



# **Wild Rice (Manoomin) Abundance and Harvest in Northern Wisconsin in 1999**

by  
Peter F. David  
Wildlife Biologist

Administrative Report 01-02  
February 2001

**Great Lakes Indian Fish  
& Wildlife Commission**

Biological Services Division

P.O. Box 9

Odanah, WI 54861

(715) 682-6619



## **WILD RICE (MANOOMIN) ABUNDANCE AND HARVEST IN NORTHERN WISCONSIN IN 1999**

### **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 1999 survey was similar in design to a survey first conducted in 1987, and repeated each year since 1989.

### **METHODS**

#### **Abundance Estimation**

Thirty lakes and 10 river or flowage sites have been ground surveyed annually 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. types and abundance of competing vegetation, pH, presence of beaver). Ground surveys were conducted from mid-July through mid-August.

Aerial surveys of 50 waters not ground surveyed were conducted on August 2<sup>nd</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, 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 907 individuals in 1999. When individuals obtained their 1999 permit, they were asked if they harvested rice the

previous year. Fifty-eight percent (87/151) of the individuals who indicated they had riced in 1998 (“active” ricers) were surveyed by phone as well as twenty-eight percent (214/756) of the remaining permit holders (“inactive” ricers) (Table 1).

| Table 1. Summary of 1999 tribal off-reservation wild rice harvest survey sampling. |              |                 |                 |                                |   |
|--|--------------|-----------------|-----------------|--------------------------------|---|
| GROUP  | TOTAL NUMBER | NUMBER SURVEYED | PERCENT SAMPLED | PERCENT ACTIVE OFF-RESERVATION | ESTIMATED NUMBER ACTIVE OFF-RESERVATION |
| “ACTIVE” <sup>1</sup>  | 151          | 87              | 58              | 39.1%                          | 59                                      |
| “INACTIVE” <sup>1</sup>  | 756          | 214             | 28              | 10.7%                          | 81                                      |
| TOTAL  | 907          | 301             | -               | -                              | 140                                     |

<sup>1</sup> Based on activity the previous year; see discussion in text.

The number of tribal members actually harvesting off-reservation in 1999 was estimated by extrapolating the percent of active respondents in the active and inactive groups (Table 1). Since the “active” group reported harvesting appreciably more rice per license than the “inactive” group (84 pounds versus 50), separate harvest estimates were made for each group.

One tribal family, known to be unique in its level of harvesting activity from previous years surveys, did not respond to the 1999 harvest survey. An estimate for the harvest of this family was made by determining the average change in harvest from 1998 for all other tribal harvesters, and applying that change to the 7000 pound harvest reported by that family in 1998.

State ricers were required to obtain an annual ricing permit. A mail questionnaire was mailed to each of the 467 individuals who obtained a state ricing license. The number of active ricers and total harvest was estimated by expanding the results reported by the 238 (51%) respondents to the state survey.

## RESULTS AND DISCUSSION

### Abundance Estimation

Ground survey results and 15 years of abundance information for 40 waters surveyed annually are reported in Figure 1, Table 2, and Appendix 1. In addition, abundance estimates for 50 additional waters surveyed only from the air are listed in Table 3. A total of 2193 acres of wild rice were found on surveyed waters. Andryk (1986) estimated that the Wisconsin ceded territories supported approximately 5,000 acres of rice in 1985, a year of approximately 44% more rice acreage than 1999 based upon surveys on the 40 index waters. Thus, it is estimated that approximately 63% of the rice acreage in the Wisconsin ceded territories was surveyed in 1999.

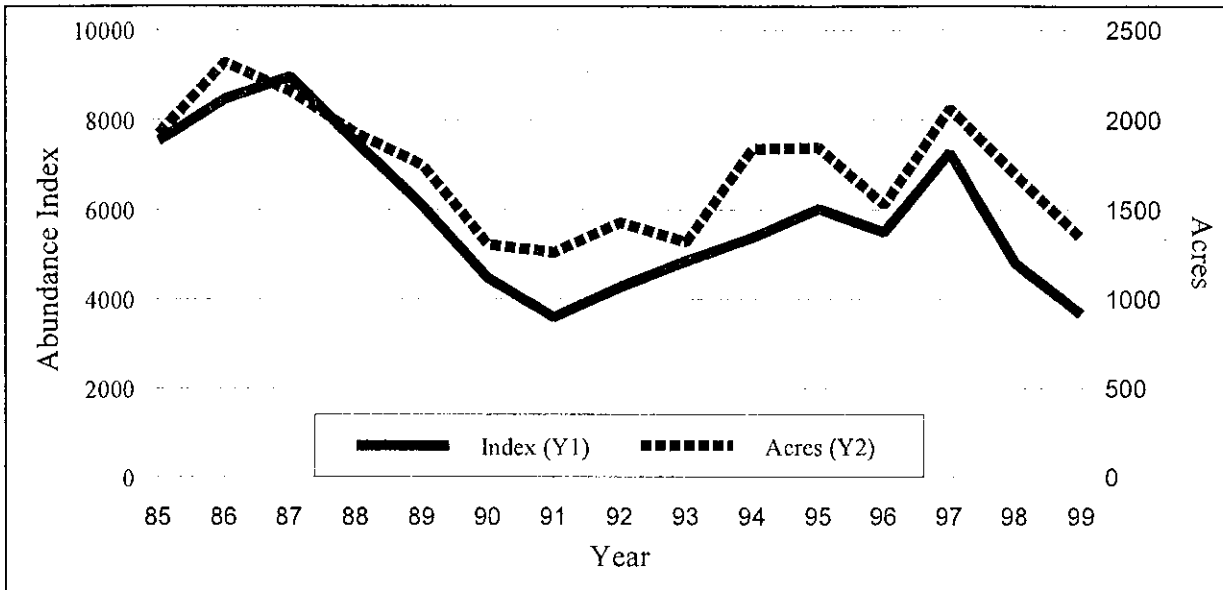


Figure 1. Wild rice acreage and abundance index from 40 Wisconsin rice waters surveyed annually from 1985-1999.

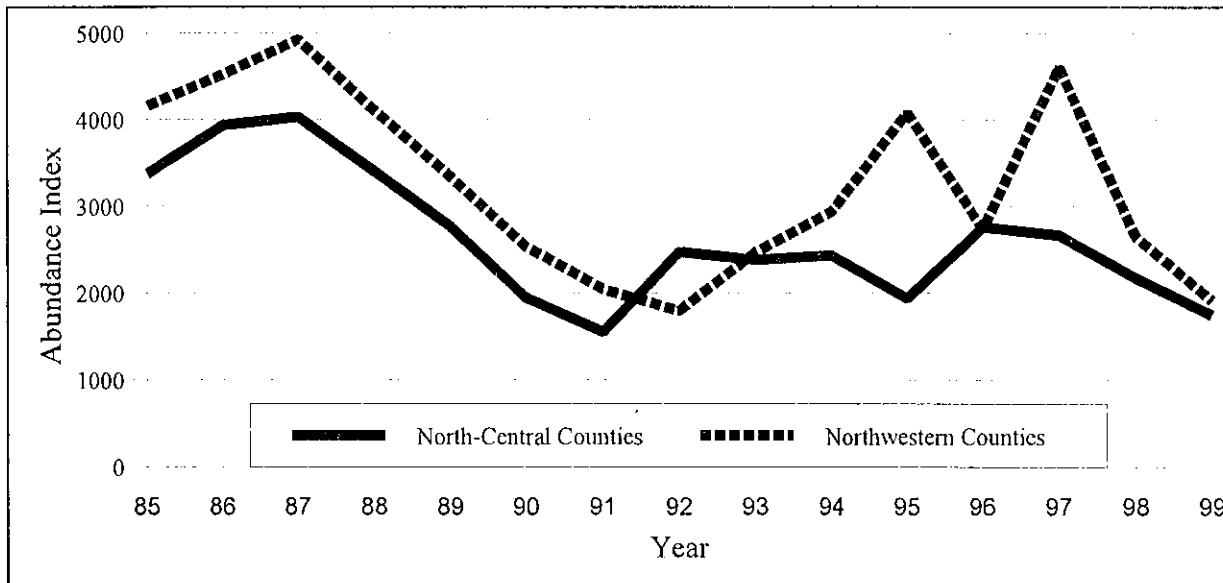


Figure 2. Wild rice abundance index from 40 Wisconsin rice waters surveyed annually from 1985-99; northwestern versus north-central Wisconsin waters (Highway 13 used to separate northwestern from north-central waters).

Table 2. Wild rice acreage, density and abundance index from 40 Wisconsin rice waters for 1996-1999 and the 1985-1999 means. (Data for 1985-1995 are located in Appendix 1.)

| WATER                      | 1996  |      |       | 1997  |      |       | 1998  |      |       | 1999  |      |       | 1985-1999  |           |            |
|----------------------------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|-------|------------|-----------|------------|
|                            | 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              | 7     | 5    | 35    | 15    | 3    | 45    | 8     | 4    | 32    | 3     | 3    | 9     | 12         | 2.8       | 44         |
| <b>BAYFIELD</b>            |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| TOTOGATIC LAKE             | 15    | 3    | 45    | 440   | 4    | 1760  | 135   | 3    | 405   | 95    | 2    | 190   | 175        | 2.8       | 588        |
| <b>BURNETT</b>             |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| BASHAW LAKE                | 8     | 3    | 24    | 8     | 3    | 24    | 2     | 3    | 6     | 4     | 2    | 8     | 13         | 2.7       | 38         |
| BIG CLAM LAKE              | 180   | 4    | 720   | 200   | 3    | 600   | 210   | 3    | 630   | 180   | 4    | 720   | 160        | 3.7       | 572        |
| BRIGGS LAKE                | 26    | 4    | 104   | 35    | 4    | 140   | 25    | 3    | 75    | 18    | 2    | 36    | 31         | 3.8       | 122        |
| GASLYN LAKE                | 18    | 3    | 54    | 20    | 3    | 60    | 18    | 3    | 54    | 23    | 2    | 46    | 29         | 3.4       | 103        |
| LONG LAKE                  | 70    | 2    | 140   | 115   | 3    | 345   | 65    | 2    | 130   | 40    | 2    | 80    | 85         | 2.6       | 222        |
| MUD LAKE (2)               | 18    | 5    | 90    | 18    | 4    | 72    | 11    | 3    | 33    | 6     | 3    | 18    | 15         | 3.5       | 53         |
| WEBB CREEK                 | 12    | 5    | 60    | 10    | 5    | 50    | 12    | 4    | 48    | 16    | 3    | 48    | 11         | 3.7       | 51         |
| <b>DOUGLAS</b>             |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| MULLIGAN LAKE              | 42    | 1    | 42    | 13    | 2    | 26    | 10    | 2    | 20    | 16    | 2    | 32    | 27         | 1.7       | 56         |
| <b>POLK</b>                |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| RICE BED CREEK             | 8     | 5    | 40    | 10    | 5    | 50    | 8     | 4    | 32    | 6     | 3    | 18    | 11         | 4.6       | 51         |
| RICE LAKE (1)              | 90    | 3    | 270   | 80    | 2    | 160   | 15    | 1    | 15    | 15    | 2    | 30    | 53         | 3.3       | 188        |
| WHITE ASH LAKE             | 13    | 4    | 52    | 16    | 5    | 80    | 14    | 3    | 42    | 10    | 4    | 40    | 14         | 3.2       | 48         |
| <b>SAWYER</b>              |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| BILLY BOY FLOW.            | 5     | 1    | 5     | 2     | 1    | 2     | 0     | 0    | 0     | 3     | 1    | 3     | 16         | 2.1       | 52         |
| BLAISDELL LAKE             | 75    | 4    | 300   | 110   | 3    | 330   | 100   | 4    | 400   | 75    | 2    | 150   | 78         | 3.1       | 255        |
| PACWAWONG LAKE             | 80    | 4    | 320   | 115   | 4    | 460   | 100   | 4    | 400   | 67    | 3    | 201   | 88         | 3.6       | 335        |
| PHIPPS FLOWAGE             | 32    | 4    | 128   | 38    | 5    | 190   | 35    | 4    | 140   | 24    | 4    | 96    | 35         | 4.1       | 138        |
| <b>WASHBURN</b>            |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| DILLY LAKE                 | 26    | 4    | 104   | 24    | 4    | 96    | 24    | 3    | 72    | 30    | 4    | 120   | 23         | 4.2       | 98         |
| POTATO LAKE                | 22    | 3    | 66    | 13    | 2    | 26    | 12    | 3    | 36    | 9     | 3    | 27    | 13         | 3.1       | 40         |
| RICE LAKE                  | 6     | 4    | 24    | 19    | 3    | 57    | 14    | 2    | 28    | 10    | 3    | 30    | 27         | 3.3       | 103        |
| SPRING LAKE (1)            | 28    | 4    | 112   | 15    | 2    | 30    | 14    | 3    | 42    | 5     | 3    | 15    | 18         | 3.3       | 63         |
| TRANUS LAKE                | 1     | 1    | 1     | 4     | 1    | 4     | 8     | 1    | 8     | 2     | 2    | 4     | 46         | 1.5       | 73         |
| SUBTOTAL                   | 782   |      | 2736  | 1320  |      | 4607  | 840   |      | 2648  | 657   |      | 1912  | 980        |           | 3254       |
| <b>NORTH-CENTRAL CTYS.</b> |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| <b>FOREST</b>              |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| ATKINS LAKE                | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 25         | 0.9       | 73         |
| INDIAN/RILEY LAKE          | 3     | 3    | 9     | 2     | 3    | 6     | 4     | 3    | 12    | 5     | 3    | 15    | 5          | 2.9       | 13         |
| PAT SHAY LAKE              | 90    | 2    | 180   | 100   | 2    | 200   | 100   | 1    | 100   | 60    | 2    | 120   | 56         | 1.5       | 92         |
| RAT RIVER                  | 13    | 4    | 52    | 24    | 5    | 120   | 24    | 4    | 96    | 21    | 4    | 84    | 22         | 4.6       | 104        |
| WABIKON LAKE               | 40    | 2    | 80    | 50    | 3    | 150   | 80    | 3    | 240   | 30    | 2    | 60    | 41         | 2.5       | 104        |
| <b>LINCOLN</b>             |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| ALICE LAKE                 | 28    | 3    | 84    | 45    | 3    | 135   | 50    | 1    | 50    | 20    | 3    | 60    | 58         | 3.1       | 211        |
| <b>ONEIDA</b>              |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| FISH LAKE                  | 50    | 3    | 150   | 9     | 4    | 36    | 40    | 4    | 160   | 58    | 2    | 116   | 43         | 3.7       | 159        |
| LITTLE RICE LAKE           | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 10         | 1.9       | 42         |
| RICE LAKE                  | 80    | 1    | 80    | 100   | 1    | 100   | 100   | 1    | 100   | 100   | 1    | 100   | 74         | 1.4       | 142        |
| SPUR LAKE                  | 85    | 5    | 425   | 85    | 4    | 340   | 95    | 4    | 380   | 56    | 3    | 168   | 81         | 3.7       | 337        |
| WISCONSIN RIVER            | 160   | 5    | 800   | 140   | 5    | 700   | 150   | 3    | 450   | 180   | 3    | 540   | 143        | 4.5       | 633        |
| <b>PRICE</b>               |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| BLOCKHOUSE LAKE            | 26    | 3    | 78    | 28    | 3    | 84    | 28    | 2    | 56    | 2     | 2    | 4     | 23         | 3.3       | 84         |
| <b>VILAS</b>               |       |      |       |       |      |       |       |      |       |       |      |       |            |           |            |
| ALLEQUASH LAKE             | 90    | 5    | 450   | 75    | 5    | 375   | 80    | 3    | 240   | 60    | 3    | 180   | 81         | 4.1       | 347        |
| LITTLE RICE LAKE           | 4     | 3    | 12    | 8     | 5    | 40    | 20    | 3    | 60    | 16    | 3    | 48    | 11         | 2.3       | 28         |
| MANITOWISH RIVER           | 12    | 5    | 60    | 14    | 5    | 70    | 15    | 3    | 45    | 16    | 4    | 64    | 16         | 4.2       | 72         |
| PARTRIDGE LAKE             | 20    | 5    | 100   | 22    | 5    | 110   | 27    | 3    | 81    | 17    | 4    | 68    | 20         | 4.3       | 90         |
| RICE LAKE                  | 22    | 4    | 88    | 20    | 5    | 100   | 25    | 3    | 75    | 20    | 4    | 80    | 23         | 3.4       | 74         |
| WEST PLUM LAKE             | 22    | 5    | 110   | 20    | 5    | 100   | 14    | 2    | 28    | 20    | 2    | 40    | 26         | 3.5       | 93         |
| SUBTOTAL                   | 745   |      | 2758  | 742   |      | 2666  | 852   |      | 2173  | 681   |      | 1747  | 761        |           | 2638       |
| COUNT:                     |       |      | 40    |       |      | 40    |       |      | 40    |       |      | 40    |            |           |            |
| TOTAL:                     | 1527  |      | 5494  | 2062  |      | 7273  | 1692  |      | 4821  | 1338  |      | 3659  | 1741       |           | 5892       |
| AVERAGE:                   |       |      | 137   |       |      | 182   |       |      | 121   |       |      | 91    |            |           |            |

| Table 3. Estimated wild rice abundance and density for waters aerially surveyed in 1999. |                                |                        |                          |                        |
|--|--------------------------------|------------------------|--------------------------|------------------------|
| COUNTY   | WATER                          | ESTIMATED ACRES - 1999 | ESTIMATED DENSITY - 1999 | ESTIMATED ACRES - 1998 |
| BARRON   | Bear Lake                      | 9                      | sparse-medium            | 20                     |
| BURNETT  | Carter's Bridge - Loon Lake    | 70                     | dense                    | 70                     |
|  | - Gull Lake                    | 45                     | medium-dense             | 42                     |
|  | Clam River Flowage             | 38                     | dense                    | 42                     |
|  | North Fork Flowage             | 35                     | dense                    | 28                     |
|  | North Lang Lake                | 3                      | medium-dense             | 2                      |
|  | Phantom Flowage                | 30                     | sparse-dense             | 20                     |
|  | Rice Lake <sup>1</sup>         | 5                      | sparse-medium            | 6                      |
|  | Rice Lake <sup>2</sup>         | 5                      | medium                   | 2                      |
|  | Rice Lake <sup>3</sup>         | 1                      | sparse                   | 7                      |
|  | Spencer Lake                   | 6                      | dense                    | 2                      |
| Yellow Lake  | 15                             | sparse-medium          | 4                        |                        |
| DOUGLAS  | Lower Ox Lake                  | 7                      | medium-dense             | 8                      |
|  | Minong Flowage (Smiths Bridge) | 40                     | medium-dense             | 25                     |
|  | Radigan Flowage                | 8                      | medium-dense             | 25                     |
|  | St.Croix River/Cutaway Dam     | 5                      | medium                   | 25                     |
|  | Upper Ox Lake                  | 6                      | dense                    | 5                      |
| FOREST   | Hiles Millpond                 | 4                      | sparse-medium            | (not surveyed)         |
|  | Little Rice Lake               | 40                     | sparse-dense             | 60                     |
|  | Scattered Rice Lake            | 6                      | medium-dense             | 8                      |
| IRON   | Little Turtle Flowage          | 8                      | dense                    | 8                      |
| ONEIDA   | Big Lake                       | 10                     | medium-dense             | 8                      |
|  | Cuenin Lake                    | 25                     | medium-dense             | 21                     |
|  | Scott Creek Impoundment        | 5                      | medium                   | (not surveyed)         |
|  | The Thoroughfare               | 80                     | medium-dense             | 85                     |
|  | Wolf River <sup>4</sup>        | 12                     | dense                    | 12                     |
| POLK   | Balsam Branch Creek            | 2                      | medium                   | 2                      |
|  | Joel Flowage                   | 13                     | medium-dense             | 32                     |
|  | Little Butternut               | 8                      | medium-dense             | 7                      |
|  | Rice Lake <sup>5</sup>         | 0                      | -                        | 3                      |
|  | Rice/Glenton Lake <sup>6</sup> | 0                      | -                        | 1                      |
| SAWYER   | West Branch Chippewa River     | 14                     | medium                   | 12                     |
| VILAS  | Aurora Lake                    | 62                     | medium-dense             | 42                     |
|  | Devine Lake                    | 6                      | sparse-dense             | 14                     |
|  | Frost Lake                     | 15                     | medium-dense             | 35                     |
|  | Irving Lake                    | 40                     | sparse-medium            | 80                     |
|  | Island Lake                    | 22                     | sparse-medium            | 28                     |
|  | Lower Ninemile Lake            | 8                      | medium-dense             | 6                      |
|  | Mann Lake Flowage              | 2                      | medium                   | 6                      |
|  | Mickeys Mud Lake               | 3                      | medium                   | 5                      |
|  | Mud Creek <sup>7</sup>         | 16                     | medium-dense             | 18                     |
|  | Nixon Lake / Creek             | 4                      | medium-dense             | 4                      |
|  | Rest Lake                      | 4                      | dense                    | 4                      |
|  | Rice Creek <sup>8</sup>        | 8                      | dense                    | 10                     |
|  | Rice Creek <sup>9</sup>        | 12                     | medium                   | 10                     |
|  | Round Lake                     | 6                      | dense                    | 8                      |
| Upper Ninemile Lake  | 45                             | sparse-dense           | 55                       |                        |
| WASHBURN   | Gilmore Lake                   | 3                      | medium                   | 4                      |
|  | Long, Mud, & Little Mud Lakes  | 30                     | medium-dense             | 40                     |
|  | Trego Flowage                  | 14                     | medium-dense             | 16                     |

<sup>1</sup> NE of Trade Lake, (T37N, R18W, S10); <sup>2</sup> NE of Hertel, (T39N, R14W, S15); <sup>3</sup> W of Frederic, (T37N, R18W, S36); <sup>4</sup> NW of Lennox; <sup>5</sup> NW of Frederic; <sup>6</sup> S of Milltown; <sup>7</sup> E of HWY 17; <sup>8</sup> N of Big Lake; <sup>9</sup> N of Island Lake

Survey results and field observations indicate that 1999 was a poor year for wild rice across the state. The 1999 abundance index decreased 24% from 1998, to a level 38% below the 1985-1999 average (Figure 1), and to the second lowest level reported since the survey was initiated. Fairly large declines were noted in the indices for both northwestern and north-central waters. For northwestern waters, large declines were observed in 3 of the 4 Sawyer county waters surveyed, and in Totogatic Lake, which is located just north of the Sawyer county line in Bayfield County. The greatest decline among the north-central waters occurred on Spur Lake in Oneida county, a lake often important to Sokaogon Chippewa harvesters. Overall, 22 of the 40 lakes surveyed showed a decline from 1998, 10 showed an increase and 8 were essentially unchanged.

It remains difficult to account for changes in rice abundance on a regional scale and even on individual lakes 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 301 tribal permit holders and 238 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. Fifty-seven of the tribal and 204 of the state licensees surveyed reported harvesting rice in 1999. The total number estimated active in each group was 140 tribal members and 400 state licensees (Table 4).

Tribal harvesters active off-reservation reported making from 1 to 8 ricing trips, averaging 2.4 trips. Tribal survey respondents made a total of 142 off-reservation harvesting trips, gathering 4,003 pounds of green rice (Appendix 2), an average of 28 pounds per trip. The total off-reservation harvest per active license averaged 64 pounds.



Table 4. A comparison of tribal (off-reservation) and state wild rice harvest in 1999.

|                     | NUMBER OF PERMIT HOLDERS | ESTIMATED NUMBER ACTIVE | AVERAGE NUMBER OF TRIPS | AVERAGE HARVEST/ TRIP | AVE. HARVEST /ACTIVE LICENSE | TOTAL ESTIMATED HARVEST / TRIPS |
|---------------------|--------------------------|-------------------------|-------------------------|-----------------------|------------------------------|---------------------------------|
| TRIBAL              | 907                      | 140                     | 2.4                     | 27                    | 64                           | 8,981 / 336                     |
| TRIBAL <sup>1</sup> | 907                      | 144                     | 2.6                     | 40                    | 103                          | 14,766 / 370                    |
| STATE               | 457                      | 400                     | 2.4                     | 29                    | 71                           | 28,310 / 971                    |
| TOTAL               | 1374                     | 540                     | 2.4                     | 29                    | 69                           | 37,291 / 1307                   |
| TOTAL <sup>1</sup>  | 1374                     | 544                     | 2.5                     | 32                    | 79                           | 43,076 / 1341                   |

<sup>1</sup>Includes harvest estimates for unique non-respondent family, based upon 1998 reported harvest, as described in the methods section.

In comparison, active state licensees reported making from 1 to 20 ricing trips, averaging 2.4 trips. Collectively, state survey respondents made 495 trips and harvested a total of 14,438 pounds of green rice (Appendix 2), an average of 29 pounds per trip. The total harvest per active license averaged 71 pounds.

The amount of rice harvested per individual varied greatly (Table 5). A single state ricer reported harvesting 1533 pounds. The greatest amount reported harvested by a tribal respondent was 350 pounds. In addition, one tribal family is estimated to have gathered 5785 pounds of rice, based upon harvest reported in 1998 (see Methods section). Because this single family has comprised such a significant portion of the tribal off-reservation harvest, separate harvest estimates were made with and without their estimated harvest (Table 4).

Eighty-six percent of the state-licensed respondents gathered rice in 1999, versus 16% 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, who are not required to have a permit to harvest on-reservation.

| Table 5. Distribution of harvest among active respondents to the 1999 harvest survey. |             |         |                          |
|---|-------------|---------|--------------------------|
| TRIBAL  |             |         |                          |
| POUNDS OF GREEN RICE HARVESTED  | INDIVIDUALS |         | PERCENT OF TOTAL HARVEST |
|   | NUMBER      | PERCENT |                          |
| 0 - 50  | 31          | 54.4    | 19.4                     |
| 51 - 100  | 13          | 22.8    | 26.3                     |
| 101 - 150   | 8           | 14.0    | 23.4                     |
| 151 - 200   | 3           | 5.3     | 14.2                     |
| 201 - 300   |             |         |                          |
| 301 - 500   | 2           | 3.5     | 16.7                     |
| 501 - 1000  |             |         |                          |
| 1001 +  |             |         |                          |
| STATE   |             |         |                          |
| POUNDS OF GREEN RICE HARVESTED  | INDIVIDUALS |         | PERCENT OF TOTAL HARVEST |
|   | NUMBER      | PERCENT |                          |
| 0 - 50  | 120         | 58.8    | 21.7                     |
| 51 - 100  | 54          | 26.5    | 27.3                     |
| 101 - 150   | 14          | 6.9     | 14.9                     |
| 151 - 200   | 9           | 4.4     | 7.3                      |
| 201 - 300   | 2           | 1.0     | 2.9                      |
| 301 - 500   | 3           | 1.5     | 9.7                      |
| 501 - 1000  | 1           | 0.5     | 5.6                      |
| 1001 +  | 1           | 0.5     | 10.6                     |

Using the approach to estimate harvest described above in the Methods section, total off-reservation harvest for tribal permit holders was estimated at 14,766 pounds of green rice. The total harvest for state permittees was estimated at 28,310 pounds, with all but 324 pounds of it coming from off-reservation waters. Thus, the total off-reservation harvest was estimated at 42,752 pounds, with tribal ricers accounting for 35% of the harvest.

This harvest estimate is 8% below the 1998 total off-reservation harvest estimate of 46,319 pounds, which was nearly 60% below the bumper harvest observed in 1997 (David, 2000) (Figure 3). However, the decline observed in 1999 was attributable nearly entirely to tribal harvest, as state harvest estimates were essentially unchanged between years.

The decrease in tribal harvest may be attributable to a variety of factors. There are fewer off-reservation tribal ricers than state ricers, and they are not as evenly distributed across the landscape. As a result, they may be more sensitive to crop failures on particular waters, as occurred in 1999 on Totogatic Lake in Bayfield County, traditionally an important harvest location for many tribal members.

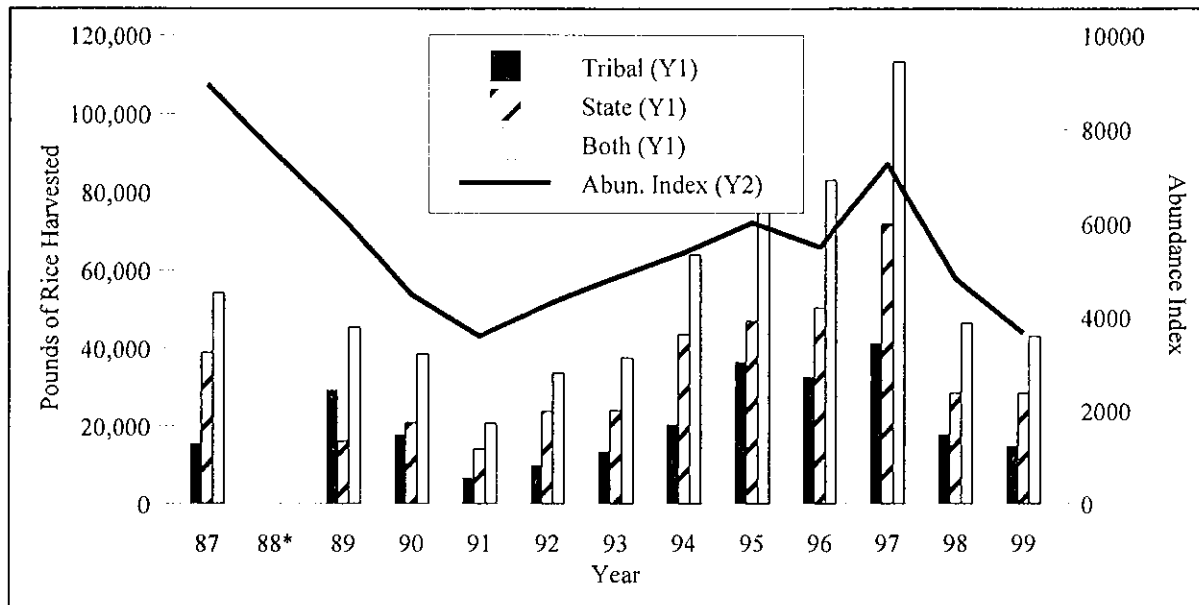


Figure 3. Harvest trends versus abundance index, 1987-97 (\* no harvest estimates for 1988).

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). Over eighty waters were reported riced in 1999, with 99% of the harvest reported by surveyed state licensees coming from waters within the ceded territory (Appendix 2). Approximately 10% of the total 1999 harvest came from sites planted by the WDNR, the U.S. Forest Service, GLIFWC, or other seeding cooperators.

### Opinions of Respondents

**Annual abundance:** Individuals were asked if they felt the 1999 wild rice crop was better, the same, or worse than the 1998 crop. Among the 165 active respondents with an opinion, 43% felt 1999 was worse than 1998, 26% felt 1999 was about the same as 1998, and 31% were of the opinion that 1999 was better than 1998. These opinions were fairly similar to the results from the abundance surveys of 40 rice waters discussed above, which found declines in abundance on 55% of the waters, little change in abundance on 20% of the waters, and increases on 25%.

**Comments:** Respondents offered a variety of comments and opinions, although relatively few consistent themes surfaced. Seven individuals indicated that poor weather damaged the beds or limited their harvest. Two people reported high smut levels at the Clam River Flowage (Burnett), while one each noted the same at the Mondeaux (Taylor) and Phantom (Burnette) flowages. "Thin beds" with "fluff" rice was noted at the Thoroughfare (Oneida); high levels of

worms were noted at the Mondeaux Flowage and Island Lake (Vilas); and empty hulls were reported from Pacwawong (Sawyer). General declines in beds were noted for Long Lake (Burnett) and the Mud chain and Yellow River Flowage (Washburn).

Regarding the control of regulated lakes, five people felt that lake opening information needed to be more available; one suggested that lake openings should rotate on a two day rather than three day pattern while another felt no rotation should be used; and one individual indicated that regulated lakes that no longer support rice should not be listed as "open". Three individuals felt the regulated lakes should have been opened earlier, with two of these suggesting a standard opening date from year-to-year. Two people complained of people picking before lakes were opened. Other regulatory suggestions were to include rice harvesting on the Patrons License (three people) and to offer a non-resident ricing license.

One individual felt that GLIFWC was paying too much for green seed, and another felt that the emphasis of the seeding program should be on historic sites rather than artificial flowages. The need to preserve rice lake habitat was also noted.

Finally, two individuals indicated that they had difficulty finding processors. Most of the remaining comments came from first time ricers, who generally enjoyed the experience, although one person indicated that their ricing trip was both their first and last.

**Potential Waters for Seeding:** Respondents named 26 waters which might benefit from seeding or other management activities. Sites named are listed in Appendix 3.

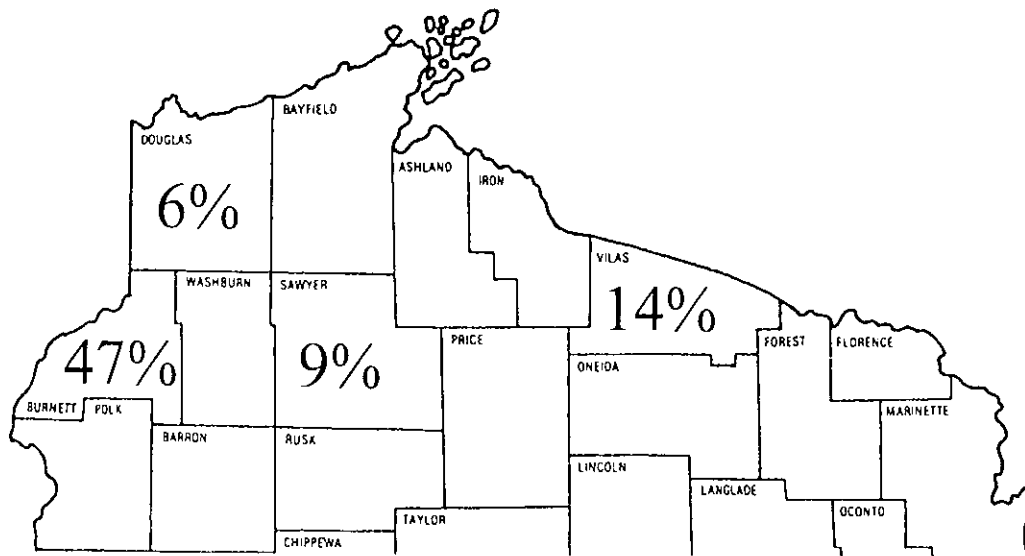


Figure 4. Distribution of counties accounting for more than 5% of the total estimated 1999 off-reservation wild rice harvest, tribal and state harvesters combined.

## **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. 2000. Wild rice abundance and harvest in the Wisconsin Ceded Territories in 1998. Great Lakes Indian Fish and Wildlife Commission Administrative Report 00-1. 16 pp.

| Appendix 1. Wild rice acreage and abundance index for 40 Wisconsin rice waters, 1985-95. |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
|--|-------------|------|-------------|-------------|------|-------------|-------------|------|-------------|-------------|------|-------------|-------------|------|-------------|
| WATER  | 1985        |      |             | 1986        |      |             | 1987        |      |             | 1988        |      |             | 1989        |      |             |
|  | ACRES       | DEN. | INDEX       | ACRES       | DEN. | INDEX       | ACRES       | DEN. | INDEX       | ACRES       | DEN. | INDEX       | ACRES       | DEN. | INDEX       |
| <b>NORTHWESTERN CTYS.</b>  |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| <b>BARRON</b>  |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| SWEENEY CREEK  | 25          | 5    | 125         | 15          | 1    | 15          |             |      |             | 30          | 5    | 150         | 5           | 1    | 5           |
| <b>BAYFIELD</b>  |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| TOTOGATIC LAKE   | 5           | 1    | 5           | 200         | 5    | 1000        | 350         | 4    | 1400        | 300         | 3    | 900         | 40          | 2    | 80          |
| <b>BURNETT</b>   |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| BASHAW LAKE  | 25          | 5    | 125         | 15          | 2    | 30          | 8           | 1    | 8           | 20          | 3    | 60          | 55          | 3    | 165         |
| BIG CLAM LAKE  | 200         | 5    | 1000        | 200         | 4    | 800         | 60          | 5    | 300         | 70          | 5    | 350         | 120         | 5    | 600         |
| BRIGGS LAKE  | 33          | 5    | 165         | 37          | 5    | 185         | 40          | 5    | 200         | 30          | 3    | 90          | 33          | 3    | 99          |
| GASLYN LAKE  | 60          | 5    | 300         | 60          | 4    | 240         | 30          | 5    | 150         | 60          | 3    | 180         | 10          | 3    | 30          |
| LONG LAKE  | 140         | 1    | 140         | 140         | 2    | 280         | 120         | 5    | 600         | 100         | 3    | 300         | 65          | 1    | 65          |
| MUD LAKE (2)   | 20          | 5    | 100         | 17          | 4    | 68          | 2           | 3    | 6           |             |      |             | 23          | 1    | 23          |
| WEBB CREEK   | 12          | 5    | 60          | 20          | 5    | 100         |             |      |             | 0           | 0    | 0           | 0           | 0    | 0           |
| <b>DOUGLAS</b>   |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| MULLIGAN LAKE  | 22          | 1    | 22          | 20          | 1    | 20          | 10          | 1    | 10          | 55          | 3    | 165         | 54          | 5    | 270         |
| <b>POLK</b>  |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| RICE BED CREEK   | 40          | 5    | 200         | 40          | 5    | 200         |             |      |             | 3           | 5    | 15          | 1           | 5    | 5           |
| RICE LAKE (1)  | 70          | 5    | 350         | 25          | 4    | 100         | 75          | 5    | 375         | 50          | 3    | 150         | 60          | 5    | 300         |
| WHITE ASH LAKE   | 30          | 3    | 90          | 20          | 1    | 20          | 35          | 5    | 175         | 2           | 3    | 6           | 15          | 3    | 45          |
| <b>SAWYER</b>  |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| BILLY BOY FLOW.  | 22          | 5    | 110         | 30          | 4    | 120         | 30          | 5    | 150         | 25          | 3    | 75          | 45          | 5    | 225         |
| BLAISDELL LAKE   | 19          | 3    | 57          | 90          | 3    | 270         | 100         | 3    | 300         | 100         | 5    | 500         | 75          | 5    | 375         |
| PACWAWONG LAKE   | 100         | 5    | 500         | 100         | 4    | 400         | 100         | 5    | 500         | 100         | 5    | 500         | 80          | 5    | 400         |
| PHIPPS FLOWAGE   | 11          | 5    | 55          | 20          | 5    | 100         |             |      |             | 40          | 5    | 200         | 35          | 3    | 105         |
| <b>WASHBURN</b>  |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| DILLY LAKE   | 30          | 5    | 150         | 30          | 5    | 150         | 35          | 5    | 175         | 30          | 5    | 150         | 10          | 5    | 50          |
| POTATO LAKE  | 23          | 5    | 115         | 20          | 2    | 40          | 20          | 3    | 60          | 5           | 5    | 25          | 10          | 3    | 30          |
| RICE LAKE  | 48          | 5    | 240         | 40          | 4    | 160         | 80          | 5    | 400         | 30          | 3    | 90          | 40          | 3    | 120         |
| SPRING LAKE (1)  | 30          | 5    | 150         | 25          | 5    | 125         | 15          | 5    | 75          | 25          | 3    | 75          | 25          | 3    | 75          |
| TRANUS LAKE  | 100         | 1    | 100         | 100         | 1    | 100         | 45          | 1    | 45          | 40          | 3    | 120         | 90          | 3    | 270         |
| <b>SUBTOTAL</b>  | <b>1065</b> |      | <b>4159</b> | <b>1264</b> |      | <b>4523</b> | <b>1155</b> |      | <b>4929</b> | <b>1115</b> |      | <b>4101</b> | <b>891</b>  |      | <b>3337</b> |
| <b>NORTH-CENTRAL CTYS.</b>   |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| <b>FOREST</b>  |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| ATKINS LAKE  | 130         | 5    | 650         | 140         | 2    | 280         | 15          | 1    | 15          | 30          | 3    | 90          | 60          | 1    | 60          |
| INDIAN/RILEY LAKE  | 20          | 3    | 60          | 15          | 2    | 30          | 4           | 1    | 4           | 1           | 5    | 5           | 6           | 1    | 6           |
| PAT SHAY LAKE  |             |      |             |             |      |             | 1           | 1    | 1           | 4           | 1    | 4           | 15          | 2    | 30          |
| RAT RIVER  | 36          | 5    | 180         | 35          | 5    | 175         | 20          | 5    | 100         | 18          | 5    | 90          | 15          | 5    | 75          |
| WABIKON LAKE   | 62          | 3    | 186         | 50          | 2    | 100         | 90          | 2    | 180         | 10          | 1    | 10          | 10          | 1    | 10          |
| <b>LINCOLN</b>   |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| ALICE LAKE   | 168         | 4    | 672         | 165         | 5    | 825         | 125         | 5    | 625         | 5           | 3    | 15          | 120         | 3    | 360         |
| <b>ONEIDA</b>  |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| FISH LAKE  | 37          | 5    | 185         | 60          | 3    | 180         | 60          | 1    | 60          | 70          | 5    | 350         | 70          | 4    | 280         |
| LITTLE RICE LAKE   | 23          | 5    | 115         | 23          | 3    | 69          | 30          | 5    | 150         | 20          | 5    | 100         | 22          | 3    | 66          |
| RICE LAKE  | 118         | 1    | 118         | 118         | 3    | 354         | 0           | 0    | 0           | 118         | 5    | 590         | 100         | 3    | 300         |
| SPUR LAKE  | 110         | 5    | 550         | 110         | 5    | 550         | 96          | 3    | 288         | 100         | 5    | 500         | 100         | 5    | 500         |
| WISCONSIN RIVER  |             |      |             | 120         | 5    | 600         | 120         | 5    | 600         | 180         | 3    | 540         | 100         | 5    | 500         |
| <b>PRICE</b>   |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| BLOCKHOUSE LAKE  | 10          | 5    | 50          | 20          | 4    | 80          | 50          | 5    | 250         | 50          | 5    | 250         | 25          | 3    | 75          |
| <b>VILAS</b>   |             |      |             |             |      |             |             |      |             |             |      |             |             |      |             |
| ALLEQUASH LAKE   | 58          | 4    | 232         | 60          | 4    | 240         | 245         | 5    | 1225        | 100         | 5    | 500         | 75          | 2    | 150         |
| LITTLE RICE LAKE   | 9           | 5    | 45          | 20          | 3    | 60          | 30          | 1    | 30          | 15          | 3    | 45          | 20          | 3    | 60          |
| MANITOWISH RIVER   |             |      |             | 30          | 5    | 150         | 30          | 5    | 150         | 10          | 5    | 50          | 15          | 5    | 75          |
| PARTRIDGE LAKE   | 15          | 4    | 60          | 25          | 5    | 125         | 35          | 5    | 175         | 13          | 5    | 65          | 20          | 3    | 60          |
| RICE LAKE  | 22          | 5    | 110         | 15          | 1    | 15          | 30          | 2    | 60          | 15          | 3    | 45          | 50          | 1    | 50          |
| WEST PLUM LAKE   | 40          | 4    | 160         | 50          | 2    | 100         | 23          | 5    | 115         | 50          | 3    | 150         | 35          | 3    | 105         |
| <b>SUBTOTAL</b>  | <b>858</b>  |      | <b>3373</b> | <b>1056</b> |      | <b>3933</b> | <b>1004</b> |      | <b>4028</b> | <b>809</b>  |      | <b>3399</b> | <b>858</b>  |      | <b>2762</b> |
| COUNT:   |             |      | 37          |             |      | 39          |             |      | 36          |             |      | 39          |             |      | 40          |
| <b>TOTAL:</b>  | <b>1923</b> |      | <b>7532</b> | <b>2320</b> |      | <b>8456</b> | <b>2159</b> |      | <b>8957</b> | <b>1924</b> |      | <b>7500</b> | <b>1749</b> |      | <b>6099</b> |
| AVERAGE:   |             |      | 204         |             |      | 217         |             |      | 249         |             |      | 192         |             |      | 152         |

| 1990  |      |       | 1991  |      |       | 1992  |      |       | 1993  |      |       | 1994  |      |       | 1995  |      |       |
|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|-------|
| ACRES | DEN. | INDEX | ACRES | DEN. | INDEX | ACRES | DEN. | INDEX | ACRES | DEN. | INDEX | ACRES | DEN. | INDEX | ACRES | DEN. | INDEX |
| 4     | 1    | 4     | 0     | 0    | 0     | 9     | 4    | 36    | 0     | 0    | 0     | 40    | 4    | 160   | 1     | 3    | 3     |
| 32    | 2    | 64    | 118   | 2    | 236   | 60    | 2    | 120   | 110   | 3    | 330   | 320   | 2    | 640   | 410   | 4    | 1640  |
| 10    | 2    | 20    | 8     | 3    | 24    | 7     | 3    | 21    | 6     | 4    | 24    | 8     | 3    | 24    | 12    | 1    | 12    |
| 125   | 3    | 375   | 140   | 1    | 140   | 110   | 3    | 330   | 215   | 3    | 645   | 190   | 3    | 570   | 200   | 4    | 800   |
| 46    | 4    | 184   | 28    | 5    | 140   | 36    | 4    | 144   | 28    | 4    | 112   | 22    | 3    | 66    | 30    | 3    | 90    |
| 28    | 4    | 112   | 20    | 4    | 80    | 14    | 3    | 42    | 20    | 5    | 100   | 21    | 2    | 42    | 26    | 2    | 52    |
| 72    | 2    | 144   | 55    | 2    | 110   | 55    | 3    | 165   | 65    | 5    | 325   | 85    | 3    | 255   | 85    | 3    | 255   |
| 23    | 3    | 69    | 18    | 3    | 54    | 22    | 4    | 88    | 9     | 2    | 18    | 10    | 4    | 40    | 12    | 5    | 60    |
| 0     | 0    | 0     | 20    | 5    | 100   | 15    | 5    | 75    | 13    | 5    | 65    | 10    | 5    | 50    | 12    | 5    | 60    |
| 33    | 2    | 66    | 30    | 2    | 60    | 10    | 1    | 10    | 50    | 1    | 50    | 41    | 1    | 41    | 2     | 1    | 2     |
| 2     | 5    | 10    | 2     | 3    | 6     | 2     | 5    | 10    | 11    | 5    | 55    | 5     | 5    | 25    |       |      |       |
| 48    | 3    | 144   | 60    | 3    | 180   | 76    | 3    | 228   | 55    | 5    | 275   | 25    | 2    | 50    |       |      |       |
| 5     | 2    | 10    | 12    | 3    | 36    | 7     | 4    | 28    | 9     | 4    | 36    | 8     | 2    | 16    | 20    | 2    | 40    |
| 20    | 2    | 40    | 3     | 1    | 3     | 20    | 1    | 20    | 0     | 0    | 0     | 20    | 1    | 20    | 8     | 1    | 8     |
| 95    | 4    | 380   | 105   | 2    | 210   | 20    | 2    | 40    | 40    | 2    | 80    | 100   | 3    | 300   | 65    | 2    | 130   |
| 75    | 3    | 225   | 90    | 2    | 180   | 48    | 1    | 48    | 40    | 2    | 80    | 105   | 3    | 315   | 125   | 4    | 500   |
| 42    | 3    | 126   | 65    | 4    | 260   | 43    | 5    | 215   | 18    | 4    | 72    | 42    | 3    | 126   | 40    | 3    | 120   |
| 19    | 5    | 95    | 15    | 3    | 45    | 19    | 4    | 76    | 20    | 3    | 60    | 16    | 3    | 48    | 16    | 5    | 80    |
| 8     | 3    | 24    | 18    | 2    | 36    | 8     | 3    | 24    | 8     | 4    | 32    | 15    | 2    | 30    | 10    | 3    | 30    |
| 44    | 4    | 176   | 26    | 2    | 52    | 10    | 2    | 20    | 12    | 4    | 48    | 18    | 3    | 54    | 15    | 3    | 45    |
| 22    | 2    | 44    | 18    | 1    | 18    | 5     | 3    | 15    | 3     | 1    | 3     | 12    | 4    | 48    | 25    | 5    | 125   |
| 110   | 2    | 220   | 75    | 1    | 75    | 40    | 1    | 40    | 30    | 2    | 60    | 20    | 1    | 20    | 28    | 1    | 28    |
| 863   |      | 2532  | 926   |      | 2045  | 636   |      | 1795  | 762   |      | 2470  | 1133  |      | 2940  | 1142  |      | 4080  |
| 1     | 1    | 1     | 1     | 1    | 1     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     |
| 2     | 2    | 4     | 2     | 4    | 8     | 3     | 3    | 9     | 2     | 4    | 8     | 2     | 4    | 8     | 4     | 2    | 8     |
| 3     | 1    | 3     | 5     | 1    | 5     | 64    | 1    | 64    | 100   | 3    | 300   | 100   | 1    | 100   | 90    | 1    | 90    |
| 18    | 5    | 90    | 20    | 5    | 100   | 48    | 5    | 240   | 12    | 5    | 60    | 15    | 5    | 75    | 15    | 2    | 30    |
| 4     | 3    | 12    | 30    | 4    | 120   | 72    | 3    | 216   | 16    | 4    | 64    | 30    | 3    | 90    | 38    | 1    | 38    |
| 33    | 3    | 99    | 7     | 3    | 21    | 39    | 1    | 39    | 10    | 4    | 40    | 9     | 4    | 36    | 50    | 2    | 100   |
| 80    | 5    | 400   | 8     | 4    | 32    | 38    | 5    | 190   | 28    | 5    | 140   | 20    | 3    | 60    | 20    | 2    | 40    |
| 20    | 4    | 80    | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 0     | 0    | 0     | 15    | 3    | 45    |
| 1     | 1    | 1     | 0     | 0    | 0     | 112   | 2    | 224   | 0     | 0    | 0     | 100   | 1    | 100   | 70    | 1    | 70    |
| 15    | 1    | 15    | 0     | 0    | 0     | 110   | 2    | 220   | 110   | 4    | 440   | 80    | 5    | 400   | 70    | 4    | 280   |
| 135   | 5    | 675   | 120   | 5    | 600   | 150   | 4    | 600   | 120   | 5    | 600   | 180   | 5    | 900   | 150   | 5    | 750   |
| 20    | 5    | 100   | 12    | 2    | 24    | 22    | 3    | 66    | 13    | 3    | 39    | 20    | 3    | 60    | 25    | 2    | 50    |
| 42    | 4    | 168   | 55    | 5    | 275   | 66    | 5    | 330   | 75    | 5    | 375   | 60    | 4    | 240   | 75    | 3    | 225   |
| 2     | 1    | 2     | 2     | 2    | 4     | 0     | 0    | 0     | 0     | 0    | 0     | 4     | 1    | 4     | 8     | 1    | 8     |
| 32    | 5    | 160   | 8     | 5    | 40    | 0     | 0    | 0     | 15    | 4    | 60    | 12    | 4    | 48    | 10    | 4    | 40    |
| 8     | 3    | 24    | 18    | 5    | 90    | 15    | 5    | 75    | 30    | 5    | 150   | 26    | 5    | 130   | 12    | 3    | 36    |
| 22    | 5    | 110   | 16    | 5    | 80    | 20    | 3    | 60    | 16    | 4    | 64    | 28    | 4    | 112   | 28    | 2    | 56    |
| 5     | 1    | 5     | 30    | 5    | 150   | 35    | 4    | 140   | 10    | 4    | 40    | 18    | 4    | 72    | 25    | 3    | 75    |
| 443   |      | 1949  | 334   |      | 1550  | 794   |      | 2473  | 557   |      | 2380  | 704   |      | 2435  | 705   |      | 1941  |
|       |      | 40    |       |      | 40    |       |      | 40    |       |      | 40    |       |      | 40    |       |      | 38    |
| 1306  |      | 4481  | 1260  |      | 3595  | 1430  |      | 4268  | 1319  |      | 4850  | 1837  |      | 5375  | 1847  |      | 6021  |
|       |      | 112   |       |      | 90    |       |      | 107   |       |      | 121   |       |      | 134   |       |      | 158   |

| Appendix 2. Ricing trips and pounds of green rice harvested by respondents to the 1999 wild rice harvest survey. |                             |             |            |             |            |                |            |
|--|-----------------------------|-------------|------------|-------------|------------|----------------|------------|
| COUNTY   | WATER                       | TRIBAL      |            | STATE       |            | COMBINED TOTAL |            |
|  |                             | TRIPS       | POUNDS     | TRIPS       | POUNDS     | TRIPS          | POUNDS     |
| ASHLAND  | KAKAGON SLOUGHS             |             |            | 5           | 165        | 5              | 165        |
|  | <b>Subtotal</b>             |             |            | <b>5</b>    | <b>165</b> | <b>5</b>       | <b>165</b> |
| BARRON   | BEAR LAKE                   | 1           | 20         | 14          | 338        | 15             | 358        |
|  | UNNAMED WATER               |             |            | 1           | 50         | 1              | 50         |
|  | <b>Subtotal</b>             | <b>1</b>    | <b>20</b>  | <b>15</b>   | <b>388</b> | <b>16</b>      | <b>408</b> |
| BAYFIELD   | TOTOGATIC LAKE              | 4           | 24         | 2           | 10         | 6              | 34         |
|  | UNNAMED WATER               |             |            | 3           | 98         | 3              | 98         |
|  | <b>Subtotal</b>             | <b>4</b>    | <b>24</b>  | <b>5</b>    | <b>108</b> | <b>9</b>       | <b>132</b> |
| BURNETT  | BLACK BROOK FLOWAGE         | 3           | 150        | 17          | 392        | 20             | 542        |
|  | BRIGGS LAKE                 | 7           | 252        | 4           | 126        | 11             | 378        |
|  | CARTERS BRIDGE              | 6           | 255        |             |            | 6              | 255        |
|  | CLAM FLOWAGE                | 2           | 95         | 14          | 437        | 16             | 532        |
|  | CLAM LAKE                   | 36          | 912        | 89          | 3004       | 125            | 3916       |
|  | CULBERTSON LAKE             |             |            | 1           | 20         | 1              | 20         |
|  | EAGLE LAKE                  |             |            | 1           | 5          | 1              | 5          |
|  | GASLYN LAKE                 | 3           | 95         | 3           | 25         | 6              | 120        |
|  | LONG LAKE                   | 7           | 252        | 10          | 193        | 17             | 445        |
|  | MUD LAKE                    | 2           | 200        | 1           | 35         | 3              | 235        |
|  | NORTH LANG LAKE             |             |            | 7           | 255        | 7              | 255        |
|  | PHANTOM FLOWAGE             | 1           | 30         | 21          | 429        | 22             | 459        |
|  | RICE LAKE                   |             |            | 1           | 30         | 1              | 30         |
|  | SPENCER LAKE                |             |            | 1           | 87         | 1              | 87         |
|  | UNNAMED WATER               |             |            | 2           | 66         | 2              | 66         |
|  | WEBB CREEK                  | 1           | 50         | 4           | 140        | 5              | 190        |
|  | YELLOW RIVER                | 1           | 15         | 5           | 75         | 6              | 90         |
| <b>Subtotal</b>  | <b>69</b>                   | <b>2306</b> | <b>181</b> | <b>5319</b> | <b>250</b> | <b>7625</b>    |            |
| DOUGLAS  | LOWER OX LAKE               |             |            | 1           | 50         | 1              | 50         |
|  | MINONG FLOWAGE (SMITHS BRG) | 2           | 30         | 17          | 678        | 19             | 708        |
|  | MULLIGAN LAKE               |             |            | 3           | 160        | 3              | 160        |
|  | RADIGAN FLOWAGE             |             |            | 1           | 25         | 1              | 25         |
|  | ST. CROIX RIVER             | 1           | 20         |             |            | 1              | 20         |
| <b>Subtotal</b>  | <b>3</b>                    | <b>50</b>   | <b>22</b>  | <b>913</b>  | <b>25</b>  | <b>963</b>     |            |
| FOREST   | LITTLE RICE FLOWAGE         |             |            | 1           | 15         | 1              | 15         |
|  | RAT RIVER                   |             |            | 1           | 9          | 1              | 9          |
|  | WABICON LAKE                | 1           | 13         |             |            | 1              | 13         |
|  | WOLF RIVER                  | 2           | 57         | 1           | 20         | 3              | 77         |
|  | <b>Subtotal</b>             | <b>3</b>    | <b>70</b>  | <b>3</b>    | <b>44</b>  | <b>6</b>       | <b>114</b> |
| IRON   | UNNAMED WATER               | 3           | 65         |             |            |                |            |
|  | <b>Subtotal</b>             | <b>3</b>    | <b>65</b>  |             |            | <b>3</b>       | <b>65</b>  |
| LANGLADE   | ACKLEY WILDLIFE AREA        |             |            | 1           | 23         | 1              | 23         |
|  | DALY POND                   |             |            | 2           | 50         | 2              | 50         |
|  | MINIWAUKAN LAKE             |             |            | 2           | 90         | 2              | 90         |
|  | SPIDER CREEK FLOWAGE        |             |            | 1           | 0          | 1              | 0          |
|  | UNNAMED WATER               |             |            | 1           | 29         | 1              | 29         |
|  | WOLF RIVER                  |             |            | 1           | 1          | 1              | 1          |
| <b>Subtotal</b>  |                             |             | <b>8</b>   | <b>193</b>  | <b>8</b>   | <b>193</b>     |            |
| LINCOLN  | ALEXANDER LAKE              |             |            | 1           | 25         | 1              | 25         |
|  | LAKE ALICE                  | 2           | 54         | 3           | 134        | 5              | 188        |
|  | WISCONSIN RIVER             | 2           | 50         | 8           | 285        | 10             | 335        |
|  | <b>Subtotal</b>             | <b>4</b>    | <b>104</b> | <b>12</b>   | <b>444</b> | <b>16</b>      | <b>548</b> |
| MARINETTE  | LAKE NOQUEBAY               |             |            | 1           | 0          | 1              | 0          |
|  | <b>Subtotal</b>             |             |            | <b>1</b>    | <b>0</b>   | <b>1</b>       | <b>0</b>   |
| MARQUETTE  | NESHKORO MILLPOND           |             |            | 6           | 61         | 6              | 61         |
|  | UNNAMED WATER               |             |            | 2           | 80         | 2              | 80         |
|  | <b>Subtotal</b>             |             |            | <b>8</b>    | <b>141</b> | <b>8</b>       | <b>141</b> |

Appendix 2 continued on next page.



| Appendix 2. Ricing trips and pounds of green rice harvested by respondents to the 1999 wild rice harvest survey (cont.) |                          |            |              |             |               |                |               |
|---|--------------------------|------------|--------------|-------------|---------------|----------------|---------------|
| COUNTY  | WATER                    | TRIBAL     |              | STATE       |               | COMBINED TOTAL |               |
|   |                          | TRIPS      | POUNDS       | TRIPS       | POUNDS        | TRIPS          | POUNDS        |
| ONEIDA  | BIG LAKE THOROUGHFARE    | 2          | 55           | 14          | 291           | 16             | 346           |
|   | LAUREL LAKE              | 2          | 110          |             |               | 2              | 110           |
|   | SPUR LAKE                | 2          | 27           | 3           | 98            | 5              | 125           |
|   | UNNAMED WATER            |            |              | 5           | 115           | 5              | 115           |
|   | WISCONSIN RIVER          |            |              | 4           | 81            | 4              | 81            |
|   | <b>Subtotal</b>          | <b>6</b>   | <b>192</b>   | <b>26</b>   | <b>585</b>    | <b>32</b>      | <b>777</b>    |
| POLK  | JOEL FLOWAGE             | 2          | 25           | 3           | 110           | 5              | 135           |
|   | LT. BUTTERNUT LAKE       | 3          | 75           | 5           | 135           | 8              | 210           |
|   | MCKENZIE CREEK           | 2          | 20           |             |               | 2              | 20            |
|   | RICE BED CREEK           |            |              | 1           | 32            | 1              | 32            |
|   | RICE LAKE                |            |              | 3           | 71            | 3              | 71            |
|   | WHITE ASH LAKE           | 1          | 15           |             |               | 1              | 15            |
|   | <b>Subtotal</b>          | <b>8</b>   | <b>135</b>   | <b>12</b>   | <b>348</b>    | <b>20</b>      | <b>483</b>    |
| PRICE   | SPRING CREEK             |            |              | 6           | 99            | 6              | 99            |
|   | <b>Subtotal</b>          |            |              | <b>6</b>    | <b>99</b>     | <b>6</b>       | <b>99</b>     |
| RUSK  | LEA FLOWAGE              |            |              | 6           | 216           | 6              | 216           |
|   | <b>Subtotal</b>          |            |              | <b>6</b>    | <b>216</b>    | <b>6</b>       | <b>216</b>    |
| SAWYER  | NELSON LAKE              | 1          | 3            | 1           | 15            | 2              | 18            |
|   | PACWAWONG LAKE           | 9          | 235          | 54          | 1057          | 63             | 1292          |
|   | PHIPPS FLOWAGE           | 13         | 251          | 12          | 258           | 25             | 509           |
|   | <b>Subtotal</b>          | <b>23</b>  | <b>489</b>   | <b>67</b>   | <b>1330</b>   | <b>90</b>      | <b>1819</b>   |
| TAYLOR  | CHEQUAMEGON WATERS FLOW. |            |              | 12          | 407           | 12             | 407           |
|   | MONDEAUX FLOWAGE         |            |              | 6           | 284           | 6              | 284           |
|   | <b>Subtotal</b>          |            |              | <b>18</b>   | <b>691</b>    | <b>18</b>      | <b>691</b>    |
| VILAS   | ALLEQUASH LAKE           | 3          | 130          | 8           | 159           | 11             | 289           |
|   | AURORA LAKE              | 5          | 202          | 29          | 1474          | 34             | 1676          |
|   | EAGLE RIVER CHAIN        |            |              | 1           | 30            | 1              | 30            |
|   | IRVING LAKE              | 1          | 31           | 1           | 9             | 2              | 40            |
|   | ISLAND LAKE              | 2          | 75           | 6           | 64            | 8              | 139           |
|   | MANITOWISH RIVER         |            |              | 1           | 5             | 1              | 5             |
|   | MANN FLOWAGE             |            |              | 4           | 227           | 4              | 227           |
|   | NIXON CREEK              |            |              | 1           | 10            | 1              | 10            |
|   | PRESQUE ISLE             | 2          | 55           |             |               | 2              | 55            |
|   | RICE CREEK               |            |              | 2           | 30            | 2              | 30            |
|   | RICE LAKE                |            |              | 1           | 30            | 1              | 30            |
|   | UPPER NINEMILE FLOWAGE   | 1          | 17           | 8           | 353           | 9              | 370           |
|   | WEST PLUM LAKE           |            |              | 3           | 20            | 3              | 20            |
|   | WILD RICE LAKE           |            |              | 1           | 25            | 1              | 25            |
| <b>Subtotal</b>   | <b>14</b>                | <b>510</b> | <b>66</b>    | <b>2436</b> | <b>80</b>     | <b>2946</b>    |               |
| WASHBURN  | CRANBERRY CREEK          |            |              | 2           | 210           | 2              | 210           |
|   | DILLY LAKE               | 3          | 23           | 6           | 97            | 9              | 120           |
|   | LITTLE MUD LAKE          |            |              | 1           | 11            | 1              | 11            |
|   | MUD LAKE                 |            |              |             |               | 0              | 0             |
|   | POTATO CREEK             |            |              | 1           | 7             | 1              | 7             |
|   | POTATO LAKE              |            |              | 1           | 15            | 1              | 15            |
|   | SPRING LAKE              | 1          | 15           | 3           | 22            | 4              | 37            |
|   | TRANUS LAKE              |            |              | 1           | 0             | 1              | 0             |
|   | TREGO FLOWAGE            |            |              | 2           | 28            | 2              | 28            |
|   | UNNAMED WATER            |            |              | 11          | 320           | 11             | 320           |
|   | YELLOW RIVER             |            |              | 1           | 5             | 1              | 5             |
| <b>Subtotal</b>   | <b>4</b>                 | <b>38</b>  | <b>29</b>    | <b>715</b>  | <b>33</b>     | <b>753</b>     |               |
| WAUSHARA  | SAXVILLE POND            |            |              | 1           | 3             | 1              | 3             |
|   | <b>Subtotal</b>          |            |              | <b>1</b>    | <b>3</b>      | <b>1</b>       | <b>3</b>      |
| UNNAMED   | UNNAMED WATER            |            |              | 4           | 300           | 4              | 300           |
|   | <b>Subtotal</b>          |            |              | <b>4</b>    | <b>300</b>    | <b>4</b>       | <b>300</b>    |
| <b>GRAND TOTAL</b>  |                          | <b>142</b> | <b>4,003</b> | <b>495</b>  | <b>14,438</b> | <b>637</b>     | <b>18,441</b> |

| Appendix 3. Waters suggested for seeding by respondents to the 1999 wild rice harvest survey. |  |
|---|--|
| COUNTY  | WATER  |
| Barron  | Hemlock Lake at Bolger Flowage inlet<br>Lake 30<br>Montanis Lake   |
| Bayfield  | The flowage above the Namekagon Dam  |
| Burnett   | Bass Lake, Union Township<br>Big Sand Lake<br>Hay Creek Flowage, NE of Danbury<br>Long Lake<br>Mud Lake (Oakland Township) |
| Douglas   | Allouez Bay<br>Little Brule Slough   |
| Forest  | Pickereel Lake   |
| Langlade  | Hunting River, above the Fitzgerald Dam road   |
| Marinette   | Lake Noquebay  |
| Oneida  | Bear Lake, south bay   |
| Pierce  | Rush River   |
| Polk  | Half Moon Lake<br>Lotus Lake<br>Trade Lake   |
| Price   | Cranberry Lake<br>Sailor Lake  |
| Washburn  | Long Lake<br>Yellow River Flowage  |
| Vilas   | Lake Content<br>Palette Lake   |
| Pine - MN   | Crooked Lake, near Duxbury   |