



Department of Natural Resources / DNR-PRD
Wilderness State Park
Lakeshore Campground Study for Redevelopment Project
Carp Lake, Michigan

Study Phase 100 Report

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Michigan
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Michigan Natural Features Inventory

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INTRODUCTION & PARK HIGHLIGHTS

STUDY OVERVIEW



The Wilderness State Park campground located on the shoreline of Lake Michigan is one of Michigan's most valuable resources and is in need of redevelopment to meet the current demands of today's 21st century campers and recreation enthusiasts. The existing campground was developed in the early 1950's during a time when camping was predominately tents and occasional pop-up campers. Users now often come with large RV's, boats, floats and many other camping toys and amenities. This has greatly affected the surrounding natural

environment and requires a reevaluation to accommodate the footprint of current camper needs and recreational activities.

This campground is special to many people, and many campers are often repeat visitors, returning year after year. One of the greatest draws is the ability to camp so close to the water's edge of Lake Michigan with direct access to the sandy beaches. With this comes an extensive impact to the native and endangered vegetation, wildlife and other species so closely affiliated with the fragile shoreline ecosystem.

Additionally, the existing utilities and infrastructure have served their purpose and need to be upgraded. Barrier free access, overall site drainage and vehicular circulation roads are also in need of upgrades, repair and improvements.

Many of the dedicated patrons of this State Park have voiced concerns to keep this park as is so as not to destroy the unique character of the campground. The redevelopment initiatives will place great attention on their concerns and input while balancing the upgrades to meet regulatory compliance and future users well into the 21st century and beyond.

HISTORIC SIGNIFICANCE

Some of the most historic and iconic buildings at Wilderness State Park are located in the Pines Campground just south of the Lakeshore Campground. These structures were built by the Civilian Conservation Corps (CCC) in 1933 and 1934 as part of a public work relief program initiated as the New Deal by President Franklin D. Roosevelt. An old kiosk structure built during this era is still remaining and awaiting a new home at the Lakeshore Campground. The objective is to pay homage to the detailed craftsmanship of the artisans who originally constructed the historic structures.



The design team has envisioned that some of the wonderful stone masonry details on these buildings be replicated in some manner within the Lakeshore Campground that celebrates the artisanship and historical significance found within the park.



Most of this area was cut-over prior to 1900, leaving only scattered individual trees and one small stand intact. Yet, the area has re-grown and now stands as it once did, providing its visitors an opportunity to experience a Michigan landscape as it occurred prior to European settlement.



It is recommended that timber harvested at the State Park from fallen, dead or diseased trees be repurposed for new signage or other features and pay homage to the early timber industry in the late 1800's. This is also a good form of sustainable and green design practices that were part of the everyday life of earlier days.

REGIONAL CONTEXT



The regional context and location of Wilderness State Park is significant in many ways. It is not only a draw for campers from within the State of Michigan, but it also serves patrons coming from Chicago, New York, Indiana, Kentucky, Washington, and many other states.

The parks border is approximately 12 miles from Mackinaw City. Campers wishing for day trips to town or perhaps to use the park as a base camp for day excursions across the Mackinaw Bridge or to Mackinaw Island can utilize this facility.

In November 2012, the above map, which illustrates a proposed

regional trail from Belle Isle in Detroit to Wisconsin, was published in the Detroit Free Press. The existing Northern Central State portion of this trail that runs through Mackinaw City is approximately 10.5 miles from the lakeshore campground. The campground could possibly provide overnight accommodations or a destination for trail users.

THE NORTH COUNTRY TRAIL

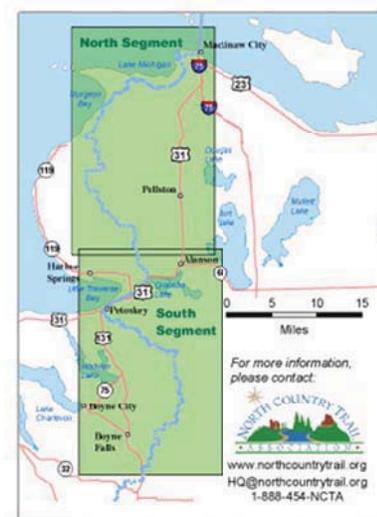
An even larger national scenic trail called the North Country Trail (NCT) has segments running through Wilderness State Park. This trail connects America's red plaid nation, wandering 4,600 miles through America's rugged northern heartlands. Stretching across seven states, it is the longest National Scenic Trail and is brought to local communities through the dedication and hard work of volunteers. From New York to North Dakota, North Country Trail hikers can find adventure nearby.

While only a few have attempted to thru-hike the whole trail in one shot, thousands find their way onto a section of the NCT each year. Spring, summer, fall or winter, the trail offers something for everyone. Winter camping and snowshoeing, long-distance trail running, a saunter through quiet spring meadows or vineyards, crossing salmon-filled rivers, a weekend with the grandkids.... you can find what you're looking for on the North Country Trail, and very close by! This trail can be rugged and welcoming, remote and festive. You get to choose your own adventure!



Some quick facts about the North Country Trail:

- Longest National Scenic Trail in the United States (4,600 miles when complete)
- Administered by the National Park Service
- Passes through 12 National Forests
- Created by Congress in 1980



INTERNATIONAL DARK SKY PARK DESIGNATION

A more recent notable feature near Wilderness State Park is the International Dark Sky Park designation which was announced on May 9, 2011. The Headlands hosts one of only six such designations in the United States. This designation should be promoted and highlighted as part of any future interpretive signage or promotional material. This international recognition makes Wilderness State Park a great destination for star gazers and photographers. With this also comes the need to be very thoughtful with future lighting design standards.

Emmet County's Headlands property awarded prestigious International Dark Sky Park designation

The Headlands joins five other parks in the United States

By Beth Anne Piehl, Emmet County Communications & Web Development Director

Prestigious International Dark Sky Park designation has been awarded to Emmet County's Headlands property, a 600-acre thickly forested gem situated along the clear blue expanse of Lake Michigan just west of Mackinaw City.

The board of directors with the Tucson, Arizona-based International Dark-Sky Association made the official announcement on Monday, May 9, 2011. [The Headlands](#) becomes just the sixth International Dark Sky Park in the United States.

The designation was awarded after a rigorous application and review process that culminated in January, after years of groundwork laid by county citizens and officials determined to preserve the night sky above Northern Michigan. Continual support from the Emmet County Board of Commissioners to work toward the designation was paramount.

"The Headlands, with its two-and-a-half miles of shoreline and 600 acres of old-growth timber, is a beautiful place that will be protected forever," said James E. Tamlyn, chairman of the Emmet County Board of Commissioners. "Add to that the ability to have uninterrupted night-time viewing and it continues that experience – and that's what the Headlands is all about. It's protected now, and as time goes by nothing's going to change that."

To achieve International Dark Sky Park designation, a Dark Sky Park Committee of county staff and local residents compiled a comprehensive, 75-page application that included not only details about the amenities of the region and the Headlands, but also an intricate lighting inventory of each light fixture and their lighting output at three structures on the property.

Importantly, the application needed to be sponsored by an IDA member with established astronomy knowledge. Through their early-on programming efforts, the committee caught the attention of internationally-recognized astronomer Patrick Stonehouse, who discovered Comet 1998 H1 (Comet Stonehouse) from his rooftop, personal observatory in next-door Cheboygan County. He served as Emmet County's nominating authority by providing a letter of recommendation to the IDA, which was further supported with about 20 letters from state and local leaders across the arts, recreation, government, chambers of commerce and more.

"Your achievement will benefit all those local star lovers who will have nowhere else to go in lower Michigan to see their celestial friends," Stonehouse wrote, in a congratulatory email after learning of the designation. "Children from the cities who have only seen pictures of stars in books will be thrilled and inspired as they gaze at thousands of bright twinkling stars, silent and magically suspended in the clear dark skies over the Headlands."

The IDA also required light meter readings of the sky at dark; copies of the county's stringent lighting ordinances; maps; and programming and marketing plans.

"Emmet County's zoning ordinances have sound and up-to-date outdoor lighting requirements, which expedited the successful application for Dark Sky Park status," said MaryLou Tanton, Dark Sky Park Committee member and founder of the Petoskey-based Outdoor Lighting Forum. "We hope to continue to work with other Michigan communities to enact similar provisions."



Night sky above the Headlands. Photo courtesy of Robert de Jonge, www.robertdejonge.com

SPECIAL NATURAL FEATURES

The majority of the many miles of shoreline consist of wide sandy beaches with scattered cobble, backed by one of the best developed and most diverse forested dune and swale complexes in Michigan, with some spectacular wetland areas mixed throughout. The scattered cobble beach areas provide some of the best habitat in Michigan for the federally endangered piping plover. In fact, almost the entire shoreline of the proposed natural areas is designated as critical habitat for the piping plover.



The Great Lakes population of piping plovers was historically several hundred breeding pairs in size, but had declined to 17 breeding pairs by the time the species was listed as endangered by the federal government in 1986. Since then, the population has fluctuated between 12 and 50 breeding pairs with breeding areas largely confined to Michigan, and many of those have been consistently located at Wilderness State Park. During the 2002 nesting season, 16 of 52 active nests were at Wilderness State Park.

The native landscape supports fine populations of two Great Lakes endemic plant species - Pitcher's Thistle and Houghton's Goldenrod - and additional threatened plants - Lake Huron Tansy, Pumpell's Bromegrass, and Butterwort.

More detailed analysis of the plants, natural communities and bird species is contained within this report.



RECREATIONAL OPPORTUNITIES

Wilderness State Park offers extensive recreational opportunities to meet the needs of many users. Specific activities highlighted on the MDNR website include:

- Cross Country Skiing
- Hiking
- Metal Detecting
- Mountain Biking
- Swimming
- Fishing
- Hunting
- Explorer Program
- Snowmobiling
- Watchable Wildlife



Some of the more popular uses and activities serving the patrons of the Lakeshore Campground include:

- Pure Tourists
- Beach Sunset Viewing
- Trail Users
- Fisherman (late May – June)
- Hunters
- Dark Sky Star Gazers
- Botanists
- Photographers



The park also offers:

- 4 designated natural areas
- Programs – Explorer Guide (to facilitate nature based education)
- Biking (mountain & street bikes)
- Cross Country Skiing (groomed trails)
- Hosts seasonal events (fundraising runs)
400 runners requiring approximately 25 camp sites

It is important to ensure the campground redevelopment initiatives cater to today's predominant uses. However, it is also imperative that future changes anticipate foreseeable and unforeseeable recreational trends, users, special equipment and technology associated with these activities.

Some examples of these activities and users at this time may include but are not limited to:

- Kite Boarding
- Stand-up Paddle Boarding
- More Mountain Bike Trails
- Senior Activities (catering to our aging population)
- Wi-Fi Service to Accommodate App's for All Users
 - Digital trail maps
 - Plant and wildlife identification
 - Photo downloads for Facebook sharing
 - Other...
- Geocaching

REDEVELOPMENT STUDY PROCESS

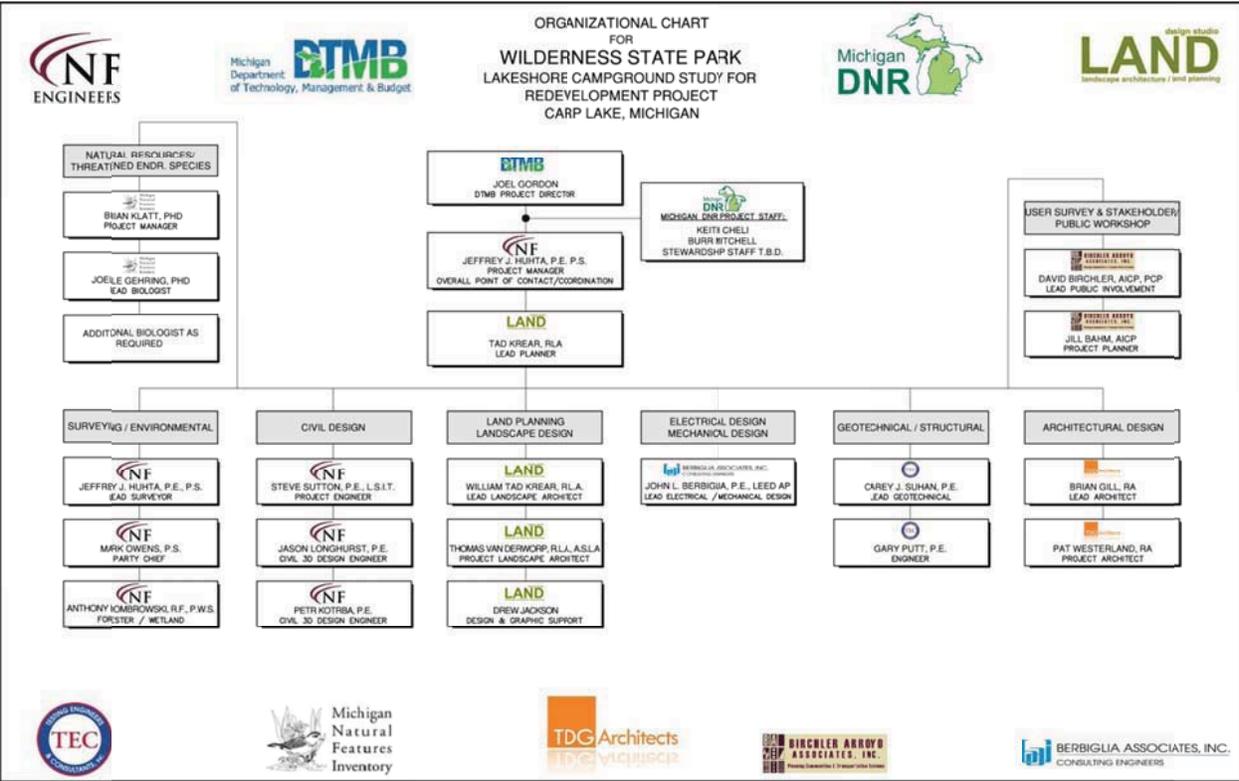
PROJECT INITIATION

This design and planning study has been initiated by the State of Michigan, Department of Technology, Management and Budget (DTMB) and the Department of Natural Resources (DNR) Parks and Recreation Division to look at redevelopment concept alternatives, associated costs and potential construction phasing to maintain use during the redevelopment of the facility.

This report is the first step of the process and is referred to as the *Study Phase 100* as defined in the General Services Contract for all site and building improvements. The design team has assembled this report to summarize the findings of the various tasks completed in this phase of work pertaining to background research, field work, surveys and other inventory and analysis tasks specific to the Lakeshore Campground.

DESIGN PROCESS

The following organizational chart illustrates the core design team and members associated with this planning initiative.



The design process is broken down into the following phases and the design team is focusing on phases 100 thru 400 at this time:

- Study Phase 100
- Programming Phase 200
- Schematic Design Phase 300
- Preliminary Design Phase 400
- Final Design Phase 500
- Construction Administration Phase 600 (Office Services)
- Construction Administration Phase 700 (Field Services)

PRELIMINARY REDEVELOPMENT GOALS

Some of the initial redevelopment goals discussed and contemplated at this time are listed below. The Programming Phase 200 will expand and refine the redevelopment goals based on the Study Phase findings and input from the Client, Public, Special Interest Groups and the Design Team members.

- Creation of a designated group campsite(s) for up-to approximately 15 family members
- Develop remote or rustic camping sites
- Improve overall utilities and infrastructure
- Improve technology infrastructure (Wi-Fi)
- Improve access management to the lake to protect the native and endangered species
- Create campsites to better accommodate all users and recreational vehicles and user groups
- Improve ADA accessibility requirements
- Enhance and brand the unique characteristics of the campground (define a character unique to Wilderness State Park).
- Upgrade amenities and services to cater to the current and future patrons
- Improve the roads and overall drainage
- Provide designated areas on the beach for dog walking and running
- Upgrade the toilet / shower building
- Reinforce and better brand "Wilderness" State Park's unique qualities and characteristics

KICK-OFF MEETING

A kick-off meeting was held on October 1st and 2nd, 2012 and was attended by various members of the design team as well as client representatives from the DTMB and DNR. The goals and agenda from that meeting are listed below:

Goal of kick-off meeting:

- Introduce the DNR & DTMB to the project team (done through the course of the meeting)
- Establish communication protocols
- Establish timelines for future meetings

- Introduction of Go-To-Meeting as a source to stay connected and reduce travel time for team members
- Client overview of goals and expectations
- Obtain background documents
- Review action items of proposal for Study and Programming Phases of the project
- Perform site walk with key DNR/DTMB staff to thoroughly understand conditions and concerns
- Provide opportunity for open discussion with Park Rangers

Agenda:

Monday October 1st, 2012, 1:30 pm

- 1:30pm Introductions / Client & Team Member Roles
 House Keeping / Effective Communication
 Establish Lines of Communication Protocol (who gets copied on emails)
 Establish email list/project drop box or FTP site for larger files
 Discuss use of Go-To-Meeting
 Client Overview / Comments & Expectations
 General Discussion of Available Background Information (documents hand-off)
 Revised Tentative Schedule Overview (focus on Study Phase 100 & Programming Phase 200)
 Existing Conditions Detailed Analysis
 Site Specific Research
 Action items
 Precedent research discussion
 Natural Features Inventory
 Threatened & Endangered Species Inventory (MNF)
 Infrastructure Evaluation
 Electrical: John Berbiglia – Go-To- Meeting (3:00pm)
 Other action items
 Buildings, Structures & Facilities Inventory
 Buildings: Brian Gill – Go-To-Meeting (3:00pm)
 Other action items
- 3:30pm Park User Survey / Work Shop
 Dave Birchler: Go-To-Meeting (3:30pm)
 On-Site Workshop Alternatives (Futures for State Campgrounds)
 Thinking... Outside the box discussion
- 4:30pm Field Site Walk (all welcome to join us)

Tuesday October 2nd, 2012, 8:30 am

- 8:30am Recap of Monday's meeting & continued discussion
- 9:00pm Functional Conditions Review
 Action items discussion
 Surveying Processes and procedures
 Action items discussion
 Geotechnical Investigation

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| | Actions items discussion |
| | TEC: Carey Suhan – Go-To Meeting (9:00am) |
| | Site Drainage |
| | Action items discussion |
| 10:00am | Programming |
| | Action items discussion |
| 11:00am | Round Table discussion with Park Rangers and DNR Staff |
| 12:00pm | Break for Lunch |
| 1:00pm | Establishment of Meeting Schedule moving forward |
| 1:30pm | Field walk/initiation of site investigation (all welcome to join us) |
| 4:00pm | Depart |

BACKGROUND INFORMATION HAND-OFF

The following is a list of requested documents that was turned over to the design team:

- 2003 Natural Features Inventory
- 2012 Central Reservation System Data Collected
- Green Toilet Shower Building Phase 100 Study Report and Schematic Prototypes
- 2001 Sanitary Lift Station Improvement Plans
- 2010 Camper Survey on Campground Redevelopment
- All existing site plans, utility plans, and/or construction plans
- Overall Wilderness State Park Master Plan
- A list of service providers and contact information for same (example: waste hauler, electrical provider, gas provider, etc.)
- Email list serve of campers who have had a reservation at the park within the past 24 months

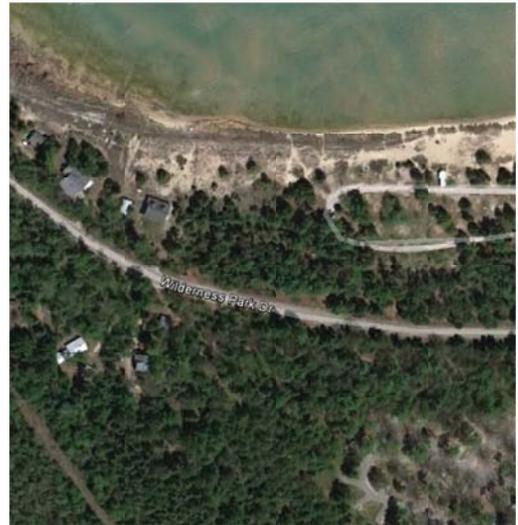
INTERVIEWS & SITE WALK WITH PARK STAFF

A round table discussion and site walk with the park supervisor, rangers and staff proved to be very beneficial to the design team. The design team gained a tremendous level of appreciation for the extensive knowledge they had of their clients, the campground and the entire Wilderness State Park. It was very apparent that they wear many hats on a daily basis and have a true passion for their jobs and serving the users of the park. Their specific input/testimonials are weaved throughout this report in the respective sections of the many items covered. Their continued input throughout this entire process will be invaluable to the success of any future upgrades to the campground.

INFORMATION RECEIVED FROM EMMET COUNTY REGISTER OF DEEDS

The NFE team performed research of existing records available from Emmet County Register of Deeds, in support of determining the westerly boundary limits of the Lakeshore Campground area. Maps obtained from Emmett County identify a cluster of properties with tax identification numbers 24-02-02-27-100-014, 015, 018, 018, 019, 020, 021, 022 & 025. Deeds for these properties were obtained and legal descriptions were plotted on the face of the survey. NFE found existing monumentation at the northeast corner of parcel 019, and other monuments along the north side of Wilderness Park Drive. The monuments along the north side of Wilderness Park Drive did not specifically correspond to a property corner. Additionally, a rotation of the legal descriptions to hold the centerline of Wilderness Park Drive did not yield a result where any of the "T" bar irons were agreeable for line in a north/south direction. The "T" iron at the northeast corner of parcel 019 was held for alignment in an east/west direction as it fit well to the centerline of Wilderness Park Drive and agreed fairly well with lines of occupation along the eastern boundary of said lots.

Based on the above boundary (as depicted in the prepared topographic survey, it is evident that there are boundary related occupation issues that should be addressed. The wood fence line along the east property line of parcel 015 appears to be encroaching on to the Lakeshore Campground property. No recorded surveys were found on file at Emmet County that would support the fence is properly located, although the property owners may have unrecorded surveys within their possession. It is recommended at this time that the current survey be provided to the owners of parcel 015, 020 and 022 for their review and opportunity to furnish any boundary related documents they may have in their possession so that a final determination can be made with respect to the boundary in this area.



If no other documents are available, then it may be recommended that the DNR serve notice to the adjoining property owners of the existing encroachment to prevent a claim of adverse possession against the Lakeshore Campground property. All tax parcel maps, tax descriptions, and deeds can be found in the appendix.

PHOTOGRAPHIC INVENTORY

An extensive photographic inventory was conducted by various members of the design team each focusing on documenting images of items pertaining to their specialized fields and assigned tasks. These photos appear throughout the study within their respective sections. Extensive video coverage was taken and many of the photos within the report are actual still captures from the video footage.

BACKGROUND RESEARCH

ON-LINE RESEARCH DOCUMENTS

Pursuant to the goal of developing a unique and contextually designed 21st century facility that meets the current recreational and camping demands of today's users, the design team has conducted extensive research from current applicable journals, reports, plans/studies, development criteria, recreational trends, and initiatives. Additionally, precedent research of other recent exemplary, recreation and campground plans/projects has been completed. The research collected and disseminated below will provide insight into developing a high quality campground and help guide planning efforts to push the traditional programming, planning and design envelope. It is hopeful that this research effort will be of great value to the DTMB/DNR for evaluating and guiding future State Park development/redevelopment projects.

The documents obtained from this research will be referenced and utilized throughout the design process to further assist with the program development and design phases. Copies of these documents will be referenced in the report bibliography and made available through links on the project website if so desired.

DESIGN CRITERIA, STANDARDS AND PRACTICES:

- The latest '**Recreation Facility Design Criteria**' developed by the US Department of the Interior has been reviewed as a benchmark to guide redevelopment efforts. These comprehensive guidelines are based on extensive experience and best practices for current recreation design and often exceed traditional minimum design criteria and standards. A detailed up-to-date criterion is provided for developing all major campground recreational components and includes recommendations for the latest sustainable construction materials.
- **Michigan DNR Planning and Design Criteria**
The latest park design and planning principles pertaining to environmental stewardship and sustainable practices can be found at designingtheparks.org. Planning and design principles addressed include:
 - 'Inspire stewardship and exercise leadership through demonstrations of sustainable practices'
 - 'Allow parks to become classrooms of sustainable design'
 - 'Elevate public stewardship through transparent and engaging processes'
 - 'Create stewardship through active learning about the park's unique natural resources'
 - 'Broaden the visitors understanding of how the various park ecosystems are connected'
 - 'Acknowledge the sites complexity and embrace it'
 - 'Reconcile conflicting mandates through clear understanding of each mandate's resource value'
 - 'Draw upon the latest science and research'

- 'Accommodate, incorporate and support emerging technologies to embrace visitors of all ages and backgrounds'
- **A comprehensive list of campground and RV parks;** do's and don'ts can be found in 'Campground RV and Park Lessons' compiled by Arizona State University. Some of the lessons most pertinent to our project include:
 - Do consider the possibility of public-private cooperation.
 - Don't make "third-class citizens" of campers by keeping them away from the lake attraction.
 - Don't use too much road. Many public campgrounds have far more roads than are needed.

NATIONAL PARTICIPATION AND RECREATIONAL ACTIVITY TRENDS:

The research efforts identified below reflect the latest national participation and activity trends.

- **Why are Young Adults Shunning the National Parks; 5/ 2012**
 - The National Park Service has begun to see a disturbing shift in the demographic of its visitors over the past decade or so, as young adults appear to have fled the parks en masse
 - Young adults between the ages of 20 and 29 now make up just 11 percent of the visitors to Yosemite and a stunning six percent at Yellowstone.
 - In an attempt to reverse the trend, the National Parks Conservation Association has launched an initiative to connect people with the parks. The goal is to deliver a personal connection with these iconic landscapes and inspire more people to visit. This ambitious project hopes to not only get young people into the parks, but diverse ethnic groups as well.
- **A Special Report on Camping; 2011.** This extensive report on camping, a partnership project of the Outdoor Foundation, KOA and Coleman provides current detailed data and analysis of demographics, activities, and participation on camping in the United States. Key findings include;
 - Almost 40 million Americans went camping in 2010 for a total of 514.8 million outings, totals were down slightly from 2009's 44 million campers and 580.7 million outings.
 - Over three-quarters of campers participate in multiple outdoor activities.
 - "Extreme" campers go camping most often, taking 6.26 trips per year.
 - Seventy percent of all trips are taken with friends, showing the social aspect of camping
 - Family members are the most popular camping companions for 35 to 54 year olds—more than half of their trips include immediate family members.
 - Ninety-two percent of campers hiked during their last in-season trip.
 - Even though camping numbers are still strong, overall participation is down. Among various age groups the adolescent group gained a modest amount of

participants while all other age groups lost participants, greatest decline was in the 18 -24 age group.

- Hiking, Running/Jogging, Trail Running, Fishing, Canoeing, Bicycling (Road), Kayaking, Bicycling (Trail) are the activities with the highest participation (a complete list of activity participation by age group is presented)
- **2012 Outdoor Recreation Participation Topline Report; 2012.** Comprehensive report of participation and activity trends in United States. It shows that in 2011;
 - More than 141 million Americans, or 49.4 percent of the U.S. population, participated in outdoor activities last year, reflecting an increase of three million people compared to 2010.
 - Americans made a total of 11.6 billion outdoor outings in 2011, which is 1.5 billion more than the previous year.
 - The most popular activities were running, biking, camping, fishing and hiking
- **RV's Parks redefining camping experience; 7/2011** Industry/Park Trends
 - People are redefining what it means to camp by adding luxury amenities (introduced by recreation vehicles) with all the comforts of home
 - Trend being referred to as 'GLAMPING or Glamour Camping'
 - KOA campgrounds are adding 'Luxury Park Model Cabins' that include: televisions, full kitchens, linens...
 - Devils Fork State Park (South Carolina) has also added two & three bedroom 'Villas'
 - Biggest trend is adding WI-FI, Table Rock State park offers Wi-Fi in the Parks store and visitor center

MICHIGAN PARTICIPATION & RECREATION ACTIVITY TRENDS

The research efforts identified below reflect the latest national participation and activity trends.

- **What's up with Michigan State Parks 'Lure Dive Users With Rec 101';** "Goal is to attract people to parks by seeing them in a different way"... new activities and 'Recreation Passport Info.
 - Fitness activities include: Stand-up paddle boarding, trail running, kayaking, wind surfing
 - Gear and instructions are provided in the Recreation 101 program for nominal fees
- **Trail Running Hot New Trend that's part of expansion of (MI) State Park Recreation; 8/2012**
 - Organized events (triathlons...) have become very popular, Sleepy Hollow attracted more than 800 participants for 2012 organized race
 - Loops are needed for trail running (so not to have to shuttle people back to start)
 - Another benefit of trail running is runners get to explore miles of park lands

- **Biking in Michigan**
 - MDNR is committed to promoting responsible mountain biking
 - MDNR goal is to find appropriate balance between bike access and natural resource protection
 - Additional info can be found at Michigan Mountain Biking Association (MMBA)
- **Latest SCORP Findings:** Table of Michigan Recreation Activities and Their Relative Importance
 - Latest breakdowns of Recreation activities and their importance, support for current initiatives and Initiates/direction to improve Michigan Outdoor recreation

RECENT MICHIGAN INITIATIVES:

- **The Future of Michigan's Parks and Outdoor Recreation – 'A report to Governor Snyder' 2012;** Specific recommendations for the future of Michigan's Parks
 - Identify and protect important natural, cultural, historic and prehistoric resources for the enjoyment and education of Michigan's residents and visitors, and expand stewardship of these resources.
 - Diversify funding and use new criteria to target investments. This includes a recommendation that the state move the Recreation Passport to an "opt-out" system of funding, and pursues expanded revenue bonding authority to address a backlog of priority maintenance and improvement needs at outdoor recreation facilities. In addition, the report recommends re-establishing the State Parks Foundation to accept private donations toward parks projects.
 - Give high priority to investment in the development of regional connected trail networks. The report urges development of a comprehensive trails database available through an easily accessible platform.
 - Encourage greater connections between communities and their recreational assets to strengthen regional identities.
 - Create four to five "signature parks" in Michigan's core urban areas as a tool for revitalizing those areas, and integrate green infrastructure in Michigan's urban redevelopment.
 - Integrate tourism and economic development marketing to fully leverage the economic and social benefits that parks and outdoor recreation resources can provide.
 - Prioritize investment in safety, maintenance of, and access to parks and recreation spaces.
- **Michigan Statewide Comprehensive Outdoor Recreation Plan: 2013-2018** Complete Final Report is on DNR Website
- **Connecting Michigan A Statewide Trailways Vision and Action Plan...** Complete Final Report is on DNR Website

SUSTAINABILITY, LOW IMPACT DEVELOPMENT (LID), STEWARDSHIP PLANS AND INITIATIVES:

Wilderness in name alone promotes the principles of Environmental Stewardship, Sustainable Design and Low Impact Development. These environmental principles show up in every aspect of society today and will serve as the underlying theme of our planning and design efforts. Outlined below are significant principles, goals, strategies and design initiatives applicable to our effort:

- **Field Guide to Environmental Sustainability** – MDNR and Environment Parks Division, The Bible of DNR Sustainability mission, principles, vision, and action plans
- **State Park Stewardship Program** – The State Park Stewardship Program was established in 1995 and operates within the Parks and Recreation Division of the Michigan Department of Natural Resources. The following primary goals have been established.
 - The comprehensive inventory of all natural and cultural resources within Michigan's state park system (over 100 state parks encompassing 280,000+ acres). The inventory attempts to identify and monitor unique, rare and endangered species as well as significant historic and archaeological sites.
 - The protection of park natural and cultural resources
 - The restoration and management of Michigan's native ecosystems and preservation of the native species within them.
- **Green Vision: Twanoh State Park;** Washington State Park sets clear goals and strategies including;
 - GOAL 1 HEALTHY WATER QUALITY: Reduce water and sediment pollution into the Puget Sound
 - Strategy 1: Reduce effective impervious areas and maximize infiltration.
 - Strategy 2: Treat stormwater run-off before discharge to the Sound.
 - Strategy 3: Improve effectiveness of water use and wastewater treatment.
 - Strategy 4: Reduce, treat, and/or eliminate sources of toxic chemical pollutants (e.g., pesticides, fertilizers, gasoline, creosote, detergents).
 - Strategy 5: Reduce erosion and fine sediment loads in streams and other water bodies.
 - Strategy 6: Improve water quality education.
 - GOAL 2 HEALTHY HABITAT: Create healthy habitat and populations of fish and wildlife species
 - Strategy 1: Protect and restore natural shoreline and marine life near shore processes.
 - Strategy 2: Protect and restore freshwater systems.
 - Strategy 3: Protect and restore native plant communities.
 - Strategy 4: Enhance native fish and wildlife species/communities.
 - Strategy 5: Identify and reconnect fish and wildlife habitat connectivity.

- GOAL 5 HEALTHY STRUCTURES: Sustainable Design and Low-Impact Development
 - Strategy 1: Promote energy-efficient and energy-producing design, and reduce resource and energy consumption.
 - Strategy 2: Use sustainably harvested, local, non-toxic materials and finishes in building design and maintenance.
 - Strategy 3: Site and design new park structures in a way that achieves the Sound-Friendly vision.
 - Strategy 4: Improve “green design” education.

SOCIAL MEDIA AND TECHNOLOGY:

The surge of social media is undeniable and will continue to become more and more part of our daily lives. There are many ways in which social media platforms can be part of the Wilderness State Park experience and be used to attract new groups of younger, tech-savvy visitors.

- **Technology + Social Media – An Outdoor Nation Special Report;**
 - High tech tools that enhance the outdoor experience include; GPS, iPod's/mp3 players and mobile phones
- **Pure Michigan Surges on Social Media;** Pure Michigan is expanding its presence into new social media platforms
 - Pure Michigan is expanding its presence into social media platforms including, Instagram, Pinterest and Google+
 - Pure MI has launched a new Facebook App. In May/2012
 - E-newsletter includes ideas to help plan Michigan Getaways
 - Pure Michigan holds the No. 1 state tourism spot on Instagram
- **Tapping Social Media to Help Save California's State Parks;**
 - (CSPF) launched a successful advocacy campaign that included social media to help keep California's state parks open.
- **New Jersey mobilizes state parks with Android, iPhone app;**
 - The state of New Jersey is using a mobile application to encourage a new group of younger, tech-savvy users to visit state parks
- **Minnesota DNR for the Techie;**
 - Working on ways to keep up with technology including: geocaching to virtual tours, Wi-Fi in the parks, and podcasts,
 - Mobile apps, Social media
 - All 75 Minnesota state parks and SRAs (and one state trail) are participating in the geocaching Avian Adventure. All you need is a hand-held GPS unit. Many Parks with free GPS loaner
 - Multiple Parks with Wi-Fi Internet access
 - Multiple Podcasts about Minnesota state parks or Tales of Water Trails
 - DNR provides Virtual Tours

RECENT MICHIGAN STATE PARK MANAGEMENT PLANS:

- The latest **Michigan State Park Management Plans** can be found on the MDNR website.
 - A management plan for Wilderness State Park is scheduled to be completed by March 21st 2014.

REGIONAL TRAILS

North Country Trail Association

<http://northcountrytrail.org/>

North Country Trail Association | 229 E. Main St. | Lowell, MI 49331 | toll-free (866) 445-3628 | fax (616) 897-6605 | hq@northcountrytrail.org

PRECEDENT RESEARCH; EXEMPLARY, RECREATION AND CAMPGROUND PLANS/PROJECTS

- **Tully Lake Campground Sustainability Study**, Royalston, Massachusetts;
 - This study was prepared by graduate students from the Conway School of Landscape Design located in Conway, MA. The report was prepared in the spring of 2010 and is an example of a comprehensive process with excellent graphics to help illustrate the design process.

OTHER DOCUMENTS COLLECTED & REVIEWED

- Campground Design Guidelines
- LARA Code Reviews
- Outdoor Recreation Guidelines – B.F. Compliance
- MDEQ Campground Rules

USER SURVEYS

ON-SITE USER SURVEY (JUNE – SEPTEMBER, 2011)

Public input was collected from the Park Rangers/Supervisor from June 2011 through September 2011 during various hosted coffee hours at the campground. Many camp patrons participated and were really excited and more than willing to provide their input. Common themes of the

camper comments will be implemented in the Program Development phase of the study. The summary of the comments received is included in the appendix.

ON-LINE SURVEY (WINTER 2012/2013)

Public Input Acquisition

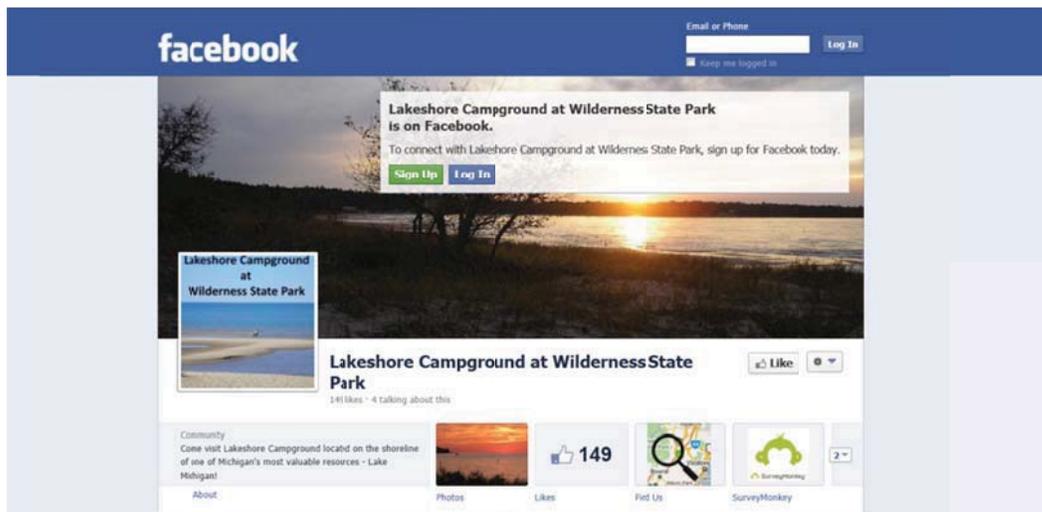
In the early stages of the design process, it was deemed critical that users of the Lakeshore Campground be offered a variety of opportunities to provide input regarding their desires and concerns relative to future campground updates. Approximately 5,000 users who visited Lakeshore Campground within the past two years were sent an email blast and a follow-up email that included general information about the Lakeshore Campground Redevelopment Study and opportunities for input and feedback. This information was also posted on the DNR website and a press release was sent out to the local newspaper. The following public input avenues were made available to Lakeshore Campground users.

SURVEY

Park users were asked to complete an online survey seeking user's opinions about existing and future recreational opportunities, programs, and facilities at Wilderness State Park generally and Lakeshore Campground, in particular.

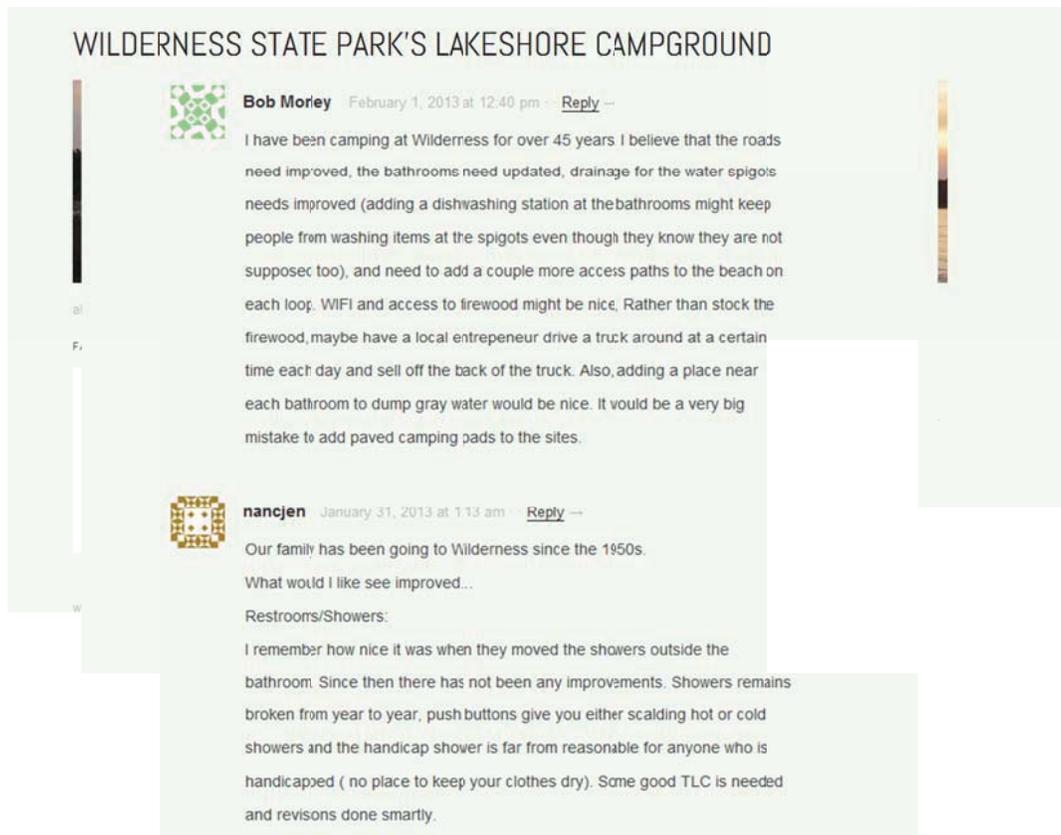
PICTURE THIS! ON LAKESHORE CAMPGROUND FACEBOOK PAGE

A Lakeshore Campground Facebook page was created and received 149 "likes." The Picture This! Exhibit, a component of the Facebook page, offered park users a chance to submit photos of what they like best at Wilderness State Park and Lakeshore Campground and what they feel needs work to make their visitor experience more enjoyable and meaningful. Camera phone photos or digital pictures could be uploaded to the Lakeshore Campground Facebook page. These photos will be exhibited at an on-site workshop that will take place in mid-2013.



THE LAKESHORE CAMPGROUND WEBSITE

The Lakeshore Campground website was created to provide park and campground users with general information about the campground, the study, and the public input process. Website visitors could post comments directly to the website.



Sample of public input and comments

ONLINE SURVEY OVERVIEW

The online survey was designed to obtain feedback from individuals who have been recent visitors to Lakeshore Campground within the past two years. Input from users who are most familiar with the campground, including its existing facilities, programs, and recreational opportunities was considered critical to the design process. Survey respondents were given approximately seven weeks to complete the survey. An email blast was sent to approximately 5,000 individuals on December 14, 2012, which included a link to the online survey. A second email blast was sent on January 11, 2013, reminding users to please complete the survey by the January 31st deadline. An overwhelming total of 1,269 respondents (25%) completed the survey.

The 21-question survey was divided into the following four sections:

About You Questions 1 – 4:

Questions about the user's visit to Wilderness State Park as a whole*

Lakeshore Campground General Questions 5-16:

Questions pertaining to when and how users access the Campground and importance/enjoyment of recreational features and programs.

Unique Characteristics of Lakeshore Campground Question 17:

Question asked what makes Lakeshore Campground special?

Room for Improvement Questions 18-21:

Questions pertain to improvements, tools, features that users would like to see at Lakeshore Campground

*If respondents did not answer 'Lakeshore Campground' or 'Both' to Question #4, the survey automatically ended. The survey was designed to gather feedback specifically from Lakeshore Campground users.

ABOUT YOU

Overall, the information acquired from the survey confirms that Wilderness State Park and Lakeshore Campground are highly valued by users. Survey respondents of all ages completed the survey however approximately 86% of respondents were over 35 years old. More than half of the respondents indicated that they visit Wilderness State Park at least once per year, while 42% answered that they visit often but not every year. Over 67% of respondents indicated that they travel more than 200 miles to visit the Park, which verifies the strong connection that users have to Wilderness State Park. In fact, the primary features that draw users to Wilderness State Park are the beach, the park atmosphere, the location near other attractions, and the special natural resources at the park.

LAKESHORE CAMPGROUND GENERAL QUESTIONS

The most popular time of the year to visit Lakeshore campground is June through September, which is typical of most campgrounds in Upper Michigan. Approximately 50% of overnight campers typically stay 3-5 nights, while approximately 20% stay 6-10 nights, and 31% one or two. Figure 1 and Figure 2 provide information about the type of camping parties that visit Lakeshore Campground. Figure 1 indicates the number of people that are typically in a party and Figure 2 shows the number of campsites that a group typically occupies. While the size of the camping party clearly varies, more than 70% of groups only occupy one campsite at Lakeshore Campground, which means that the campground, on average, can accommodate a larger number of individual parties.

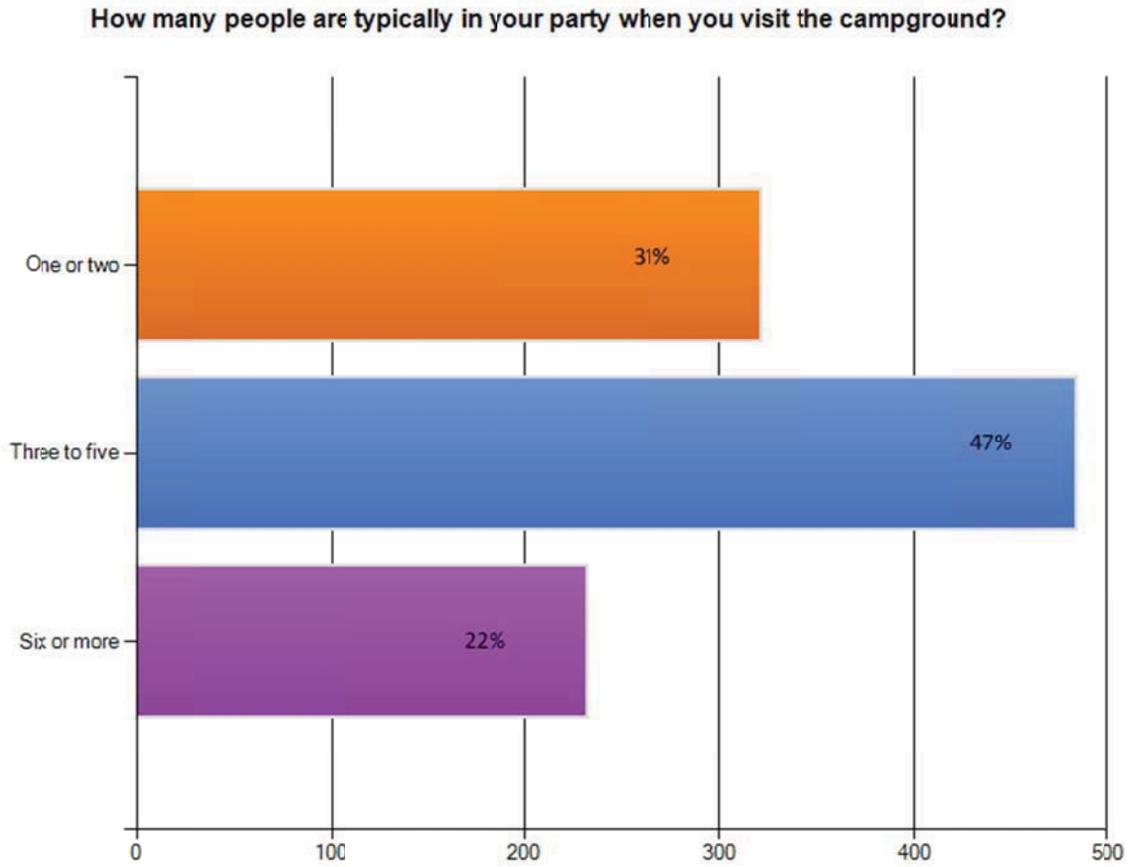


Figure 1

How many campsites does your group typically occupy when you visit Lakeshore Campground?

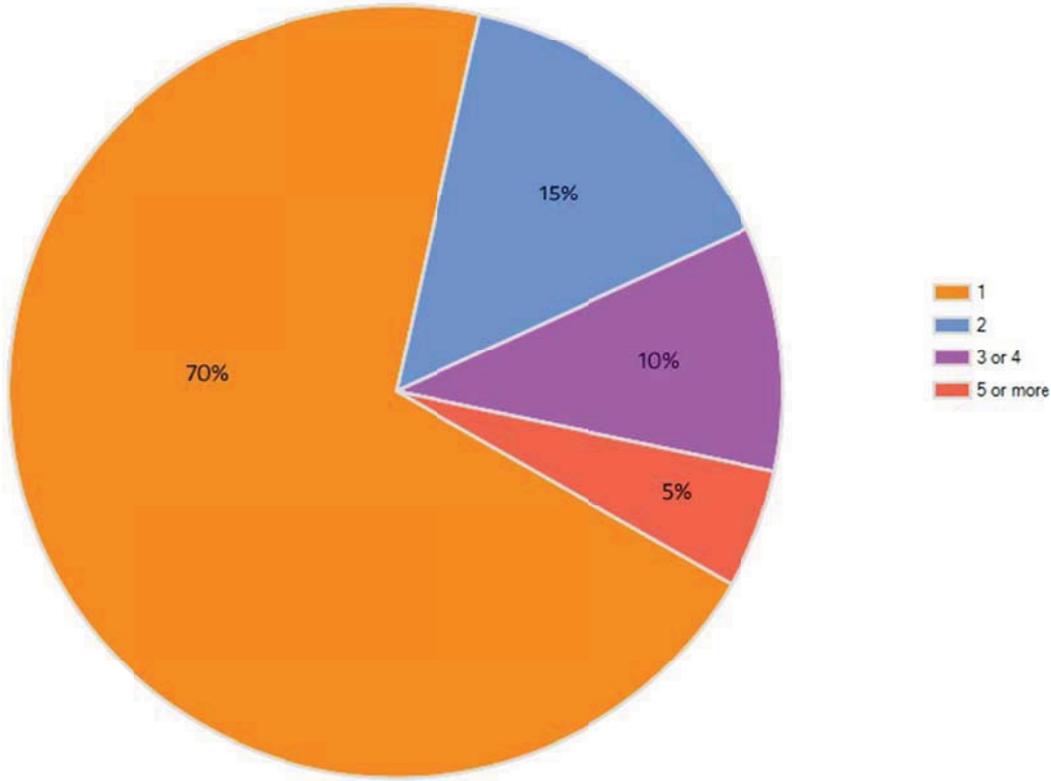


Figure 2

Camping enthusiasts come to Lakeshore Campground with a wide range of camping accommodations including tents, pop-up campers, RV's, camper trailers, and bring along many other camping amenities such as boats and floats. Figure 3 shows that Lakeshore Campground still attracts users that prefer tents and pop-up campers as well as larger camping vehicles. Over 65% of visitors camp in something larger than a tent. Half of all campers utilize and RV, camper trailers or 5th wheel campers.

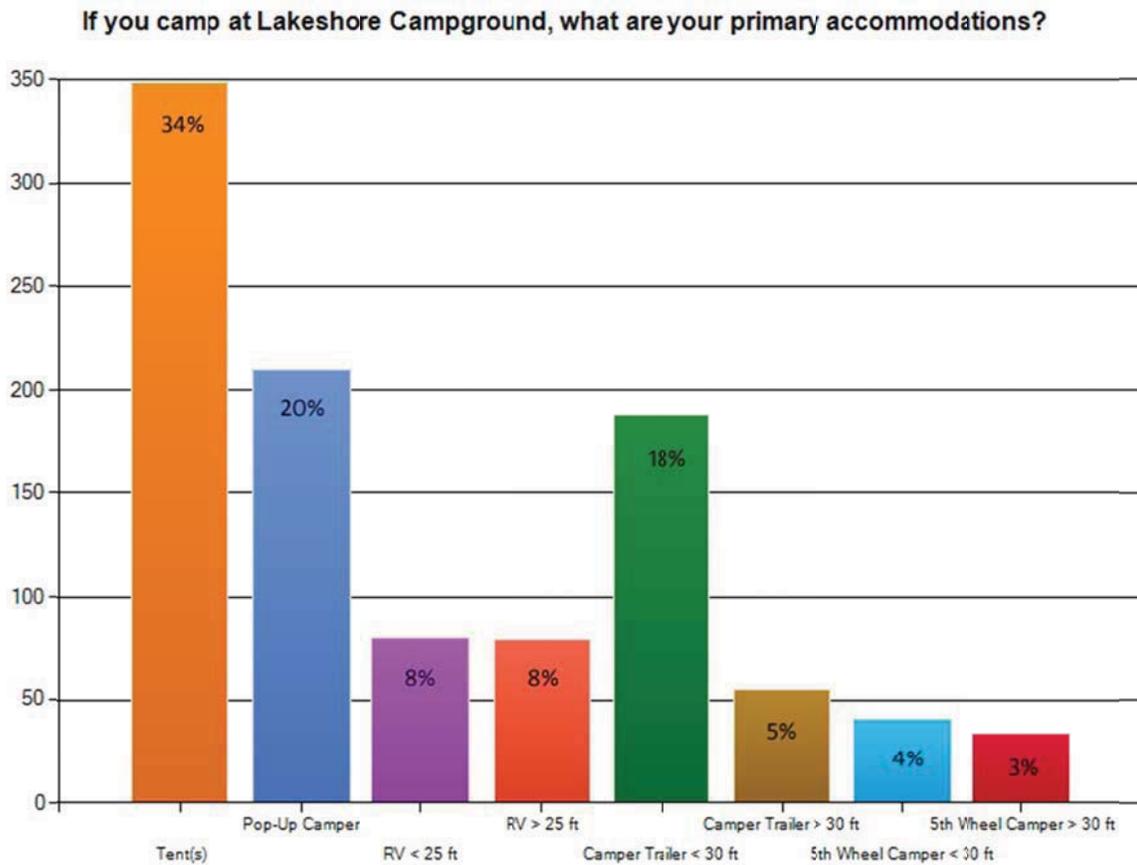


Figure 3

Wilderness State Park provides a wide range of programmed activities for all park users. The explorer guide program (48%) was ranked as the most popular park program by campground users, followed by tournaments (ex: horseshoe, bean bag) (17%), movie night (15%), and the 4th of July Bike Parade (15%). In addition to camping, the park offers a variety of recreational opportunities including swimming, fishing, boating, biking, hiking, hunting and bird watching. Figure 4 illustrates the recreational features that users view as the park's most important. Given the popularity of Lakeshore Campground, it is no surprise that visitors chose camping as the park's most important recreation feature, although swimming, hiking, and biking are also highly valued by users.

What are the park's most important recreational features for you? (check up to 3 choices)

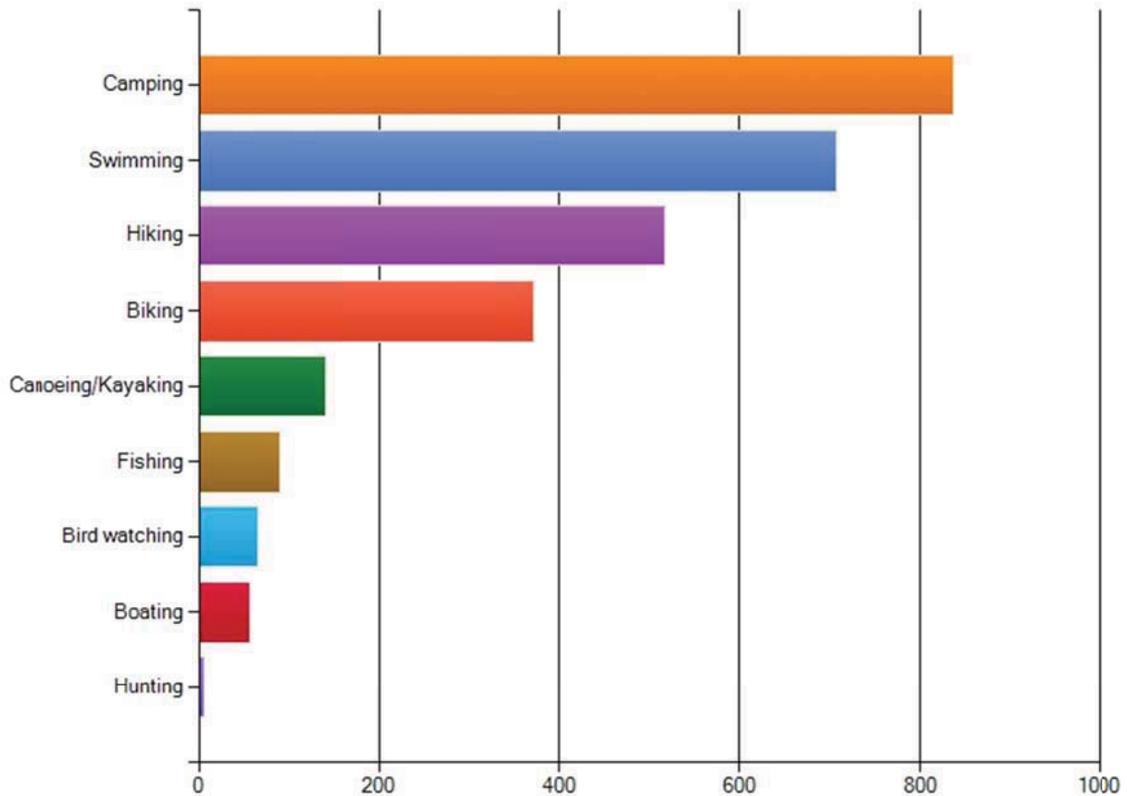


Figure 4

UNIQUE CHARACTERISTICS

Certainly, Wilderness State Park's offering of various recreational opportunities and programs is a primary reason why approximately 53% of Lakeshore Campground users choose to spend their time exclusively within the park rather than elsewhere in the area. Survey respondents were given the opportunity to choose up to five characteristics that make Wilderness State Park and Lakeshore Campground unique. The results, displayed in Figure 5, illustrate why such a large number of users are willing to travel long distances to visit the park.

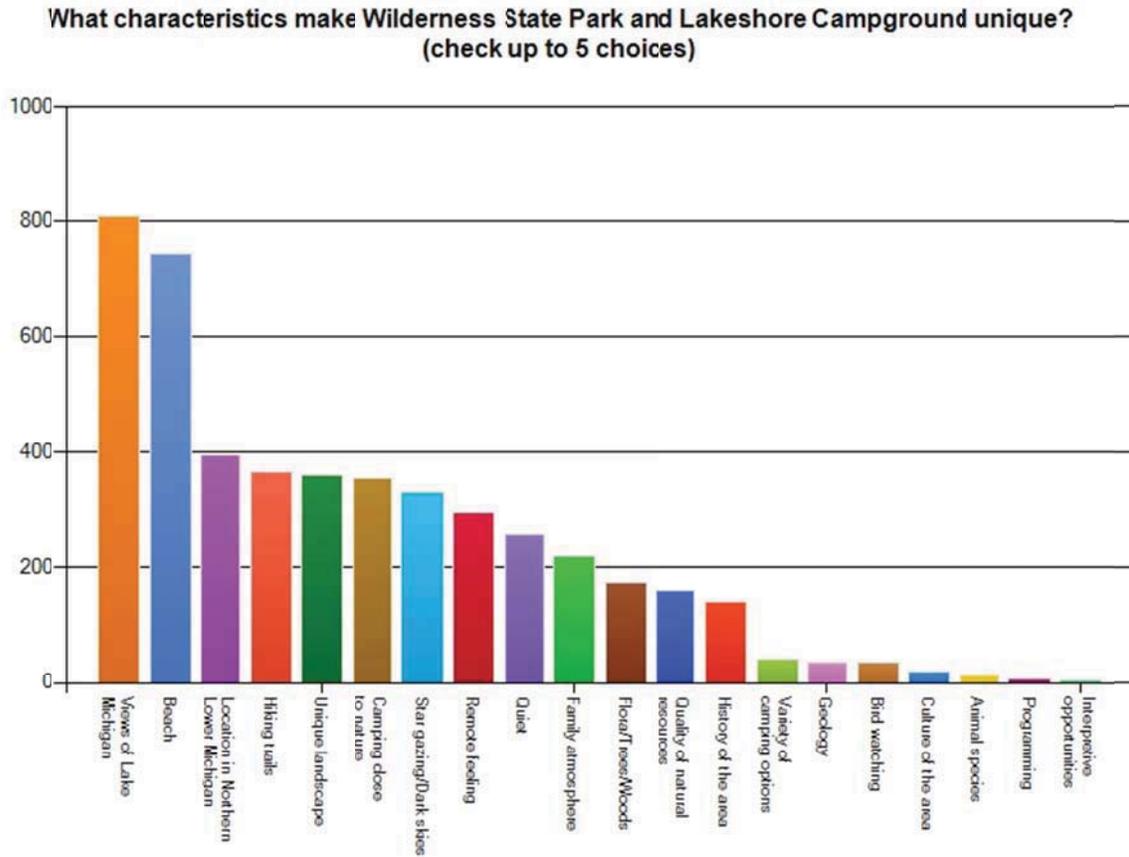


Figure 5

ROOM FOR IMPROVEMENT

The final four questions of the survey pertained to improvements and/or additional features that users would like to see incorporated at Lakeshore Campground. Figures 6 and 7 show what users chose as the most important (Figure 6) and the least important (Figure 7) improvements or additions to the campground. Users feel that improving the bathhouse/restroom facilities, views of the lake, the beach, electrical service, and RV/tent sites should be prioritized. Improvements to the fish cleaning station, pavilion, dishwashing station, and the addition of bike rentals/racks, and dog run/park are not elements that users feel needing attention at this time. Furthermore, survey respondents had the opportunity to comment on what features they would like to see improved or added at Lakeshore Campground, as described below:

- The majority of the comments focus on the need to repair/repave internal roads within the park
- Campground users would like to see improvements to on-site drainage, better access to the beach, updated bathhouses, and more space between campsites
- Users would like to see grass/vegetation removed from the beach
- Overall, users feel that the campsites are too crowded and that there should be designated areas for tent camping only and for camper/RV use only

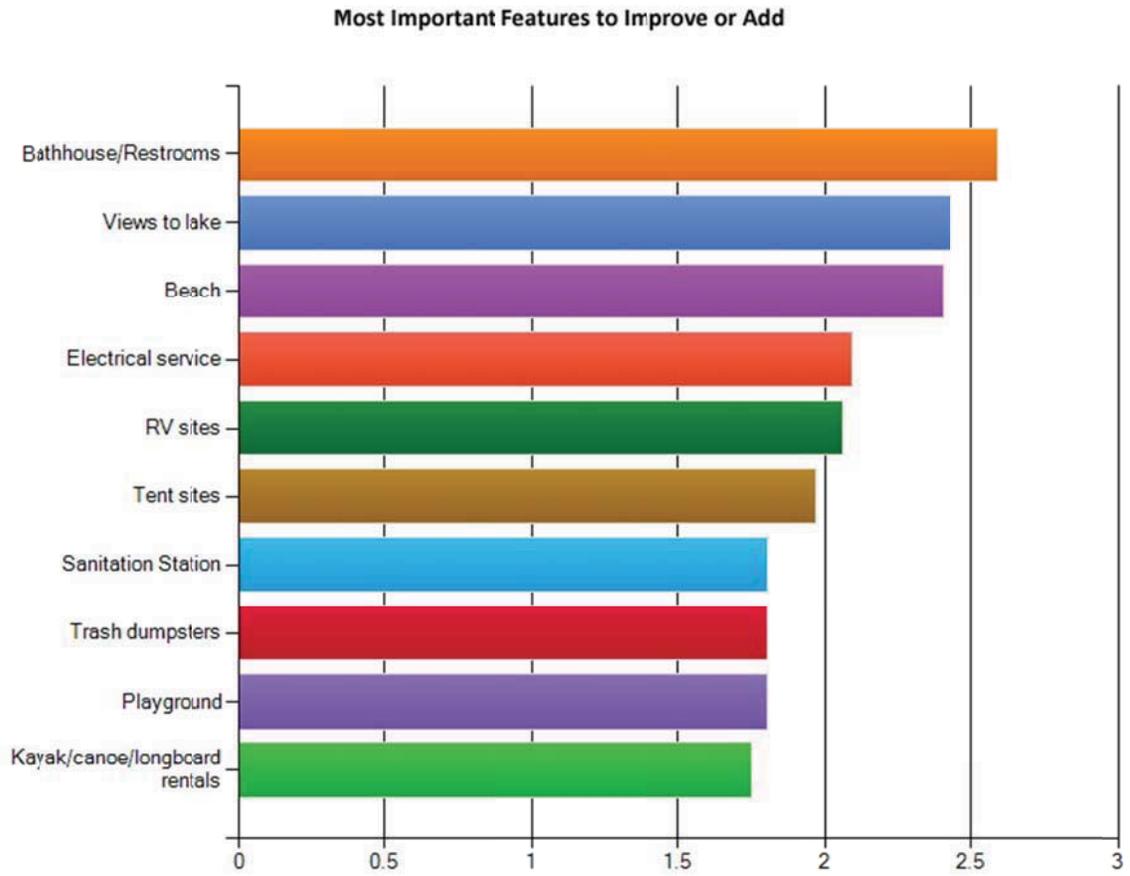


Figure 6

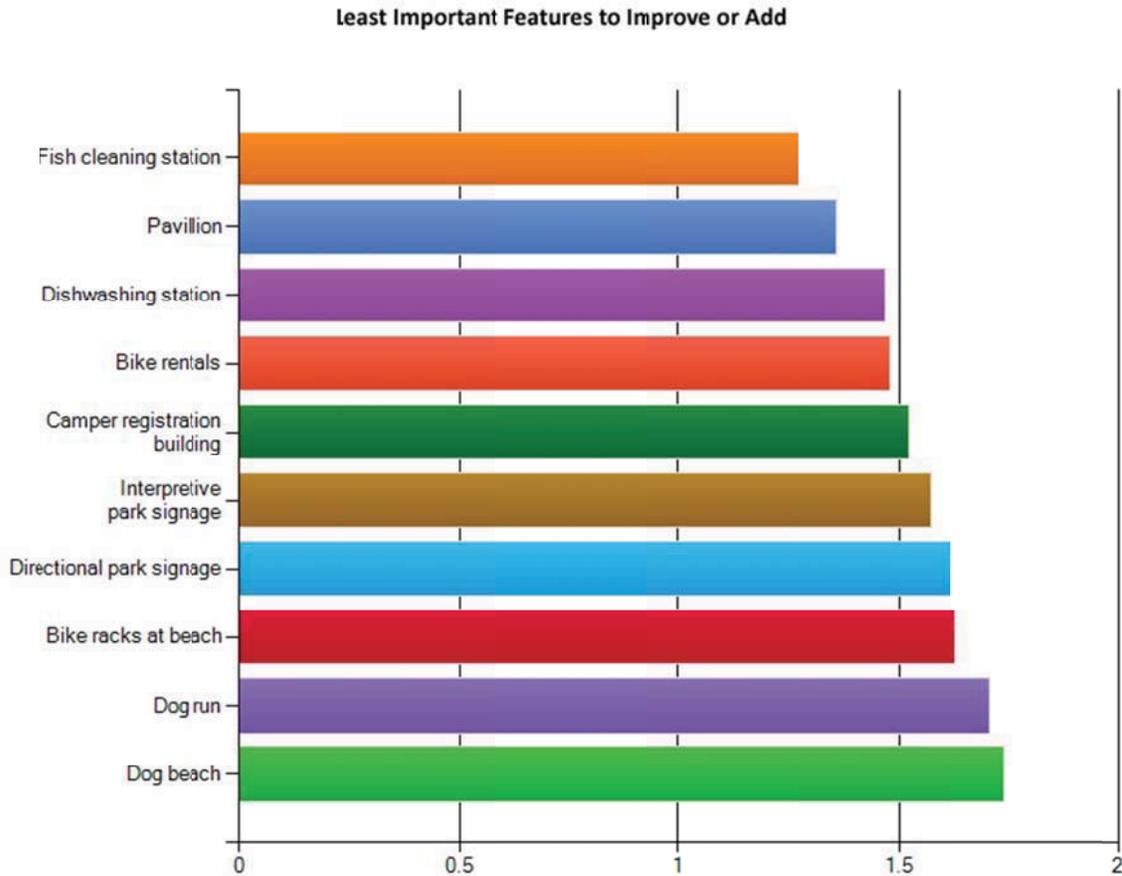


Figure 7

Finally, users recognize that technological and environmental updates to Wilderness State Park would greatly enhance both their interaction with the park and their ability to keep it clean and safe. On-line registration for campground use, wireless access, and downloadable online trail maps are the most popular technology tools deemed useful by survey respondents. Likewise, alternative energy and environmentally friendly features prioritized by users include recycling/composting facilities, minimizing invasive species, and solar power.

The input provided by park and campground users via the survey is greatly appreciated and will be a critical component of the design and planning process.

FIELD WORK

SURVEYING PROCESS AND PROCEDURES

As it relates to the overall survey plan for this project, our team completed a topographic survey of the project area which will serve as a base drawing for the required site planning and detailed design documents. Our team also surveyed readily discernable wetland areas, environmentally sensitive areas, stands of vegetation, substantial trees, etc., utilizing the expertise of our woodlands/wetlands expert, biologists, land planners, and engineering experts. Additionally, our team determined the Ordinary High Water Mark for Lake Michigan in this area pursuant to MDEQ and USACE requirements.



Surveying was completed to locate all topographic features within the existing campground and a comprehensive topographic survey was prepared of all areas within the project limits. Surveying data secured as a part of this project will be used for detailed design services by the NFE/LDS team and includes sufficient data to support determination of ADA compliance, and utilization of CIVIL 3D CADD design and modeling. In addition, FGDC compliant Metadata was procured for all permanent geospatial datasets produced under this project. All work was prepared within the Michigan State Plane Coordinate system under the NAD 1983 datum.

Survey control for this project was based on MDOT CORS Station variables. New site benchmarks are identified on the topographic survey drawings that can be used by the contractor to perpetuate the design for implementation in the field. In order to achieve the survey results, the NFE/LDS team utilized state of the art RTK GPS equipment. A permanent coordinate system was also established within the project limits for purposes of perpetuating the design through the construction process.

In addition, there are locations where trees and wetland vegetation are located within the limits of the proposed improvements. Team Registered Forester, Professional Wetland Scientist, and Biologists reviewed existing vegetation and wildlife in anticipation of making recommendations for required permitting. A wetland delineation survey was prepared and is shown on the topographic base drawing. This data will be utilized as a part of Part 301/303 permit submittal.



NATURAL FEATURES INVENTORY (MNFI)



A general reconnaissance survey of the natural features of WSP was conducted by the Michigan Natural Features Inventory (MNFI) in 2003. That assessment indicated that the park contains a number of high-quality natural communities, including boreal forest, dry-mesic northern forest, Great Lakes barrens, Great Lakes marsh, open dunes, interdunal wetland, and wooded dune-and-swale complex. Additionally, 11 rare species of plants and 8 rare animal species are known to occur in WSP.

Because of the known occurrence of these natural features and the fact that the campground and potential expansion area to the east of the existing campground were not a particular focus of the 2003 survey, a field reconnaissance via meander survey of these areas was conducted in October 2012. The 2012 survey efforts focused on several of the rare plant species that can be reliably identified at that time of the year and on the potential for nesting raptors. A number of the potential plant species and at least one species of insect known to occur in WSP could not be assessed due to seasonal considerations.

The survey revealed that two plant species, Pitcher's thistle (*Cirsium pitcheri*) and Lake Huron tansy (*Tanacetum huronense*), are abundant in the open dunes along both the existing campground and potential expansion area. However, at this time these species appear to be limited to the open dune areas only; no individuals of either species were found in the first terrace of stabilized dunes in the expansion area (the equivalent area in the existing campground is occupied by the campsites nearest the lake). It is interesting to note that despite heavy camper use of the dunes along the existing campground over an extended time, both Pitcher's thistle and Lake Huron tansy maintain substantial populations. Indeed, based on an enumeration conducted during the meander survey, total density of Pitcher's thistle in the existing campground and potential expansion areas are similar, though reproduction, which is not very good in either



area, does appear to be higher in the less impacted area. Interestingly, the pattern is reversed for Lake Huron tansy, which has a greater density in the less impacted area, but greater reproductive activity in the existing campground area.

No evidence was found during the 2012 survey for nesting raptors in either the existing campground or the potential expansion area.

As the campground redevelopment proceeds, it will be very feasible to avoid the thistle and tansy as they are located in the open dunes; areas otherwise not suitable for development. Additionally, the redevelopment provides an opportunity to include new stewardship features, such as boardwalks out onto the beach to better guide camp visitors away from the existing populations of these species. Once redevelopment plans are further delineated with respect to the footprint of planned activities, surveys for the species not addressed in the 2012 reconnaissance should be conducted at appropriate times of year and redevelopment plans adjusted accordingly.

VEGETATION ANALYSIS & TREE SURVEY

Overview:

Most of the forest canopy layer at the lakeshore campground's current camping sites is predominately comprised of White Spruce, Eastern White Pine and Northern White Cedar. While not the predominant species, some of the largest caliper trees consist of the Eastern White Pine, ranging from 18" to 26" in caliper.

A partial tree survey for the "campground proper" was conducted in October of 2012 and 842 trees were tagged. Thirteen (13) different tree species were identified and include the following species with DBH calipers ranging from 3" to 26".



Observations:

The general health and condition of the existing trees is fair to good due to soil compaction over the years. There is little to no understory vegetation within the existing campground area sites with the exception of some small pockets of shrubs and lawn areas. No invasive species were noted.

Implications:

Signs of tree stress are evident due to soil compaction and possible gas in the soils. Gas Leakage may be more of an educational / management approach. Growth rate of trees appears to be stunted, averaging two to three inches of growth per year.

Design Significance / Opportunities:

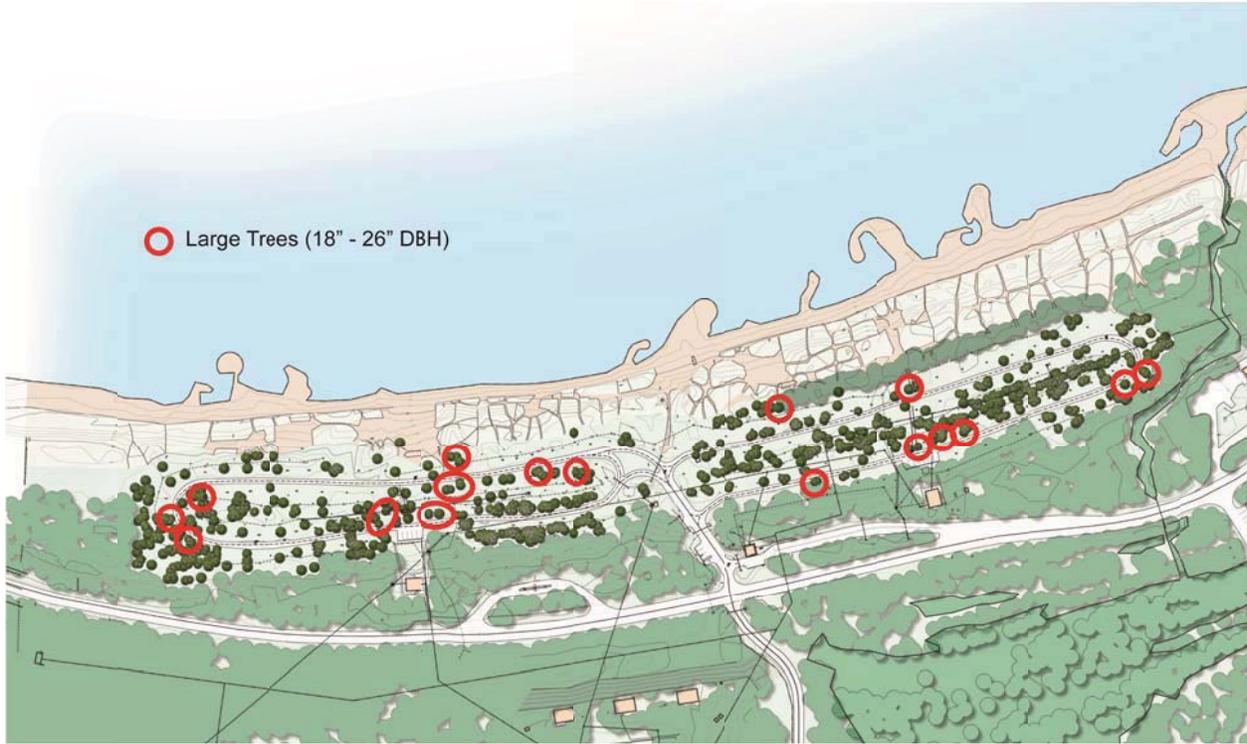


The White Spruce, Northern White Cedar and Eastern White Pine canopy attributes greatly to the overall character of the campsites and provide shade for campers, wildlife habitat and also contribute to the overall character of the "wilderness" campground and atmosphere.

A Landscape Reclamation & Management Strategy should be developed as part of the Preliminary Design phase to ensure existing trees and vegetation are protected and/or reclaimed as part of the construction process. Strategies and specific methodologies for pre-construction, during construction and post construction should be developed.

TREE SURVEY GRAPHIC

The graphic illustration below depicts the 842 surveyed trees that were surveyed. They are shown in the dark green color. The red circles highlight some of the larger trees ranging in diameter breast height (DBH) for 18 inches to 26 inches.



TREE SURVEY SUMMARY

| <u>Common Name</u> | <u>Botanical Name</u> | <u>Total # trees</u> | <u>Percentage of Total</u> | <u>Average Dia. (b)</u> | <u>Minimum Diameter</u> | <u>Maximum Diameter</u> | <u>Median Dia. (b)</u> |
|----------------------|----------------------------|--------------------------|--------------------------------|-----------------------------|-----------------------------|-----------------------------|----------------------------|
| White Spruce | <i>Picea glauca</i> | 368 | 43.71% | 11.3 | 4.0 | 24.0 | 11.0 |
| Eastern White Pine | <i>Pinus strobus</i> | 150 | 17.81% | 14.8 | 6.0 | 26.0 | 14.0 |
| Northern White-cedar | <i>Thuja occidentalis</i> | 148 | 17.58% | 10.4 | 4.0 | 18.0 | 10.0 |
| Red Pine | <i>Pinus resinosa</i> | 93 | 11.05% | 11.7 | 6.0 | 18.0 | 12.0 |
| Balsam Poplar | <i>Populus balsamifera</i> | 37 | 4.39% | 8.6 | 4.0 | 16.0 | 8.0 |
| Balsam Fir | <i>Abies balsamea</i> | 27 | 3.21% | 7.8 | 5.0 | 14.0 | 8.0 |
| White Ash | <i>Fraxinus americana</i> | 4 | 0.48% | 6.5 | 5.0 | 8.0 | 6.5 |
| White Birch | <i>Betula papyrifera</i> | 4 | 0.48% | 10.8 | 8.0 | 15.0 | 10.0 |
| Silver Maple | <i>Acer saccharinum</i> | 3 | 0.35% | 4.7 | 4.0 | 6.0 | 4.0 |
| Sugar Maple | <i>Acer saccharum</i> | 3 | 0.35% | 5.3 | 4.0 | 6.0 | 6.0 |
| Cherry spp. | <i>Prunus spp.</i> | 2 | 0.24% | 5.5 | 5.0 | 6.0 | 5.5 |
| Red Maple | <i>Acer rubrum</i> | 2 | 0.24% | 9.0 | 3.0 | 15.0 | 9.0 |
| Tag Alder | <i>Alnus serrulata</i> | 1 | 0.12% | 5.0 | 5.0 | 5.0 | 5.0 |
| | | 842 | 100.00% | | | | |

H137 FORESTRY FIELD NOTES & FOREST TYPE CHARACTERIZATION

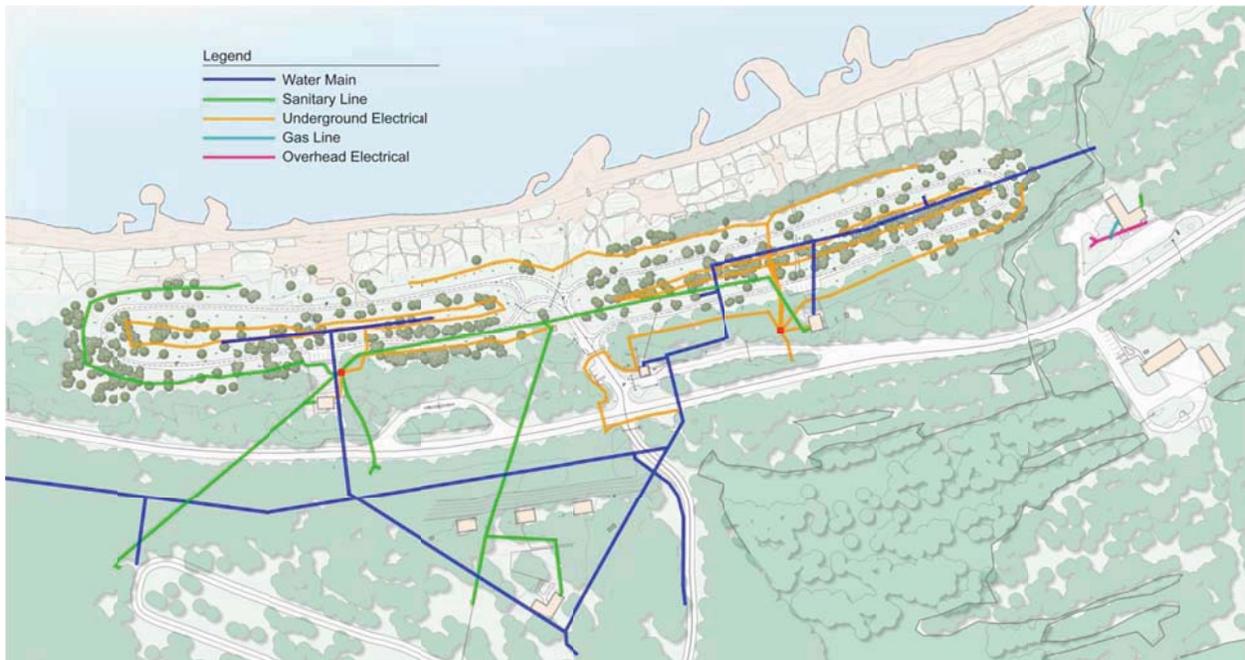
Tree Plot

1. Area dominated by large Eastern White Pine, pole size White Spruce, occasional large Red Pine and some Northern White-Cedar. Higher ground on N side of county road is an occasional Red Oak.
2. Opening in tree canopy approximately 50' across.
3. Fairly open area dominated almost entirely by pole size Red Pine (8"-15").
4. Area dominated by pole size to larger Red Pine, White Spruce, occasional Northern White Cedar and occasional large White Pine with sporadic Balsam Fir.
5. Area dominated by large Red Pine, occasional smaller spruce, White Pines very occasional only.
6. Mixed coniferous forest Red Pine and White Spruce dominant... White Pine has faded out of mix.
7. Large White Pine, mostly pole size White Spruce, lower elevations toward campground dominated entirely by pole size Northern White Cedar.
8. Coniferous – dominated by pole size spruce, interspersed with large White Pine, an occasional Balsam Fir along with a few pole sized Red Pines.
9. Coniferous – good size Red Pine, occasional large White Pine, pole size spruce.
10. Mixed coniferous (open canopy) forest equally dominated by White & Red Pine with understory of White Spruce (large areas covered by ground Juniper). Red Oak occasional. Area located just west of large stream & north side of county road.
11. Located in picnic area – coniferous forest dominated by large Red Pine with occasional White Pine. Again, much ground Juniper. Natural regeneration with White Spruce. (This area description is typical for the entire area extending from the large stream on the east to the ranger's residence on the west.). Area between the park headquarters and the ranger residence is similar but with more tree canopy closure.
12. Mixed hardwood / coniferous forest consisting of Red Oak, White Birch, Red Maple, Red & White Pine, White Spruce and occasional Balsam Fir with understory of White Spruce, Maple. Located on west side of park entrance road leading to south campground area (area across the street from sanitation station).
13. (South side of county road, east of south park entrance drive) Mixed coniferous forest consisting of mature White Pine & White Spruce, occasional White Birch & Tamarack.
14. (West of the small stream, south side of river, north of large wetland area). Coniferous forest but more wet mesic soils – more Balsam Fir, vary occasional Red Maple in open area, higher ground areas has Eastern White Pine & White Spruce. Interspersed is Northern White Cedar.
15. Mixed coniferous forest consisting of pole size Red Pine, stunted White Spruce, occasional White Pine and some Balsam Fir.
16. Mixed hardwood/coniferous forest – hardwood species consist of Red Oak and White Birch (very occasional) conifers dominate with Red Pine, some Northern White Cedar, Eastern White Pine.
17. Same as previous but more conifers dominance.
18. Wetter, mostly Balsam Fir with some of upland knolls inhabited by Red & White Pines

19. Mixed hardwood / conifer forest...little more moist, oaks have faded out. Tree canopy consisting of Red Maple, Trembling Aspen, pines faded out and conifers dominated by spruce & fir.
20. Close to river is coniferous forest dominated by Red Pine with understory of White Spruce and occasional White Pine. South off of pt 20, gradually changing from conifers to hardwoods. Rolling land. May be a few small wetland pockets within undulating depressions.
21. 22 Mixed coniferous / hardwood forest (area east of entrance drive to south camp). Deciduous species consist of Red Maple, coniferous species White Pine, White Spruce, occasional oak and Balsam Fir.



INFRASTRUCTURE EVALUATION



ELECTRICAL SITE UTILITIES

Electrical service to the State Park is provided by Great Lakes Energy. Great Lakes Energy provides electric service from a 7200 volt distribution system. Grade mounted and pole mounted step down transformers are used to provide a usable voltage typically 120/240 volt or 120/208 volt. Revenue metering of the step down transformers, and therefore the energy consumed, is provided by Great Lakes Energy

The 7200 volt primary distribution system as well as the step down transformers are owned and maintained by Great Lakes Energy. Distribution beyond the step down transformers is typically the responsibility of the park.

The Great Lakes Energy 7200 volt primary distribution will be revised by Great Lakes Energy to accommodate the new locations where electric service is required as well as maintaining power to the existing services which are to remain.

New pad mounted transformers will be located as required to provide service to the new park electrical loads including the Toilet/Shower buildings and recreational vehicle distribution panels.

Although the total expected electrical load of the renovated park has not been tabulated, it is anticipated that the Great Lakes energy 7200 volt primary distribution has sufficient capacity to accommodate the park's needs. This will be further investigated during the next design phase.

POWER DISTRIBUTION

Power distribution to the Toilet/Shower buildings would be provided via a pad mounted transformer. The pad mounted transformer will be served at 7200 volts by Great Lakes Energy. The 7200 volt service feeders and pad mounted transformers would be owned and maintained by Great Lakes Energy. The service would be metered by Great Lakes Energy.

The transformer secondary power which would typically be 120/240 volt or 120/208 volt will serve a circuit breaker type main building panel which would provide branch circuit distribution for lighting, receptacles, mechanical equipment, building equipment, etc.

The Toilet/Shower building panel will also include spare power for future needs as well as site needs in the area.

RECREATIONAL VEHICLE POWER

120/240 volt exterior recreational vehicle power distribution panels will be located in the areas where recreational vehicle power receptacles are required. Approximately 150 receptacles, 1/2 rated at 30 amp and 1/2 rated at 50 amp, are anticipated.

Typically up to 16 recreational vehicle power receptacles would be served from a single distribution panel. It is anticipated that up to ten distribution panels could be required.

Each recreational vehicle power receptacle would be served from a circuit breaker in a distribution panel. Distribution panels would be served by a Great Lakes Energy transformer. The transformer secondary would be electrically metered by Great Lakes Energy.

Recreational vehicle power kiosks would be located at various locations so that Visitors wishing to power their recreational vehicle could buy power. The kiosk would allow the visitor to enter the recreational vehicle location number, selected how many hours of power is desired and then pay with a credit card. System programming would include which locations provide a 30 amp service and which provide a 50 amp service. Typically an internet connection would be required at the kiosk so that the credit card could be verified and processed.

Research has determined that the two largest manufacturers of metered power systems are Eaton and TruRead. These systems are typically manufactured for the marina industry. The State has TruRead metering installed at other facilities and has not been pleased with the system. The Eaton system makes use of a receptacle bollard with one or more integral contactors used for switching power based on signaling from the kiosk. Bollards can be provided with one or more receptacles based on needs. The use of wireless systems appears limited however as a result of advances in technology; more advanced systems are anticipated in the future.

LIGHTING SYSTEMS

Interior lighting within the Toilet/Shower buildings will primarily be accomplished with 28 watt, T8, 4 foot fluorescent lamps as well as compact fluorescent lamps. In addition the use of LED fixtures will be used where cost, maintenance and lighting objectives are met and a where favorable life cycle cost can be achieved.

Illuminating spaces with natural day light will be incorporated into the building design. In order to achieve maximum efficiency and lamp life, as well as minimizing energy costs, lighting will typically be controlled with occupancy sensors. Day light sensors will also be used where spaces are illuminated with natural day light. Electric lighting will be turned off when natural day lighting can be used and the systems will take into consideration the Dark Sky designation.

Exterior lighting will typically utilize compact fluorescent lamps or LED fixtures. In exterior applications, LED fixtures are proving very cost effective as compared to typical metal halide fixtures.

Lighting fixtures will be specification grade, UL listed and complete with all accessories required.

WIRING DEVICES

120 volt, 20 amp receptacles will be provided for convenience at locations as coordinated with park staff. Receptacles will also be provided to serve equipment where appropriate. All receptacles accessible to visitors as well as exterior receptacles will be GFCI type. Exterior receptacles will also be provided with exterior weatherproof covers.

TELECOMMUNICATIONS

Currently telephone service is provided to the park from AT&T. This does not include internet access, only telephone communications.

Cellular service within the park is spotty. In almost all areas, it is difficult to receive a signal that has a strength greater than one bar. Trees contribute to the lack of signal. Knowledgeable visitors know that if you stand at the shoreline, you can get a signal from across the straits that can commonly be three bars.

Comcast and Charter Cable both provide cable service in northern Michigan, however based on the remoteness of the Wilderness State park, and the lack of other customers in the area they have both indicated that installing service to the park would not be cost effective. Charter Cable performed a study and determined to bring cable service to the park would cost some \$340,000.00.

In the park office, they have tried using both AT&T and Verizon USB type AirCards with little success. The lack of a reasonable cellular signal prevents the effective use of AirCards.

The federal government recently installed communication towers as part of an emergency warning system. HughesNet, a satellite internet provider was able to make use of these towers to install antennas and repeaters. HughesNet began offering satellite internet service to this area of northern Michigan. The park has had internet service provided by HughesNet for approximately two months. The service communicates through a local satellite dish and modem. Although download and upload speeds are limited, it is a significant improvement over the previously used modem that communicated via the AT&T telephone service. Other than the HughesNet satellite service, there does not appear to be other reasonable options for internet.

Additional investigation is required to determine if down load and up load speeds, as well as system bandwidth can be provided to support the Wi-Fi system discussed below.

WI-FI

Wi-Fi service can be provided as a convenience to park visitors. WIFI service is provided in various parks around the Country and has been reported to be a greatly appreciated and valuable amenity. Wi-Fi service can not only be used for typical internet based activities, including browsing, downloading, emailing, etc., it can also be used to provide park information and to promote the park to visitors. This is accomplished by giving visitors the ability to wirelessly visit a park web site. This would typically include information regarding park history, operations, features, services, schedules, etc. It can also provide visitors with information regarding activities, amenities, retail business, medical services, etc. available within a drivable distance from the park. The use of an outdoor Wi-Fi system not only provides visitors with the ability to receive and send data, it provides the visitor with knowledge.

Wi-Fi service is provided by locating pole mounted antennas on repetitive centers. A typical outdoor Wi-Fi antenna creates a Wi-Fi hotspot which can, depending on site conditions and the equipment used, have a signal radius of 110 to 200 feet. Locating antennas appropriately can result in the coverage of large exterior areas.

Internet service is typically provided by an internet service provider. With the use of a data network employing switches and routers, service is provided to the remote exterior antennas. Typically fiber cable is used for distribution to antennas in order to avoid the losses and limitations associated with copper conductors. Prior to the design of the Wi-Fi system, expectations and performance objectives, including the required bandwidth based on anticipated usage must be defined. The areas to be covered as well as the percentage of coverage must be determined in order to determine antenna quantities and locations. In addition, in a park setting, the impact of trees must also be taken into consideration.

Additional investigation is required to determine if down load and up load speeds, as well as system bandwidth can be provided to support the WIFI system discussed in this report.

POTABLE WATER WELL SYSTEM RESEARCH & TESTING



The NFE team has performed a limited amount of research of existing records available from the County Health Department and MDEQ regarding the existing well systems. In addition, a review of the visible water facility components on-site, a review of historical park records and facility locations mapped out on the existing condition / topographic survey was recently completed. We have a firm understanding of the existing water

system. Existing well logs identify that there are two wells located within the Wilderness Campground. The main well, which services both the Pines Campground and the Lakeshore Campground, is located in an existing well house located at the extreme western end of the campground areas. The depth of the existing 6" steel casing well is 190 feet, where historical testing results for flow and capacity identified 75 GPM. Testimony indicated that water quality is very good and that all testing from Emmet County Health Department has yielded positive results for the entire history of the well. Within the well house, there exists a late model Gould vertical turbine pump (model GCLC), an abandoned buried horizontal pressure tank, six (6) 119 gallon vertical pressure tanks, and associated piping, valves, injection ports, control panels, etc., typically associated



with a Type II well system. The layout and building style are typical for an installation of this type and appear to meet current standards for housing this system. A thorough analysis of the existing system, including adaptability for future water metering installation, would be completed as a part of the future design.

It is recommended that as a part of additional testing during the design phase, a qualified well driller should determine expected flow rates and capacity of the existing system to see how they may vary from the preliminary results. In addition, water samples should be obtained and tested for turbidity, water hardness, and other water quality related concerns in accordance with County and State Health Department guidelines. Finally, a sounding test should be performed on the existing steel well casing to ascertain the casing is in acceptable condition for future considerations and existing pump motors and controls should be inspected to ascertain their long term viability.

Preliminary water consumption and usage calculations for system sizing conclude that the existing well system is currently at 80% capacity. The ability of this existing well system to provide adequate service to expanded uses within the Lakeshore Campground will have to be closely monitored, with respect to development plans.



As a part of the schematic design phase, preliminary layouts of the proposed water system facilities shall be prepared to identify how this utility system relates to proposed conditions. The schematic layout should be refined during the design development process to assure water system requirements are integrated for the proper planning of the site. It is understood that architectural, electrical and mechanical drawings will be required and that permits from MDEQ, LARA, and Emmett County Health Department will be needed. As such, communication with these agencies should be established at the appropriate time to facilitate a smooth permitting process. Based upon our understanding of the existing system, its age and capabilities, we would make the following recommendations with respect to future development of the Lakeshore Campground:

- Replace the existing pump, controls and pressure tanks within the well house to a Variable Frequency Drive (VFD) system. The existing vertical turbine pump is an older model, and while it may currently function, future replacement and maintenance may become difficult. In addition, the ability for VFD pumps to provide near municipal pressures and volumes, with reduced electrical demand, makes the system an ideal choice for the park. Likewise, the elimination of pressure tanks, which generally have a very finite lifespan, within the system will aid in the reduction of their future maintenance and replacement costs.
- Replace large segments of the existing water distribution system within the Lakeshore Campground, with appropriately sized HDPE water main. Much of the system is smaller diameter galvanized lines which are at the end of their life expectancy.
- Consider the implementation of a separate VFD well system, for the primary use of the Lakeshore Campground. As noted above, since the current capacity of the system to provide coverage to the Pines and Lakeshore areas may restrict future development concepts, adding an appropriately sized secondary well system may provide increased capability for the Lakeshore area. In addition, for purposes of system redundancy, adding a secondary well and interconnection piping and valving would allow for the periodic shut-down (planned or emergency) of one well, while maintaining water to users of both campgrounds.

SANITARY SEWER LIFT SYSTEM

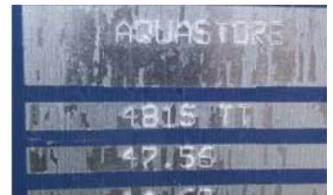


Historically, the existing site has been served with a sanitary sewage lift station fed from multiple gravity sewers that are servicing the various facilities within the campgrounds and surrounding area. The existing pump station is situated in a greenbelt area adjacent to the refuse collection area. This lift station pumps sewage to the south into a second sanitary sewer lift station where the sewage is then pumped to the sanitary treatment facility.

We understand that the lift station and sanitary sewage treatment system was reconstructed in 2001 and that it is the desire for the proposed facility to re-utilize this system in its current location and capacity. We will continue to coordinate and assist in the site planning of the required system and coordinate the necessary permits and approvals with the MDEQ and Emmet County. The plans shall be developed to accommodate the proposed site and facility locations, and options for expansion of the system in the future will be considered as necessary.



Through testimony from staff, and as identified in the original RFP, the existing lift station will be re-utilized as a part of this project. It is anticipated that sewer laterals will be further evaluated as a part of the design process in an effort to save infrastructure costs. Placement of proposed facilities will somewhat dictate how the existing sanitary sewers will be re-utilized. It may become necessary to run new lateral lines and connect to the existing sanitary sewer lift station.



SANITATION STATION



The existing sanitation station is located adjacent to Wilderness Park Drive behind campsites 142 and 143. The location of the sanitation station can be seen from the campsites immediately adjacent, and serves as a visual and aromatic nuisance rendering these campsites as some of the least attractive sites within the campground.

The existing sanitation station is in need of significant upgrades. It is significantly outdated, and does not meet the needs of the Wilderness Campgrounds as they are utilized or exist today during high usage times throughout the summer. Through testimony from staff, vehicle stacking is problematic due to the limited dump stations, and due to the configuration of the entry and exit geometrics. Discussions were held where it is believed that a more appropriate location for this facility would be somewhere as trailers were leaving the camp grounds rather than its current location. It is recommended that the Sanitation Station be relocated away from the Lakeshore campground proper, and that its capacity be increased via adding an additional dump station.



NATURAL GAS & PROPANE

Currently natural gas service is not provided to the park.

The natural gas regional provider is MichCon, a subsidiary of Detroit Edison. Based upon a review of MichCon facilities and discussions with representatives from their office, the terminus of their existing gas main system is located at Wilderness Park Drive and Trails End Road, outside the westerly Mackinaw City limits. This terminus is approximately 7 miles in distance from the Park, measured along Wilderness Park Drive. At this time, MichCon has no immediate plans to further extend the gas main system to the west.

The Park and neighboring residential properties are currently serviced by propane. It would be expected that propane will remain the source for heating / utility service going forward and will be assumed for future development plans for the park.



WASTE MANAGEMENT

TRASH:



Three 8 yard dumpsters are currently located near the entry of the Lakeshore Campground. Two additional ones are located in the Pines and one at the maintenance shop. Waste hauling is provided by Little Traverse Disposal and 2 pick-ups a week are scheduled during the peak season.

Although this facility is centrally located within the campground, it has little screening with exception of an old wood fence located on the north side of the dumpsters. The recycling bin on the south side provides some screening by the nature of its layout. New plans should study ways of better screening this facility while still maintaining functionality for the campers and waste hauling service.

RECYCLING

As evidenced in the adjacent photo, there are currently bins available for recycling of paper, metal, glass and tin. The park staff is currently hauling a one ton load of glass, plastic and tin to Mackinaw/Cheboygan



County, twice a week. Opportunities to improve and continue this green initiative should be further explored with maintenance and facilities operators of the park along with the waste hauling services.

FISH CLEANING STATION



The small mouth bass season occurs in the months of April through June and is a popular recreational activity at the camp and with that comes some challenges for the campground to deal with. The smell of the fish guts, bones, gills and fish oil/grease is not pleasant.

The following images are from; JWC's Monster Cleaning Station "Monster Muffin" which has been installed at State Parks throughout the country. This and other proprietary systems should be evaluated relative to the sanitary system's ability to handle the grinded solids or other ways to dispose of the waste created by these systems during the programming and design phases.



The Monster Fish Cleaning Station turns fish waste into small particles which are easily flushed away. The self-contained stainless steel table uses a powerful Muffin Monster dual shafted grinder to shred solids, such as fish parts, cans, plates, utensils and fishing lures. This prevents clogging and protects downstream equipment. It is clean, cost effective and reliable.



DISH WASHING STATION

No formal area for washing dishes is presently available at the campground. There are however, various signs at water spigots and drinking fountains forbidding the washing of dishes. Providing a designated dish washing station should be considered. A station at the toilet/shower room building has been suggested. The challenge of integrating this facility is the separation of solids and grease and preventing them from entering the sanitary system. Design options will be studied and evaluated in the design phase.



GEOTECHNICAL INVESTIGATION / SOIL BORINGS

The NFE team through the efforts of Testing Engineers and Consultants (TEC) performed a geotechnical investigation of the project area. Appropriate MISS DIG clearance was obtained prior to mobilizing on site to perform the subsurface exploration. TEC obtained ten subsurface explorations consisting of 2 five foot deep borings, 8 ten foot deep borings. Laboratory investigations were performed to determine the strength, compressibility and physical characteristics of the soils encountered. An analysis was performed of the results of the field and laboratory investigation, and all findings and recommendations were summarized in a written report contained in the Appendix.



A summary of these results provides the following conclusions:

- Asphalt thickness ranged from ¾ inch to 5 ¾ inch with the primary thickness being 1 ½ to 2 inch
- Aggregate base thickness ranged from 3 to 10 inches and seemed to be contaminated by underlying subbase soils. The resulting material would no longer be considered MDOT 21AA which is a common asphalt base material.
- Unpaved areas contained approximately 3 to 10 inches of topsoil.
- Underlying native soils are predominantly fine grained sand with some medium to coarse layers below depths of about 3 feet.
- Standard penetration values range from 5 to 37 blows per foot, with bulk densities ranging from 100 to 144 pounds per cubic foot.
- The elevation of the ground water is generally between about elevation 580 and 584 and appears to have a significant gradient from south to north as you get closer to Lake Michigan.
- Depending on depth and location of footings and utilities, it should be expected that some dewatering may be required to accommodate construction.
- The on-site soils are generally acceptable for support of the proposed structure on shallow foundations.
- On-site soils are generally acceptable for site balancing and grading activities.
- As truck traffic is expected to be minimal in this area, it is recommended that the new pavement section be 3 ½ inches of HMA pavement overlaying an 8 inch thick 21AA aggregate base.

As identified, the completed report can be found in the appendix, and will be carefully reviewed in conjunction with the proposed site programming and schematic plan development.

SITE DRAINAGE

There are a number of locations throughout the campground where it is evident that drainage problems exist. Rainwater runoff currently pools in several spots along the roads and washes across the beach and through the playground area. In these cases, it will be required to appropriately address drainage routes being impacted as a part of the proposed design, and where feasible, propose recommended design solutions. We expect that a variable range of drainage devices will be required to adequately address drainage concerns throughout the campground system. Specifically, leaching basins and underdrain/drain fields will be implemented to promote ground water infiltration. Culverts will be strategically located, drainage swales and/or spillways may be implemented, rain gardens and/or bio-swales will be implemented, and surface areas will be re-graded to adequately address overall site drainage. Facilities will be appropriately sized in accordance with best practices.

Overall, there are many areas of concern with respect to site drainage. The campground was developed within a “Dune and Swale” complex. This particular dune and swale complex has been created over a long period of time as the historical high water mark for Lake Michigan has receded. Typical to a dune and swale complex is the creation of trapped drainage areas behind the dune that can result in wetland complexes in the swales.



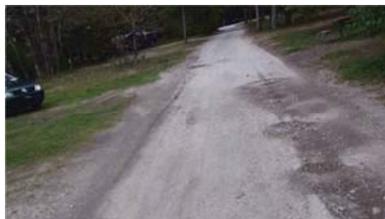
In this specific case, the Lakeshore Campground has been developed within a swale of the dune and swale complex. Wetlands have not developed in this area primarily due to a lack of watershed upstream of the campground, and due to man's development in this area. Additionally, the drainage area upstream of the campground is bisected by Wilderness Park Drive which intercepts runoff from higher elevations and diverts these flows into area drainage facilities. It is interesting to note that on the south side of Wilderness Park Drive, this dune and swale complex has resulted in significant wetlands

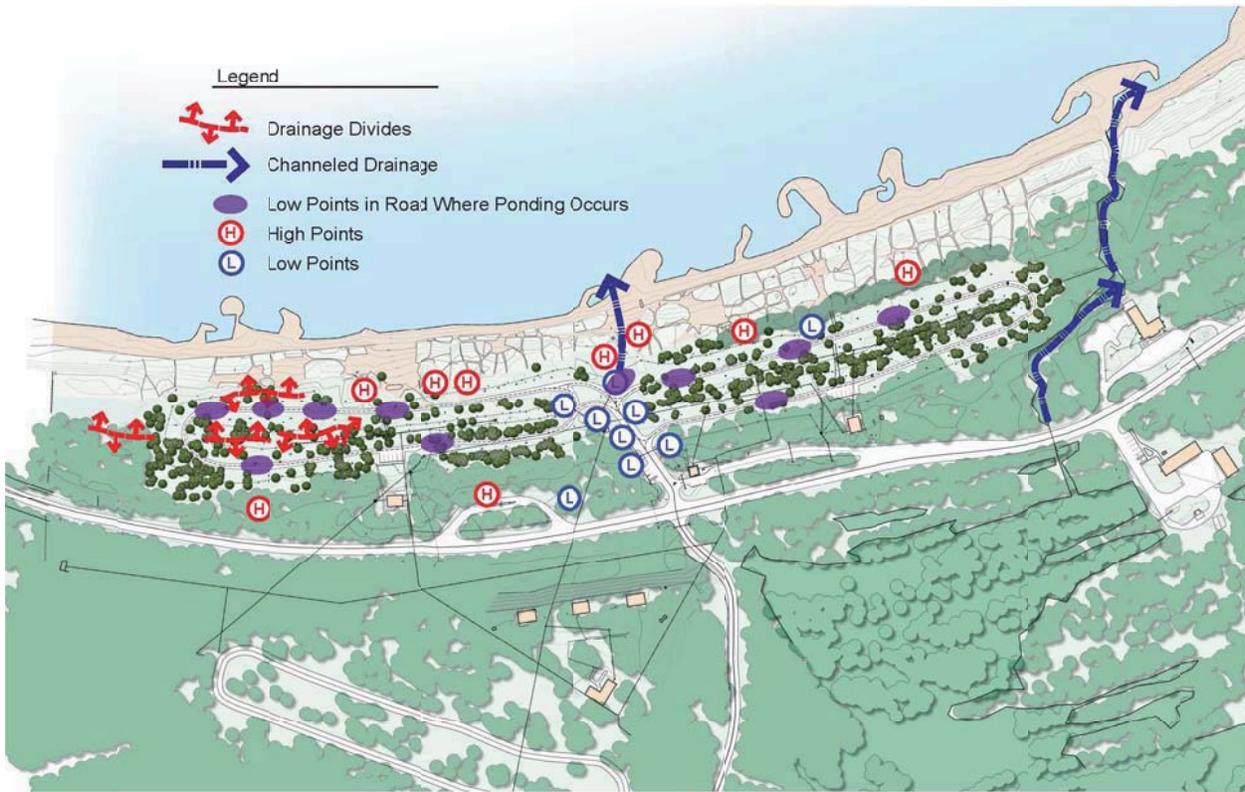
being created. Additionally, the campground was developed in very close proximity to Lake Michigan where fluctuations in the Ordinary High Water Mark can present challenges with respect to designed drainage outlets. The current OHWM is approximately elevation 580.00 where the elevation of the campground ranges in elevation from 585 to 591 with the highest roadway elevation being approximately elevation 588.

Based on a review of the topographic survey prepared by NFE, the roadway area contains approximately 12 different locations that would be considered low spots or poorly drained areas. These areas fluctuate in approximate elevation from 585.00 to 585.50 across a total length of almost 1800 feet. This is a clear indication of how poorly drained the roadway system is. Additionally, there is only one location where a catch basin can be found (between campsite 125 and 127). Testimony concluded that this catch basin was connected to an underground drainage field below campsite 125. Testimony further concluded that this method of drainage was successful in this area of the campground.



As a part of this project, it will be necessary to design corrective measures into the proposed plans and specifications. It may become necessary to sacrifice some campsites in favor of drainage facilities and/or features. Drainage systems will continue to be developed as the project progresses through the design phase of the project. Critical to a good design is the understanding that there is truly no designated outlet for storm water management. Concepts which promote leaching will be crucial for an acceptable storm water management plan. Big Stone Creek is a possible drainage outlet for some of the redeveloped campground, but efforts should be made to avoid a drainage outlet to this drainage feature if possible and utilize the intermittent drainage outlet further to the west.





BUILDINGS, STRUCTURES & FACILITIES INVENTORY

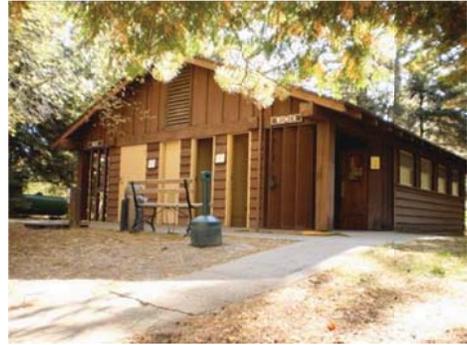
As a part of the overall analysis, our team performed a review of existing buildings, structures and various facilities supporting the Lakeshore Campground. The review included a visual inspection of existing structures, a videotaped walking analysis together with testimony from park staff, a review of existing available records, and a review of MDNR provided plans for a modern structure proposed as a part of “Green Building Study”. This inventory will serve as a base line as the design team develops programming requirements for new facilities.

BATHHOUSES



There exist two (2) identical bathhouse structures...one located at the west end of the Lakeshore Campground in proximity to campsite 132, and the other located at the east end of the Campground in proximity to campsite 22. The exterior finishes for these structures consist of rough sawn lap timber siding and asphalt/fiberglass shingles. The structures are slab on grade and the siding extends to the floor slab. The finish floor of the bathhouse is elevated and does not comply with today's ADA

accessibility guidelines. This must be addressed as a part of the replacement structures. Each bathhouse contains four (4) shower stalls with one of those stalls being accessible. The shower stalls are very small in comparison to the modern replacement buildings that the DNR has generally accepted as their standard.



Each building contains a men's restroom and a woman's restroom. The men's restroom contains 2 sinks, 2 urinals, and 2 toilets. The woman's restroom contains 3 toilets and 2 sinks. The restrooms are joined together via a narrow utility corridor and a janitor closet. The Janitor closet contains mechanical equipment, piping, janitorial supplies. The hot water heaters were replaced in 2010 and in very good working order. Testimony from DNR staff suggest that the janitor closet should contain a recessed floor drain or a slop sink for dumping mop buckets, and that quarry tile floor finish is preferred from a maintenance standpoint.

The westerly bathhouse is serviced by six parking spaces (none identified as accessible), and associated pathways and sidewalks. There is an existing sidewalk which extends southerly to a gravel parking area adjacent to Wilderness Park Drive. It is assumed that this arrangement is made available to the general public as there was no specific signage prohibiting use. None of the sidewalks that lead to the bathhouse facility are ADA compliant, and this needs to be addressed as a part of the design phase of the project.



The easterly bathhouse is serviced by seven parking spaces (none identified as accessible), and associated pathways and sidewalks. None of the sidewalks that lead to the bathhouse facility are ADA compliant, and these needs to be addressed as a part of the design phase of the project. Overall, the bathhouse structures are very dated and are at the end of their life expectancy. This was identified as the single most important element for upgrade/replacement as a part of the park user survey. It is highly recommended that these structures be replaced as a part of the campground renovation.



BOOK/GAME BARN



host campsite in the future.

The Book/Game Barn is one of those features that make Wilderness a special place to come. This facility is operated and maintained by the Lakeshore Campground host and is a facility where campers (children of all ages) can come and check out books, board games and other fun activities. This structure is portable in that there are no specific foundations, and should be relocated to whichever campsite is determined to be the



REGISTRATION / CONTACT STATION



The contact station contains a structure that measures approximately 20 feet by 20 feet (slab on grade) and is immediately adjacent to campsites 5 and 7. This building is served by multiple utilities/services including: electrical, propane gas, satellite dish, water service (with exterior hose bib), sanitary service, communication tower, & AT&T communication service.

The exterior of the structure is very well maintained and consists of a fieldstone exposed foundation wall (with limestone cap) and simulated log style siding. The roofing system consists of asphalt/fiberglass shingles. Overall, this structure is in very good condition, and efforts should be made to preserve the building as a part of redevelopment.

The Registration/Contact Station is serviced by 300 foot +/- long service/stacking lane that extends easterly to the easterly bathhouse. Testimony from park staff indicate that backups occur on occasion and the stacking lane could be lengthened but they manage to make due to the low traffic volumes on Lakeshore Drive. The need for this stacking should be reviewed by park staff and team members as to recommendations for the programing and design phases. The vegetative buffer adjacent to campsites 5 through 17 do not to adequately screen these campsites from the registration activities. In addition, the registration station is serviced with four parking spaces (one of which is accessible). Testimony from park staff suggests that this is an adequate number of parking spaces needed for registration/contact station activities. These spaces are also used by beachgoers coming from The Pines campground.



PIT TOILETS



There are four (4) pit toilets located on the Lakeshore Campground proper. There is one each (unisex) located adjacent to the existing Bathhouses, and two each (one men's and one women's) located in the day use area. It was understood through testimony that the existing bathhouses are winterized in the late fall leaving the pit toilets as the only facilities available for park users during the winter. The structures themselves are in fair to poor condition and will soon be reaching their life expectancy. It is recommended that these structures be contemplated

for replacement as a part of the parks redevelopment. Additionally, it was determined through testimony that the westerly pit toilet contains an outlet pipe where effluent may be discharging into an old drain field/subsurface drainage system. The extent of this system is indeterminable and as such is not recommended to exist moving forward.



PARK HEADQUARTERS

The Park Headquarters is located immediately east of the Lakeshore campground and adjacent to Wilderness Park Drive. This facility contains meeting rooms and activity rooms for occasional pancake breakfasts, coffee hours, and other engaging activities held by the staff.



The structure itself is in fairly good repair and is well maintained. The cost of replacement of this structure would be significant, and as such, disturbance to this facility should be avoided. We do not recommend that any work be proposed as a part of this facility with the exception of better improved ADA parking spaces.

PARK SUPERVISORS RESIDENCE

The Park Supervisor Residence is a critical element to the overall function and operation of Wilderness State Park. As this park is extremely remote and in operation throughout the year, it is vitally important that the park supervisor remain close to the park in order to properly manage the facilities. The Supervisor's Residence is located immediately east of the Park Headquarters building, west of the day use area, and adjacent to Wilderness Park Drive. The structure itself is in fairly good repair and is well maintained. The cost of replacement of this structure would be significant, and as such, disturbance to this facility should be avoided. We do not recommend that any work be proposed as a part of this facility.

BUILDING DESIGN GOALS AND OBJECTIVES

Our team's approach to the design of the any new structures associated with the Lakeshore Campground redevelopment is recommended as follows:

- Design functional buildings that, at a minimum, have the same amount of fixtures as the current building.

- Keep the aesthetics of the new buildings similar to the existing building(s), possibly reusing or re-purposing the existing siding materials
- Provide for adequately sized utility corridors to provide for ease of maintenance
- Provide upgraded flooring systems that require little or no maintenance and that will perform over time.
- Investigate the design possibility of integrating a dishwashing facility within the limits of the comfort station building.
- Investigate fixtures and materials that will perform over time
- Investigate “green building strategies” that are cost effective and have functional advantages or monetary paybacks for maintenance and/or operational cost reductions to the overall buildings. These strategies may include nature daylight, energy efficient light fixtures, low flow or waterless plumbing fixtures, efficient heating strategies (geothermal), etc.
- Investigate opportunities for winter operational use of one bathhouse and associated costs.

It is expected that our team will build upon the prototype design previously constructed by the DNR at other park locations. Specifically, we may use an existing prototype building’s floor plan as a starting point for the design of the upgraded toilet/shower buildings. Since Wilderness State Park is somewhat unique in the “look” and the desire to maintain the “look” of its existing buildings, we expect to alter the prototype floor plans to meet the aesthetic requirements. Our goal will be to “keep it simple” and provide very functional, durable buildings.

PARK MAINTENANCE AND GROUNDS



The park maintenance facility is located southeast of the Lakeshore Campground. Two primary building structures and a large service yard provide areas for equipment, supplies and materials for maintaining the park.



“GREEN” TOILET/SHOWER BUILDING PROTOTYPE

Following are prototypical floor plans and facade perspectives for a “Green” Toilet/Shower Building that has been implemented in other Michigan State Parks. The construction documents for these facilities have been fully developed. The DTMB/DNR has indicated there are opportunities for improving some of the details, construction materials, interior finishes and fixtures specified for these structures. Specifically, reducing construction costs, developing building facades that are contextual with Wilderness State Parks historic vernacular were

emphasized. One of the noted attributes of these new buildings was the good natural light provided to the interior.



INTEGRATED
ARCHITECTURE

exterior view 1

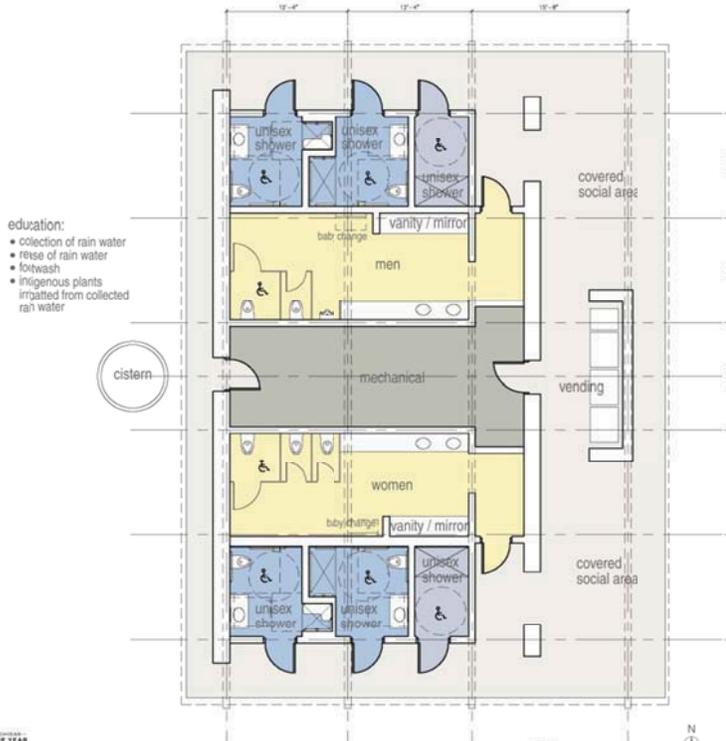
260808 07 March 2008
Otsego State Park Shower Building



INTEGRATED
ARCHITECTURE

exterior view 2

260808 07 March 2008
Otsego State Park Shower Building



- education:
- collection of rain water
 - reuse of rain water
 - footwash
 - indigenous plants irrigated from collected rain water



| 100 campsite guidelines | | 100 campsite proposed | |
|-------------------------|---|-----------------------|---|
| men | | men | |
| water closets | 3 | water closets | 2 |
| urinals | 2 | urinals | 1 |
| showers | 3 | showers | 3 |
| women | | women | |
| water closets | 4 | water closets | 3 |
| showers | 3 | showers | 4 |
| total fixtures | 9 | total fixtures | 6 |
| total showers | 6 | total showers | 6 |

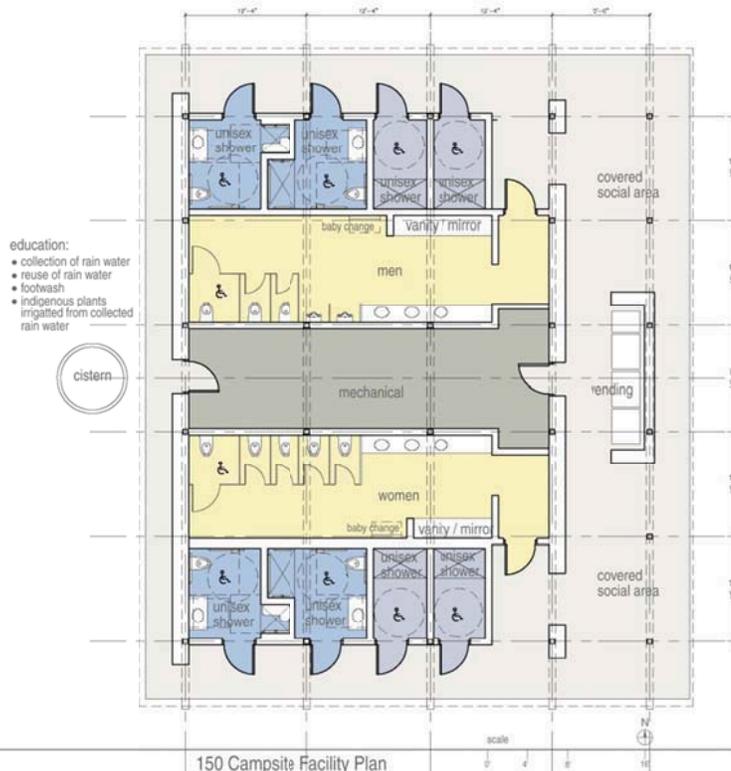
1,572 sf - not including covered outdoor areas



100 Campsite Facility Plan



Toilet / Shower Building Standard Design



- education:
- collection of rain water
 - reuse of rain water
 - footwash
 - indigenous plants irrigated from collected rain water



| 150 campsite guidelines | | 150 campsite proposed | |
|-------------------------|----|-----------------------|----|
| men | | men | |
| water closets | 5 | water closets | 3 |
| urinals | 3 | urinals | 2 |
| showers | 4 | showers | 5 |
| women | | women | |
| water closets | 5 | water closets | 4 |
| showers | 4 | showers | 8 |
| total fixtures | 14 | total fixtures | 14 |
| total showers | 8 | total showers | 8 |

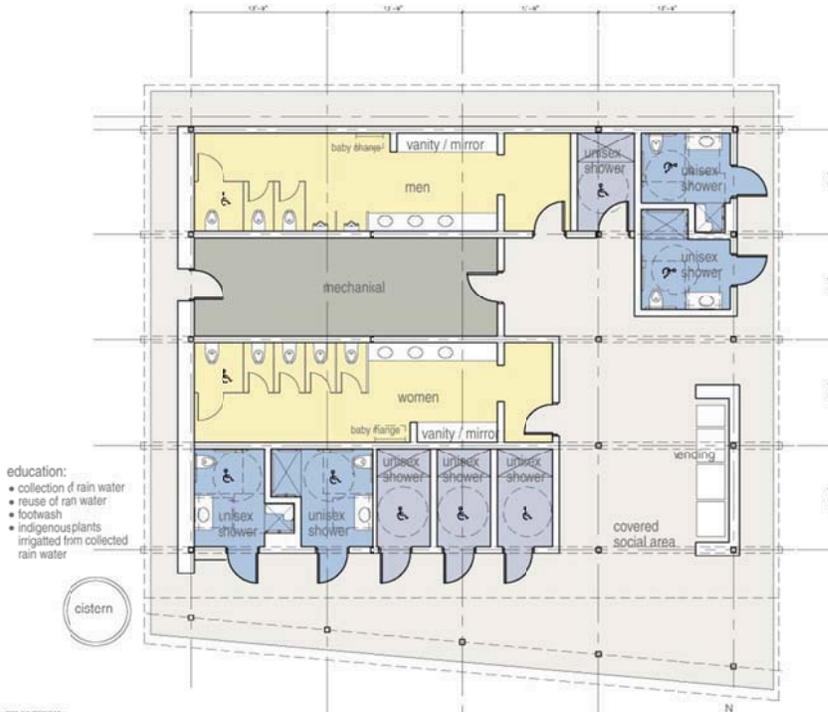
2,010 sf - not including covered outdoor areas



150 Campsite Facility Plan



Toilet / Shower Building Standard Design



- education:
- collection of rain water
 - reuse of rain water
 - footwash
 - indigenous plants irrigated from collected rain water

| 150 campsite guidelines | | 150 campsite proposed | |
|-------------------------|----|-----------------------|----|
| men | | men | |
| water closets | € | water closets | 3 |
| urinals | 2 | urinals | 2 |
| showers | 4 | | |
| women | | women | |
| water closets | € | water closets | 5 |
| showers | 4 | unisex | |
| total fixtures | 14 | water closets | 4 |
| total showers | € | showers | 8 |
| | | total fixtures | 14 |
| | | total showers | 8 |

1922sf - not including covered outdoor areas



Alternate 150 Campsite Facility Plan

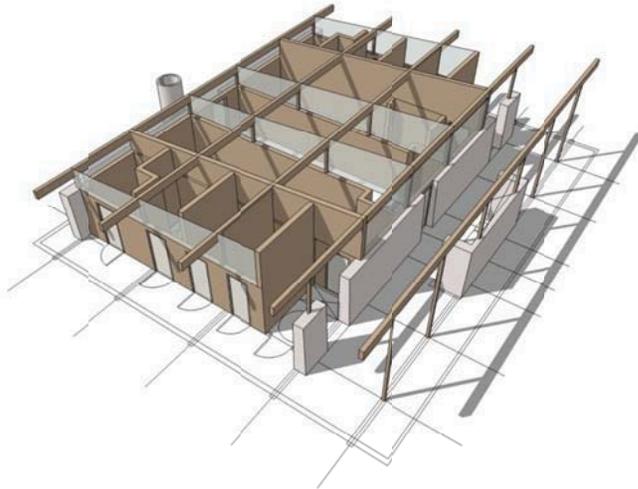
scale



20066

01.10.07

Toilet / Shower Building Standard Design



exterior

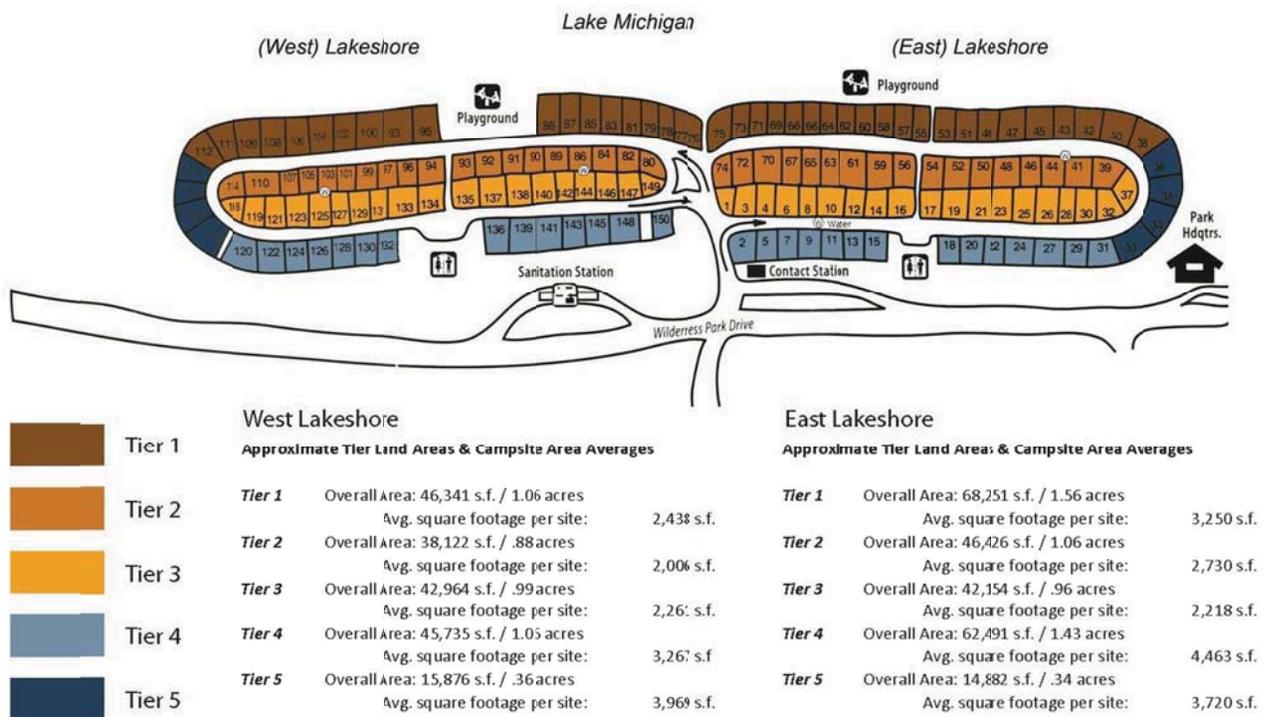
20066

01.10.07

Toilet / Shower Building Standard Design

EXISTING CAMPGROUND DETAILED ANALYSIS

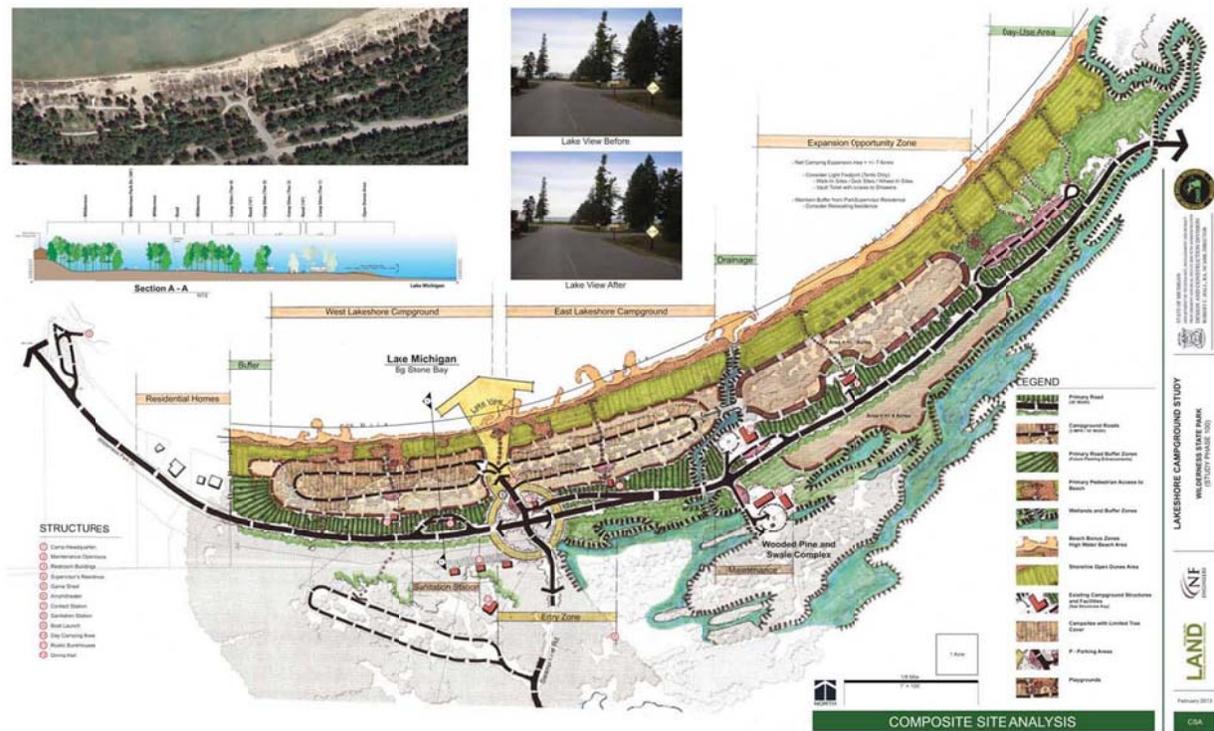
The Lakeshore Campground has 150 modern camp sites and is equally divided with 75 sites on the East Lakeshore camp loop road and 75 on the West Lakeshore camp loop road. Each site contains an electrical pedestal, campfire ring, picnic table and unimproved camp pad. Some campsites are fairly open and void of trees, while other campsites have moderately to heavily tree cover on the sites (see composite site analysis and tree survey map). Given the size of the individual sites and the turning radius of the roads, campers/trailers 30 feet or larger do not use this campground. Park staff reference sites based on the following tier classification. Sizes of the sites range from approximately 2,006 square feet to 4,463 square feet. A detailed analysis of land areas per tier is provided below.



COMPOSITE SITE ANALYSIS

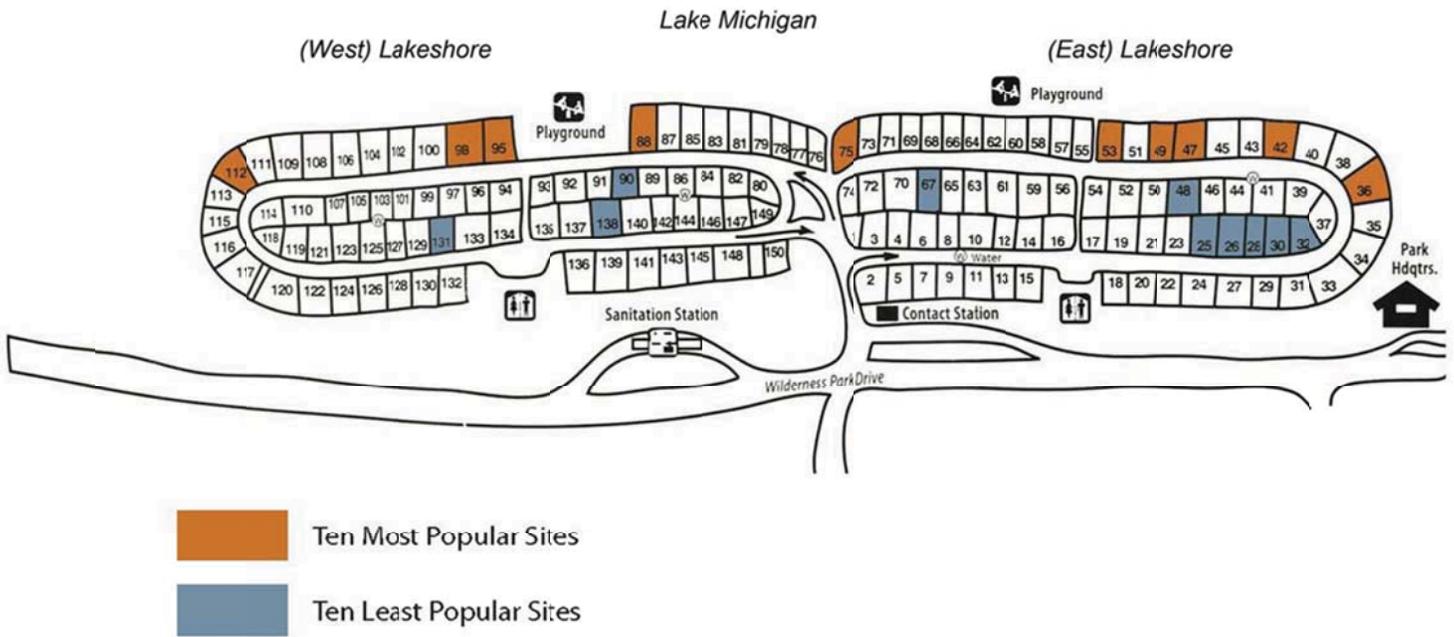
The following Composite Site Analysis has been prepared using diagrammatic symbols to illustrate existing land use zones, potential future redevelopment zones, pedestrian and vehicular circulation, buffer zones, view sheds, existing building structures, etc.. One of the zones depicted in the drawing is the campsite areas with limited tree cover. These zones may be suitable locations for larger trailer pull-thru sites should they be considered as a program element for redevelopment. Campsites 76 and 77 are located at the terminus of the entry drive fronting Big Stone Bay. While they are prime sites, consideration should be given to open up a view shed of the lake as part of the overall entry experience should the entry drive remain in its current location.

Expansion areas for the campground are limited due to the physical constraints of the property configuration, the existing roadway and environmental features associated with the wooded dune and swale complex and the open dune areas along the lake containing endangered plants. The Expansion Opportunity Zone depicted on the analysis diagram consists of an area approximately seven acres in size and is located east of the East Lakeshore Campground and north of the supervisor's residence. This would be an ideal area for developing more remote or rustic tent camping sites along the highly popular and valued lakefront property. Consideration for light footprint walk-in sites selectively located amidst the endangered plants and high quality woodlands might be a great addition to the campground. The design team has even contemplated designated deck systems for pitching tents to ensure control of camping locations. This area might be served by pit toilets with camper access to the more distant improved bathhouses.



A full scale copy at 1' = 100 will become the base map for the preliminary schematic design layout alternatives once the design work phase commences.

10 MOST POPULAR AND LEAST POPULAR CAMPSITES



EAST LAKESHORE CAMPGROUND

75 Modern Campsites



WEST LAKESHORE CAMPGROUND

75 Modern Campsites



CAMPSITE & EQUIPMENT USAGE ANALYSIS

CAMPSITE USAGE EVALUATION

Methodology

Data supplied by MDNR was analyzed and charted using MS Excel statistical tools. Occupancy data was attributed by “high season” (June, July, and August) and “low season” (May and September). Campsites were attributed by Tier (Exhibit 1). Site occupancy over a 3-year period (2010-2012) was evaluated; comparing, minimum, maximum, and average occupancy for each Tier (Exhibit 2) and by high vs. low seasons by Tier (Exhibit 3). The number of occupancies over the 3-year period was totaled for each site, ranked by percentile, broken into quartiles, and mapped (Exhibit 4).

MAP OF TIERS

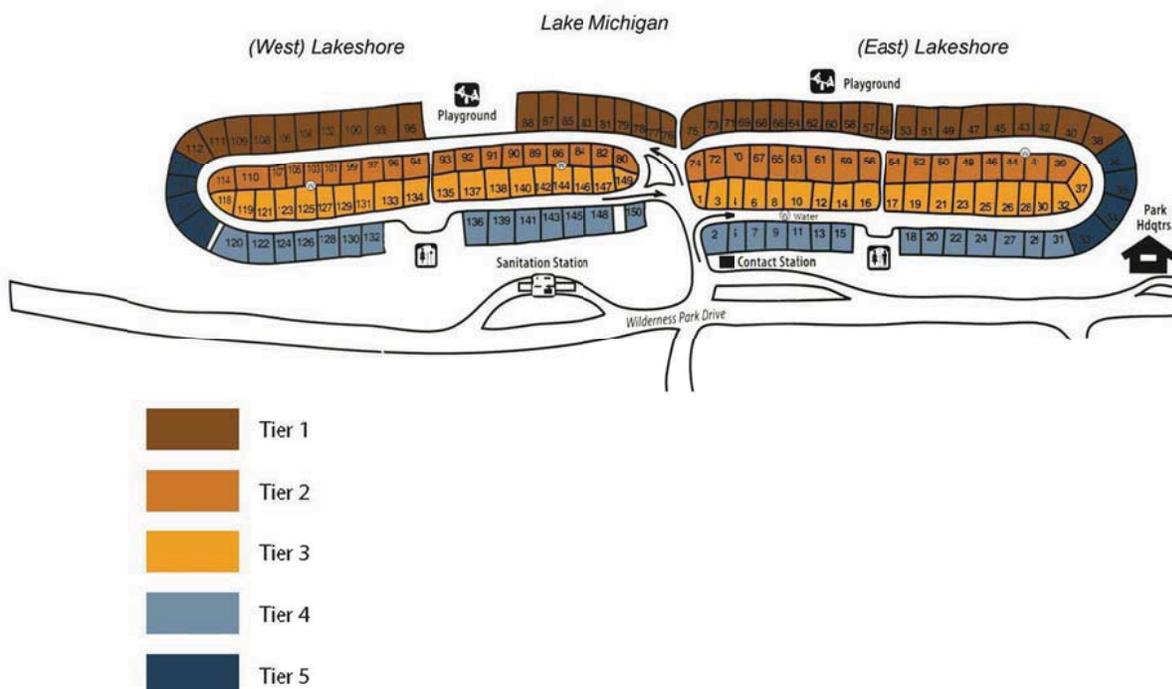


Exhibit 1

SITE OCCUPANCY BY TIERS

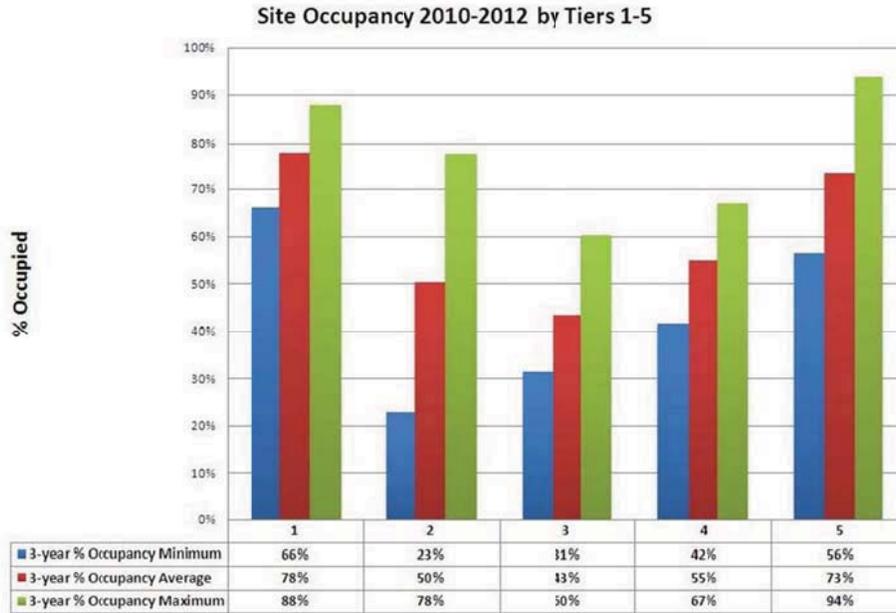


Exhibit 2

SITE OCCUPANCY BY TIERS AND SEASON

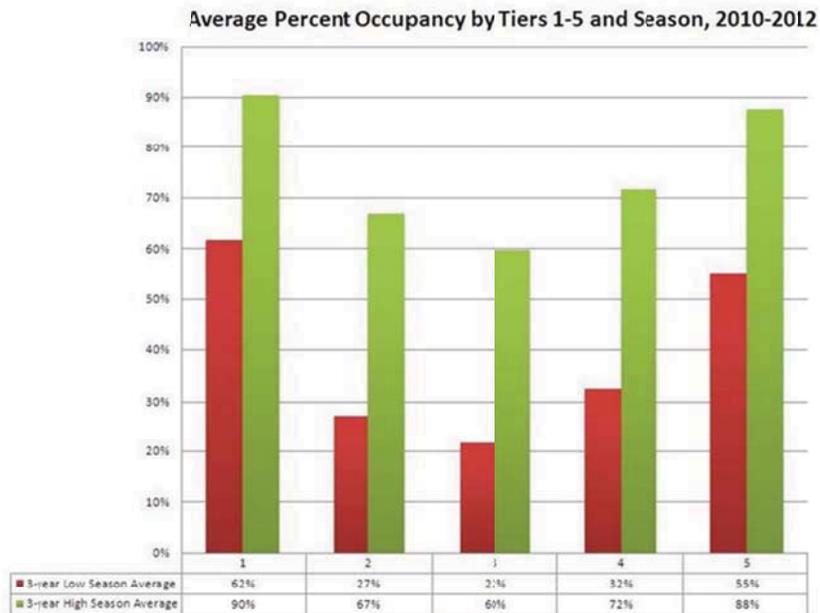


Exhibit 3

Campsites within two sites of beachfront, playgrounds, restrooms, sanitation station, and contact station were assigned attributes for proximity to those features, by yes/no (Exhibit 5). Number of nights occupied per site per month was back calculated from percentages to allow for summary and calculation of averages over the 3-year period by proximity attributes. The distribution across quartiles within each amenity classification was charted (Exhibit 6).

Stay length was calculated as nights per reservation for the five-year period of record (2007-2011) by equipment type (Exhibit 7). The proportion of total stays accounted for by each equipment type was calculated and charted (Exhibit 8).

PROXIMITY TO AMENITIES

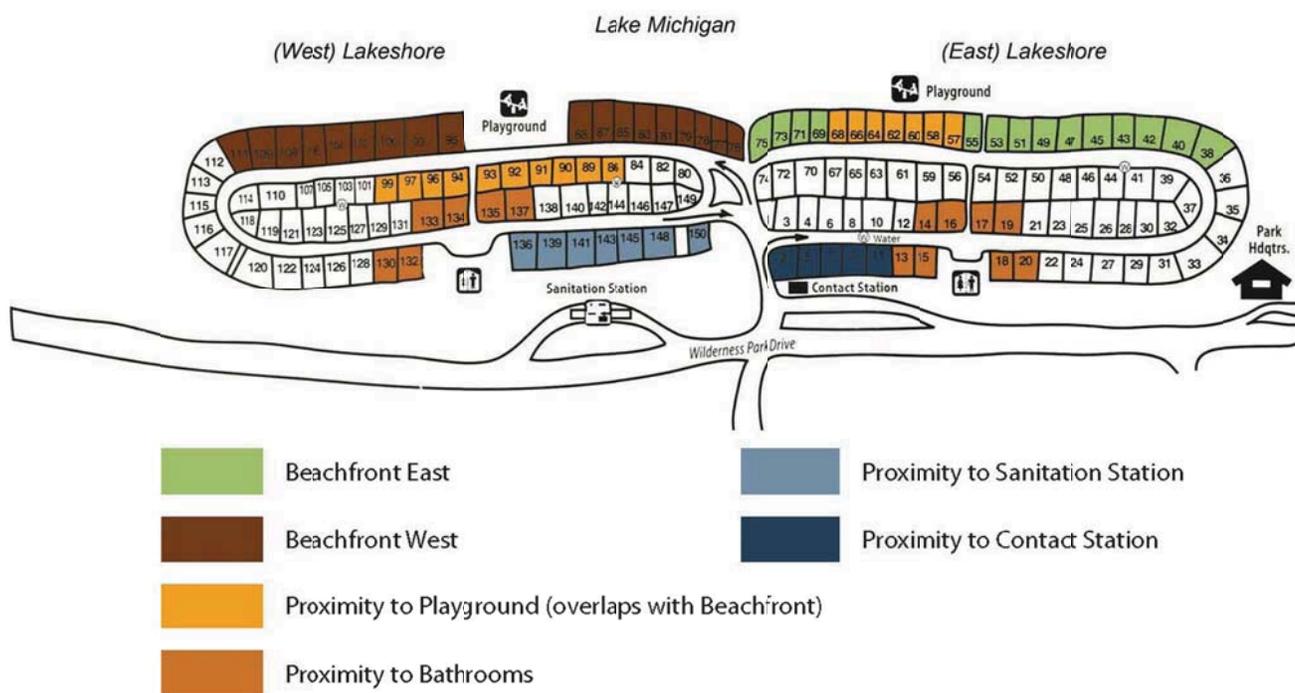


Exhibit 5

SITE OCCUPANCY BY QUARTILE BY PROXIMITY TO AMENITY

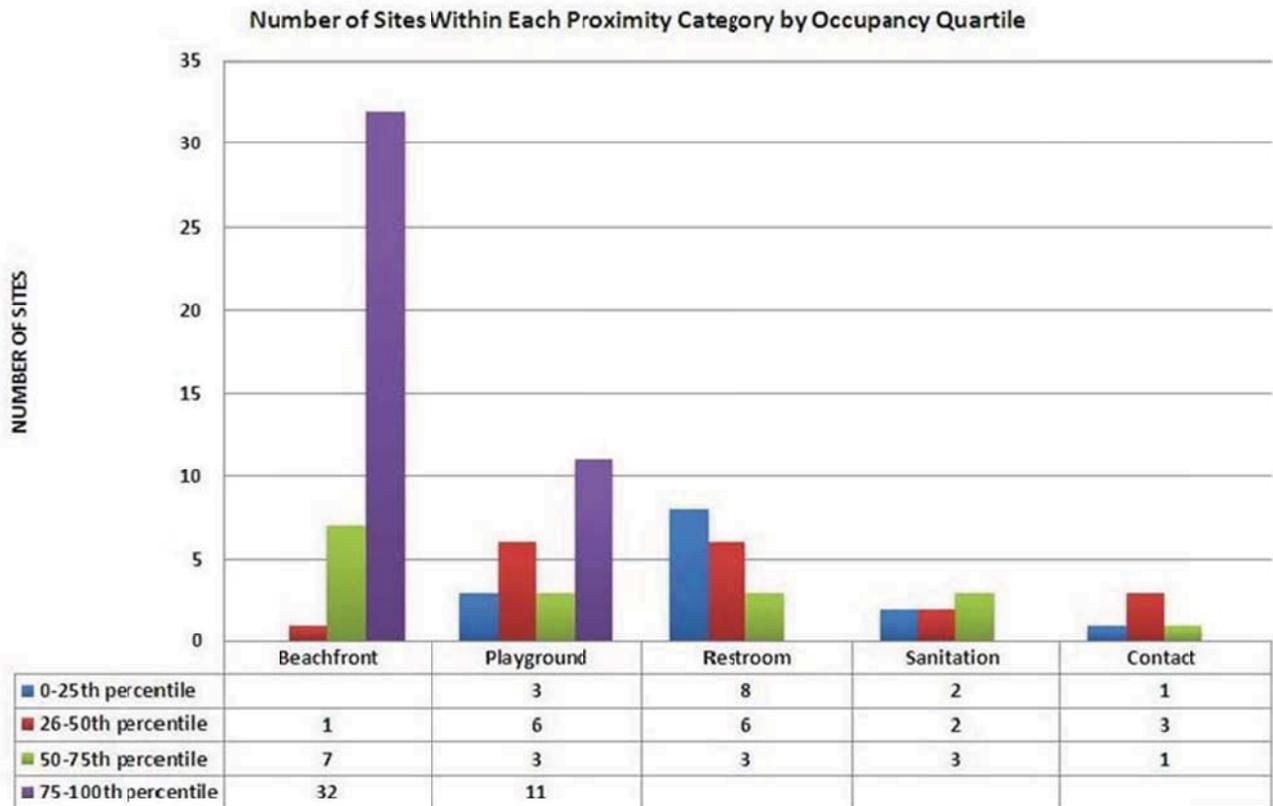


Exhibit 6

STAY LENGTH (NIGHTS PER RESERVATION) BY EQUIPMENT TYPE (2007-2011)

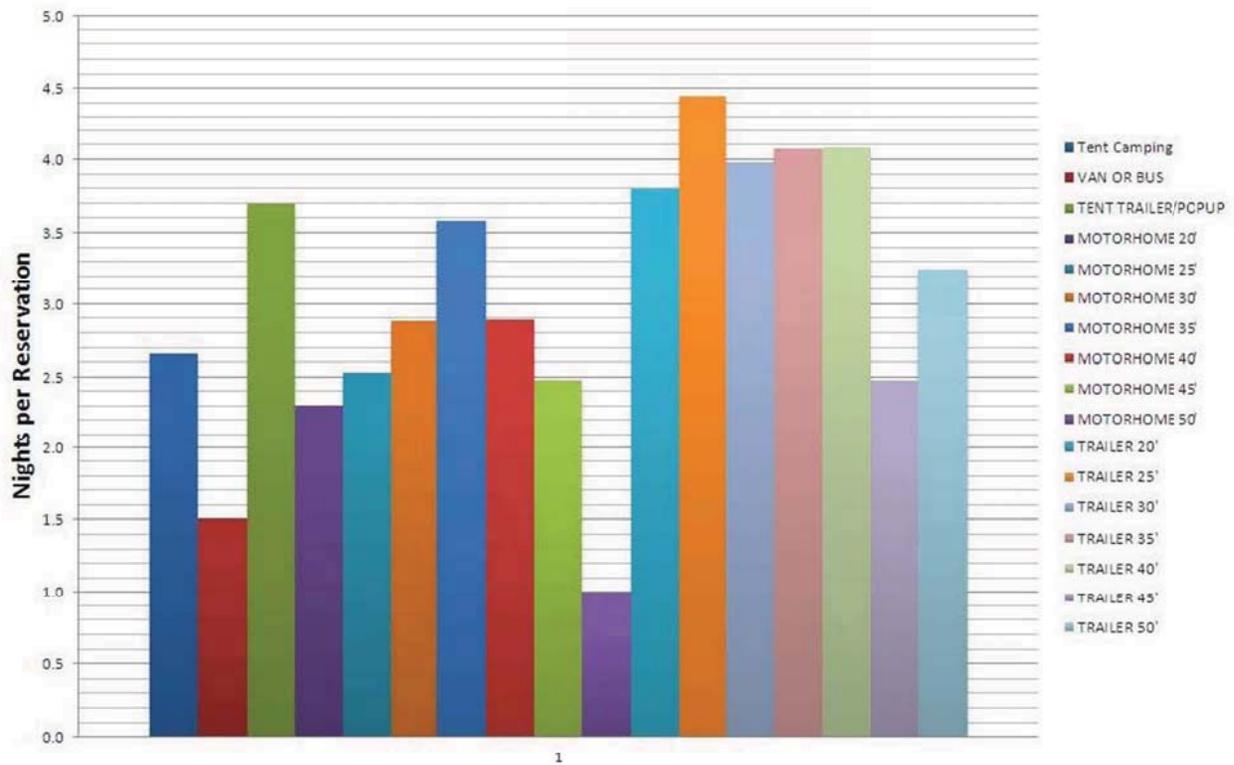
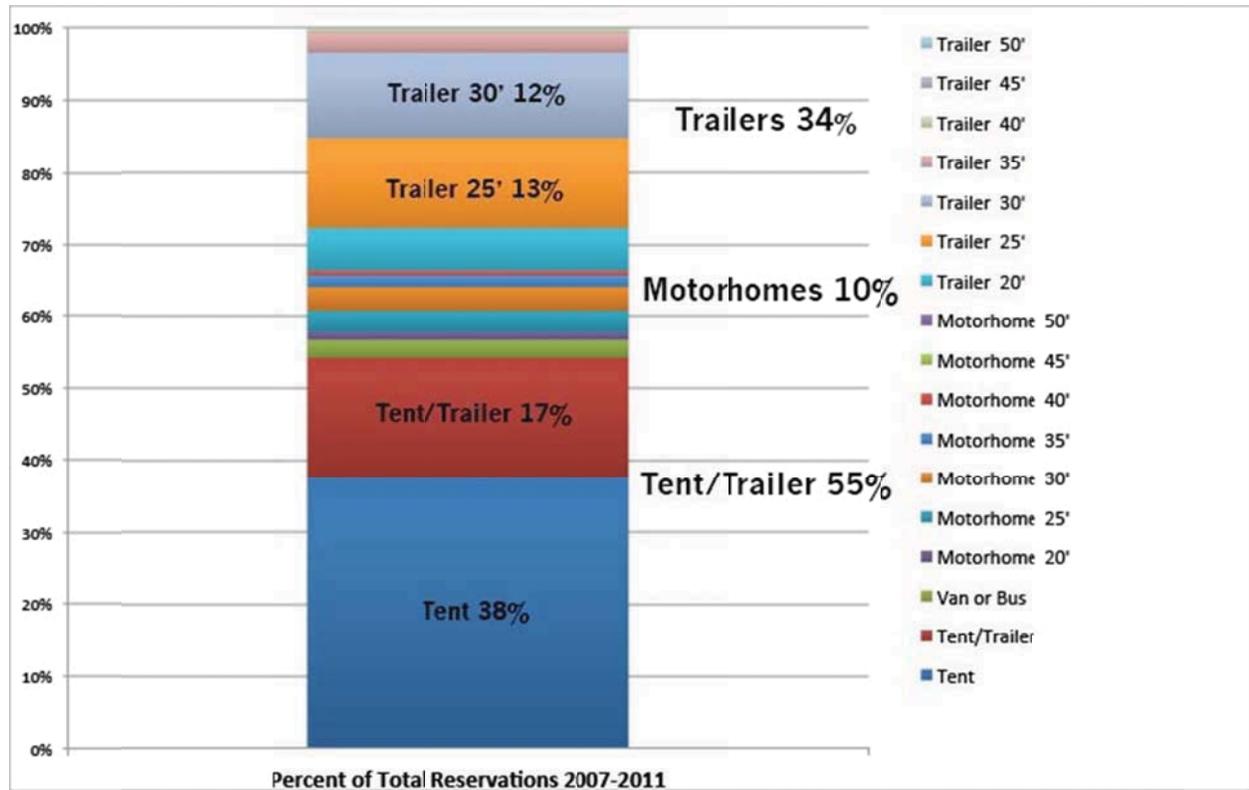


Exhibit 7

PROPORTION OF TOTAL RESERVATION BY EQUIPMENT TYPE (2001-2011)



OBSERVATIONS

SITE OCCUPANCY

Several trends are observed. Tiers 1 and 5 have the highest occupancy rate, followed by 2, 4, and 3. Occupancy across all tiers is higher in the high season, but remains above 50% in Tiers 1 and 5 even in the low season.

When sites are mapped by occupancy quartile, additional trends are observed. Campers clearly prefer beachfront sites first, followed by sites along the perimeter. Sites near bathrooms, the contact station, and the sanitation station ranked lower, with the exception of a few sites in the 50-74th percentile, which included larger sites and those close to paths to the beach. It's possible those with larger equipment (trailers, motor homes) are using these higher-ranked interior sites.

Several sites had proximity to both the beachfront and the playground. Inspection of the occupancy quartile map reveals that sites located close to a playground but not the beachfront ranked in the lower 2 quartiles for occupancy. Although 48% of playground sites ranked in the top quartile, 39% ranked in the bottom two quartiles, suggesting that close proximity to a playground is not independently a desirable campsite trait, and may in fact be an undesirable trait.

EQUIPMENT

In general, those with motorhomes stay the longest amount of time, followed by those with trailers. Van or bus campers stay the shortest time, followed by those with tents and pop-up trailers. Tents (38%) and Tent/Trailers (17%) together accounted for 53% of all reservations. Trailers of 25-35 feet accounted for 27% of reservations. These percentages account for both the Pines and Lakeshore campgrounds and have not been independently evaluated. General observations by park staff indicated that very few trailers 35' or larger utilize the lakeshore camp sites due to limited turning radiuses and tight conditions.

CONCLUSIONS/POSSIBLE DESIGN IMPLICATIONS

- Sites along the beachfront and at the perimeter of the campground were most desirable, while sites within the interior of the campground adjacent to other sites were least desirable. The main exception is sites close to beach paths or larger sites. A design goal to increase the number of beachfront and perimeter sites would address the desires of campers.
- Campground infrastructure, including bathrooms, sanitation, playgrounds and contact station were less desirable (Campsites 90-93, 2 and 5 may be less desirable strictly due to their lack of wilderness character). A design solution that isolates or buffers these facilities from campsites will minimize their negative impact on camper experience.
- It may be advantageous to locate campground infrastructure in the interior of the campsite, and use the space on the perimeter to add more campsites.
- Interior sites with close access to a beach path were more desirable, so it may be advantageous to create more beach paths in between beachfront campsites to give interior sites more direct beach access.
- The majority of campers used tent equipment or tent/trailers, and those tend to have more rapid turnover. It may be advantageous to increase the number of smaller sites designated for tents in desirable, sensitive areas (i.e. the beachfront to the east of the campground proper and perimeter), and to create several larger sites that can accommodate trailers in the less sensitive and less desirable interior areas, adjacent to the infrastructure.

EXISTING SIGNAGE INVENTORY

Signage at the campground is extensive and is constructed of many varied materials, shapes and forms. Opportunities for unifying the overall sign package with some unique identity to Wilderness State Park should be considered in the programming and design phase. The MDEQ/DNR has a sign shop at the Hartwick Pines State Park and should be consulted with concerning the various capabilities and unique approaches they have taken in the past for constructing signs in house.

Inventory List: (this list was derived from observations and site photos and is not all inclusive)

- Interpretive Kiosks (numerous throughout campground)
- Wilderness Native Garden (homemade wood sign)
- Off Duty (old wood sign)
- No Glass Containers or Animals (old tired looking sign)
- Flag Signal System (Red, Yellow, Green swim flags) – near contact station?
- Homemade Sandwich Speed Sign (SLOW 5 Mph – Children at play)
- Bulletin Board Kiosk (cork board pin up – weather forecast & programs)
- Fish Guts Only (handmade sign adjacent to metal trash can)
- Dogs Prohibited on Wilderness State Park Beaches (large sign)
- No Dogs On Beach (smaller signs)
- Beach Kiosk Sign(s)
 - Flag Signal System
 - Paddlers Be Aware
 - No Beach Guard
 - Campground Rules
 - Emergency Phone Numbers
 - Wilderness Park Emergency Plan
- Campsite Numbers on Electrical Pedestals
- No Dishwashing (at drinking fountains)
- No Parking Any Time
- Recreation Passport Required For Entry w/ No Dogs On Beach
- Traffic Sign (SLOW)
- Traffic Signs (STOP)
- East Lakeshore Sites 1 - 75 (Directional Sign)
- West Lakeshore Sites 75 – 150 (Directional Sign)
- Closed Area – Piping Plover Nesting Area (seasonal signs)
- This Water Safe For Drinking
- Headquarters Sign
- Recycle Bin Sign
- Directional Sign
 - Sanitation Station
 - Lakeshore Campground
 - Rustic Bunk Houses

Trailhead Parking
 Information Kiosk at Contact Station
 No Bikes (near bathhouse – old wood sign)
 Pay Phone
 Campers Register Here Before Setting Up Camp & Buy Vehicle Permit Here
 Please Have Vehicle License Plate Number With You For Registration
 Green Initiative / Green Products
 Reserved Parking Sign / BF (1 spot near dumpsters)
 Lifeboat & Float

CONSIDERATIONS

Possible New Signage:

- Dark Sky Park Interpretive Sign
- Sustainability Related Signage
- Forest System / Tree ID Interpretive Signs
- How can I camp “green” signage”



Integrating native wood in its natural form for signage



Integrating stone with signage as well as other materials:

- Foam Panel Systems
- Metal
- Other...

Develop and update signage and map icons....



Following is a photographic inventory which includes most of the signs at the campground organized by their general type of function.

Beach Signs



Beach Kiosk



Closed Area Sign



Flag Signal System

Directional Signs



Amphitheater



Drinking Water



Camp Site Areas



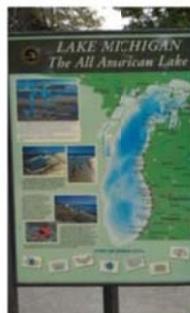
Wayfinding Signs



Educational Signs



Coastal Vegetation



Lake Michigan



Piping Plover



Michigan's Natural Heritage



Michigan's Magnificent Shoreline

Area Signs



Site
Number



Headquarters Sign



Recycling Area



Garden

Rule Signs



No
Parking



Drinking
Fountain



No
Bikes



Do Not
Was
Dishes or
Clothes



No Glass
Or Animals



Recreation
Passport /
No Dogs



Dogs Prohibited

Traffic Signs



5 MPH



Slow

Trail Signs



10k Finish



Trail Map



Walkway

Instructional Signs



Emergency Telephone Numbers



Registration Sign



Fish Guts Only!

Miscellaneous Signs



Bulletin Board



Events Sign



Weather



Green Initiative



Trail Number



Information Kiosk



Off Duty



Information Kiosk



Information Kiosk

PLAYGROUNDS



The existing Lakeshore Campground contains 2 playgrounds. The playgrounds consist of swing set structures and slides placed immediately adjacent to the beach area. The first swing set is located in the west loop adjacent to campsite 93 with the second playground being adjacent to campsite 64. The playground structures are old and have come to the end of their life expectancy. It was noted through staff interviews that the foundation system of these structures is a maintenance concern where the concrete

foundation becomes exposed and results in a safety hazard. It is recommended that these structures be replaced as a part of the campground renovation. A camper noted in the comments from 2011 On-Site Survey that the playgrounds should be moved off the beach. Additionally, any new structures should have barrier free access.



PUBLIC GATHERING SPACES

There are no formal public gathering spaces located within the lakeshore campground. There is however an amphitheater across Lake Shore Drive in the Pines Campground. It may be worth considering some type of formalized area for informal gatherings. This area could also have some type of shade / rain canopy structure such as a pavilion or gazebo. One notion might be to repurpose and relocate the historic cabin currently located near the sanitary lagoons.



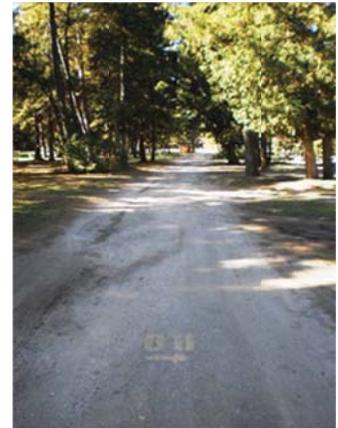
FUNCTIONAL CONDITIONS REVIEW

GEOMETRIC CONSIDERATIONS

There are multiple locations where geometric (horizontal) changes are required to address appropriate design standards for horizontal alignment. The park user survey will drive the geometric review as a determination of vehicle type that will be permitted within this campground will be necessary to prepare turning movement studies. As a part of schematic design development, NFE/LDS will complete a turning template analysis (utilizing AUTOTurn software) of the preferred horizontal alignment location to ascertain that access by RV's and maintenance vehicles is achieved. As called for in our detailed work plan, we will hold a meeting early in the process to better familiarize ourselves with the design intent, challenges and concerns as to visualize and discuss possible design options with DTMB/DNR staff. Preliminary discussions with Staff have concluded that significant challenges exist in proximity to campsite 36 where vehicle parking combined with the existing horizontal alignment of the road in this area creates significant challenges for RV's to navigate this corner. At this time, it is premature to address turning template issues.

VEHICULAR CIRCULATION

Upgrades to vehicular circulation should be studied relative to turning radiuses, mid-loop cut thru points, intersection conflicts, road widths, alternative entry locations, additional parking areas, etc. All camper vehicle types should be considered including vehicles with boat trailers, fifth wheel trailers, motorhomes, emergency vehicles, services vehicles and the like. Specific analysis should be considered for, PULL-IN, BACK-IN and PULL-THROUGH camp sites. Programming strategies will further define the relevant approaches and upgrade to the existing vehicular system. Methodologies for traffic calming such as speed tables, pinch points, and other systems should also be studied and incorporated into future design schemes.



PEDESTRIAN CIRCULATION



Due to the low traffic speeds of the campground loop roads and low traffic volumes, roadways double as primary walkways. Two cut-thru passages between the interior campsites with direct access to bathhouses are present and delineated with wood fencing as seen in the adjacent image. These pathways have woodchip surfaces.

Three primary routes to the beach/lake are formally designated but perhaps could be improved physically and visually. One is centrally located at the entry drive terminus and the other two are located near the playgrounds. Campers in tier one on the lakefront sites have forged extensive trails through the dunes to gain beach access. It has been suggested in numerous camper comments to consider more delineated walkways or boardwalk access to the beaches and lake. Some even suggested more dedicated access points. Paved walkways and Mobi-Matts that would provide ADA access to the beach were verbally discussed at with the camp staff. The primary concern of this application is the windblown sand and maintaining them.



A trail located across from the west campground toilet building was noted that provides access through the woods and up a very steep hill to the Pines campground. It should be determined if further improvements to this circulation route are desired. Of specific concern is the existing hillside erosion which could be augmented with a wood or stone stair system and a re-vegetation planting initiative on the hillside in order to re-stabilize the slopes.

BEACH

The beach areas are a critical asset / amenity of the campground based on the survey results and camper comments. Given the current historic low water levels of Lake Michigan, users are benefiting from the "bonus beach" and unique peninsulas that have formed. Future design and improvements to the designated beach and swim areas should take into account the average and high water lake levels.

It should be determined if lifeguard and rescue equipment and associated signage is fully code compliant or could be improved.



CAMPSITE TYPOLOGY

A detailed study of the campsite typology shall be evaluated during the design phase study. Accommodating all users and equipment types has been deemed critical to ensure the campground offers opportunities for all users while not creating an RV campground scenario that is competitive with KOA campgrounds. One of the overriding goals is to develop areas for smaller group camping with accommodations for 5-7 families (15- 20 family members). The development of communal fire rings was also discussed.

A campground currently exists at the eastern end of the park for larger groups and camping retreats but has not been evaluated as part of this study.

PAVING, EARTHWORK & ADA COMPLIANCE

As part of the preliminary design, a detailed grading plan should be prepared demonstrates engineering feasibility while respecting the existing natural state of this pristine property. Finish grades for various facilities should be derived so as to blend in with the existing grade to limit the amount of disturbance to existing vegetation. In addition, paved pathways and access roads should be strategically located so as to accommodate utility corridors for the proposed improvements for ease of maintenance and also to limit the amount of disturbance to existing vegetation due to utility construction.

As it relates to earthwork, the proposed plan should be carefully developed to limit the amount of disturbance to existing vegetation. Foundation spoils should be re-dispersed immediately adjacent to proposed structures and grading for roadways and utilities should be kept to a minimum. The goal of the overall grading plan should be to minimize grading, and use it as a preservation tool to reduce land development costs. There are only a few locations where, due to ADA compliance, there may be a large amount of cut/fill. Otherwise, the grading concept should blend well with the existing topography.

In review of the project area, it is noted that ADA compliance within the existing campground is substandard and does not meet current ADA guidelines. As a part of the redevelopment of the campground, it is required that all public structures and amenities be accessible and that accessible campsites shall be provided.

As it specifically relates to ADA compliance, it will be required to identify all accessible routes to proposed facilities and that ADA compliant designs shall be made to assure ADA code compliance is addressed. Specifically, all ADA compliant parking spaces and camp sites should be identified on the schematic site plans together with accessible routes to all proposed facilities.

In addition to the above, multi-use pathways may be implemented as a part of the redevelopment of the campground. Specifically, pathways and boardwalks should be considered within environmentally sensitive areas to reduce man's footprint within these areas. Pathways and boardwalks shall be reviewed for compliance with current AASHTO standards in accordance with the Universal Accessibility Advisory Committee's suggestions, the United States

Access Board's Outdoor Accessibility Guidelines, and will be in conformance with all current State of Michigan standards and guidelines.

PARKING

Improvements to existing parking areas were discussed with the park staff. Specifically, providing more parking for patrons of the Pines Campground who utilize the beach area was deemed critical as well as providing designated parking areas for trailers with boats. Boat trailers are currently allowed within the Lakeshore Campground. Secured alternative designated areas for parking boats should be considered while reducing the overall footprint of parking on campsites.

Parking Statistics:

Total Spaces: 94 (5 of which are accessible)

Day Camping Parking: 75 (4 of which are accessible)

Contact (adjacent to dumpsters): 6 (1 of which is accessible)

West Lakeshore: 6

East Lakeshore: 7

Ranger Station: (gravel parking / not defined)

*Does not include Park Headquarters and Maintenance Area parking.

CURRENT FUNCTION DESIGN ISSUES (STAFF CONCERNS)

- Removal of site 35 for access to the east
- Create road pinch points for traffic calming
- Fire department codes require 20' clear on roadways (verify?)
- More overnight guest parking needed
- Need for paved pads at waterfront (while limiting paved areas)
- Need for designated large group campsites (5-7 minimum)
- Need for more designated access points to beach (currently 3)
- Boat storage area requirements on campsites (need alternatives)
- Consider winter hook-up sites and tile field implications
- Natural light shafts within bathhouses

SITE ENTRY

The entrance to the Lakeshore Campground is located off Wilderness Camp Road in Carp Lake Township. NFE/LDS shall explore the opportunity to relocate the entry drive to give the campground a more functional entrance and to minimize environmental impacts to existing adjacent campsites. Entry modifications will be reviewed to assure overall driver safety and to reduce maintenance concerns.

The primary entry should provide views to Big Stone Bay / Lake Michigan should it remain in its current location.

PERMITTING

Multiple permits required as a part of this project including: Threatened and Endangered Species Permit (Part 365); MDEQ and USACE Joint Permit for Wetlands Protection (Part 303), Inland Lakes & Streams (Part 301), Sand Dune Protection (Part 353), and Shorelines Protection (Part 323); MDEQ Campground Unit Permit, MDEQ Water Distribution Permit, Emmett County Health Department Permit, County Road Commission Permit, and LARA Construction Code Review. Additionally, the DTMB is an authorized agency under the Environmental Protection Act to administer the SESC program on behalf of State of Michigan projects. As such, plans and permit applications shall be submitted to the DTMB for the SESC permit. As a part of future phases of the project, the design team should be mindful of these permitting requirements to assure that planning and initial designs are in keeping with agency requirements. The design team should reach out and engage the various permitting authorities in the design process where appropriate to assure the permitting process goes as smoothly as possible.

MAINTENANCE

A discussion of maintenance issues was conducted with the DNR staff at the initial kick-off meeting. Some of the items discussed are outlined below:

- The problems with dishwashing and grey water
- Need for a screening system for composting
- Need for a stainless steel fish cleaning station
- Separation tank for solids and grease
- Intensity of fisherman during April-June, small mouth bass season
- Need for an additional sanitation station with a double turnaround
- Challenge of raking beaches (stewardship vs. EPA regulations)
- Maintenance and enforcement issues of dog waste and Department of Health requirements
 - Pertaining to potential future designated dog beach

- Toilet / Shower Building Related
 - Need for slop sinks
 - Need for gravity drains for winterization
 - Building freeze if not winterized
 - Need for isolated shut-off valves for all plumbing
 - Need for overhead lines for easy access
 - Need for monolithic products for ease of cleaning restrooms and showers
 - (MDOT standards might be worth evaluating)

GREEN AND SUSTAINABILITY INITIATIVES

Clear strategies for Green and Sustainability initiatives should be evaluated throughout the programming and design process. As stated earlier, Wilderness in name alone promotes the principles of Environmental Stewardship, Sustainable Design and Low Impact Development. Many approaches have been identified throughout this report and should be evaluated as the schematic design phase proceeds.



Some initiatives might be less expensive such as programs and signage that educate campers about how to “Camp Green” and conserve energy and our natural resources. Expensive methodologies might include the installation of geothermal heating and cooling systems or solar panels on the toilet/shower buildings. Obviously initial costs of systems need to be evaluated against payback times and energy savings.

Green & Sustainability Initiatives will likely fall into one of the following categories:

- Educational Programs / Signage
- Physical Improvements
- Maintenance & Management Practices
- Construction Materials and Methods

The design team will reference the research documents currently obtained as well as continue to seek out new information throughout the design and planning process. Many programs and opportunities have already been developed and outlined in the; Field Guide to Environmental Sustainability – MDNR and Environment Parks Division and the State Park Stewardship Program.

Following is some general information from the MDNR-PR's “Camp Green” Pilot Projects:



Reduce your impact on the environment by becoming a green camper!

- **Water Conservation**
An effort to reduce water use by installing water-saving technologies in Recreation Division facilities.
- **Clean Marina Program**
The Parks and Recreation Division staffed harbors will be joining the Clean Marina Program.
- **Product Metering Devices**
Simple metering devices help ensure the proper amount of product is used for the job.
- **Green Buildings**
Small changes to new construction can reap big rewards.
- **Biological Control of Non-Native Species**
Ever go green by eating green? That's the concept behind using a small beetle to combat an invasive weed species in Lake Ovid.
- **Growing Not Mowing**
Reductions in mowing improve air and water quality and reduce energy consumption.
- **Bio-Products**
Equipment used by the DNR Park and Recreation Division utilizes a variety of bio-based alternatives to reduce dependence on petroleum products.
- **Recycling at Park and Recreation Offices**
DNR staff in the field and in the Lansing office are stepping up recycling efforts.
- **Cleaning Green**
Certified "green" cleaners provide clean facilities and protect the surrounding natural areas.

How Can I Camp Green?

- Go for a walk or swim to cool off
- Turn off your camper AC when not inside
- Keep camper windows and doors closed when AC is on
- Turn off appliances when not in use
- Use energy efficient light bulbs in your camper
- Turn off camper lights during the day and outside lights at night
- Take shorter showers
- Use water spigots only to fill containers
- Use the park's recycling area or take recycling home
- Keep gray water off the ground
- Burn wood, not garbage, in fire rings
- Leave Styrofoam plates and cups on store shelves

DOG PARKS

Providing areas for dog runs was one of the overriding themes and comments from campers. This will be evaluated in the design phase as to the implications relevant to health department guidelines, EPA regulations and issues related to the Piping Plover nesting.



The design team will continue to research design precedents throughout the country and opportunities to accommodate this desired amenity and the associated design and regulatory issues. One such concern is dogs are allowed on leash on the beach with the exception of bird nesting season (Mid April – June).

TECHNOLOGY

There are several opportunities for Wilderness State Park to embrace new technologies such as apps for smart phones and MP3 players and social media sites which can improve employee productivity, visitor experience at the camp, and increase awareness of the park. Some of these opportunities are listed below.

- Facebook
 - A Facebook page has been created for Wilderness State park and has allowed users to “like” the park and in doing so spread word about the park to their friends on Facebook.
 - This page also allows for users to post and share photos and write about their experiences while visiting the park. This is a great way to increase awareness of the park and creating a community where users of the park can collectively share their experiences with one another.
- Google+
 - Google+ is a second popular social networking site which would provide several similar advantages as Facebook.
- Apps
 - Trails map apps – there are several smartphone and MP3 apps that allow users access to trails at thousands of parks all over the country. Wilderness may have the ability to create or add their trail maps to these existing apps. Some of these even allow users to track their routes on the trails and post them within the app allowing other users to follow a route taken by a previous hiker. Examples of these apps are:
 - Trail Maps by National Geographic
 - Bike Maps – Bicycle Routes & Trails
 - National Park Maps HD
 - GPS apps – As expected by the type of app these allow users to track where they are in the park and allows users the ability to calculate time taken to travel and estimated times of travel.
 - Payment apps – these apps would greatly increase the speed of registration and the ease of payment for park visitors. Several apps have been made that allow a user to accept a credit card payment using their smart phone. Examples of these apps are as follows.
 - Square
 - PayAnywhere
 - GoPayment
 - Arrival time apps – These apps allow users to notify others that they have left their current location and will be arriving around a specific time. Wilderness State Park could use this type of app to notify employees when visitors will be arriving, ensuring that visitors immediately have assistance upon arrival thus speeding up the registration process. Examples of these apps are as follows.
 - Twist

For the Techie

Love gadgets? So do we! There are more and more high tech ways to interact with Minnesota state parks and trails. From geocaching to virtual tours, wifi in the parks, and podcasts, we're working on ways to keep up with technology. Some people prefer to completely unplug when they head outside, and that's great, but for those who'd rather have options...we aim to please!



- [Mobile apps](#)
- [Social media](#)



Geocaching

Try your hand at a modern-day treasure hunt! All 75 Minnesota state parks and SRAs (and one state trail) are participating in the **geocaching Avian Adventure**. All you need is a hand-held GPS unit. Don't have one? Not a problem...read on!

Parks with free GPS loaner units:

[\(Learn more...\)](#)

- [Afton State Park](#)
- [Big Stone Lake State Park](#)
- [Buffalo River State Park](#)
- [Camden State Park](#)
- [Father Hennepin State Park](#)
- [Flandrau State Park](#)
- [Fort Snelling State Park](#)
- [Glendalough State Park](#)
- [Gooseberry Falls State Park](#)
- [Jay Cooke State Park](#)
- [Lake Bemidji State Park](#)
- [Lake Bronson State Park](#)
- [Lake Carlos State Park](#)
- [Lake Shetek State Park](#)
- [Mille Lacs Kathio State Park](#)
- [Myre-Big Island State Park](#)
- [Nerstrand Big Woods State Park](#)
- [Savanna Portage State Park](#)
- [Sibley State Park](#)
- [Soudan Underground Mine State Park](#)
- [Split Rock Lighthouse State Park](#)
- [Upper Sioux Agency State Park](#)
- [Whitewater State Park](#)
- [Wild River State Park](#)
- [William O'Brien State Park](#)

List of geocache locations for each park.

Parks with wifi

When you want to get away but also need to stay connected, try one of these parks...they all have wireless Internet access in selected locations.

- [Red River State Recreation Area](#)
- [Lake Bemidji State Park](#)
- [Lake Bronson State Park](#)
- [St. Croix State Park](#)
- [Itasca State Park](#)
- [William O'Brien State Park](#)

Podcasts

Listen up! Check out some of our podcasts about [Minnesota state parks](#) or [Tales of Water Trails](#).

Virtual Tours

Want to see what a place is like without leaving home? Now you can! Check out our [virtual tours](#), available for many parks and a few trails, with more launching later this summer.

REGISTRATION SYSTEMS AND FORMS

Contact Station

Vehicle stacking lane (occasional back-ups)

Technology that would improve check-in speed???

Smart phone credit card scanners

License plate scanners

Vehicle passport scanners

Available Apps





SELF-REGISTRATION ENVELOPE

VEHICLE ENTRANCE PASSPORT AND/OR CAMPGROUND REGISTRATION

Issued by authority of Act 451, P.A. 1994, as amended. Failure to comply may result in prosecution.

DETACH AND PLACE ON VEHICLE DASH BOARD (DRIVER'S SIDE)

INSTRUCTIONS

- 1. Calculate vehicle passport and/or camping fees from posted fee schedule.
2. Complete all information, detach receipt, and place on vehicle dashboard.
3. Enclose fee in envelope and deposit in on-site drop pipe or park office.
4. Annual Recreation Passport(s) will be mailed to address written below.
5. Camping not permitted at Boat Access sites.
6. If confirmation of this transaction is not received, please contact the park office.

Your user fees provide for the continued operation and development of the Michigan State Park and Recreation System. Thank you.

Form with fields: TODAY'S DATE, DEPARTURE DATE, VEHICLE LICENSE NUMBER

RECEIPT

PR3030-1(Rev. 10/13/2010)



VEHICLES REGISTERED IN MICHIGAN ONLY

OUT-OF-STATE VEHICLES USE OTHER SIDE

RECREATION PASSPORT AND/OR CAMPGROUND REGISTRATION

077282

Form with fields: Today's Date, Telephone, Name, Street Address, City, State, ZIP

Table with columns: No. of Passenger Vehicle Passports, Cost Per Passport, Fee, No. of Motorcycle Passports, Cost Per Passport, Fee, Vehicle License Number(s), Month of Plate Expiration(s)

DEPOSIT ENVELOPE IN DROP PIPE OR PARK OFFICE

Form with fields: Park Name, Type of Camp Unit, Campsite No., Arrival Date, Departure Date, No. of Nights, Cost per Night, Total Camp Fee

Table with columns: RECREATION PASSPORT FEE, CAMPING FEE, TOTAL FEES

FOR DNRE USE ONLY

Form with fields: Camp Registration Number(s), Recreation Passport Number(s)

Table with columns: ENCLOSED AMOUNT, DATE MAILED



VEHICLES WITH OUT-OF-STATE PLATES ONLY

MICHIGAN REGISTERED VEHICLES USE OTHER SIDE

RECREATION PASSPORT AND/OR CAMPGROUND REGISTRATION

OUT-OF-STATE VEHICLE RECREATION PASSPORT REQUIRED EITHER DAILY OR ANNUAL

Form with fields: Today's Date, Telephone, Name, Street Address, City, State, ZIP

Table with columns: No. of Daily Passports, Cost Per Day, Fee, No. of Annual Passports, Cost Per Annual, Fee, Vehicle License Number(s), State

DEPOSIT ENVELOPE IN DROP PIPE OR PARK OFFICE

Form with fields: Park Name, Type of Camp Unit, Campsite No., Arrival Date, Departure Date, No. of Nights, Cost per Night, Total Camp Fee

Table with columns: RECREATION PASSPORT FEE, CAMPING FEE, TOTAL FEES

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