



**Manoomin (Wild Rice)
Enhancement and Research
in the Ceded Territories in 1997**

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MANOOMIN (WILD RICE) ENHANCEMENT AND RESEARCH IN THE CEDED TERRITORIES - 1997

INTRODUCTION

The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) conducts a wild rice (*Zizania aquatica*) enhancement and research program in the territories ceded in the Treaties of 1836, 1837, 1842 and 1854. Most wild rice management projects are conducted cooperatively with other natural resource agencies. This report summarizes activities carried out under this program in 1997.

Manoomin has been a staple in the diet of native people in the upper Great Lakes region for over 1000 years (Johnson 1970). It has been an important component of the diet and the culture of the Ojibwe people since their immigration into the heart of wild rice range nearly 3 centuries ago (Vennum 1988). With the arrival of Europeans, wild rice also became an important economic commodity, providing critical nutrition to the fur-trappers and traders moving into the area. Today, manoomin retains extraordinary significance to the Chippewa, and is considered sacred food. The September moon is still referred to as the rice making moon (Manoominike Giizis), and the harvest season is still celebrated with traditional pow-wows.

In addition to its value to Native Americans, wild rice provides a valuable food source for wildlife, and its presence increases the biological diversity of wetlands. Wild rice can also improve water quality by tying up nutrients and by decreasing the wind action across lakes that can suspend particles and lead to water clarity and quality problems. Unfortunately, wild rice is much less abundant than it was historically.

The re-affirmation of off-reservation treaty rights has restored the Tribes' opportunity to manage wild rice in the ceded territories. The general objective for the enhancement program is to increase the amount of wild rice in the ceded territories through the reestablishment of historic beds and the development of new beds. In 1985, GLIFWC and the Wisconsin DNR cooperated in the first attempt to inventory wild rice beds in Wisconsin. In 1987, GLIFWC began off-reservation seeding activities by planting 200 pounds of seed in Pat Shay Lake, Vilas County, Wisconsin in cooperation with the Nicolet National Forest (NNF), and providing approximately 100 pounds of seed to the Wisconsin Department of Natural Resources (WDNR) for seeding on a state wildlife area. The seeding program grew gradually over the next several years, until it expanded significantly to 5775 pounds in 1991 (Figure 1) with funding support from the Bureau of Indian Affairs' Circle of Flight program. Nearly 3 or more tons of rice have been seeded annually since, including the seeding of over 7 tons of green seed in 1997, which is summarized below.

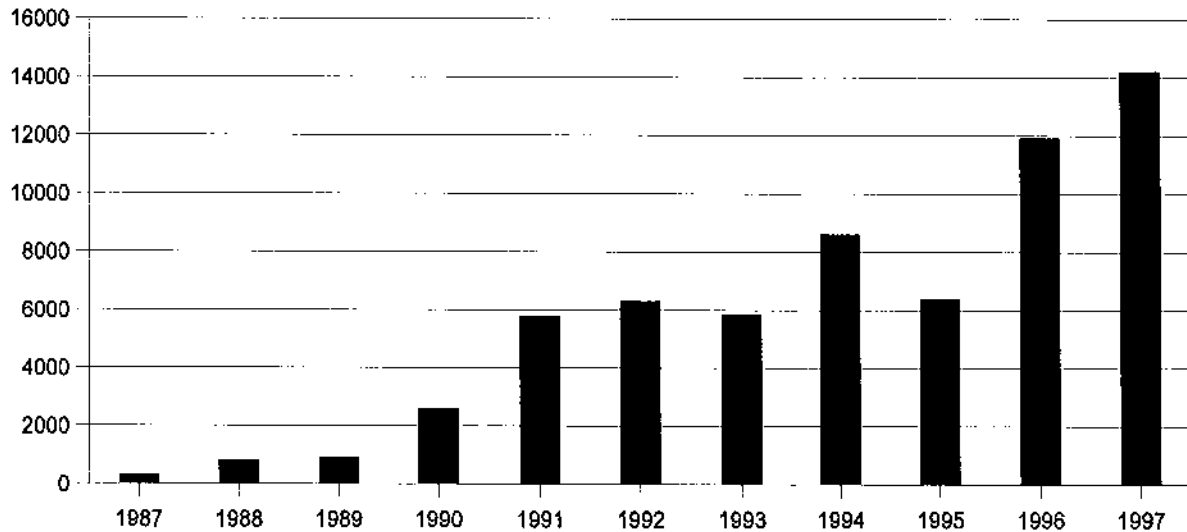


Figure 1. Pounds of wild rice seeded, 1987-1997.

ENHANCEMENT

Seeding Summary

In 1997, as in other recent years, GLIFWC concentrated its management efforts on purchasing locally harvested rice and distributing it to cooperators (listed below) who conducted the majority of the seeding. Seeding sites were selected by GLIFWC staff, member Tribes, cooperators, or some combination of the three. With the assistance of these cooperators a total of 14,212 pounds of wild rice was seeded in 64 waters in 17 Wisconsin and 5 Michigan counties.

Cooperative Activities

GLIFWC's wild rice seeding program is a highly cooperative effort. Without the strong financial and manpower support of numerous partners, this important undertaking would be far less successful. The tribes' interest in this resource has acted as a catalyst, stimulating effective partnerships with other agencies sharing a concern for this resource. Cooperators in 1997 included GLIFWC member tribes, including the Lac Vieux Desert Band, the Keweenaw Bay Indian Community, the Bay Mills Community, the Bad River Band, the Lac du Flambeau Band, and the Red Cliff Band; the Nicolet, Chequamegon and Ottawa National Forests; the Wisconsin Department of Natural Resources (WDNR), and the Michigan Department of Natural Resources (MiDNR). The contributions of each of these cooperators on individual waters are summarized by project below.

Seed Purchasing

Seed purchasing in 1997 was facilitated by an unusually abundant crop. The crop was about average in north-central Wisconsin, and was very good in the northwest part of the state and on many Minnesota waters (David 1997). With these good conditions GLIFWC was able to purchase over 7 tons of seed (Figure 1). Seed purchased was harvested from at least 26 different waters, with the largest amounts coming from Rice Lake (Forest County, WI, 2,768 pounds), Phantom Flowage (Burnett County, WI, 1,599 pounds), Totagatic Lake (Bayfield County, WI, 1,345 pounds), Sandy River Flowage (Aitkin County, MN, 1,294 pounds), and Clam Lake (Burnett County, WI, 1,188 pounds). All other waters supplied less than 600 pounds of seed.

Seeding

Fifty-two Wisconsin and twelve Michigan waters received 14,212 pounds of seed under cooperative seeding ventures in 1997. Seeding was done at a rate of approximately 50 pounds per acre, so approximately 284 acres were seeded. Figure 2 displays the locations of seeded waters. All sites were seeded in the fall. Sites seeded were:

- 1) **Name:** Fish Lake, Fish Lake Wildlife Area
Location: Southwestern Burnett County
Cooperator: WDNR
Seed Source: Long Lake, Burnett County (131 pounds); Clam Lake, Burnett County (70 pounds); Clam River Flowage, Burnett County (51 pounds); Crooked Lake, Pine County, MN (39 pounds)
Summary: A total of 291 pounds of seed purchased by GLIFWC with funds from the Circle of Flight program (COF) and the WDNR was seeded at for the fourth year on Fish Lake. Success has been limited to date, despite a historical record of rice on this lake, and success on several nearby flowages. This area has had above average precipitation in recent years, and unusually high water levels may be limiting success.

- 2-7) **Name:** Crex Meadows Sites: Dike 6 Flowage, Kylingstad Flowage, Lower Hay Creek Flowage, North Fork Flowage, Reisinger Lake and South Refuge (Refuge Extension) Flowage
Location: Western Burnett County
Cooperator: WDNR
Seed Source: Dike 6 Flowage: Clam Lake, Burnett County (20 pounds); Kylingstad Flowage: Phantom Flowage, Burnett County (57 pounds); Lower Hay Creek Flowage: Long Lake, Burnett County (62 pounds); North Fork Flowage: Clam Lake, Burnett County (60 pounds) and Phantom Flowage, Burnett County (47 pounds); Reisinger Lake: Phantom Flowage, Burnett County (80 pounds) and Crooked Lake, Pine County MN (35 pounds); South Refuge Flowage: Clam Lake, Burnett Co. (72 pounds)
Summary: Seed purchased by GLIFWC with funds from the COF program and the WDNR was seeded at 6 sites on the Crex Meadows Wildlife Area by the WDNR.

Lower Hay Creek, North Fork Flowage and South Refuge Flowage received 62, 107 and 72 pounds respectively to expand recent successful seedings. Dike 6 and Kylingstad Flowages received 20 and 57 pounds respectively in new seeding attempts. Reisinger Lake received 115 pounds in an effort to revitalize seeding efforts conducted in 1992 and 1993.

- 8) **Name:** Black Brook Flowage, Amsterdam Sloughs Wildlife Area
Location: Central Burnett County
Cooperator: WDNR
Seed Source: Phantom Flowage, Burnett County WI
Summary: 84 pounds of seed purchased by GLIFWC with COF and WDNR funds was seeded by the WDNR. This was an effort to expand a bed started by seedings conducted in 1993 and 1996.
- 9) **Name:** Unnamed (Olson Road) Flowage, Amsterdam Sloughs Wildlife Area
Location: Central Burnett County
Cooperator: WDNR
Seed Source: Phantom Flowage, Burnett County WI
Summary: 51 pounds of seed purchased by GLIFWC with COF and WDNR funds was seeded by the WDNR. A small seeding had also been done on this site in 1992.
- 10) **Name:** Yellow River (T39N, R14W, Sec.20)
Location: East-central Burnett County
Cooperator: WDNR
Seed Source: Clam Lake, Burnett County (60 pounds) and St. Croix River, Douglas County (55 pounds)
Summary: 115 pounds of seed purchased by GLIFWC with COF and WDNR funds was seeded by the WDNR in the second year of planting along a stretch of the river 3 miles downstream of Rice Lake that historically supported rice. Good initial take was reported from the 1996 seeding.
- 11) **Name:** Clam Falls Flowage
Location: Northeast Polk County
Cooperator: WDNR
Seed Source: Phantom Flowage, Burnett County, WI
Summary: 52 pounds of seed purchased by GLIFWC with COF and WDNR funds was seeded by the DNR in the initial seeding effort on this water.
- 12) **Name:** Casey Creek Flowage
Location: Northwest Washburn County
Cooperator: WDNR
Seed Source: A mix of Clam Lake, Clam Flowage, Briggs Lake and Phantom Flowage, all of Burnett County; pounds from each not recorded.

- Summary:** A total of 230 pounds of seed purchased by GLIFWC with COF and WDNR funds was seeded by the DNR in the initial seeding effort on this water.
- 13) **Name:** Yellow River Flowage
Location: Along the Yellow River just east of Spooner
Cooperator: WDNR
Seed Source: Long Lake, Burnett County
Summary: 45 pounds of seed purchased by GLIFWC with COF and WDNR funds was seeded by the DNR in the initial seeding effort on this water.
- 14) **Name:** Tranus Lake
Location: Northeast Washburn County
Cooperator: None
Seed Source: Clam Lake, Burnett County (70 pounds) and Totagatic Lake, Bayfield County (60 pounds)
Summary: A total of 130 pounds of seed purchased by GLIFWC with COF funds was seeded by GLIFWC in an initial effort to restore beds on this historic rice water.
- 15) **Name:** Black Brook Flowage
Location: Northeast Washburn County
Cooperator: WDNR
Seed Source: A mix of Clam Lake, Clam Flowage, Briggs Lake and Phantom Flowage, all of Burnett County; pounds from each not recorded.
Summary: A total of 146 pounds of seed purchased by GLIFWC with COF and WDNR funds was seeded on this flowage by the DNR. This site was also seeded with some success in 1995 and 1996 without GLIFWC participation.
- 16) **Name:** Murphy Flowage
Location: Northwest Rusk County
Cooperator: WDNR
Seed Source: Not recorded; possibly Mondeaux Flowage, Taylor County
Summary: 150 pounds of seed purchased by GLIFWC with COF and WDNR funds was seeded by the DNR in the initial seeding effort on this water.
- 17-20) **Name:** Red Cliff Reservation sites: Bradum Marsh (Hatchery wetland), Eagle Bay, Frog Bay/River, and Raspberry River (4 sites).
Location: Northeastern Bayfield County
Cooperator: Red Cliff Band of Lake Superior Chippewas
Seed Source: Bradum Marsh: Phantom Lake, Burnett County (315 pounds), Yellow River, Burnett County (36 pounds) and Briggs Lake, Burnett County, (34 pounds); Frog Bay: Phantom Lake, Burnett County (157 pounds) and Mud Lake, Swiss Township, Burnett County (45 pounds); Eagle Bay Beaver Ponds: Totagatic Lake, Bayfield County (55 pounds) and Clam Lake, Burnett County (54 pounds); Raspberry River: Phantom

Flowage (202 pounds), Yellow River (112 pounds), Mud Lake, Swiss Township (101 pounds), Long Lake (45 pounds), Clam Lake (34 pounds), all Burnett County; Dilly Lake, Washburn County (48 pounds); Totagatic Lake, Bayfield County (45 pounds).

Summary: This was the initial seeding on Frog Bay; the remaining three sites were in their third or fourth year of seeding and all have shown some degree of take.

- 21) **Name:** Chippewa Lake
Location: Southeast Bayfield County
Cooperator: Chequamegon National Forest
Seed Source: Totagatic Lake, Bayfield County
Summary: 286 pounds of rice purchased by GLIFWC with USFS and COF funds was seeded by the USFS in the second seeding attempt on this historic rice water.
- 22) **Name:** Kakagon Sloughs
Location: Northern Ashland County
Cooperator: Bad River Band of Chippewa Indians
Seed Source: Kakagon Sloughs, Ashland County WI
Summary: 590 pounds of locally harvested rice was purchased with COF funds and seeded in the Kakagon by the Bad River Band in a variety of study plots.
- 23) **Name:** Gile Flowage (northeast bay)
Location: North-central Iron County
Cooperator: WDNR
Seed Source: A mix of Clam Lake, Clam River Flowage, Long Lake and Briggs Lake, all Burnett County, and Crooked Lake, Pine County MN; details not recorded.
Summary: 300 pounds of seed purchased by GLIFWC with WDNR and COF funds was seeded by the WDNR in the second seeding of this water. The rice was planted into the northeast bay of this flowage adjacent to HWY 2, which now has a separate water level control structure. A limited take was noted from the 1996 seeding.
- 24) **Name:** Turtle Flambeau Flowage South
Location: Southeast Iron County
Cooperator: WDNR
Seed Source: A mix of Clam Lake, Clam River Flowage, Long Lake and Briggs Lake, all Burnett County, and Crooked Lake, Pine County MN; details not recorded.
Summary: 200 pounds of seed was purchased by GLIFWC with WDNR and COF funds was seeded by the WDNR in the initial seeding of this area on the Flowage, near the Otter Creek inlet.
- 25) **Name:** Chewelah Lake
Location: West-central Vilas County
Cooperator: Lac du Flambeau Band

Seed Source: Hay Creek Flowage, Pine County MN (211 pounds); Phantom Flowage, Burnett County (60 pounds); Clam Lake, Burnett County (50 pounds), Sandy River Flowage, Aitkin County, MN (26 pounds)

Summary: 347 pounds of seed purchased by GLIFWC on behalf of the Lac du Flambeau Band was seeded by the band in the initial seeding of this on-reservation lake.

- 26) **Name:** Middle Sugarbush Lake
Location: Southwest Vilas County
Cooperator: Lac du Flambeau Band
Seed Source: Clam Lake, Burnett County
Summary: 154 pounds of seed purchased by GLIFWC on behalf of the Lac du Flambeau Band was seeded by the band in the initial seeding of this on-reservation lake. The area seeded was the north side of the narrow west of the inlet from Lower Sugarbush.
- 27) **Name:** Gates Lake
Location: Northcentral Price County
Cooperator: USFS
Seed Source: A mix of Mondeaux Flowage, Taylor County; Radigan Flowage, Douglas County, and St. Croix River, Douglas County; pounds from each not recorded.
Summary: 115 pounds of seed purchased by GLIFWC with USFS and COF funds was seeded by the USFS in the initial seeding of this lake.
- 28) **Name:** Hay Lake
Location: Price/Iron/Ashland County juncture
Cooperators: USFS, WDNR
Seed Source: A mix of Mondeaux Flowage, Taylor County; Radigan Flowage, Douglas County, and St. Croix River, Douglas County; pounds from each not recorded.
Summary: 115 pounds of seed purchased by GLIFWC with USFS and COF funds was seeded by the USFS in the third annual seeding of this water. Only sparse beds have been reported from the first two years of seeding.
- 29) **Name:** Schmuland Flowage
Location: Northern Price County
Cooperator: USFS
Seed Source: A mix of Mondeaux Flowage, Taylor County; Radigan Flowage, Douglas County, and St. Croix River, Douglas County; pounds from each not recorded.
Summary: 115 pounds of seed purchased by GLIFWC with USFS and COF funds was seeded by the USFS in the initial seeding of this water.
- 28) **Name:** Upper Squaw Flowage
Location: Northern Price County
Cooperators: USFS

Seed Source: A mix of Mondeaux Flowage, Taylor County; Radigan Flowage, Douglas County, and St. Croix River, Douglas County; pounds from each not recorded.

Summary: 230 pounds of seed purchased by GLIFWC with USFS and COF funds was seeded by the USFS in the initial seeding of this water.

31-32) Name: Wilson and Upper Wilson Flowages

Location: Northeastern Price County

Cooperator: USFS

Seed Source: A mix of Mondeaux Flowage, Taylor County; Radigan Flowage, Douglas County, and St. Croix River, Douglas County; pounds from each not recorded.

Summary: 230 pounds of seed purchased by GLIFWC with USFS and COF funds was seeded by the USFS in the third annual seeding at this location. There are two flowages here, sometimes referred to as Wilson and Upper Wilson, or collectively as Wilson; this seeding included both Upper Wilson and the north end of Wilson.

33) Name: Mravik Flowage, Pershing Wildlife Area

Location: Northwestern Taylor County

Cooperator: WDNR

Seed Source: Not recorded; possibly Mondeaux Flowage, Taylor County

Summary: 347 pounds of seed purchased by GLIFWC with WDNR and COF funds was seeded on this flowage by the WDNR. This site had responded well to an initial seeding in 1991, but that bed declined after a drawdown for dike repairs.

34) Name: Lake Wausau

Location: Central Marathon County

Cooperator: WDNR

Seed Source: Clam Lake, Burnett County

Summary: 144 pounds of rice purchased by GLIFWC with WDNR and COF funds was seeded by the WDNR in the initial seeding attempt on this water, east of the mouth of the Rib River.

35-39) Name: Mead Wildlife Area Flowages: Berkhahn, North Honey, Small Flowage #3, Teal and Townline

Location: South-Central Marathon County

Cooperator: WDNR

Seed Source: Berkhahn, North Honey, Teal and Small Flowage #3: Totagatic Lake, Bayfield County; Townline: Phantom Flowage, Burnett County (63 pounds), Clam Lake, Burnett County (61 pounds), Rice Lake, Forest (32 pounds)

Summary: 824 pounds of seed purchased by GLIFWC with WDNR and COF funds was seeded on these waters by the WDNR as follows: Berkhahn: 197 pounds, North Honey: 173 pounds, Small Flowage #3: 89 pounds, Teal: 209 pounds, and Townline: 156 pounds. This was the third year of seeding on Teal Flowage and the second on North Honey; the remaining 3 sites were seeded for the first time.

- 40) **Name:** Dandy Creek Flowage, Meadow Valley Wildlife Area
Location: Northeast Monroe County
Cooperator: WDNR
Seed Source: Bear Lake, Washburn County
Summary: 24 pounds of rice purchased by GLIFWC with WDNR funds was seeded by the WDNR in the initial seeding effort on this water.
- 41-43) **Name:** Meadow Valley Flowage Northwest, Northeast and East Pools
Location: Northwest Juneau County
Cooperator: WDNR
Seed Source: Totagatic Lake, Bayfield County
Summary: 20 pounds of seed purchased by GLIFWC with WDNR funds was seeded by the WDNR on each of these pools of the Meadow Valley Flowage in small initial test seedings.
- 44-46) **Name:** Wood County Wildlife Area Flowages: 3 Unnamed Flowages: T21N, R2E, Section 8, and T21N, R3E, Sections 19 and 29
Location: Southwest Wood County
Cooperator: WDNR
Seed Source: T21N, R2E, Section 8: Bear Lake, Washburn County; T21N, R3E, Section 19: Totagatic Lake, Bayfield County; T21N, R3E Section 29: Bear Lake, Washburn County.
Summary: T21N, R2E, Section 8 flowage received 56 pounds of rice, T21N, R3E, Section 19 flowage 75 pounds, and T21N, R3E Section 29 flowage 55 pounds in initial test seedings of all 3 waters.
- 47) **Name:** Sandhill Wildlife Area Unnamed Flowage T21N, R3E, Section 4
Location: Southwest Wood County
Cooperator: WDNR
Seed Source: Bear Lake, Washburn County
Summary: 23 pounds of rice purchased by GLIFWC with WDNR funds was seeded by the WDNR in a small initial test seeding on this impoundment west of Overgaard Road.
- 48) **Name:** Thunder Lake
Location: Northeast Oneida County
Cooperator: None
Seed Source: Rice Lake, Forest County
Summary: 400 pounds of rice purchased by GLIFWC with COF funds was seeded along the west shores of this historic rice lake in an initial test seeding by GLIFWC.
- 49) **Name:** Halsey Lake
Location: Westcentral Forest County
Cooperator: None

Seed Source: Rice Lake, Forest County, WI (358 pounds); Spider Creek Flowage, Langlade, County (148 pounds)

Summary: 506 pounds of rice purchased by GLIFWC and with COF funding was seeded by GLIFWC in an initial seeding attempt on this lake, which reportedly historically supported rice. Primary areas seeded were sections of the south and west shores. The bottom of this lake is highly flocculent in the areas of suitable depth, which may limit success.

50) **Name:** Knowles Creek Impoundment

Location: Southeastern Forest County

Cooperator: Nicolet National Forest

Seed Source: Rice Lake, Forest County

Summary: 25 pounds of rice purchased by GLIFWC and cost shared by the Nicolet National Forest and GLIFWC was seeded by the Nicolet in the second seeding attempt on this water. This impoundment is not actually on Knowles Creek, but a small tributary to it.

51) **Name:** Rat River

Location: Southeastern Forest County

Cooperators: Nicolet National Forest,

Seed Source: Rice Lake, Forest County

Summary: 130 pounds of seed purchased by GLIFWC and cost shared by the Nicolet National Forest and GLIFWC was seeded by the Nicolet along a stretch of the river located south of Bear Lake. This is the eighth year that some portion of the river has been seeded. After an initially slow take, the rice has responded well; rice is now established in several patches on approximately 2 miles of the river.

52) **Name:** Revolver Lake

Location: Southeastern Forest County

Cooperator: Nicolet National Forest

Seed Source: Rice Lake, Forest County

Summary: 145 pounds of rice purchased by GLIFWC and cost shared by the Nicolet National Forest and GLIFWC was seeded by the Nicolet in the third annual seeding attempt on this water. Despite apparently suitable habitat, little take has been observed thus far.

53) **Name:** Presque Isle Flowage

Location: South-central Gogebic County, Michigan

Cooperator: MiDNR

Seed Source: Spider Creek Flowage, Langlade County Wisconsin

Summary: 120 pounds of rice purchased by GLIFWC with COF funds was seeded by GLIFWC, in cooperation with the MiDNR, in the initial seeding of this water.

- 54) **Name:** Crooked Lake
Location: Southeastern Gogebic County, Michigan
Cooperators: Lac Vieux Desert Band of Chippewa Indians, Ottawa National Forest
Seed Source: Primarily a combination of Rice Lake, Forest County, and Sandy River Flowage, Aitkin County MN. A trace small amount of seed from Mud Lake, Swiss Township, Burnett County may have also been included.
Summary: Approximately 500 pounds of seed purchased by GLIFWC with funds from the Lac Vieux Desert Band was seeded in Crooked Lake by the Band. This was the sixth year of seeding in an effort to reestablish the historic bed on this lake. Excellent results were observed from the previous seedings, with a substantial bed established on the south-west most bay of this lake in the Sylvania Wilderness Area.
- 55) **Name:** Lac Vieux Desert
Location: Southeastern Gogebic County, Michigan
Cooperator: Lac Vieux Desert Band of Chippewa Indians
Seed Source: Primarily a combination of Rice Lake, Forest County, and Sandy River Flowage, Aitkin County MN. A trace small amount of seed from Mud Lake, Swiss Township, Burnett County may have also been included.
Summary: Approximately 300 pounds of seed purchased by GLIFWC with funds from the LVD Band was seeded in Lac Vieux Desert by the LVD Band. This was a continuation of seeding efforts conducted over the past 7 years aimed at reestablishing the historic beds on this lake. While the initial response from these seedings was favorable, increasing water levels appear to be reducing the size of the bed. The long term success of this bed will be dependant upon future water level regulation.
- 56) **Name:** Ontonogan River
Location: Southeastern Gogebic County, Michigan
Cooperator: Lac Vieux Desert Band of Chippewa Indians
Seed Source: Primarily a combination of Rice Lake, Forest County, and Sandy River Flowage, Aitkin County MN. A trace small amount of seed from Mud Lake, Swiss Township, Burnett County may have also been included.
Summary: Approximately 700 pounds of seed purchased by GLIFWC with funds from the LVD Band was seeded by the Band in the third year of seeding this water. A bed is reportedly becoming established in the wide area about 6 miles east of Watersmeet.
- 57) **Name:** Sucker Lake
Location: Eastern Gogebic County, Michigan
Cooperator: Ottawa National Forest
Seed Source: Sandy River Flowage, Aitken County MN (505 pounds) and Hay Creek Flowage, Pine County MN (93 pounds)
Summary: 598 pounds of rice purchased by GLIFWC with funds provided by the Ottawa National Forest and COF was seeded by the Ottawa in the third seeding attempt on this

water. Several nice beds are reportedly becoming established along the northwest shore as a result of previous seedings, despite a relatively firm bottom on this lake.

- 58-59) Name:** Sturgeon River Sloughs Wildlife Area Pools 1 and 7
Location: Southeastern Gogebic County, Michigan
Cooperator: MiDNR
Seed Source: Rice Lake, Forest County WI (678 pounds); Partridge Lake, Vilas County WI (154 pounds); Totagatic Lake, Bayfield County WI (96 pounds) and Upper Ninemile Flowage, Vilas County, WI (77 pounds)
Summary: 1005 pounds of seed purchased by GLIFWC with COF funds was seeded by the MiDNR between Pools 1 and 7 on the Surgeon River Sloughs Wildlife Area. Various pools on this wildlife area were also seeded in 1993 and 1994.
- 60) Name:** Sand Point Slough
Location: Northwest Baraga County, Michigan
Cooperator: Keweenaw Bay Indian Community
Seed Source: Phantom Flowage, Burnett County WI (314 pounds) and Radigan Flowage, Douglas County WI (202 pounds)
Summary: 516 pounds of seed purchased by GLIFWC and paid for by the KB Community was seeded by KB in the sixth seeding of this on-reservation slough associated with Lake Superior. Rice has reportedly shown good response here, but reportedly has been heavily impacted by muskrats. It remains to be seen if this bed will persist without regular seeding.
- 61) Name:** The Pinery Lakes
Location: Northcentral Baraga County, Michigan
Cooperator: Keweenaw Bay Indian Community
Seed Source: Sandy River Flowage, Aitkin County MN (218 pounds); St. Croix River, Douglas County, WI (120 pounds); Jaskari Lake, Carlton County MN (47 pounds); Aitkin Lake, Aitkin County MN (44 pounds) and unknown MN water (35 pounds)
Summary: 477 pounds of seed purchased by GLIFWC and paid for by the KB Community was seeded by KB in the seventh seeding of these small, twin, on-reservation lakes. Seeding was concentrated in those areas that showed some establishment from the previous years' seeding, but it remains to be seen if these beds will persist without regular seeding.
- 62) Name:** Spectacle Lake
Location: Central Chippewa County, Michigan
Cooperator: Bay Mills Community of Chippewa Indians
Seed Source: Not recorded
Summary: 300 pounds of seed purchased by GLIFWC on behalf of the Bay Mills Community was seeded by Bay Mills in the fifth seeding of this water. Seedings from prior years have reportedly produced several acres of rice.

- 63) **Name:** Waishkey (Back Bay), Lake Superior
Location: Central Chippewa County, Michigan
Cooperator: Bay Mills Community of Chippewa Indians
Seed Source: Not recorded
Summary: 700 pounds of seed purchased by GLIFWC on behalf of the Bay Mills Community was seeded by Bay Mills in the third seeding of this bay on Lake Superior.
- 64) **Name:** Houghton Lake
Location: West-central Roscommon County, Michigan
Cooperator: MiDNR
Seed Source: Spider Creek Flowage, Langlade County WI (311 pounds); The Big Lake Thoroughfare, Oneida County WI (107 pounds) and Miniwakan Lake, Langlade County WI (85 pounds)
Summary: 503 pounds of seed purchased by GLIFWC with COF funds was seeded by the MiDNR in the second year of an effort to reestablish the historic rice beds on this water. There is concern that the current operation of the dam on this lake may be hindering success, by holding water levels slightly too deep.

RESEARCH

Wild Rice Genetics Investigations

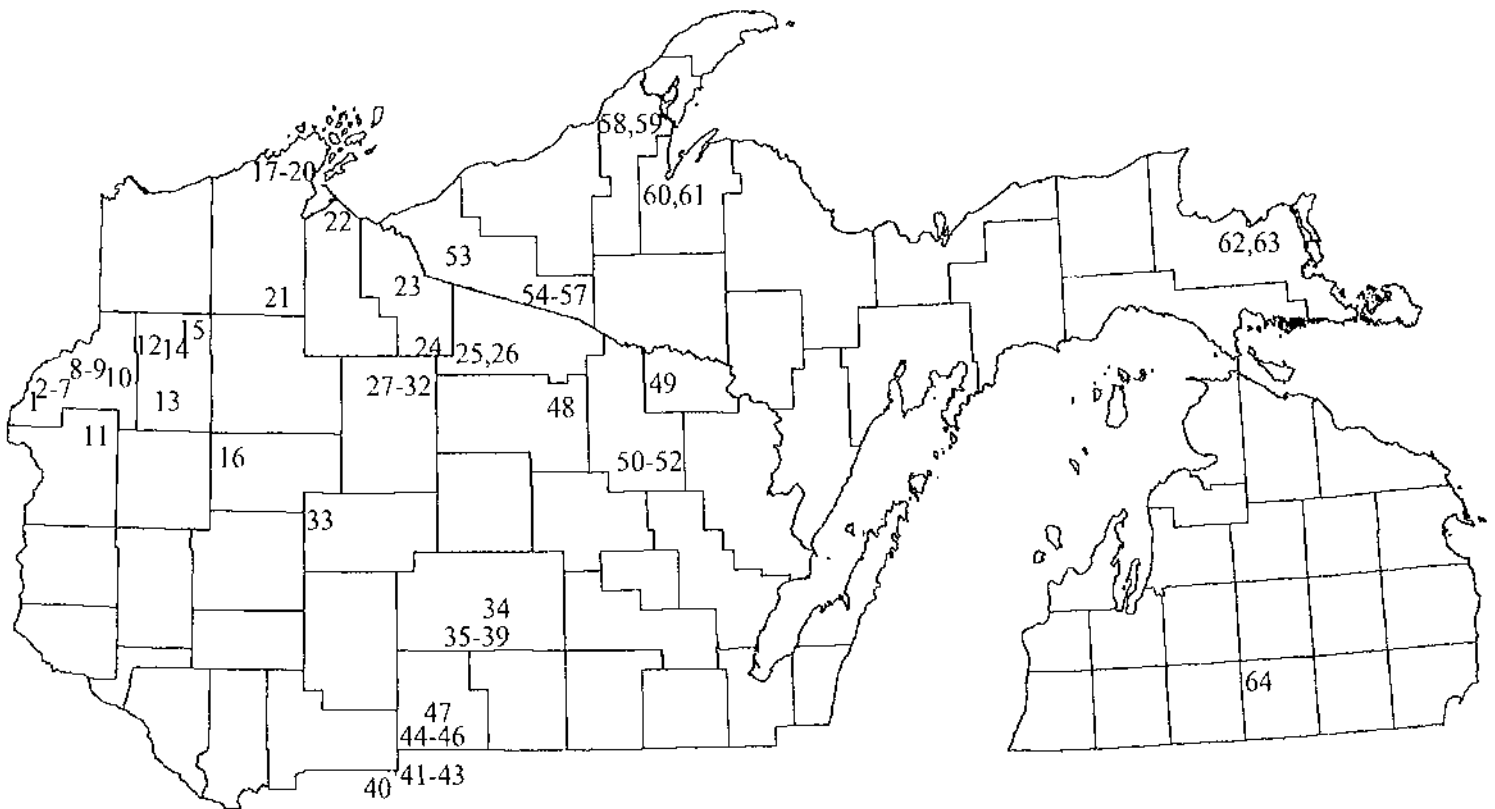
Environmental threats that place both existing populations and restoration activities at risk have created a need for a better understanding of rice's phenotypic and genotypic variation, and how that variation may be related to local adaptation. Wild rice is known to show fairly high levels of phenotypic variation across its range, but little is known about patterns in this variation, especially in Wisconsin. In addition, the relationship between phenotypic variation and genetic variation is largely unknown. Although wild rice is wind pollinated, the pollen is relatively heavy, and the seed is not believed to generally disperse great distances. Thus it is believed that individual stands may in time develop into unique strains, adapted to local conditions.

In 1996 the first phase of a cooperative study with the UW-Madison Botany Department examining genetic variation in wild rice was concluded with the completion of the report "Genetic Variability in Wild Rice populations in northern Wisconsin" (Lu and Waller, 1996).

In 1997, GLIFWC continued working with Dr. Don Waller at UW-Madison by coordinating the collection of additional wild rice tissue samples from 10 populations ranging from Minnesota to the Upper Peninsula of Michigan. These samples have been preserved by staff at the UW for genetic analysis at a later date.

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| <p>1. Fish Lake, Fish Lake Wildlife Area</p> <p>2-7. Crex Meadows Wildlife Area Sites: Dike 6 Flowage, Lower Hay Creek Flowage, Kylingstad Flowage, North Fork Flowage, Reisinger Lake, South Refuge (Refuge Extension) Flowage</p> <p>8-9. Amsterdam Sloughs Wildlife Area Sites: Black Brook Flowage, Unnamed (Olson Road) Flowage</p> <p>10. Yellow River</p> <p>11. Clam Flalis Flowage</p> <p>12. Casey Creek Flowage</p> <p>13. Yellow River Flowage</p> <p>14. Tranus Lake</p> <p>15. Black Brook Flowage</p> <p>16. Murphy Flowage</p> <p>17-20. Red Cliff Reservation Sites: Bradum Marsh, Frog Bay/River; Eagle Bay, and Raspberry River</p> <p>21. Chippewa Lake</p> <p>22. Bad River Reservation Site: Kakagon Sloughs</p> <p>23. Gile Flowage</p> <p>24. Turtle Flambeau Flowage (south site)</p> <p>25-26. Lac du Flambeau Reservation Sites: Chewelah Lake and Middle Sugarbush Lake</p> <p>27-32. Chequamegon National Forest Sites: Gates Lake, Hay Lake, Schmuland Flowage, Upper Squaw Creek Flowage, Wilson and Upper Wilson Flowages.</p> <p>33. Mnavik Flowage, Pershing Wildlife Area</p> | <p>34. Lake Wausau</p> <p>35-39. Mead Wildlife Area Sites: Berkhahn Flowage, North Honey Island Flowage, Small Flowage #3, Teal Flowage, Townline Flowage.</p> <p>40. Dandy Creek Flowage</p> <p>41-43. Meadow Valley Flowage: Northwest, Northeast and East Pools.</p> <p>44-46. Wood County Wildlife Area Sites: 3 Unnamed Flowages: T21N, R2E, Sections 8; T21N, R3E Sections 19 and 29.</p> <p>47. Sandhill Wildlife Area Site: Unnamed Flowage T21N, R3E, Sec. 4</p> <p>48. Thunder Lake</p> <p>49. Halsey Lake</p> <p>50-52. Nicolet National Forest Sites: Knowles Creek Impoundment, Rat River, and Revolver Lake</p> <p>53. Presque Isle Flowage</p> <p>54-57. Ottawa National Forest Sites: Crooked Lake, Lac Vieux Desert, Ontonogan River, Sucker Lake</p> <p>58-59. Sturgeon River Sloughs Wildlife Area, Pools 1 and 7</p> <p>60-61. Keweenaw Bay Reservation Sites: Sand Point Slough and Pinery Lakes</p> <p>62-63. Bay Mills Reservation Sites: Waishkey (Back) Bay on Lake Superior and Spectacle Lake</p> <p>64. Houghton Lake</p> |
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Figure 2. Waters seeded in 1997 GLIFWC cooperative ventures.

