



Ecology ≡ Harvest ≡ Management



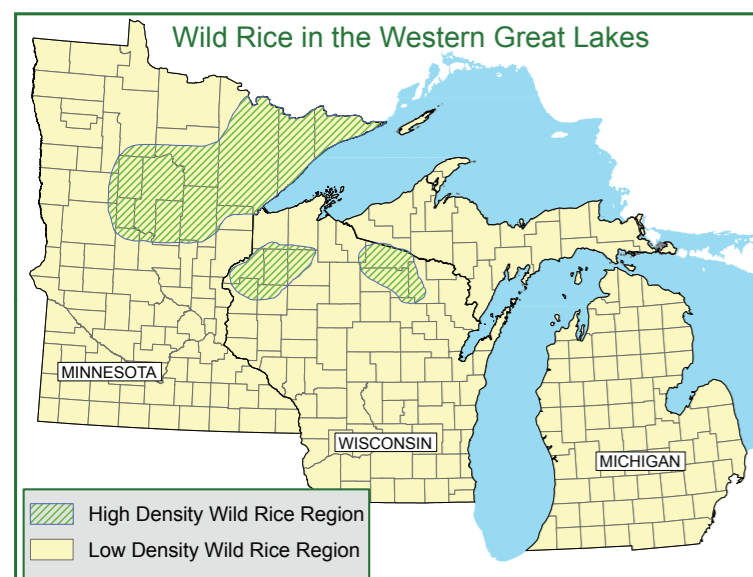
Range & Ecological Significance

In the United States, northern wild rice is only found in abundance in northern Minnesota and Wisconsin, and select locations in Michigan. (Southern wild rice has a larger but spottier distribution extending from the Midwest to the eastern seaboard.)

Manoomin has tremendous ecological value, and the lakes and streams where it occurs in abundance support unusually diverse and complex biological communities. Within its core range there may be no food more important to waterfowl, being heavily consumed by mallards, blue-winged teal, ring-necked ducks, wood ducks, and others. Wild rice also benefits breeding waterfowl, providing roosting and loafing areas for adults, and essential brood cover for young. The plant's green tissue is also heavily utilized by resident Canada geese and trumpeter swans, who often select rice waters for nesting.

Wild rice's other ecological contributions are often less appreciated. From the muskrat that feeds on a tender spring shoot, to the invertebrate that lives on the fall's dying straw, manoomin benefits a wide range of fish and wildlife species because of the food, cover, or physical structure it adds to the environment.

The habitat wild rice provides species ranging from moths to moose and snails to rails creates wetland communities that are vibrant with life. Wild rice can also help maintain water quality by binding loose soils, tying-up nutrients and slowing winds across shallow wetlands. These factors can preserve water clarity and reduce algae blooms. Manoomin is an ecological treasure.



Harvesting

Harvesting wild rice can be a deeply rewarding experience. A fall day spent gathering manoomin can yield a year's worth of memories to be enjoyed regardless of how much rice falls in the canoe.

The harvest season typically begins in mid- to late-August, peaks 2-3 weeks later, and continues for roughly 3-6 weeks total. The timing of the peak will vary from site-to-site and year-to-year. However, there is a consistent annual pattern, with riverine sites generally ripening earlier than lakes, and with the same lakes being relatively early or late each year.

Harvest methods haven't changed much in the last century. Modern harvest regulations reflect traditional harvest techniques that provide good harvest opportunity while protecting manoomin beds. Regulations vary slightly between the states of Minnesota and Wisconsin, and between tribes. Typically, a permit is required, and rice can only be harvested from canoes or similar boats, with the use of smooth wooden ricing sticks known as flails or knockers. Hour restrictions and other regulations may apply. The state of Michigan does not currently have ricing regulations but is considering developing them. In the meantime, Michigan harvesters are encouraged to use similar harvesting methods to protect the state's few remaining beds. Contact your tribal or state natural resource department for detailed harvesting regulations.



Generally, two people rice as a team. The "poler" moves the canoe slowly through the rice bed using a long push-pole while the "knocker" harvests the grain using two wooden sticks. A push-pole is simply a 15-18-foot pole with a natural wooden fork or a metal "duck bill" attached to one end. The knocker uses one ricing stick to lean the rice stalks over the canoe, and the second to gently swipe the seed heads, dislodging the ripe grain. It's important to use care. Rice matures gradually, beginning at the top of the stem. If seeds do not drop with a gentle stroke, the rice is not sufficiently ripe and you should



Drying



Parching



Dancing



Winnowing

stop ricing and try again in a few days. Excessive force will only damage the plants and reduce harvest opportunity later in the season.

Seating position is a matter of personal preference. The knocker can sit near the front of the canoe and face the poler in the back or sit near the middle of the canoe and face forward. Some ricers prefer to pole from the front of the canoe, with the knocker facing forward in the rear. Whatever the arrangement, it's usually best if the poler guides the canoe using methodical, parallel passes through the bed. An orderly pattern will maximize your harvest potential and reduce interference with other ricers.

With some preparation even a novice team can rice successfully if the plants are ripe. However, ricing is an art and success tends to improve with experience. The ability to read a rice bed for ripeness, to develop rhythm between poler and knocker, and to understand when and where to go are all important. Your yield will increase with knowledge, experience, coordination and scouting effort.

A ricing trip may yield anywhere from a few pounds of freshly harvested "green" rice to more than 200 pounds. But since even intensive hand harvesting over the course of a season removes only about 15% of the seeds produced, abundant seed remains available for wildlife and natural reseeding of the bed.

Finally, many ricers like to acknowledge the gift of wild rice. To the Ojibwe, manoomin is viewed as one of the "more than

human" beings that gives selflessly so humans can survive. Ricing trips frequently begin by giving thanks for this gift and asking for safety on the water, and end with some form of giving back, such as sowing a bit of harvested seed into a sparse looking part of the bed, or reserving some of their harvest for those unable to pick for themselves.

What's next? Freshly harvested or "green" rice can be used for reseeding, but if your goal is food for the table, your harvest will need to be "finished." Traditional finishing is labor intensive and involves parching the green rice, "dancing" to loosen the sheath that encloses each grain, and winnowing to separate out the finished rice grains.

Some people greatly enjoy this finishing process but most ricers use professional finishers, found scattered across rice country, who have mechanized parts of the finishing process. Finishers may charge a fee or may keep a portion of your rice (typically 20%) in lieu of payment. 100 pounds of green rice usually yields 35-45 pounds of finished rice. The color of finished rice may vary from green-grey to black; this color is more influenced by finishing techniques than by seed origin. Regardless of who finishes your rice be sure to spread your green rice thinly on a tarp to air dry, to jump start the drying process, and to prevent molding.

Finishing is an art unto itself. If you want to give it a try, do some research or look for a mentor to guide you through the steps. If you need help finding a finisher, talk to other ricers, or contact GLIFWC or your local natural resource agency.



Aerial surveys are used to monitor abundance



Research



Dean Lake in a bust year



Dean Lake with a bumper crop

Delicious & Nutritious Yet Easy to Cook

The food that grows on the water is a nutritional gift. Manoomin is low in fat and gluten free, but high in protein, fiber, B vitamins and minerals such as iron, potassium and phosphorus, as well as antioxidants. Overall, manoomin is nutritionally richer than white rice, oats, barley, wheat or rye. Gatherers of wild rice often enjoy knowing their harvest hasn't been treated with commercial fertilizers, herbicides or insecticides.

The unique, nutty flavor of wild manoomin is unmatched. It cooks in only 25-35 minutes, and since cooked rice yields 3-4 times its dry weight, a little goes a long way.

Manoomin is also highly versatile. You can start your day with manoomin porridge, muffins or pancakes; have it for lunch or dinner in soups, side dishes or casseroles, or "pop" it for a nutritious and tasty snack. Hundreds of recipes can be found in cookbooks or on the Internet. Explore various cooking techniques and recipes, or come up with your own!



Stewardship

Although wild rice has declined in abundance from historic levels, many are working to bring manoomin back. Inter-agency efforts are underway to protect, steward and restore manoomin throughout the western Great Lakes region. Tribal, state, county, federal and private natural resource organizations, lake associations and interested individuals are working to promote this special resource. Public support is essential for these efforts to succeed. With your help, we can work to ensure that manoomin remains a viable part of the landscape and culture.

Abundance Monitoring is important to determine the health of the resource. Because of the high variability in abundance from year-to-year, long-term studies are critical. Abundance monitoring can also be used to evaluate restoration efforts and to direct harvesters to the most productive stands, saving unnecessary trips to waters with poor stands.

Restoration and Enhancement includes seeding rice at historic sites and introducing manoomin to sites with suitable habitat, such as artificial impoundments. It can also involve restoring historic habitat conditions (such as water levels and fluctuations), protecting beds from negative impacts, or addressing threats from invasive species.

Harvest Monitoring can occur on individual waters or across broad areas. It can help biologists determine if wild rice abundance is adequate to meet the human demand or can be used to monitor the effectiveness of restoration efforts. In Wisconsin, a sample of state and tribal harvesters are surveyed each year to estimate harvest; in other areas surveys may occur more sporadically. Since harvest information is critically useful to biologists, ricers can help steward this gift by sharing their harvesting information.

Research can increase our understanding and appreciation of this unique plant and it may also improve our ability to protect and preserve manoomin for future generations.

Legal Protection is provided to wild rice because of the plant's great value and limited abundance. Contact your local tribal or state natural resources department for more information, and to promote legal protections for rice on the waters in your area.

Public Information is critical for the long-term protection of our wild rice resource. Each generation carries the responsibility of ensuring that manoomin remains healthy and abundant for future generation of humans and non-humans alike. Manoomin's future depends on the public understanding and appreciating the value of this very giving plant.



Cultivated (Paddy Grown) Wild Rice

Cultivated wild rice is commonly found in supermarkets and road side stands at a significantly lower price than wild-grown, hand-harvested manoomin. Although it may appear quite similar to natural wild rice, it is a fairly different product. Cultivated wild rice is often grown using fertilizers, herbicides, insecticides or fungicides. It is also mechanically harvested and is often finished differently than natural wild rice. As a result, the flavor, color and cooking characteristics differ from natural wild rice. If you are interested in natural manoomin, check the label: Wisconsin and Minnesota require cultivated wild rice to be labeled as such.



Natural wild rice is often lighter and more variable in color than its cultivated cousin.

For more information
 For tribal harvest regulations or stewardship information see:
<https://data.glifwc.org/manoomin.harvest.info>

For additional copies of this brochure contact:
Great Lakes Indian Fish & Wildlife Commission (GLIFWC)
www.glifwc.org
 or call 715.682.6619

For state harvest regulations or information contact:
Wisconsin DNR
www.dnr.wi.gov
 or call 888.936.7463 (1.888.WDNRINFo)

Minnesota DNR
www.dnr.state.mn.us
 or call 888.647.6367 (888.MINNDNR)

Michigan DNR
www.michigan.gov/dnr
 or call 517.284.9453 (517.284.WILD)

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MANOOMIN

Introduction

Few plants within the western Great Lakes region have influenced the ecological and human landscape more deeply than manoomin (Ojibwe), or wild rice. Culturally, manoomin has long maintained a central role in the lives of the Ojibwe and other Native American tribes, possessing both spiritual and practical significance. Ecologically, wild rice has provided for untold generations of fish, waterfowl and wildlife, adding beauty and abundance to wetlands it graces. Manoomin is indeed a gift.

Although there are two closely related species of wild rice found in North America: *Zizania aquatic* (southern wild rice) and *Zizania palustris* (northern wild rice), this brochure will concentrate on the larger grained and more frequently harvested northern species.



Cultural Significance

To the Anishinaabe (Ojibwe or Chippewa) manoomin, is the "food that grows on the water" and the plant whose presence fulfilled Anishinaabe prophecies and signaled the end of their migration from the eastern seaboard. This special gift and "spirit food" from the Manidoog (Great Spirit) has been a central component of Native American culture in the rice region for hundreds of years, featuring in the lives of the Dakota, the Menominee (who take their name from this plant), and other tribes. With more overall nutrition than any other food available in the region, manoomin became a healthy and critically important staple in the native diet.

August, known as Manoominike-giizis or the Ricing Moon, was a time not only of intense labor but of celebration, thanksgiving and socialization. When finished correctly, wild rice could be stored for long periods of time to be available when other foods were not. Because of manoomin's cultural and spiritual significance, it remains an important element in feasts and ceremonies today.

Wild rice came to have great importance to early Europeans as well. Their journals contain many references to the plant they found growing on the lakes and riverways they traversed. As a staple food of the voyageurs, manoomin helped the regional fur trade flourish.



Today, manoomin faces a new threat: climate change. As the name "northern wild rice" implies, manoomin is adapted to thrive under harsh northern conditions. Warming temperatures and higher humidity levels can promote disease outbreaks, while more frequent and severe storm events can uproot floating leaf stage rice, or destroy dikes on rice flowages. Without a strong commitment from the public and resource stewards, further declines in manoomin abundance are likely.

Unfortunately, many historic rice beds have been lost, with some of the greatest losses occurring along the edges of its range. Manoomin can be hurt by pollution, large boat wakes, increased sulfide levels, invasive species, and other factors. Historically, changes in hydrology have been especially damaging. The shallow lakes and rivers which support rice have frequently been dammed or drained, and even small modifications of water depth can destroy rice habitat. Although it is impossible to document exactly how many acres of rice have disappeared, it is clear that the losses are substantial.

A Resource in Decline



Water Fluctuations: Generally, annual fluctuations should not be too great, and water levels during the growing season should be stable or gradually receding. However, too much stability in water levels over many years is detrimental to manoomin. The loss of natural year-to-year fluctuations, as may occur where water levels are artificially controlled, tends to favor perennial plants over manoomin. Some natural fluctuations should be maintained, even if it means an occasional poor year for rice.

Sediment Type: Several inches of soft organic muck are considered optimal. However, manoomin is fairly tolerant and beds exist on a wide variety of bottom types. Extremely soft or flocculent bottoms may be unsuitable, but moderately flocculent sites are a preferred habitat niche.

Water Clarity/Color: Clear water is preferred, as darkly stained or turbid water limits sunlight penetration and may hinder early plant development. However, manoomin beds can be supported on moderately stained waters, particularly where water depths are limited to about 2 feet or less.

Climate change threatens northern wild rice in many ways. This important rice flowage in northwest Wisconsin was lost, perhaps permanently, when the dike failed following an historic rainstorm.



Water Flow: Manoomin requires the presence of flowing water, with gently moving rivers and flowages providing optimal habitat. Rice also does well in the shallow areas of lakes that have an inlet and outlet. In waters with relatively little flow, rice will typically vary more in abundance from year-to-year.

Water Depth: This is perhaps the most critical element. Rice grows in about 6 inches to 3 feet of water, with the 1-2 foot range being optimal.

Manoomin abundance can vary widely from year-to-year, especially on the most lake-like beds. The rule-of-thumb for lake beds is that a typical 4-year period will include a bumper year, 2 fair years, and 1 bust or failure.

During May the plant is generally in a submerged stage, when a cluster of 1-4 underwater leaves form. By mid-June the plant is in the floating leaf stage when ribbon-like leaves lay flat on the water's surface. This is often considered a critical stage, as the plant is buoyant and the roots not fully developed. High winds or waves, or a rapid increase in water levels, can uproot or drown entire beds.

By the end of June one or more aerial shoots have usually begun to develop (often reaching a height of 2-5 feet above the water surface during August). Multiple shoots, up to 10 or more, are most common where the water is shallow and the plant density is low.

By late-July, flowering begins. Separate male and female flowers form along the spike at the top of each stem, one on each of the empty sheaths that will eventually hold a seed. These open first. Three to four days later the yellow and pink male blossoms open, dangling from small branches below the seed spike. This time differential in opening promotes cross-pollination with neighboring plants as manoomin is wind-pollinated; bees will readily gather rice pollen but they don't visit the female flowers.

In August and September, the seeds develop and mature, filling in the seed sheaths. Seeds on a single stalk reach maturity over a 10-14 day period, with the highest seeds maturing first. Ripening is also affected by sediment type, water depth, weather, and other factors. Fully developed seeds eventually separate, drop

Habitat Requirements



Life Cycle

Wild rice is an annual aquatic grass with a fairly simple life cycle: mature seed drops off the plant in August or September and usually sinks rapidly into the sediment near the mother plant. The seed remains dormant in the substrate until spring when warming water and low oxygen conditions stimulate germination. Although some seeds will typically germinate the following spring, some may remain dormant for five or more years. This extended dormancy allows manoomin to survive occasional crop failures.

Next, the plant goes through several distinct growth phases. During May the plant is generally in a submerged stage, when a cluster of 1-4 underwater leaves form. By mid-June the plant is in the floating leaf stage when ribbon-like leaves lay flat on the water's surface. This is often considered a critical stage, as the plant is buoyant and the roots not fully developed. High winds or waves, or a rapid increase in water levels, can uproot or drown entire beds.

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By late-July, flowering begins. Separate male and female flowers develop on the same stalk. The inconspicuous white female flowers form along the spike at the top of each stem, one on each of the empty sheaths that will eventually hold a seed. These open first. Three to four days later the yellow and pink male blossoms open, dangling from small branches below the seed spike. This time differential in opening promotes cross-pollination with neighboring plants as manoomin is wind-pollinated; bees will readily gather rice pollen but they don't visit the female flowers.

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