

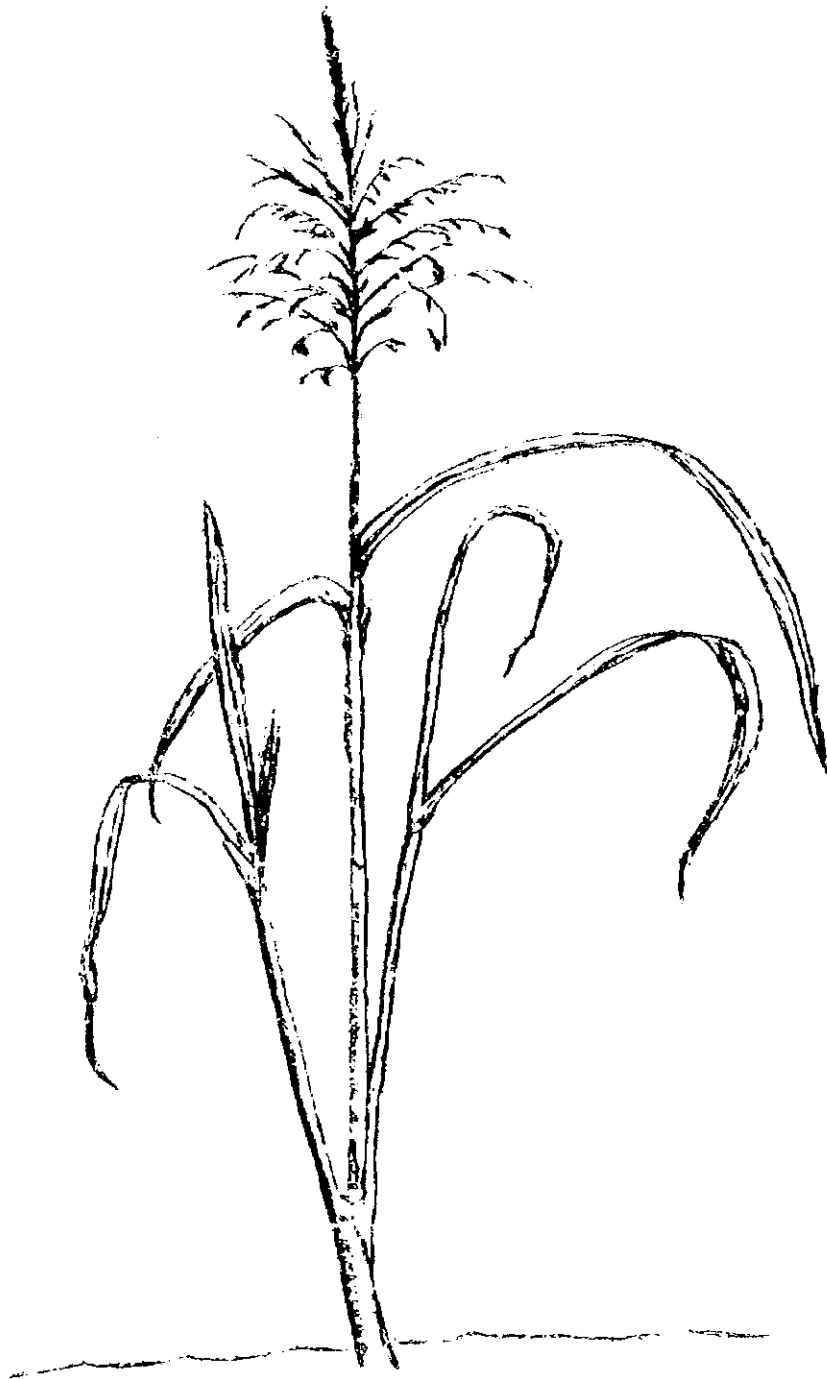


**Wild Rice (Manoomin)
Abundance and Harvest
in Northern Wisconsin in 2005**

by
Peter F. David
Wildlife Biologist

Administrative Report 08-22
November 2008

**Great Lakes Indian Fish
& Wildlife Commission**
Biological Services Division
P.O. Box 9
Odanah, WI 54861
(715) 682-6619



Acknowledgments: I would like to thank Dan North and Tanya Aldred for their assistance in conducting the harvest surveys described in this report, and Neil Kmiecik for his editorial review.
Miigwech!

MANOOMIN (WILD RICE) ABUNDANCE AND HARVEST IN NORTHERN WISCONSIN IN 2005

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 2005 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 5th, 10th and 23rd. 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 850 individuals in 2005. When individuals obtained their 2005 permit, they were asked if they harvested rice the previous year. Fifty-one percent (78/153) of the individuals who indicated they had riced in 2004 ("active" ricers) were surveyed by phone, as well as 24% (124/526) of those individuals who

indicated they had not riced the previous year (“inactive” ricers). Since 171 permit holders failed to answer the question, these individuals were treated as a third group in this survey (as was done in 2001, 2003 and 2004); 65% (112/171) of these individuals were also surveyed (“non-responsive” ricers) (Table 1).

The number of tribal members who actually harvested off-reservation in 2005 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 2005 tribal off-reservation manoomin harvest survey sampling.					
GROUP	TOTAL NUMBER	# SURVEYED	% SAMPLED	% ACTIVE OFF-RESERVATION	EST. # ACTIVE OFF-RESERVATION
ACTIVE ¹	153	78	51%	17.9%	27
INACTIVE ¹	526	124	24%	4.0%	21
NON-REPONSIVE ¹	171	112	65%	14.3%	24
TOTAL	850	314			72

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 569 of the 585 individuals who obtained the state license. The number of active ricers was estimated by expanding the results reported by the 294 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 471 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 50 additional waters surveyed only from the air are listed in Table 3. A total of 2,288 acres of wild rice were estimated for these 90 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 2005.

Survey results and field observations indicate that 2005 was an unusual year in many respects. While some beds did very well, many had a relatively poor year. Overall, the wild rice abundance index showed a marked decline from 2004 (Table 2). Although the total acreage of beds was similar between years, bed density was generally poorer in 2005. Northwest Wisconsin waters showed the greatest downturn, with 12 of the 21 waters surveyed both years showing a decline, resulting in a 34% decrease regionally. Among north-central waters, 10 of 18 trended downward, with a regional decrease of 17% (Table 2, Figure 2). Overall, the 2005 index was down 26% from 2004, and 38% below the long-term index average (1985-2005). The 2005 index was the second lowest since surveys began in 1987.

Aerial surveys, harvest data and comments from harvesters (see Comments section below) suggest the crop may have been even poorer than the abundance index suggests. The index reflects only the size and density of beds, not seed production, which can be highly variable between years. The color of many beds, as observed on air surveys, had an unusual reddish tinge, possibly reflecting a high prevalence of brown spot disease. This disease has been shown to negatively impact seed production in cultivated wild rice beds. An unusually high number of survey respondents also commented on the presence of “ghost rice”, or empty hulls. Combined with frequent comments about harvest being limited by low water (that hindered access) or high wind or rain, it appears the season may have been even poorer from a harvester’s viewpoint than the abundance index implies.

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.

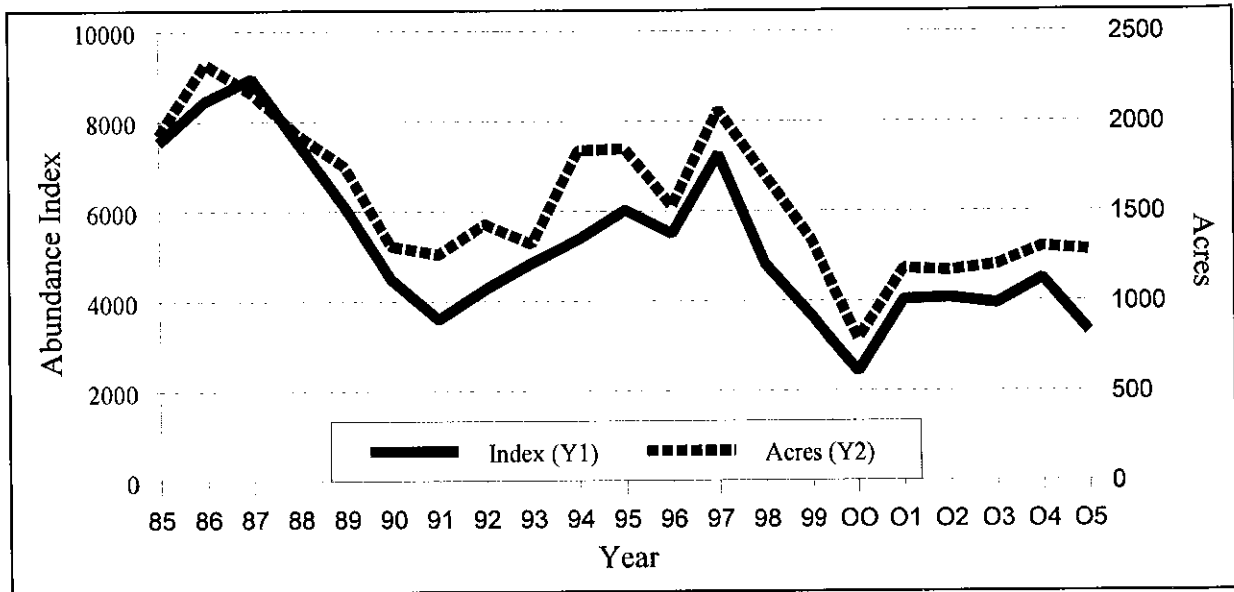


Figure 1. Manoomin acreage and abundance index from 40 Wisconsin rice waters surveyed annually from 1985-2005.

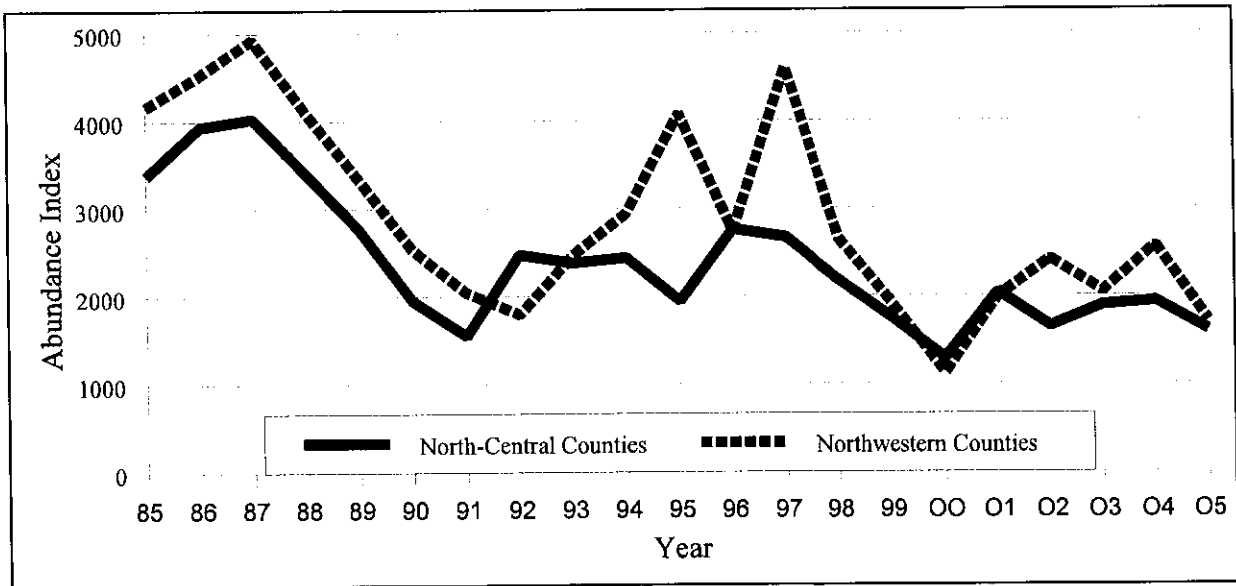


Figure 2. Manoomin abundance index from 40 Wisconsin rice waters surveyed annually from 1985-2005; northwestern versus north-central Wisconsin waters (Highway 13 was used to separate northwestern from north-central waters).

Table 2. Manoomin acreage, density and abundance index from 40 Wisconsin waters for 2002-2005, and the 1985-2005 means.
(Data for 1985-2001 can be found in David, 2001 and David, 2008a.)

WATER	2002			2003			2004			2005			1985-2005		
	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	MEAN ACRES	MEAN DEN.	MEAN INDEX
NORTHWESTERN CTYS.															
BARRON															
SWEENEY CREEK	5	3	15	20	3	60	1	1	1	11	2	22	10	2.6	37
BAYFIELD															
TOTOGATIC LAKE	18	2	36	120	2	240	135	2	270	350	2	700	160	2.7	496
BURNETT															
BASHAW LAKE	3	3	9	6	2	12	2	2	4	4	2	8	11	2.6	30
BIG CLAM LAKE	190	4	760	135	3	405	165	3	495	120	2	240	151	3.4	514
BRIGGS LAKE	8	4	32	12	5	60	19	3	57	22	3	66	28	3.8	109
GASLYN LAKE	7	3	21	12	4	48	25	4	100	5	1	5	24	3.2	86
LONG LAKE	60	2	120	20	1	20	40	3	120	20	2	40	69	2.4	177
MUD LAKE (2)	12	5	60	14	5	70	10	4	40	10	1	10	14	3.5	49
WEBB CREEK	9	4	36	11	5	55	12	4	48	12	3	36	12	3.9	55
DOUGLAS															
MULLIGAN LAKE	10	3	30	20	4	80	38	3	114	42	3	126	26	2.2	62
POLK															
RICE BED CREEK	8	3	24	15	4	60			40*	10	2	20	11	4.3	47
RICE LAKE (1)	40	3	120			130*	40	4	160	30	4	120	50	3.3	177
WHITE ASH LAKE	9	3	27	6	4	24	6	4	24	7	4	28	12	3.3	41
SAWYER															
BILLY BOY FLOW.	15	4	60	7	3	21	5	2	10	7	2	14	13	2.2	43
BLAISDELL LAKE	95	1	95	95	1	95	95	2	190	90	1	90	78	2.8	219
PACWAWONG LAKE	135	5	675	105	4	420	120	5	600	24	2	48	89	3.7	349
PHIPPS FLOWAGE	25	4	100	22	3	66	25	4	100	15	1	15	30	3.9	119
WASHBURN															
DILLY LAKE	13	4	52	16	5	80	16	4	64	8	4	32	21	4.1	87
POTATO LAKE	24	5	120	16	4	64	20	4	80	8	2	16	14	3.1	44
RICE LAKE	4	4	16	8	3	24	8	3	24	8	3	24	22	3.4	82
SPRING LAKE (1)	3	2	6	4	2	8	8	2	16	17	2	34	14	2.8	49
TRANUS LAKE	2	2	4	3	2	6	5	2	10	4	3	12	34	1.6	54
SUBTOTAL	695		2,418	667		2,048	795		2,567	824		1,706	895		2,925
NORTH-CENTRAL CTYS.															
FOREST															
ATKINS LAKE	0	0	0	0	0	0	0	0	0	0	0	0	18	0.7	52
INDIAN/RILEY LAKE	11	4	44	14	4	56	2	3	6	3	2	6	6	3.0	17
PAT SHAY LAKE	1	3	3	0	0	0	1	1	1	2	1	2	39	1.5	65
RAT RIVER	22	5	110	24	5	120	24	5	120	22	5	110	22	4.7	104
WABIKON LAKE	65	2	130	65	3	195	60	4	240	55	3	165	44	2.7	120
LINCOLN															
ALICE LAKE	30	4	120	15	2	30	60	3	180	55	2	110	51	3.1	177
ONEIDA															
FISH LAKE	5	3	15	5	2	10	6	2	12	4	2	8	33	3.2	118
LITTLE RICE LAKE	0	0	0	0	0	0	0	0	0	0	0	0	7	1.3	30
RICE LAKE	60	1	60	60	1	60	22	3	66	16	1	16	67	1.4	118
SPUR LAKE	30	2	60	68	3	204	65	2	130	18	2	36	70	3.2	267
WISCONSIN RIVER	145	5	725	125	5	625	120	5	600	140	5	700	144	4.6	653
PRICE															
BLOCKHOUSE LAKE	1	1	1	5	1	5	1	1	1	1	1	1	17	2.7	61
VILAS															
ALLEQUASH LAKE	20	3	60	26	4	104	30	4	120	20	3	60	66	4.0	278
LITTLE RICE LAKE	23	3	69	36	3	108	36	4	144	36	3	108	15	2.6	45
MANITOWISH RIVER	13	5	65	13	5	65	11	4	44	12	5	60	15	4.4	70
PARTRIDGE LAKE	9	4	36	13	4	52	18	4	72	16	3	48	19	4.2	82
RICE LAKE	36	4	144	43	5	215	43	4	172	43	3	129	26	3.5	92
WEST PLUM LAKE	2	3	6	20	2	40	7	3	21	14	3	42	20	3.2	72
SUBTOTAL	473		1,648	532		1,889	506		1,929	457		1,601	680		2,420
COUNT:			40			39			39			40			40
TOTAL:	1,168		4,066	1,199		3,807	1,301		4,456	1,281		3,307	1,575		5,345
AVERAGE:			102			98			114			83			134

*water not surveyed; index value estimated.

Table 3. Estimated manoomin acreage and density for waters aerially surveyed in 2005.					
COUNTY	WATER	2005 EST. ACRES	2005 EST. DENSITY	2004 EST. ACRES	2004 EST. DENSITY
Barron	Bear Lake	29	medium-dense	32	medium
Burnett	Clam River Flowage	35	dense	30	dense
	Loon Lake (Carters Bridge)	70	medium-dense	70	medium-dense
	North Fork Flowage	45	medium-dense	25	medium
	North Lang Lake	2	medium-dense	2	medium
	Phantom Flowage	65	medium-dense	50	sparse-medium
	Rice Lake ¹	13	medium-dense	13	medium-dense
	Rice Lake ²	2	sparse-medium	3	medium
	Yellow Lake	16	sparse-dense	20	medium-dense
Douglas	Gordon (St. Croix) Flowage	7	medium	not surveyed	
	Lower Ox Lake	16	sparse-medium	9	medium
	Minong Flowage (Smiths Bridge)	28	dense	25	medium
	Radigan Flowage	6	sparse-medium	8	sparse-medium
	St.Croix River/Cutaway Dam	42	medium-dense	35	medium-dense
	Upper Ox Lake	4	dense	4	dense
Forest	Hiles Millpond	5	medium	4	sparse-medium
	Little Rice Flowage	80	sparse-medium	90	medium-dense
	Scott Lake	10	medium-dense	6	medium
Iron	Little Turtle Flowage	35	medium	15	medium
	Mud Lake	13	medium-dense	8	dense
Langlade	Daly Pond	6	medium-dense	8	dense
	Goose Island (Pickrel Creek)	4	dense	4	dense
	Miniwaukan Lake	3	medium-dense	7	medium
	Spider Creek Flowage	5	sparse	5	sparse
Oneida	Big Lake	9	sparse-medium	12	medium-dense
	Cuenin Lake	18	medium-dense	15	medium-dense
	Fourmile Lake	5	sparse-dense	not surveyed	
	Roe Lake	3	medium-dense	1	medium
	The Thoroughfare	65	medium	60	sparse-medium
	Wolf River ³	15	medium-dense	16	medium-dense
Polk	Joel Flowage	7	medium-dense	10	medium
	Little Butternut	5	medium-dense	4	medium
	Rice Lake ⁴	5	sparse-medium	3	sparse-medium
Price	Lower Steve Creek Flowage	6	medium	not surveyed	
	Spring Creek Wildlife Area	45	medium-dense	15	medium-dense
Vilas	Aurora Lake	45	sparse-dense	65	sparse-dense
	Frost Lake	26	medium	7	medium
	Irving Lake	15	medium-dense	25	medium
	Island Lake	40	sparse-medium	60	sparse-dense
	Lower Ninemile Lake	19	medium	18	sparse-dense
	Nixon Lake	8	sparse-dense	5	sparse-medium
	Rest Lake	5	medium-dense	4	medium
	Rice Creek ⁵	11	medium-dense	9	medium-dense
	Rice Creek ⁶	9	medium	11	dense
	Round Lake	3	medium-dense	3	medium-dense
Upper Ninemile Lake	60	medium-dense	72	dense	
Washburn	Long, Mud, & Little Mud Lakes	30	medium-dense	23	medium-dense
	Trego Flowage	12	dense	not surveyed	

¹ W of Frederic, (T37N, R18W, S36); ² Near Hertel; ³ NW of Lennox; ⁴ N of Big Lake; ⁵ N of Island Lake ⁶ NW of Frederic

Harvest Estimation

Responses were obtained from 314 tribal permit holders and 294 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-five of the tribal and 237 of the state licensees surveyed reported harvesting rice in 2005. The total number estimated active in each group was 72 tribal members and 472 state licensees (Table 4).

Tribal harvesters active off-reservation reported making from 1 to 10 ricing trips, averaging 3.5 trips. Tribal survey respondents made a total of 126 off-reservation harvesting trips, gathering 5,177 pounds of green rice (Appendix 1), with an extrapolated total harvest estimate of 9,378 pounds in 255 trips, an average of 37 pounds per trip (Table 4). The total off-reservation harvest per active license averaged 130 pounds.

	NUMBER OF PERMIT HOLDERS	ESTIMATED NUMBER ACTIVE	AVERAGE NUMBER OF TRIPS	AVERAGE HARVEST/ TRIP	AVE. HARVEST/ ACTIVE LICENSE	TOTAL ESTIMATED HARVEST / TRIPS
TRIBAL	850	72	3.5	37	130	9,378 / 255
STATE	585	472	2.8	22	62	29,041 / 1,324
TOTAL	1,435	544	2.9	24	71	38,419 / 1,579

In comparison, active state licensees reported making from 1 to 20 ricing trips, averaging 2.8 trips. Collectively, state survey respondents made 668 trips and harvested a total of 15,183 pounds of green rice (Appendix 1), an average of 22 pounds per trip. The total harvest per active state license averaged 62 pounds.

The amount of rice harvested per individual varied greatly (Table 5). The unique state ricer discussed in the Methods section reported harvesting 1,500 pounds of rice, while the most reported by one tribal ricer was 417 pounds. In 2004, tribal members gathering 150 pounds or less accounted for 8.9% of the total tribal harvest (David, 2008b) while in 2005 they accounted for 35.7%; respective numbers for state licensees were 40.5% in 2004 and 59.6% in 2005.

Eighty-one percent of the state-licensed respondents gathered rice in 2005, versus 8% 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 2005 harvest survey.			
TRIBAL			
POUNDS OF GREEN RICE HARVESTED	INDIVIDUALS		PERCENT OF TOTAL HARVEST
	NUMBER	PERCENT	
0 - 50	8	22.9	5.4
51 - 100	11	31.4	17.6
101 - 150	5	14.3	12.7
151 - 200	3	8.6	10.5
201 - 300	2	5.7	10.0
301 - 500	6	17.1	43.8
501 - 1000			
1001 +			
STATE			
POUNDS OF GREEN RICE HARVESTED	INDIVIDUALS		PERCENT OF TOTAL HARVEST
	NUMBER	PERCENT	
0 - 50	145	61.7	16.9
51 - 100	47	20.0	22.1
101 - 150	26	11.1	20.6
151 - 200	8	3.4	9.5
201 - 300	2	0.9	3.5
301 - 500	4	1.7	9.5
501 - 1000	2	0.9	8.1
1001 +	1	0.4	9.9

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 9,378 pounds of green rice (Table 4). The total harvest for state permittees was estimated at 29,041 pounds, with all but 233 pounds of it coming from off-reservation waters. Thus, the total off-reservation harvest was estimated at 38,186 pounds, with tribal ricers accounting for 25% of the harvest.

This harvest estimate is less than half of the 2004 off-reservation harvest estimate of 81,633 pounds (David, 2008b). Tribal harvest decreased roughly 60% from 2004, state harvest about 50%. Downward trends were evident for both state and tribal ricers in the number of active individuals (down 18% overall) and the pounds harvested per trip (down 38% overall). Tribal ricers also showed a decline in the average number of trips made (6.0 to 3.5). Manoomin harvest tends to vary with abundance as well as other factors (Figure 3); harvest in 2005 was likely more influenced by disease and pollination failure than in most years.

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). One hundred ten sites were reported riced in 2005 (not including unnamed locations), eighteen more than in 2004.

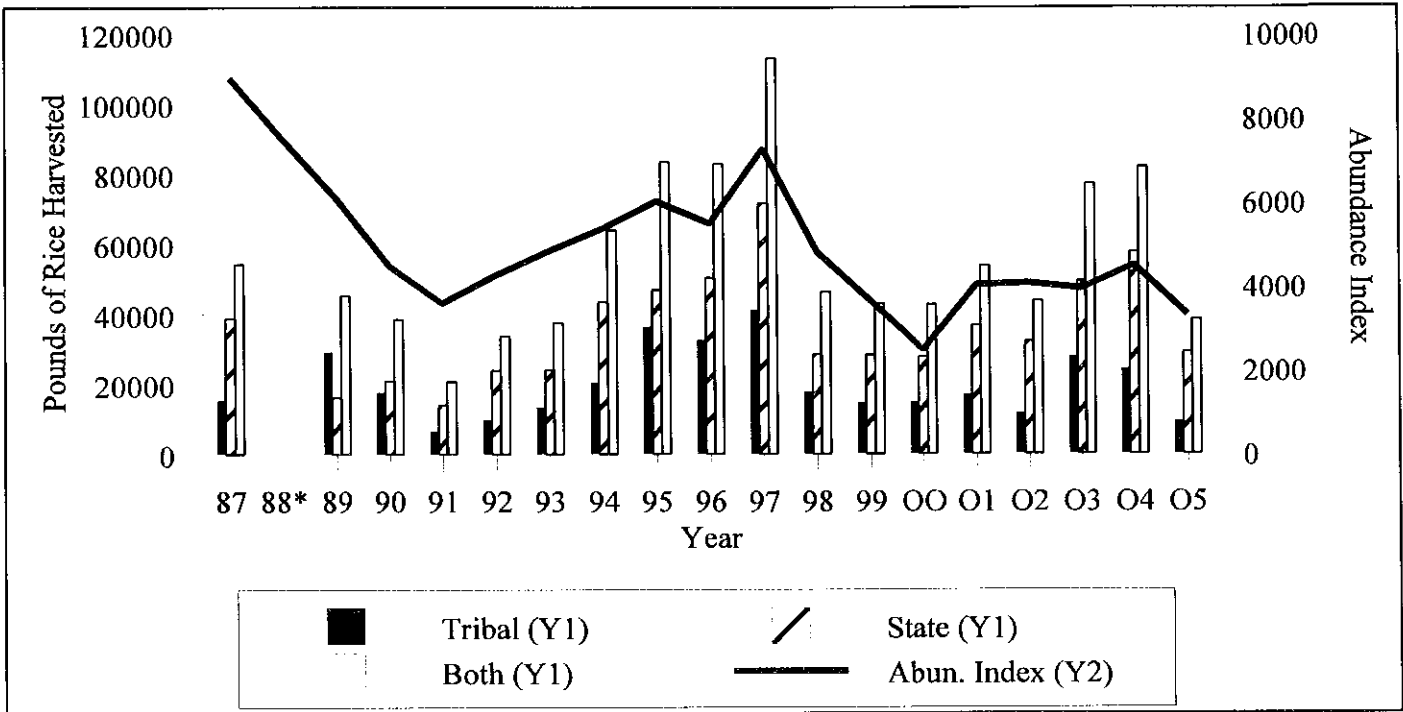


Figure 3. Harvest trends versus abundance index, 1987-2005 (* no harvest estimates for 1988).

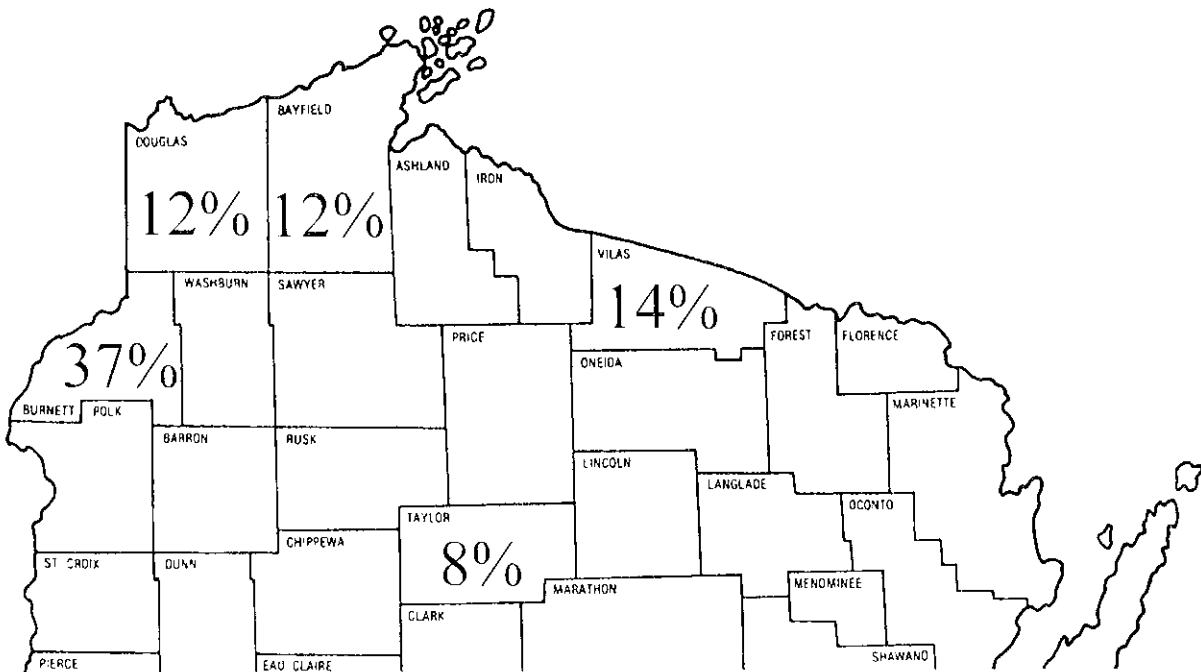


Figure 4. Distribution of counties accounting for 5% or more of the manoomin harvest reported by county by respondents to the 2005 harvest survey, tribal and state harvesters combined.

Just 1% of the harvest reported by surveyed state licensees came from waters outside the ceded territory (Appendix 1). Approximately 34% of harvest reported from named locations came from sites planted by the WDNR, the U.S. Forest Service, GLIFWC, or other seeding cooperators. This was up from 13% in 2004, but similar to the 30% recorded in 2003 (David, 2008a). Four of the five most heavily harvested waters were seeded sites, including the Phantom and North Fork Flowages (Burnett), Chippewa Lake (Bayfield) and Chequamegon Waters Flowage (Taylor).

Opinions of Respondents

Annual Abundance: Individuals were asked if they felt the 2005 wild rice crop was better, the same, or worse than the 2004 crop. Among the 200 active respondents with an opinion, 76% felt 2005 was worse than 2004, 13% felt both years were about the same, and 11% were of the opinion that 2005 was better than 2004.

Collectively, these opinions correlated fairly well with results from the abundance surveys of 40 rice waters discussed earlier, which showed a 26% decline in overall abundance state-wide between years.

Rice Worm Abundance: For just the second year, survey respondents were asked how they rated the abundance of “rice worms” (larvae stage of the moth *Apamea apamiformis*) in the current year. Among the 237 respondents who expressed an opinion, 7% rated them as very low, 30% as low, 39% as average, 13% as medium high, and 12% as high. These figures were markedly higher than respondents reported in 2004 (Figure 5).

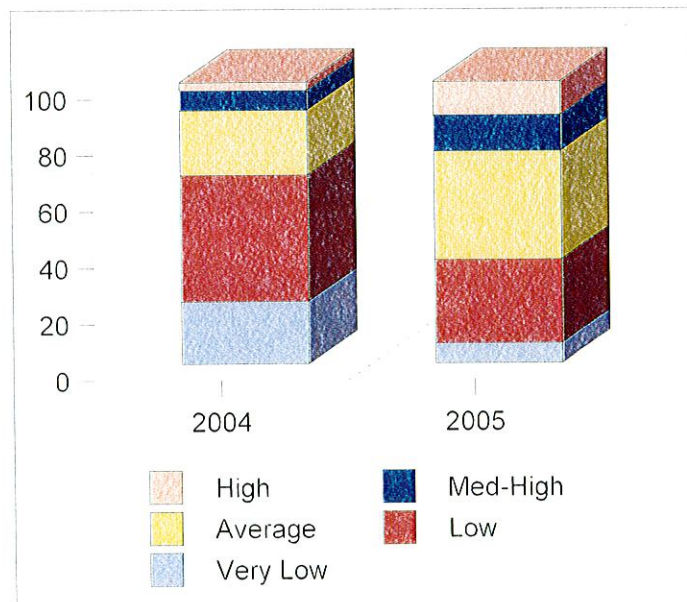


Figure 5. Opinions of manoomin harvest survey respondents on the abundance of rice worms, 2004 versus 2005.

Comments: Respondents offered a number of comments and opinions, many of them touching upon the poor condition of the crop, or difficulties they had harvesting it.

The most frequent comment made (11 individuals) was that low water hindered access to rice beds. Eleven individuals also stated that high winds or rain took the rice, and another 11 commented on the high frequency of empty hulls and/or pollination problems.

There were also a higher than average number of comments that lakes opened too late (8 comments, 4 different waters specifically mentioned). The lack of production resulting from poor pollination may have led to some of the comments.

Individual comments of interest included: “brown spot disease bad, especially on Lower Steve Creek Flowage (Price)”; “smut levels high”; “Bear Lake in Barron County was the worst it has been in 8 years”; “rice on Clam (Burnett) matured all at once”; “rivers better than lakes this year”; and “need to protect the rice beds on the White River” (Marquette). Individuals also asked that more information on abundance, processors, and newly seeded sites to be placed on the GLIFWC website.

Several respondents mentioned seeding wild rice at various sites. One person mentioned seeding Upper Steve Creek Flowage (Taylor) the previous year, but noted no success. Another mentioned seeding the Lily River, Bog Brook and “Rowmans Creek” in Forest County; a third planted Bergen Creek and the Totogatic River in Washburn County. Other plantings took place at the McMillian Marsh Wildlife Area, and the Little Eau Pleine River Reservoir in Marathon County, Oneman Lake in Iron County, and Prairie Lake in Barron County, where a test seeding the previous year reportedly “did well”.

Potential Waters for Seeding or Other Restoration: Respondents suggested 31 different waters which might be candidates for seeding or other restoration efforts. Sites named are listed in Appendix 2.

LITERATURE CITED

- Andryk, T. 1986. Wild rice wetland inventory of northwest Wisconsin. Great Lakes Indian Fish and Wildlife Commission Administrative Report 86-4. 51 pp.
- David, P.F. 2001. Wild rice abundance and harvest in the Wisconsin Ceded Territories in 1999. Great Lakes Indian Fish and Wildlife Commission Administrative Report 01-02. 16 pp.
- David, P.F. 2008a. Wild rice (manoomin) abundance and harvest in the Wisconsin Ceded Territories in 2003. Great Lakes Indian Fish and Wildlife Commission Administrative Report 08-20. 15 pp.
- David, P.F. 2008b. Wild rice (manoomin) abundance and harvest in the Wisconsin Ceded Territories in 2004. Great Lakes Indian Fish and Wildlife Commission Administrative Report 08-21. 15 pp.

Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2005 harvest survey.							
COUNTY	WATER	TRIBAL		STATE		COMBINED TOTAL	
		TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS
Ashland	Kakagon Sloughs			2	105	2	105
	Subtotal	0	0	2	105	2	105
Barron	Bear Lake			6	110	6	110
	Subtotal	0	0	6	110	6	110
Bayfield	Chippewa Lake			59	1,452	59	1,452
	Totogatic Lake	14	360	38	326	52	686
	Subtotal	14	360	97	1,778	111	2,138
Burnett	Bashaw Lake			4	17	4	17
	Briggs Lake	1	40	15	377	16	417
	Carters Bridge			6	110	6	110
	Clam Flowage	1	100	1	22	2	122
	Clam Lake	13	630	34	802	47	1,432
	Duckshot Lake			1	10	1	10
	Gaslyn Lake	3	170			3	170
	Lipsett Lake			1	3	1	3
	Long Lake	2	160	22	769	24	929
	Mud Lake (Swiss)	4	200	2	22	6	222
	North Fork Flowage	4	110	23	881	27	991
	Peterson Lake			1	5	1	5
	Phantom Flowage	5	140	54	1,553	59	1,693
	St. Croix River			1	40	1	40
	Unnamed Water	7	290	2	80	9	370
	Yellow Lake	1	50	1	10	2	60
	Yellow River	1	75			1	75
	Subtotal	42	1,965	168	4,701	210	6,666
Chippewa	Chippewa River			3	20	3	20
	Holcombe Flowage			2	5	2	5
	Subtotal	0	0	5	25	5	25
Douglas	Lower Ox Lake			1	10	1	10
	Minong Flowage			29	913	29	913
	Mulligan Lake	7	145	15	397	22	542
	Radigan Flowage			3	4	3	4
	St. Croix River	3	250	5	170	8	420
	Upper Ox Lake			5	220	5	220
	Subtotal	10	395	58	1,714	68	2,109
Florence	Unnamed Water			1	6	1	6
	Subtotal	0	0	1	6	1	6
Forest	Hiles Millpond	1	70			1	70
	Little Rice Lake			1	20	1	20
	Rat River	1	0	7	262	8	262
	Rice Lake			1	5	1	5
	Scattered Rice Lake	1	30	4	65	5	95
	Scott Lake			1	5	1	5
	Wabicon Lake	1	0			1	0
	Subtotal	4	100	14	357	18	457

(Appendix 1 continued on the next page.)

Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2005 harvest survey.							
COUNTY	WATER	TRIBAL		STATE		COMBINED TOTAL	
		TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS
Green Lake	Lake Puckaway			1	1	1	1
	Subtotal	0	0	1	1	1	1
Iron	Bear Creek			2	20	2	20
	Little Bear Flowage			2	26	2	26
	Mud Lake			3	45	3	45
	Subtotal	0	0	7	91	7	91
Langlade	Lily River			1	20	1	20
	Miniwaken Lake			2	24	2	24
	Turtle Lake	1	0			1	0
	Wolf River			1	0	1	0
	Subtotal	1	0	4	44	5	44
Lincoln	Jersey Flowage			2	2	2	2
	Lake Alice			2	30	2	30
	Wisconsin River	10	220	9	376	19	596
	Subtotal	10	220	13	408	23	628
Marathon	Private Pond			3	107	3	107
	Subtotal	0	0	3	107	3	107
Marquette	Fox River			1	2	1	2
	White River			1	8	1	8
	Subtotal	0	0	2	10	2	10
Oneida	Big Lake			6	95	6	95
	Cuenin Lake			1	5	1	5
	Emma Lake			1	5	1	5
	Gary Lake			9	120	9	120
	Killarney Lake			2	46	2	46
	Lower Ninemile Flowage			1	1	1	1
	Spur Lake	4	125	2	25	6	150
	The Thoroughfare	2	100	20	282	22	382
	Unnamed Water			1	0	1	0
	Wisconsin River			5	10	5	10
Subtotal	6	225	48	589	54	814	
Polk	Apple River			3	0	3	0
	Balsam Branch			1	50	1	50
	Fountain Lake			1	60	1	60
	Joel Flowage			13	137	13	137
	Little Butternut			3	100	3	100
	Rice Bed Creek			1	10	1	10
	Rice Lake			1	0	1	0
	Straight River			2	1	2	1
	Subtotal	0	0	25	358	25	358
Price	Beaver Dam Lake			1	2	1	2
	Hay Lake	1	20			1	20
	Musser Lake			2	12	2	12
	Price Creek Flowage	1	80			1	80
	Subtotal	2	100	12	123	14	223

(Appendix 1 continued on the next page.)

Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2005 harvest survey.							
COUNTY	WATER	TRIBAL		STATE		COMBINED TOTAL	
		TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS
Sawyer	Blaisdell Lake			1	0	1	0
	Chippewa River, West Fork			1	10	1	10
	Mosquito Brook			1	10	1	10
	Pacwawong Flowage	5	75	13	5	18	80
	Partidge Crop Lake			1	5	1	5
	Phipps Flowage	3	145	5	71	8	216
	Unnamed Water			1	20	1	20
	Wilson Lake			1	10	1	10
	Subtotal	8	220	24	131	32	351
Taylor	Chequamegon Waters Flowage	1	5	27	1,083	28	1,088
	Mondeaux Flowage	2	160	18	250	20	410
	Subtotal	3	165	45	1,333	48	1,498
Unnamed	Unnamed Water			21	1,500	21	1,500
	Subtotal	0	0	21	1,500	21	1,500
Vilas	Allequash Lake	1	20	9	64	10	84
	Aurora Lake	1	60	6	127	7	187
	Irving Lake	1	50	6	64	7	114
	Island Lake	4	241	9	185	13	426
	Little Rice Creek			1	5	1	5
	Lost Creek			3	10	3	10
	Lower Ninemile Lake	1	100	4	90	5	190
	Manitowish River			9	161	9	161
	Mann Flowage	1	60			1	60
	Muskellunge Creek			1	0	1	0
	Nixon Creek			3	15	3	15
	Nixon Lake	4	320	6	200	10	520
	Partridge Lake	1	70	1	4	2	74
	Plum Creek			1	0	1	0
	Plum Lake	1	40	1	0	2	40
	Rice Creek			2	20	2	20
	Round Lake	1	0	1	0	2	0
	Unnamed Water	3	200			3	200
	Upper Ninemile Flowage	2	86	16	413	18	499
	West Plum Lake			2	0	2	0
Subtotal	21	1,247	81	1,358	102	2,605	
Washburn	Dilly Lake	1	30	5	51	6	81
	Little Mud Lake	1	40			1	40
	Potato Lake	1	30	2	0	3	30
	Rice Lake			1	0	1	0
	Tranus Lake			5	80	5	80
	Trego Flowage			3	0	3	0
	Unnamed Water	2	80			2	80
	Whalen Lake			2	20	2	20
	Subtotal	5	180	18	151	23	331
Waupaca	White Lake			7	118	7	118
	Wolf River			2	40	2	40
	Subtotal	0	0	9	158	9	158
Waushara	Auroraville Millpond			2	15	2	15
	Saxville Millpond			2	10	2	10
	Subtotal	0	0	4	25	4	25
GRAND TOTAL		126	5,177	668	15,183	794	20,360

Appendix 2. Waters suggested for seeding or restoration by respondents to the 2005 wild rice harvest survey.*	
COUNTY	WATER
Barron	Lake Desaire Lake Montanis Prairie Lake Red Cedar River
Bayfield	Fish Creek Sloughs Sioux River Star Lake
Burnett	Hunters Lake Mud Lake (Oakland Township) St. Croix River
Dane	Goose Lake (on Goose Lake State Wildlife Area) Mud Lake (on Goose Lake State Wildlife Area)
Douglas	Gordon (St. Croix) Flowage
Forest	Deer Creek Impoundment Knowles Creek Impoundment
Iron	Deer Lake Oneman Lake
Oneida	Deer Lake (T40N, R9E, S32; on state trust lands)
Polk	Alabama Lake Blom Lake Clam Falls Flowage Grass Lake
Portage	Plover River (near junction with the Wisconsin)
Sawyer	Chippewa Flowage Tiger Cat Flowage Twin Lakes (between Upper and Lower; between Lower Twin and Burns Lake) Winter Lake
Washburn	Yellow River Flowage
Waushara	Jordans Pond

* Suggested waters with relatively well established beds not included.