

MANOMIN: Good Grain

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Wild rice is valuable for wildlife and relished by man, but few sites are suitable for it today. Lake Totogatic illustrates how this crop fails or thrives in response to conditions.

The Algonquin Indian term for wild rice is *manomin*, which means "good grain." This term is appropriate.

From a nutritional viewpoint wild rice compares favorably with other cereals, but with a higher protein and mineral content than cultivated rice. In addition, it contains a satisfactory proportion of the human Vitamin B requirement. The grains of wild rice are, to many, superior in taste to any of man's highly developed domestic grains. This superior taste is reflected in price to the consumer, \$1.75 a pound and higher in the Wisconsin retail market in 1955.

The Lakes States Indian tribes were dependent on wild rice as one of their stable food sources. In fact, the Chippewa Indians valued wild rice so highly that harvest rights were included along with fish and game rights in their treaties with the white man. Missionaries, explorers and French voyageurs also relied on wild rice for food. Browse through the historical reports for the Great Lakes region and note the numerous references to the trade and commerce of "fawn-skins" of wild rice.

THERE WAS intense competition between the tribes for the wild rice stands. Major battles were fought between the Sioux and the Chippewa Indians at the mouth of the Brule river and on Chequamegon bay for the lush rice growth in the Kakagon sloughs of northern Ashland county. Controversy was common in the Yellow Lakes region of Burnett county and Mulligan lake in Douglas county. Skirmishes for rice rights were common on numerous other lakes. Although the Chippewas were eventually successful, the Sioux, who were forced into the

plains region, continued to sneak into Minnesota and Wisconsin to harvest rice during the fall season.

For the harvest of wild rice, Indians originally tied the stems into sheaves which prevented both the loss of ripe kernels and excessive feeding by birds. When the kernels were all ripe they untied the sheaves and knocked the grain into the boat with a flail. This practice was discontinued because sheaved rice could be easily stolen by unfriendly neighboring tribes.

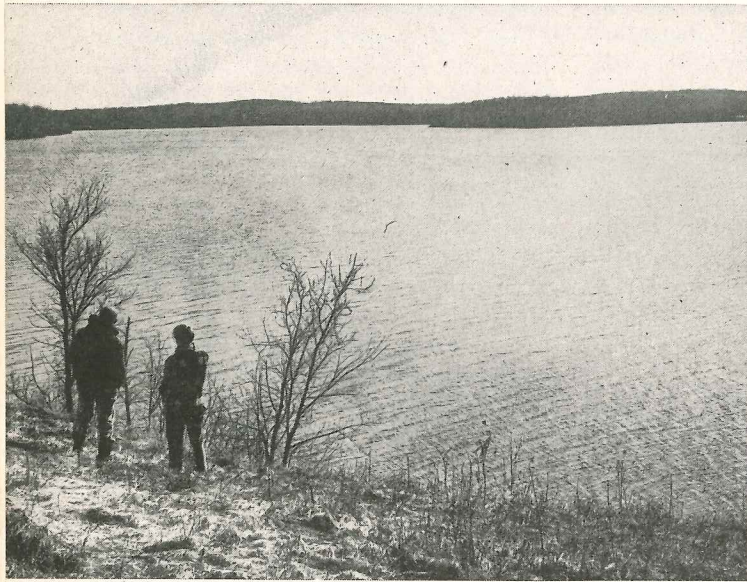
TODAY, harvesters pole a narrow boat through the ripening stand and flail the heads which are held over the boat. This is not an efficient method, and even though repeat trips are made as the seed ripens, less than one-fifth is usually harvested. The remainder is left for waterfowl and for re-seeding. Minnesota experts figure a usual harvest amounts to 30 to 40 pounds of processed rice per acre.

The hulls of the rice seed, which are similar to those of oats, are removed as follows: The kernels are spread on a rack in the open air for several days. Then they are parched in a drum which is rotated over a wood fire, after which the kernels are sent through a threshing huller and a fanning mill. In contrast, primitive Indians parched rice in a heated stone-line pit, or in a kettle over a wood fire. The hulls were removed by dancing on the grains in bare feet, after which the hulls were separated by winnowing in the wind.

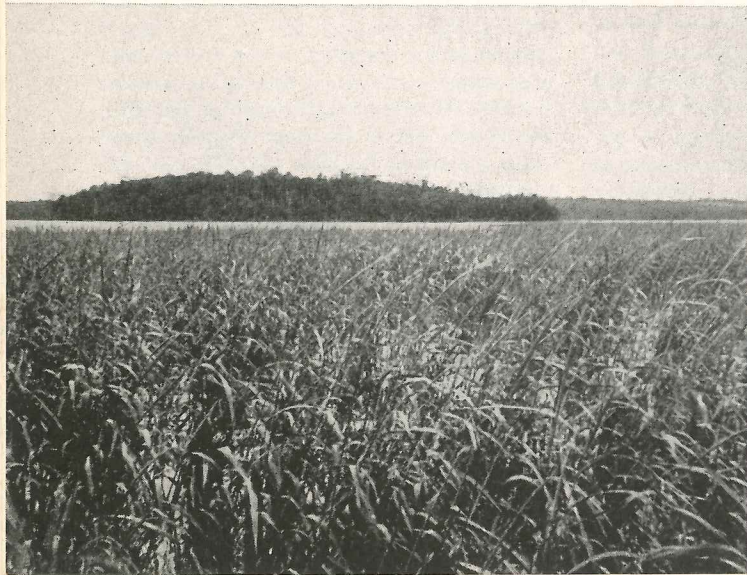
Various wildlife species show a high preference for rice marshes. Waterfowl, for example, feed extensively on rice seed. An analysis of 1,102 duck stomachs



Indians harvesting wild rice in northern Wisconsin.



BEFORE: With the outlet dammed, Lake Totogatic was a body of open water.



AFTER: With a lower water level, wild rice has come back. Re-seeding was unnecessary here.

taken from the region east of the Mississippi river showed the volume of wild rice consumed as 5.1 percent; only the pond weeds and smartweeds were found in greater quantities. Ducks also make considerable use of dense stands of wild rice to raise their broods. Here the ducklings are safe from most predators. During the fall migration, waterfowl find ideal escape, feeding and resting cover in rice stands.

Muskrats feed on the rice canes and use them extensively in their house construction. Geese feed on wild rice. Blackbirds are keen competitors with other wildlife and humans for the rice seed.

USE OF RICE STANDS is heaviest during the fall season when the marsh echoes and re-echoes a wildlife cacophony; the sudden rush of air and chattering voices of thousands of blackbirds as they rise and settle into the rice stand, the quack of the mallard and black duck, the whistle of the woodduck, the rapid *pbbbr-pbbbr* of the ringneck duck, the whistling wings of new waterfowl arrivals as they circle the marsh, the occasional splash of a muskrat. Wildfowlers, if they listen to the myriad marsh sounds, have a rich esthetic reward in addition to tangible success in the ducks which might be bagged.

The fall period is the end of the annual growing cycle of the wild rice stand. Those kernels which have not been harvested, or eaten by blackbirds or other wildlife, fall into the water and lie dormant until spring. Then, as the sun warms the water temperature, a single leaf grows upward from the seed. By June, the leaves look like green ribbons on the water surface. Flowering stalks appear in July and by August the plant extends 5 to 6 feet above the water. The grain ripens from the head of the stalk downward over a period of about 10 days. The seeds fall into the water and the process starts anew.

Minnesota biologists, who have studied wild rice for many years, estimate that on any given stand over a four-year period there will be one bumper crop,

two fair crops and one near failure. Best rice crops come during years of declining water levels. In July, when the wild rice is flowering, hot, dry weather may cause poor pollination and a light crop.

Botanists generally classify wild rice into three major varieties: a giant species which grows along the east and gulf coasts and inland to southern Wisconsin; a smaller variety which grows in the northern Lake States; and a large variety of the southern midwest. There are many intergradations between these varieties.

In the northern Lake States region, ideal conditions for wild rice are shallow water a few inches in depth to 2 or 3 feet, sufficient water movement to prevent stagnancy, no appreciable amounts of alkali, and a muck bottom. In addition, wild rice, like most water plants, will not grow where there is much variation in the water level. During June, when the leaves are like ribbons, rice is extremely sensitive to water level changes. A 6-inch raise may pull the germinating seed out of the soft muck and eliminate half the stand; a foot increase may wipe it out entirely.

LAKE TOTOGATIC, located near the headwaters of the Totogatic river in Bayfield county, is an excellent example of effects of water level changes on wild rice. This 558-acre lake had been a high rice producer for many years. Each fall, Indians camped on the lake shore for the rice harvest. Wild fowl used the lake in large numbers. Muskrats were plentiful.

Interference by man along with a sequence of natural events almost completely eliminated the rice in Lake Totogatic. In the late 1800's a logging dam was constructed at the lake outlet. Water level fluctuation, especially during the spring, seriously damaged the rice stand. With abandonment of the dam the lake levels dropped and rice began to re-establish itself. By 1942, department game biologists estimated that 50 percent of the lake area was covered with wild rice.

Nature interfered next. A torrential rain during the 1947 growing season al-

most eliminated the rice again. Shortly thereafter a beaver colony constructed a dam at the outlet raising the lake levels. Later, trappers cleaned out the colony.

Man, however, was not satisfied to let the lake reach a lower level, and logs, stones and debris were used to reinforce the dam. The object was to prevent the winter kill of fish. With high levels, the oxygen content of the water would be greater, wild rice and other aquatic vegetation would be eliminated, oxygen consumption by decaying plant matter would thus be reduced, and fish would better survive the long winter period.

Their principle was correct. In practice on Lake Totogatic, however, the higher levels simply flooded more marsh areas, oxygen depletion continued high and fishing was not improved. Wild rice was largely destroyed.

BASICALLY, to make a fishing area out of a valuable wild rice marsh is not sound conservation. The surrounding country contains numerous good fishing lakes and streams. Rice marshes are rare. Ironically, the Conservation Department was attempting, at considerable expense, to create a wildlife marsh only 6 miles away.

In view of these facts the department requested the Public Service Commission to declare the dam an illegal structure and to order its removal. In 1954 this was done and the department removed the dam with dynamite. Since then, water levels have dropped approximately 18 inches, and wild rice, *from natural sources*, is rapidly re-establishing itself. No re-seeding was necessary on Lake Totogatic. Habitat conditions are near perfect and the rice is coming back. Also, wild celery, pondweeds and other aquatic plants of high value to wildlife are, through natural means, re-establishing themselves.

In 1955, waterfowl use during the fall migration was five-fold that of the previous fall. Literally thousands of ring-neck ducks and lesser number of scaup, redheads, teal, mallards, and other species used the lake. Game managers esti-

mate that over 200 different sportsmen hunted Lake Totogatic during the waterfowl season. The hunter success on opening weekend of the waterfowl season was two ducks per hunter, an average higher than most Wisconsin marsh areas. Muskrat populations have increased. Indians again camp on the lake shore in August and September to harvest rice.

Through the cooperative effort of two state agencies—The Public Service Commission and the Wisconsin Conservation Department—and with a few dollars worth of dynamite a valuable natural resource was restored.

UNFORTUNATELY, re-establishing wild rice marshes is usually not that simple. Permanent dams have, in many instances, raised water levels too high for rice growth. For example, Father Marquette in 1673 found portions of the Wisconsin river so choked with rice that paddling a canoe was almost impossible. Today that river is harnessed for water power and industrial uses. Many of the rice stands which Father Marquette observed have disappeared.

Pollution in other areas has so changed the water chemistry that wild rice propagation is out of the question. Accelerated rates of erosion and lake filling has destroyed other important rice waters.

In select situations, planting wild rice seed may be possible, but consult your local game manager for advice before you spend money for seed. Well over three-fourths of all wild rice propagation efforts have failed and thousands of dollars of money wasted because conservation agencies and sportsmen's groups have not been careful in the selection of planting sites.

Once a satisfactory area has been located for planting, purchase your seed from a reputable private business specializing in aquatic plants. Planting is best in the spring. Keep the seed moist, as drying will reduce germination. Scatter the seed by hand, one large handful to each 6 by 6 feet, which is the equivalent of 1 bushel per acre. Select

shallow, partly sheltered water areas with a muck bottom and where there is no other vegetation. Also, muskrat populations must be low as this animal, if present in large numbers, can destroy new seedings. Finally, be sure that the site conditions described earlier are met.

Wild rice production should be encouraged in northern Wisconsin. Here, where the population is sparse and the economy relatively poor, every economic return to communities is important. Forests, fur, wild rice, recreation and watershed management complement each other. Private investors on a limited scale are becoming interested in the economic aspects of wild rice propagation. At Hayward, for example, community leaders are directing their efforts towards Wisconsin wild rice management as a means of employment for local

Indians. In Washburn county a forest land owner has constructed a 20-acre flowage on what was former waste land, primarily for wild rice management and secondarily for minnow propagation. In Minnesota, where the estimated retail value of wild rice is about a million dollars, conservationists consider the matter of enough import so that a committee has been formed to coordinate the research, management and harvest of the resource.

Each year human use of wild rice is greater. Also, our wild fowl populations are progressively being harder pushed to find a place to nest and feed. The value of our rice marshes increase. Every effort should be made to protect our existing wild rice stands and to re-establish the crop where possible.

RIGHTS-OF-WAY:

Problem and Opportunity

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It's feasible now to manage rights-of-way satisfactorily from all standpoints: utility, scenic, game and soil conservation. Consider the Egler method.

Based on their utility or function, the three general classifications of rights-of-way are: *transportation* — chiefly highways and railways; *communication* — chiefly telephone and telegraph lines; and *transmission*—chiefly electric power lines, although oil and gas lines may be a factor in some places.

The hundreds of thousands of miles of such rights-of-way, though they occupy but narrow strips of land, amount in the aggregate to thousands of acres. They do in fact form a veritable network over the greater portion of the nation. As I sit here looking at the highway map of Vernon county, on the scale of $\frac{1}{2}$ inch to the mile, it occurs to me that if the telephone lines and the

REA lines were superimposed upon it there would be such a tangle that the map would be all but unintelligible.

Very few people fully realize the scope and extent of the vast system of rights-of-way in their own locality and of these few there are yet less who understand and appreciate either the practical problems or the considerable opportunities inherent in them.

One of the practical and continual problems, as a natural and common feature, is that of controlling the vegetation to the extent that it will not seriously interfere with the function, the safety, the operation or the expected utility of the right-of-way. In the control of vegetation the objective of the