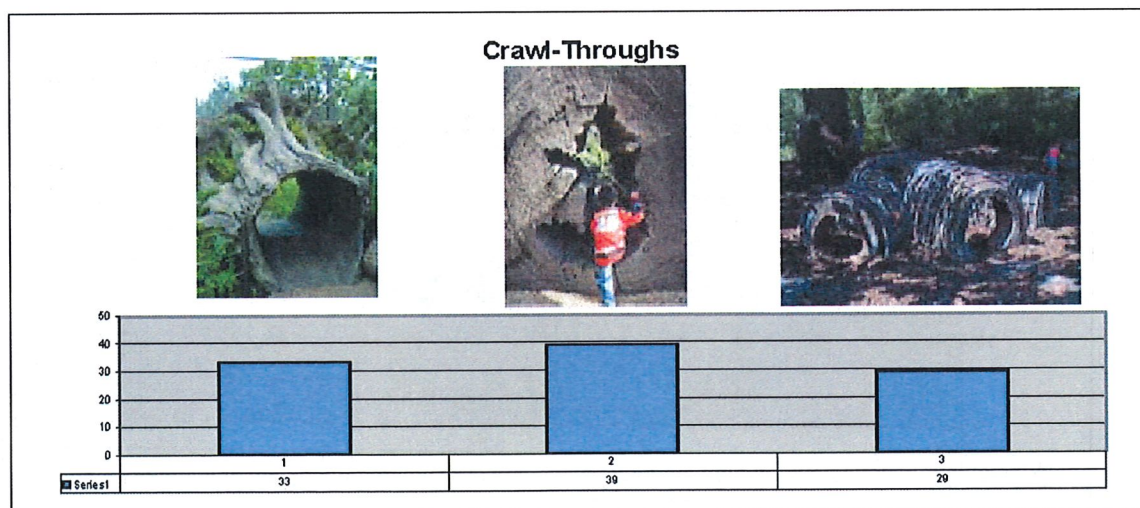
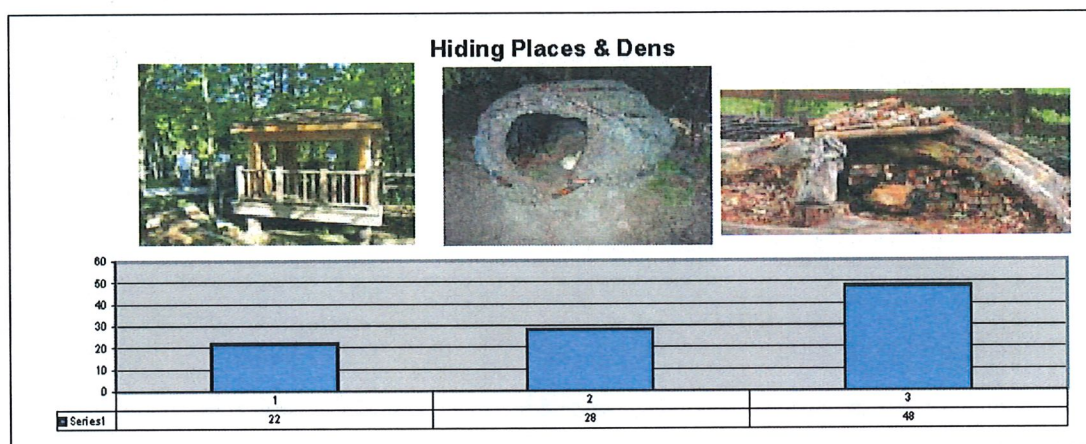
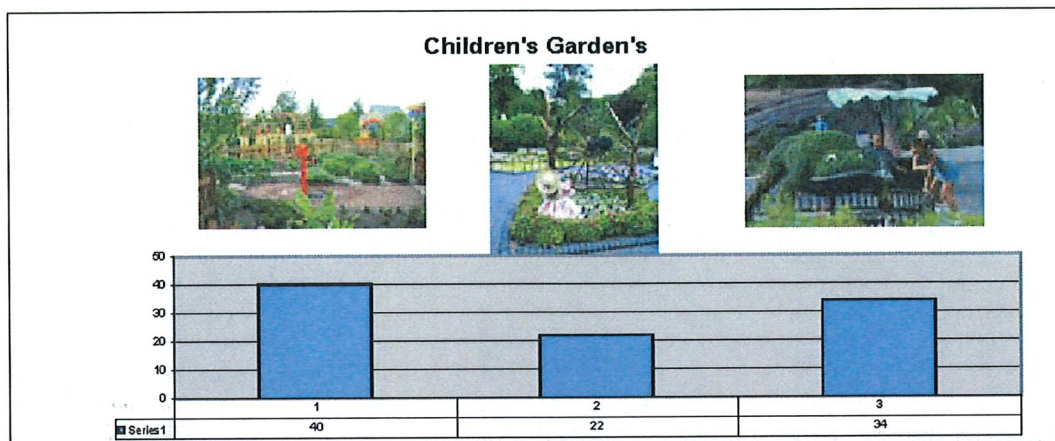


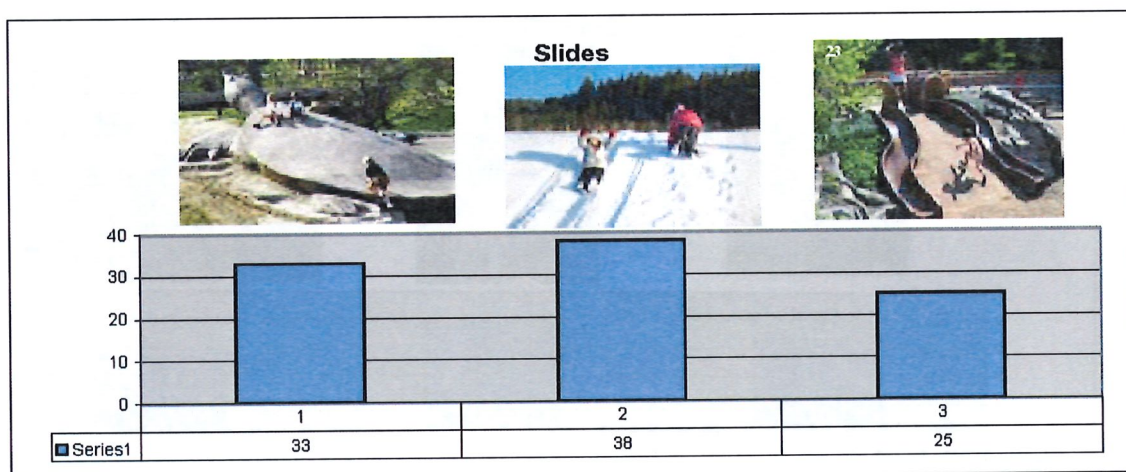
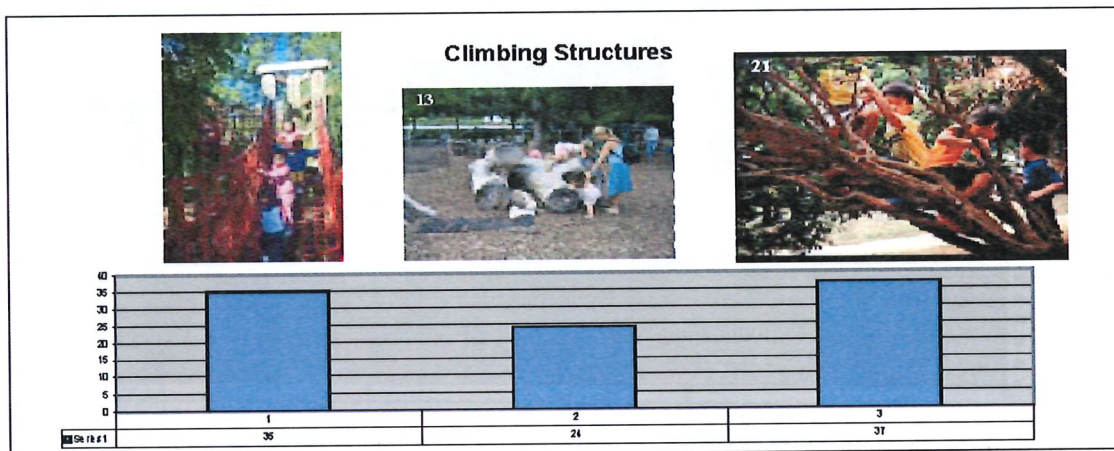
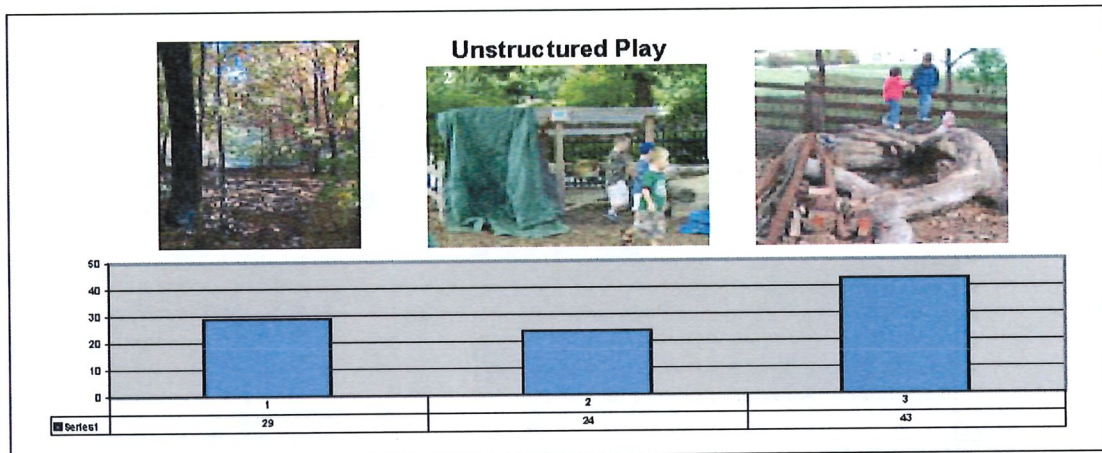
Respite Areas



Viewing Blinds







C Site & Building Programs & Spatial Needs

Site Program Elements Summary — List of Desired Elements

Draft – January 10, 2007

Physical Site Program Elements

1. Enhance visibility/awareness of TNC to surrounding transportation routes and access
 - Otter Lake Road/County Road H2 corner- existing conifers make a good backdrop for TNC identification. Area could be backlit, weed trees removed from conifers.
 - The Otter Lake road frontage could have art elements/or other to communicate the TNC identity.
 - A kiosk of sorts could be placed at the entrance to TNC that gives program information – registration information, etc. Character of kiosk important.
 - Provide identification element along I-35E – could be artistic in character.
2. Consider future interaction with Bald Eagle - Otter Lakes Regional Park development
 - Boat launch on Otte Lake is a low use area and would be low priority for signs or other features to promote TNC.
3. Consider potential interaction/connection with other adjacent land uses and facilities
 - School has a trail to the Otter Lake/H2 corner where there is a safe crossing and a trail to TNC. The school is also overflow parking for TNC.
 - A hill by the WB Township park could be used for sliding, but if far from parking lot and is separated by an existing chain link fence and the TNC beehives are located there.
 - A defined trail entrance and kiosk to TNC a good idea at the WB Township park.

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 - A defined trail entrance and kiosk to TNC a good idea at the WB Township park.
4. Create a new vehicular arrival and entry experience for visitors
 - Good idea to improve entrance experience, using existing parking lot. Entrance could provide visitor a sense of the TNC experience – could provide vistas to destinations.
5. Entry signage
 - Existing sign inadequate, difficult to see and does not communicate much about TNC. A kiosk of sorts could be placed at the entrance to TNC that gives program information – registration information, etc. Character of kiosk important.

-
6. Parking lot expansion and redevelopment as required
 - The school serves as overflow parking. Existing parking lot holds about 80 cars. AT times parking needs can be up to 100-150. As the site becomes a destination, more parking may be needed on site.
 - There are two bus-parking stalls presently. Bus parking need not be on site – busses drop off students and typically leave the site. An increase in the number of busses at the site should be factored into the site plan for the future.
 7. Vehicle access and drop-off to building
 - The long distance between the parking lot and the building is an issue – its too long of a walk to drop off young children, growing conflict between vehicles and pedestrians.
 - Additional parking near the building should be considered. Building can serve as a visual buffer from rest of site. Parking should be screened from the site.
 - A separate pedestrian walk is needed.
 8. Storage garage redeveloped
 - Existing building inadequate, a reuse of an existing building.
 - TNC to determine storage building needs and size.
 - New building could be combined with other site facilities, shelter, in a new location.
 9. Entire pedestrian experience and entry grounds from parking to building redeveloped
 - Need separate walkway and drop-off drive
 - The area can be a programmed space that provides orientation – “advanced organizer”
 - Area should be a purposeful landscape with charm.
 - Art center interested in a historic type structure for arts programming in area.
 10. Orientation/information/signage structure or element within entry grounds (non-staffed)
 - Sign standard needed that has a character unique to TNC. Autobahn has nice signs. Signs can have an artistic element to them.
 - Interpretive signs should be self-directed and provide identification.
 - Signage needed that educates about limits but not rules signs.
 - Could place a relief map of site in the entrance of building for way finding and interpretation.

11. Nature play area

- A strong definition needed
- Team member's definitions: discovered, logs stumps trees in an enclosed area, changeable – ability to reorder, unstructured, allowed destruction, parental supervision, from a adjacent hut or deck, natural looking, themed playground area, includes tree house, bridges, tunnels, defined area with natural place with some sense of discovery – sand, maze, a place for kids to discover nature with some level of comfort. Rope hanging from tree

12. Water play feature

- Part of an enhanced landscape area
- Priority out of program
- Water play with recirculation water system is ok.
- Could be combined with inaccessible area for observing water bugs, etc.
- Water play could incorporate the study of the physics of water.

13. Children's garden

- This is a very important program element
- Be artistic in nature
- Garden could be the entrance to unstructured play area
- High maintenance element
- The pump or other water element a important feature within garden.
- Garden concept could include apple trees, prairie garden, butterfly garden, prairie maze, others – “discovery garden”
- Be an example of sustainability – companion plantings.

14. Other demonstration gardens (Rain, butterfly, sustainable landscape practices, etc.)

- Garden concept could include apple trees, prairie garden, butterfly garden, prairie maze, others – “discovery garden”

15. Unstructured nature discovery area

- Pine forest could be an unstructured play area

16. Gathering area

- Small and large group areas of 12-65 people – several areas needed of different sizes.
- Gathering at destination areas.

-
- Shade is needed
 - Acoustic needs?
 - Existing area is too sunny-hot, uncomfortable to sit on – hard, cold
 - TNC often uses the slope with the cotton wood trees out front for a gathering orientation area.
17. Bug proof Indoor/outdoor space (screened-in nature)
- A porch type structure could provide a layer of comfort with nature.
 - Fits the cottage theme of the WBL area.
 - Farm theme does not fit well with site, the area was not really farmed.
18. Climbing/play structure
- Climbing elevation element important
 - Don't recreate that which is found in other parks. This needs to be a unique feature to TNC. Dislike the structure found at Morton Arboretum
19. Elevated experience structure (viewing tower, treetop platform, tree canopy walkway)
- Very important –
 - Wooded ridge near the WB Township offices is far away for such a feature.
20. Lake exploration platform/access (docks, large deck, Plexiglas tubs)
- Use teal pond. Direct more water to teal pond (what if it was dredged some to open up more water) Dries out in fall. Soils at TNC drain quickly. Any "scrape" would need to be lined to keep water.
 - Could existing raingarden be expanded and with a lesser depression?
21. Trail system and total site evaluation for new 'Destinations' development and locations
- Some trail changes needed near the large prairie for fire breaks and to reduce duplication of trails.
 - Some trail surfaces need improvement for skiing.
 - Maintain dual use of trails for TNC and for skiing.
 - Extend boardwalk on the west side of Tamarack Lake
22. Changing landscapes exhibit (at old farm site or wet lands reclamation or other)
- Too difficult to interpret and for visitors to comprehend.

23. Program and event spaces

- Sugar shack location and structure
 - New shack and location needed. Two sugar bush areas exist on site.
 - Dual purpose structure with storage, amphitheater, outdoor classroom, etc.
 - Needs to be accessible by ATV
- Trail destinations:
 - Could put a blind at the pond with the dead-head trees
 - Could put a blind or elevated structure at the boardwalk west of Tamarack Lake.
 - Enhance creek under boardwalk west of Tamarack Lake
 - Others on site analysis
- Art activities and required facilities and elements:
 - Follow up with WB Arts Council
- Performing and presentation amphitheater:
 - Warner Nature Center has a nice performance space.
 - Needs to be comfortable, shaded, and large enough for 12 – 65 people. Not concrete, wood or turf.
 - Existing one is sized adequately.
- Weather shelter for flexible uses –
 - Yes it is needed.
 - Existing picnic shelter is used, but could replace with new or additional.

24. Other elements

- Camping area for scouts and others - No
- Fire-pit maybe on larger scale for community gathering
 - Yes, important for programming
 - Could be several of them.
 - Could be combined with amphitheater type space
 - Skiers could use it
- Cross-country skiing/snow shoeing
 - Ski racks exist

-
- Hawks mews (bird blind)
 - Important, part of a larger discussion about the role of life animals and animal rehab.
 - Weathering area
 - Utilities and maintenance requirements and needs
 - Picnic area with tables
 - Don't encourage picnicking, no grills. A place to eat lunch in a shelter.
 - Wading pool incorporated with water play feature
 - Yes
 - Site furniture/bike racks/lighting/trash cans/others
 - New bike rack – some interesting ones available now
 - Benches of unique character
 - Swinging benches – motion is great
 - Skating rink on man made pond area

Tamarack Nature Center – Destination for Discovery

Draft Building and Shelter Requirements - Feb. 6, 2007

Building program (space requirements) as outlined 6 February 2007 with Marcie Oltman, Jim Roe, Greg Ingraham, and Gary Hittle. Meeting participants discussed the need to plan for the building and shelter space to match and support the enhanced outdoor activity and visitation. If TNC is to be successful as a Destination for Discovery and be a regional attraction, the addition of outdoor destinations will require an equal effort to provide indoor program and support space. Marcie would like to see the building spaces to become more dedicated-use spaces as opposed to multi-use spaces. The following is a list of the spaces defined as dedicated needs to support the anticipated increased visitation and to provide indoor programs and meeting space. The space needs are listed by room or activity type. Existing building is approx. 6,650 s.f.

Entry Lobby

(Redefine existing layout/use; not adequate for this to be a regional destination center; possibly becomes secondary entrance and introduce new main entry)

- Large orientation/gathering space
- Circulation hub
- Waiting/lounge area
- Reception area with small office
- Gift shop/coffee bar
- Coat closet
- Storage space (200 s.f. min.)

Exhibit Gallery (1500 – 2000 s.f.)

- Seasonal exhibit space
- Wildlife viewing area
- Indoor wildlife habitat displays (reptiles, raptors, owl, fish, insects, worms, etc.)
- Indoor/outdoor wildlife display
- Activities/adventure/destination element
- Storage space (200 s.f. min.)

Events/Community Hall

(Events/programs using existing classroom space)

- Great Room ambience (similar to existing two story lobby/exhibit space)
- Fireplace
- Space to accommodate 75-100 people
- Rental hall with required support elements/spaces
- Lounge/site observation areas
- Storage space (200 s.f. min.)

Early Childhood Program

(Existing program has been shoehorned into extra spaces as available; potential to double student numbers and space requirements)

- Two classrooms (20 students each)
- Bathrooms in each classroom
- Teacher's office/prep area
- Parent group meeting area (private)
- Dressing/coat/locker hall
- Storage space (200 s.f. min.)
- Kitchen/lunch area (can this be the main kitchen)

Classrooms

(Expansion space equal to existing 1500 s.f classroom space)

- Dedicated space used for classrooms only
- Existing function OK as classrooms, but conflicts with multi-use
- New storage space
- Attached outdoor classroom space (3 season and open)
- Flexible dividable wall works well.

Arts Studio

(Would like this to be in a separate part of the building but still connected to main building; or in a separate building related to the TNC building. Space requirements to be outlined with Arts Council)

Administrative Offices

(Two to four times larger than existing 1150 s.f.)

- 4 core offices (director, naturalist, others...)
- 4 interpretive staff offices
- Conference room (not a multi-use space)
- Resource library
- Work/prep/copy space
- Kitchenette/lunch area (separate from main kitchen)
- Storage space (200 s.f. min.)

Volunteer Center

(There currently is not space dedicated to this valuable asset of the Center's function; they overflow into whatever space is available) Return sense of community and hands on involvement.

- 'Citizen's Science Program' space
- Meeting/sitting/office space
- Coat/locker hall
- Storage space

Kitchen

(Existing is probably inadequate and location not desirable for future expansion; need to program this space further based on needs; for now use 225 s.f.). Close to adjacent events.

Winter Equipment Rental

(Existing space is adequate; functions as summer programs staff office; is there a need to change this?)

Support Space requirements

- Animal care room (150 s.f.)
- Restrooms (additional required?)
- Hallways and circulation space
- Workshop/maintenance room
- Mechanical room
- Storage space (Marcie stated a great need for this)

Parent/Caregiver/Teacher observation area.

Related to the primary children's outdoor activity areas. Separate building or attached to the main building.

- Covered outdoor seating
- Bathrooms

Maintenance/storage garage

(For outdoor maintenance and programs needs, workshop, storage, trash/recycling, additional space for indoor needs depends on availability on new additional building storage)

Sugar Shack/Program Shelter/ Cider House

Flexible shelter building with multiple garage doors to accommodate various programs indoor and outdoor.

Picnic Shelters

(Smaller informal shelters away from building)

- Small for lunch-time users.
- Determine other shelter needs based on desired school bus/camp/field trip group size
- Orient to observation areas

Memorial Garden

Way to manage memorials in a consistent way.

D Master Plan Construction Cost Estimates

Tamarack Nature Center - A New Destination for Discovery

Ramsey County, MN

8.13.07

Phase	Building and Structures	Cost Estimate	Subtotals	Totals
3	North addition w/basement and exhibit gallery remodel (admin. and volunteer center) 2,400 sq. ft.	\$ 1,020,000		
3	South addition (classrooms, early childhood and observation area) 4,000 sq. ft. No basement.	\$ 1,100,000		
3	West screened outdoor classroom (800 sq. ft.) and plaza	\$ 170,000		
3	Furnishings	\$ 250,000		
	Nature Center building total		\$2,540,000	
1	Children's Garden w/potting shed and cistern, water and elec.	\$ 250,000		
1	Outdoor multi-use pavilion (1600 sq. ft.) w/ restrooms and utilities	\$ 305,000		
2	Maintenance building w/ water, elec., heat & insulate (2200 sq. ft.)	\$ 275,000		
2	Sugar shack - cider house w/ water and elec.	\$ 130,000		
	Other building total		\$ 960,000	
	Building total			\$3,500,000
	Indoor Exhibits			
3	Lookout tree	\$ 145,000		
3	Live animal exhibits (three)	\$ 90,000		
3	3-D Site map	\$ 30,000		
	Indoor exhibit total			\$ 265,000

Phase	Building and Structures	Cost Estimate	Subtotals	Totals
	Site Development			
1	Turnaround and Phase 1 parking (30 spaces) w/lighting, hydrant, transition road to east and storm water	\$ 250,000		
2	Parking lot - Phase 2 (50 cars)	\$ 165,000		
5	Parking lot - Phase 3 (80 cars w/lighting and storm water)	\$ 338,000		
5	Demo existing parking and restore to prairie	\$ 89,000		
5	Entry drive to County Rd H2	\$ 122,000		
1	Phase 1 walkways	\$ 23,000		
2	Utility relocation	\$ 100,000		
2	Gathering area, orientation hub and pond	\$ 124,000		
2	Loop trail (paved)	\$ 164,000		
5	Art node and art trail	\$ 65,000		
5	Art elements	\$ 200,000		
5	Entry sign	\$ 15,000		
5	Prairie restoration	\$ 30,000		
3	Native plantings	\$ 60,000		
2	Misc. paths and walks	\$ 160,000		
5	Misc. grading and restoration	\$ 153,000		
	Total site development			\$2,058,000
	Outdoor Exhibits/Destinations			
	Nature Play Area:			
	Woodland play stream, water table and mechanical systems	\$ 300,000		
	Hills and hollows	\$ 27,500		
	Trunks and stumps	\$ 32,500		
	Upside down trees (from site)	\$ 27,500		
	Boulder prospect	\$ 25,000		
	Sitting terrace, paths and enclosure	\$ 37,500		
1	Total nature play		\$ 450,000	
3	Wildlife thicket	\$ 15,000		

Phase	Building and Structures	Cost Estimate	Subtotals	Totals
4	Teal Pond 1200 lin ft of boardwalk and 3 docks	\$ 215,000		
4	Observation tower & prairie cut	\$ 250,000		
4	Bird blind	\$ 35,000		
4	Canopy walk	\$ 125,000		
4	Tamarack Lake raft-pontoon	\$ 65,000		
	Total outdoor exhibits/destinations			\$1,155,000
	Residential Inholding Property	\$ 500,000		
	Design and Engineering 10%-15%			\$ 875,000
	Total Project Estimate			\$8,353,000

E Supportive Research

Children Need Safe, Accessible Places to Play in Nature. Gone are the days when children muck about in the woods behind the house. Such places are few and far between and are in danger of disappearing altogether. Daily life now is a series of appointments and schedules and too often “outside” is the pavement between the car and daycare. The result is what author Robert Michael Pyle describes as “the extinction of experience”—children no longer engaging in open-ended play time, exploring special forested places, creating whole new worlds with nothing more than their imaginations and the natural world around them. At best, we are discouraging children from bonding with and becoming interested in nature. At worst, we are depriving children of reaching their full potential as individuals (Nixon, 1997). Although it is too early to tell what the long-term societal effects of disengagement from the natural world might be. However, it is hard to imagine they will be positive.

Recent studies in neuroscience confirm that the quality and richness of children’s early experiences, environments and interactions not only affects brain development but later abilities to learn and reason (Robinson, 1997). Play is essential to healthy human development and a key component of preserving community and culture (Fronczek, 2004). Clearly, “rich experiences produce rich brains” (Nash, 1997). For most of history, when children were free to play, their first choice was the richest, most dynamic environment of all—the nearest “wild” place (Pyle, 2002) where they had the freedom to play and explore almost without restriction.

Sadly, there has probably never been a time when children are less likely to spontaneously enjoy nature play. Children today have much less unstructured contact with nature than their parents, just a few decades ago. American children today spend little time outdoors for a variety of reasons: “stranger danger,” communities designed for cars instead of families, the harmful effects of nature such as skin cancer and Lyme Disease; the endless parade of lessons, enrichments and extra curricular activities (Moore, 1997). David Orr, Chair of the Environmental Studies Program at Oberlin College, cites one study that revealed that the average time children’s spend outdoors dropped by one half from 86 minutes per day in 1981 to a mere 42 minutes in 1997 (Finch, 2004).

Children Need Support and Recognition in Education and Public Policy

Children are losing out on the school front as well. The trend of eliminating recess in many public school districts throughout the U.S, in an effort to spend more time on academics (NAEYC, 1998.) In most schools, science already receives considerably less attention than reading, writing, and mathematics. In kindergarten through grade 3, less than 20 minutes per day is spent on science; in the upper elementary grades, the average is about one half hour (Louv, 1990). Moreover, since environmental concepts often are infused into the curriculum at a teacher's discretion, some children receive lessons about the natural world only through infrequent field trips to nature centers, public parks, or museums. In spite of consensus that attitudes form early, most early childhood programs do no better. Typically, only a small portion of the day is allocated to outdoor time, mostly for children's energy release and large motor development and usually on bland asphalt, sand, grass, mulch or pea gravel surfaces. The underlying message is that the natural world is not all that important and there are more valuable things to do than playing outside.

Children Need Healthy Lifestyles The focus of children's everyday life has dramatically shifted from outdoors to indoors. Negative health consequences have become severe. A recent report by the World Health Organization (WHO) presents a global alert for all countries regarding the deterioration of children's physical health resulting from environmental lifestyle changes. The prevalence of overweight children is particularly acute in the United States, now reaching beyond 15% among children six to nineteen years old, and more than 10% among two-to-five-year-olds (Ogden et al. 2002).

Research has shown that time spent outdoors is an environmental determinant that most strongly correlates with increased physical activity and fitness in children (Sallis et al. 2003; Moore, et al. 2003; Finn et al. 2002). Prior to adolescence, children relate to the world through their senses and bodily movement, which is strongly motivated by the diversity and freedom of outdoor environments. This is especially true of the "close-by nature" green of everyday life (Kuo & Sullivan, 2002; Wells, 2000). These new and important empirical research findings suggest a powerful strategy to counteract the childhood fitness crisis by creating outdoor, green environments that are so attractive that children will spend longer periods of time outside, engaged in higher levels of physical activity in the fresh air and sunlight (Rivkin, 2000).

Children Need Direct, Authentic Experience Many people develop a deep and abiding respect for wilderness and wildlife despite having only indirect experience. However, environmental scholars agree, "...direct, personal contact with other living things affects us in vital ways that vicarious experience can never replace" (R. M. Pyle, in Nixon, 1997). Indeed, Suzuki (in Estes, 1993) observed that "the vast majority of scientists were

keen on some aspect of nature as children; they took an interest in bugs or birds or stars—a direct interest in nature...” A present day example is the world-renowned, Harvard natural scientist, E.O. Wilson (1994) who freely admits, “every child has a bug period. I just never grew out of mine.” The message here is clear: environmentally conscious citizens hold the key to preservation and enhancement of the natural world; the citizens and scientists of tomorrow are the youth of today. If we want to ensure a connection with the natural world that will foster positive and respectful attitudes toward the environment, then we must end children’s estrangement from the natural world by providing them with safe, enjoyable experiences in natural habitats.

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