WILD RICE SEEDING

TECHNICAL GUIDANCE DOCUMENT

Document No.: WRG 6A-15
Publication Date: 1/28/2012

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INTRODUCTION

Wild rice has significant cultural and ecological significance in Minnesota. Historically, it was a primary food source for Native Americans and played a key role in their day-to-day lives. Wild rice is still harvested today and plays a role in the northern Minnesota economy. Ecologically, wild rice is a major food source for a variety of bird and animal species. Wild rice provides an energy source for waterfowl during fall migrations. It also provides valuable habitat for invertebrates that, in turn, sustain many species of fish.

Unfortunately, wild rice populations have been on the decline in Minnesota. Exact causes for the decline are not known, but likely reasons include; competition with invasive species, climatic conditions, boat traffic, carp, pollutants, and hydrology alterations. This fact sheet provides natural history information about wild rice, as well as strategies for establishing new populations.

Range of *Zizania aquatic var. aquatica*

The largest populations of wild rice are in the central and northeast parts of the state. Historical accounts and herbarium collections show that it had a very wide distribution across Minnesota, likely covering most, if not all of the state.

Wild rice is an annual, meaning that it only lives one season. The seed ripens in the fall and then drops its seed. The seed can remain viable in the soil for many years. The seed germinates under water and extends floating leaves before sending up a main stem that produces separate male and female flower parts.

Wild rice is likely adapted to local site conditions; take advantage of micro-adaptations by planting wild rice as close to the collection site as possible. Scientists believe that populations growing in the northern part of the state are genetically different than plants growing along the Minnesota and Mississippi Rivers in the southern half of the state. Cultivars being used in wild rice production have different genetics and growth habitats than native wild rice populations and should not be used for restoring wild rice populations.

APPLICATION

Water Depth Requirements

Wild rice tends to grow in water ranging from six-inches to three feet deep, with less seed produced at deeper water levels. Water level is most important in the spring and summer when seeds germinate.

Water Movement Requirements

Wild rice tends to do well in areas where there is some water movement such as wetlands and lakes with inlets and outlets, and slow moving rivers. In some cases, seeding of lakes is focused near the inlet or near springs. There have been cases where wild rice has persisted in more isolated sites. Water movement likely provides oxygen and nutrients that are important to wild rice growth.

Water Clarity and Quality

As wild rice germinates under water, it requires sunlight for sufficient growth. Some coloration in the water is tolerated, but water that is too dark will hinder growth. Essential nutrients are necessary for the growth of wild rice, but the presence of salts or sulphides inhibits its growth. Eutrophic conditions are also not beneficial for establishment.

Wave Tolerance

On larger lakes, wild rice tends to establish in bays and sheltered areas. Too much wave action from wind or boats can inhibit growth. Most seeding on lakes is focused on the wind-protected side.

Substrate

Wild rice can establish on a variety of substrates ranging from sand to silt and clay. There has been good success re-introducing wild rice into the Anoka Sandplain, where porous soils have been beneficial. Substrates that have deep layers of muck soils may be too soft to promote growth and anchoring of roots.

Indicator Species

The presence of broad-leaf arrowhead has been a good indicator of areas where wild rice may thrive. Areas with water lilies and pondweeds may also provide suitable habitat, though, excessive plant competition may inhibit establishment.

Seed Collection

Most wild rice harvest is conducted by traditional methods using canoes and harvesting paddles. The harvest in conducted near the end of August through the first week of September.

Areas Open to Harvest

Contact private landowners for permission before harvesting near private property. State Waterfowl Production areas are open to harvest, but State Wildlife Management Areas are not.

Seed Storage

It is believed that seed must be stored wet or it will lose germination. As a result, most efforts to re-introduce wild rice have involved seeding shortly after harvest. Due to decomposition caused by requisite damp storage conditions, do not store seed more than two to three weeks.

Planting Methods

Seed is hand broadcast from boats. Some mechanical seeders are being developed and tested by agencies and tribes. Large scale efforts have used helicopters with specially-equipped seeding bags for dispersal. In some cases, sites are seeded over two or three consecutive seasons to ensure establishment.

Seeding Rates

Seeding rates tend to range between 6-30 pounds per acre.

Success Rates

Success rates vary significantly due to seasonal variability in water levels and weather conditions. Due to the unpredictable nature of wild rice, success rates of ten to twenty percent is common, and fifty percent considered very good. Sites that are not ideal for growth may establish weak populations that will slowly disappear.

Permit Requirements

A DNR aquatic plant permit is required for planting wild rice on DNR-protected waters. Permits can be found at their website http://www.dnr.state.mn.us/eco/apm/docs.html

Contractors

There are private individuals in Minnesota who harvest seed commercially. Many of these private harvesters may also assist with seeding efforts as contractors. The advantage of working with private harvesters is that they can coordinate seed collection, storage, and shipment to the project site. Partners working on this fact sheet are developing a list of contractors that may be able to assist with seeding efforts.

OTHER CONSIDERATIONS

Drawdowns may be beneficial to wild rice growth by consolidating substrates and aiding establishment of seed that has sunk deeper into the soil. Some wild rice sites are managed by releasing water in the fall, keeping water levels low in the spring, and then raising levels in the summer. This method requires sufficient hydrology for sites to meet desired water levels during summer months. Periodic re-seeding efforts may be needed on sites that have marginal conditions for wild rice growth.

COSTS

Seed prices should be negotiated with individual harvesters. Current (2013) prices tend to vary between $1.50-$3.00 a pound depending on yearly conditions. Costs for seeding are set on a per-acre, hourly, or per-pound basis.

ADDITIONAL REFERENCES

http://www.saveourrice.org/index.html
http://www.dnr.state.mn.us/aquatic_plants/emergent_plants/wildrice.htmlhttp://files.dnr.state.mn.us/fish_wildlife/legislativereports/20080215_wildricestudy.pdf

http://www.dnr.state.mn.us/wildlife/shallowlakes/wildrice.html
http://wrs.umn.edu/alumni/phdgrads/walker/index.htm
http://www.saveourrice.org/pdf/LakesWithRice50acres.pdf