



**Wild Rice (Manoomin)
Abundance and Harvest
in Northern Wisconsin in 2003**

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MANOOMIN (WILD RICE) ABUNDANCE AND HARVEST IN NORTHERN WISCONSIN IN 2003

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 2003 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 30 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 7th, 8th and 12th. 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.

One lake, Rice Lake in Polk County, with an average abundance index of 181 (1985-2002) was not surveyed in 2003. Thus, when comparisons are made between 2003 and 2002, data for this lake was suppressed for 2002 as well. For comparisons between 2003 and long term averages, an index was estimated for this lake by applying the ratio between the long term overall index and the 2003 overall index for all other waters (3807/5318) to the long term index for Rice Lake (181). This produced an estimated index of 130 for this water in 2003.

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 944 individuals in 2003. When individuals obtained their 2003 permit, they were asked if they harvested rice the previous year. Thirty-five percent (55/157) of the individuals who indicated they had riced in 2002 (“active” ricers) were surveyed by phone, as well as 17% (100/584) of those individuals who indicated they had not riced the previous year (“inactive” ricers). Since 203 permit holders failed to answer the question, these individuals were treated as a third group in this survey (unlike last year, but as was done in 2001); 22% (45/203) of these individuals were also surveyed (“non-responsive” ricers) (Table 1).

The number of tribal members who actually harvested off-reservation in 2003 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.

GROUP	TOTAL NUMBER	# SURVEYED	% SAMPLED	% ACTIVE OFF-RESERVATION	EST. # ACTIVE OFF-RESERVATION
ACTIVE ¹	157	55	35%	41.8%	66
INACTIVE ¹	584	100	17%	2.0%	12
NON-RESPONSIVE ¹	203	45	22%	8.9%	18
TOTAL	944	200			96

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 558 of the 621 individuals who obtained the state license. The number of active ricers was estimated by expanding the results reported by the 310 respondents to the state survey (50% of licensees).

Among state respondents was one individual 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 566 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 48 additional waters surveyed only from the air are listed in Table 3. A total of 2,121 acres of wild rice were estimated for these 88 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 2003.

Survey results and field observations indicate that the 2003 rice crop was similar overall to 2002 (Table 2). However, the distribution of the rice was somewhat different, with the abundance index declining about 15% on northwestern waters, and increasing a similar amount on north-central waters (Figure 2). Most of the decline in the northwest was attributable to two waters, Clam Lake in Burnett County and Pacwawong Flowage in Sawyer County. Among all northwest waters, 13 increased, 7 declined and one was unchanged, and although Clam and Pacwawong led the decliners, both still had appreciable areas of harvestable rice.

Among north-central waters, 4 showed an increase, 10 a decline and 4 were unchanged (Table 2). The Rhinelander Flowage/Wisconsin River showed the biggest decline, but also still had a substantial quantity of harvestable rice. Overall, the 2003 index was 72% of the long-term index average (1985-2003).

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.

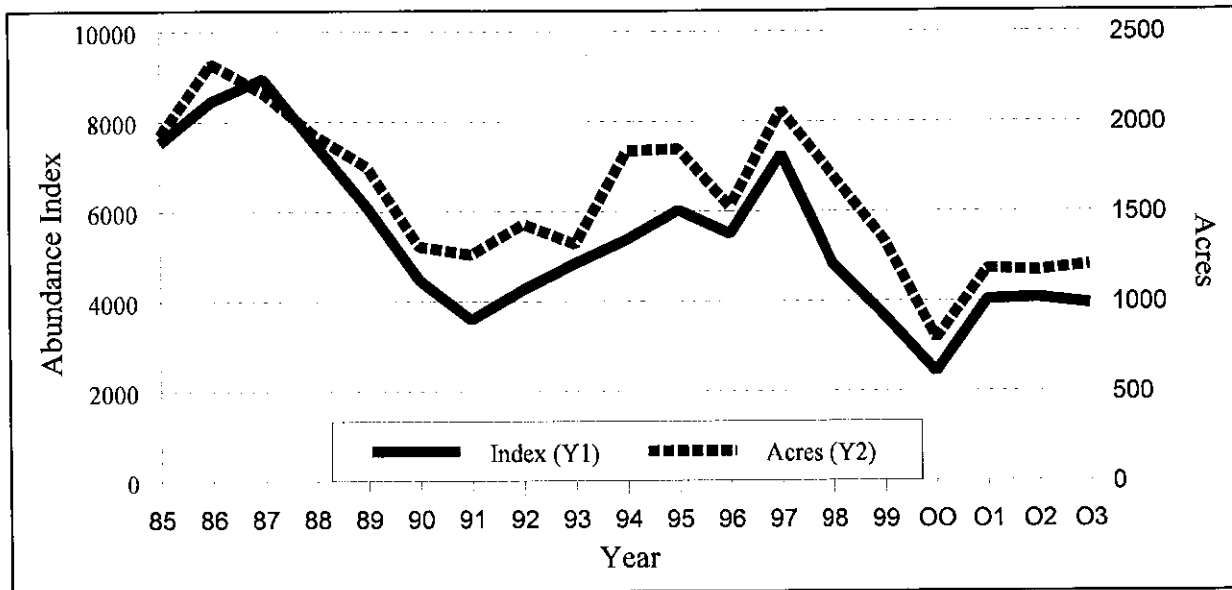


Figure 1. Manoomin acreage and abundance index from 40 Wisconsin rice waters surveyed annually from 1985-2003.

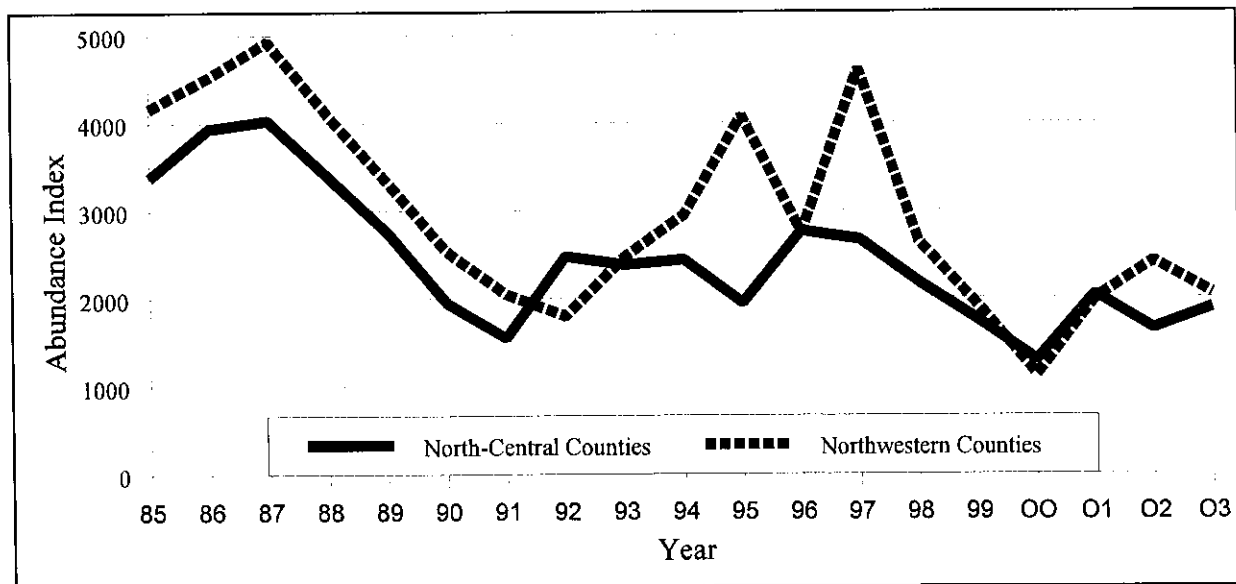


Figure 2. Manoomin abundance index from 40 Wisconsin rice waters surveyed annually from 1985-2003; northwestern versus north-central Wisconsin waters (Highway 13 was used to separate northwestern from north-central waters).

Table 2. Manoomin acreage, density and abundance index from 40 Wisconsin waters for 2000-2003, and the 1985-2003 means.
(Data for 1985-1999 can be found in David, 2001.)
(*Index for Rice Lake, Polk County, year 2003 estimated; see text.)

WATER	2000			2001			2002			2003			1985-2003		
	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX
NORTHWESTERN CTYS.															
BARRON															
SWEENEY CREEK	5	2	10	3	2	6	5	3	15	20	3	60	11	3	39
BAYFIELD															
TOTOGATIC LAKE	51	3	153	65	3	195	18	2	36	120	2	240	152	3	497
BURNETT															
BASHAW LAKE	7	1	7	7	3	21	3	3	9	6	2	12	12	3	33
BIG CLAM LAKE	31	2	62	125	2	250	190	4	760	135	3	405	152	3	529
BRIGGS LAKE	22	4	88	41	4	164	8	4	32	12	5	60	29	4	114
GASLYN LAKE	18	2	36	15	3	45	7	3	21	12	4	48	25	3	89
LONG LAKE	20	1	20	20	3	60	60	2	120	20	1	20	73	2	187
MUD LAKE (2)	6	3	18	15	3	45	12	5	60	14	5	70	14	4	52
WEBB CREEK	20	5	100	20	5	100	9	4	36	11	5	55	12	4	56
DOUGLAS															
MULLIGAN LAKE	15	4	60	18	3	54	10	3	30	20	4	80	25	2	56
POLK															
RICE BED CREEK	4	4	16	15	4	60	8	3	24	15	4	60	11	4	49
RICE LAKE (1)			80*	50	3	150	40	3	120			130*	52	3	181
WHITE ASH LAKE	8	2	16	6	4	24	9	3	27	6	4	24	13	3	42
SAWYER															
BILLY BOY FLOW.	5	2	10	4	2	8	15	4	60	7	3	21	14	2	46
BLAISDELL LAKE	30	3	90	72	3	216	95	1	95	95	1	95	77	3	227
PACWAWONG LAKE	48	4	192	120	3	360	135	5	675	105	4	420	91	4	351
PHIPPS FLOWAGE	19	4	76	18	5	90	25	4	100	22	3	66	32	4	126
WASHBURN															
DILLY LAKE	21	4	84	18	3	54	13	4	52	16	5	80	22	4	92
POTATO LAKE	12	2	24	12	2	24	24	5	120	16	4	64	14	3	44
RICE LAKE	14	4	56	11	4	44	4	4	16	8	3	24	24	3	89
SPRING LAKE (1)	0	0	0	5	1	5	3	2	6	4	2	8	15	3	51
TRANUS LAKE	2	1	2	5	2	10	2	2	4	3	2	6	37	2	59
SUBTOTAL	358		1,120	665		1,985	695		2,418	667		2,048	904		3,009
NORTH-CENTRAL CTYS.															
FOREST															
ATKINS LAKE	0	0	0	0	0	0	0	0	0	0	0	0	20	1	58
INDIAN/RILEY LAKE	7	3	21	5	5	25	11	4	44	14	4	56	6	3	18
PAT SHAY LAKE	4	1	4	8	4	32	1	3	3	0	0	0	44	2	73
RAT RIVER	16	4	64	18	5	90	22	5	110	24	5	120	22	5	103
WABIKON LAKE	24	2	48	36	5	180	65	2	130	65	3	195	42	3	111
LINCOLN															
ALICE LAKE	24	3	72	12	4	48	30	4	120	15	2	30	50	3	181
ONEIDA															
FISH LAKE	10	2	20	14	2	28	5	3	15	5	2	10	36	3	129
LITTLE RICE LAKE	0	0	0	0	0	0	0	0	0	0	0	0	8	1	33
RICE LAKE	60	1	60	70	1	70	60	1	60	60	1	60	72	1	126
SPUR LAKE	25	1	25	45	2	90	30	2	60	68	3	204	73	3	286
WISCONSIN RIVER	165	4	660	180	5	900	145	5	725	125	5	625	146	5	654
PRICE															
BLOCKHOUSE LAKE	4	1	4	4	1	4	1	1	1	5	1	5	19	3	67
VILAS															
ALLEQUASH LAKE	40	3	120	35	5	175	20	3	60	26	4	104	70	4	298
LITTLE RICE LAKE	4	3	12	20	4	80	23	3	69	36	3	108	13	2	36
MANITOWISH RIVER	14	5	70	16	5	80	13	5	65	13	5	65	15	4	72
PARTRIDGE LAKE	21	4	84	18	5	90	9	4	36	13	4	52	19	4	85
RICE LAKE	10	2	20	28	5	140	36	4	144	43	5	215	25	4	85
WEST PLUM LAKE	2	2	4	6	2	12	2	3	6	20	2	40	22	3	76
SUBTOTAL	430		1,288	515		2,044	473		1,648	532		1,889	702		2,490
COUNT:			39			40			40			39			40
TOTAL:	788		2,488	1,180		4,029	1,168		4,066	1,199		3,937	1,606		5,499
AVERAGE:			62			101			102			98			137

Table 3. Estimated manoomin acreage and density for waters aerially surveyed in 2003.					
COUNTY	WATER	2003 EST. ACRES	2003 EST. DENSITY	2002 EST. ACRES	2002 EST. DENSITY
Barron	Bear Lake	26	sparse-medium	not surveyed	
Burnett	Clam River Flowage	27	dense	55	dense
	Grettum Flowage	10	sparse-dense	not surveyed	
	North Fork Flowage	50	medium-dense	40	medium-dense
	North Lang Lake	4	dense	3	dense
	Phantom Flowage	55	medium	35	medium-dense
	Rice Lake ¹	10	medium	2	sparse
	Yellow Lake	16	medium-dense	16	sparse
Douglas	Lower Ox Lake	10	medium	5	sparse-medium
	Minong Flowage (Smiths Bridge)	28	medium-dense	33	dense
	Radigan Flowage	4	sparse	6	medium
	St.Croix River/Cutaway Dam	40	medium-dense	48	dense
	Upper Ox Lake	6	dense	not surveyed	
Forest	Hiles Millpond	10	medium	10	medium
	Little Rice Flowage	80	medium	60	medium
	Scott Lake	2	medium	not surveyed	
Iron	Gile Flowage	5	dense	4	medium-dense
	Little Turtle Flowage	20	dense	not surveyed	
	Mud Lake	6	medium-dense	3	medium
Langlade	Daly Pond	8	medium-dense	4	medium
	Miniwaukan Lake	4	medium	1	medium
	Spider Creek Flowage	30	dense	not surveyed	
Oneida	Big Lake	10	medium	6	medium-dense
	Cuenin Lake	15	medium-dense	18	medium-dense
	Fourmile Lake	3	dense	not surveyed	
	Scott Creek Impoundment	8	medium	10	medium
	The Thoroughfare	75	medium-dense	70	medium
	Wolf River ²	14	medium-dense	14	medium-dense
Polk	Joel Flowage	6	medium	not surveyed	
	Little Butternut	3	medium	not surveyed	
Price	Lower Steve Creek Flowage	1	sparse	not surveyed	
	Spring Creek Wildlife Area	8	medium-dense	not surveyed	
Sawyer	Partridge Crop Lake	14	medium	6	sparse-medium
	West Branch Chippewa River	16	medium-dense	10	medium
Vilas	Aurora Lake	45	sparse-dense	17	medium
	Devine Lake	6	medium	2	medium-dense
	Frost Lake	9	medium	9	sparse-medium
	Irving Lake	20	sparse-medium	25	medium
	Island Lake	60	sparse-medium	50	medium
	Lower Ninemile Lake	18	medium	15	medium
	Nixon Lake	3	sparse	not surveyed	
	Rest Lake	4	medium-dense	4	medium
	Rice Creek ³	8	sparse-medium	18	dense
	Rice Creek ⁴	10	medium-dense	12	medium-dense
	Round Lake	2	medium-dense	1	medium
	Upper Ninemile Lake	80	sparse-dense	55	medium-dense
Washburn	Long, Mud, & Little Mud Lakes	23	medium-dense	22	medium-dense
	Trego Flowage	10	dense	8	medium

¹ W of Frederic, (T37N, R18W, S36); ² NW of Lennox; ³ N of Big Lake; ⁴ N of Island Lake

Harvest Estimation

Responses were obtained from 200 tribal permit holders and 310 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. Twenty-nine of the tribal and 283 of the state licensees surveyed reported harvesting rice in 2003. The total number estimated active in each group was 96 tribal members and 567 state licensees (Table 4).

Tribal harvesters active off-reservation reported making from 1 to 17 ricing trips, averaging 5.3 trips. Tribal survey respondents made a total of 151 off-reservation harvesting trips, gathering 8,845 pounds of green rice (Appendix 1), with an extrapolated total harvest estimate of 27,802 pounds in 511 trips, an average of 54 pounds per trip (Table 4). The total off-reservation harvest per active license averaged 290 pounds.

Table 4. A comparison of tribal (off-reservation) and state manoomin harvest in 2003.

	NUMBER OF PERMIT HOLDERS	ESTIMATED NUMBER ACTIVE	AVERAGE NUMBER OF TRIPS	AVERAGE HARVEST/ TRIP	AVE. HARVEST/ ACTIVE LICENSE	TOTAL ESTIMATED HARVEST / TRIPS
TRIBAL	944	96	5.3	54	290	27,802 / 511
STATE	621	567	2.6	34	87	49,358 / 1,453
TOTAL	1,565	663	3.0	39	116	77,160 / 1,964

In comparison, active state licensees reported making from 1 to 21 ricing trips, averaging 2.6 trips. Collectively, state survey respondents made 737 trips and harvested a total of 25,529 pounds of green rice (Appendix 1), an average of 34 pounds per trip. The total harvest per active state license averaged 87 pounds.

The amount of rice harvested per individual varied greatly (Table 5). The unique state ricer discussed in the Methods section reported harvesting 1,700 pounds of rice, while the most reported by one tribal ricer was 1,200 pounds.

Ninety-one percent of the state-licensed respondents gathered rice in 2003, versus 10% 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.

Table 5. Distribution of harvest among active respondents to the 2003 harvest survey.			
TRIBAL			
POUNDS OF GREEN RICE HARVESTED	INDIVIDUALS		PERCENT OF TOTAL HARVEST
	NUMBER	PERCENT	
0 - 50	3	10.3	1.2
51 - 100	3	10.3	2.3
101 - 150	3	10.3	4.5
151 - 200	6	20.7	12.2
201 - 300	7	24.1	19.2
301 - 500	2	6.9	9.0
501 - 1000	3	10.3	25.6
1001 +	2	6.9	26.0
STATE			
POUNDS OF GREEN RICE HARVESTED	INDIVIDUALS		PERCENT OF TOTAL HARVEST
	NUMBER	PERCENT	
0 - 50	145	51.2	14.3
51 - 100	72	25.4	21.1
101 - 150	28	9.9	13.6
151 - 200	14	4.9	9.8
201 - 300	12	4.2	11.9
301 - 500	5	1.8	7.6
501 - 1000	6	2.1	15.0
1001 +	1	0.4	6.7

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, who are not required to have a permit to harvest on-reservation.

Using the approach to estimate harvest described above in the Methods section, total off-reservation harvest for tribal permit holders was estimated at 27,802 pounds of green rice (Table 4). The total harvest for state permittees was estimated at 49,358 pounds, with all but 217 pounds of it coming from off-reservation waters. Thus, the total off-reservation harvest was estimated at 76,943 pounds, with tribal ricers accounting for 36% of the harvest.

This harvest estimate is 77% above the 2002 off-reservation harvest estimate of 43,542 pounds (David, 2008). While both state and tribal harvest increased from 2002, state harvest showed a 54% increase, while tribal harvest more than doubled (up 137%). For the state, the increase was attributable to an increase in the number of ricers, while the tribal increase was attributable primarily to an increase in the number of trips made, and the amount harvested per trip. Manoomin harvest tends to vary with abundance as well as other factors (Figure 3).

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). Approximately ninety-one waters were reported riced in 2003 (not including unnamed locations), up from the 75 waters

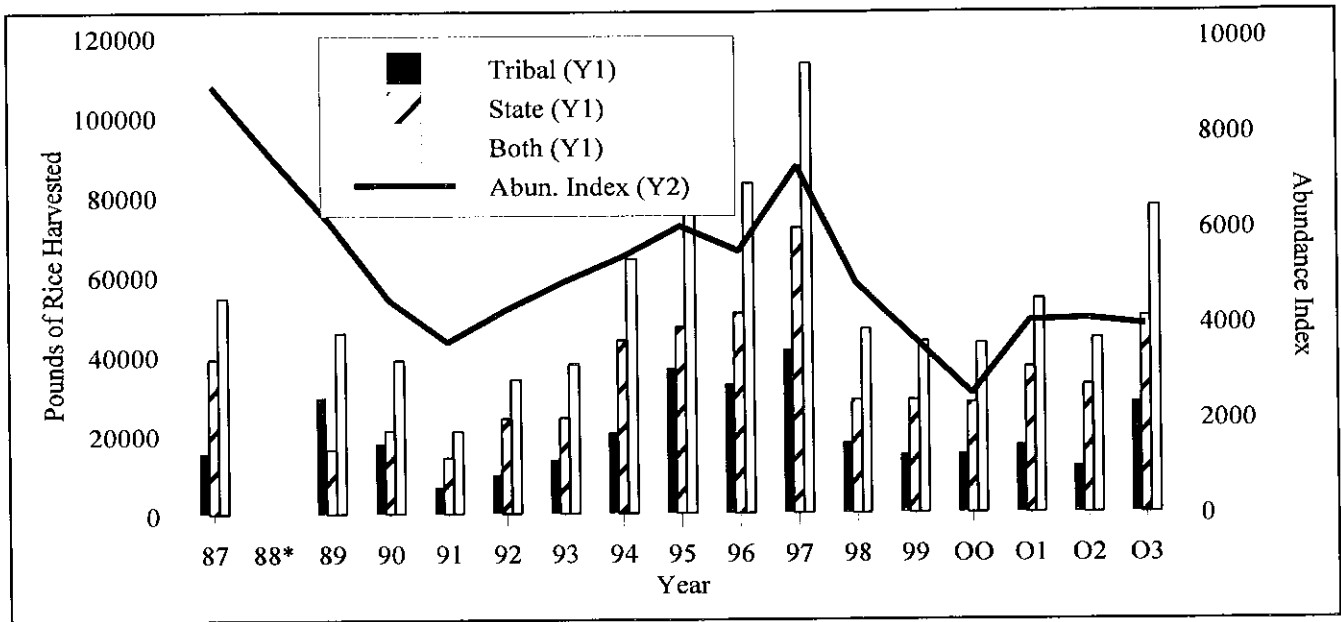


Figure 3. Harvest trends versus abundance index, 1987-2001 (* no harvest estimates for 1988).

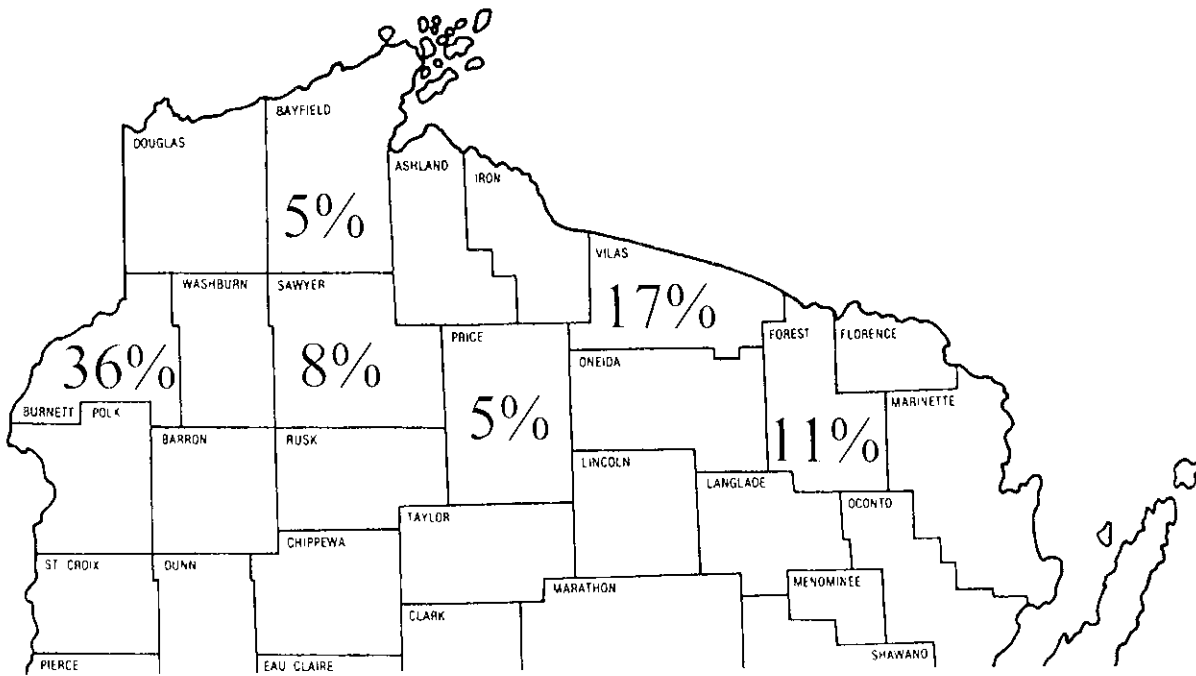


Figure 4. Distribution of counties accounting for 5% or more of the manoomin harvest reported by respondents to the 2003 harvest survey, tribal and state harvesters combined.

reported in 2002, and perhaps accounting for some of the increased harvest. Less than 1% of the harvest reported by surveyed state licensees came from waters outside the ceded territory (Appendix 1). Approximately 30% of harvest reported from named locations came from sites planted by the WDNR, the U.S. Forest Service, GLIFWC, or other seeding cooperators, including the Phantom Flowage in Burnett County, the most heavily harvested water in 2003. This was up from 20% in 2002.

Opinions of Respondents

Annual Abundance: Individuals were asked if they felt the 2003 wild rice crop was better, the same, or worse than the 2002 crop. Among the 206 active respondents with an opinion, 62% felt 2003 was better than 2002, 32% felt both years were about the same, and 6% were of the opinion that 2003 was worse than 2002.

Unlike most past years, these opinions did not correlate well with results from the abundance surveys of 40 rice waters discussed earlier, which found little overall change in abundance state-wide between years. This may be because ricers are taking greater advantage of newly seeded beds, as shown in both the increase mentioned above, and in the increase in the total number of beds riced. It may also be that rice abundance in the state this year was not well reflected by the 40 waters used to develop the index. It is interesting that while the index waters showed little overall trend in abundance, waters only aerially surveyed showed an upward trend; of the 36 waters surveyed by air in both 2002 and 2003, 17 showed a increase in abundance, 7 a decline, and 12 were essentially unchanged.

Date-Regulated Waters: Respondents were also asked their opinion about how many waters should be date-regulated. Twenty-four of 29 tribal and 175 of 283 state rices expressed an opinion. State ricers were fairly divided in their opinion, though more favored keeping the number the same or increasing it than having fewer or no waters regulated (Table 6). Most tribal members favored increasing the number or keeping it the same. A much higher percentage of state licensees expressed no opinion; many of these individuals had relatively little ricing experience.

Opinion	Tribal	State	Total	Percent
More	10	44	54	27.1
Same	10	49	59	29.6
Fewer	2	36	38	19.1
None	2	46	48	27.4
Total	24	175	199	100

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

The most frequent comments (9 individuals) were expressions of thanks for managing and/or protecting the resource; an additional 5 indicated they would like to see more seeding done. Six individuals mentioned that they liked it when the date-regulated lakes in an area were opened on a rotation, while 1 individual disliked this approach. A low incidence of rice worms was mentioned by 5 people. Two respondents indicated that information on finishing rice needs to be developed, and two state respondents felt license fees should be dropped. No other comments were made by more than one individual.

Potential Waters for Seeding or Other Restoration: Respondents suggested 33 different waters which might be candidates for seeding or other restoration efforts. Sites named are listed in Appendix 2.

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Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2003 harvest survey.							
COUNTY	WATER	TRIBAL		STATE		COMBINED TOTAL	
		TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS
Ashland	Kakagon Sloughs	2	100			2	100
	Subtotal	2	100	0	0	2	100
Barron	Bear Lake	17	358			17	358
	Subtotal	17	358	0	0	17	358
Bayfield	Chippewa Lake	13	481			13	481
	Totogatic Lake	48	910	5	175	53	1,085
	Subtotal	61	1,391	5	175	66	1,566
Burnett	Bashaw Lake	1	5			1	5
	Black Brook Flowage	2	25			2	25
	Briggs Lake	1	41			1	41
	Carters Bridge	3	121	2	65	5	186
	Clam Flowage	17	668	2	110	19	778
	Clam Lake	50	1,972	4	210	54	2,182
	Clam River	1	30			1	30
	Eagle Lake	1	25			1	25
	Gaslyn Lake	3	76			3	76
	Long Lake	13	350			13	350
	Mud Lake	1	15			1	15
	Mudhen Lake	2	37			2	37
	North Fork Flowage	8	200			8	200
	North Lang Lake	2	90			2	90
	Phantom Flowage	118	5,952	8	500	126	6,452
	Reed Lake	2	80			2	80
	Rice Lake	4	62			4	62
	Spencer Lake	1	15			1	15
	Webb Creek	3	50			3	50
	Yellow River	3	90			3	90
	Unnamed Water			9	1,200	9	1,200
	Subtotal	236	9,904	25	2,085	261	11,989
Douglas	Lower Ox Lake	4	67			4	67
	Minong Flowage	18	440	2	75	20	515
	Pokegama River	1	3			1	3
	Radigan Flowage	6	160	1	0	7	160
	St. Croix River	13	376	3	150	16	526
	Upper Ox Lake	2	45			2	45
	Subtotal	44	1,091	6	225	50	1,316
Forest	Bog Brook Flowage	1	40			1	40
	Laona Millpond	2	200			2	200
	Little Rice Lake	28	2,015	1	100	29	2,115
	Rat River	6	550	4	500	10	1,050
	Rice Lake	2	12			2	12
	Wabikon Lake	6	50	1	20	7	70
	Subtotal	45	2,867	6	620	51	3,487
Green Lake	Lake Puckaway	1	2			1	2
	Subtotal	1	2	0	0	1	2

(Appendix 1 continued on the next page.)

Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2003 harvest survey.							
COUNTY	WATER	TRIBAL		STATE		COMBINED TOTAL	
		TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS
Iron	Bear River	7	70			7	70
	Gile Flowage	2	33			2	33
	Little Turtle Flowage	4	112			4	112
	Mud Lake	5	102	1	0	6	102
	Subtotal	18	317	1	0	19	317
Jackson	Priv. Cranberry Bog	2	35			2	35
	Subtotal	2	35	0	0	2	35
Langlade	Lily River	1	50			1	50
	Subtotal	1	50	0	0	1	50
Lincoln	Alexander Flowage	2	5			2	5
	Lake Alice	1	200	3	100	4	300
	Wisconsin River	2	15			2	15
	Subtotal	5	220	3	100	8	320
Marquette	Neshkoro Millpond	2	84			2	84
	Subtotal	2	84	0	0	2	84
Oneida	Big Lake	1	50			1	50
	Eagle Lake	2	14			2	14
	Rhineland Flowage	2	35	2	55	4	90
	Rice Lake	2	15			2	15
	Spur Lake	9	377	10	445	19	822
	Throughfare	2	74	4	150	6	224
	Subtotal	18	565	16	650	34	1,215
Polk	Apple River	2	36			2	36
	Joel Flowage	7	106			7	106
	Rice Bed Creek	5	155			5	155
	White Ash Lake	1	17			1	17
	Subtotal	15	314	0	0	15	314
Price	Blockhouse Lake			7	130	7	130
	Spring Creek WA	32	1,485			32	1,485
	Subtotal	32	1,485	7	130	39	1,615
Rusk	Lea Flowage	2	47			2	47
	Subtotal	2	47	0	0	2	47
Sawyer	Barker Lake	1	7			1	7
	Blaisdell Lake	14	205			14	205
	Chippewa River	2	22			2	22
	Namakagon River	1	74	1	20	2	94
	Pacwawong Flowage	90	1,571	5	360	95	1,931
	Phipps Flowage	10	240	3	100	13	340
	Unnamed Water			2	70	2	70
	Subtotal	118	2,119	11	550	129	2,669
Taylor	Chequamegon Waters	3	194	1	40	4	234
	Mondeaux Flowage	16	1,074	1	60	17	1,134
	Subtotal	19	1,268	2	100	21	1,368

(Appendix 1 continued on the next page.)

Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2003 harvest survey.								
COUNTY	WATER	TRIBAL		STATE		COMBINED TOTAL		
		TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS	
Vilas	Allequash Lake	8	263	2	65	10	328	
	Aurora Lake	12	382	13	888	25	1270	
	Irving Lake	8	360	4	230	12	590	
	Island Lake	7	200	1	65	8	265	
	Little Rice Lake	4	148	5	340	9	488	
	Lost Creek	4	10			4	10	
	Lower Ninemile Lake			2	65	2	65	
	Manitowish River	2	94			2	94	
	Mann Creek	1	5			1	5	
	Nixon Creek	3	30			3	30	
	Plum Lake			1	56	1	56	
	Rice Creek	3	61			3	61	
	Rice Lake			1	80	1	80	
	Unnamed Water	2	50	12	760	14	810	
	Upper Ninemile Lake	21	1,137	4	193	25	1330	
	Subtotal		75	2,740	45	2,742	120	5,482
	Washburn	Dilly Lake	6	400	1	30	7	430
Gilmore Lake		2	16			2	16	
Long Lake		2	12			2	12	
Potato Lake		5	37			5	37	
Rocky Creek		2	23			2	23	
Tranus Lake		1	48			1	48	
Unnamed Water		1	3			1	3	
Subtotal			19	539	1	30	20	569
Waupaca	White Lake	2	12			2	12	
	Subtotal	2	12	0	0	2	12	
Waushara	Auroraville Millpond	2	20			2	20	
	Saxesville Millpond	1	1			1	1	
	Subtotal	3	21	0	0	3	21	
Unnamed	Unnamed Water			23	1,438	23	1,438	
	Subtotal			23	1,438	23	1,438	
GRAND TOTAL		737	25,529	151	8,845	888	34,374	

Appendix 2. Waters suggested for seeding or restoration by respondents to the 2003 wild rice harvest survey.*	
COUNTY	WATER
Ashland	Fish Creek
Barron	Bolger Flowage (on Rusk county line) Duck Lake (east of Cameron) Hemlock Lake Kelly Lake Lake Montanis Rice Creek (north of Highway 8) Rice Lake (at Red Cedar Inlet) Stump Lake
Bayfield	Eau Claire Lakes Chain Namekagon Lake (above the dam)
Burnett	Mud Lake (Oakland Township) Yellow Lake Yellow River (north of Little Yellow Lake)
Douglas	Gordon Flowage Mulligan Lake St. Louis River Estuary
Forest	Revolver Lake
Oconto	Waupee Lake
Oneida	Spur Lake
Polk	Alabama Lake Clam Falls Flowage Goose Lake (T33N, R17W, S27) Rice Lake
Sawyer	Ghost Lake Nelson Lake Teal Lake (southwest flats) Totagatic Flowage Yellow River Flowage
Vilas	Pickerel Creek (north of Boot Lake)
Washburn	Casey Creek Flowage Davis Flowage
Waukesa	Mukwonago River

* Suggested waters with relatively well established beds not included.