

Research Projects 2004-05

Pictured Rocks National Lakeshore
National Park Service
U.S. Department of the Interior



Wildlife Investigations

A *Black Bear Ecology* project will continue during May 2004 by Pictured Rocks National Lakeshore (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 on a geographic information system and used to determine home range and preferred habitats. For more information on this project, please contact Jerry Belant.

A *Forest Carnivore Monitoring* project will be conducted this spring. Lakeshore biological staff have modified or developed non-invasive techniques for assessing distribution and activity levels in various habitats for fishers and martens. Although we know these species occur within Pictured Rocks, no detailed information on their distribution or ecology exists. Hair snares will be evaluated to determine their efficacy in detecting their presence and suitability for DNA analyses. Some live capture and radio telemetry work will also be conducted, emphasizing fisher and American marten to assist in verifying these techniques. For additional information on this project, please contact Jerry Belant.



A *Bat Inventory* project will continue this June through August 2004. The intent of this project originally was to determine which species of bats are present at the Lakeshore and their approximate distribution and abundance. This year's emphasis will be determining bat activity levels in northern hardwood forests under intensities of selective harvesting. Bats will be identified through capture in mist nets and vocalizations detected by Anabat recorders. The study is funded as part of the Natural Resource Challenge through the Great Lakes Inventory and Monitoring Network. This project is part of a national program that intends to document at least 90% of the expected terrestrial vertebrates and vascular plants that occur in most units of the National Park system. The work will be performed by

Laura Kruger, graduate student at Michigan Technological University. For additional information on this project, please contact Jerry Belant.

A *Reptile and Amphibian Survey* will be conducted through October 2004. The purpose of this project is to determine which species are present in the lakeshore and their approximate distribution. Various capture methods are employed to determine species presence including cover boards, live traps, and searching suitable habitats. This study is also funded as part of the Natural Resource Challenge through the Great Lakes Inventory and Monitoring Network. The work will be performed by Gary Casper, Herpetologist with the Milwaukee Public Museum. For additional information on this project, please contact Jerry Belant.

An *Earthworm Distribution Survey* will be conducted by investigators from the Natural Resources Research Institute, University of Minnesota-Duluth. Earthworms present in the lakeshore are exotics and have been shown to alter plant species abundance and composition in other western Great Lakes forests. The intent of this project is to determine which worm species are present, estimate their distribution and relative abundance, and their effects on vegetation. For additional information on this project, please contact Jerry Belant.

Aquatic Investigations

Coaster brook trout are a strain of native brook trout that spend part of their life in tributary streams and part in the Great Lakes. In western Lake Superior they are sought by anglers for their large size, attractive scale markings, and taste. Populations took a precipitous decline around 1900 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. Coaster brook trout restoration in the Lake Superior basin is a high priority of the Great Lakes Fishery Commission. In 1997, in cooperation with the U.S. Fish and Wildlife Service and the Michigan Department of Natural Resources, PRNL began reintroducing coasters in its streams. Stocking and monitoring of their movements will continue through 2008. Crews electro-shock with backpack shockers in streams to assess survival and size class structure of coasters. The State of Michigan enacted new minimum size and possession limit regulations for brook trout in the region to protect these fish from over-harvesting until their populations have stabilized.

Since 2003 several hundred coasters have been implanted with electronic tags by Northern Michigan



University researchers. Their movements are recorded as they swim past battery-powered, stationary antennae near the mouths of streams. The data show when and how often coasters move in and out of streams to Lake Superior. The research also examines physical stream conditions that may affect the timing of migration, over-wintering habitat of coasters, and stream movements of resident brook trout. Understanding the timing and duration of their migrations will aid in protecting them. Other research is focusing on competition between steelhead trout and coaster brook trout in stream habitats. For additional information, please contact Lora Loope.

The *Aquatics Monitoring Program* continues this year, led by PRNL biological staff. The purpose of this program is to establish baseline data on select physical, chemical, and biological parameters within inland waters of the Lakeshore. It is designed to detect long-term changes in the environment. Personnel will be collecting data on various lakes and streams throughout the spring, summer, and fall. In addition, staff will regularly monitor aquatic habitats for the presence of non-native species like zebra mussels. Populations of the non-native spiny water flea, known to be present in Beaver Lake since 1997 and Grand Sable Lake since 2002, will be monitored.

PRNL staff is also participating in the *Michigan Odonata Survey*, which documents dragonflies and damselflies on a county-wide basis. For additional information on this program, please contact Lora Loope.

Pictured Rocks National Lakeshore cooperates with the U.S. Fish and Wildlife Service's *Sea Lamprey Control Program* to estimate the population of the non-native sea lamprey. Spawning adult populations are estimated using the mark/recapture method in the Miners River. In July 2004 TFM, a chemical lampricide that targets larval sea lamprey, will be applied to three streams in the Lakeshore. In addition, the U.S. Fish and Wildlife Service staff is trying an alternate method to assess larval sea lamprey population levels in Beaver Lake. Rather than applying a chemical that causes lamprey to rise to the surface, they will use an electro-shocking boat that they hope will allow them to assess the population just as accurately. Electro-shocking will not harm native, non-targeted species like freshwater mussels. For additional information on this program, please contact Lora Loope.

Vegetation Investigations

Exotic Plant Management will continue during the 2004 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 one week removing invasive exotic plants in the Grand Sable Dunes. 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 highly invasive non-native plants which are spreading and altering native plant communities. These populations, 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 pos-

sible spread of non-native plants. A total of 301,500 exotic plants were removed from the dunes in 2001, 2002 and 2003. For more information on this project, please contact Bruce Leutscher.

Long-term Forest Inventory and Monitoring will continue at Pictured Rocks National Lakeshore during the 2004 field season. This is the fourth and final year for initial establishment of 150 plots throughout the Lakeshore in all forest types.

Measurements at each plot include indicators for forest health, forest structure, tree growth, overall vegetative biodiversity, downed woody materials, and abiotic parameters such as soil type. The baseline data collected during the first stage of this project will provide insight into the current state of Lakeshore forests, distribution of plant species and communities, and forest fuel loading. Long-term data will track changes in the forest, provide early detection of any threats to forest health, and provide valuable information related to management of Lakeshore resources. For additional information on this project, please contact Bruce Leutscher.

A study of the *Biogeographic Distribution and Genetic Diversity of Pitcher Plants* will take place this year. This study intends to examine the biogeographic dispersal of wetland plants and their patterns of colonization on isolated islands and adjacent mainland systems throughout the Lake Superior Watershed. Pitcher



Pitcher's Thistle (Eaton)

plants will be used as a representative species of northern wetland bog and fen communities. Genetic diversity of individuals at Pictured Rocks National Lakeshore, Apostle Islands National Lakeshore, Isle Royale National Park and three Canadian Provincial Parks will be compared for an understanding of plant dispersal capabilities across a natural fragmentation barrier such as Lake Superior. Understanding the ability of this plant to move across barriers will provide information about the potential of plant communities to move in response to habitat loss, fragmentation, and in the face of changing ecological habitat caused by such events as global warming. This study will provide valuable information on the ability of northern bog/fen ecosystems to respond to fragmentation events and help in restoration projects centered on this plant. The research will be conducted PhD. candidate Jennifer Taylor from Michigan Technological University. For additional information on this project, please contact Bruce Leutscher.

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