Wild Rice (Manoomin) Abundance and Harvest in Northern Wisconsin in 2002

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MANOOMIN (WILD RICE) ABUNDANCE AND HARVEST IN NORTHERN WISCONSIN IN 2002

INTRODUCTION

As part of its wild rice management program, the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) conducts annual surveys of wild rice abundance on northern Wisconsin waters. These surveys provide a long term data base on wild rice abundance and annual variability in the ceded territory.

GLIFWC also conducts an annual survey to estimate the amount of wild rice harvested off-reservation in the Wisconsin ceded territory. The Wisconsin Department of Natural Resources (WDNR) cooperates with this survey by providing the names and addresses of state wild rice harvest license purchasers, so that both state and tribal harvest can be estimated. The 2002 survey was similar in design to a survey first conducted in 1987, and repeated each year since 1989, with minor modifications as described in the Methods section.

METHODS

Abundance Estimation

A select group of thirty lakes and 10 river or flowage sites have been ground surveyed most years since 1985; abundance information from these waters is used to derive a yearly index of rice abundance in the ceded territory. The index is derived by multiplying the number of acres of rice on each water surveyed by a factor ranging from 1 to 5 which relates to rice density (1=sparse, 5=dense) and then summing the values derived for each of the 40 waters. In addition to abundance information, ground surveys include information on habitat suitability (e.g. abundance of competing vegetation, presence of beaver, obvious development impacts). Ground surveys were conducted from mid-July through late August.

Aerial surveys of some of these waters, and additional waters not ground surveyed, were conducted on August 14th, 16th and 20th. Aerial survey information is limited to an estimate of the size and approximate density of the rice beds. These surveys provide abundance information from waters not ground surveyed, help verify ground estimates of manoomin acreage, occasionally fill in survey gaps when ground crews are unable to access lakes, and help the Commission direct ricers to the more productive stands.

Harvest Estimation

Slightly different techniques were used to estimate harvest by tribal and state ricers. Tribal members who wished to harvest rice off-reservation were required to obtain an off-reservation harvesting permit validated for ricing. This permit was obtained by 781 individuals in 2002. When individuals obtained their 2002 permit, they were asked if they harvested rice the

previous year. Thirty-six percent (54/151) of the individuals who indicated they had riced in 2001 ("active" ricers) were surveyed by phone, as well as 21% (134/630) of those individuals who indicated they had not riced the previous year ("inactive" ricers) (Table 1). Individuals who failed to answer this question were included in the "inactive" group based upon the similarities of their survey responses to others in the inactive group.

The number of tribal members actually harvesting off-reservation in 2002 was estimated by extrapolating the percent of active respondents in each group (Table 1). Due to differences in sampling and activity rates among groups, separate harvest estimates were made for each group, then combined to estimate total tribal harvest.

Table 1. Summary of 2002 tribal off-reservation manoomin harvest survey sampling.

GROUP	TOTAL NUMBER	# SURVEYED	% SAMPLED	% ACTIVE OFF-RESERVATION	EST. # ACTIVE OFF-RESERVATION
ACTIVE[1]	151	54	36%	50.0%	76
INACTIVE[1]	630	134	21%	4.5%	28
TOTAL	781	188			104

[1] Based on activity the previous year; see discussion in text.

State ricers were required to obtain a state license. A mail questionnaire was mailed to each of the 432 individuals who obtained the state license. The number of active ricers was estimated by expanding the results reported by the 222 (51%) respondents to the state survey.

Among state respondents was one individuals who reported a harvest that far exceeded that of other state ricers. Because of this, total state harvest was estimated by extrapolating the harvest reported by all other state respondents to the other 392 estimated active state ricers, then adding the harvest reported by this individual.

RESULTS AND DISCUSSION

Abundance Estimation

Ground survey results and abundance information for the 40 waters surveyed annually are reported in Figures 1 and 2, and Table 2. In addition, abundance estimates for 42 additional waters surveyed only from the air are listed in Table 3. A total of 2,035 acres of wild rice were estimated for these 82 surveyed waters. Andryk (1986) estimated that the Wisconsin ceded territories supported approximately 5,000 acres of rice in 1985, a year with an abundance index considerably higher than in 2002.

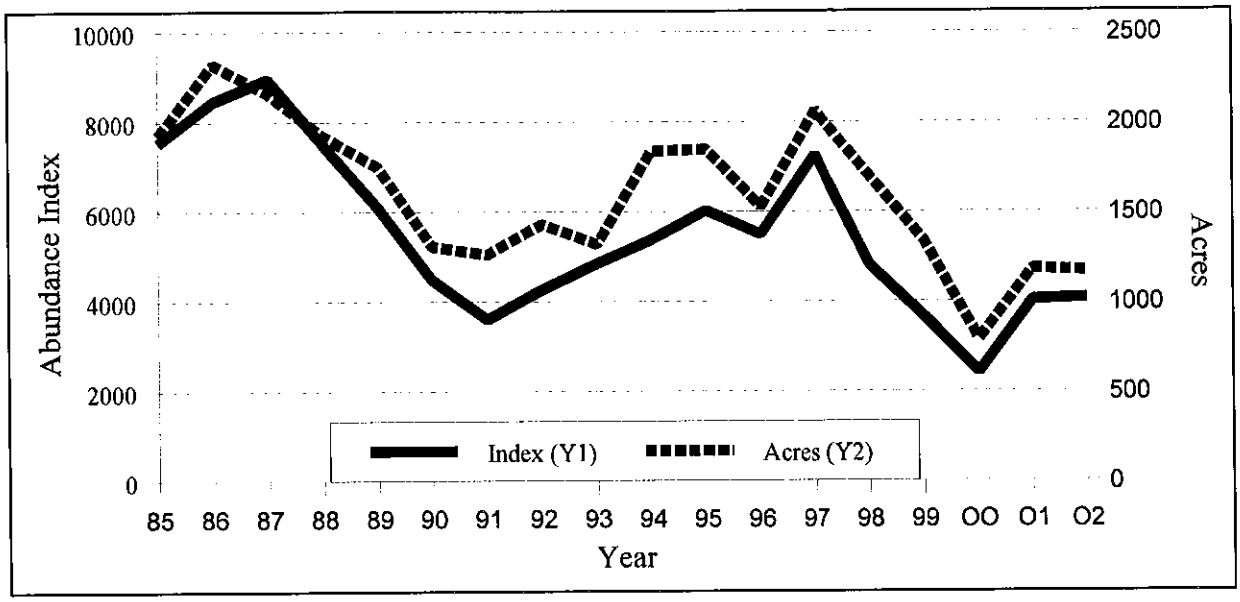

Figure 1. Manoomin acreage and abundance index from 40 Wisconsin rice waters surveyed annually from 1985-2002.

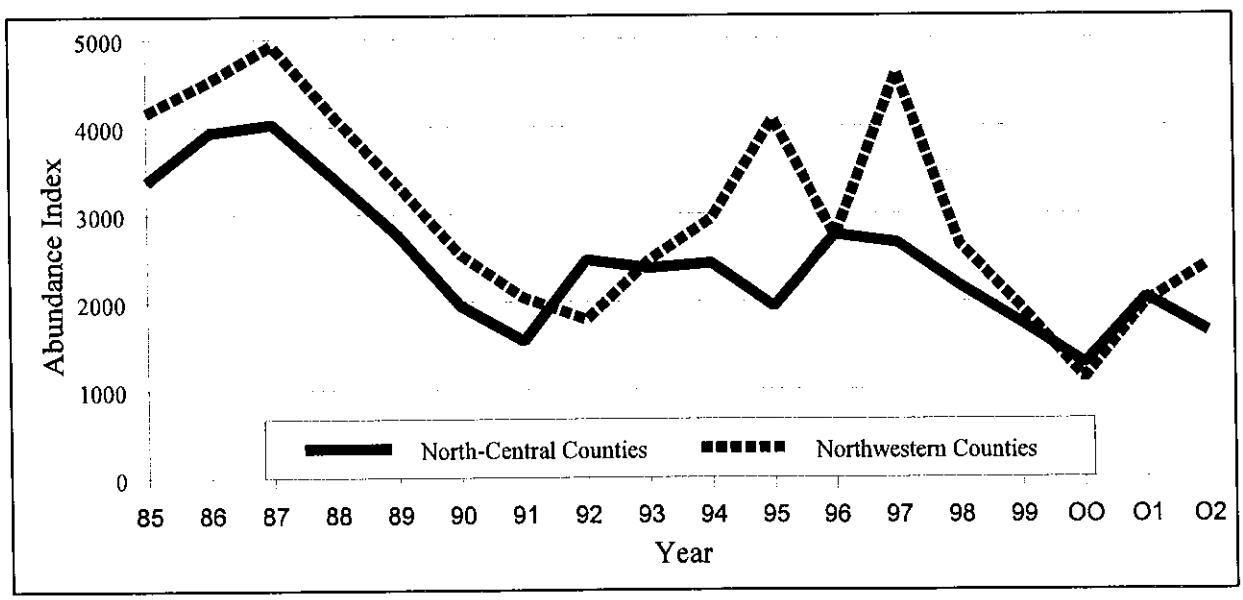

Figure 2. Manoomin abundance index from 40 Wisconsin rice waters surveyed annually from 1985-2002; northwestern versus north-central Wisconsin waters (Highway 13 used to separate northwestern from north-central waters).

Table 2. Manoomin acreage, density and abundance index from 40 Wisconsin waters for 1999-2002, and the 1985-2002 means. (Data for 1985-1997 can be found in David, 2001.)

	1999			2000			2001			2002			1985-2002		
WATER	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	MEAN ACRES	MEAN DEN.	MEAN INDEX
NORTHWESTERN CTYS															
BARRON															
SWEENY CREEK	3	3	9	5	2	10	3	2	6	5	3	15	10	2.7	38
BAYFIELD															
TOTOGATIC LAKE	95	2	190	51	3	153	65	3	195	18	2	36	154	2.8	511
BURNETT															
BASHAW LAKE	4	2	8	7	1	7	7	3	21	3	3	9	12	2.7	34
BIG CLAM LAKE	180	4	720	31	2	62	125	2	250	190	4	760	153	3.5	536
BRIGGS LAKE	18	2	36	22	4	88	41	4	164	8	4	32	30	3.8	117
GASLYN LAKE	23	2	46	18	2	36	15	3	45	7	3	21	26	3.3	91
LONG LAKE	40	2	80	20	1	20	20	3	60	60	2	120	76	2.5	196
MUD LAKE (2)	6	3	18	6	3	18	15	3	45	12	5	60	14	3.5	51
WEBB CREEK	16	3	48	20	5	100	20	5	100	9	4	36	12	3.9	56
DOUGLAS															
MULLIGAN LAKE	16	2	32	15	4	60	18	3	54	10	3	30	25	2.0	54
POLK															
RICE BED CREEK	6	3	18	4	4	16	15	4	60	8	3	24	10	4.4	48
RICE LAKE (1)	15	2	30				50	3	150	40	3	120	52	3.3	181
WHITE ASH LAKE	10	4	40	8	2	16	6	4	24	9	3	27	13	3.2	44
SAWYER															
BILLY BOY FLOW.	3	1	3	5	2	10	4	2	8	15	4	60	14	2.2	48
BLAISDELL LAKE	75	2	150	30	3	90	72	3	216	95	1	95	76	3.0	235
PACWAWONG LAKE	67	3	201	48	4	192	120	3	360	135	5	675	90	3.7	348
PHIPPS FLOWAGE	24	4	96	19	4	76	18	5	90	25	4	100	32	4.1	129
WASHBURN															
DILLY LAKE	30	4	120	21	4	84	18	3	54	13	4	52	22	4.1	92
POTATO LAKE	9	3	27	12	2	24	12	2	24	24	5	120	14	3.1	43
RICE LAKE	10	3	30	14	4	56	11	4	44	4	4	16	25	3.4	92
SPRING LAKE (1)	5	3	15	0	0	0	5	1	5	3	2	6	15	2.9	54
TRANUS LAKE	2	2	4	2	1	2	5	2	10	2	2	4	39	1.5	62
SUBTOTAL	**657**		**1912**	**358**		**1120**	**665**		**1985**	**695**		**2418**	**915**		**3060**
NORTH-CENTRAL CTYS															
FOREST															
ATKINS LAKE	0	0	0	0	0	0	0	0	0	0	0	0	21	0.8	61
INDIAN/RILEY LAKE	5	3	15	7	3	21	5	5	25	11	4	44	5	3.1	16
PAT SHAY LAKE	60	2	120	4	1	4	8	4	32	1	3	3	47	1.7	77
RAT RIVER	21	4	84	16	4	64	18	5	90	22	5	110	22	4.6	102
WABIKON LAKE	30	2	60	24	2	48	36	5	180	65	2	130	41	2.6	106
LINCOLN															
ALICE LAKE	20	3	60	24	3	72	12	4	48	30	4	120	52	3.2	189
ONEIDA															
FISH LAKE	58	2	116	10	2	20	14	2	28	5	3	15	25	3.4	136
LITTLE RICE LAKE	0	0	0	0	0	0	0	0	0	0	0	0	9	1.6	35
RICE LAKE	100	1	100	60	1	60	70	1	70	60	1	60	73	1.3	129
SPUR LAKE	56	3	168	25	1	25	45	2	90	30	2	60	73	3.3	291
WISCONSIN RIVER	180	3	540	165	4	660	180	5	900	145	5	725	147	4.5	655
PRICE															
BLOCKHOUSE LAKE	2	2	4	4	1	4	4	1	4	1	1	1	20	2.9	71
VILAS															
ALLEQUASH LAKE	60	3	180	40	3	120	35	5	175	20	3	60	73	4.1	309
LITTLE RICE LAKE	16	3	48	4	3	12	20	4	80	23	3	69	11	2.4	32
MANITOWISH RIVER	16	4	64	14	5	70	16	5	80	13	5	65	15	4.4	72
PARTRIDGE LAKE	17	4	68	21	4	84	18	5	90	9	4	36	20	4.3	87
RICE LAKE	20	4	80	10	2	20	28	5	140	36	4	144	24	3.4	78
WEST PLUM LAKE	20	2	40	2	2	4	6	2	12	2	3	6	23	3.3	78
SUBTOTAL	**681**		**1747**	**430**		**1288**	**515**		**2044**	**473**		**1648**	**700**	124.5	**2524**
COUNT:			40			39			40			40			40
TOTAL:	**1338**		**3659**	**788**		**2408**	**1180**		**4029**	**1168**		**4066**	**1615**		**5584**
AVERAGE:			91			62			101			102			140

Table 3. Estimated manoomin acreage and density for waters aerially surveyed in 2002.

COUNTY	WATER	2002 EST. ACRES	2002 EST. DENSITY	2001 EST. ACRES	2001 EST. DENSITY
Bayfield	Chippewa Lake	50	medium-dense	35	medium-dense
Burnett	Carter's Bridge - Loon Lake	70	medium-dense	70	medium-dense
	- Gull Lake	15	medium	20	medium-dense
	Clam River Flowage	55	dense	45	medium-dense
	North Fork Flowage	40	medium-dense	42	dense
	North Lang Lake	3	dense	4	medium-dense
	Phantom Flowage	35	medium-dense	8	medium
	Rice Lake [1]	2	sparse	12	medium
	Rice Lake [2]	2	sparse	12	sparse-medium
	Yellow Lake	16	sparse	20	sparse-medium
Douglas	Lower Ox Lake	5	sparse-medium	9	medium-dense
	Minong Flowage (Smiths Bridge)	33	dense	30	medium-dense
	Radigan Flowage	36	medium-dense	42	dense
	St.Croix River/Cutaway Dam	48	dense	48	dense
Forest	Hiles Millpond	10	medium	25	medium
	Little Rice Flowage	60	medium	120	medium-dense
Iron	Gile Flowage	4	medium-dense	4	medium-dense
	Mud Lake	3	medium	-	(not surveyed)
Langlade	Daly Pond	4	medium	14	medium-dense
	Miniwaukan Lake	1	medium	4	dense
Oneida	Big Lake	6	medium-dense	12	medium-dense
	Cuenin Lake	18	medium-dense	20	medium-dense
	Scott Creek Impoundment	10	medium	12	medium-dense
	The Thoroughfare	70	medium	75	medium-dense
	Wolf River[3]	14	medium-dense	14	dense
Polk	Rice Lake[4]	2	sparse-medium	0	-
Sawyer	Partridge Crop Lake	6	sparse-medium	6	sparse-medium
	West Branch Chippewa River	10	medium	18	dense
Vilas	Aurora Lake	17	medium	85	medium-dense
	Devine Lake	2	medium-dense	20	sparse-medium
	Frost Lake	9	sparse-medium	18	medium
	Irving Lake	25	medium	30	medium
	Island Lake	50	medium	100	medium
	Lower Ninemile Lake	15	medium	25	medium-dense
	Mickeys Mud Lake	1	sparse	1	sparse
	Rest Lake	4	medium	4	medium
	Rice Creek [5]	18	dense	15	dense
	Rice Creek [6]	12	medium-dense	10	dense
	Round Lake	1	medium	6	medium-dense
	Upper Ninemile Lake	55	medium-dense	80	medium-dense
Washburn	Long, Mud, & Little Mud Lakes	22	medium-dense	20	medium
	Trego Flowage	8	medium	5	dense

[1] NE of Hertel, (T39N, R14W, S15); [2] W of Frederic, (T37N, R18W, S36); [3] NW of Lennox;
[4] NW of Frederic; [5] N of Big Lake; [6] N of Island Lake

Survey results and field observations indicate that ceded-territory wide, rice abundance in 2002 was essentially unchanged from 2001. However, that abundance was distributed differently. The 2002 abundance index for the north-central part of the state was down 19% from 1999 while the index for the northwest increased 22% (Table 2 and Figures 1 and 2). The 2002 index was 73% of the long-term index average (1985-2002). It is interesting that less than half of the northwestern waters (10 of 22) showed an increase in abundance, but a great increase in the large beds on Big (Upper) Clam Lake in Burnett County was sufficient to markedly lift the index. Among the north-central waters, 12 of 18 waters showed a decrease from the previous year.

It remains difficult to determine why rice changes in abundance on either the regional or local scale because the environmental factors that influence abundance are not well understood. Wild rice is affected by a variety of factors, and the relative impact of each varies by year. Some of these factors, such as spring temperatures and water levels, can affect rice regionally, and may account for instances where beds in the north-central counties display one trend in abundance while those in the northwestern region may show another. At the other extreme, a localized impact can cause a stand to fail while those around it flourish. Furthermore, those factors that might explain some of the variation in rice abundance are not being monitored systematically. Thus, explanations about changes in rice abundance remain largely a matter of conjecture.

Annual variability in rice abundance may be inversely related to the amount of water flow through the system. Relatively open systems such as rivers and flowages appear to vary less in rice abundance than relatively closed lake systems. Although open systems may still experience boom and bust years, the level of abundance tends to be closer to the average level most years. This may be because some environmental variables, such as nutrient availability or spring water temperatures, are more consistent in these systems from year to year.

Harvest Estimation

Responses were obtained from 188 tribal permit holders and 222 state licensees. Survey respondents were asked to report all harvest which occurred under their permit. For state licensees, this included on-and off-reservation harvest; for tribal members it included only off-reservation harvest, since no permit is required to harvest on-reservation. Thirty-three of the tribal and 202 of the state licensees surveyed reported harvesting rice in 2002. The total number estimated active was 104 tribal members and 393 state licensees (Table 4).

Tribal harvesters active off-reservation reported making from 1 to 9 ricing trips, averaging 3.4 trips. Tribal survey respondents made a total of 112 off-reservation harvesting trips, gathering 3,735 pounds of green rice (Appendix 1), with an extrapolated total harvest estimate of 11,713 pounds in 352 trips, an average of 33 pounds per trip (Table 4). The total off-reservation harvest per active license averaged 113 pounds.

Table 4. A comparison of tribal (off-reservation) and state manoomin harvest in 2002.

	NUMBER OF PERMIT HOLDERS	ESTIMATED NUMBER ACTIVE	AVERAGE NUMBER OF TRIPS	AVERAGE HARVEST/ TRIP	AVE. HARVEST/ ACTIVE LICENSE	TOTAL ESTIMATED HARVEST / TRIPS
TRIBAL	781	104	3.4	33	113	11,713 / 352
STATE	432	393	2.5	33	82	32,073 / 984
TOTAL	1,213	497	2.7	33	88	43,786 / 1,336

In comparison, active state licensees reported making from 1 to 21 ricing trips, averaging 2.5 trips. Collectively, state survey respondents made 515 trips and harvested a total of 18,362 pounds of green rice (Appendix 1), an average of 33 pounds per trip. The total harvest per active state license averaged 82 pounds (or 72 pounds when the most active individual is not included).

The amount of rice harvested per individual varied greatly (Table 5). The unique state ricer discussed in the methods section reported harvesting 3,929 pounds of rice, while the most reported by one tribal ricer was 360 pounds.

Ninety-one percent of the state-licensed respondents gathered rice in 2002, versus 13% for the tribes. Differences in permit systems between the two groups accounts for the different activity levels observed. The tribal ricing permit is a simple check-off category on a general natural resources harvesting permit available at no cost to tribal members. The category is frequently checked by individuals whose primary interest is one of the other harvest activities listed on the permit. The state permit is a unique license available for a fee, and thus is rarely obtained by individuals without a strong intention of ricing. The tribal activity rate is also lowered because members are asked to respond only if they harvested rice off-reservation. When on-reservation rice beds have good stands, many tribal ricers concentrate their efforts there.

The data collected in this survey can be used to estimate off-reservation harvest by tribal permit holders, and both total and off-reservation harvest by state licensees. It cannot be used to estimate on-reservation harvest by tribal members, where no harvest permit is required.

Using the approach to estimate harvest described above in the Methods section, total off-reservation harvest for tribal permit holders was estimated at 11,713 pounds of green rice (Table 4). The total harvest for state permitees was estimated at 32,073 pounds, with all but 244 pounds of it coming from off-reservation waters. Thus, the total off-reservation harvest was estimated at 43,542 pounds, with tribal ricers accounting for 27% of the harvest.

This harvest estimate is 17% below the 2001 off-reservation harvest estimate of 52,736 pounds (David, 2008). While both state and tribal harvest decreased from 2001, state harvest showed a 13% decline, while tribal harvest fell 31%. The decline in harvest was related to a decrease in the number of active ricers for both groups, but especially for the tribes. Manoomin harvest tends to vary with abundance as well as other factors (Figure 3). Many ricers seem to prefer particular waters, and declines in rice abundance on those waters could lead to harvest declines even when other beds have good stands. Several respondents also indicated that poor weather during the harvest season reduced their harvest (see *Comments* below).

Table 5. Distribution of harvest among active respondents to the 2002 harvest survey.

TRIBAL

POUNDS OF GREEN RICE HARVESTED	INDIVIDUALS		PERCENT OF TOTAL HARVEST
	NUMBER	PERCENT	
0 - 50	7	21.2	5.5
51 - 100	14	42.4	25.4
101 - 150	1	3.0	4.0
151 - 200	5	15.2	21.4
201 - 300	4	12.1	25.2
301 - 500	2	6.0	18.5
501 - 1000	-	-	-
1001 +	-	-	-

STATE

POUNDS OF GREEN RICE HARVESTED	INDIVIDUALS		PERCENT OF TOTAL HARVEST
	NUMBER	PERCENT	
0 - 50	112	55.4	14.4
51 - 100	53	26.2	22.0
101 - 150	18	8.9	12.5
151 - 200	6	3.0	5.8
201 - 300	6	3.0	8.9
301 - 500	4	2.0	9.1
501 - 1000	2	1.0	6.0
1001 +	1	0.5	21.4

The distribution of ricing effort and harvest has tended to reflect the distribution of rice waters in the state, and the abundance of rice on those waters (Figure 4). Seventy-five waters were reported riced in 2002 (not including unnamed locations), similar to the 77 reported in 2001. All but 33 pounds of the harvest reported by surveyed state licensees came from waters within the ceded territory (Appendix 1). Approximately 20% of the harvest reported by specific location (i.e. harvest for "unnamed" waters excluded) came from sites planted by the WDNR, the U.S. Forest Service, GLIFWC, or other seeding cooperators. This was up from 12 % in 2001.

Opinions of Respondents

Annual abundance: Individuals were asked if they felt the 2002 wild rice crop was better, the same, or worse than the 2001 crop. Among the 158 active respondents with an opinion, 31% felt 2002 was better than 2001, 40% felt both years were about the same, and 29% were of the opinion that 2002 was worse than 2001.

These opinions trended similarly with the results from the abundance surveys of 40 rice waters discussed above, which found similar levels of rice abundance across the ceded territory, but a different distribution of that abundance on the landscape.

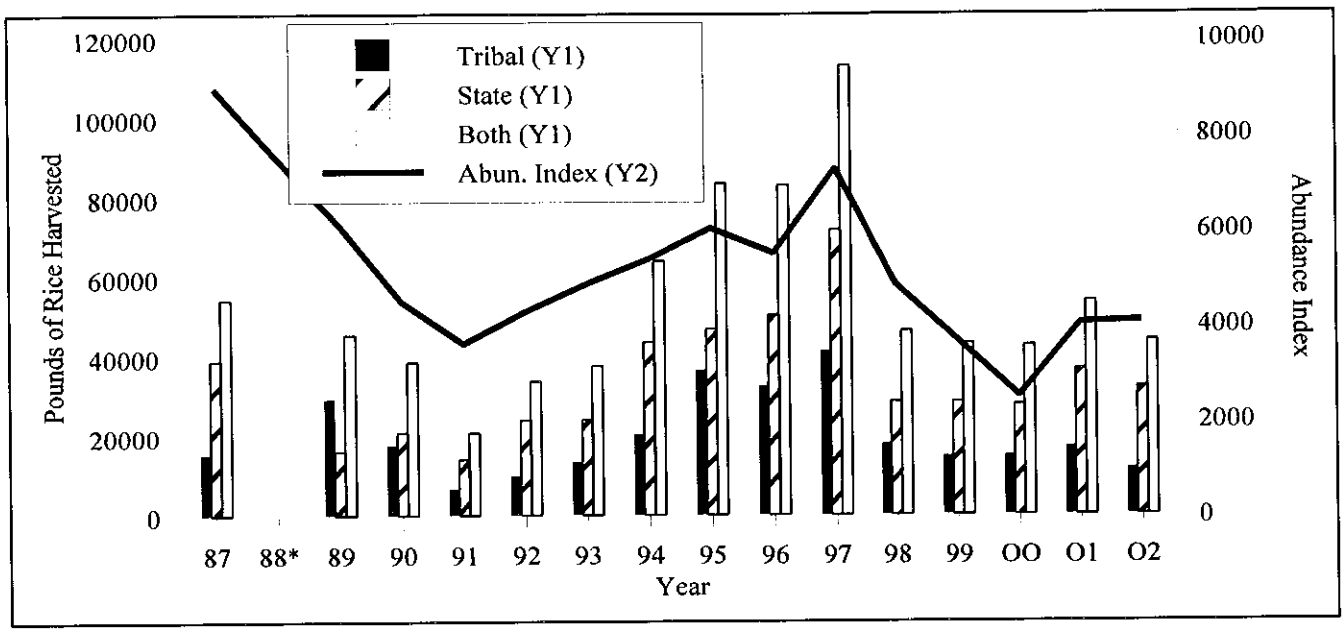

Figure 3. Harvest trends versus abundance index, 1987-2002 (* no harvest estimates for 1988).

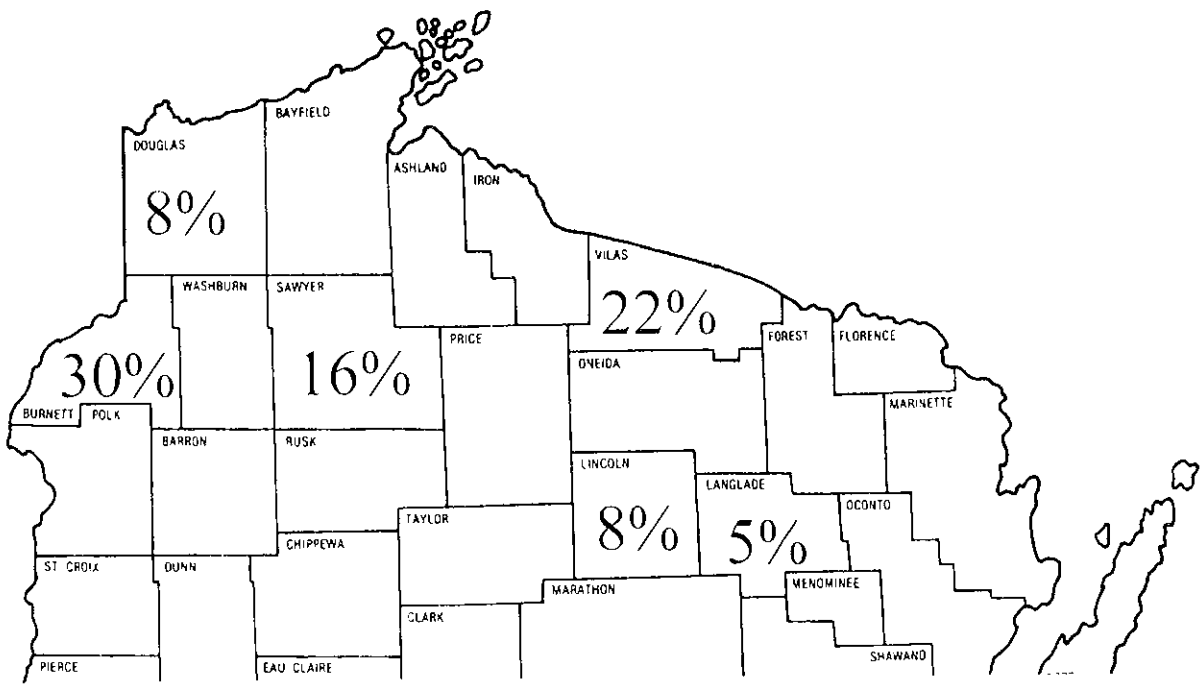

Figure 4. Distribution of counties accounting for 5% or more of the manoomin harvest reported by respondents to the 2002 harvest survey, tribal and state harvesters combined.

Comments: Respondents offered a number of comments and opinions, although relatively few consistent themes surfaced.

The most frequent comment (7) related to having hard wind and rain reduce an individual's harvest. Perhaps related to this, 6 individuals reported harvesting too late. Poor pollination and/or empty hulls were mentioned by 4 people, specifically mentioning problems at Clam Lake (Burnett), the Minong Flowage (Douglas) and St. Croix River (Douglas), waters which interestingly are relatively close to each other. Two individuals each mentioned problems with lake openings, that Totogatic Lake in Bayfield County was doing poorly in recent years, and that water levels on Phantom Flowage (Burnett) were held too low for good picking. No other comments were made by more than one individual.

Several respondents mentioned seeding rice. Sites reportedly seeded included Bog Brook Flowage and Shoe Lake in Forest County, the St. Louis River in Douglas County, and McMillian Marsh in Marathon County.

Others shared the following comments:

Thanks for all the great work you are doing to protect and expand the gorgeous rice beds.

We had gathered about 5 lbs of green rice when we swamped the boat. My buddy refuses to get into a canoe with me again.

I most likely wouldn't have even filled this out and sent it in except that I saw a program on public television that explained who and what you guys do at GLIFWC. It helped me understand there are people out there actually involved, not just a bunch of bureaucrats.

This was my first season ricing, and I feel really lucky to live in a place with such a resource available to us. I hope someday to bring my son ricing too.

Potential Waters for Seeding: Respondents suggested 40 different waters from 10 counties which might be candidates for seeding. Sites named are listed in Appendix 2.

LITERATURE CITED

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Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2002 harvest survey

		TRIBAL		STATE		COMBINED TOTAL	
COUNTY	WATER	TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS
ASHLAND	KAKAGON SLOUGHS			3	40	3	40
	Subtotal	**0**	**0**	**3**	**40**	**3**	**40**
BARRON	BEAR LAKE			7	85	7	85
	Subtotal	**0**	**0**	**7**	**85**	**7**	**85**
BAYFIELD	CHIPPEWA LAKE			10	390	10	390
	NAMEKAGON RIVER			1	17	1	17
	RASPBERRY RIVER			1	5	1	5
	TOTOGATIC LAKE	1	30			1	30
	Subtotal	**1**	**30**	**12**	**412**	**13**	**442**
BURNETT	BLACK BROOK FLOW			2	46	2	46
	BRIGGS LAKE			5	62	5	62
	CARTERS BRIDGE	2	50	1	35	3	85
	CLAM FLOWAGE			1	45	1	45
	CLAM LAKE	12	370	97	3,060	109	3,430
	GASLYN LAKE			1	0	1	0
	HAY CREEK FLOWAGE			1	2	1	2
	LONG LAKE	2	40	4	126	6	166
	MUD LAKE	4	50	2	45	6	95
	NORTH FORK FLOWAGE			15	297	15	297
	PHANTOM FLOWAGE	1	50	45	2,385	46	2,435
	ST CROIX RIVER			1	0	1	0
	UPPER NORTH FORK FL.			1	16	1	16
	YELLOW LAKE			1	3	1	3
	YELLOW RIVER			2	42	2	42
	Subtotal	**21**	**560**	**179**	**6,164**	**200**	**6,724**
DOUGLAS	GORDON FLOWAGE	5	95			5	95
	LOWER OX LAKE	1	50			1	50
	MINONG FLOWAGE			18	707	18	707
	RADIGAN FLOWAGE	2	45	10	203	12	248
	ST. CROIX RIVER	20	500	8	244	28	744
	Subtotal	**28**	**690**	**36**	**1,154**	**64**	**1,844**
FOREST	LITTLE RICE LAKE			2	300	2	300
	RAT RIVER	3	170	1	50	4	220
	SCATTERED RICE LAKE			2	100	2	100
	Subtotal	**3**	**170**	**5**	**450**	**8**	**620**
IRON	LITTLE BEAR RIVER			4	20	4	20
	LITTLE TURTLE FLOWAGE			4	15	4	15
	UNNAMED WATER			3	20	3	20
	Subtotal	**0**	**0**	**11**	**55**	**11**	**55**
LANGLADE	ACKLEY WA PONDS			3	918	3	918
	DALYS POND			2	120	2	120
	LILY RIVER			1	35	1	35
	SPIDER CREEK FLOWAGE			1	10	1	10
	Subtotal	**0**	**0**	**7**	**1,083**	**7**	**1,083**
LINCOLN	LAKE ALICE			11	1,668	11	1,668
	WISCONSIN RIVER			2	10	2	10
	Subtotal	**0**	**0**	**13**	**1,678**	**13**	**1,678**
MARQUETTE	NESHKORO MILL POND			3	33	3	33
	Subtotal	**0**	**0**	**3**	**33**	**3**	**33**

(Appendix 1 continued on the next page.)

Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2002 harvest surve

		TRIBAL		STATE		COMBINED TOTAL	
COUNTY	WATER	TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS
ONEIDA	BIG LAKE			2	25	2	25
	SPUR LAKE			1	15	1	15
	WISCONSIN RIVER			2	120	2	120
	WOLF RIVER	2	60			2	60
	Subtotal	**2**	**60**	**5**	**160**	**7**	**220**
POLK	BALSAM BRANCH			1	1	1	1
	CRANBERRY MARSH			1	20	1	20
	JOEL FLOWAGE			3	5	3	5
	LITTLE BUTTERNUT LAKE			1	0	1	0
	Subtotal	**0**	**0**	**6**	**26**	**6**	**26**
PRICE	SPRING CREEK			1	6	1	6
	UNNAMED WATER			5	10	5	10
	Subtotal	**0**	**0**	**6**	**16**	**6**	**16**
RUSK	LEA LAKE FLOWAGE			5	106	5	106
	Subtotal	**0**	**0**	**5**	**106**	**5**	**106**
SAWYER	BILLY BOY FLOWAGE			1	60	1	60
	CHIPPEWA RIVER			3	68	3	68
	HUNTER LAKE			1	1	1	1
	PACWAWONG FLOWAGE	18	690	98	2,402	116	3,092
	PHIPPS FLOWAGE	1	30	8	247	9	277
	Subtotal	**19**	**720**	**111**	**2,778**	**130**	**3,498**
TAYLOR	CHEQUAMEGAN WATERS			1	0	1	0
	MONDEAUX FLOWAGE			4	130	4	130
	Subtotal	**0**	**0**	**5**	**130**	**5**	**130**
VILAS	ALLEQUASH LAKE	3	140	3	65	6	205
	ANVIL LAKE			1	25	1	25
	AURORA LAKE	5	210	15	525	20	735
	FROST LAKE			2	4	2	4
	IRVING LAKE	8	295	10	473	18	768
	ISLAND LAKE	4	195	5	98	9	293
	LITTLE RICE LAKE			5	80	5	80
	MANITOWISH RIVER	7	280	6	300	13	580
	MANN FLOWAGE			2	49	2	49
	NIXON CREEK			2	15	2	15
	PARTRIDGE LAKE			1	20	1	20
	PLUM LAKE	1	30			1	30
	RICE LAKE	3	180	1	5	4	185
	SPRING CREEK			1	6	1	6
	UNNAMED WATER			10	265	10	265
	UPPER NINE MILE FL.	3	75	19	1,538	22	1,613
	Subtotal	**34**	**1,405**	**83**	**3,468**	**117**	**4,873**
WASHBURN	BLACK BROOK FLOWAGE			5	217	5	217
	DILLY LAKE	4	100	5	60	9	160
	POTATO LAKE			1	7	1	7
	ROCKY RIDGE CREEK			2	35	2	35
	TRANUS LAKE			5	205	5	205
	Subtotal	**4**	**100**	**18**	**524**	**22**	**624**
	GRAND TOTAL	**112**	**3,735**	**515**	**18,362**	**627**	**22,097**

Appendix 2. Waters suggested for seeding by respondents to the 2002 wild rice harvest survey.	
COUNTY	WATER
Barron	Desaire Lake Duck Lake Hemlock Lake Lake Montanis Stump Lake
Bayfield	Bass Lake (T44N, R6W, S24) Dinner Camp Lake Lake Namekagon (above dam) Namekagon River (Upper) Ryberg Lake Sioux River
Burnett	DOT Mitigation Site (CTH H, Town of Roosevelt, near Timberland Church) Kreiner Lake Taylor Lake Yellow River below Yellow Lake
Forest	Atkins Lake
Jefferson	Rock River ("Was historically common" - state respondent 146)
Oconto	Waupee Lake
Polk	Clam Falls Flowage Joel Flowage (new impoundment) Largon Lake McKenzie Creek Mud or Briget Lake Straight Lake
Rusk	Bucks Lake (east of Murphy Flowage)
Sawyer	Callahan Lake Chippewa Flowage Ghost Lake Indian School/Hospital Lake Smith Lake (north end) Star Lake Teal Lake Tiger Cat Flowage
Washburn	Leesome Lake Little Long Lake No Mans Lake (on Burnett County line) Pickerel Lake Pokegama Lake Spooner Lake Tranus Lake