



Superior Wildlands 2007 - 2008

FREE

Climate Change and Your Protected Areas

THE THREE FEDERAL agencies that sponsor this newspaper have different but related missions. The common thread among them however is the preservation and conservation of wild places, wild life, and wild processes that sustain them and the recreational uses we all enjoy. As scientists develop larger bodies of data through sophisticated modelling, another common thread of concern is that of climate change and its impact on how it affects you the visitor and how land managers will deal with the profound challenges that change creates.

There is little debate among reputable scientists that the earth's climate is in fact getting warmer, and will continue to warm in the coming decades and centuries as a direct result of human activities. Studies predict melting polar ice sheets, more intense storms and hurricanes, rising sea levels, and growing numbers of endangered species. Do these predictions have anything to do with the Great Lakes and your public lands?

Climate change could be the most important issue we will face in the coming decades at Seney National Wildlife Refuge, the Hiawatha National Forest and Pictured Rocks National Lakeshore.

Climate induced change in ecological systems will also have impacts on visitor experiences in protected areas, whether they be bird watching at a refuge, fishing in a national forest, or photographing orchids at a national lakeshore. What do scientists know, what do they think they know, and what do they think the effects will be?

A Changing Climate...

Scientific evidence shows that ma-

...jor and widespread climate changes have occurred with startling speed. Global temperature is increasing. In the last 100 years, global surface temperatures have risen an average 1.33° F (0.74° C). More than 20% of this change has occurred within the last 10 years, with 11 of the last 12 years ranking among the 12 warmest years on record. (IPCC



2007) Global temperatures are projected to continue to increase in the future, at least through the next century with temperatures up to 11.5°F (6.4°C) higher by the end of the 21st century. (IPCC 2007)

...And Its Ecological Effects

Analysis of changes in phenology or range of over 1500 species globally show patterns of change in accord with observed climate warming in the 20th century. Species ranges shifted approximately 6 km toward the poles per decade, and spring events came more than 2 days earlier per decade. (Parmesan and Yohe 2003, Wohlforth 2004)

Globally, including the great lakes region, individual species favor-

ing cool climates are shifting their ranges up in elevation and northward and warm-adapted communities are expanding. Cool adapted tree species such as sugar maple and birch are projected to have contracted habitat in the Northeastern U.S., shifting largely to Canada. More southern species such as oaks, hickories and pines may see

an expansion of potential habitats; however, expansion may be limited by soil and seed dispersal. (Parmesan 2006, USDA 2001, IPCC 1998) Upper Peninsula forest composition is predicted to change from northern hardwood/boreal mix to more southern species (model predictions under a 5°C increase in annual temp). (He et al. 2002) Paper birch habitat is modeled to virtually disappear from the area under some GHG scenarios. (Prasad 1999)

Increased variability of temperature and precipitation will be harmful to vegetation and could cause diebacks. Climate change models predict higher temperature highs and more extreme precipitation events. As plants rely on specific

ranges of temperature and precipitation, longer droughts, more flooding events and heat waves outside of their normal range will stress them. In addition, less predictable winters with warm snaps may cause trees and other vegetation to come out of dormancy, which increases their vulnerability to future cold temperatures. (Winnett 1998) (USDA 2001)

Temperature and Precipitation

The northern Midwest, including the upper Great Lakes region, has warmed by almost 4°F (2°C) in the 20th century. Data for Lakes Michigan, Huron and Superior show that summer water temperatures are increasing. Lake Superior's summer surface water temperatures have increased by 4.5°F (2.5°C) over the last 27 years (Austin and Colman 2007) and the rate of warming of the water is faster than the warming of the air. The timing of Lake Superior's summer overturn over the past twenty seven years is now two weeks earlier than expected. On average the rate of the summer of overturn has been half a day earlier each year. (Austin and Colman 2007)

Ice around the great lakes and streams is declining and melting earlier. (Anderson et al. 1996, Austin and Colman 2007, Magnuson et al. 2000, Robertson et al. 1992) Two-thirds of the winters over the past 15 years in the Midwest have been above the long-term average. (Wuebbles et al. 2003) Winters are getting shorter in the Great Lakes region. The last spring frost is coming earlier and the first autumn frost is coming later. (Kling et al. 2003) Snow cover in the northern hemisphere has declined about 5% over the past 30 years. (UCS 2006)

Continued on next page...

Visitor Activities

Climb a lighthouse tower, join a ranger for a fun learning experience this summer, listen to some great folk music - all here on your public lands.

Seney Wildlife Refuge

Take a quiet evening bike ride on the wildlife drive. Watch for osprey, eagles, and bittern as they move about the refuge. Hear the rhythmic song of frogs and toads.

Hiawatha Forest

Dip your paddle in a river or scan the wetland for migrating songbirds. Canter your horse along a northern lake. Pedal a bike up a long hill to a breathtaking vista.

Pictured Rocks Lakeshore

Spend the night watching for the northern lights over Lake Superior, photograph orchids in a quiet forest, feel the pull of a brook trout at the end of your line.



Climate Change continued...

THE GREAT LAKES REGION will likely grow drier overall. Any increases in precipitation will likely be counterbalanced by increased evaporation due to temperature increases. (Kling et al. 2003)

New Faces In New Places

As lake temperatures increase, the number of exotic species, such as zebra mussels and sea lamprey, will likely increase. (MPR 2007) For example, Zebra mussels add to increased productivity in lakes by increasing water clarity that leads to accelerated algae growth. (Poff et al. 2002)

Distribution of fish will change according to the temperature of water. Warm water fish will expand northward, while cold water fish will decrease. (Wuebbles et al. 2003) Increasing temperatures and potential storminess will disrupt the shallow waters that many fish, including the whitefish, spawn in. This will threaten population levels of native fish. (Poff et al. 2002)



Badger first recorded in Lakeshore - 2005

The disruption of coordination in timing between lifecycles of predators and prey or of may be the greatest impact due to climate change on wildlife species. (Parmesan 2006)

Changes in climate are having significant effects on breeding and winter distribution of birds in North America. (IPCC 1998) Bird species migration timing and range is changing due to climate change.



In Michigan, one study has shown that some species are arriving significantly earlier than in the past. Although these species appear capable of adapting, they rely heavily on specific vegetation, if that cannot respond to the same changes, then bird communities will be impacted. (USGCRP 1996)

Scientists think that due to vegetation shifts and thus habitat shifts, parks may experience a shift in mammalian species greater than anything documented in the geological record. This is based on the idea that species will change location as a group and is debatable. However, several researchers have concluded that rapid changes on the order of 20 to 50 years are possible. (Burns et al. 2003) Specific changes in mammal populations and movements may be hard to predict due to the complexity of interactions with their environment and the rapid pace of change that is expected. (Burns et al. 2003)

Warming temperatures increase problems related to insects and disease. Because insects and pathogens have shorter life spans than most forest vegetation, they can respond more rapidly to climate change. A

longer growing season may mean that more generations of pests can attack vegetation, while a shorter and warmer winter will mean more successful over-wintering for pests. If vegetation has been stressed by drought or fire it is also more susceptible to disease and infestation. (USDA 2001, IPCC 1996, Hayhoe et al. 2007, Winnett 1998)

Visitor Experiences

Decreasing lake levels will make some areas of the lakes inaccessible to many watercraft. As spring arrives earlier, mosquitoes and black flies will begin hatching earlier in the season and may take longer to die off as winters become shorter. This will be a nuisance to visitors and may increase the risk of mosquito transmitted viruses to visitors. (Reither 2001)

Changes in fish communities will change the recreational fishing experience. Increases in severe storm events may impact campers boaters and hikers, and increased summer temperatures may lead to more heat related illnesses.

Although periods of drought will exist, periods of drought will occasionally be broken by intense short-

duration rain storms (UCS 2003). This could create hazardous conditions that could lead to visitor injury by falling debris, flooding, vehicle accidents, etc.

Rising temperatures and earlier springs are likely to increase forest fire hazards, increase the fire season and create larger fires. This could in turn increase atmospheric carbon contributions from forests. (Westerling et al. 2006, USDA 2001, Winnett 1998, IPCC 1998)

Park and Forest facilities may be inadequate for new conditions. Recreational infrastructure such as fixed docks and boat ramps may be too high as lake levels decline. Shallow water at docks and anchorages may limit access by deeper-draft boats. Navigational hazards and new sand bars may be exposed.

Shallow lake margins will expose new land which, depending on local conditions, may be new beaches or mud flats.

Drying of ephemeral wetlands on lake margins may adversely affect the food web that support sport fish communities, as well as the spawning areas fish depend upon for reproduction.

Reduced groundwater and stream flows may affect the availability of high quality water to support both protected area ecosystems and facilities.

Increasing frequency and intensity of severe storms and floods may also pose threats to historic structures, roads and trails, archeological sites, administrative facilities, and other park resources and infrastructure.

What Can We Do?

- Become knowledgeable about climate change and how individual actions can make a difference.

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Interpretation & Education Partners

THE MONEY YOU SPEND on souvenirs in gift stores at the Park, Forest or Refuge; generously donate; or contribute for membership all goes to non-profit natural history associations to be spent on interpretation, education and research. Each natural history association is guided by a volunteer Board of Directors, which votes on how revenue and donations should be spent based on budget and projects suggested by agency staff and volunteers. Here are some improvements paid for in whole or part by these associations:

- Special events, e.g. Birding By the Bay
- Informational leaflets
- Exhibits and interpretive signs
- Observation scopes and decks

- Food stipends for interns
- Teacher workshop materials and support.
- This newspaper!

Hiawatha Interpretive Association
PO Box 913
Munising, MI 49862
www.Hiawathainterpretive.com

Seney Natural History Association
1606 Refuge Entrance Rd.
Seney, MI 49883
www.seneyfriends.org

Eastern National
470 Maryland Drive, Suite 1
Ft. Washington, PA 19034
www.eparks.com/eparks



Hiawatha Interpretive Association



Calling All Artists!

ARE YOU AN ARTIST working in two dimensions looking for a residency experience in the beautiful central Upper Peninsula? Would the cliffs of Grand Island or Pictured Rocks inspire you? Both Hiawatha National Forest and Pictured Rocks National Lakeshore offer artist in residence programs. Let our landscapes and history inspire you!

Hiawatha National Forest - Grand Island NRA
Artist in Residence Program
400 East Munising Ave.
Munising, MI 49862

Pictured Rocks National Lakeshore
Artist in Residence Program
P.O. Box 40
Munising, MI 49862



Good Times at Seney

SENEY NATIONAL WILDLIFE Refuge is a great place to watch wildlife for visitors of all ages and abilities. Established in 1935 as a refuge and breeding ground for migratory birds and other wildlife, today the 95,238 acre Refuge supports a variety of wildlife including endangered and reintroduced species by providing a rich mosaic habitat. Nearly two-thirds of the Refuge are wetlands.

Visitor Center
Open May 15 - Oct. 15, 9 a.m. - 5 p.m., seven days a week, including holidays. Exhibits, a children's touch table, orientation slide show, and a bookstore. Binoculars and field guides can be checked out free of charge, courtesy of the Seney Natural History Association.

Marshland Wildlife Drive
This seven mile one-way auto tour route follows alongside wetlands and meadows and through forests. Three free wheelchair accessible observation decks with viewing scopes make this a great wildlife watching opportunity.

Pine Ridge Nature Trail
Starting from the Visitor Center, this 1.4 mile loop trail takes visitors through a variety of landscapes. Songbirds and beavers are common sightings along this trail.

Bicycling
Many miles of backcountry roads

are available for biking through the Refuge. For those who seek wildlife and solitude, these are the trails for you. Trails are only open during daylight hours so you need to plan your trip carefully. Refuge staff drive through the backcountry while conducting surveys, so please be aware of the possibility of vehicles on the roads. To help you plan your visit, mileage is marked on the Refuge map. Certain roads may be closed to all entry during peak migration periods.

The Pine Ridge Nature Trail and the cross-country ski trails are closed to bicycles.

Canoeing
Enjoy a day of paddling along the Manistique River, which flows through the southern part of the Refuge. Outfitters are located in Germfask. Use is limited to daylight hours with no overnight camping allowed. No boats or other flotation devices are allowed on Refuge pools. Due to numerous snags, shallow water, limited access by road, and no camping allowed, the Driggs River is not recommended for canoeing.

Fishing
Anglers can fish along the 3.5 mile Fishing Loop or at the accessible fishing pier. Species found on the Refuge include northern pike, yellow perch, brown bullhead, brook trout, and sunfish. To protect



Osprey on nest

the Trumpeter Swan and Common Loon, lead sinkers cannot be used on the Refuge. Check the fishing brochure for current rules.

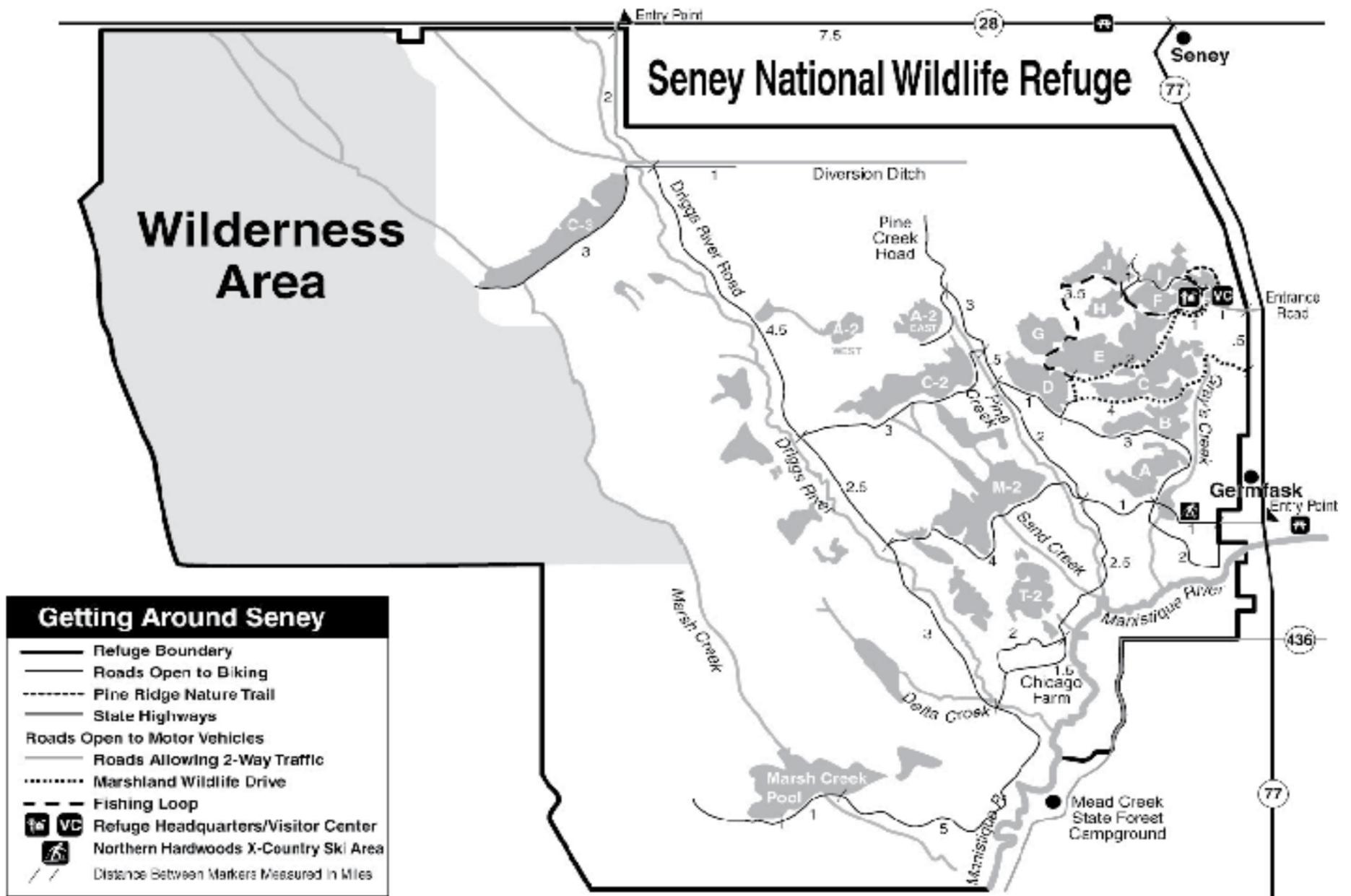
Hunting
Ruffed grouse, woodcock, snowshoe hare, deer, and bear may be hunted during some state seasons, in designated areas. Check the hunting leaflet for current rules.

Winter Activities
The Northern Hardwoods Cross-Country Ski Area offers over nine miles of groomed diagonal-tracked trails. Turn west off M-77 onto Robinson Road 1/3 mile south of the blinking light in Germfask. The trailhead is at the end of the road. Snowshoeing is allowed anywhere except on the ski trails. Snowmobiles are not permitted on the Refuge.

Are You a Photographer?

WE INVITE YOU to visit the Hiawatha National Forest and the Seney National Wildlife Refuge and enter your photos in our Annual Photo Contests. For information and rules, contact:

Hiawatha Forest Photo Contest 400 East Munising Avenue Munising, MI 49862	Seney NWR Photo Contest 1674 Refuge Entrance Road Seney, MI 49883
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Glossy Buckthorn is Invading Your Wildlife Habitats

“HEY - LOOK AT THAT EAGLE in the top of the pine tree. Did you see that bird that just dove under the water? I think it was a loon...” This is a snippet of conversation typically heard while traveling along the Marshland Wildlife Drive at Seney National Wildlife Refuge (Seney NWR). The drive provides visitors with a great opportunity to observe wildlife in their natural habitats. What you are not likely to observe is the “behind the scenes” work that goes into managing those habitats. Take for example the ecotone habitat between upland and wetland sites (such as the dikes you on the Marshland Wildlife Drive). In these transition zones you find a diverse set of native plants such as Tag Alder, Bog Birch, Choke Cherry and Willow, but also may discover a growing wall of Glossy Buckthorn.

Glossy Buckthorn (*Frangula alnus*) is an exotic, invasive species and a management challenge to the scientists and land managers at Seney NWR. Glossy Buckthorn is native to Eurasia and northern Africa. It was probably introduced to North America before the 1800's and became widespread and naturalized in the early 1900's. Many places, including Seney NWR, planted Glossy Buckthorn for ornamental landscaping and food for wildlife. From the perspective of an individual species Glossy Buckthorn is an amazing and very successful plant. It grows rapidly, produces dense thickets, reproduces prolifically by producing large quantities of fruit (seeds are spread by birds and rodents) and vigorously re-sprouts when cut. From a management perspective Glossy Buckthorn is trouble. It easily out-competes native shrubs by leafing out earlier, retaining its leaves and fruit longer and growing faster. As it pushes out native plants the result is less plant species diversity which local wildlife has traditionally relied upon. Like other land management agencies, the U.S. Fish and Wildlife Service (of which, Seney NWR is a part of) has implemented management actions aimed at reducing the amount and distribution of invasive plants. The National Wildlife Refuge System does this in accordance with the National Wildlife Improvement Act of 1997. Since 2001 Seney NWR has employed several treatments to control Glossy Buckthorn. Research regarding these treatments has shown that using repeated low-volume herbicide (glyphosate) spray has been the most effective

way of killing Glossy Buckthorn. Even so, complete eradication of Glossy Buckthorn has not been achieved during this research. This means continual research, monitoring and treatment will be needed.

As scientists and land managers work to minimize the spread of Glossy Buckthorn and other invasive species, you can help too. Many invasives, including Glossy Buckthorn, are still legally sold through nurseries and garden centers. By learning to identify this species, you can make better choices when selecting suitable plants for landscaping. Your knowledge may even give you a better understanding of the challenges land managers face trying to take care of the habitats and wildlife you observe along Seney's Marshland Wildlife Drive.



Glossy Buckthorn

The Duck Stamp Story



What are Duck Stamps?

FEDERAL MIGRATORY BIRD Hunting and Conservation Stamps, commonly known as “Duck Stamps”, are pictorial stamps produced by the U.S. Postal Service for the U.S. Fish & Wildlife Service. They are not valid for postage. All waterfowl hunters 16 years of age or older must purchase a stamp. Besides serving as a hunting license, a current year's Federal Duck Stamp also serves as an entrance pass for National Wildlife Refuges where admission is normally charged. Duck Stamps, and the products that bear Duck Stamp images, are also popular collector items.

More Than Just A License

Federal Duck Stamps are a vital tool for wetland conservation. Ninety-eight cents out of every dollar generated by the sales of Federal Duck Stamps goes directly to purchase or lease wetland habitat for protection in the National Wildlife Refuge System. Understandably, the Federal Duck Stamp Program has been called one of the most successful conservation programs ever initiated and is a highly effective way to conserve America's natural resources. Thanks to hunters, stamp collectors, and conservationists, Duck Stamp sales have raised nearly \$700 million to conserve more than 5.2 million acres of crucial habitat throughout the United States and its territories.

Duck Stamp Art

Artists can choose one of five waterfowl species and can use a medium of their choice. Entries are judged by a panel of noted art, waterfowl, and philatelic authorities. The top 20 entries from each competition are kept on display at various museums, festivals, and expositions.

There is also a Junior Duck Stamp program. It aims to teach the importance of conserving our wetlands and migratory birds through arts. The program allows students (K-12) to participate in an annual art competition. Not only does the student practice sketching, drawing, painting, and composition, but studies the particular animal and its habitat. Revenue generated by the sales of Junior Duck Stamps funds environmental education programs in all 50 states, the District of Columbia, and 2 territories (American Samoa and the Virgin Islands).



More Duck Stamp information can be found at <http://duckstamps.fws.gov>



Spotting Ducks



Rachel Carson A Conservation Legacy



"It is a wholesome and necessary thing for us to turn again to the earth and in the contemplation of her beauties to know the sense of wonder and humility." – Rachel Carson

MAY 27, 2007, marks the 100th anniversary of the birth of Rachel Carson, one of the world's foremost leaders in conservation. Her work as an educator, scientist, and writer revolutionized America's interest in environmental issues.

About Rachel Carson

As a young child, Carson's consuming passions were exploring the forests and streams surrounding her hillside home near the Allegheny River in Pennsylvania and her writing. She was first published at the age of 10 in a children's magazine dedicated to the work of young writers. In 1925, Carson entered Pennsylvania College for Women as an English major determined to become a writer, but switched to biology midway through her studies. Her first experience with the ocean came during a summer fellowship at the U.S. Marine Laboratory in Woods Hole, Massachusetts. Upon graduation from Pennsylvania College, she was awarded a scholarship to complete graduate work in biology at Johns Hopkins University in Maryland, an enormous accomplishment for a woman in 1929.

The Beginning of a Legacy

Carson's distinction in writing and biology led to a job with the U.S. Bureau of Fisheries (now the U.S. Fish and Wildlife Service) in 1935. She created a series of 7-minute radio spots on marine life called "Romance Under the Waters." Meanwhile, she continued to submit writings on conservation and nature to newspapers and magazines, urging people to regulate the "forces of destruction" and consider always the welfare of the "fish as well as that of the fisherman."

During her free time, Carson wrote books about her government research. Her first book, titled *Under the Sea-Wind* was published in 1941, and highlighted her unique ability to present deeply intricate scientific material in clear poetic language that captivated readers and sparked their interest in the natural world. During her 15-year career with the Service, she wrote numerous pamphlets and bulletins on conservation, one of the most well-known a series called *Conservation in Action* – devoted to exploring wildlife and ecology on national wildlife refuges.

Carson's second book, *The Sea Around Us*, was published in 1951 and remained on the *New York Times*' best-seller list for 81 weeks. The success of her second book prompted Carson to resign her position with the Service in 1952 to devote all her time to writing. *The Sea Around Us* along with *The Edge of the Sea*, a third book published in 1956, provided a new perspective on conservation to concerned environmentalists.

An Environmental Revolution

But it was her final book, *Silent Spring*, published in 1962, which awakened society to an awareness of its responsibility to other forms of life. Carson had long been aware of the dangers of chemical pesticides but was also aware of the controversy within the agricultural community which depended on pesticide use to increase crop production. She had long hoped someone else would publish an expose' on DDT but eventually realized that only she had the background as well as the economic freedom to do it.

Silent Spring provoked a firestorm of controversy as well as personal attacks on Carson's professional integrity. The pesticide industry mounted a massive campaign to discredit Carson even though she did not urge the complete banning of pesticides but called for research to be conducted to ensure pesticides were used safely and alternatives to dangerous chemicals such as DDT could be found. The federal government, however, ordered a complete review of pesticide policy and Carson was asked to testify before a Congressional committee. As a direct result of that review, DDT was banned. With the publication of *Silent Spring*, Carson is credited with launching the contemporary environmental movement and awakening concern by Americans about the environment.

Carson once said that "man's endeavors to control nature by his powers to alter and to destroy would inevitably evolve into a war against himself, a war he would lose unless he came to terms with nature." She died from cancer in 1964 at the age of 57. The U.S. Fish and Wildlife Service named one of its refuges near Carson's summer home on the coast of Maine as the Rachel Carson National Wildlife Refuge in 1969 to honor the memory of this extraordinary woman.

For more information, please visit <http://www.fws.gov/rachelcarson>

Managing for Wildlife

WATER LEVELS ON over 7,000 acres of Refuge habitat are managed using a system of water control structures and dikes. High water levels protect fish populations during the winter, protect nesting birds from predation, and regulate vegetation growth. Low water levels create mudflats for cranes and other birds, enhance feeding opportunities for migratory waterfowl and shorebirds, and make fish more accessible to osprey and bald eagles. Prescribed burns, river and wetland restoration, mowing, and forest management are used by the Refuge to maintain healthy and diverse wildlife habitats.

A Seney Year

Spring

ABOUT THE TIME the ice melts off the pools, the Refuge's summer residents begin returning to their nesting grounds. Canada geese are usually the first to arrive in late March to early April. Their familiar honking is a welcome sign that spring is near. Following shortly behind are sandhill cranes and red-winged blackbirds. Common loons arrive after most of the ice has melted.

Late Spring - Early Summer

Spring and fall are the best viewing times for most wildlife species. Biting insects (black flies, deer flies, and mosquitoes) can be a problem during warmer months. Wood ticks may also be found. Refuge habitat supports a variety of wildlife including black bear, white-tailed deer, coyote, river otter, beaver, Ruffed, Spruce, and Sharptailed Grouse, Yellow Rails, woodcock, Bald Eagles, fox, muskrat, mink, turtles, frogs and insects. The Refuge's many species of songbirds are some of the last to arrive. By the end of May, birdwatchers will be delighted with the variety of birds. The best time to listen for birds is late May to early June.

Autumn

Peak waterfowl migration occurs from the end of September to mid-October. Loons are some of the earliest to leave in September. By the end of October most migratory birds have left the Refuge for their wintering grounds. Common species include Canada geese, hooded mergansers, mallards, black ducks, ringnecked ducks, wood ducks, and sandhill cranes.

Special Rules

Please do not feed wildlife.

Daylight use only.

Dogs are allowed on a leash.

No camping or overnight parking is allowed.

Off-road vehicles are prohibited.

Open fires are not allowed.

No boats or flotation on Refuge pools

Seney National Wildlife Refuge
1606 Refuge Entrance Road
Seney, MI 49883
(906) 586-9851 ext.15
<http://midwest.fws.gov/seney>



Lighthouse Tours Offered

TOURS OF THE AU SABLE Light Station will be presented this summer from July 1 through August 21, Wednesday through Sunday plus Saturdays August 25 and September 1. The 30 minute tours begin at noon and go through late afternoon. Tour groups visit the first floor of the assistant keepers dwelling, then up into the 87 foot high tower and into the lens room. From there, spectacular views of the lake, shipwrecks, and the Grand Sable



3rd Order Fresnel Lens

Dunes are visible from the catwalk. The 1874 light station continues to shine 17 miles out on Lake Superior. A \$2 tour fee is charged (age 6 and above). Check Lakeshore bulletin boards and the on-line newspaper for tour days and times.

Suspect Firewood

WITH THE ARRIVAL of the 2007 camping season Lakeshore staff are concerned. Very concerned. You can help ease those worries by not moving firewood.

Why? For the past several years, an insect known as the Emerald Ash Borer, or EAB, has been making a slow and deadly migration throughout the Midwest. Millions of ash trees have been destroyed in Michigan and, most recently, the EAB is showing up in suburbs around the Chicago area. That's kind of scary when you realize that a lot of visitors to campgrounds in the Upper Peninsula hail from outside the area, and many of them bring their own camp firewood.

The campfire is an old camping ritual that evokes happy summer memories. Whether snuggling by the fire or roasting marshmallows, everyone who has camped will remember the crackling, cozy fire. And, with over 60 campsites in the Lakeshore, we are talking about a lot of crackling, cozy fires.



emerald ash borer

Unfortunately, firewood is the preferred vehicle of the EAB. Unable to travel more than two miles on its own, the EAB needs to hitch a ride to get around. At the present time, most experts believe it has made its way through the Midwest by people who transport infested firewood to other parts of the state or even the country. And, since it has no natural predators like birds, other insects, or snakes, is virtually indestructible.

To bring the situation under control so that more trees are not killed by these pests, moving firewood into the Upper Peninsula is banned, this

means it is illegal to transport wood out of state, and can bring with it substantial fines or jail time if an individual knowingly moves wood out of quarantined areas.

Additionally, Pictured Rocks National Lakeshore has banned the import of all ash firewood to reduce the potential for EAB to become established in the park. This ban consistent with the Michigan Department of Agriculture and Department of Natural Resources policy.

Park Rangers are making special efforts to visually inspect firewood at campgrounds and other areas during routine patrols and fee collection. A fine may be levied on persons bringing firewood into the park.

The introduction of exotic species - both terrestrial and aquatic - is one of the greatest threats to the ecological health of the national lakeshore. In combating this pest species and others, we ask the public to join us in helping to preserve and protect the natural systems in the park for this and future generations.

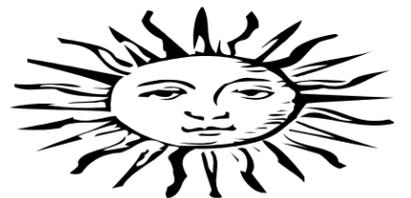
An ALTRAN public transportation van will be available to visitors with mobility impairment this summer. The van will be available at lower Hurricane River Campground and will run from noon to 5 p.m. on Saturday, July 7 & 21, and August 4 & 18. The round trip fee is \$2.50. ALTRAN: 906-387-4845.

Climate Change continued...

- Use public transportation at home, to and around parks, forests and wildlife refuges. Walk, use mass transit, carpool with friends, or ride a bike whenever possible.
- Purchase alternative solar and wind generated power and "carbon credits" to help offset your emissions.
- When it is time to replace the family vehicle, consider one that gets more miles per gallon than your present vehicle.
- Convert home and office lighting to compact fluorescent bulbs. Turn off lights you are not using them.
- When it is time to replace an appliance or when buying or building a new house, look for the Energy Star® label identifying energy-efficient models.
- Buy products that feature reusable, recyclable, or reduced packaging to save the energy required to manufacture new containers and reduce greenhouse gas emissions from landfills.
- Educate others. Let friends and family know about these practical, energy-saving steps they can take to save money while protecting the environment. Share this paper with a friend. Calculate your carbon contribution at: <https://www.greentagsusa.org>
- Encourage your company to join Waste Wi\$e recycling



- programs, sustainable practices programs, and to buy office equipment with the Energy Star® label.
- Encourage scientific research and public discussion on global warming and solutions such as energy efficiency and alternative energy.



In Conclusion

National Parks, Forests and Refuges will be challenged in the coming decades to meet their mandate of protecting current species biodiversity within their boundaries. While wildlife may be able to move northward or to higher elevation to avoid the impacts of climate change, protected areas cannot. As animals move out of protected regions, they must survive in unprotected habitat. (Burns et al. 2003) Land and wildlife management agencies will need an informed and active constituency to address these challenges. Will you help?

Things to Consider

FALLING ROCK, CASCADING dunes, rip tides and encounters with bears due to improper backcountry storage of food...as a Lakeshore visitor, these are things you should be thinking about.

Many of the cliff areas along the North Country Trail are actually overhangs with free space below. As you are hiking in the park, remember this and stay back from the edge.



While the Grand Sable Dunes are a unique and beautiful part of the park, they too can hold hazards. Be aware that sand banks can collapse - sending you downslope or perhaps covering you. Take care when traversing dune faces.



Rip currents are possible at several beach locations along the Lakeshore depending on weather and water conditions. Check the bulletin boards to know what they look like and how to get out of one.

We would all like to see a bear during our visit to the park, but at a safe distance. Remember that a fed bear is a dead bear. Please follow food storage guidelines posted on bulletin boards and in backcountry regulations by hanging your food on the food pole provided or securing food in a vehicle.



Regulations In Brief

WE HOPE YOU enjoy your visit to the Lakeshore. To help ensure it is pleasant, please take a couple of minutes to become familiar with the following use regulations of the National Lakeshore.

CAMPING - permitted only within designated Lakeshore campsites. Camping permits are required. Beach or roadside camping is prohibited.

BACKCOUNTRY CAMPERS - must purchase a backcountry permit prior to entering the backcountry. Permits are available by prior reservation and at visitor centers in Munising and Grand Marais.

PETS - where permitted, must be on a 6-foot leash. Check the pet map on bulletin boards for specific locations of pet walking areas.

BICYCLES - permitted on roads where automobiles are permitted. Not permitted on hiking trails or roads closed to vehicular traffic.

HUNTING - prohibited park-wide during the high visitor use period of April 1 through Labor Day. Hunting is allowed the remainder of the year as established by state and federal laws. Target shooting and trapping are prohibited year-round.

CAMPFIRES - allowed only in fire rings. Fires on beaches — except in fire rings provided — are prohibited.

ATVs - are prohibited in the park.



REMOVING ROCKS or other natural features is prohibited. Please do not injure or remove plants or harass wildlife.

NO WILDLIFE FEEDING - Birds and small mammals rely on natural food to get them through the winter. Please do not make them dependent on human food.

NO LITTERING - Each of us enjoy a clean Lakeshore. Please pick up after yourself and others.

FIREWORKS - are best left to the experts. Use or possession of fireworks within the Lakeshore is prohibited.

Visit our official Lakeshore website: www.nps.gov/piro

Notable Day Hikes

YOUR VISIT TO Pictured Rocks National Lakeshore may be only an hour or two or you may spend a week or more. If you only have a day or two to spend at the Lakeshore, consider visiting these popular attractions in developed areas of the park. Please note that bicycles are not permitted on Lakeshore trails. Pets are allowed along all park roads and are permitted in some other areas. Pets must always be on a 6-foot leash.

Munising Falls

Nestled in a cool, shady valley, the 50 foot falls are at the end of a short 800 foot walk on an improved trail. The trail is a good place to look for wildflowers in spring and early summer. Water from the creek was once used in the production of iron at the Schoolcraft blast furnace, a story told on wayside exhibits and in the Munising Falls Interpretive Center. Pets are allowed on the trail to Munising Falls, but not on Becker Farm entrance road and fields or on North Country Trail.

Sand Point

The Sand Point beach is a popular spot for walking in the evening to watch the sun go down over Munising Bay. The Sand Point Marsh Trail, a half-mile disabled accessible interpretive trail, features a large print brochure for visually impaired visitors. Sand Point is a good place to look for warblers in spring and fall. Park Headquarters is also located on Sand Point in a former U.S. Coast Guard building. Pets are permitted on Sand Point to the base of the Pictured Rocks cliffs. Pets are prohibited on Sand Point Marsh Trail.

Miners Castle

Beginning at the picnic area, a paved foot trail leads you past interpretive exhibits to breathtaking overlooks of Lake Superior and Grand Island. Erosion over long periods of time has created the interesting rock formations that give this place its name. Pets permitted in picnic and overlook area but prohibited on the North Country Trail.

Miners Falls

A 1.2 mile round trip gravel path through a deep woods environment leads to the falls overlook. Miners River plunging some 60 feet over a cliff is home to brook and steelhead trout. A free, self-guiding interpretive trail guide is available at the trailhead. Pets are permitted in picnic area on a 6 foot leash, but are prohibited on the trail to Miners Falls.

Miners Beach

A picnicker and beach walker's delight, Miners Beach extends for one mile on Lake Superior where waves roll in to polish beach cobbles. Miners River is popular for steelhead fishing in spring and fall. A 1.0 mile trail connects Miners Castle developed area and the picnic area at Miners Beach. Pets are allowed in picnic area and on Miners Beach.

White Pine Trail

Located at the Little Beaver Lake Campground this 1.0 mile self-guiding interpretive trail explores the plant and animal communities of a cool, shady valley. Free trail guides are located at the trailhead. No pets are allowed in this area.

Chapel Rock

Circumnavigating Chapel Lake takes you to the beautiful Chapel Beach and Chapel Rock. The 6.6 mile trip makes a great day hike. Pets are not permitted on this trail.

White Birch Trail

Located at the Twelvemile Beach Campground, this two mile self-guiding interpretive trail explores a variety of ancient Lake Nipissing beach and upland plant communities. Free trail guides are located at the trailhead. No pets are allowed in this area.

Log Slide Overlook

The 1000 foot trail to the viewing platform from the picnic area is worth the walk. Newspaper accounts tell of logs sent down the dry log chute generating enough friction to cause the chute to catch fire. Today the chute is gone, but the lumberjack stories still linger as you gaze out over the Grand Sable Banks and Dunes. This is a good place to glimpse the Au Sable Light Station to the west and Grand Marais to the east. Pets are allowed only to the overlook platform.

Au Sable Light Station

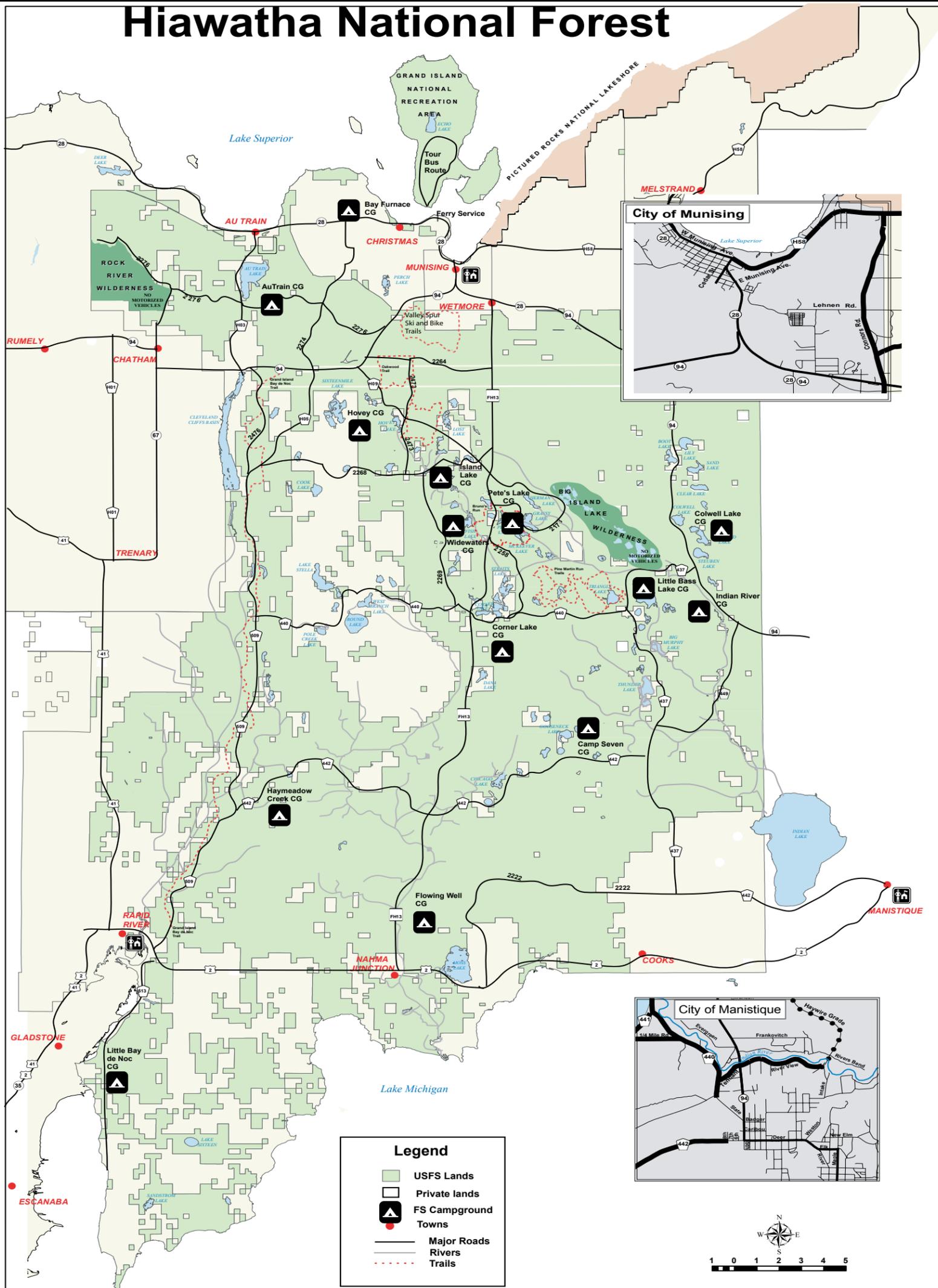
This picturesque station is being renovated by the National Park Service. Strolling about the grounds on a stormy day, one can feel the sense of duty and history for which this station is preserved. Access to the station is by a 1.5 mile hiking trail beginning at the east end of the lower Hurricane River Campground. No pets are allowed in this area. Check at visitor centers and park bulletin boards for summer interpretive tours scheduled at the light station.

Sable Falls

A picnic lunch at Sable Falls can begin a great afternoon of exploring. A 0.5 mile hike from the parking lot leads you to the falls and Sable Creek and on to Lake Superior. No pets are allowed in this area.



Chapel Beach



National Forest Surveys

AS YOU TRAVEL THROUGHOUT the Hiawatha National Forest, you may see bright orange signs that say “Traffic Survey Ahead”! As part of a year long survey project, employees and volunteers are conducting informal interviews with Forest visitors in developed and dispersed recreation sites and along roads across the Forest. This is part of a national survey that is conducted once every five years to gather information on recreation trends on national forests across the country. The information is useful in identifying visitor needs, and it provides National Forest managers with an estimate of how many people recreate on national forest lands and what activities they engage in while there.

Any information provided by the public will be confidential, and the survey is voluntary. This recreation visitor program gathers basic visitor information. All responses are totally confidential, and a basic interview lasts about 8 minutes. The questions visitors are asked include: where they recreated on the Forest, how many people they traveled with, how long they were on the Forest, what other recreation sites they visited while on the Forest, and how satisfied they were with the facilities and services provided.

Information collected in this national study will be used in local Forest planning, at the state planning level, and by Congress. The more we know about our visitors and their expectations, the better we can provide for their needs. Although the survey is entirely voluntary, we would appreciate it if visitors would take the time to answer a few quick questions. If you have any questions about this program you can visit our web site at <http://www.fs.fed.us/recreation/programs/nvum>.

OHV Riding Guide

Where can I ride?

1. Cross country travel is prohibited. (Travel on closed roads or on user created routes constitutes cross country travel.)
2. Travel is allowed on the Coalwood and Haywire OHV trails.
3. Travel is allowed on country roads according to respective county ordinances.
4. Travel is allowed on Forest Service woods roads marked with a vertically numbered sign post, UNLESS gated, bermed or signed closed. (See Figure A)
5. Travel is prohibited on gravel roads marked with a horizontally numbered sign post UNLESS posted with a 12-inch square brown sign with a four-wheeler shown in white (B & C).

In order to accommodate loop riding on the Munising Ranger District, the following horizontally-signed forest roads (FR) are open:

- FR2276 (Buck Bay Creek Rd) from one mile west of M-94 to FR2483 (Chatham Ski Hill Rd)
- FR2483 from FR2276 to Pine Grove Cemetery east of Chatham
- FR2274 (Ridge Rd) from FR2276 to MDNR multiple use trail on the old rail road grade.
- FR2482 from M-94 to FR2276
- FR2473 (Mirror Lake Rd) from Buckhorn Rd south to Doe Lake Rd.

What is "the head-shake rule"?

Together, items 4 and 5 above constitute what we call the Hiawatha's "head-shake rule." If the sign post is horizontal, shake your head horizontally to signify "no, these forest roads are usually not open to OHVs." If the sign post is vertical, nod your head vertically to signify "yes, these forest roads are usually open."

Where can I park?

Access to the district's designated trails and road system is available at the BP gas station in Wetmore.

How should we ride?

OHVs must travel single file on the edge of the travel way, but NOT in



the road ditch. Be prepared to share the road with passenger vehicles.

What is the speed limit on Forest Service roads?

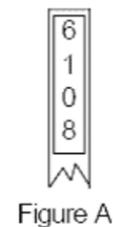
OHVs will be limited to a speed of 25 M.P.H. or less.

Where can I get maps?

Hiawatha National Forest maps are available for purchase at the Hiawatha National Forest Interagency visitor center in Munising. The center also sells the Alger County Sno-riders "Groomed Snowmobile Trails and ATV Trail Map for Alger County and Surrounding Area."

What else should I know?

OHVs must follow all guidelines and regulations in the Michigan DNR Off-Road Vehicle Guide. An MDNR OHV sticker is also required.



Special Events, Races, and Festivals on the Hiawatha National Forest



There are many special events that take place on the Hiawatha National Forest that are sponsored by private citizens or non-profit groups. Anyone interested in having an event on the National Forest must obtain a special use permit. For more information, please contact the Forest Service at 906-786-4062.

Grand Island Trail Marathon and 10 K, July 28, Grand Island NRA, Munising, MI. If you like trail marathons, you won't want to miss this one! The race route takes runners along one of the most spectacular shorelines in Lake Superior. Contact <http://www.greatlakesendurance.com/> or runskikayak@hotmail.com for more information.

Great Lakes Sea Kayak Symposium July 19-22 in Grand Marais, MI. Whether they are being introduced to kayaking for the first time or you have been on the water for years, attendees will find classes and trips. The oldest kayaking symposium on the great lakes welcomes paddlers of all ages and abilities for a weekend packed with fun and learning opportunities. Trips include

Grand Island National Recreation Area. Contact the Great Lakes Sea Kayaking Club at <http://www.glsks.org/> Jacob1965@sbcglobal.net for more information.

Tour Da Woods September 8th Mountain Bikers will love the remote trails that make up this challenging race. More experienced riders can take on "Hiawatha's Revenge" 30 mile race and beginners can try the 15 mile "Red Deer Run". There is even a "Tour da Valley" youth race. Contact Anna River Peddlers at http://www.annariverpedalers.org/events_registration.html or contact@annariverpedalers.org for more information.

UP 200 sled dog race, February 2008.- The U.P. 200 is a competitive, 12 dog, mid-distance sled dog race, always held on the third weekend of February. The race is approximately 240 miles in length and is a qualifying race for the Iditarod. Over 15,000 visitors come to Michigan's Upper Peninsula (U.P.) to see the U.P. 200! It is a favorite winter event for local residents and out of town guests.

Cross Country Ski Bash, January 2008 at Valley Spur. Adults may choose between the 24K Big Foot's Revenge or 12K Stairway to Heaven. The Locomotive Chase is a 5K Youth Event. Challenge yourself, the trail or take it as a race. No matter what, you will not forget the beauty of your surroundings as you travel through the forests and hills of the Hiawatha National Forest. For more information visit <http://xcskiandbikevalleyspur.com> or contact Dave Worel at 906-387-2865.

Taste and Glide, March 2008 at Valley Spur. Always the first Saturday in March, the popular Taste and Glide cross-country ski event celebrates the joy of skiing and the joy of eating! Fun for all ages, the only race is to get to the Chocolate Strawberries. For more information visit <http://xcskiandbikevalleyspur.com> or contact Dave Worel at 906-387-2865.

Snowman Triathlon, March 2008, Valley Spur. The annual "Snow Man" Triathlon is usually held the second weekend in March. The triathlon consists of a 7 mile ski race, followed by a 1 mile snowshoe run and finishing with a 4 mile run. The triathlon can be done as an individual or in teams. For more information visit <http://xcskiandbikevalleyspur.com> or contact Dave Worel at 906-387-2865.

Munising 300 snow mobile race, March 2008. The exciting Munising 300 snowmobile race includes many trails through the Hiawatha National Forest and the route even goes out to Grand Island and back. For more information visit <http://www.algercounty.org/race.html>.



Grand Island

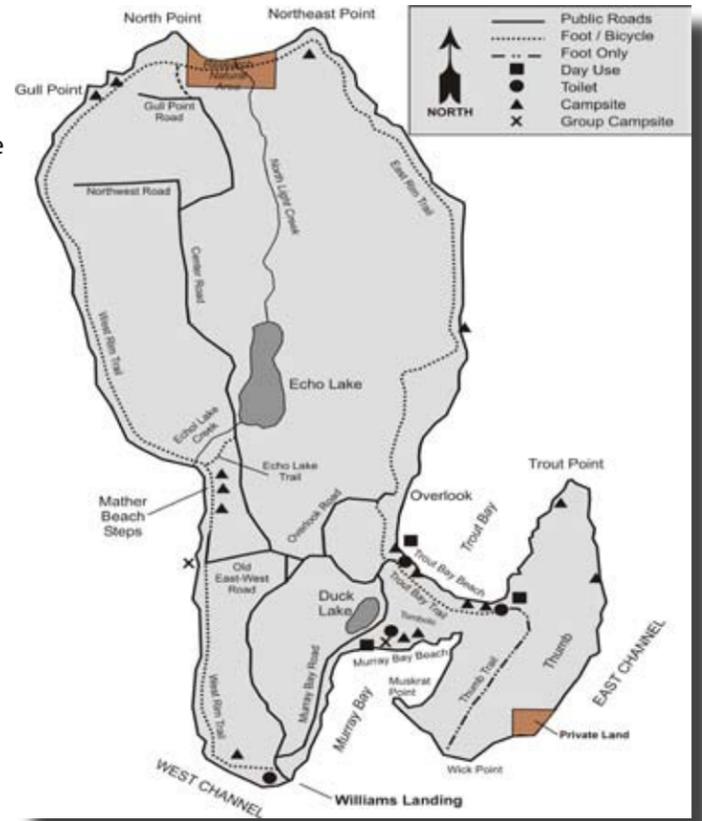
LOCATED IN LAKE SUPERIOR about one-half mile offshore from Munising, Grand Island's historical residents and visitors have included Native Americans, voyageurs, hunters, trappers, fur traders, loggers, geologists and vacationers.

A National Recreation Area since 1988, the 22-square mile island's scenic natural beauty and interesting history make it an attractive place for a full day's mountain bike trip or a backcountry overnight stay.

Visitor motor vehicles are not permitted, but a daily narrated bus tour of the lower part of the island is available during the summer season. Inquire about times at the ferry dock or at the Visitor Information Center in Munising. Although no camping permit is required, a \$2 per person entry fee is included in the price of each ferry ticket. Boaters arriving on the island are requested to deposit their fees in the tube provided near the designated campsites. General backcountry regulations and safety concerns apply on Grand Island, but campers should stop at the Visitor Information Center in Munising to receive the latest updates and to purchase maps.

If you are traveling to and from the island on the passenger ferry, keep the ferry schedule in mind as you plan your time on the island. Consider your level of fitness and your pace as you make route choices. For instance, a family planning a day of biking can arrive on the early boat, take a leisurely pace and travel up the west rim trail, cut across the island to Trout Bay Overlook, travel down to Trout Bay day use area for a picnic meal and beach walk, and finish the day biking down along Murray Bay to Williams Landing in time to return to the mainland. More energetic cyclists can mountain bike

the 23-mile main island perimeter route in four to six hours, with time for brief stops and some exploration. The island is criss-crossed by a network of old logging roads, providing a secluded setting for hikers and cyclists. Bicycling off roads and trails is not allowed because it damages fragile vegetation. Random camping is permitted at least 100 feet from trails, roads, water, cliffs, the Research Natural Area, private property, and other campsites.



Camping on the sandy tombolo that connects the two parts of the island is limited to designated campsites. Please respect private property signs and do not approach buildings.

Public Lands Summer Events

Date	Program	Presenter	Location	For more info call:
June	Wildlife Wednesdays	Evening Auto tours 7pm	Seney National Wildlife Refuge	Seney 906-586-9851 x15
June 16	Celebrating Wetland Flora - 1 pm	Deb LeBlanc, USFS Ecologist	Munising	USFS 906-387-2512 (Pre-registration required)
June 9	Children's Fishing Day	Open to all children 1-16	Seney National Wildlife Refuge	Seney 906-586-9851 x15
June 9	16th Annual Kids Fishing Day 11 am	Designed to introduce young people to the joys of fishing.	Camp 7 Lake Campground	USFS 906-474-6442
June 11	Native Plant Restoration - 9-3 pm	Deb LeBlanc, USFS Ecologist	Bay Furnace	USFS 906-387-2512 (Pre-registration required)
June 19-21	Garlic Mustard Pull - 9-3 pm	Deb LeBlanc, USFS Ecologist	Various Locations	USFS 906-387-3700 (Pre-registration required)
July	Wildlife Wednesdays	Evening Auto tours 7pm	Seney National Wildlife Refuge	Seney 906-586-9851 x15
JULY 1-31	Au Sable Lighthouse Tours	Wednesday - Sunday 12 - 5:30	Au Sable Light Station	Pictured Rocks NL 906-387-3700 (\$2 / person fee)
JULY 1-31	Campground Programs	8 pm Monday Thru Thursday Evenings	See park bulletin boards for location	PRNL 906-387-3700
JULY	Park Ranger Cruise Narration	Monday - Thur 2 pm	Pictured Rocks Cruises	Pictured Rocks NL 906-387-3700
July 6	Hiawatha Culture Tour - 7 pm	Dusty Fiddles	Bay Furnace Campground	USFS 906-387-3700
July 7	Pictured Rocks Culture Tour 7 pm	Dusty Fiddles	Miners Castle	Pictured Rocks NL 906-387-3700
JULY 7	ALTRAN shuttle to Au Sable Light Station - Noon to 5 pm		Hurricane River Campground	ALTRAN 906-387-4845
T - S, July 10-28	Grand Island Archaeology Site 9 am - 3 pm	Open to Public	Grand Island NRA Archaeology Field School	USFS 906-387-3700
July 13	Hiawatha Culture Tour - 7 pm	Bill Jamerson	Bay Furnace Campground	USFS 906-387-3700
July 13	Hiawatha Culture Tour - 7 pm	Tom Hodgson	Camp 7 Campground	USFS 906-474-6442
July 20	Hiawatha Culture Tour - 7 pm	Kraig Kenning	Camp Seven Campground	USFS 906-474-6442 (National Slide Guitar Champion)
July 21	Hiawatha Culture Tour - 7 pm	Kraig Kenning	Bay Furnace Campground	USFS 906-387-3700 (National Slide Guitar Champion)
JULY 21	ALTRAN shuttle to Au Sable Light Station - Noon to 5 pm		Hurricane River Campground	ALTRAN 906-387-4845
July 27	Hiawatha Culture Tour 7 pm	Reg Pettibone Native Dancers	Camp Seven Campground	USFS 906-474-6442
JULY 28	Pictured Rocks Culture Tour 7 pm	Reg Pettibone Native Dancers	Twelvemile Beach Campground	Pictured Rocks NL 906-387-3700
August	Wildlife Wednesdays	Evening Auto tours 7pm	Seney National Wildlife Refuge	Seney 906-586-9851 x15
AUGUST 1-22, 25	Au Sable Lighthouse Tours	Wednesday - Sunday 12 - 5:30	Au Sable Light Station	Pictured Rocks NL 906-387-3700 (\$2 / person fee)
AUGUST 1-31	Park Ranger Cruise Narration	Monday - Thur 2 pm	Pictured Rocks Cruises	Pictured Rocks NL 906-387-3700
AUGUST 1-31	Campground Programs	8 pm Monday Thru Thursday Evenings	See park bulletin boards for location	PRNL 906-387-3700
August 2	Grand Island Archaeology - 7 pm	Dr. Jim Skibo	Alger Heritage Center	USFS 906-387-3700
AUGUST 4	ALTRAN shuttle to Au Sable Light Station - Noon to 5 pm		Hurricane River Campground	ALTRAN 906-387-4845
August 10	Hiawatha Culture Tour 7 pm	Rob and Anne Burns	Bay Furnace Campground	USFS 906-387-2512
August 18	Hiawatha Artist in Residence 9-4 pm	Photo Workshop	Ken Halfmann	Location TBA USFS 906-387-2512 (Pre-registration required)
August 18	ALTRAN shuttle to Au Sable Light Station - Noon to 5 pm		Hurricane River Campground	ALTRAN 906-387-4845
August 23	Hiawatha Artist in Residence 7 pm	Photo Exhibit	Ken Halfmann	Alger Heritage Center USFS 906-387-2512 (Pre-registration required)
August 18	Hiawatha Culture Tour 7 pm	Carl Behrund	Bay Furnace Campground	USFS 906-387-3700
Program: Evening Presentation - Great Lakes Legends				
SEPTEMBER				
SEPTEMBER 1	Au Sable Lighthouse Tours	Saturday 12 - 5:30	Au Sable Light Station	Pictured Rocks NL 906-387-3700 (\$2 / person fee)
September 8	National Public Lands Day	Deb LeBlanc, USFS Ecologist	Munising	USFS 906-387-2512 (Pre-registration required)
	Native Seed Collection Project			
September 29	Scout Activity Day - Activity stations for Boy & Girl Scouts		Seney National Wildlife Refuge	Seney 906-586-9851 x15 (Pre-registration required)
OCTOBER				
October 8 - 14	National Wildlife Refuge Week		Seney National Wildlife Refuge	Seney 906-586-9851, x15



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Nature's Adventure where Huron, Michigan & Superior Meet





LIKE ALL NATIONAL PARK AREAS, Pictured Rocks National Lakeshore is charged with the management of natural resources and natural process so they are unimpaired for future generations. In order to achieve this portion of our mission, a staff of three permanent employees and several seasonal researchers conduct numerous inventory and monitoring activities in the park. These folks are the ones who help determine “what makes this place tick.” A summary of 2007 activities follows.

Aquatic Investigations

Coaster brook trout are a life form of native brook trout that spends part of its life in tributary streams and part in coastal areas of large lakes like Lake Superior. As adults they look different from stream-dwelling brook trout and were sought by anglers for their large size, attractive scale markings, and taste. Populations took a precipitous decline due largely to over-harvesting but also to predation by sea lamprey, competition from introduced, non-native salmon, and the sedimentation of gravelly spawning habitat. A graduate student from Dr. Jill Leonard’s lab at Northern Michigan University continues to track the movements of electronically tagged brook trout and non-native steelhead in three streams at Pictured Rocks National Lakeshore (PRNL). Students from Dr. Leonard’s lab periodically electroshock streams with backpack units to assess survival and size class structure of these species.

Dr. Leonard’s lab will be tracking locations of radio-tagged coaster brook trout in the near shore area of Lake Superior in 2007, thanks to funding from Trout Unlimited. Radio receivers will be suspended from buoys and checked on a regular basis.



Brook Trout Monitoring

The Aquatics Monitoring Program continues. Monitoring of five inland lakes at PRNL will continue using protocols consistent with those of national parks throughout the Great Lakes region. The program is designed to detect long-term changes in the water quality of these lakes. In addition, staff regularly check aquatic habitats for the presence of non-native species like zebra mussels and purple loosestrife. Populations of the non-native spiny water flea, known to be present in Beaver Lake since 1997 and in Grand Sable Lake since 2002, will be monitored. Major streams at PRNL are monitored for fluctuations in discharge, or flow.

Pictured Rocks National Lakeshore cooperates with the U.S. Fish and Wildlife Service’s Sea Lamprey Control Program to estimate the population of this non-native sea lamprey. Spawning adult populations in the Miners River are estimated using a mark/recapture method.

Amphibian and reptile surveys will be conducted during the late spring and early summer months throughout PRNL.

Vegetation Investigations

Exotic Plant Management will continue during the 2007 field season. Pictured Rocks National Lakeshore staff, in cooperation with staff and volunteers from The Nature Conservancy, will remove invasive exotic plants from Sand Point in Munising and Coast Guard Point in Grand Marais. An exotic plant management team, which serves nine Great Lakes National Park units, will spend about two weeks removing invasive exotic plants in the Grand Sable Dunes and trail heads. The objectives of this effort include restoration of native habitat and protection of threatened and endangered plant species. Efforts at Pictured Rocks NL are focused on the Grand Sable Dunes. The dunes contain several large infestations of invasive non-native plants that are spreading and altering native plant communities. These popula-



Spotted Knapweed Removal

tions, as well as communities of rare and endangered native plant species, have been mapped using GPS technology. This information is being used to guide control efforts and model the occurrence and possible spread of non-native plants. More than 400,000 exotic plants have been removed from the dunes since 2001.

A Campground Impact Study will begin in 2007. Lakeshore staff will survey vegetation composition and structure, down woody debris, and soil compaction associated with backcountry campgrounds. This study will attempt to discern the severity and spatial extent of impact from campgrounds to vegetation surrounding campsites by comparing data with control sites not impacted by continued human disturbance. Staff will also survey for invasive non-native plants to determine if problem species are being carried in by campers and if exotic plant control efforts need to be initiated.

Researchers from Michigan Technological University will continue sampling for Emerald Ash Borer (EAB), an exotic forest pest, during 2007. Trap trees have been established near Hurricane River campground to attract EAB for purposes of detecting presence of the insect, which kills ash trees. The EAB has killed millions of ash tree in the lower peninsula of Michigan, and threatens all of Michigan’s estimated 700 million ash trees. The insect is moved when people transport infested wood from one area to another. Michigan agencies are cooperating to contain this insect and protect Michigan’s forests.

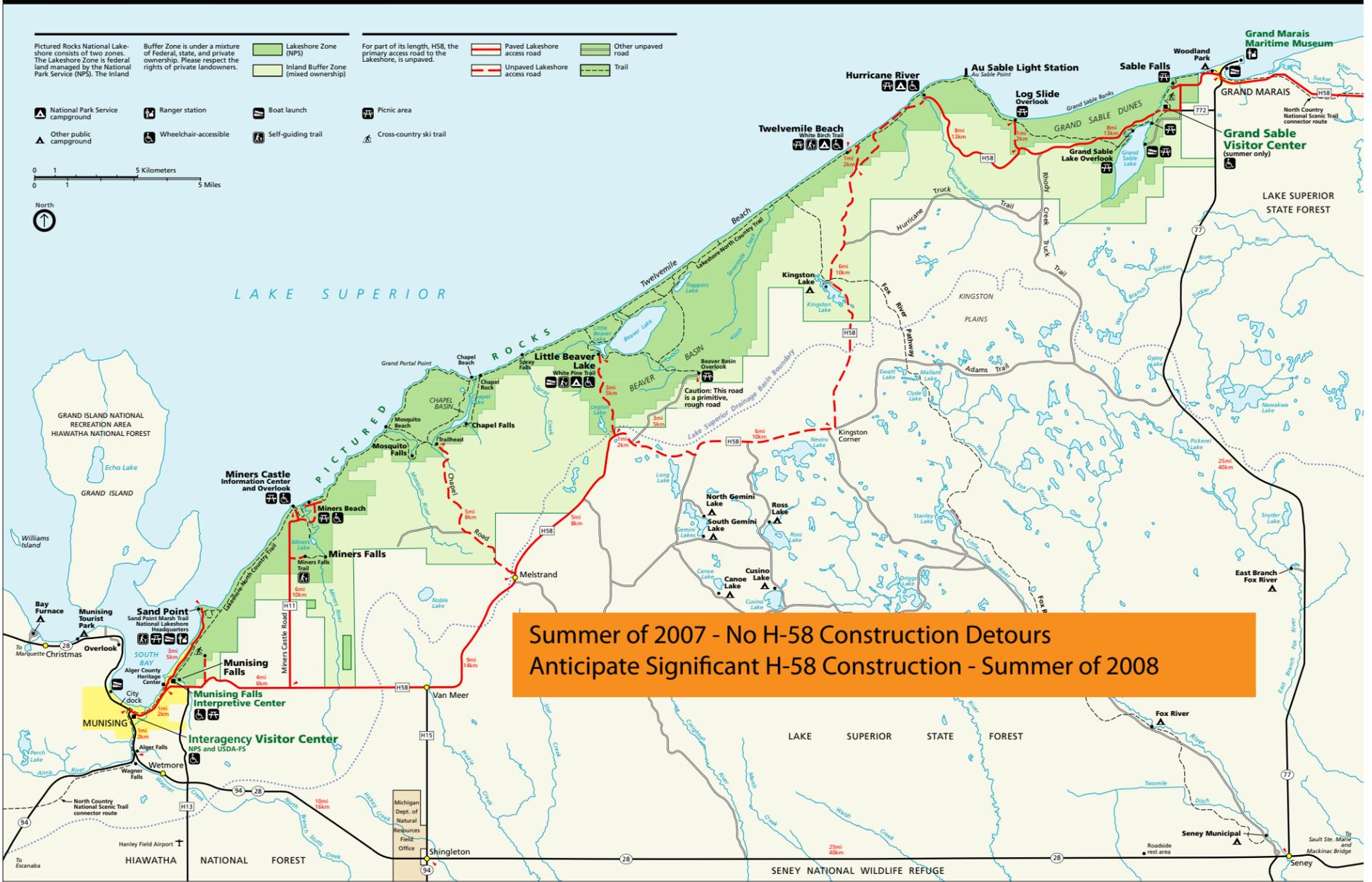
A study of the federally threatened Pitcher’s thistle and associated plant communities will begin in 2007. The Grand Sable Dunes of Pictured Rocks National Lakeshore contain the only known population of this plant species along the U.S. shore of Lake Superior. Researchers from Northern Michigan University and the National Park Service plan to map plant populations in open dune habitats, assess status of Pitcher’s thistle populations, and identify threats to the species long-term viability at the lakeshore. This study was initiated in response to the U.S. Fish and Wildlife Service’s (USFWS) Recovery Plan for Pitcher’s Thistle released in 2001. The USFWS service provided funds to conduct this assessment.

An assessment of rare orchid populations in jack pine forests of the Grand Sable Dunes will continue in 2007. The objectives include determination of environmental variables which coincide with presence-absence of the populations, and to document population dynamics and dispersal/establishment mechanisms. Populations of rare plants will be mapped in the field using GPS, and population densities estimated. The establishment randomly located plots throughout the study area will provide a spatial framework for the collection of numerous data sets related to biotic and abiotic variables of interest. Predictive models based on the results of the analysis will be developed, which will allow for assessment of vegetative trends at the plot, patch, and landscape scales. It is expected that the results of this research will define resource and habitat specifications of selected rare plant species, which will be useful in preparing management goals for the conservation of these species and their habitats.



Calypso Orchid

Pictured Rocks Lakeshore



Research 2007 - continued Wildlife Investigations

A Black Bear Ecology project will continue during May 2007 by PRNL biological staff. The intent of this project is to determine black bear movements, activity patterns, and habitat use in relation to human activity at the Lakeshore. Biologists intend to determine whether bears avoid, select, or are indifferent to areas heavily used by people. Black bears will be captured in standard culvert-style live traps during June-July. Select bears will be immobilized and receive a radio transmitter. These transmitters send a unique signal that biologists can receive to determine their location. Locations will be plotted using a geographic information system and used to determine home range, preferred habitats, and survival rates.



A project assessing human traffic levels on avian distribution and abundance along trails will continue during 2007. Previous work in the southwest U.S. and elsewhere demonstrated that birds are adversely affected by human intrusions for distance up to 100m either side of the physical trail. This study will determine if degree of human activity on trails in northern hardwood forests influences bird activity along these trail corridors. Various metrics will include population density estimates, species richness, and artificial nest depredation rates.

An inventory of small mammal distribution and abundance within jack pine stands in the Grand Sable Dunes will be initiated this summer. No systematic inventory work on this group of animals has been conducted to date in the dunes. This study will assess the influence of patch size and vegetation characteristics on small mammal occupancy and abundance. In addition, this project will look at the influence of spotted knapweed on small mammal and avian communities in the dunes. Data that will be collected includes estimating the number of species present within several of the jack pine stands, along with population estimates and estimates of dispersal.

Biologists from the Great Lakes Inventory and Monitoring network will initiate a long-term monitoring protocol for estimating amphibian occupancy at the lakeshore. Field work will begin in late April. The goal is to have a statistically-valid means for assessing change in the distribution of several frog species across years.

National Parks of Lake Superior Foundation



Pictured Rocks National Lakeshore



Apostle Islands National Lakeshore



Isle Royale National Park



Grand Portage National Monument

THE NATIONAL PARKS of Lake Superior Foundation (NPLSF) is a newly organized, privately supported effort to fund special projects in the four U.S. national parks on Lake Superior. Your donation will go to the National Parks of Lake Superior Foundation to assist parks with worthy projects over and above funding for basic park operations. Projects include preservation of historic structures and lighthouses, improved visitor services, enhanced environmental education programs and more. The NPLSF is actively seeking partners to assist

in developing this special new funding organization which will complement efforts by the Friends organizations of individual parks. We invite individuals and major donors to contact us to learn more about how they can become involved in these efforts. Your donation is tax deductible.

For additional information or to make a donation, please contact:

www.nationalparksoflakesuperior.org
P.O. Box 632
Houghton, Michigan 49931
906-228-7914