



**Wild Rice (Manoomin)  
Abundance and Harvest  
in Northern Wisconsin in 2006**

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*Miigwech!*

## **MANOOMIN (WILD RICE) ABUNDANCE AND HARVEST IN NORTHERN WISCONSIN IN 2006**

### **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 2006 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 3<sup>rd</sup>, and 4<sup>th</sup>. 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 910 individuals in 2006. When individuals obtained their 2006 permit, they were asked if they harvested rice the previous year. Forty-five percent (77/170) of the individuals who indicated they had riced in 2005 ("active" ricers) were surveyed by phone, as well as 21% (145/679) of those individuals

who indicated they had not riced the previous year (“inactive” ricers). Since 61 permit holders failed to answer the question, these individuals were treated as a third group in this survey (as has been done in most years since 2001); 26% (16/61) of these individuals were also surveyed (“non-responsive” ricers) (Table 1).

The number of tribal members who actually harvested off-reservation in 2006 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 <sup>1</sup>	170	77	45%	29.9%	51
INACTIVE <sup>1</sup>	679	145	21%	9.0%	61
NON-REPONSIVE <sup>1</sup>	61	16	26%	6.3%	4
TOTAL	910	238			116

<sup>1</sup> 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 624 of the 659 individuals who obtained the state license. The number of active ricers was estimated by expanding the results reported by the 340 respondents to the state survey (54% of licensees).

Among state respondents was one group of 4 individuals who harvested together and who collectively reported a harvest that far exceeded that of other state ricers. Because of the uniqueness of this group, total state harvest was estimated by extrapolating the harvest reported by all other state respondents to the other 601 estimated active state ricers, then adding the harvest reported by these four individuals.

## 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 2,250 acres of wild rice was 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 2006.

Survey results and field observations indicate that rice abundance in 2006 was very mixed compared to the relatively poor year experienced in 2005. Overall, the abundance index increased 28% (Table 2). However, this increase was attributable to increases in density; acreage estimates actually declined 13%, being particularly poor in the north-central part of the state. In the northwest, the abundance index increased on 11 waters, fell on 9, and was essentially unchanged on 2, increasing 62% regionally. Among north-central waters, 8 fell, 5 rose and 5 were unchanged, declining 9% regionally (Table 2, Figure 2). Overall, the 2006 index was 80% of the long-term index average (1985-2006).

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.

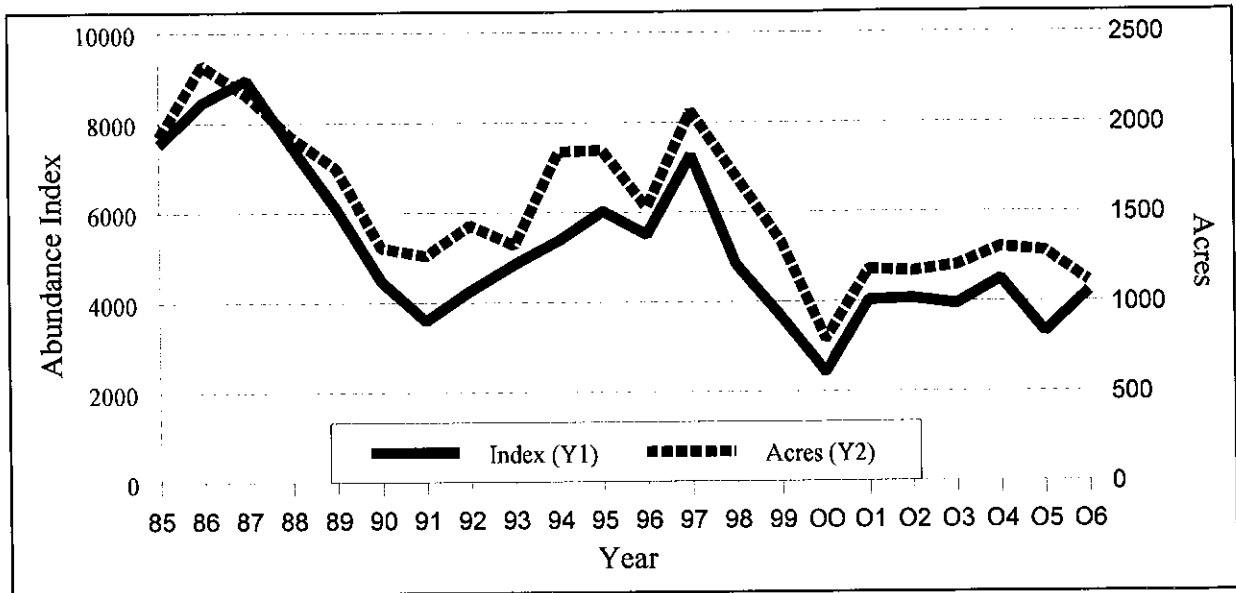


Figure 1. Manoomin acreage and abundance index from 40 Wisconsin rice waters surveyed annually from 1985-2006.

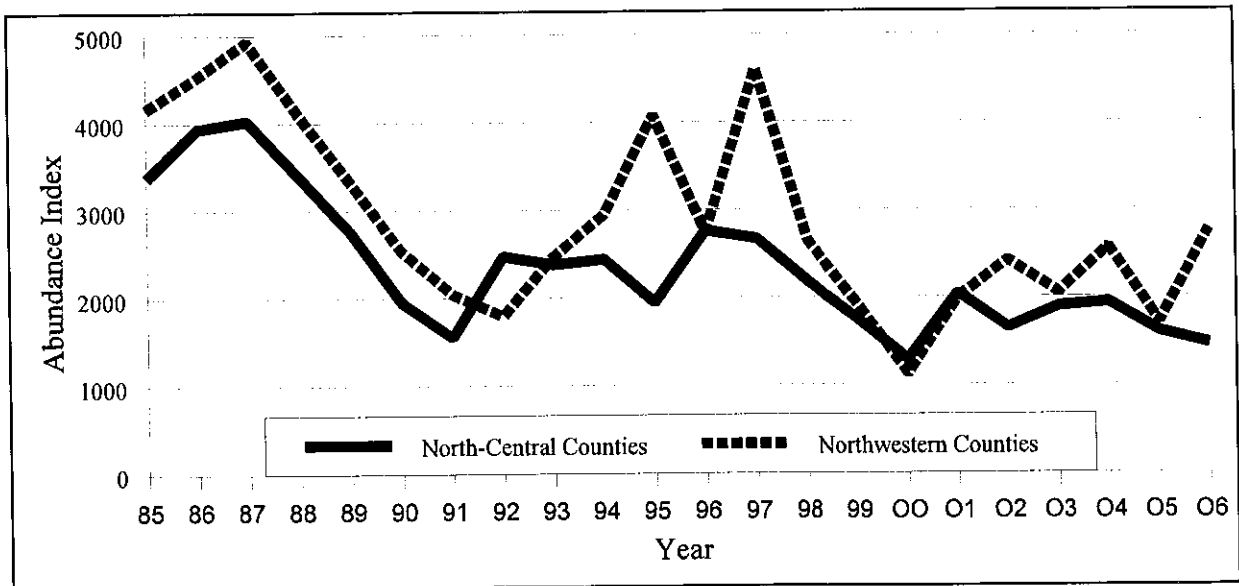


Figure 2. Manoomin abundance index from 40 Wisconsin rice waters surveyed annually from 1985-2006; northwestern versus north-central Wisconsin waters (Highway 13 was used to separate northwestern from north-central waters).

Table 2. Manoomin acreage, density and abundance index from 40 Wisconsin waters for 2003-2006, and the 1985-2006 means.  
(Data for 1985-2002 can be found in David, 2001 and David, 2008a.)

WATER	2003			2004			2005			2006			1985-2006		
	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	ACRES	DEN.	INDEX	MEAN ACRES	MEAN DEN.	MEAN INDEX
<b>NORTHWESTERN CTYS.</b>															
<b>BARRON</b>															
SWEENEY CREEK	20	3	60	1	1	1	11	2	22	0	0	0	10	2.5	35
<b>BAYFIELD</b>															
TOTOGATIC LAKE	120	2	240	135	2	270	350	2	700	108	2	216	158	2.6	483
<b>BURNETT</b>															
BASHAW LAKE	6	2	12	2	2	4	4	2	8	1	1	1	10	2.5	29
BIG CLAM LAKE	135	3	405	165	3	495	120	2	240	220	4	880	154	3.4	531
BRIGGS LAKE	12	5	60	19	3	57	22	3	66	30	4	120	28	3.8	110
GASLYN LAKE	12	4	48	25	4	100	5	1	5	1	1	1	23	3.1	82
LONG LAKE	20	1	20	40	3	120	20	2	40	65	4	260	69	2.5	181
MUD LAKE (2)	14	5	70	10	4	40	10	1	10	13	5	65	14	3.6	50
WEBB CREEK	11	5	55	12	4	48	12	3	36	20	5	100	12	4.0	57
<b>DOUGLAS</b>															
MULLIGAN LAKE	20	4	80	38	3	114	42	3	126	9	2	18	25	2.2	60
<b>POLK</b>															
RICE BED CREEK	15	4	60			40*	10	2	20	15	4	60	11	4.3	48
RICE LAKE (1)			130*	40	4	160	30	4	120	4	2	8	48	3.3	168
WHITE ASH LAKE	6	4	24	6	4	24	7	4	28	7	2	14	12	3.2	40
<b>SAWYER</b>															
BILLY BOY FLOW.	7	3	21	5	2	10	7	2	14	7	5	35	13	2.3	43
BLAISDELL LAKE	95	1	95	95	2	190	90	1	90	65	4	260	78	2.8	221
PACWAWONG LAKE	105	4	420	120	5	600	24	2	48	90	4	360	89	3.7	349
PHIPPS FLOWAGE	22	3	66	25	4	100	15	1	15	26	5	130	30	4.0	120
<b>WASHBURN</b>															
DILLY LAKE	16	5	80	16	4	64	8	4	32	11	3	33	20	4.1	85
POTATO LAKE	16	4	64	20	4	80	8	2	16	1	1	1	13	3.0	42
RICE LAKE	8	3	24	8	3	24	8	3	24	9	3	27	22	3.4	80
SPRING LAKE (1)	4	2	8	8	2	16	17	2	34	43	4	172	16	2.8	54
TRANUS LAKE	3	2	6	5	2	10	4	3	12	3	2	6	33	1.6	52
<b>SUBTOTAL</b>	<b>667</b>		<b>2,048</b>	<b>795</b>		<b>2,567</b>	<b>824</b>		<b>1,706</b>	<b>748</b>		<b>2,767</b>	<b>888</b>		<b>2,917</b>
<b>NORTH-CENTRAL CTYS.</b>															
<b>FOREST</b>															
ATKINS LAKE	0	0	0	0	0	0	0	0	0	0	0	0	17	0.6	50
INDIAN/RILEY LAKE	14	4	56	2	3	6	3	2	6	3	4	12	5	3.1	16
PAT SHAY LAKE	0	0	0	1	1	1	2	1	2	1	1	1	37	1.5	62
RAT RIVER	24	5	120	24	5	120	22	5	110	22	5	110	22	4.7	104
WABIKON LAKE	65	3	195	60	4	240	55	3	165	70	3	210	45	2.7	124
<b>LINCOLN</b>															
ALICE LAKE	15	2	30	60	3	180	55	2	110	6	3	18	49	3.1	170
<b>ONEIDA</b>															
FISH LAKE	5	2	10	6	2	12	4	2	8	2	2	4	32	3.2	113
LITTLE RICE LAKE	0	0	0	0	0	0	0	0	0	0	0	0	7	1.3	28
RICE LAKE	60	1	60	22	3	66	16	1	16	3	1	3	64	1.4	112
SPUR LAKE	68	3	204	65	2	130	18	2	36	8	2	16	67	3.1	255
WISCONSIN RIVER	125	5	625	120	5	600	140	5	700	150	5	750	144	4.6	658
<b>PRICE</b>															
BLOCKHOUSE LAKE	5	1	5	1	1	1	1	1	1	1	1	1	17	2.6	58
<b>VILAS</b>															
ALLEQUASH LAKE	26	4	104	30	4	120	20	3	60	8	2	16	63	3.9	266
LITTLE RICE LAKE	36	3	108	36	4	144	36	3	108	23	3	69	15	2.6	46
MANITOWISH RIVER	13	5	65	11	4	44	12	5	60	13	5	65	15	4.4	70
PARTRIDGE LAKE	13	4	52	18	4	72	16	3	48	23	3	69	19	4.2	82
RICE LAKE	43	5	215	43	4	172	43	3	129	28	4	112	26	3.5	93
WEST PLUM LAKE	20	2	40	7	3	21	14	3	42	2	2	4	20	3.1	69
<b>SUBTOTAL</b>	<b>532</b>		<b>1,889</b>	<b>506</b>		<b>1,929</b>	<b>457</b>		<b>1,601</b>	<b>363</b>		<b>1,460</b>	<b>666</b>		<b>2,376</b>
COUNT:			39			39			40			40			40
<b>TOTAL:</b>	<b>1,199</b>		<b>3,937</b>	<b>1,301</b>		<b>4,496</b>	<b>1,281</b>		<b>3,307</b>	<b>1,111</b>		<b>4,227</b>	<b>1,554</b>		<b>5,293</b>
AVERAGE:			98			114			83			106			132

\*water not surveyed; index value estimated.

Table 3. Estimated manoomin acreage and density for waters aerially surveyed in 2006.					
COUNTY	WATER	2006 EST. ACRES	2006 EST. DENSITY	2005 EST. ACRES	2005 EST. DENSITY
Barron	Bear Lake	17	sparse-medium	29	medium-dense
Bayfield	Chippewa Lake	50	sparse-dense	not surveyed	
Burnett	Clam River Flowage	30	medium-dense	3	dense
	Grettum Flowage	40	medium-dense	0	-
	Loon Lake (Carters Bridge)	70	dense	70	medium-dense
	North Fork Flowage	52	medium-dense	45	medium-dense
	North Lang Lake	3	dense	2	medium-dense
	Phantom Flowage	55	medium	65	medium-dense
	Rice Lake <sup>1</sup>	5	medium	13	medium-dense
	Rice Lake <sup>2</sup>	12	medium-dense	2	sparse-medium
	Yellow Lake	3	sparse	16	sparse-dense
Douglas	Gordon (St. Croix) Flowage	9	medium	7	medium
	Lower Ox Lake	14	medium	16	sparse-medium
	Minong Flowage (Smiths Bridge)	14	dense	28	dense
	Radigan Flowage	12	medium-dense	6	sparse-medium
	St.Croix River/Cutaway Dam	48	dense	42	medium-dense
	Upper Ox Lake	7	dense	4	dense
Forest	Hiles Millpond	9	medium	5	medium
	Little Rice Flowage	130	medium-dense	80	sparse-medium
	Scott Lake	8	medium	10	medium-dense
Langlade	Daly Pond	8	medium-dense	6	medium-dense
	Goose Island (Pickerel Creek)	6	dense	4	dense
	Miniwaukan Lake	18	sparse-dense	3	medium-dense
	Spider Creek Flowage	30	dense	5	sparse
Oneida	Big Lake	12	medium-dense	9	sparse-medium
	Cuenin Lake	4	sparse-medium	18	medium-dense
	Fourmile Lake	8	medium-dense	5	sparse-dense
	Roe Lake	8	medium-dense	3	medium-dense
	The Thoroughfare	55	medium-dense	65	medium
	Wolf River <sup>3</sup>	17	dense	15	medium-dense
Polk	Joel Flowage	12	medium	7	medium-dense
	Little Butternut	3	sparse-medium	5	medium-dense
	Rice Lake <sup>4</sup>	3	sparse-medium	5	sparse-medium
Sawyer	Chippewa River (West Branch)	12	sparse-dense	not surveyed	
	Partridge Crop Lake	10	sparse-medium	not surveyed	
Vilas	Aurora Lake	80	dense	45	sparse-dense
	Devine Lake	12	medium-dense	not surveyed	
	Frost Lake	9	medium-dense	26	medium
	Irving Lake	35	sparse-dense	15	medium-dense
	Island Lake	50	sparse-medium	40	sparse-medium
	Lower Ninemile Lake	34	sparse-dense	19	medium
	Nixon Lake	5	sparse-dense	8	sparse-dense
	Rice Creek <sup>5</sup>	18	dense	11	medium-dense
	Rice Creek <sup>6</sup>	9	dense	9	medium
	Round Lake	4	medium-dense	3	medium-dense
Upper Ninemile Lake	65	dense	60	medium-dense	
Washburn	Long, Mud, & Little Mud Lakes	20	medium	30	medium-dense
	Treco Flowage	4	medium	12	dense

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



## Harvest Estimation

Responses were obtained from 238 tribal permit holders and 340 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-seven of the tribal and 312 of the state licensees surveyed reported harvesting rice in 2006. The total number estimated active in each group were 116 tribal members and 605 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 138 off-reservation harvesting trips, gathering 7,418 pounds of green rice (Appendix 1), with an extrapolated total harvest estimate of 21,830 pounds in 405 trips, an average of 54 pounds per trip (Table 4). The total off-reservation harvest per active license averaged 188 pounds.

	NUMBER OF PERMIT HOLDERS	ESTIMATED NUMBER ACTIVE	AVERAGE NUMBER OF TRIPS	AVERAGE HARVEST/ TRIP	AVE. HARVEST/ ACTIVE LICENSE	TOTAL ESTIMATED HARVEST / TRIPS
TRIBAL	910	116	3.5	54	188	21,830 / 405
STATE	659	605	2.7	37	103	62,091 / 1,660
TOTAL	1,569	721	2.9	41	116	83,921 / 2,065

In comparison, active state licensees reported making from 1 to 19 ricing trips, averaging 2.7 trips. Collectively, state survey respondents made 874 trips and harvested a total of 33,951 pounds of green rice (Appendix 1), an average of 37 pounds per trip. The total harvest per active state license averaged 103 pounds.

The amount of rice harvested per individual varied greatly (Table 5). The unique group of state ricers discussed in the Methods section reported harvesting 4,370 pounds of rice collectively, while the most reported by one tribal ricer was 800 pounds. In 2005, tribal members gathering 150 pounds or less accounted for 35.7% of the total tribal harvest (David, 2008b) while in 2006 they accounted for 26.2%; respective numbers for state licensees were 59.6% in 2005 and 45.5% in 2006. These numbers suggest an improvement in the crop between years.

Ninety-two percent of the state-licensed respondents gathered rice in 2006, 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.

Table 5. Distribution of harvest among active respondents to the 2006 harvest survey.			
TRIBAL			
POUNDS OF GREEN RICE HARVESTED	INDIVIDUALS		PERCENT OF TOTAL HARVEST
	NUMBER	PERCENT	
0 - 50	5	13.5	2.1
51 - 100	12	32.4	12.3
101 - 150	7	18.9	11.8
151 - 200	2	5.4	5.0
201 - 300	4	10.8	14.7
301 - 500	2	5.4	9.6
501 - 1000	5	13.5	44.6
1001 +	0	0.0	0.0
STATE			
POUNDS OF GREEN RICE HARVESTED	INDIVIDUALS		PERCENT OF TOTAL HARVEST
	NUMBER	PERCENT	
0 - 50	133	42.6	11.1
51 - 100	85	27.2	17.9
101 - 150	47	15.1	16.5
151 - 200	14	4.5	7.3
201 - 300	16	5.1	11.9
301 - 500	3	1.0	3.4
501 - 1000	9	2.9	15.7
1001 +	5	1.6	16.1

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 21,830 pounds of green rice (Table 4). The total harvest for state permittees was estimated at 62,091 pounds, with all but 150 pounds of it coming from off-reservation waters. Thus, the total off-reservation harvest was estimated at 83,771 pounds, with tribal ricers accounting for 26% of the harvest.

This harvest estimate is more than double the 2005 estimate of 38,186 pounds (David, 2008b). Both tribal and state harvest increased in similar proportion. The average number of ricing trips made showed little change between years for either group, but the number of active individuals and the pounds harvested per trip increased markedly for both groups (tribal harvesters increased 61%, pounds per trip 46%; state harvesters increased 28%, pounds per trip 68%). 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). Ninety-one sites were reported riced in 2006 (not including unnamed locations), versus 110 in 2005.

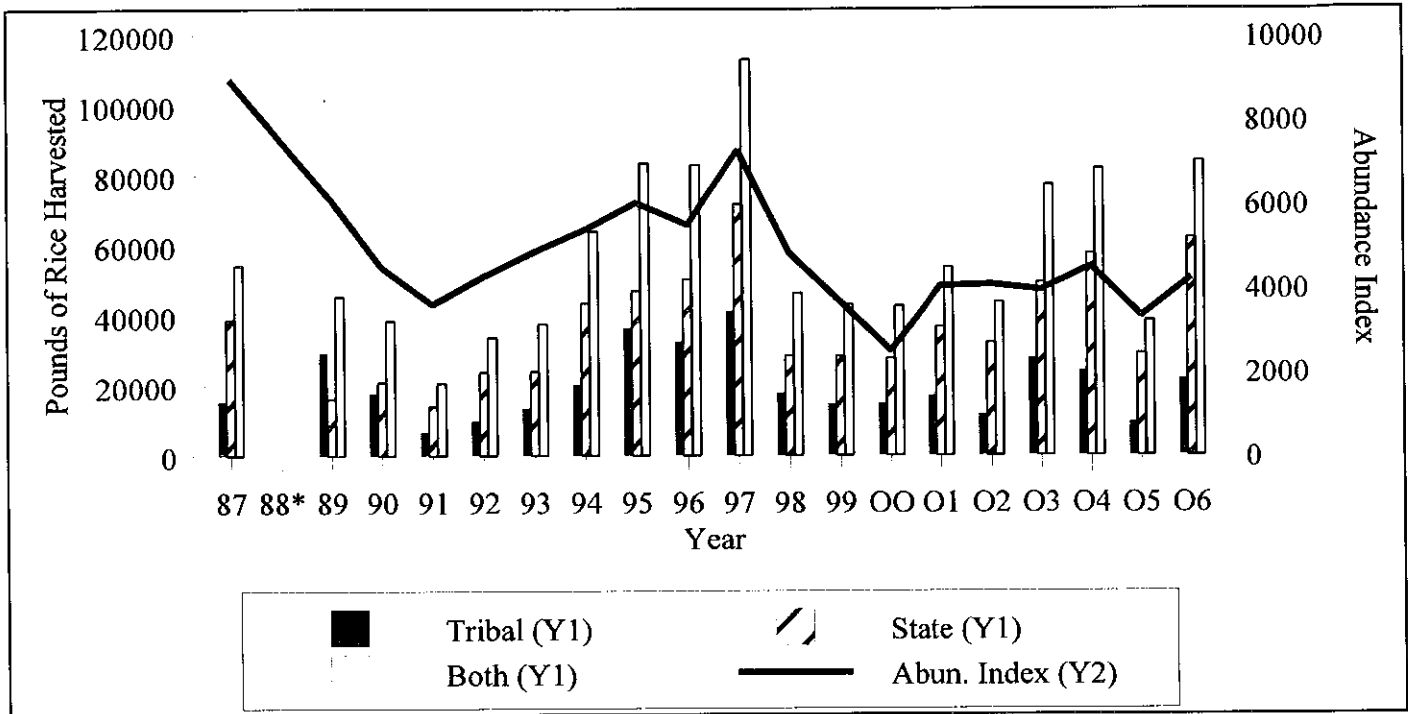


Figure 3. Harvest trends versus abundance index, 1987-2006 (\* no harvest estimates for 1988).

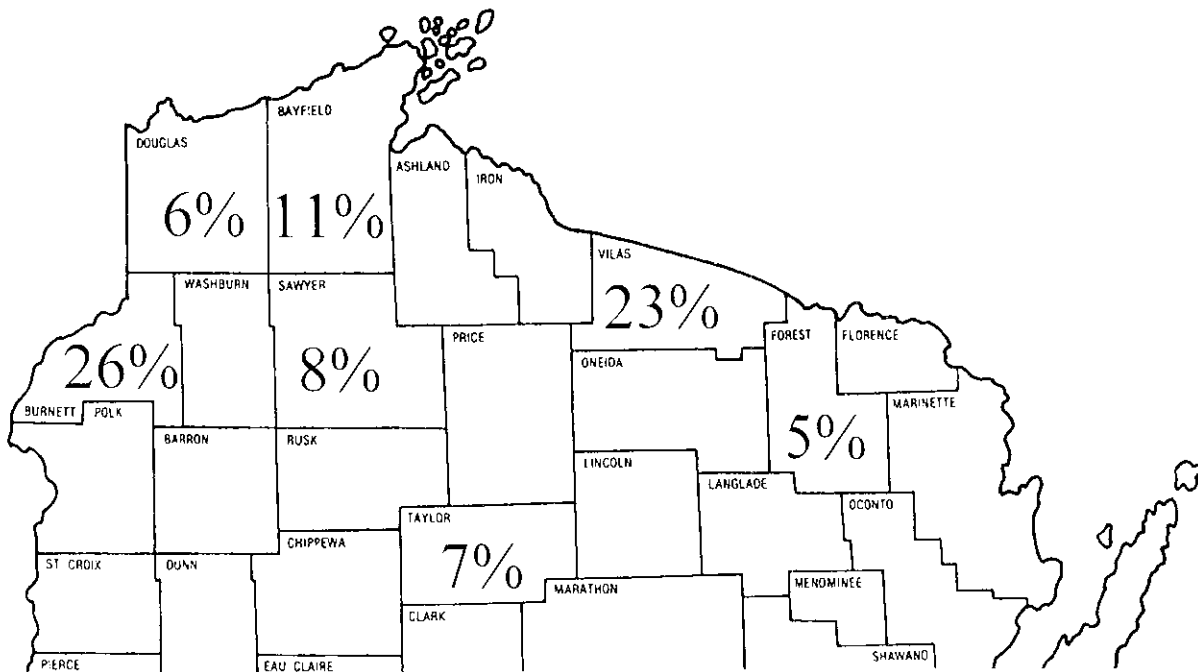


Figure 4. Distribution of counties accounting for 5% or more of the manoomin harvest reported by county by respondents to the 2006 harvest survey, tribal and state harvesters combined.

Less than 1% of the harvest reported by surveyed state licensees came from waters outside the ceded territory (Appendix 1). Approximately 26% 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 down from 34% in 2005, likely as a result of good production on several historic beds; in 2006, 2 of the 5 most heavily harvested beds had been seeded; in 2005 seeded sites accounted for 4 of the top 5 (David, 2008b).

### Opinions of Respondents

Annual Abundance: Individuals were asked if they felt the 2006 wild rice crop was better, the same, or worse than the 2005 crop. Among the 262 active respondents with an opinion, 68% felt 2006 was better than 2005, 25% felt both years were about the same, and 7% were of the opinion that 2006 was worse than 2005.

Collectively, these opinions correlated fairly well with results from the abundance surveys of 40 rice waters discussed earlier, which showed a 28% increase in overall abundance state-wide between years. The strong overall sense of improvement may also reflect a lack of the disease and pollination problems which seemed to be unusually high in 2005 (David, 2008b).

Rice Worm Abundance: For the third consecutive 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 328 respondents who expressed an opinion, 18% rated them as very low, 32% as low, 28% as average, 13% as medium high, and 9% as high. These figures suggest a decline in rice worm abundance from 2005 (Table 6).

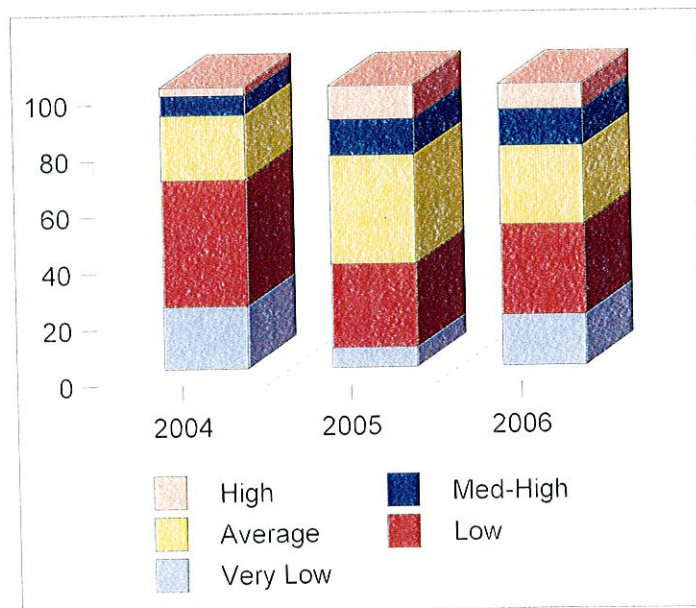


Figure 5. Opinions of manoomin harvest survey respondents on the abundance of rice worms, 2004 versus 2005.

Comments: Respondents offered a number of comments and opinions, but fewer than in most years, perhaps suggesting general satisfaction with the season.

The most frequent comment made (6 individuals) was simply thanks or appreciation for management efforts.

Regarding the timing of the opening of date-regulated lakes, one person indicated the timing was good this year, one felt that lakes were opened too soon, two felt that lakes opened too late (specifically mentioning Bear Lake (Barron) and Butternut Lake (Polk)), while another suggested that no posting was necessary.

Individual comments of interest included: “Beds on Mudhen Lake (Burnett) declining”; “worse year ever at Spring Creek Wildlife Area (Price)”; “lots of empty hulls on the Clam River Flowage (Burnett)”; and “would like to see more rice in southern Wisconsin”. One individual suggested that wild rice harvesting be included in the state’s Sportsman’s license, and another felt that there should be a limit on the amount an individual can harvest.

Several respondents mentioned seeding wild rice at various sites. One person mentioned seeding Hutchinson Lake (Oneida) in 2005, but did not mention any results in 2006. Another individual who mentioned seeding Oneman Lake in Iron County in 2005 said it did well until muskrats browsed heavily on it. Other waters reportedly seeded in 2006 included Deer Lake (Iron), Knowles Creek Impoundment (Forest), and Newmans Flowage (county unknown). Other plantings took place on the Main and Little Eau Pleine River Reservoir Flowages at the McMillian Marsh Wildlife Area in Marathon County and the Bern Forested Wetland Management Area, also in Marathon County.

**Potential Waters for Seeding or Other Restoration:** Respondents suggested 21 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 2006 harvest survey							
COUNTY	WATER	TRIBAL		STATE		COMBINED TOTAL	
		TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS
Ashland	Kakagon Sloughs			2	60	2	60
	Sand Cut			2	40	2	40
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>100</b>	<b>4</b>	<b>100</b>
Barron	Bear Lake			17	478	17	478
	Red Cedar River			1	3	1	3
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>481</b>	<b>18</b>	<b>481</b>
Bayfield	Chippewa Lake	7	295	58	2,403	65	2,698
	Totogatic Lake	9	355	61	1,520	70	1,875
	<b>Subtotal</b>	<b>16</b>	<b>650</b>	<b>119</b>	<b>3,923</b>	<b>135</b>	<b>4,573</b>
Burnett	Briggs Lake	3	180	2	60	5	240
	Clam Lake	9	390	71	2,340	80	2,730
	Clam River Flowage			3	150	3	150
	Long Lake	3	230	40	2,720	43	2,950
	Loon Lake			3	41	3	41
	North Fork Flowage			22	1,376	22	1,376
	North Lang Lake			1	17	1	17
	Peterson Lake			1	15	1	15
	Phantom Flowage	3	325	63	2,639	66	2,964
	Rice Lake			5	75	5	75
	Spencer Lake			3	122	3	122
	Unnamed Lake			3	95	3	95
	Webb Creek			3	130	3	130
	Yellow Lake			1	16	1	16
<b>Subtotal</b>	<b>18</b>	<b>1,125</b>	<b>221</b>	<b>9,796</b>	<b>239</b>	<b>10,921</b>	
Chippewa	O'Neil Creek Flowage			4	60	4	60
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>60</b>	<b>4</b>	<b>60</b>
Douglas	Amnicon Lake			1	0	1	0
	Lower Ox Lake	1	15	1	15	2	30
	Minong Flowage	4	135	18	611	22	746
	Mulligan Lake	1	40	23	544	24	584
	Radigan Flowage			2	60	2	60
	St. Croix Flowage			2	80	2	80
	St. Croix River	6	308	17	777	23	1,085
	Upper Ox Lake	1	10	3	43	4	53
	<b>Subtotal</b>	<b>13</b>	<b>508</b>	<b>67</b>	<b>2,130</b>	<b>80</b>	<b>2,638</b>
Forest	Little Rice Lake	6	250	10	1,108	16	1,358
	Rat River			2	100	2	100
	Scattered Rice Lake			1	0	1	0
	Unnamed Lake			5	500	5	500
	Wabikon Lake	4	90			4	90
<b>Subtotal</b>	<b>10</b>	<b>340</b>	<b>18</b>	<b>1,708</b>	<b>28</b>	<b>2,048</b>	
Iron	Bear Creek Flowage			2	40	2	40
	Bear River	2	55			2	55
	Little Bear Creek	1	15			1	15
	Little Turtle Flowage			8	325	8	325
	Mud Lake			8	192	8	192
<b>Subtotal</b>	<b>3</b>	<b>70</b>	<b>18</b>	<b>557</b>	<b>21</b>	<b>627</b>	

(Appendix 1 continued on the next page.)

Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2006 harvest survey.							
COUNTY	WATER	TRIBAL TRIPS POUNDS		STATE TRIPS POUNDS		COMBINED TOTAL TRIPS POUNDS	
Langlade	Miniwakan Lake			2	44	2	44
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>44</b>	<b>2</b>	<b>44</b>
Lincoln	Jersey Flowage			2	2	2	2
	Lake Alice			2	15	2	15
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>17</b>	<b>4</b>	<b>17</b>
Marathon	Private Pond			1	34	1	34
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>34</b>	<b>1</b>	<b>34</b>
Marquette	Harrisville Millpond			2	18	2	18
	White River Millpond			2	20	2	20
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>38</b>	<b>4</b>	<b>38</b>
Oneida	Big Lake			4	100	4	100
	Gary Lake			2	15	2	15
	Killarney Lake			2	33	2	33
	Roe Lake			3	50	3	50
	The Thoroughfare			18	510	18	510
	Wolf River			4	400	4	400
	Wisconsin River	4	330	9	345	13	675
	<b>Subtotal</b>	<b>4</b>	<b>330</b>	<b>42</b>	<b>1,453</b>	<b>46</b>	<b>1,783</b>
Polk	Joel Flowage			2	16	2	16
	Little Butternut			1	3	1	3
	Rice Lake			4	87	4	87
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>106</b>	<b>7</b>	<b>106</b>
Price	Musser Lake	1	50	5	59	6	109
	Sping Creek WA			14	427	14	427
	Upper Steve Creek Flowage			2	58	2	58
	Wilson Flowage			6	151	6	151
	<b>Subtotal</b>	<b>1</b>	<b>50</b>	<b>27</b>	<b>695</b>	<b>28</b>	<b>745</b>
Sawyer	Barker Lake			2	10	2	10
	Chippewa River (West Fork)			4	135	4	135
	Lake Chetac	1	60			1	60
	Moose Lake			1	32	1	32
	Pacwawong Flowage	14	640	68	2,015	82	2,655
	Phipps Flowage	1	30	4	133	5	163
	Totogatic River			3	60	3	60
	Unnamed Lake			2	79	2	79
	Wilson Lake			1	20	1	20
<b>Subtotal</b>	<b>16</b>	<b>730</b>	<b>85</b>	<b>2,484</b>	<b>101</b>	<b>3,214</b>	
Taylor	Chequamegon Waters Flowage	1	80	32	1,486	33	1,566
	Mondeaux Flowage			34	1,501	34	1,501
	<b>Subtotal</b>	<b>1</b>	<b>80</b>	<b>66</b>	<b>2,987</b>	<b>67</b>	<b>3,067</b>

(Appendix 1 continued on the next page.)

Appendix 1. Ricing trips and pounds of green manoomin harvested by respondents to the 2006 harvest survey.							
COUNTY	WATER	TRIBAL		STATE		COMBINED TOTAL	
		TRIPS	POUNDS	TRIPS	POUNDS	TRIPS	POUNDS
Vilas	Aurora Lake	2	200	33	1,812	35	2,012
	Bear Lake			1	20	1	20
	Devine Lake	4	180			4	180
	Irving Lake	3	100	12	508	15	608
	Island Lake	7	470	22	908	29	1,378
	Lac Vieux Desert	7	350	1	25	8	375
	Little Rice Lake	4	150	3	210	7	360
	Lost Creek			5	30	5	30
	Lower Ninemile Lake	6	500			6	500
	Manitowish River			10	385	10	385
	Nixon Creek/Lake			9	250	9	250
	Partridge Lake	2	120	1	65	3	185
	Rice Creek	3	150	4	75	7	225
	Rice Lake	1	30			1	30
	Round Lake	6	670			6	670
	Unnamed Lake			11	1,020	11	1,020
	Upper Ninemile Flowage	2	100	19	1,218	21	1,318
	<b>Subtotal</b>		<b>47</b>	<b>3,020</b>	<b>131</b>	<b>6,526</b>	<b>178</b>
Washburn	Dilly Lake			8	70	8	70
	Mud Lake			3	87	3	87
	Rocky Creek			4	65	4	65
	Spring Lake	9	515	9	460	18	975
	<b>Subtotal</b>	<b>9</b>	<b>515</b>	<b>24</b>	<b>682</b>	<b>33</b>	<b>1,197</b>
Waupaca	Partridge Lake			2	20	2	20
	Pine River			2	25	2	25
	White Lake			7	75	7	75
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>120</b>	<b>11</b>	<b>120</b>
Waushara	Saxeville Millpond			1	10	1	10
	<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>1</b>	<b>10</b>
<b>GRAND TOTAL</b>		<b>138</b>	<b>7,418</b>	<b>874</b>	<b>33,951</b>	<b>1,012</b>	<b>41,369</b>



Appendix 2. Waters suggested for seeding or restoration by respondents to the 2006 wild rice harvest survey.*	
COUNTY	WATER
Barron	Butternut Lake Duck Lake Kelly Lake Upper and Lower Waterman Lakes
Bayfield	Bark River Sloughs Bear Lake Blueberry River Sloughs Hay Lake
Burnett	Fish Lake (Wildlife Area) Mud Lake (Oakland Township)
Clark	Sportsman Lake
Door	Kangaroo Lake (south end)
Douglas	Big Lake (on the Brule River) Flat Lake Gordon (St. Croix) Flowage
Iron	Turtle Flambeau Flowage (at Otter and Beaver Creek inlets)
Jefferson	Lake Koshkonong
Polk	Alabama Lake Clam Falls Flowage
St. Croix	Twin Lakes (near Roberts)

\* Suggested waters with relatively well established beds not included.