Need More Information?

For harvest regulations or management information contact one of the agencies listed below. For additional copies of this brochure, contact the Great Lakes Indian Fish and Wildlife Commission.

Wisconsin DNR
101 South Webster Street
Box 7921
Madison, WI 53707
(608) 266-2621
TDD: (608) 267-6897
Website: www.dnr.state.wi.us

Minnesota DNR
500 Lafayette Road
St. Paul, MN 55155-4040
(888) 646-6367
Out of State: (651) 296-6157
TTY: (800) 657-3929
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Great Lakes Indian Fish and Wildlife Commission (GLIFWC)
P.O. Box 9
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Great Lakes Indian Fish and Wildlife Commission (GLIFWC)

Wisconsin Department of Natural Resources (WDNR)

Circle of Flight

Minnesota Department of Natural Resources (MDNR)

U.S. Fish and Wildlife Service (USFWS)

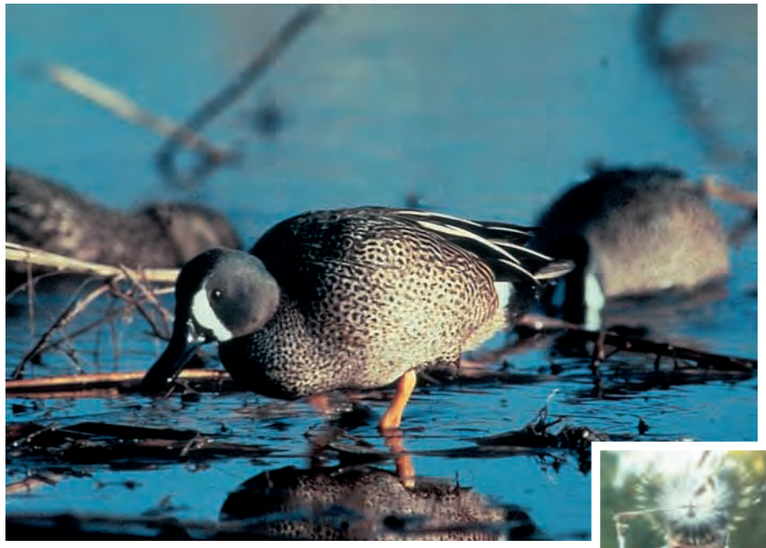
North American Waterfowl Management Plan

WILD RICE

Ecology • Harvest • Management

Ecological Significance

Wild rice is important in the ecology of many lakes and streams. Its nutritious seeds have long been recognized as a valuable waterfowl food. Within its core range in Minnesota and northern Wisconsin there may be no food more important to waterfowl, being readily and heavily consumed by mallards, blue-winged teal, ring-necked ducks, wood ducks and other species. Wild rice also benefits breeding waterfowl, providing roosting and loafing areas to adults, and essential brood cover for the young.



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, wild rice benefits a wide range of species because of the food, cover, or physical structure it adds to the environment. The habitat it provides species ranging from moths to moose and snails to rails adds to the biological diversity of the wetlands where it is found.

Wild rice can also help maintain water quality by binding loose soils, tying-up nutrients and slowing winds across shallow wetlands. These factors can increase water clarity and reduce algae blooms. Wild rice is an ecological treasure.

Cultural Significance

To the Anishinaabe (Chippewa or Ojibwa) it is ***manoomin***, a term derived from "Manitou," meaning Great Spirit and "meenum," meaning delicacy. It is the "food that grows on water," whose presence fullfilled the prophecies foretold in the story of the Anishinaabe's migration from the east. Considered a special gift from the Manitou, this "spirit food" has been a central component of Native American culture in the rice region for hundreds of years, featuring in the lives of the Dakota and the Menominee (who took their name from this plant) as well as the Ojibwa. The August, or Rice Making Moon, signaled the harvest season, which was a time for celebrations of thanksgiving. Its distribution influenced inter-tribal battles and the placement of Indian reservations.

Manoomin had great importance to early European explorers 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, it helped the regional fur trade flourish.

Because of its significance, wild rice's presence in Wisconsin and Minnesota is well documented. Current maps of the historic rice range are dotted with names originating from this plant. Numerous lakes, rivers or towns are named Rice or Manoomin, or bear related names such as "Poygan," derived from the Menominee word for gathering rice. It is believed that no other plant has contributed to more geographic names in all of North America!

A Historic Decline

Unfortunately, many historic rice beds have been lost. Rice can be hurt by pollution, large boat wakes, exotic species, and other factors. Especially damaging are changes in water levels. The lakes and rivers which support rice have frequently been dammed, and even small increases in depth can destroy the habitat for this species. Although it is impossible to measure exactly how many acres of rice have disappeared, it is clear the loss has been substantial.

Habitat Requirements

Water Flow: Rice does best in the presence of flowing water, with rivers and flowages being optimal examples. Rice also does well in lakes that have an inlet and outlet. In lakes with relatively little flow, rice may persist, but will typically vary more in abundance from year-to-year.

Water Depth: This is perhaps the most critical element. Rice grows in about 0.5-3 feet of water, with 1-2 feet being optimal.

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

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 level over many years may be detrimental. The loss of year-to-year fluctuations, as may occur where water levels are artificially controlled, may lead to perennial plants out-competing rice. Some natural fluctuations should be maintained, even if it means an occasional poor year for rice.

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

THE LIFE CYCLE

SPRING

EARLY SUMMER

MID-SUMMER

EARLY FALL

Totogatic Lake 1996 - a bust year.

Wild rice is an annual aquatic grass. Its life cycle is fairly simple: The 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 mud until spring when warming water and low oxygen conditions stimulate germination. Although most seed will usually germinate the first spring, some may remain dormant for five or more years. This extended dormancy allows wild rice to survive occasional crop failure.

Next the plant goes through several distinct growth phases. By late May and early June the plant is in the **submerged leaf stage** during which a cluster of 1-4 underwater basal leafs 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 generally considered the most critical stage; the plant is buoyant and high winds or a rapid increase in water levels can uproot or drown entire beds.

By the end of June one or more **aerial shoots** have begun to develop. These shoots will continue to grow into August, reaching a height of 2-8 feet above the water. Multiple shoots, up to 10 or more, are most common where the water is shallow and the plant density is low.

As early as late July, **flowering** begins. Both male and female flowers develop on the same stalk, the female above the male. The female flowers open first, followed 3-4 days later by the male flowers. The pollen is wind-borne. This timing difference in flower opening promotes cross pollination.

In August and September the seeds develop and mature. 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. Ripe seed drops into the sediment, unless harvested by humans or wildlife. An acre of good rice beds can yield over 500 pounds of seed.

This gradual, uneven ripening means rice can be harvested repeatedly during the season, which may extend for up to 3-4 weeks on a particular lake. Different water bodies will also ripen at slightly different times, so the harvest season may last six weeks if fair weather holds.

Rice abundance can vary widely from year to year, especially on the most "lake-like" beds. The rule-of-thumb for lake beds: A typical four year period will include a bumper year, two fair years, and a bust (see photos left and right).

Totogatic Lake 1995 - a bumper crop.

Ecology · Harvest · Management

Human Harvest

Harvesting wild rice can be a deeply rewarding experience. A fall day spent gathering this grain can yield a year's worth of memories to be relived each time the harvest is savored. The grain is nutritionally rewarding as well. Low in fat but high in protein, fiber, B vitamins and minerals, manoomin is nutritionally higher than white rice, oats, barley, wheat or rye. Gatherers of the wild crop often enjoy knowing their harvest hasn't been treated with commercial fertilizers, herbicides or insecticides.

Harvest typically begins in mid to late August and peaks 2-3 weeks later. The timing of the peak will vary from site to site. However, there is consistency from year to year, with river beds generally being earlier than lakes, and with the same lakes being relatively early or late each season.

Harvest methods haven't changed much in the last century. Allowable harvest techniques vary slightly from state to state, but all reflect traditional tribal methods, requiring the rice to be harvested from canoes or small boats with the use of smooth, wooden ricing sticks.

Generally, two people rice as a team. One moves the canoe through the rice bed using a long push-pole while the other "knocks" the grain. The knocker uses one ricing stick to bend the rice stalks over the boat, and the second to lightly stroke the seed heads, dislodging the ripe grain. It's important to knock gently. If the seeds don't drop with a gentle stroke, the rice isn't sufficiently ripe. Try a different site, or come back in a couple of days. Excessive force will only break the stems, preventing them from being harvested again.

Seed size, like ripening dates, varies by location but is quite consistent from year-to-year at each site. Seed size does not affect the flavor or quality of the rice.

A ricing trip may yield anywhere from a few pounds of rice to more than 200! But since even intensive hand harvesting removes only about 15% of the annual yield, abundant seed remains for wildlife and to reseed the bed.

Freshly harvested rice (referred to as "green" rice) can be used for sowing, but if your goal is food for the table, the rice will need to be finished. Finishing rice involves reducing the moisture content through parching, and removing the sheath that covers the seed. Traditional finishing is labor intensive and involves parching, "dancing" to loosen the hulls, and winnowing the rice (see photos). Some people greatly enjoy this part of the process while others prefer to have professionals, who have mechanized parts of the process, finish their rice for them.

Scattered across rice country are places you can bring your green rice for finishing. Finishers may charge a fee, or may keep a portion of your rice (typically 20%) in lieu of payment. A hundred pounds of green rice usually yields from 35-60 pounds of finished rice. The color of finished rice may vary from green-grey to black, but the color is more influenced by finishing techniques than by the origin of the seed.

Delicious Yet Easy to Cook

The unique, nutty flavor of wild manoomin is unmatched. It cooks in only 30-40 minutes, and since cooked rice yields 3-4 times its dry weight, a little goes a long way. Manoomin is highly versatile. You can start your day with it cooked as a breakfast cereal or in muffins or pancakes. Have it for dinner in soups, side dishes or casseroles, or "pop" it for a nutritious and tasty bed-time snack. Hundreds of recipes can be found in general or specialty cookbooks, or even on the Internet! Explore various cooking techniques and recipes, or come up with your own!

A Few Words about Cultivated or Paddy-grown Wild Rice

Paddy-grown wild rice is commonly found in supermarkets and road side stands at a significantly lower price than hand-harvested, wild grown manoomin. Although it may appear quite similar to natural wild rice, it is a fairly different product. Paddy rice differs genetically and may be grown commercially using fertilizers, herbicides or insecticides. It is also mechanically harvested and is often finished somewhat differently than natural wild rice. If you are interested in natural wild rice, check the label; Wisconsin and Minnesota require cultivated wild rice to be labeled as such.

Freshly harvested rice

Finished rice

Management

Although wild rice has declined in abundance from historic levels, there is hope this trend may be reversed. A growing interagency effort is underway to manage and restore wild rice. Tribal, state, federal and private natural resource organizations and interested individuals are working to promote this special resource. Public support is essential for these efforts to succeed. With your help, we can try to ensure that manoomin remains a viable part of our wetland ecosystems.

Wild Rice Management Can Take Several Forms:

Abundance Monitoring is important to determine whether or not rice is continuing to decline in abundance. Because of the high variability in abundance from year-to-year, only long term studies will answer this question. Abundance monitoring can also be used to direct harvesters to the most productive stands and save unnecessary trips to waters with poor stands.

Restoration and Enhancement includes seeding rice at historic sites and introducing rice to sites with suitable habitat, such as artificial impoundments. It can also involve restoration of historical habitat conditions (such as water levels) or protection of rice beds from negative environmental impacts.

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 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. Contemporary annual harvest estimates from off-reservation waters within the state have varied from 34,000 to over 110,000 pounds.

Research can increase our understanding and appreciation of this unique plant. It may also improve our ability to restore lost beds or increase the likelihood of success when introducing rice at new sites. Current research includes efforts to understand the genetic variability of wild rice.

Seeding

Research

Successful test seeding

Aerial surveys are used to monitor abundance