WILD RICE WETLAND INVENTORY OF NORTHWEST WISCONSIN

Compiled by:

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

Administrative Report 86-4

March 1986

ACKNOWLEDGMENTS

The author would like to gratefully acknowledge the following for their vital contributions to this survey: Todd Varnes, UW-Stevens Point Student Intern, for developing the survey scheme and methodology, supervising the field survey crew, and summarizing the field data; Ernest Quagon (Lac Courte Oreilles tribal member) and Joseph Oustigoff (St. Croix tribal member) for collecting field data; tribal conservation departments for providing information on locations of existing and historical rice beds, Lac Courte Orielles, St. Croix, Lac du Flambeau, and Mole Lake; also for providing survey site locations, wildlife managers, wardens, biologists, and conservation personnel of the Wisconsin Department of Natural Resources (WDNR), U.S. Forest Service, and various county conservation or forestry departments; James Flanagan, WDNR warden, for survey site information and use of equipment, supplies, and the Siren WDNR Ranger Station, Dave Jacobson and WDNR Northwest District staff for cooperation in conducting the mail survey; Phillip Wallace for the use of state parks for camping by the field crew; and GLIFWC wardens Gordon Arbuckle and Ken Rusk for the use of their boats and outboard motors for field work.

TABLE OF CONTENTS

WILD RICE WETLAND INVENTORY OF NORTHWEST WISCONSIN

Abstract: A wild rice inventory of northwestern Wisconsin was conducted during summer 1985 to collect necessary information for development of a wild rice management program in northern Wisconsin. A wild rice suitability index was developed and after further refinement will be used to monitor wild rice habitat quality and assess potential reintroduction sites. Biological, chemical, and physical factors were recorded, and detailed maps were prepared. Sixty two lakes, 11 rivers and 8 flowages supported 767 ha (1896 acres) of wild rice in northwestern Wisconsin. Total wild rice acerage for the northern one-third of Wisconsin was estimated at 2.000 ha or 5,000 acres and was associated with favorable spring water levels in 1985. Perennial aquatic vegetation, crayfish, and beaver were found to negatively impact wild rice beds in northwest Wisconsin. Purple loosestrife was commonly found and is considered a threat to wild rice wetlands in northern Wisconsin.

INTRODUCTION

Wild rice (Zizania aquatica) abundance and distribution in Wisconsin has been drastically reduced since the early nineteenth century (Taube 1951, Stoddard 1957, Fannucchi et al. in press). Wild rice, once abundant throughout the state, in now classified as a scarce resource, Wis. Admin. Code sec. NR 1.95 (4), as much wild rice has been eliminiated by altering river courses, constructing dams and flowages, shoreline development, wetland drainage, dredging, pollution, vegetation competition, high beaver (Castor canadensis) populations and carp (Carpinus carpia). This decline is cause for alarm in light of wild rice's important ecological, economic, cultural, and aesthetic values. Consequently, the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) and Wisconsin Department of Natural Resources (WDNR) in 1985 established a joint working group to develop a wild rice protection and enhancement program in northern Wisconsin.

The first task of the GLIFWC - WDNR wild rice technical working group was to inventory existing and potential wild rice sites. Consequently, GLIFWC hired a student intern and 2 aides to survey the WDNR Northwest Wisconsin District and WDNR hired a student intern to survey the WDNR North Central district during summer of 1985. This report presents preliminary results of GLIFWC's wild rice survey of northwest Wisconsin. Detailed analysis of the data collected will be conducted once all the data has been entered into computer files to facilitate comprehensive statistical analysis.

METHODS

A mail survey of tribal conservation departments, WDNR wildlife managers, biologists, wardens, U.S. Forest Service, county conservation departments, and other researchers on current, past, and potential wild rice sites was conducted prior to field work. Meetings with wild ricers were held at the Lac Courte Oreilles, Lac du Flambeau, St. Croix, and Mole Lake Indian Reservations to supplement the mail survey data and develop a list of survey sites.

A 17 foot canoe and a 14 foot aluminum boat were used to collect biological, chemical, physical, and geographic data at the wild rice survey sites. We developed a survey form to facilitate systematic data collection and to calculate a wild rice suitability index for each site (Appendix B). All factors that we identified as potentially affecting wild rice were assigned numerical values, with the sum of values at a site used as the suitability index. Data recorded included size and density of wild rice beds, vegetative composition, bottom types, pH, conductivity, shoreline and watershed characteristics, and wildlife observations. County surface water resource books, published by WDNR, provided supplemental information such as: size, depth, and dimensions of water body; water control structure(s); freezout occurrence; water source; etc.

WDNR lake survey maps, topographic maps, and aerial photos were used for mapping wild rice beds and surrounding aquatic vegetation. Three wild rice stem density measurements were taken at each site, with a 0.5 meter wood frame, and averaged to estimate stem density for the site. Conductivity and pH were measured from one water sample at each site with Hach mini-meters. For bottom sampling we constructed two 2.5 meter-long core samplers, from 3.8 cm diameter PVC pipe, with 3.7 cm diameter solid plastic tubes as plungers. A 4 cm diameter thin leather strip was attached to the end of the plunger to create a seal and suction for drawing up the bottom sample.

Three bottom samples and 3 water samples were obtained from each of 41 selected wild rice beds and sent to the White Earth Reservation in Minnesota for detailed chemical analysis and development of a model for predicting wild rice stand quality. Samples were collected from wild rice beds as follows: 25 from northwestern Wisconsin, 6 from north central Wisconsin, 8 from the Kakagon sloughs on the Bad River Reservation, and 2 from extraordinary rice beds in Marquette County, southern Wisconsin. This analysis has not yet been conducted and thus is not included in this report.

RESULTS AND DISCUSSION

Wild Rice Acreage

A total of 127 bodies of water (82 of which supported wild rice) and 767 ha (1,896 acres) of wild rice were surveyed (Appendix A, Tables 1, 2, 3). Wild rice beds were present in 62 lakes, 11 rivers, and 8 flowages. A total of 479.1 ha (1,184 acres) of dense wild rice beds, 133.1 ha (329 acres) of medium density wild rice beds, and 154.8 ha (382.5 acres) of sparse density wild rice beds were recorded. There was much variability in the size of rice beds, ranging from 0.04 ha (0.1 acres) to 80.9 ha (200 acres). Size of dense rice beds averaged 11.7 ha (28.8 acres), medium density rice beds averaged 7.8 ha (19.3 acres), and sparse density rice beds averaged 6.2 ha (15.3 acres).

In general, the largest percentage of rice occurred in dense beds, which averaged larger in size than those of medium or sparse density beds. Rice density varies from year to year depending on a variety of environmental factors, the most important being stable spring water levels (Chambliss 1940, Thomas and Stewart 1969). Water levels were considered favorable in spring 1985, and thus it was considered a good year for wild rice in northwestern Wisconsin (Flanagan et al. pers. comm.).

Approximately 951 ha (2,350 acres) of wild rice was surveyed in the WDNR North Central district (Niemann 1986). We estimate that (with the 767 ha surveyed in northwestern Wisconsin, roughly 200 ha on Chippewa Indian Reservations, and assorted unsurveyed rice beds) the northern one-third of Wisconsin supported roughly 2,000 ha or 5,000 acres of natural wild rice stands in 1985. If all this acreage were utilized by hand harvesting (with average hand harvesting yields) it could potentially yield $2,000,000 worth of wild rice annually at the 1985 average Wisconsin price of $6.00/pound of processed rice. Hand harvesting takes only 10 to 20% of rice seeds produced annually by a wild rice bed (Moyle 1944, Lawrence 1951, G. Fannucchi 1983) leaving ample amounts for reseeding and wildlife utilization.

The 2,000 ha estimate of wild rice in northern Wisconsin was associated with the favorable water conditions of spring 1985. When water levels are favorable, Minnesota supports an estimated 12,100 ha (30,000 acres) of wild rice (Libertus 1981) and northwest Ontario supports an estimated 10,700 ha (26,400 acres) (Lee 1976).

Associated Aquatic Plants

Common aquatic emergent plants associated with wild rice were: cattail (Typha latifolia), burreed (Sparganium angustifolium), bulrush (Scirpus spp.), pickerelweed

(Pontederia cordata), and arrowhead (Sagittaria spp.). Common submergent plants associated with wild rice were: coontail (Ceratophyllum demersum), various pondweeds (Potamogaton spp.), elodea (Elodea canadensis), water milfoil (Myriophyllum spp.), and wild celery (Vallisneria americana). Common floating aquatics were; yellow pond lily (Nuphar spp.), white water lily (Nymphaea spp.) water shield (Brasenia schreberi), and duckweed (Lemna spp.).

Generally, as wild rice density decreased the abundance of emergent, submergent, and floating perennial competitors increased. Floating aquatics (especially white water lily and water shield) are of most concern because of their ability to shade out wild rice plants (Kutcha 1984). Purple loosestrife (Lythrum salicaria), also of concern as a potential threat to rice beds (Stuckey 1980), was found in 15 wild rice survey areas. Purple loosestrife, an exotic plant that rapidly outcompetes native aquatic plants (Thompson et al. 1980), is spreading swiftly throughout northern Wisconsin.

Water Chemistry

Average pH values of wild rice beds were: 6.4 (SD = 3.1) for dense beds, 7.5 (SD = 0.9) for medium density beds, and 7.6 (SD = 1.7) for sparse density beds. Average conductivity values of wild rice beds (in umhos/cm) were: 143 (SD = 45) for dense beds, 119 (SD = 44) for medium density beds, and 121 (SD = 46) for sparse density beds.

Generally, pH was lower and conductivity was higher for dense rice beds than for medium or sparse density beds, which is consistent with what was found in north central Wisconsin (Niemann 1986). The average northwestern Wisconsin pH of 6.4 for dense wild rice beds is outside of what has been considered the optimum pH range for wild rice, 7.2 - 8.8 (Moyle 1944, Stoddard 1957), but is consistent with the average pH of 6.0 found in the roughly 3400 acre Nett Lake rice bed (Swan 1983), considered one of the finest beds in Minnesota.

The range of pH and conductivity measurements in northwestern Wisconsin rice beds was great: 6.4 to 10.1 for pH, and 49 to 225 umhos/cm for conductivity. This variability limited analysis. In addition, time permitted only one pH and conductivity measurement at each survey site. Consequently, since pH varies from time of year and local weather conditions, the measurements offer limited insight into the water chemistry of wild rice beds in northwestern Wisconsin.

Wild Rice Suitability Index

The wild rice suitability index varied from 91.6 to

166.0 at sites supporting wild rice, varying at each site depending on wild rice presence, basin depth and contours, shoreline characteristics, bottom types, water quality, water control structures, abundance of aquatic plant competitors, wildlife utilization, and other factors that we measured and assigned points to based on potential impact to rice (wild rice survey form, Appendix B). The index was significantly lower (at the 95% level) at survey sites which did not support wild rice than at sites supporting wild rice.

GLIFWC designed the survey index as a relatively quick way to assess wild rice habitat, to evaluate potential reintroduction sites and monitor rice habitat changes. There was some questionable variability in index values collected between northwest Wisconsin rice surveyors and north central Wisconsin surveyors. However, within a survey crew observations appeared standardized and thus we feel the index can be made workable if all surveyors are adequately trained to standardize their observations.

Associated Fish and Wildlife

Approximately 14% of the wild rice beds on lakes, including some of the largest, appeared to have problems with beaver altering spring water levels. Beaver dams are most damaging during periods of high runoff, when they can rapidly raise water levels, uprooting rice plants which are in the critical floating leaf stage from mid-May to the end of June (Chambliss 1940, Thomas and Stewart 1969).

Crayfish were found on 57% of the survey sites and are suspected to be negatively impacting a large percentage of northwest Wisconsin wild rice beds. Rusty crayfish (Orcotnectes rusticus) are not native to Wisconsin but are currently considered by WDNR to be present in all clear-water, relatively hard-bottom lakes of northern Wisconsin (A. Ensign pers. comm.). Rusty crayfish populations can dramatically reduce abundance of aquatic plants (Magnuson et al. 1975, Lorman 1980) and have eliminated most rooted aquatics in Lake Metonga, Forest Co., WI (Carlson 1979). They are also considered responsible for dramatic declines in aquatic plants in many other northern Wisconsin lakes (Capelli 1982, Lorman 1980). Rusty crayfish can severely impact wild rice in the floating leaf stage (Noetzel 1986) and are a suspected cause for wild rice decline on the Sugarbush Lakes chain of the Lac du Flambeau Indian Reservation, Vilas County, Wisconsin (D. Schwalenberg pers comm).

Muskrat (Ondatra zibethicus) were found to seriously impact sparse rice stands, taking a large percentage of the emerging wild rice stems. Muskrats have been responsible for failure of planted rice beds (Krummes 1940, Dore 1969) and can impair the ability of a rice bed to reseed itself (W.

Fannucchi et al. 1983). Muskrat damage (eliminating seed producing stems) for 3 successive years or more to sparse wild rice beds may greatly reduce or eradicate a rice bed. The University of Minnesota (Agricultural Experiment Station) found that less than 10% of wild rice seeds were still viable after being dormant in the sediment for 3 years, and progressively much less were viable after each additional year of dormancy (Oelke et al. 1983).

Carp (Carpinus carpia) were present in at least 18% of the survey sites as indicated in WDNR County surface water resources publications. Wild rice eradication on Lake Koshkonong in southern Wisconsin has been attributed to the introduction of carp there (Black 1944) and carp have been documented uprooting wild rice within a few days of stocking in a research pond at Madison, Wisconsin (Black 1946). Carp can be especially destructive to wild rice when its in the floating leaf stage in May and June (Rose 1984).

Blackbirds (Agelaius phoeniceus) were found to utilize most of the rice beds surveyed. However, researchers have found that blackbirds feed mostly on the rice worm (Apamea apamiformis) and do not consume enough seeds to impact the yields of handharvesters (J. Stewart unpubl., D. Wilcox pers. comm). Blackbirds may reduce rice seed yields though, if large numbers feed in ripe rice stands prior to harvesting, knocking the rice into the water before handharvesters have the opportunity to harvest it.

RECOMMENDATIONS

Research

The wild rice survey data for northwest Wisconsin needs to be combined with that from northeast Wisconsin, and entered in computer files to facilitate comprehensive analysis. A large range of factors impact wild rice bed size, density, and yield and thus multivariate analysis is needed to collectively examine and weigh all factors potentially impacting northern Wisconsin wild rice beds.

An annual systematic monitoring program of the larger and more important wild rice beds should be initiated. GLIFWC plans include developing an annual aerial survey over northern Wisconsin rice areas and intensified field monitoring at select wild rice sites including complete sediment and water chemistry analysis in relation to wild rice seed production. WDNR plans to continue the rice survey initiated last summer by surveying 9 wild rice sites in 1986 that were not surveyed in 1985 due to lack of time (Niemann 1986).

The wild rice suitability index needs to be refined through supplemental field work and testing. This index can become a valuable tool for assessing wild rice potential

in a body of water to target wild rice enhancement and reintroduction efforts.

More research on crayfish damage needs to be done. Rusty crayfish damage to wild rice beds in northern Wisconsin needs to be quantified and control techniques developed.

Management

GLIFWC and WDNR plan to select several existing and potential wild rice sites to initially target rice protection, enhancement, and reintroduction efforts. Proven rice enhancement techniques and experimental techniques will be implemented. Results from site-specific management will be used with the inventory data base for development of rice protection, enhancement, and reintroduction guidelines and expanded plans for northern Wisconsin.

In the absence of management guidelines, current rice management efforts should be directed at stabilizing May - June water levels by beaver control and/or utilizing existing water control structures. Beaver impacting large bodies of water or rice beds should be controlled through trapping and subsequent removal of dams. Beaver control must be selective, since shallow beaver ponds (less than 1.5 m or 5 ft. deep) can create rice habitat if dam alteration is done at key moments in the spring to prevent rapid water level increases.

Competing perennial aquatic plants in wild rice beds can be controlled by application of aquatic herbicides (roteo is EPA approved for spraying over water in Wisconsin), by mechanical removal, or by overwinter drawdown if feasible (Kuchta 1984). Overwinter drawdown not only controls competing perennials but can also control abundance of rusty crayfish, muskrats, and beaver. Control of perennial aquatics in combination with spring water level stabilization can cause substantial increases in rice bed size and quality. The 200 acre rice bed in Clam Lake, Burnett County (the largest we surveyed) has experienced at least a 3-fold increase in size since the early 1970's, as a result of installation of a water control structure at the outlet and subsequent mechanical removal of submergent aquatics annually by a weed cutter. This work was done by the Clam Lake Association, which reports that not only has it benefitted wild rice but it has also improved fishing success on the lake.

Purple loosestrife control by herbicides or hand removal should be done wherever possible. Purple loosestrife not only poses a threat to wild rice but to the ecological diversity and importance of all wetlands in northern Wisconsin.

LITERATURE CITED

Black, J.D. 1944. "Carp problem" in 1901. Wis. Conserv. Bull. 9(7):6.

Black, J.D. 1946. Nature's own weed killer - the German carp. Wis. Conserv. Bull. 11(4):3-7.

Carlson, H. 1979. Comprehensive fishery survey report for Lake Metonga, Forest County. Wis. Dep. Nat. Res. Prog. Rep. 39pp.

Capelli, G.M. 1982. Displacement of northern Wisconsin crayfish by Orconectes rusticus. Limnol. Oceanogr., 27(4), 1982, 741-745.

Chambliss, C.E. 1940. The botany and history of Zizania aquatica. Annual rep., Smithsonian Inst. p. 134.

Dore, W.R. 1969. Wild rice. Canada Dep. Agric. Plant Res. Inst. Publ. 1393. 84pp.

Fannucchi, G.T., W.A. Fannucchi, L.E. Nauman. 1983. The effects of traditional wild rice harvesting on a wild rice marsh. Pp. 21-39 in Fannucchi, G.W. Wild rice in east central Minnesota. M.S. Thesis. Univ. Wis. - Stevens Point. 39pp.

Fannucchi, G., W. Fannucchi, and S. Craven. In Press. Wild rice - a Wisconsin resource. Univ. Wis. Extens. Serv. Madison.

Fannucchi, W.A., G.W. Fannucchi, and L.E. Nauman. 1983. Muskrat use of wild rice beds in central Minnesota. Pp. 9-20 in Fannucchi, W.A. Wildlife use of wild rice beds and the impact of rice harvesting on wildlife in east central Minnesota. M.S. Thesis. Univ. Wis. - Stevens Point. 20pp.

Krummes, W.T. 1940. The muskrat: a factor in waterfowl habitat management. Trans. North Am. Wildl. Conf. 5:395-398.

Kuchta, R. 1984. Wild rice research on Lower Rice Lake in Clearwater County, Minnesota 1982 - 1983. White Earth Indian Reserv. Official Doc. 63pp.

Lawrence, D. 1951. Wild rice. Minnesota Nat. 2:24-25.

Lee, P.F. 1976. Northwestern Ontario wild rice management plan. Ontario Ministr. Nat. Resour. 59 pp.

Libertus, R. 1981. Wild rice. Minnesota DNR Commissioners Rep. 2pp.

Lorman, J.G. 1980. Ecology of the crayfish, Orconectes rusticus, in northern Wisconsin. PhD Thesis, Univ. Wis. - Madison.

Magnuson, J.J., G.M. Capelli, J.G. Lorman, and R.A. Stein. 1975. Consideration of crayfish for macrophyte control. Pp. 66-74 in P.L. Brezonik and J.L. Fox, eds. The proceedings of a symposium on water quality management through biological control. Rep. No. ENV 07-75-1, University of Florida, Gainesville.

Moyle, J.B. 1944. Minnesota wild rice. J. Wildl. Manage. 8:177-184.

Niemann, R.G. 1986. Survey of wild rice beds in north central Wisconsin. Wis. Dep. Nat. Res. Rep. through Univ. Wis. - Stevens Point Intern Progr. 15pp.

Noetzel, D. 1986. Update on crayfish control research. Entomology Dept. Univ. Minn. Presented at the 17th Annual Wild Rice Conf. Grand Rapids, MN.

Rose, J.D. 1984. Limnology of wild rice production. Limno. Rep. Northland College, Ashland, WI. 14 pp.

Oelke, E.A., J.K. Ransom and M.J. McClellan. 1983. Wild rice production research - 1982. Pp. 19-32 in Minnesota Wild Rice Research 1982. Univ. Minn. Agr. Exp. Stn. 121 pp.

Swan, M. 1983. A study of the productivity of Nett Lake, Bois Forte Reservation. Minn. Chippewa Tribe Res. Lab. Rep. 11 pp.

Stoddard, C.H. 1957. Utilization of swamplands for wild rice production: a progress report. J. Soil Water Conserv. 33: 135 -138.

Stuckey, R.L. 1980. Distributional history of Lythrum salicaria (purple loosestrife) in North America. Bartonia, v. 47, 3-21.

Thomas, A.G. and J.M. Stewart. 1969. The effect of different water depths on the growth of wild rice. Can. J. Bot. 47:1525-1531.

Thompson, D.Q., R.L. Stuckey, and Erik Kiviat. 1980. Spread, impact, and control of purple loosestrife (Lythrum salicaria) in North American wetlands. U.S. Fish and Wildl. Serv. Draft Rep. 30 pp.

Taube, E. 1951. Wild rice. Scient. Month. 73: 369-375.

APPENDIX A

Summary of Wild Rice Survey Data

Table 1. Physical and chemical parameters of 1985 wild rice survey areas in northwest Wisconsin.

Name of Waterbody	Wild Rice in hectares (acres)[a]	% of water body <1.5m (5ft) deep covered by W.R. beds	Subject to freeze out?[b]	Bottom types[c]	Shoreline types[d]	Major water source[e]	Drainage type[e]	Noticeable occurrences of pollution	Water control structures	pH reading	Conductivity reading
Barron County											
Bear Lk.	29.10 (72.00)[3]	20%	N	$Mu^2/D^1/S^3/G^1$	$W^3/U^4/D^2$	str	str	yes	yes	8.0	160
Beaver Dam Lk.	-	-	N	$Mu^1/D^1/S^4/G^2/R^2$	$W^2/U^4/D^2$	str	str	yes	yes	8.5	152
Lake Vermillion Lk.	-	-	N	$Mu^1/D^1/S^4/G^2/R^2$	$A^1/W^1/B^1/U^5/D^1$	str	str	No	No	9.0	205
Red Cedar Lk.	-	-	N	$Mu^3/D^2/S^2$	$A^1/W^1/U^4/D^3$	str	str	yes	yes	9.1	120
Rice Lk.	-	-	O	$Mu^3/D^1/S^3$	$A^1/W^1/U^3/D^3$	str	str	yes	yes	9.5	135
Rice Lk.	0.08 (0.20)[2]	2%	O	$Mu^4/D^1/S^3$	$W^2/U^1/D^3$	str	str	yes	no	7.2	112
Stump Lk.	0.04 (0.10)[1]	1%	O	Mu^6	$W^1/U^5/D^1$	str	str	no	yes	9.6	160
Tuscobia Lk.	0.40 (1.00)[1]	2%	O	Mu^4/D^2	$A^1/W^1/U^4/D^1$	str	str	no	no	7.1	145
Vermillion R.	10.10 (25.00)[3]	50%	O	$S^4/G^1/D^1/Mu^1$	$A^1/W^3/D^1$	str	str	no	yes	6.4	122
Burnett County											
Bashaw Lk.	10.10 (25.00)[3]	60%	N	Mu^5/D^1	$W^2/U^4/D^3$	str	str	yes	no	10.1	180
Big Island Lk.	0.69 (1.7)[3]	25%	N	$Mu^2/S^2/R^2$	$W^4/U^3/D^1$	str	str	no	no	7.1	100
Big Sand Lk.	-	-	N	Mu^3/S^3	$W^1/U^3/D^2$	seep	str	yes	no	7.4	95
Bradshaw Sl.	2.40 (6.00)[1]	60%	C	$Mu^3/D^1/S^3$	W^1/U^5	str	str	no	no	7.3	86
Briggs Lk.	13.36 (33.00)[3]	90%	C	$Mu^4/D^1/S^2$	$W^4/U^2/D^1$	str	str	no	no	8.5	110
Clam River Fl.	22.26 (55.00)[3]	30%	N	$Mu^2/D^1/S^4$	U^5/D^1	str	str	yes	yes	8.6	60
Clam Lk.	80.94 (200.00)[3]	30%	N	Mu^5/C^1	$W^3/U^1/D^3$	str	str	yes	yes	6.6	135
Duckshot Lk.	2.02 (5.00)[3]	60%	C	Mu^5/D^1	$W^4/U^3/D^1$	seep	str	no	no	8.0	155
Gaslyn Lk.	24.28 (60.00)[3]	40%	O	Mu^5/C^1	$W^1/U^4/D^1$	str	str	no	no	7.7	140
Gull Lk.	10.12 (25.00)[2]	12%	N	$Mu^2/D^3/S^2$	$W^2/U^4/D^1$	str	str	no	no	7.0	110
Hanscom Lk.	-	-	O	D^1/S^5	$W^2/U^4/D^1$	seep	seep	no	no	9.2	125

Table 1. Continued.

Name of Waterbody	Wild Rice in hectares (acres)[a]	% of water body <1.5m (5ft) deep covered by W.R. beds	Subject to freeze out?[b]	Bottom types[c]	Shoreline types[d]	Major water source[e]	Drainage type[e]	Noticeable occurrences of pollution	Water control structures	pH reading	Conductivity reading
Jackson Lk.	0.60 (1.50)[1]	30%	N	Mu^5/D^1	W^5/U^2	str	str	no	no	6.8	105
Kent Lk.	4.05 (10.00)[3]	60%	O	Mu^5/D^1	W^5/D^1	spr	str	no	no	8.2	200
Lipsett Lk.	1.21 (3.00)[1]	3%	N	Mu^5/C^1	$W^2/U^4/D^2$	str	str	yes	no	9.2	140
Long Lk.	57.06 (140)[1]	75%	N	Mu^6	W^2/U^5	seep	str	no	no	8.2	120
Loon Lk.	-	-	N	$Mu^1/D^2/S^4$	$W^2/U^4/D^2$	seep	str	yes	no	8.7	120
Loon Lk.	22.26 (55.00)[2]	60%	O	$Mu^3/D^1/S^3$	W^3/U^3	str	str	no	no	7.2	120
Lost Lk.	-	-	C	D^1/S^5	$W^4/U^3/D^2$	seep	seep	no	no	7.0	55
Lower Clam Lk.	-	-	N	$Mu^1/D^1/S^4$	$W^1/U^3/D^3$	str	str	yes	yes	8.7	150
Mud Lk.	8.07 (20.00)[3]	80%	C	Mu^5/D^1	$W^4/U^3/D^1$	seep	str	yes	no	7.3	140
Mud Lk.	28.33 (70.00)[1]	65%	O	$Mu^4/D^1/S^2$	$W^1/U^4/D^1$	seep	str	no	no	7.6	64
Mudhen Lk.	8.09 (20.00)[3]	15%	N	Mu^5/C^1	$A^1/W^2/U^3/D^3$	seep	str	yes	no	8.6	130
North Lang Lk.	3.64 (9.00)[3]	60%	C	Mu^5/D^1	$W^4/U^3/D^1$	str	str	no	no	6.4	145
Petersen Lk.	2.40 (6.00)[1]	15%	O	$Mu^5/C^1/D^1$	W^1/U^4	seep	str	no	no	9.6	165
Rice Lk.	12.41 (30.00)[3]	75%	O	Mu^5/D^1	$A^2/W^4/U^2/D^1$	str	str	no	no	9.0	199
Rice Lk.	2.40 (6.00)[1]	3%	N	Mu^4/C^2	$W^2/U^4/D^1$	str	str	yes	no	8.9	200
Rice Lk.	6.07 (15.00)[2]	30%	O	Mu^5/C^1	W^4/U^2	seep	str	no	yes	6.8	119
Robie Lk.	-	-	N	$Mu^3/D^1/S^3$	W^1/U^5	str	str	no	no	7.5	85
Sand Lk.	-	-	N	$Mu^1/D^2/S^4$	$W^2/U^3/D^3$	seep	seep	yes	no	7.6	120
Spencer Lk.	6.07 (15.00)[3]	15%	O	Mu^5/D^1	$W^2/U^4/D^2$	seep	seep	yes	no	8.9	165
Tabor Lk.	-	-	N	$Mu^1/D^1/S^4$	$W^1/U^4/D^1$	seep	str	no	no	8.4	86
Unnamed Lk.	0.53 (1.30)[3]	60%	C	Mu^5/D^1	$W^5/U^2/D^1$	seep	seep	no	no	6.7	130
Webb Creek (lower site)	4.86 (12.00)[3]	70%	O	Mu^5/D^1	W^5/U^1	str	str	no	yes	7.5	105
Webb Creek (upper site)	0.97 (2.40)[3]	2%	O	$Mu^3/D^1/S^4$	$W^3/U^4/D^1$	str	str	no	yes	7.3	130

Table 1. Continued.

Name of Waterbody	Wild Rice in hectares (acres)[a]	% of waterbody <1.5m (5ft) deep covered by W.R. beds	Subject to freeze out?[b]	Bottom types[c]	Shoreline types[d]	Major water source[e]	Drainage type[e]	Noticeable occurrences of pollution	Water control structures	pH reading	Conductivity reading
Yellow R.	17.00 (42.00)[3]	65%	O	$Mu^5/D^1/S^2$	$W^5/U^2/D^1$	str	str	no	no	8.4	205
Yellow R.	1.21 (3.00)[2]	10%	N	$Mu^3/D^1/S^3$	U^5/D^1	str	str	yes	yes	8.4	120
Bayfield County											
Namakagon Lk.	-	-	N	$D^1/S^3/G^2/R^3$	$W^2/U^5/D^4$	str	str	no	yes	7.5	69
Totogatic Lk.	2.02 (5.00)[1]	15%	O	Mu^5	$W^2/U^4/D^1$	str	str	no	no	6.5	65
Douglas County											
Allouez Bay	-	-	N	$Mu^3/D^1/S^3/G^2/R^1$	$W^3/U^3/D^2$	str	str	yes	no	8.0	114
Amnicon Lk.	-	-	N	$Mu^2/D^2/S^3$	$W^1/U^4/D^3$	str	str	yes	no	6.7	62
Buffalo Lk.	-	-	N	$Mu^1/C^4/S^2$	$W^2/U^4/D^1$	seep	str	no	yes	6.2	35
Eau Claire R.	-	-	N	$S^5/G^2/R^2$	$W^4/U^3/D^1$	str	str	no	yes	8.4	110
Minong F.	10.12 (25.00)[2]	75%	O	$Mu^2/C^4/S^1$	$W^2/U^4/D^1$	str	str	no	yes	6.8	72
Mulligan Lk.	8.90 (22.00)[1]	35%	C	Mu^6	W^4/U^1	str	str	no	no	6.9	58
St. Croix R.	14.14 (35.00)[3]	25%	N	$Mu^2/D^1/S^4/G^1$	W^5	str	str	no	no	7.2	107
Iron County											
E. Turtle Flam F.	6.07 (15.00)[3]	10%	N	$C^5/D^1/S^1$	W^2/U^5	str	str	no	yes	7.2	77
L. Turtle F.	-	-	C	Mu^4/S^2	W^3/U^3	str	str	no	yes	7.4	111
Mud Lk.	6.07 (15.00)[1]	30%	N	Mu^5/S^1	W^4/U^2	spr	str	no	no	7.5	105
Rice Lk.	-	-	N	$Mu^4/D^1/S^2$	$W^2/U^4/D^1$	str	str	no	yes	7.4	85
Rice Lk.	0.41 (1.00)[1]	1%	O	Mu^6	$W^5/U^1/D^1$	str	str	no	no	6.7	90
Polk County											
Apple R.	1.21 (3.00)[2]	25%	C	Mu^2/S^5	W^4	str	str	no	no	8.4	220
Balsam Br. C.	1.62 (4.00)[1]	10%	N	Mu^5/D^1	$A^1/N^2/U^2$	str	str	no	yes	8.8	170
Balsam Lk.	-	-	N	S^5/G^1	$W^2/U^2/D^4$	str	str	yes	yes	8.0	175
Balsam Lk. (stumps)	-	-	N	Mu^1/D^5	W^4/D^2	str	str	yes	yes	7.9	165

Table 1. Continued.

Name of Waterbody	Wild Rice in hectares (acres)[a]	% of waterbody <1.5m (5ft) deep covered by W.R. beds	Subject to freeze out?[b]	Bottom types[c]	Shoreline types[d]	Major water source[e]	Drainage type[e]	Noticeable occurrences of pollution	Water control structures	pH reading	Conductivity reading
Big Round Lk.	0.61 (1.50)[3]	1%	N	Mu^5/C^1	$W^2/U^3/D^3$	str	str	no	yes	8.0	180
Fountain Lk	-	-	N	$C^1/D^1/S^4$	W^1/U^5	spr	str	no	yes	7.4	210
Glenton Lk.	0.04 (0.10)[1]	1%	O	Mu^5/D^1	$A^3/W^2/U^3/D^1$	seep	str	yes	no	8.6	180
Lake 29	-	-	C	C^3/S^4	$A^2/W^1/U^3/D^2$	seep	seep	no	no	8.0	48
Little Butternut Lk.	6.07 (15.00)[2]	15%	N	Mu^5/C^1	$A^1/U^4/D^2$	str	str	no	no	7.3	123
Long Lk.	-	-	N	$Mu^3/S^4/G^1$	$A^1/W^2/U^5/D^2$	seep	seep	no	no	7.9	36
Lotus Lk.	0.81 (2.00)[1]	2%	N	$Mu^1/D^1/S^5$	$W^1/U^4/D^1$	str	str	yes	no	7.4	165
Peasle Lk.	0.04 (0.10)[1]	1%	O	Mu^2/S^4	W^4/U^1	str	str	no	no	7.2	153
Rice Lk.	-	-	N	$C^1/D^1/S^4$	$A^3/N^1/U^3/D^1$	seep	seep	yes	no	9.5	140
Rice Lk.	28.33 (70.00)[3]	75%	C	Mu^5/C^1	U^5/D^1	seep	str	no	no	6.9	160
Rice Lk.	3.24 (8.00)[3]	75%	C	Mu^5/D^2	$A^1/W^5/U^1$	str	str	no	no	7.1	220
Straight R.	-	-	C	$Mu^3/S^3/G^1$	$A^1/W^4/D^1$	str	str	yes	no	6.7	190
White Ash Lk.	12.14 (30.00)[2]	75%	N	Mu^5/C^1	$W^2/U^3/D^3$	str	str	yes	no	9.0	195
Price County											
Big Pine Lk.	-	-	N	$Mu^1/S^5/G^1/R^1$	$W^4/U^4/D^1$	str	str	no	no	6.5	59
Blockhouse Lk.	4.05 (10.00)[2]	25%	O	$Mu^1/D^1/S^5$	$W^2/U^4/D^3$	str	str	yes	yes	7.1	67
Pike Lk.	-	-	N	$Mu^2/S^4/G^1/R^1$	$W^1/U^5/D^2$	str	str	no	yes	6.8	71
Squaw Cr.	5.26 (13.00)[2]	13%	O	$Mu^4/S^2/G^1$	W^4/U^3	str	str	no	no	6.8	95
Rusk County											
Chain Lk.	2.83 (7.00)[2]	5%	N	Mu^2/D^4	$W^3/U^2/D^2$	str	str	no	no	7.8	112
Fireside Lk.	4.86 (12.00)[3]	16%	N	$Mu^2/D^1/S^4/G^1$	$W^3/U^5/D^1$	str	str	no	no	8.4	140
Island Lk.	-	-	N	$Mu^1/D^1/S^4/G^1$	$A^1/W^1/U^3/D^3$	str	str	yes	yes	8.4	113
McCann Lk.	0.81 (2.00)[1]	2%	N	$Mu^3/D^5/S^1$	$W^1/U^4/D^2$	str	str	yes	no	8.2	110
Potato Cr. F.	6.07 (15.00)[3]	25%	O	Mu^5/D^1	W^4/U^3	str	str	no	yes	6.3	225

Table 1. Continued.

Name of Waterbody	Wild Rice in hectares (acres)[a]	% of waterbody <1.5m (5ft) deep covered by W.R. beds	Subject to freeze out?[b]	Bottom types[c]	Shoreline types[d]	Major water source[e]	Drainage type[f]	Noticeable occurrences of pollution	Water control structures	pH reading	Conductivity reading
Rea Flowage	0.40 (1.00)[1]	1%	N	C^5/D^1	$A^1/W^1/U^3/D^2$	str	str	yes	yes	6.8	78
Ten Mile Cr.	1.62 (4.00)[1]	2%	0	Mu^5/D^1	$A^1/W^4/U^2$	str	str	yes	no	6.6	200
Sawyer County											
Barker Lk.	29.95 (74.00)[2]	30%	0	$Mu^2/S^3/G^4/R^3$	$W^2/U^4/D^3$	str	str	yes	no	7.3	86
Beverly Lk.	-	-	N	$Mu^1/D^1/S^3/R^3$	W^2/U^5	str	str	no	no	8.3	115
Billy Boy F.	8.90 (22.00)[3]	40%	0	Mu^5/D^1	$W^4/U^3/D^1$	str	str	no	yes	7.2	94
Blaisdell Lk.	7.69 (19.00)[2]	10%	0	$Mu^2/D^1/S^3/G^2$	$W^2/U^4/D^3$	str	str	yes	no	6.6	85
Blueberry Lk.	-	-	N	$Mu^3/S^3/G^1/R^1$	$W^1/U^4/D^2$	seep	seep	no	no	9.2	104
Callahan Lk.	-	-	N	$Mu^1/D^1/S^4/G^2/R^2$	$W^2/U^4/D^2$	str	str	no	yes	7.4	73
Devils Lk.	-	-	N	$Mu^1/D^1/S^3/G^3$	W^3/U^4	seep	str	no	no	9.3	89
Ghost Lk.	-	-	N	$Mu^1/S^3/G^2/R^4$	$W^4/U^3/D^2$	str	str	no	yes	7.1	87
Lac Courte Oreilles L.	0.80 (2.00)[1]	1%	N	Mu^6	$W^1/U^3/D^3$	str	str	yes	no	8.0	111
Lake Chetac	0.80 (2.00)[3]	1%	N	$C^2/D^1/S^3$	$W^1/U^4/D^3$	str	str	yes	yes	8.4	112
Lake Chippewa	-	-	N	$Mu^2/D^1/S^4/G^1/R^1$	$A^1/W^2/U^4/D^4$	str	str	yes	yes	7.1	105
Little Round Lake	-	-	N	$S^2/G^3/R^3$	$W^2/U^4/D^3$	str	str	yes	yes	7.2	88
Mud Lk.	3.24 (8.00)[1]	25%	0	$Mu^5/D^1/S^1$	W^5	str	str	no	no	8.9	96
Nelson Lk.	-	-	N	$Mu^2/D^1/S^3/G^2/R^3$	$W^2/U^4/D^1$	str	str	no	yes	6.7	80
Pacawong Lk.	40.47 (100.00)[3]	60%	0	$Mu^5/D^1/S^1$	$W^3/U^3/D^1$	str	str	no	yes	7.4	190
Phipps F.	4.45 (11.00)[3]	25%	N	$Mu^2/D^1/S^4/G^1$	$W^2/U^3/D^2$	str	str	no	yes	7.3	150
Smith Lk.	-	-	N	$Mu^1/D^1/S^4/G^1$	$W^1/U^5/D^2$	spr	str	no	no	6.4	120
Spider Lk.	-	-	N	$Mu^1/S^2/G^2/R^4$	$W^3/U^5/D^4$	seep	str	yes	yes	7.6	82
Teal Lk.	-	-	N	$Mu^1/S^3/R^4$	$W^4/U^3/D^4$	str	str	yes	yes	7.3	71
Tiger Cat F.	-	-	0	$Mu^3/D^1/S^3/G^1$	$W^2/U^4/D^1$	seep	str	no	yes	6.9	72
Taylor County											
Mondeaux F.	4.86 (12.00)[2]	20%	0	Mu^4/D^2	$W^1/U^5/D^1$	str	str	no	yes	6.4	86

Table 1. Continued.

Name of Waterbody	Wild Rice in hectares (acres)[a]	% of water body <1.5m (5ft) deep covered by W.R. beds	Subject to freeze out?[b]	Bottom types[c]	Shoreline types[d]	Major water source[e]	Drainage type[e]	Noticeable occurrences of pollution	Water control structures	pH reading	Conductivity reading
Washburn County											
Balsam Lk.	2.83 (7.00)[3]	25%	N	$Mu^2/D^1/S^3/G^2/R^2$	$W^1/U^4/D^1$	spr	str	no	no	7.6	204
Dilly Lk.	12.14 (30.00)[3]	75%	O	$Mu^5/S^1/G^2$	$W^2/U^4/D^1$	str	str	no	no	7.8	195
Gilmore Lk.	0.80 (2.00)[1]	1%	N	$Mu^4/D^1/S^2$	$W^1/U^3/D^3$	seep	str	yes	no	8.3	67
Kekegama Lk.	1.21 (3.00)[2]	5%	N	$Mu^2/C^4/S^1$	$W^1/U^4/D^1$	str	str	no	no	9.2	185
Little Mud Lk.	12.14 (30.00)[3]	50%	N	$Mu^4/D^2/S^1$	$W^1/U^4/D^1$	spr	str	no	no	9.2	130
Long Lk.	20.24 (50.00)[3]	40%	N	$Mu^4/D^2/S^1$	$A^1/W^1/U^3/D^3$	str	str	yes	yes	8.5	185
Mud Lk.	-	-	C	$Mu^5/D^1/S^2$	$W^4/U^3/D^1$	seep	str	no	no	6.7	107
Mud Lk.	4.45 (11.00)[3]	80%	N	Mu^4/D^3	$A^2/W^1/U^4/D^1$	spr	str	yes	no	9.1	175
Nancy Lk.	-	-	N	$Mu^3/C^2/S^2$	$W^2/U^3/D^1$	seep	str	yes	no	6.9	56
Potato Lk.	12.12 (30.00)[3]	50%	O	$Mu^5/D^1/S^2/G^2$	$W^1/U^5/D^3$	spr	str	yes	no	8.6	120
Rice Lk.	19.63 (48.50)[3]	65%	N	$Mu^2/D^1/S^4$	$W^4/U^3/D^1$	str	str	no	no	7.6	116
Spring Lk.	0.40 (1.00)[1]	2%	N	$Mu^3/D^1/S^3$	$A^1/W^1/U^4/D^1$	spr	str	no	yes	8.6	154
Spring Lk.	-	-	O	$Mu^2/D^1/S^4$	$A^1/W^2/U^3/D^1$	seep	seep	no	yes	6.5	25
Spring Lk.	-	-	N	$Mu^4/D^1/S^2$	$W^1/U^4/D^2$	seep	seep	no	no	7.0	66
Spring Lk.	12.12 (30.00)[3]	55%	C	$Mu^4/D^3/S^2$	W^2/U^4	spr	str	no	no	6.9	77
Tranus Lk.	40.5 (100.00)[1]	80%	O	Mu^5/C^1	$W^2/U^4/D^1$	str	str	no	yes	7.2	49
Trego Lk.	2.83 (7.00)[3]	5%	N	$Mu^4/D^1/S^2$	$W^1/U^5/D^1$	str	str	yes	yes	7.5	160
Whalen Lk.	0.69 (1.70)[3]	20%	N	$Mu^2/S^4/R^2$	$W^3/U^4/D^2$	str	str	no	no	7.8	117
Yellow River	3.64 (9.00)[3]	60%	O	$Mu^5/D^2/S^1$	W^4/U^1	str	str	no	yes	7.1	195
TOTALS	767.76 (1896.10)										

Table 1. Continued, footnotes.

[a] Approximate stand density (percent water coverage):
X = sparse (<33%)
X^2 = medium (33-66%)
X^3 = dense (>66%)

[b] N = no
O = occasionally
C = commonly

[e] run = runoff
seep = seepage
spr = spring
str = stream

[c] Bottom type abbreviations:
Mu = muck or silt
C = clay
Ma = marl
D = detritus
S = sand
G = gravel
R = rock or boulder

Bottom types of water area <1.5 m (5ft) deep (percent coverage):
X^1 = <10%
X^2 = 10-25%
X^3 = 25-50%
X^4 = 50-75%
X^5 = 75-95%
X^6 = >75%

[d] Shoreline type abbreviations:
A = agriculture
W = wetlands besides bog mat
B = bog mat
U = upland
D = development

Shoreline types (percent coverage):
X^1 = 0
X^2 = 1-10%%
X^3 = 10-25%
X^4 = 25-50%
X^5 = 50-75%
X^6 = >75%

Table 2. Biological parameters and potential management strategies of 1985 wild rice survey areas in northwest Wisconsin.

Name of waterbody	Emergent vegetation[a] (% coverage)	Floating vegetation[b] (% coverage)	Submergent vegetation[c] (% coverage)	algae[d] (% coverage)	Purple loosestrife[e] in hectares (acres)	Potential nuisance wildlife[f]	W.R. suitability index	Potential Management strategies[g]
Ashland County								
Barron County								
Bear Lk.	10-25%	10-25%	25-50%	<10%	-	black/musk	160.0	spr. lev. ctrl./veg. ctrl./wint. draw
Beaver Dam Lk.	10-25%	10-25%	25-50%	<10%	0.20 (0.50)[6]	cray	114.0	spr. lev. ctrl./wint. draw./nuis. wildl. ctrl./ reseed.
Lower Vermillion Lk.	10-25%	10-25%	25-50%	<10%	-	cray/musk	121.0	nuis. wildl. ctrl./veg. ctrl./reseed.
Red Cedar Lk.	10-25%	10-25%	25-50%	<10%	0.40 (1.8)[6]	cray/musk	119.0	nuis. wildl. ctrl./spr. lev. ctrl/wint. draw./ veg. ctrl./reseed.
Rice Lk.	10-25%	10-25%	10-25%	10-25%	0.40 (1.8)[6]	cray	118.0	nuis. wildl. ctrl./spr. lev. ctrl/wint. draw./ veg. ctrl./reseed.
Rice Lk.	25-50%	50-75%	10-25%	<10%	-	carp/cray/black	117.5	nuis. wildl. ctrl.
Stump Lk.	25-50%	10-25%	25-50%	10-25%	-	black	145.0	nuis. wildl. ctrl./spr. lev. ctrl./wint. draw/ veg. ctrl./reseed.
Tuscobia Lk.	<10%	10-25%	>75%	<10%	-	black/musk	132.5	nuis. wildl. ctrl/veg. ctrl.
Vermillion R.	10-25%	10-25%	50-75%	<10%	0.04 (0.10)[1]	cray/black	150.0	wint. draw/spr. lev. ctrl.

Table 2. Continued.

Name of waterbody	Emergent vegetation[a] (% coverage)	Floating vegetation[b] (% coverage)	Submergent vegetation[c] (% coverage)	algae[d] (% coverage)	Purple loosestrife[e] in hectares (acres)	Potential nuisance wildlife[f]	W.R. suitability index	Potential Management strategies[g]
Burnett County								
Bashaw Lk.	10-25%	10-25%	25-50%	<10%	-	beav/black	139.0	veg. ctrl/beav. ctrl.
Big Island	10-25%	<10%	25-50%	10-25%	-	carp/cray/black	144.0	nuis. wildl. ctrl./ veg. ctrl.
Big Sand Lk.	25-50%	25-50%	10-25%	<10%	-	black/musk	106.5	veg. ctrl./reseed.
Bradshaw Sl.	25-50%	25-50%	10-25%	<10%	-	black	145.5	veg. ctrl.
Briggs Lk.	<10%	<10%	50-75%	<10%	-	cray/black	164.0	nuis. wildl. ctrl./ veg. ctrl.
Clam River F.	10-25%	<10%	>75%	<10%	-	cray/black	146.5	nuis. wildl. ctrl/veg. ctrl./wint.draw/spr. lev. ctrl.
Clam Lk.	10-25%	10-25%	50-75%	<10%	-	carp/black	155.5	nuis. wildl. ctrl./veg. ctrl./wint.draw/ spr. lev. ctrl.
Duckshot Lk	25-50%	10-25%	25-50%	<10%	-	black	144.0	beav. ctrl./veg. ctrl.
Gaslyn Lk.	25-50%	25-50%	10-25%	<10%	-	black/musk	158.5	veg. ctrl.
Gull Lk.	10-25%	25-50%	10-25%	<10%	-	black	153.0	veg. ctrl.
Hanscom Lk.	25-50%	25-50%	<10%	<10%	-	-	107.0	reseed./veg. ctrl.
Jackson Lk.	25-50%	25-50%	25-50%	<10%	-	cray/black	120.5	beav. ctrl/veg. ctrl
Kent Lk.	<10%	25-50%	>75%	<10%	1.01 (2.50)[1]	beav/cray/musk	134.0	nuis. wildl. ctrl/ beav. ctrl/veg. ctrl
Lipsett Lk.	10-25%	25-50%	25-50%	<10%	-	carp/black	126.0	nuis. wildl. ctrl.

Table 2. Continued.

Name of waterbody	Emergent vegetation[a] (% coverage)	Floating vegetation[b] (% coverage)	Submergent vegetation[c] (% coverage)	algae[d] (% coverage)	Purple loosestrife[e] in hectares (acres)	Potential nuisance wildlife[f]	W.R. suitability index	Potential Management strategies[g]
Long Lk.	25-50%	10-25%	25-50%	<10%	-	black	159.0	veg. ctrl.
Loon Lk.	10-25%	50-75%	10-25%	<10%	-	cray/black	114.0	veg. ctrl/reseed.
Loon Lk.	25-50%	10-25%	10-25%	<10%	-	cray/musk	161.5	nuis. wildl. ctrl./ veg. ctrl.
Lost Lk.	10-25%	10-25%	50-75%	<10%	0.04 (0.10)[6]	cray/black	107.5	veg. ctrl./reseed.
Lower Clam Lk.	<10%	10-25%	50-75%	<10%	-	carp/black	121.0	veg. ctrl./reseed.
Mud Lk.	10-25%	<10%	10-25%	<10%	-	-	152.0	-
Mud Lk.	25-50%	25-50%	10-25%	<10%	0.04 (0.10)[1]	black	148.0	-
Mudhen Lk.	25-50%	10-25%	25-50%	<10%	-	cray/black	149.5	veg. ctrl.
North Lang Lk.	10-25%	10-25%	25-50%	<10%	-	musk	156.0	-
Petersen Lk.	<10%	10-25%	50-75%	<10%	-	cray/black	145.0	veg. ctrl.
Rice Lk.	10-25%	10-25%	25-50%	<10%	-	cray/black	142.5	-
Rice Lk.	10-25%	25-50%	25-50%	<10%	0.81 (2.00)[5]	carp	137.0	nuis. wildl. ctrl./ veg. ctrl.
Rice Lk.	<10%	10-25%	50-75%	<10%	-	cray/black	149.0	veg. ctrl./wint. draw./ spr. lev. ctrl.
Robie Lk.	<10%	25-50%	25-50%	<10%	-	black	126.5	veg. ctrl.
Sand Lk.	10-25%	25-50%	10-25%	<10%	-	-	116.0	veg. ctrl/reseed.
Spencer Lk.	<10%	10-25%	50-75%	<10%	-	black	141.0	veg. ctrl/reseed.
Tabor Lk.	<10%	25-50%	25-50%	<10%	-	black	119.0	veg. ctrl/reseed.

Table 2. Continued.

Name of waterbody	Emergent vegetation[a] (% coverage)	Floating vegetation[b] (% coverage)	Submergent vegetation[c] (% coverage)	algae[d] (% coverage)	Purple loosestrife[e] in hectares (acres)	Potential nuisance wildlife[f]	W.R. suitability index	Potential Management strategies[g]
Unnamed Lk.	50-75%	<10%	<10%	<10%	-	black	150.0	-
Webb Cr. (lowersite)	10-25%	<10%	25-50%	10-25%	-	black/musk	156.0	wint. draw/spr. lev. ctrl./nuis. wildl. ctrl.
Webb Cr. (uppersite)	50-75%	10-25%	25-50%	10-25%	-	black	147.0	wint. draw./spr. lev. ctrl.
Yellow R.	25-50%	10-25%	25-50%	<10%	-	carp/cray/black/ musk	150.5	veg. ctrl./nuis. wildl. ctrl.
Yellow R.	25-50%	25-50%	25-50%	<10%	-	cray/black	131.5	veg. ctrl./spr. lev. ctrl./wint. draw.
Bayfield County								
Namakagon Lk.	50-75%	<10%	10-25%	<10%	-	cray/black/musk	104.5	nuis. wildl. ctrl./ veg. ctrl./reseed.
Totogatic Lk.	50-75%	10-25%	<10%	<10%	-	cray/black/musk	147.5	nuis. wildl. ctrl./ reseed.
Douglas County								
Allouez Bay	10-25%	10-25%	25-50%	<10%	12.14 (30.00)[6]	carp/black/cray musk	121.0	nuis. wildl. ctrl/ veg. ctrl./reseed.
Amnicon Lk.	25-50%	10-25%	25-50%	<10%	0.41 (1.00)[6]	cray/black	111.0	veg. ctrl./reseed.
Buffalo Lk.	10-25%	50-75%	25-50%	<10%	-	musk	114.0	wint. draw/spr. lev. ctrl./reseed./veg. ctrl.
Eau Claire R.	10-25%	<10%	50-75%	<10%	-	cray/musk	105.0	wint. draw/spr. lev. ctrl./reseed.

Table 2. Continued.

Name of waterbody	Emergent vegetation[a] (% coverage)	Floating vegetation[b] (% coverage)	Submergent vegetation[c] (% coverage)	algae[d] (% coverage)	Purple loosestrife[e] in hectares (acres)	Potential nuisance wildlife[f]	W.R. suitability index	Potential Management strategies[g]
Minong F.	25-50%	10-25%	10-25%	10-25%	-	carp/cray/black musk	153.5	wildl. nuis. ctrl./ spr. lev. ctrl./wint. draw./veg. ctrl.
Mulligan Lk.	<10%	25-50%	25-50%	<10%	-	beav/black/musk	156.0	nuis. wildl. ctrl./ beav. ctrl./spr. lev. ctrl./wint. draw.
St. Croix R.	10-25%	10-25%	50-75%	<10%	2.83 (7.00)[1]	carp/cray/black/ musk	150.5	nuis. wildl. ctrl./ veg. ctrl./
Iron County								
E. Turtle Flam F.	>75%	<10%	<10%	<10%	-	black/musk	154.5	veg. ctrl./spr. lev. ctrl./wint. draw.
L. Turtle F.	>75%	<10%	<10%	<10%	-	-	130.5	spr. lev. ctrl./wint. draw./reseed.
Mud Lk.	50-75%	10-25%	<10%	<10%	-	beav/black	140.0	beav. ctrl./reseed.
Rice Lk.	25-50%	10-25%	25-50%	<10%	-	black/musk	123.0	veg. ctrl./reseed./ wint. draw/spr. lev. ctrl.
Rice Lk.	50-75%	<10%	<10%	<10%	-	black/musk	152.0	reseed.
Polk County								
Apple River	25-50%	<10%	25-50%	10-25%	-	black/musk/beav	137.5	beav. ctrl.
Balsam Br. C.	10-25%	10-25%	>75%	<10%	-	black/musk	129.0	veg. ctrl./wint. draw. spr. lev. ctrl./reseed.
Balsam Lk.	<10%	10-25%	>75%	10-25%	-	-	103.5	veg. ctrl./reseed.
Balsam Lk. (stumps)	<10%	10-25%	50-75%	<10%	-	-	120.5	veg. ctrl./reseed.

Table 2. Continued.

Name of waterbody	Emergent vegetation[a] (% coverage)	Floating vegetation[b] (% coverage)	Submergent vegetation[c] (% coverage)	algae[d] (% coverage)	Purple loosestrife[e] in hectares (acres)	Potential nuisance wildlife[f]	W.R. suitability index	Potential Management strategies[g]
Big Round Lk.	10-25%	<10%	50-75%	10-25%	-	carp/black	151.0	nuis. wildl. ctrl./ beav. ctrl.
Fountain Lk.	<10%	25-50%	25-50%	<10%	-	black	115.5	-
Glenton Lk.	10-25%	10-25%	25-50%	10-25%	-	-	134.0	veg. ctrl./reseed.
Lake 29	<10%	50-75%	<10%	<10%	-	-	116.0	veg. ctrl./reseed.
Little Butternut Lk.	10-25%	10-25%	50-75%	<10%	-	cray/black/musk	139.0	veg. ctrl.
Long Lk.	10-25%	25-50%	10-25%	10-25%	-	cray	113.5	-
Lotus Lk.	<10%	25-50%	50-75%	<10%	-	-	136.5	veg. ctrl./reseed.
Peaslee Lk.	10-25%	10-25%	25-50%	<10%	-	carp/cray/musk	128.0	nuis. wildl. ctrl./ spr. lev. ctrl.
Rice Lk.	<10%	10-25%	50-75%	<10%	-	-	103.0	veg. ctrl./reseed.
Rice Lk.	<10%	10-25%	25-50%	<10%	-	beav/carp	148.5	beav. ctrl./nuis. wildl. ctrl.
Rice Lk.	25-50%	<10%	25-50%	<10%	-	black	157.5	veg. ctrl.
Straight R.	50-75%	<10%	10-25%	10-25%	-	cray/black	117.5	veg. ctrl./reseed.
White Ash Lk.	<10%	25-50%	50-75%	<10%	-	carp/black	139.0	nuis. wildl. ctrl./ veg. ctrl.
Price County								
Big Pine Lk.	>75%	<10%	10-25%	<10%	-	-	123.0	veg. ctrl./reseed.
Blockhouse Lk.	50-75%	10-25%	25-50%	<10%	-	cray/black/musk	138.0	nuis. wildl. ctrl./ veg. ctrl.

Table 2. Continued.

Name of waterbody	Emergent vegetation[a] (% coverage)	Floating vegetation[b] (% coverage)	Submergent vegetation[c] (% coverage)	algae[d] (% coverage)	Purple loosestrife[e] in hectares (acres)	Potential nuisance wildlife[f]	W.R. suitability index	Potential Management strategies[g]
Pike Lk.	50-75%	10-25%	<10%	<10%	-	cray/musk	117.5	veg. ctrl./reseed.
Squaw Lk.	25-50%	25-50%	25-50%	<10%	-	black/musk	143.5	veg. ctrl.
Rusk County								
Chain Lk.	50-75%	10-25%	25-50%	<10%	-	cray/black/musk	132.5	nuis. wildl. ctrl./ veg. ctrl.
Fireside Lk.	<10%	25-50%	25-50%	<10%	-	cray/black/musk	148.0	nuis. wildl. ctrl./ veg. ctrl.
Island Lk.	25-50%	25-50%	10-25%	<10%	-	cray/black	115.5	spr. lev. ctrl./ wint. draw.
McCann Lk.	25-50%	25-50%	25-50%	<10%	-	cray/black	121.0	veg. ctrl.
Potato Cr. F.	25-50%	25-50%	25-50%	<10%	-	cray/black/musk	147.0	nuis. wildl. ctrl./ spr. lev. ctrl./ wint. draw.
Rea F.	50-75%	<10%	10-25%	<10%	0.40 (1.0)[1]	black	117.5	spr. lev. ctrl./ wint. draw.
Ten Mile Cr.	50-75%	<10%	25-50%	10-25%	-	black/musk	130.0	veg. ctrl.
Sawyer County								
Barker Lk.	10-25%	25-50%	25-50%	<10%	-	cray/black/musk	137.0	nuis. wildl. ctrl./ wint. draw./spr. lev. ctrl.
Beverly Lk.	10-25%	25-50%	10-25%	<10%	-	cray/black/musk	118.5	nuis. wildl. ctrl./ veg. ctrl./reseed.

Table 2. Continued.

Name of waterbody	Emergent vegetation[a] (% coverage)	Floating vegetation[b] (% coverage)	Submergent vegetation[c] (% coverage)	algae[d] (% coverage)	Purple loosestrife[e] in hectares (acres)	Potential nuisance wildlife[f]	W.R. suitability index	Potential Management strategies[g]
Billy Boy F.	10-25%	10-25%	25-50%	<10%	-	cray/black/musk	152.5	nuis. wildl. ctrl./ spr. lev. ctrl./ wint. draw.
Blaisdell Lk.	10-25%	25-50%	50-75%	<10%	-	carp/cray/black musk	138.0	nuis. wildl. ctrl./ veg. ctrl.
Blueberry Lk.	25-50%	10-25%	10-25%	<10%	-	cray/black/musk	116.0	-
Callahan Lk.	<10%	10-25%	50-75%	<10%	-	cray/black/musk	119.5	spr. lev. ctrl./ wint. draw.
Devils Lk.	10-25%	10-25%	>75%	50-75%	-	cray/black/musk	109.0	veg. ctrl./reseed.
Ghost Lk.	10-25%	25-50%	25-50%	<10%	-	cray/black/musk	110.0	nuis. wildl. ctrl./ veg. ctrl./reseed./ wint. draw./spr. lev. ctrl.
Lac Courte Oreilles L.	25-50%	10-25%	25-50%	<10%	-	black/musk	129.5	veg. ctrl.
Lake Chetac	25-50%	25-50%	25-50%	<10%	-	black/musk	131.5	veg. ctrl./spr. lev. ctrl./wint. draw.
Lake Chippewa	25-50%	10-25%	25-50%	<10%	-	cray/black/musk	114.0	spr. lev. ctrl/wint. draw./veg. ctrl./ reseed./nuis. wildl. ctrl.
Little Round Lk.	>75%	10-25%	10-25%	<10%	-	cray/black	91.5	veg. ctrl./reseed./ spr. lev. ctrl./ wint. draw.
Mud Lk.	10-25%	10-25%	25-50%	<10%	-	cray/black	134.0	veg. ctrl.
Nelson Lk.	10-25%	10-25%	25-50%	<10%	-	cray/black/musk	122.0	veg. ctrl./wint. draw/ spr. lev. ctrl./reseed/ reseed./nuis. wildl. ctrl.