Section 15

About Ike Walton Lake

Mashkiigwaagamaa-zaaga'igan (swamp marsh water lake)

—Our Earth[1]

Introduction

The *Bear River Watershed Comprehensive Lake Management Plan* includes sections for each of the ten lakes in the watershed. The lakes are in the largest watershed in Lac du Flambeau, within the Reservation's boundaries, associated with high use landings, and have complete data sets required for a lake management plan. The purpose of the plan is to establish the current health of the watershed and lakes and suggest how to maintain or improve their health in the future.

This section includes introductory information about Ike Walton Lake; a summary of how uses of the lake have changed over time; data from the community survey; and an assessment of the lake's health based on data for the lake's biology, chemistry, nutrients, habitat, bacteria, lake levels, and aesthetics. This section also includes an action plan to improve or maintain the overall health of Ike Walton Lake.

Ike Walton Lake is in the Bear River Watershed (Subwatershed HUC12-070500020203) north of White Sand Lake on the south end of the Powell Marsh.

The lake is approximately 1423 acres and has a maximum depth of 61 feet. Ike Walton Lake is classified as a seepage lake, meaning that it is fed by groundwater, precipitation, and run off and is drained by groundwater. Its water enters the lake from the Powell Marsh.

Ike Walton Lake stratifies annually with the hypolimnion reaching dissolved oxygen below 5mg/L in the summer and winter. Ike Walton is a stained lake with Secchi readings averaging 12.5 feet, the lake's water clarity is considered to be good. Table 15-1 lists key morphological, vegetation, and water quality information for the lake.

This lake (White Sand Lake) *is about two miles long, and our course across it was northeast to a small channel, four feet wide and eight yards long, which led us into another small lake* (Sand Lake) *three-fourths of a mile long and half a mile wide, which we crossed northeast to a portage of one mile in length, leading to Mashkegwagoma lake* (Ike Walton Lake).

—R.G. Norwood
Report of a geological reconnaissance, 1847[2]

The first survey map of the Reservation, 1863, by surveyor A. C. Stuntz ,identified Ike Walton Lake as *Swamp Lake.*[3] A federal survey map of 1864 shows Ike Walton as *Swamp Lake.*[4] The 1895 Poole Brothers' map shows Ike Walton Lake as *Swamp Lake*[5]; the 1896 Rand McNally map, *Swamp Lake*[6]; the 1903 Shepard map, *Swamp Lake*[7]; 1905 Cram map, *Swamp Lake*[8]; 1909 Poole Brothers' map, *Swamp Lake*[9]; 1918 Standard Map Company, *Ike Walton Lake*[10].

Izaak Walton is best known as author of the Compleat Angler *(1653), one of three most published books in English literature. (The other two are the* Holy Bible *and the* Complete Works of Shakespeare*)*

—Andrew N. Herd, *A Fly Fishing History*[11]

Table 15-1. Basic Data for Ike Walton Lake

Morphology	
Acreage (Acres)	1423
Maximum Depth (Feet)	61
Mean Depth (Feet)	9.6
Retention Time (Years)	3.94
Drainage Area (Acres)	2410
Drainage Basin/Lake Area Ratio	1.69
Vegetation	
Survey Data Collected	2012
Number of Native Species	20
Floristic Quality Index	33.95
Simpson's Diversity Index	0.85
Percent Vegetated (%)	54.11
Average Conservatism	7.79
Water Quality	
Trophic State	Mesotrophic
Limiting Nutrient	Phosphorus
Water Acidity (pH)	7.3
Sensitivity of Acid Rain	Low
Watershed to Lake Area Ratio	3:01
Aquatic Invasive Species	None

Based on Secchi, total phosphorus, and Chlorophyll *a* data, Ike Walton Lake is classified as mesotrophic. Mesotrophic lakes generally have medium levels of nutrients and water clarity when compared to other natural lakes.

Ike Walton Lake's watershed includes water (40%), forests (29%), wetlands (29%), and urban (2%).

There are 47 dwellings, mostly residential, within 300 feet of the lake's shoreline. Ike Walton Lake has a public landing on the west side of the lake off Ike Walton Trail; access via a private landing owned by YMCA Camp Nawakwa on Ike Walton Trail, and by the Tribal unimproved landing (currently unusable) off the same road to the south. The landings are quite sandy and in need of improvement. Late summer it is hard to get a boat in or out as the water levels are low.

Brief History of Ike Walton Lake

The history of Ike Walton Lake, including how uses of the lake have changed over time, parallels the history of the other lakes in the Bear River Watershed as described in Section 3. Unless noted otherwise, the information here is footnoted in Section 3.

For hundreds of years Ike Walton Lake was used by indigenous people for subsistence. Virtually every facet of their lives depended on their relationship with the lake and its surrounding habitats for food, medicine, building materials, and transportation.

With the arrival of the Europeans in the early to mid-seventeenth century, Ike Walton Lake and the surrounding habitats took on a new use; to help provide the world with furs. Lac du Flambeau became a transportation center for the fur trade, and Ike Walton Lake became part of one of the primary canoe routes connecting the Lac du Flambeau trading post with lakes in all directions. Ike Walton, for example, was part of the primary route linking Lac du Flambeau with Lac Vieux Desert to the northeast.

By 1840 the fur-bearing animals were gone and Ike Walton Lake and its surrounding habitats took on another new use; to provide the country with timber and timber products. To facilitate the movement of logs from Ike Walton Lake to the mill on Long Interlaken Lake, a logging rail spur was constructed along the lake. Reports by present day residents tell of seeing the remnants of the track along the edge of the lake during low lake levels.[12]

Core samples taken in 1996 from Ike Walton Lake revealed that over the past 10,000 years the vegetation surrounding the lake transitioned from a boreal forest to a closed jack pine forest, then to a forest of white, red, and jack pine followed by a forest abundant with hemlock. Throughout the forests' history, several hardwoods, including oak,

maple, ironwood, elm, ash, and hickory were present. The birches, poplars, and junipers were also present in the forests' history.[13]

By 1913, the trees around Ike Walton Lake were mostly gone and the surrounding habitats were destroyed. In the early 1900's, however, the logging industry was already being replaced by the service industry, which used Ike Walton Lake and its surrounding habitats to meet the recreational needs and demands of tourists and seasonal residents.

As a result of the Dawes Act in 1887, much of the lakefront property on Ike Walton Lake was transferred from the Tribe to non-Tribal residents, opening the shorelines to development.

Goll's Chippewa Lodge (Figure 15-1 and Figure 15-2), was constructed on the shore of Ike Walton Lake. A brochure described the area replete with benefits for one's health: "*The air is dry and thin, no dust, smoke nor city dirt… hay fever, sinus and asthma sufferers find instant relief… nervous patients also respond quickly to the quiet and soothing effects of the wilderness peace. For the persons who do not feel at home unless they putter, we gladly furnish axes for wood chopping, brush hooks, saws, carpenter tools, shovels, etc…".*[14]

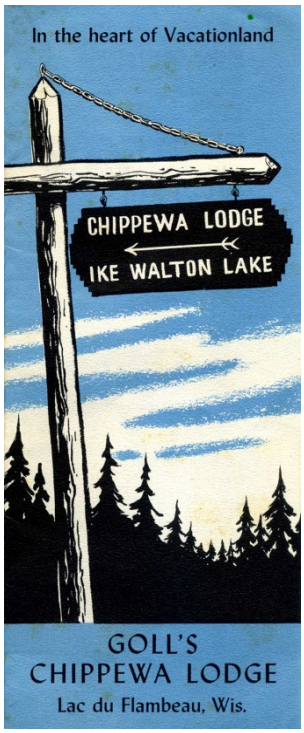


Figure 15-1. Goll's Chippewa Lodge

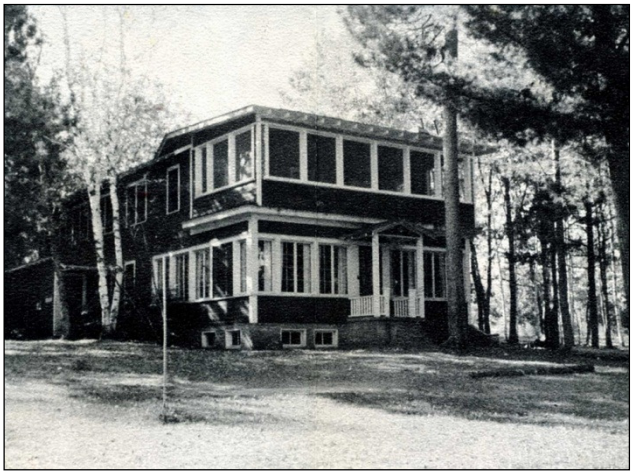


Figure 15-2. The Chippewa Lodge

In 1987, Ben Bess and Ann Rayson bought Goll's Chippewa Lodge. After a fire in 1988 on the top floor, the Raysons rebuilt the structure and reopened Chippewa Lodge B&B with 4 rooms available for quests. Saved from the fire were the original wood floors and the large stone fireplace.[15] Later, the cabins were sold and converted into condominiums.

In the 1900s, Marvin Hewitt, president of the Chicago and North Western Railroad, and R. H. Southgate, president of the Congress Hotel Company, parked their private railroad car on a sidetrack at Little Trout Lake until they returned to Chicago.[16] To expand their guests fishing opportunities, Hewitt wanted convenient access to more lakes, so he hired railroad construction crews to dig about four miles of ten-foot wide channels connecting White Sand, Sunfish, Crooked, Little Trout and Ike Walton Lakes.[17]

Ike Walton Lake Association[18]

Volunteer organizations in Wisconsin have long played an important role in protecting the lakes from declining water quality and other human impacts. To address such issues, residents on Lake Geneva established the first lake association in Wisconsin 1898.

The first organizational meeting of the Ike Walton Lake Association was held in August of 1997 at the

Lac du Flambeau Fire Station. Mr. Bryan Pierce from the University of Wisconsin Extension was a guest speaker and helped conduct the meeting. Twenty-three residents were in favor of forming a lake association. A steering committee was formed to work with Bryan Pierce over the winter to establish by-laws for an association.

The first annual meeting of the Ike Walton Lake Association was held at the Fence Lake Lodge on June 17, 1998. Forty-three of forty-six properties on the lake are currently members of the Lake Association.

Several Ike Walton Lake Association members have attended various training sessions conducted by the Lac du Flambeau Town Lakes Committee and are now active lake stewards monitoring the public boat landing and shorelines for AIS, and testing for, and reporting on, water quality and depth each season.

A Lake Sweep on the Wednesday before the Labor Day weekend each year helps to insure the continued health of Ike Walton Lake.

Several of Ike Walton Lake Association members assisted in the survey of the aquatic plant life of the lake for the *Bear River Comprehensive Lake Management Plan* conducted in August of 2012.

Community Survey[19]

Approximately 3,000 households in Lac du Flambeau were invited to participate in a mail survey during the summer of 2012 to provide information for preparing the *Bear River Watershed Comprehensive Lake Management Plan*. The survey was developed with assistance from the Wisconsin Department of Natural Resources and was approved by the WDNR before it was distributed.

The survey includes questions on topics such as residents' perceptions of the quality of lake water, fishery, and overall environment; residents' familiarity with aquatic invasive species and aquatic plants; residents' perceptions of current and ideal shoreline landscaping; and residents' interests in a variety of workshops. The survey, data tables, and other information related to the survey are in the appendix.

One-third of the questionnaires (996) were returned completed, representing 51 lakes. Of the returned questionnaires, 576 (58%) provide information on the ten lakes in the Bear River watershed and of these, 23 (4%) focus on Ike Walton Lake.

Tables presenting results of the survey are presented throughout the rest of this section. Care should be taken when interpreting the survey data because in many cases the number of respondents for Ike Walton Lake is very low.

Assessing Lake Health

Medical doctors assess human health by examining a patient's blood work, height, weight among numerous other measures (quantitative data) and by considering information like the patient's answers to questions, comments, even body language (qualitative data). Similarly, lake managers assess lake health by examining the lake's oxygen, nitrogen, and phosphorus, among other measures (quantitative data), and by considering additional information about the lake, like the presence of aquatic invasive species, nuisance aquatic plants, or even the presence of trash (qualitative data).

Ike Walton Lake Health Report

Assessing the health of Ike Walton Lake has included examining qualitative and quantitative data pertinent to the lake's biology, chemistry, nutrients, habitat, bacteria, aesthetics, and fish tissue. These categories are introduced in the next few pages and are addressed at length in the rest of the section.

Table 15-2 shows the categories, indicator assessments, and scores for various Ike Walton Lake parameters. (See Section 10 for details on rating).

Table 15-2. Ike Walton Lake Health Report

Category	Indicator Assessment		Overall Status
Biology	Invasive aquatic plant	Excellent	Excellent
	Invasive fish	Excellent	
	Invasive invertebrate	Good	
	Invasive wetland plant	Excellent	
	FQI	Good	
Chemistry	Dis. Oxygen DO	Good	Excellent
	pH pH	Excellent	
	Temperature	Excellent	
	Ionic Strength	Excellent	
	Sus. Solids SS	Excellent	
Nutrients	Phosphorus P	Excellent	Excellent
	Chlorophyll *a*	Excellent	
Habitat	Plants H	Excellent	Good
	Riparian Zone	Excellent	
	Littoral zone	Fair	
Bacteria	Bacteria	NA	NA
Aesthetics	Oil & Grease	Excellent	Excellent
	Taste & Odor	NA	
	Turb/Color	Excellent	
	Nuisance Plants	Excellent	
	Trash /Debris	Good	
Tissue	Spec. Chem. Hg	Concern	Concern
Lake Level	Level	NA	NA

The Biology Category reflects an assessment of the number and magnitude of invasive species. Ike Walton Lake has no invasive species.[20] The floristic quality index is good (FQI 33.95), and Ike Walton Lake's overall status for the Biology Category is *excellent*.

The Chemistry Category reflects an assessment[21] of data for dissolved oxygen, pH, temperature, ionic strength, and suspended solids as compared to Water Quality Standards Criteria.[22] Dissolved Oxygen for Ike Walton Lake during the summer can reach below 5mg/L, the criteria for cool water fish, so it has a status of *good*. Ike Walton Lake's overall status for the Chemistry Category is *excellent*.

The Nutrients Category reflects an assessment[23] of data for phosphorus and Chlorophyll *a* levels as compared to National Lake Survey (NLS) thresholds[24] for the Upper Midwest ecoregion health conditions and for the upper limit compared to Wisconsin's new Water Quality Standards for a two-story fishery lake.[25] The NLS was a study of Lakes across the United States, and thresholds for good, fair and poor were developed based on the data collected for each ecoregion. Ike Walton Lake's overall status for the Nutrients Category is *excellent* as average total phosphorus is 11.75 µg/L, and Chlorophyll *a* is 3.47 µg/L.

The Habitat Category reflects an assessment[26] of Ike Walton Lake's aquatic plants, riparian zone (shoreline), and littoral zone (shallow water along shoreline). Comparisons are made with eco-regional data and National Lake Survey thresholds.[27] Indicators for Ike Walton Lake have ratings of *fair* and *excellent*, and the lake's overall status for the Habitat Category is *good*.

The Bacteria Category reflects an assessment[28] of summer *E. coli* measurements that were taken weekly and then compared to Water Quality Standards criteria[29] for human health protection. Ike Walton Lake's overall status for the Bacteria Category was not assessed as there is not a public beach on the lake.

The Aesthetics Category reflects an assessment of data and information on water quality, color, and turbidity as well as an assessment of reports received by the Tribal Natural Resources Department for Ike Walton Lake on the presence of oil, grease, nuisance aquatic plants, and trash/debris. This information is compared to narrative criteria as described the Water Quality in the Water Quality Standards.[30] Ike Walton Lake's overall status for the Aesthetics Category is *excellent*.

The Tissue Category reflects an assessment of the amount of mercury in the flesh of fish in Ike Walton Lake as compared to the Water Quality Standards.[31] Most edible fish have more mercury in their flesh than what is protective for human health concerns. Ike Walton has the highest mercury concentration in the fish flesh than any other Flambeau Lake. Ike Walton Lake's overall status for the Tissue Category is of *concern*.

The Lake levels were assessed for Ike Walton Lake but a condition criterion has not been developed at this time. Information about lake levels is presented at the end of this section.

Biology Category

Biology is the science of living organisms. The organisms that live together in the lake interact in large part based on their food relationships (Food Web). The food pyramid for lakes (Figure 15-3) shows the proportion of biological production to the yield of large fish. The organisms are in balance after thousands of years of naturally evolving together within these food relationships. Invasive species, however, are organisms that evolved originally in other locations and when they move into a naturally balanced area disrupt the native organisms' relationships.

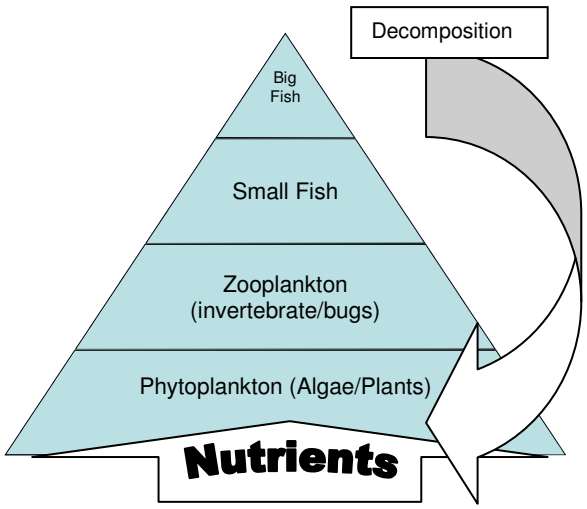


Figure 15-3. Lake Food Pyramid

Invasive species are a great concern. Their introduction can cause changes of native organisms' distribution and abundance and contribute to water quality degradation. The introduction of the invasive aquatic plant, Eurasian water milfoil, can cause the reduction in large game fish as the native insects and small fish have not evolved to eat EWM, causing a loss of food resource for large fish and an overabundance of plant matter.

To help determine the extent of residents' familiarity with Aquatic Invasive Species (AIS), the community survey asked residents to answer a few questions about AIS. Their responses to some of the questions follow.

Residents were asked if they had heard of AIS before reading about them in the survey. For Ike Walton Lake, 8 of 23 respondents (35%) indicated they had prior knowledge of AIS as compared to 171 of 576 (30%) for respondents of the ten lakes in the Bear Watershed, and 300 of 996 (30%) for all respondents from Lac du Flambeau.

Residents having prior knowledge of AIS were shown a list of AIS and then asked which, if any, are currently in the lake. Table 15-3 shows the responses of 8 residents for Ike Walton Lake (% Perceived Presence). The table also shows whether the AIS are actually in the lake. For example, 1 of the 8 residents believe that rusty crayfish is in the lake, when in fact it is not.

Table 15-3. Ike Walton Lake - Perceived vs Actual Presence of AIS

AIS	# Respondents	Perceived Presence	Actually Present
Banded Mystery Snail	1 of 8	13%	No
Eurasian Water Milfoil	0 of 8	0%	No
Rainbow Smelt	0 of 8	0%	No
Chinese Mystery Snail	0 of 8	0%	No
Freshwater Jellyfish	0 of 8	0%	No
Rusty Crayfish	1 of 8	13%	No
Curly-leaf Pondweed	0 of 8	0%	No
Purple Loosestrife	0 of 8	0%	No
None of Above	7 of 8	88%	

The same 8 respondents were asked to identify what they believe is threatened by AIS. Table 15-4 summarizes the responses for Ike Walton Lake, the ten lakes in the Bear River Watershed, and the 51 lakes in the survey. The largest percentages of responses for all three groups of respondents show water quality, native aquatic plants, and native fish as most threatened. The lowest percentage of responses for all three groups of respondents is for air quality.

Table 15-4. Ike Walton Lake - Perceived to be Threatened by Aquatic Invasive Species

	Ike Walton Lake		Bear River Lakes		All Lakes	
	# Respondents	%	# Respondents	%	# Respondents	%
Native Fish	2 of 8	25%	75 of 171	44%	113 of 302	37%
Air Quality	1 of 8	13%	9 of 171	5%	16 of 302	5%
Aquatic Plants	2 of 8	25%	60 of 171	35%	92 of 302	31%
Wetlands	2 of 8	25%	31 of 171	18%	45 of 302	15%
Shoreline Plants	3 of 8	38%	47 of 171	28%	72 of 302	24%
Amphibians	2 of 8	25%	33 of 171	19%	48 of 302	16%
Water Quality	4 of 8	50%	83 of 171	49%	125 of 302	41%
Crustaceans	1 of 8	13%	32 of 171	19%	42 of 302	14%
Other	0 of 8	0%	5 of 171	3%	8 of 302	3%
None	3 of 8	38%	28 of 171	16%	72 of 302	24%

The same residents were also asked if they are concerned about AIS getting into the lake. Table 15-5 shows that for 8 respondents for Ike Walton Lake, 33% indicate *extremely concerned*, 39% *somewhat concerned,* 11% *not too concerned*, 0% *not concerned at all*, and 17% *unsure*. Data for all three reference groups shows respondents have great concern about AIS getting into the lakes.

Table 15-5. Ike Walton Lake - Concern about AIS Getting into the Lake

Lake	# Respondents	Extremely	Somewhat	Not Too	Not at All	Unsure
Ike Walton Lake	8	33%	39%	11%	0%	17%
Bear River Lakes	170	49%	41%	4%	0%	7%
All Lakes	294	42%	42%	9%	2%	6%

The same residents were asked if they have been taking time to look for AIS in the lake. Table 15-6 shows that for 7 respondents affiliated with Ike Walton Lake, 57% indicate *not at all*, 29% *once a season*, 14% *monthly*, 0% *weekly*, and 0% *daily*. The data for Ike Walton Lake is similar to the data for the other lakes and shows that despite concern for AIS, very few residents indicate they spend time looking for AIS regularly.

Table 15-6. Ike Walton Lake - Time Spent Checking for AIS During Open Water Season

	Ike Walton Lake		Bear River Lakes		All Lakes	
	# Respondents	%	# Respondents	%	# Respondents	%
Not at all	4 of 7	57%	66 of 161	41%	114 of 280	41%
Once a Season	2 of 7	29%	45 of 161	28%	85 of 280	30%
Once a Month	1 of 7	14%	30 of 161	19%	47 of 280	17%
Once a Week	0 of 7	0%	12 of 161	8%	21 of 280	8%
Once a Day	0 of 7	0%	8 of 161	5%	13 of 280	5%

Chemistry Category

Chemistry is the science of matter and its properties and composition with a particular focus on the properties of chemical bonds. Dissolved oxygen, pH, temperature, ionic strength, and suspended solids each have a particular role in chemical bonding and movement of chemicals within the lake.

Seasonal changes and water temperature of the lake have an impact on the amount of dissolved oxygen in the lake, important for fish respiration and viability (see Section 9, *Understanding Lake Data*).

Dissolved oxygen in Ike Walton Lake (Figure 15-4) during the summer and late winter can reach below 5mg/L, the minimum criteria for cool water fish. Lake whitefish (*Coregonus elupeaformis*), for example, is a cool water fish that is very susceptible to temperature and dissolved oxygen.

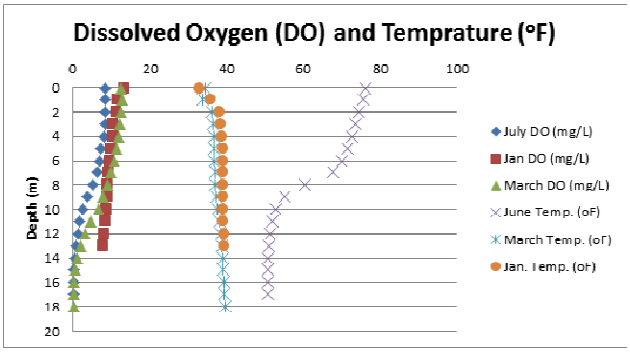


Figure 15-4. Dissolved Oxygen and Temperature Values for Ike Walton Lake at Various Depths

Conductivity is the ability of water to conduct electricity, an approximation of charged particles such as suspended solids, chloride or calcium that are dissolved in the water. Conductivity for Ike Walton Lake, measured as µS/cm, varies little seasonally or spatially and is low compared to other lakes in southern Wisconsin (see Section 9, *Understanding Lake Data*).

Calcium for Ike Walton Lake as measured in 1990 was on average 3 mg/L, quite low, meaning Ike Walton Lake may be less susceptible to infestations of zebra mussels.

pH is the measure of acidity or the negative logarithm of the hydrogen ion concentration (see Section 9, *Understanding Lake Data*).

Nutrients Category

Based on Secchi, total phosphorus, and chlorophyll data, Ike Walton Lake Lake's trophic state is mesotrophic, meaning it has medium amounts of nutrients to support a productive food web. A productive food web includes a diversity of rooted plants, macro-invertebrates (insects), and healthy fish populations.

Phosphorus and nitrogen are two nutrients that play key roles in limiting the growth of aquatic plants and algae (see Section 9, *Understanding Lake Data*). Of these, phosphorus is most critical to Ike Walton Lake.

Phosphorus originates from sources like human and animal wastes, soil erosion, detergents, septic systems and runoff from lawns. Phosphorus is the limiting nutrient for Ike Walton Lake, meaning that when the amount of phosphorus increases, the probability of algae growth also increases. Total phosphorus between 10 and 18ug/L is associated with mesotrophic and medium production of biomass (Figure 15-5).

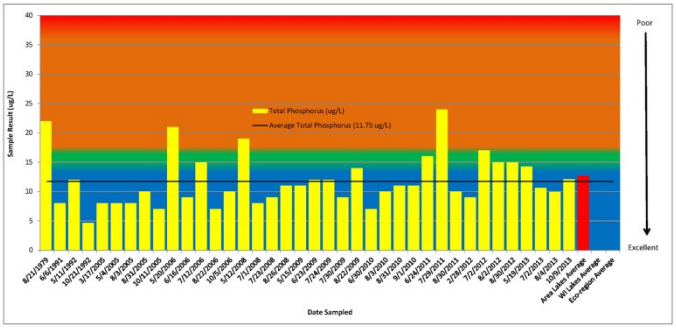


Figure 15-5. Total Phosphorus Concentrations for Ike Walton Lake

As the amount of algae increases, it is likely that the amount of chlorophyll *a* increases. Chlorophyll *a* is a green pigment present in all plant life and is necessary for photosynthesis. The amount of

Chlorophyll *a* is a common measure of water quality (Figure 15-6).

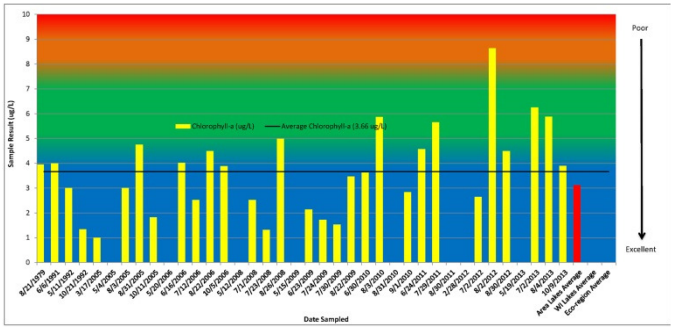


Figure 15-6. Chlorophyll *a* Concentrations for Ike Walton Lake

Figure 15-7 shows trends in Secchi depth, total phosphorus, and Chlorophyll *a* for Ike Walton Lake from 1979 until present. No significant change in water quality is noted over this time period.

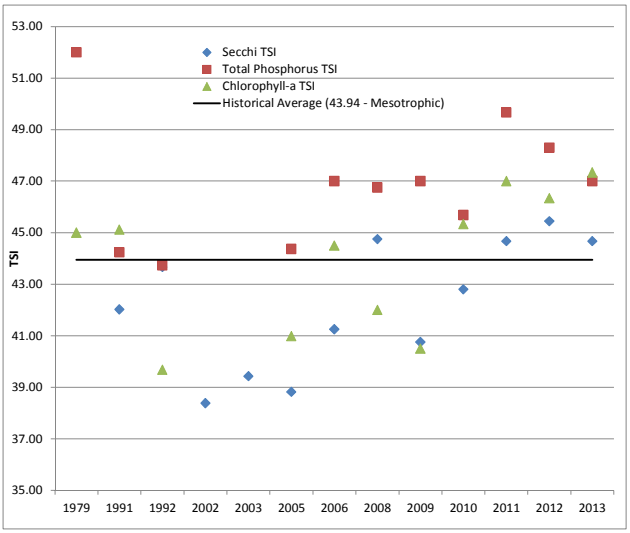


Figure 15-7. Secchi Depth, Total Phosphorus, and Chlorophyll *a* Values for Ike Walton Lake

Ike Walton Lake, is in the heart of Powell Marsh, where the lake's watershed wetland (Figure 15-89) is the primary source of total phosphorus. Though the lake's shoreline has been minimally developed, more growth and development are expected with the arrival of new residents and requisite housing, roads, businesses, and support services.

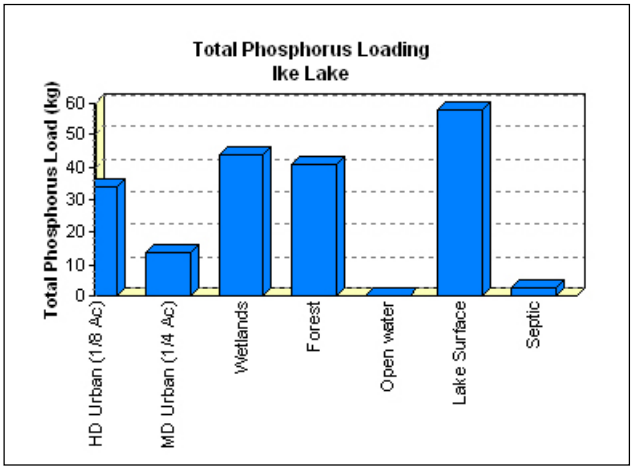


Figure 15-8. Total Phosphorus Loads from Existing Sources in the Ike Walton Lake Area

Future amounts of phosphorus for Ike Walton Lake can be anticipated by using a tool (Wisconsin Lake Modeling Suite - WiLMS) designed to predict phosphorus levels based on changes of land use in the watershed (Figure 15-98).

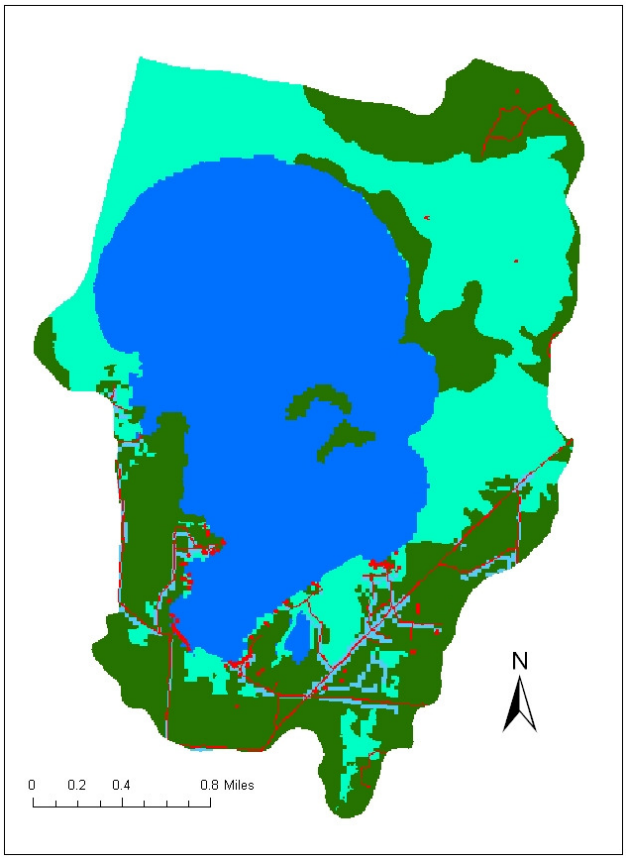


Figure 15-9. Land Use/Habitat Areas Near Ike Walton Lake (Red – Developed; Blue – Open Water; Light Green – Wetland; Dark Green – Forest)

Use of the WiLMS tool reveals that High and Medium Disturbance areas characterized by the presence of roads, homes, buildings, parking areas, and lawns, yield the most total phosphorus per unit area but are the least amount of area. Forested and wetland areas contribute more total phosphorus as it is the great majority of the watershed.

Habitat Category

Habitat refers to a specific place that is inhabited by a particular organism. Habitat includes all that the organism needs to live, including physical factors such as soil, temperature, light; and biotic factors, such as the availability of food and shelter from predators. The Habitat category includes substrate (rock, sand, muck); aquatic plants; riparian zone (shoreline); and littoral zone (shallow water along shoreline).

Substrate is the surface on which an organism grows, and rock, sand, and muck are the primary substrates of a lake. Ike Walton Lake's substrates at the north end is primarily muck or submerged wetland, while the middle and south end of the lake is primarily sand and rock. Substrate often indicates the type of plants that will grow in an area. The diversity of Ike Walton Lake's substrate is important to the health of the lake's fishery. (Figure 15-10)

Table 15-7. 2012 Aquatic Plant Community Statistics, Ike Walton Lake, Vilas County, WI

Aquatic Plant Community Statistics	2012
Total sites sampled	738
Total sites with vegetation	336
Total site shallower than max depth of plants	621
Frequency of occurrence at sites shallower than maximum depth of plants	54.11%
Simpson Diversity Index	0.85
Maximum Depth of Plants (Feet)	9
Taxonomic Richness (Number Taxa)	20*
Average Number of Species per Site (sites less than max depth of plant growth)	0.73
Average Number of Species per Site (sites with vegetation)	1.36

* - There was one species sampled that was not identified.

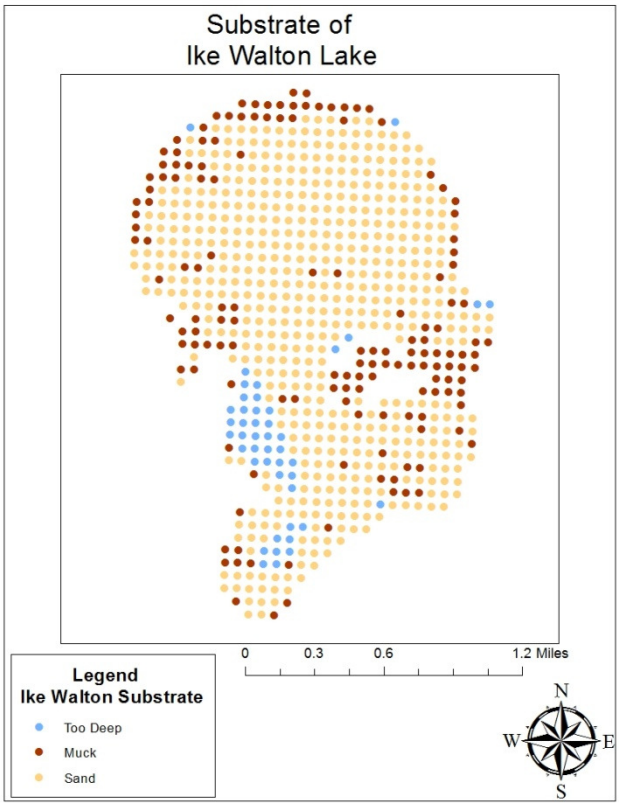


Figure 15-10. Substrate Map for Ike Walton Lake

Aquatic plants (macrophytes) are plants that grow in the water either submerged (all under water), emergent (sticking out of the water), or floating leaf. The north end of Ike Walton Lake has a large area of dense submerged plants with the most predominant being common bladderwort.

The Tribal Natural Resources Department assessed the aquatic plants in Ike Walton Lake in 2012 by following the Wisconsin Department of Natural Resources Protocol for conducting an aquatic plant point intercept survey (see Section 8).

Table 15-7 presents the statistics associated with the point intercept survey, and Figure 15-11 displays general aquatic plant data on an aerial photograph. The table shows that of the 738 sites sampled, vegetation was found at 336 sites and 621 sites were shallower than the maximum depth of plants, 9 feet. The total number of plant species found (Taxonomic Richness - Frequency of Occurrence) was 20 plants, and the Simpson Diversity Index was

0.85. (See Section 8 for detailed explanations of the terms).

- Frequency of occurrence is an estimate of how often a particular plant species is likely to be found within a lake. The estimate is based on an analysis of the data collected during the point intercept survey.
- Simpson's Diversity Index is a measure of how diverse a plant community is in the lake. The index is within a range of 0 to 1. The higher the value, the more diverse the plant community is in a particular lake. Plant diversity is an indicator of the lake's overall resiliency. Generally, a lake with high species diversity is considered to be more stable than a lake with low species diversity because it has a greater ability to withstand environmental fluctuations. A lake with a diverse plant community is better equipped to compete with exotic infestations than is a lake with low diversity.

Table 15-8 lists the aquatic plants found in Ike Walton Lake and shows the Floristic Quality Index (FQI) for the lake. The FQI is the extent to which a lake's plant community is similar to that of a pristine or undisturbed lake. The higher the floristic quality index, the closer a lake is to an undisturbed system. FQI is used to determine whether a lake's plant community is changing over time. It is also used to determine the extent to which a lake's plant community is similar to other lakes in the same ecoregion. The Floristic Quality Index for Ike Walton Lake was 33.95, meaning most of the plants can tolerate moderate disturbances (See Section 8).

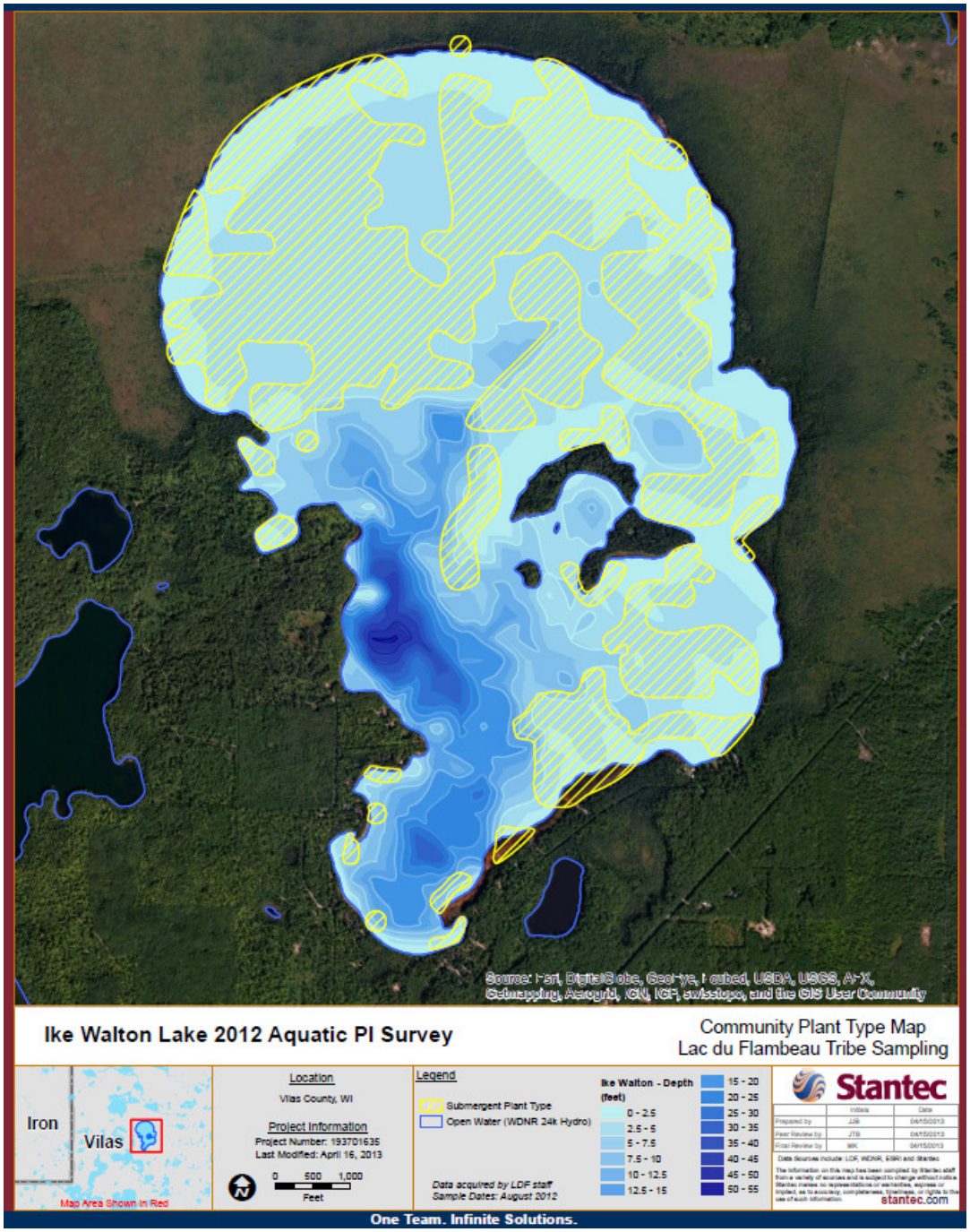


Figure 15-11. Ike Walton Lake 2012 Aquatic Point Intercept Survey

Table 15-8. 2012 Floristic Quality Index, Ike Walton Lake, Vilas County, WI

Genus	Species	Common Name	Coefficient of Conservatism C
Elatine	*minima*	Waterwort	9
Eleocharis	*acicularis*	Needle spikerush	5
Eleocharis	*palustris*	Creeping spikerush	6
Equisetum	*fluviatile*	Water horsetail	7
Eriocaulon	*aquaticum*	Pipewort	9
Isoetes	*sp.*	Quillwort	8
Juncus	*effusus*	Soft rush	4
Juncus	*pelocarpus*	Brown-fruited rush	8
Littorela	*uniflora*	Littorella	10
Lobelia	*dortmanna*	Water lobelia	10
Myriophyllum	*tenellum*	Dwarf water-milfoil	10
Nitella	*sp.*	Nitella	7
Pontederia	*cordata*	Pickerelweed	8
Potamogeton	*alpinus*	Alpine pondweed	9
Schoenoplectus	*acutus*	Hardstem bulrush	6
Sparganium	*fluctuans*	Floating-leaf bur-reed	10
Utricularia	*resupinata*	Small purple bladderwort	9
Utricularia	*vulgaris*	Common bladderwort	7
Vallisneria	*americana*	Wild celery	6
		Total Species	19
		Mean C	7.79
		Floristic Quality Index (FQI)	**33.95**

Note: There is no Coefficient of Conservatism for exotic species such as Eurasian Water-Milfoil or for species not identified to the species level (*Sagittaria sp.*).

Coefficient of Conservatism C

0-3	taxa found in wide variety of plant communities and very tolerant of disturbance.
4-6	taxa typically associated with specific plant communities and tolerate moderate disturbance.
7-8	taxa found in narrow range of plant communities and tolerate minor disturbance.
9-10	taxa restricted to a narrow range of synecological conditions, with low tolerance of disturbance.

Littoral Zone Habitat

The littoral zone extends along the shoreline from the water's edge into the water to a depth of about 9 feet for Ike Walton Lake. This is the area where most of the aquatic plants grow, providing shelter for fish to reproduce and protect their young. The plants also reduce erosion caused by waves, stabilizing the shoreline.To help determine the extent of residents' perceptions of aquatic plants, the survey asked residents if their enjoyment of the lakes was impeded by the presence of aquatic plants in the littoral zone. Table 15-9 shows that 30% of 23 residents from Ike Walton Lake indicate *never*, 57% *rarely*, 4% sometimes, 4% *often*, and 4% *always*. When comparing the data for Ike Walton Lake with the data for the other lakes, it appears that aquatic plants are perceived to have had a less negative impact.

Table 15-9. Ike Walton Lake - Whether Aquatic Plants Impede Enjoyment of the Lake

Lakes	# Respondents	Always	Often	Sometimes	Rarely	Never
		%	%	%	%	%
Ike Walton Lake	23	4%	4%	4%	57%	30%
Bear River Lakes	556	3%	4%	16%	44%	33%
All Lakes	957	3%	7%	21%	40%	29%

Residents were asked if they or members of their households have tried to control aquatic plant growth by removing plants from the lake. Table 15-10 shows that 76% of 21 respondents for Ike Walton Lake indicate *never*, 19% *some years*, and 5% *yearly*.

Table 15-10. Ike Walton Lake - Removal of Aquatic Plants from the Lake

Lakes	# Respondents	Yearly	Some Years	Never
		%	%	%
Ike Walton Lake	21	5%	19%	76%
Bear River Lakes	458	6%	14%	80%
All Lakes	816	8%	18%	74%

Residents were also asked if they or members of their household have removed trees that have fallen into Ike Walton Lake. Table 15-11 shows that 76% of 21 respondents indicate *never*, 24% *some years*, and 0% *every year*. The data for the respondents of Ike Walton Lake are very similar to the data to the other lakes. They rarely remove trees that have fallen into the lake.

Table 15-11. Ike Walton Lake - Removal of Fallen Trees from the Lake

Lakes	# Respondents	Yearly	Some Years	Never
		%	%	%
Ike Walton Lake	21	0%	24%	76%
Bear River Lakes	456	2%	27%	72%
All Lakes	814	1%	24%	75%

Residents were asked whether there is a need to control aquatic plants for Ike Walton Lake. Table 15-12 shows that 9% of 23 respondents indicate *definitely no*, 35% *probably no,* 9% *probably yes,* and 13% *definitely yes*. Thirty-five percent indicate they are *not sure*.

Table 15-12. Ike Walton Lake - Whether Aquatic Plant Control is Needed

	Ike Walton Lake	Bear River Lakes	All Lakes
	23 Respondents	503 Respondents	868 Respondents
Definitely yes	13%	8%	8%
Probably yes	9%	21%	19%
Probably no	35%	27%	29%
Definitely no	9%	9%	12%
Unsure	35%	35%	32%

Residents were asked what should be done if an aquatic invasive plant is found in the lake. Table 15-13 shows that for 8 respondents for Ike Walton Lake, 13% indicate *remove with chemicals,* 25% *remove mechanically*, 0% *remove with biological control*, 75% *remove by hand,* 13% *do nothing/no treatment*, and 13% indicate they *need more information*.

Table 15-13. Ike Walton Lake - Preferences for Treating/Removing Aquatic Invasive Plants

	Ike Walton Lake	Bear River Lakes	All Lakes
	8 Respondents	171 Respondents	302 Respondents
Apply chemicals	13%	18%	15%
Use machines	25%	21%	19%
Bio-control	0%	25%	24%
No treatment	13%	3%	2%
Pull by hand	75%	49%	51%
Need more info.	13%	41%	41%

Riparian Zone Habitat

The Riparian zone is the land area along the shoreline from the water's edge inland. In general this area is where most people access the lake via stairs or paths. It sometimes includes boathouses and storage sheds, and homes, lawns, and other structures.

The riparian zone contributes the most nutrients from erosion, fertilizers, septic systems, and general runoff. The area is critical in providing woody habitat for fish and leaf material for invertebrates, like the dragon fly which lives a life cycle requiring both water and land. It is also critical in providing habitat to sustain other animals that rely on the lakes, like song birds, eagles, loons, otter, deer, along with a multitude of other creatures. A poor riparian habitat often results in fewer species and excess nutrients, while a good riparian habitat is replete with abundant wildlife and healthy levels of nutrients.

To help determine the extent of residents' perceptions of the riparian zone, the community survey asked residents to describe the landscape in the 35 foot buffer between the shoreline and their house, and to identify what they believe should be in an ideal landscape for the same area.

Table 15-14 lists several landscape features ordinarily found in riparian zones. Residents were asked to check those features that characterize the current riparian landscape for their property and then check those features that they believe should be in an ideal riparian landscape. The table compares residents' descriptions of the current landscape with their perceptions of an ideal landscape. For example, 43% of respondents affiliated with Ike Walton Lake identify mowed grass as a feature of the current buffer zone for their property, yet 38% of them identify mowed grass in an ideal landscape.

Table 15-14. Ike Walton Lake - Current Shoreline Landscaping vs Ideal Shoreline Landscaping

	Ike Walton Lake		Bear River Lakes		All Lakes	
	21 Respondents		481 Respondents		847 Respondents	
	Current	Ideal	Current	Ideal	Current	Ideal
Mowed grass	43%	38%	45%	30%	41%	28%
Rock terrace	0%	24%	19%	24%	16%	20%
Wild	53%	33%	44%	26%	44%	28%
Native prairie grasses	24%	24%	24%	27%	26%	24%
Wood terrace	0%	14%	4%	9%	5%	9%
Sand beach	53%	52%	25%	31%	26%	33%
Rain garden	0%	14%	2%	6%	2%	4%
Flower gardens	0%	19%	10%	10%	9%	9%
Shrubs	43%	29%	36%	25%	31%	22%
Wild with wood picked up	29%	19%	23%	21%	27%	22%
Trees	76%	57%	70%	50%	66%	47%
Something else	0%	0%	3%	2%	4%	3%
It doesn't matter		5%		7%		7%

The current primary features identified by all three respondent groups include mowed grass, wild, shrubs, and trees. The response for Ike Walton for *sand beach* is double the percentage for the other lakes. When characterizing the ideal landscape, the same respondents prefer landscapes characterized by less mowed grass and less wild with fewer trees and shrubs. The percentage of responses for Ike Walton for *sand beach* remain the same as well as much higher than for the other lakes.

Residents were asked if they are interested in learning about landscape designs tailored to help protect the lakes and habitats. Table 15-15 shows that of 20 respondents for Ike Walton Lake, 0% indicate *no interest,* 35% *little interest*, 0% *some 45% a lot of interest*, and 20% *don't know*.

Table 15-15. Ike Walton Lake - Interest in Learning about Landscape Design

	Ike Walton Lake	Bear River Lakes	All Lakes
	20 Respondents	443 Respondents	787 Respondents
No interest	0%	4%	4%
Little interest	35%	40%	40%
Some interest	0%	5%	6%
A lot of interest	45%	11%	11%
Don't know	20%	40%	39%

Assessment of Riparian & Littoral Zones

The Habitat Category reflects an assessment[32] of Flambeau Lake's aquatic plants, riparian zone (shoreline), and littoral zone (shallow water along shoreline). Comparisons are made with ecoregional data, National Lake Survey thresholds[33] and WISCALM (Table 10-4).

Riparian cover includes cover-class estimates of large and small diameter tree cover in the >5m high vegetation layer; woody and non-woody vegetation in the mid-layer (0.5 to 5 m); and woody, non-woody, inundated, and barren classes in the ground cover layer (<0.5 m) of the 10 lakeshore plots. Littoral cover index excludes submerged aquatic macrophytes, but increases the weighting of floating and emergent macrophytes.

Table 15-16 compares the thresholds developed by WISCALM for Plants and the National Lake Survey for Riparian Zone and Littoral Zone to the index value were calculated based on the assessment of Ike Walton Lake's habitat.

Table 15-16. Index Values for Environmental Assessment Perceptions

Indicator Assessment	Index Value	Water Quality Assessment Thresholds			
		Excellent	Good	Fair	Poor
Plants	54%	Below 79.7%	89.7% - 79.8%	89.8% - 94.8%	100% - 94.9%
Riparian Zone	1.5		>0.8074	0.5906-0.8074	<0.5906
Littoral Zone	0.49		>0.7001	0.4156-0.7001	<.4156

Lakeshore habitat is the biggest problem in the nation's lakes; over one-third exhibit poor Shoreline condition. Poor biological health is three times more likely in lakes with poor lakeshore habitat.[34]

To help learn about residents' perceptions on habitat and environmental change, the community survey asked residents if elements of the habitat have been changing over time. Table 15-17 shows the responses for Ike Walton Lake, the Bear River watershed project lakes, and the other lakes. The data are very similar for all three response groups. The predominant response is *no change*.

Bacteria Category

Bacteria is assessed based on a measure of the most probable number (MPN) of *E. coli* in 100 milliliters of water. *E. coli* is the abbreviated name of the bacterium in the family *Enterobacteriaceae*, named *Escherichia coli*. The presence of *E. coli* in our intestines is normal. The presence of *E. coli* in swimming areas indicates that other microorganisms (including the ones that could causes illness) that live in the gastrointestinal track could also be present. The water quality criterion to protect human health, 235 MPN, is based on an illness rate of eight per 1,000 swimmers. Ike Walton Lake is not assessed for *E. coli* as there is not a public beach on the lake.

Table 15-17. Ike Walton Lake - Perceptions of Environmental Change

	Shorelines	Wetlands	Streams	Air	Forests	Grasslands	All Environment
Ike Walton Lake							
#Respondents	22	21	19	21	21	21	22
Improving	5%	5%	0%	0%	0%	0%	0%
No change	55%	57%	26%	62%	48%	43%	68%
Worsening	32%	19%	5%	5%	33%	10%	18%
Don't know	10%	19%	68%	33%	19%	48%	14%
Bear River Lakes							
#Respondents	534	522	513	522	524	513	526
Improving	5%	3%	1%	3%	4%	2%	5%
No change	52%	51%	42%	68%	52%	48%	54%
Worsening	30%	12%	11%	8%	24%	10%	23%
Don't know	13%	34%	46%	22%	20%	40%	18%
All Lakes							
#Respondents	923	901	873	909	910	882	903
Improving	4%	2%	1%	3%	4%	2%	4%
No change	56%	55%	45%	71%	57%	52%	59%
Worsening	28%	12%	9%	5%	20%	7%	19%
Don't know	13%	31%	45%	21%	19%	40%	18%

Generally, the Tribe is responsible for septic systems on property owned by the Tribe, and Vilas County is responsible for septic systems on property on non-Tribal land. Currently, all septic systems under the jurisdiction of Vilas County are on a three-year pumping/inspection schedule.

Residents were asked how often they have their septic tank inspected. Table 15-18 shows that for 12 respondents of Ike Walton Lake, 0% indicate they *do not own the property*, 100% *at least every three years*, 0% *no septic tank*, 0% *more than every three years*, and 0% *no inspection*.

Aesthetics Category

The Aesthetics Category includes data and information on water quality, color, and turbidity. It also reflects an assessment of reports received by the Tribal Natural Resources Department for Ike Walton Lake on the presence of oil, grease, nuisance aquatic plants, trash, and debris.

Reports and concerns submitted by residents to the Tribal Natural Resources Department on the turbidity and color of the lake water are not uncommon.

Table 15-18. Ike Walton Lake - Septic Tank Inspection

	Ike Walton Lake	Bear River Lakes	All Lakes
	12 Respondents	360 Respondents	609 Respondents
Do not own property	0%	7%	4%
At least every 3 years	100%	67%	71%
No tank	0%	9%	6%
More than every 3 years	0%	12%	12%
No inspection	0%	6%	7%

The extent to which lake water appears to be clear or murky is a function of the total amount of solids that are suspended in the water. Generally, the greater the amount of suspended solids in the water, the murkier it appears. Ike Walton has a considerable amount of dissolved organic carbon (DOC) from decaying plants (associated with the Powell Marsh). DOC in the lake cause the water to appear like tea.

The major source of turbidity in open water away from shore is typically phytoplankton (algae). Closer to shore, suspended matter also comes from sources such as septic systems, sewage treatment plants, storm runoff, shoreline erosion and lake bottom sediments.

The major effect of turbidity noticed by lake property residents might simply be aesthetic—people do not like to look at dirty water. High levels of turbidity can, however, cause major problems by inhibiting the penetration of light, leading to the suffocation of larvae, damage to fish gills, fish reproduction, and loss of aquatic plants and habitat.

Turbidity or cloudy water can be measured in a variety of ways. A method commonly used in Lac du Flambeau to measure water clarity is to employ a Secchi disk. The 8-inch diameter disk with white and black quadrants is tied to a line and lowered slowly down into the water. The depth at which the white quadrants are no longer visible is taken as a measure of the transparency of the water. This information provides a way to look at changes in water clarity over a long period of time. Secchi data also correlates to total phosphorus and trophic state index data. Figure 15-12 shows that over the past 22 years no significant change in water clarity has occurred for Ike Walton Lake.

The Secchi disk was created by Father Pietro Angelo Secchi in 1865. He was a priest, astronomer, and professor of physics who taught for a time at Georgetown University in Washington, DC.[35]

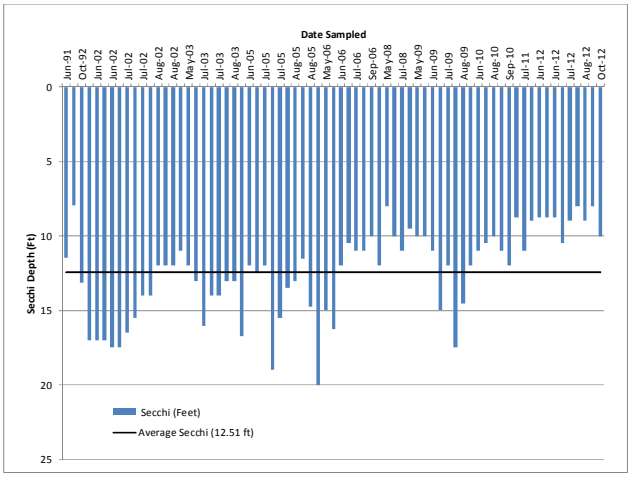


Figure 15-12. Secchi Depth Trends for Ike Walton Lake

The color of lake water reflects the type and amount of dissolved organic chemicals it contains. Transparent water with a low accumulation of dissolved materials appears blue and indicates low productivity. Dissolved organic matter, such as humus, peat or decaying plant matter, can produce a yellow or brown color. Some algae produce a reddish or deep yellow color. Water rich in phytoplankton and other algae usually appears green.

Volunteers for Ike Walton Lake have been subjectively observing and recording the lake's water color since 2002 as part of the WDNR's Citizen Lake Monitoring Network. Table 15-19 summarizes the observations. The numbers preceding the colors indicate the number of dates of observation. Blue was recorded 65 times and yellow 7 times. The specific dates of the observations are available on the Citizen Lake Monitoring website at http://dnr.wi.gov/lakes/clmn/. The website also shows observers reported that with no exceptions, the water appeared to be clear.

Table 15-19. Ike Walton Lake - Lake Water Color

Year	May	June	July	August	Sept	Oct
2002	1 Blue	4 Blue	3 Blue 1 Yellow	3 Yellow	1 Blue	
2003	1 Blue	1 Blue	3 Blue	2 Blue		
2004						
2005		3 Blue	3 Blue	4 Blue		1 Blue
2006	1 Blue	3 Blue	1 Blue	1 Blue	1 Blue	1 Blue
2007						
2008	1 Yellow		1 Blue 1 Yellow	1 Blue		
2009	2 Blue	1 Blue	3 Blue	2 Blue		
2010		1 Blue		3 Blue	1 Blue	
2011		1 Blue	2 Blue			
2012		4 Blue	1 Blue	3 Blue		1 Blue
2013	1 Yellow		2 Blue	2 Blue		1 Blue

In order to learn about residents' perceptions of the lake water quality, the community survey posed a few questions about water quality. Residents were asked to describe the current water quality of Ike Walton Lake and whether they believe that quality has been changing. Table 15-20 shows that 17% of 23 respondents for Ike Walton Lake indicate that the current water quality of the lake is *excellent* 57% *good*, 13% *fair*, 9% *poor,* 0% *very poor*, and 4% are *unsure*. More than 7 of 10 respondents have a very positive perception about the current quality of Ike Walton Lake's water. The data for Ike Walton Lake regarding perceptions of current water quality are reasonably consistent with the data for the other lakes identified in the table.

Table 15-20. Ike Walton Lake - Perception of Current Water Quality

Lakes	# Respondents	Excellent	Good	Fair	Poor	Very Poor	Unsure
		%	%	%	%	%	%
Ike Walton Lake	23	17%	57%	13%	9%	0%	4%
Bear River Lakes	554	38%	49%	7%	3%	0.2%	3%
All Lakes	956	34%	53%	7%	3%	0.1%	3%

Table 15-21 shows that 0% of 21 respondents for Ike Walton Lake indicate that water has been *improving*, 48% *no change*, 29% *worsening*, and 23% are *unsure*. Again, the data for Ike Walton Lake are reasonably consistent with the data for the other lakes noted in the table.

Table 15-21. Ike Walton Lake - Perception of Change in Water Quality

Lakes	# Respondents	Improving	No Change	Worsening	Unsure
		%	%	%	%
Ike Walton Lake	21	0%	48%	29%	23%
Bear River Lakes	519	1%	60%	17%	22%
All Lakes	719	2%	62%	16%	20%

Fish Tissue Category & Fishery

The Fish Tissue Category refers to the amount of mercury in fish flesh as compared to Water Quality Standards. Larger edible fish have more mercury in the fish flesh than what is protective for human health concerns. Tribal Water Quality Standards are protective for subsistence fish consumption and the criterion to protect human health is 0.16 PPM.

Anthropogenic (meaning caused by human activity) sources of mercury are mainly from coal fired electric utilities emissions that ultimately enter the lake and watershed via rainwater. The chemistry of

Lac du Flambeau Lakes is such that mercury becomes mobilized into the food chain accumulating in larger fish at the top of the food chain. Reductions in mercury emissions on coal fired power plants have helped to reduce mercury in the rain as seen in Figure 15-13. A comparison of 1992 data to 2007 data shows a trend of reduction, yet more than what is protective for human health.

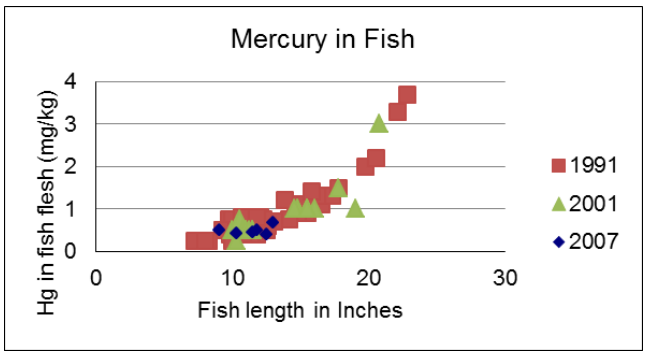


Figure 15-13. Mercury Concentrations in Fish Tissue vs Size in Inches

Ike Walton Lake's fishery supports both subsistence and sport fishing. The lake's fishery includes panfish, smallmouth and largemouth bass, musky, and walleye.[36]

The Tribal Hatchery has a history of stocking Ike Walton Lake with walleye. Table 15-22 shows the numbers of walleye that have been stocked in Ike Walton Lake from 2003–2010.

Table 15-22. Number of Fish Stocked During 2003–2010 - Ike Walton Lake (1,439 acres)

Year	Walleye	
	Fry	Fingerlings
2010		13,000
2009		9,125
2006	800,000	21,155
2004	400,000	
2003	400,000	

In order to determine residents' perceptions on the quality of fishing and whether that quality has been changing, the survey asked residents a few questions about the fishery. Residents were asked if they have fished or speared on Ike Walton Lake within the past ten years. Twenty of 23 (87%) respondents for Ike Walton Lake responded affirmatively.

These respondents were then asked to identify the type of fishing they employed. Of those who responded, 100% indicate *open water hook and line fishing*, 30% *ice fishing*, 0% *spearing*, and 0% *netting*.

The residents who have fished or speared within the past ten years were asked to describe the current quality of fishing on the lake, and how, if at all, the quality of fishing on the lake has changed during the past ten years.

Table 15-23 shows that of the 20 Ike Walton residents who responded about the current quality of fishing, 5% indicate *excellent*, 35% *good*, 45% *fair*, 10% poor, and 0% *very poor*. Five percent indicate *unsure*.

Table 15-23. Ike Walton Lake - Perceptions of Current Quality of Fishing

	Ike Walton Lake	Bear River Lakes	All Lakes
	23 Respondents	397 Respondents	750 Respondents
Excellent	5%	5%	5%
Good	35%	34%	34%
Fair	45%	42%	44%
Poor	10%	13%	11%
Very Poor	0%	4%	4%
Unsure	5%	3%	2%

Regarding whether the quality of fishing has changed during the past ten years, Table 15-24 shows that of 20 Ike Walton Lake respondents, 10% indicate fishing has *been improving*, 35% *no change*, 45% *worsening*, and 10% *unsure*. A slightly higher percentage of respondents for Ike Walton Lake indicate the quality of fishing has been worsening as compared to respondents of the other lakes.

Table 15-24. Ike Walton Lake - Perceptions of Change of Fishing Quality

	Ike Walton Lake	Bear River Lakes	All Lakes
	20 Respondents	414 Respondents	750 Respondents
Improving	10%	9%	8%
No Change	35%	28%	31%
Worsening	45%	42%	42%
Unsure	10%	21%	20%

Lake Water Levels

Lake levels fluctuate naturally due to precipitation and evaporation, both of which may vary widely from season to season and year to year. Low levels may cause stressful conditions for fish and increase the number of nuisance aquatic plants. High water levels can boost the amounts of nutrients from runoff of flooded lakeshore soils. Another consequence of fluctuating water levels is shoreline erosion.

Volunteers from Lac du Flambeau have been subjectively observing and noting lake water levels through the WDNR's Citizen Lake Monitoring Network for many years, while in 2012 the Tribal Natural Resources Department began to collect water level data systematically for selected lakes. With assistance from North Lakeland Discovery Center, Vilas County Association of Lakes, and Town Lakes Committee, monitoring equipment was installed and calibrated on sites at Little Crawling Stone Lake, Fence Lake, Flambeau Lake, Ike Walton Lake, and White Sand Lake. The equipment at the Flambeau Lake site is being monitored by the Tribal Resources Department while equipment at the other sites is being monitored by volunteer lakefront property owners. The weekly measurements recorded for Ike Walton Lake for 2012–2013 are shown in Figure 15-14.

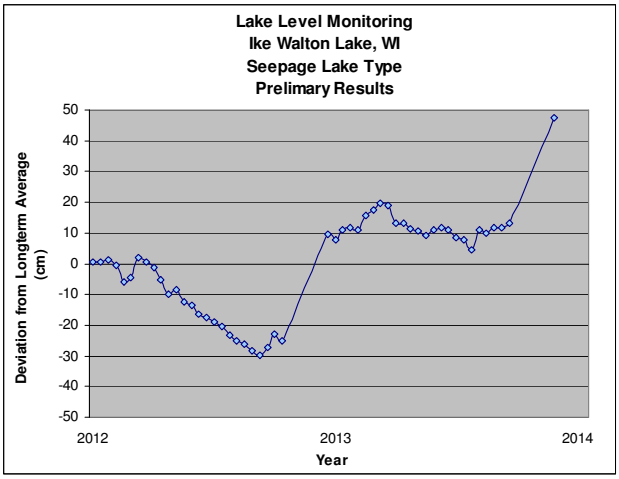


Figure 15-14. Lake Water Level Fluctuations During 2012–2014

The number of observations of lake water levels noted through the Citizen Lake Monitoring Network are shown in Table 15-25.

Table 15-25. Ike Walton Lake - Number of Observations of Lake Water Levels

Year	Low	Normal	High
2002		6	7
2003		7	
2004			
2005	6	4	
2006	8		
2007			
2008	4		
2009	8		
2010	5		
2011		3	
2012	7		2
2013	6		

Other Survey Results for Ike Walton Lake

Residents affiliated with Ike Walton Lake who responded to the survey in 2012 shared their perceptions on several topics in addition to those already presented in this section.

Activities & Watercraft

From a list of activities (fishing excluded), residents were asked to identify those in which they most often choose to participate. The activities most often identified include relaxing and enjoying nature (83%), swimming (83%), and motor-boating (70%). The activities least often identified include sailing (0%), ricing (0%), and trapping (4%).

From a list of different types of watercraft, residents were asked to identify those which they and members of their household use most often. The watercraft most often identified include motorboats with more than 25 hp (52%), motorboats less than 25 hp (48%), and canoes or kayaks (61%). Watercraft least often identified include row boats (9%), jet skis (13%), and sailboats (0%). Four percent of the respondents indicate they and members of their household do not use watercraft.

Issues of Concern

From a list of 16 concerns, residents affiliated with Ike Walton Lake were asked to identify three concerns about the lake that they believe are of most concern. For those who responded, Table 15-26 shows the three issues of greatest concern include *aquatic invasive species* (30%), *loss of fish habitat* (26%), *degradation of native aquatic plants* (22%), and *loss of wildlife habitat* (22%). The issues of least concern include *noise* (4%), *light pollution* (4%), *boat traffics* (4%), and *shoreline runoff* (4%). The items on the list are of *no concern* to 17% of the respondents.

Table 15-26. Ike Walton Lake - Lake Issues of Most Concern

	Ike Walton Lake	Bear River Lakes	All Lakes
	23 Respondents	576 Respondents	1074 Respondents
Algae bloom	13%	17%	16%
Light pollution	4%	10%	8%
Shoreline runoff	4%	14%	12%
Aquatic invasive species	30%	42%	35%
Loss of fish habitat	26%	25%	22%
Water quality degradation	17%	27%	23%
Boat traffic	4%	16%	15%
Loss of shoreline	0%	13%	10%
Septic discharge	9%	18%	15%
Degradation of native aquatic plants	22%	11%	9%
Loss of wildlife habitat	22%	10%	10%
Excessive aquatic plant growth	9%	12%	10%
Noise pollution	4%	6%	6%
Shoreline development	17%	13%	11%
Excessive fishing	9%	12%	10%
Shoreline erosion	17%	18%	10%
Not concerned about any of these	17%	17%	19%

Interest in Attending Workshops

Residents were asked if they have an interest to attend workshops on a variety of topics related to the lakes and habitats. Table 15-27 shows the largest percentages of responses for all three response groups include *identifying AIS* and *identifying aquatic plants*. Respondents from of Ike Walton Lake also show interest in *limnology*.

Table 15-27. Ike Walton Lake - Interest in Attending Workshops

	Ike Walton Lake	Bear River Lakes	All Lakes
	23 Respondents	576 Respondents	1074 Respondents
Preventing AIS	13%	13%	11%
Starting a lake association	0%	5%	14%
Controlling Purple Loosestrife	13%	17%	14%
Identifying AIS	39%	42%	38%
Lake Stewardship	4%	13%	11%
Identifying aquatic plants	44%	38%	36%
Limnology	22%	22%	20%
Other	0%	5%	4%
No interest	26%	28%	28%

Town Website

Residents were asked how often, if at all, they check the town's website to get information about the Town Lakes Committee, such as newsletters, meeting agendas, and information on AIS. Table 15-28 shows that of 23 respondents for Ike Walton Lake Lake, 0% indicate *often*, 13% *sometimes*, 26% *rarely,* and 61% *never*.

Table 15-28. Ike Walton Lake - Accessing the Town's website

	Ike Walton Lake	Bear River Lakes	All Lakes
	23 Respondents	541 Respondents	938 Respondents
Never	61%	60%	63%
Rarely	26%	26%	23%
Sometimes	13%	14%	12%
Often	0%	1%	1%

Accessing Information

Residents were asked where they would most likely go to get information about environmental issues. Table 15-29 shows that residents are most likely to seek information from the Wisconsin Department of Natural Resources.

Table 15-29. Ike Walton Lake - Accessing Sources of Information for AIS

	Ike Walton Lake	Bear River Lakes	All Lakes
	23 Respondents	576 Respondents	1074 Respondents
Tribal Natural Resources Department	22%	37%	31%
Town Lakes Committee	26%	21%	18%
Wisconsin DNR	70%	61%	59%
LdF Town Hall	22%	19%	19%
Tribal Main Office	0%	7%	5%
Other	9%	9%	9%

Setting the Pace & Ike Walton Lake

In summary, Ike Walton Lake has a very healthy ecosystem with many strong qualities. The primary challenge is ensure these attributes do not degrade from their current conditions. At the same time, there is room for improvement, particularly with respect to improving the lake's habitat, monitoring the presence of mercury in fish tissue, and guarding against the arrival of aquatic invasive species.

The following tables, Setting the Pace, constitute a long-term action plan to maintain or improve the overall health of Ike Walton Lake. The plan includes six goals with supporting objectives and activities. The goals include:

I. Preserve or Improve Current Water Quality.

II. Prevent Infestations of Aquatic Invasive Species.

III. Control or Reduce the Spread of Aquatic Invasive Species.

IV. Broaden Residents' Understanding of Swimmer's Itch.

V. Reduce User Conflicts.

VI. Strengthen or Increase Collaborations.

Table 15-30. Setting the Pace - Ike Walton Lake

Goal I - Preserve or Improve Current Lake Water Quality					
Objective A - Provide residents with opportunities to learn about the current lake water quality and how they can help preserve or improve it.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Attend CLMN Workshops	Tribe, TLC, Lake Assoc.	# Attendees	Availability of workshops & support of Tribe, Town, Lake Associations	$50 per attendee	Annual
2. Attend CBCW Workshops	Tribe, TLC, Lake Assoc.	# Attendees	Availability of workshops & support of Tribe, Town, Lake Associations	$50 per attendee	Annual
3. Teach at After-School Program	Tribe/TLC	Pre & Post Survey	Support of Tribe & School, availability of volunteers	$35 per volunteer	Annual Spring Term
4. Host Limnology/Ecology Workshops	Tribe/TLC	# Attendees, workshop evaluation	Availability of presenters, # registrants	$100 per attendee	Every 2-3 years
5. Host Lake Steward Workshops	TLC/Tribe	# Attendees, workshop evaluation	Availability of presenters, # registrants, support of partnering organizations	$300 per registrant (based on 50 registrants)	Every 3-4 years
6. Host Landscaping/Shoreline Habitat Workshops	Tribe/TLC	# Attendees, workshop evaluation	Availability of presenters, # registrants, support of Tribe, Town	$100 per attendee	Every 2-3 years
7. Update Webpages	Tribe, TLC, Lake Assoc.	# Clicks	Support of Tribe, Town, Lake Associations	Variable	Ongoing
8. Host Lakes Fest	Tribe	# of Attendees	Support of Tribe, presenters, attendees	$7,000 per Event	Annual

Table 15-31. Setting the Pace - Ike Walton Lake

Goal I - Preserve or Improve Current Lake Water Quality					
Objective B - Continue monitoring lake water quality.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Improve or establish standards for assessing aesthetics	Tribe/WDNR	Implementation of improved/new standards Report Card: Aesthetics	Support of Tribe & WDNR	$30,000 to establish	Ongoing once established
2. Collect data on lake water levels, temperature, chemistry, clarity, nutrients	Tribe/TLC/ Lake Assoc	Data Reports Report Card: Biology, Chemistry, Nutrients	Support of Tribe, WDNR, Volunteers	$20,000	Annual
3. Expand & implement schedule of Point Intercept Surveys	Tribe	WDNR Verification Report Card: Biology, Habitat	Support of Tribe, WDNR	$7,000 average per lake	Ongoing
4. Conduct shoreline sweeps	Tribe/TLC/ Lake Assoc	CLMN Data Sheets Report Card: Biology, Habitat, Aesthetics	Support of Tribe, TLC, Volunteers	$12 per hour, .58 per mile	Annual
5. Conduct individual property sweeps	Tribe/TLC/ Lake Assoc	CLMN Data Sheets Report Card: Biology, Habitat, Aesthetics	Support of Tribe, TLC, Property Owners	$48 per property	12 per season

6. Collect data on bio-accumulative pollutants (fish tissue)	Tribe	Database Report Card: Tissue	Support of Tribe	$20,000	Annual
8. Expand participation in CLMN	Tribe/TLC/ Lake Assoc.	CLMN Data Sheets Biology, Chemistry, Nutrients	Support of TLC, Lake Associations	$12 per hour, .58 per mile	Ongoing
9. Collect & analyze data on weather/climate	Tribe/ Volunteers	List of sources	Support of Tribe	$10,000	Annual
10. Expand taking core samples from the lakes	Tribe	Reports of data Report Card: Biology, Habitat	Support of Tribe	$50,000-$100,000 for all lakes	One time lake
11. Identify impact of the operation of motor vehicles and motorboats on the lakes	Tribe	Report of study Report Card: Aesthetics	Support of Tribe	$10,000-50,000 per study	To be determined
12. Identify impact of forestry clear-cutting practices on the lakes	Tribe	Report of Study Report Card: Habitat, Nutrients	Support of Tribe	$20,000-70,000	To be determined
13. Consider monitoring species of concern, like frogs, bats, etc.	Tribe/TLC/ Lake Assoc	Document discussions	Support of Tribe, TLC, Lake Associations	$12 per hour, .58 per mile	To be determined
14. Consider maintaining/expanding propagation of wild rice	Tribe	To be determined	Support of Tribe Availability of resources	To be determined	To be determined
15. Consider monitoring for spiny waterflea	Tribe/TLC/ Lake Assoc	To be determined	Support of Tribe, TLC, Lake Associations	To be determined	To be determined

Table 15-32. Setting the Pace - Ike Walton Lake

Goal I - Preserve or Improve Current Lake Water Quality					
Objective C - Minimize impact from development.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Identify shoreline restoration needs	Tribe	Report of Study Report Card: Habitat, Nutrients	Funding	$10,000 for five lakes	Ongoing
2. Establish shoreline restoration demonstration project	Tribe	Finished project Report Card: Habitat	Funding, Available shoreline	$10,000 per 100 feet of shoreline	2015
3. Restore selected shorelines	Tribe	Finished projects Report Card: Habitat	Land ownership, jurisdictions	$10,000 per 100 feet of shoreline	2015, ongoing
4. Encourage lake home shoreline restorations	Vilas Co/Tribe	Finished projects Report Card: Habitat	Support of Tribe, County, & Landowners	$10,000 per 100 feet of shoreline	Ongoing
5. Install erosion controls bank stabilization	Tribe/Vilas Co	Finished projects Report Card: Habitat	Support of Tribe, Federal funding	$3,000 per erosion site	Ongoing
6. Review & suggest best management practices on all land-disturbing projects	Tribe	Report of study Report Card: Habitat	Support of Tribe, Federal funding	$10,000-$50,000	Annual
7. Review & comment on all storm water projects	Tribe	Reports/documents Report Card: Habitat, Nutrients, Bacteria	Support of Tribe, Federal funding	$10,000-$50,000	Annual
8. Review & comment on all National Pollution Discharge Elimination Permits	Tribe	Reports/documents Report Card: Habitat, Nutrients, Bacteria	Support of Tribe, Federal funding	$10,000-$50,000	Annual
11. Work with Planning and Land Department for future low-impact development initiatives	Tribe	Report Report Card: Habitat, Nutrients, Chemistry	Support of Tribe	Variable	To be determined
12. Review & update water quality standards and shoreline codes	Tribe	Revised documents Report Card: All categories	Support of Tribe, Federal funding	$50,000 per review	Triennial
13. Enforce inspection schedule for all development initiatives	Tribe	Completion reports Report Card: All categories	Support of Tribe, Federal funding	$20,000	Annual
14. Conducting septic inspections	Tribe/Vilas Co	Report of inspections Report Card: Nutrients Bacteria	Support of Tribe, Vilas County	$150 per unit	Ongoing
16. Review & comment on all potential rules or permits regulating mercury emissions	Tribe	Reports/documents Report Card: Fish Tissue	Support of Tribe, Federal funding	$10,000-$50,000	Annual

Table 15-33. Setting the Pace - Ike Walton Lake

Goal II - Prevent Infestations of Aquatic Invasive Species					
Objective A - Provide the public with opportunities to learn about Aquatic Invasive Species and how to prevent their introduction.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Coordinate TLC/Tribal planning with lake associations' planning	TLC/Tribe Lake Assoc	Partner feedback	Support of TLC, Tribe & lake associations	Volunteers @ $12/hour & .58/mile	Annual
2. Encourage volunteers to attend training sessions provided by the Clean Boats Clean Waters (CBCW) program	TLC/Tribe/ Lake Assoc	Identify number of attendees	Availability of workshops, volunteers, & help from lake associations	$50 per attendee	Annual
3. Periodically offer workshops locally on how to identify and prevent AIS	TLC	Agendas, participant evaluations	Availability of presenters and registrants, & help from lake associations	$35 per attendee	Annual
4. Encourage volunteers to attend training sessions provided by the Citizen Lake Monitoring Network (CLMN)	TLC/Tribe	Identify number of attendees	Availability of workshops, volunteers, & help from lake associations	$50 per attendee	Annual
5. Disseminate information via media, including Town, Tribal, and Lake Association websites	TLC/Tribe/ Lake Assoc	Copies of releases	Availability of writer(s)	Variable	Ongoing
6. Highlight AIS and prevention in documents produced locally, such as newsletters, brochures	TLC/Tribe/ Lake Assoc	Copies of documents	Availability of writers	Volunteers @ $12/hour & .58/mile	Ongoing
7. Highlight AIS prevention at landings through signage & distribution of educational materials	TLC/Tribe Lake Assoc	Periodic review of signage	Availability of new signage & WDNR education materials	Cost of signage, volunteers @ $12/hour, .58/mile, WDNR materials	Ongoing
8. Identify local Key Communicators who will speak about AIS at community events	TLC/Tribe	List of individuals	Availability of communicators	Volunteers @ $12/hour, .58/mile	Annual
9. Ask resorts & select businesses to distribute AIS information	TLC/Lake Associations	List of accepting business	Availability of materials, approval of businesses	Volunteers @ $12/hour, .58/mile, WDNR materials	Annual
10. Continue hosting the Lake Steward Workshop	TLC/Tribe	Participant evaluation	Availability of presenters, # registrants, support of partnering organizations	$300/registrant (based on 50 registrants)	Every 3-4 years

Table 15-34. Setting the Pace - Ike Walton Lake

Goal II - Prevent Infestations of Aquatic Invasive Species					
Objective B - Provide the public with opportunities to actively and purposefully look for Aquatic Invasive Species.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Coordinate TLC/Tribal planning with lake associations' planning	TLC/Tribe Lake Assoc	Partner feedback	Support of TLC, Tribe & lake associations	Volunteers @ $12/hour, .58/mile	Annual
2. Organize and support whole-lake shoreline sweeps	Tribe/TLC/ Lake Assoc	# sweeps, participant feedback Report Card: Biology	Support of TLC, Tribe & Lake Associations	$12/hour, .58/mile, supplies @ $300/lake	Annual
3. Support establishing system of personal property sweeps	TLC/Lake Assoc	# properties, participant feedback Report Card: Biology	Support of TLC & Lake Associations	Volunteers @ $12/hour, .58/mile	Annual
4. Inspect watercraft at landings	Tribe/TLC/ Lake Assoc	# inspectors, # hours inspection Report Card: Biology	Support of TLC, Tribe, Lake Associations, Volunteers, WDNR	$12/hour, .58/mile, supplies @ $200/landing	Annual
5. Coordinate SCUBA diving/ snorkeling sweeps near landings	TLC/Tribe	Log Report Card: Biology	Support of Tribe & volunteers	$500/season	Annual
6. Provide convenient drop-off points on each lake for suspected AIS samples	TLC/Lake Assoc	# participants Report Card: Biology	Support of TLC & lake associations	$100 per lake	Annual
7. Assist Lake Associations with grant applications for hiring watercraft inspectors	TLC	# attendees, workshop evaluation Report Card: Biology	Support of TLC & Lake Associations	$30 per attendee	Annual

Table 15-35. Setting the Pace - Ike Walton Lake

Goal III - Control or Reduce the Spread of Aquatic Invasive Species					
Objective A - Provide the public with opportunities to learn about local infestations of Aquatic Invasive Species and how they can help control or reduce their spread.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Coordinate TLC/Tribal planning with lake associations' planning	TLC/Tribe Lake Assoc	Lake association feedback	Support of TLC & lake associations	Volunteers @ $12/hour, .58/mile	Annual
2. Encourage volunteers to attend training sessions provided by the Clean Boats Clean Waters (CBCW) program	TLC/Tribe/ Lake Assoc	# of attendees	Availability of workshops, volunteers, & help from lake associations	$50 per attendee	Annual
3. Offer TLC workshops on how to identify and control or reduce AIS	TLC	Agendas, participant evaluations	Availability of presenters and registrants, & help from lake associations	$30 per attendee	Annual
4. Encourage volunteers to attend training sessions provided by the Citizen Lake Monitoring Network (CLMN)	TLC/Tribe/ Lake Assoc	# of attendees	Availability of workshops, volunteers, & help from lake associations	$50 per attendee	Annual
5. Disseminate information via media, including Town, Tribal, and Lake Association websites	TLC/Tribe/ Lake Assoc	Copies of releases	Availability of writer(s)	Volunteers @ $12/hour, .58/mile	Ongoing
6. Highlight AIS and prevention in documents produced locally, such as newsletters, brochures	TLC/Tribe/ Lake Assoc	Copies of documents	Availability of writers	Volunteers @ $12/hour, .58/mile, printing	Ongoing
7. Highlight AIS control at landings through signage & distribution of educational materials	TLC/Tribe Lake Assoc	Periodic review of signage	Availability of new signage	Cost of signage, volunteers @ $12/hour, .58/mile, WDNR materials	Annual
8. Identify local Key Communicators who will speak about AIS at community events	TLC/Tribe/ Lake Assoc	List of individuals	Availability of communicators	Volunteers @ $12/hour, .58/mile	Annual
9. Ask resorts & select businesses to distribute AIS information	TLC/Tribe/ Lake Assoc	List of accepting businesses	Availability of materials & approval of businesses	Volunteers @ $12/hour, .58/mile	Annual
10. Continue hosting the Lake Steward Workshop	TLC/Tribe	Participant evaluation	Availability of presenters, # registrants, support of partnering organizations	$300 per registrant (based on 50 registrants)	Triennial

Table 15-36. Setting the Pace - Ike Walton Lake

Goal III - Control or Reduce the Spread of Aquatic Invasive Species					
Objective B - Reduce the scope of existing infestations of purple loosestrife and minimize the spread of the infestations to new locations.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
2. Encourage lake association participation	TLC/Lake Assoc	# Lake Associations involved	Support of Lake Associations	$12/hour, .58/mile	Annual
3. Continue inter-agency relationships on Purple Loosestrife (Tribe, WDNR, Public School)	TLC/Lake Assoc	Survey agencies	Support of agencies	Variable	Annual
4. Raise & distribute beetles	TLC/Lake Assoc	150 plants & 200,000 beetles Report Card: Biology, Habitat	Support from Tribe, WDNR, school, & availability of volunteers, materials, roots & seed beetles	$3,000-5,000	Annual
5. Host or conduct workshops on Purple Loosestrife	TLC/Lake Assoc	Agendas, participant evaluations	Support of volunteers & other agencies	$30/attendee	Annual
6. Provide residents with information on bio-control	TLC/Lake Assoc	Documents provided	Support of TLC/Tribe/Lake Associations	$1000 printing/supplies	Annual
7. Consider restoring tall native wetland plants to infested areas	Tribe/TLC/ Lake Assoc	Document discussions	Support of TLC/Tribe/Lake Associations, others	To be determined	To be determined

Table 15-37. Setting the Pace - Ike Walton Lake

Goal III - Control or Reduce the Spread of Aquatic Invasive					
Objective C - Continue monitoring infestations of Rainbow Smelt and Rusty Crayfish.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Publicize history of previous actions to monitor/control infestations	Tribe	Documents	Tribal support	$12/hour, .58/mile	Ongoing
2. Conduct workshop on the fishery, including monitoring smelt and crayfish	Tribe/TLC	Agenda, participant evaluations	Tribal Support	$12/hour, .58/mile	Ongoing

Table 15-38. Setting the Pace - Ike Walton Lake

Goal IV - Broaden Residents' Understanding of Swimmer's Itch					
Objective A - Provide residents with a variety of educational experiences and materials on Swimmer's Itch, including alternatives treating it or reducing the probability of contracting it.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
2. Review current research and literature	Bear River Team	List of items reviewed	Availability of research & literature	$12/hour, .58/mile	Ongoing
3. Contact appropriate professionals and authorities about Swimmers' Itch	Bear River Team	List of individuals/organizations	Availability of professionals	$12/hour, .58/mile	Ongoing
4. Host community-wide workshops	Bear River Team	Agenda & evaluation of participants	# registrants, availability of presenters	$30/attendee	Annual
5. Distribute information in newsletters, bulletins, and PSAs	Bear River Team	Copies of items distributed	Support of partnering agencies	$12/hour, .58/mile	Annual
6. Identify alternatives for treating it or reducing the probability of contracting it	Bear River Team	Summative report	Availability of alternatives	$12/hour, .58/mile	To be determined
7. Conduct or participate in a research study of Swimmer's Itch	Bear River Team	Final research report	Support of partnering agencies	$150,000	To be determined

Table 15-39. Setting the Pace - Ike Walton Lake

Goal V - Reduce User Conflicts					
Objective A - Provide the public with opportunities to learn about user conflicts.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Determine extent of user conflicts	Tribe	Survey	Tribe/TLC/Funding	To be determined	Triennial
2. Develop & distribute education materials on minimizing user conflicts	Tribe, WDNR	Availability of materials, distribution list	Support of Tribe, WDNR, availability of resources	To be determined	Ongoing
3. Host workshop on fishery (size limits, stocking, etc.)	Tribe	# attendees, workshop evaluation	# registrants, support of Tribe, availability of resources	$100/attendee	Quadrennial
4. Joint review of current enforcement (# wardens, incidents, etc.)	Tribe/Town	Report	Support of Tribe & Town	To be determined	To be determined

Table 15-40. Setting the Pace - Ike Walton Lake

Goal VI - Strengthen or Increase Collaborations					
Objective A - Encourage participation in educational experiences related to partnerships and collaborations.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
2. Encourage attendance at Lake Leaders Institute	TLC/Tribe/ Lake Assoc	# attendees	Availability of volunteers, resources	$800/attendee	Biennial
3. Encourage attendance at Wisconsin Lakes Conference	TLC/Tribe/ Lake Assoc	# attendees	Availability of volunteers, resources	$800/attendee	Annual
4. Encourage attendance at Vilas County Lakes Association	TLC/Tribe/ Lake Assoc	# attendees	Availability of volunteers, resources	$100/attendee	Annual
5. Encourage attendance at Lakes Fest	Tribe/TLC/ Lake Assoc	# attendees	Support of partnering agencies	$7,000/event	Annual
6. Provide workshop or meeting for lake associations on planning	TLC	# attendees, workshop evaluation	Support of TLC, # registrants	$30/attendee	Annual
7. Provide a workshop for lake associations on preparing grant applications	TLC	# attendees, workshop evaluation	Availability of grants, support of TLC, # registrants	$30/attendee	Annual

Table 15-41. Setting the Pace - Ike Walton Lake

Goal VI - Strengthen or Increase Collaborations					
Objective B - Provide a variety of ways to share information about watershed and lake planning.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Host a Lake Association Gathering	TLC/Tribe	# attendees, program evaluation	Support of Tribe/TLC/ Lake Associations	$50/attendee	Annual
2. Establish an ongoing exchange of newsletters, brochures, etc. between lake associations, the Tribe, and the TLC	TLC	Participant evaluation	Support of partnering agencies	$100	Annual
3. Disseminate information to lake associations about the Wisconsin Lakes Association, Annual Convention, Leadership Program, & other local, County and State offerings	TLC	Lake association feedback	Support of TLC and lake associations, availability of materials	Volunteers @ $12/hour, .58/mile	Annual
4. Present information at Local, County, State, & National conferences and meetings	Tribe/TLC	Per host agency	Support of Tribe, Town, availability of presenters	Variable	Per host agency
5. Consider issuing joint TLC/Tribe/Lake Association newsletter	TLC/Tribe/ Lake Assoc	Newsletter distribution	Support of partnering agencies, availability of author	$7,000/issue	Annual

Table 15-42. Setting the Pace - Ike Walton Lake

Goal VI - Strengthen or Increase Collaborations					
Objective C - Focus on ways to reach out to individuals and organizations.					
			Limitations		
Potential Activities	**Facilitator(s)**	**Evaluation**	**Limitations**	**Cost Estimates**	**Timeframe**
1. Establish system for contacting new residents	TLC	# residents contacted	Support of TLC	$100/visit	Ongoing
2. Encourage the WDNR to establish a protocol for writing watershed and lake management plans.	Bear River Action Team	Development of protocol	Support of WDNR	TBD	To be determined
3. Revise the current *Rapid Response Plan*	Tribe/TLC	Availability of revised plan	Tribal support	$1,000-$5,000	Quinquennial
4. Consider establishing a watershed plan for the other watersheds in Lac du Flambeau	Tribe/TLC	Additional watershed plans	Positive evaluation of Bear River Watershed plan, support of Tribe & TLC, availability of volunteers and resources	$50,000/ watershed	To be determined
5. Evaluate establishing the position of Invasive Species Coordinator for Lac du Flambeau	Tribe/TLC	Report	Support of Tribe, Town, & Lake Associations	TBD	To be determined
6. Develop an indigenous arts and sciences institute	Tribe/ Universities	# Participants	Support of Tribe and universities	$4,000,000	To be determined

Notes for Section 15

1. *GIDAKIIMINAAN (Our Earth): An Anishinaabe Atlas of the 1836, 1837, and 1842 Treaty Ceded Territories* (Great Lakes Indian Fish & Wildlife Commission, 2007) 9 & 44.
2. R.G. Norwood was a field scientist who participated in a geological survey in 1847 of Wisconsin sponsored by the U.S. government. His report was presented to Congress in a letter by David Owen in 1848, *Letter of the Secretary of the Treasury, communicating a report of the geological reconnaissance of the Chippewa Land District of Wisconsin, and the northern part of Iowa*. Pages 91-93. https://archive.org/details/lettersecretary00offigoog.
3. See map in Section 3, Figure 2.
4. Michael J. Goc, *Reflections of Lac du Flambeau: An Illustrated History of Lac du Flambeau, Wisconsin, 1745-1995* (New Past Press Inc., 1995) 26.
5. *Map of the Famous hunting & fishing grounds embraced in the lake region of Gogebic County, Michigan., and in Iron, Vilas, Forest, & Oneida Counties, WI* (Poole Brothers, 1895). Available at the Vilas County Historical Museum.
6. *Map of Lincoln, Oneida, Vilas* (Rand, McNally and Company, Chicago, 1896). Available at the Vilas County Historical Museum.
7. *Map of the Wisconsin River Valley* (Shepard, E.S., Rhinelander, WI, Between 1900 & 1903). Available at the Vilas County Historical Museum.
8. George F. Cram, Chicago, 1905. Available at Vilas County Historical Museum.
9. *Star Lake Country Northern Wisconsin* (Poole Brothers, 1909. Available at Vilas County Historical Museum.
10. *Map of Vilas County* (Standard Map Company, Chicago, 1918). Available at Vilas County Historical Museum.
11. Andrew N. Herd, *A Fly Fishing History* (1993) 1. Online at http://www.flyfishinghistory.com/walton.htm.
12. John Dean, President of the Ike Walton Lake Association, 2013.
13. Sasha Weinstein, *Mercury in Ike Walton Lake Zee Lakes, Lac du Flambeau Indian Reservation, North Central Wisconsin* (Provided by Tribal Natural resources Department, December 1994).
14. Brochure provided by the Ike Walton Lake Association, undated, 2013.
15. Holly Hirsch, *Chippewa Lodge B&B retains a bit of history* (Lakeland Times, undated). Available from the Ike Walton Lake Association, 2013.
16. Lakeland Times, May 23, 1968.
17. Goc, 92.
18. Information in the first paragraph is from *People of the Lakes: A Guide for Wisconsin Lake Organizations*, DNR Publication PUB-FH-821-2006. Information for the Ike Walton Lake Association was provided in a statement by John Dean, President of the Association, 2013.
19. The survey data presented throughout the section is from the *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012. See Appendix.
20. Quality Assurance Protection Plan (QAPP), Lac du Flambeau Band of Lake Superior Chippewa Indians, Aquatic Plant habitat Point Intercept Survey of Lakes for Plants 2010.
21. Quality Assurance Protection Plan, Lac du Flambeau Band of Lake Superior Chippewa Indians, General Chemistry Assessment of Waters within the Lac du Flambeau Reservation 2012 (QAPP) for General Chemistry.
22. Tribal Water Quality Standards.
23. Quality Assurance Protection Plan, Lac du Flambeau Band of Lake Superior Chippewa Indians, General Chemistry Assessment of Waters within the Lac du Flambeau Reservation 2012 (QAPP) for General Chemistry.
24. National Lakes Assessment: Technical Appendix, Data Analysis Approach; Lakes, Ponds, and Reservoirs January 2010, 10-12.
25. Results of the WISCALM Botanist Review Panel for Wisconsin 2012 Consolidated Assessment and Listing Methodology (WIS CLAM) for Clean Water Act Section 305(b), 314, and 303(d) Integrated Reporting, April 2012 http://dnr.wi.gov/topic/surfacewater/documents/FINAL_2012_WisCALM_04-02-12.pdf.
26. Quality Assurance Protection Plan, Lac du Flambeau Band of Lake Superior Chippewa Indians, (QAPP) Shore land Development Habitat 2008.
27. National Lakes Assessment: Technical Appendix, Data Analysis Approach; Lakes, Ponds, and Reservoirs January 2010, 10-12.
28. Quality Assurance Protection Plan, Lac du Flambeau Band of Lake Superior Chippewa Indians, (QAPP) for Beach Monitoring 2008.
29. Tribal Water Quality Standards.
30. Ibid.
31. Quality Assurance Protection Plan, Lac du Flambeau Band of Lake Superior Chippewa Indians, General Chemistry Assessment of Waters within the Lac du Flambeau Reservation 2012 (QAPP) for General Chemistry.
32. National Lakes Assessment: Technical Appendix, Data Analysis Approach; Lakes, Ponds, and Reservoirs January 2010, 10-12.
33. Quality Assurance Protection Plan, Lac du Flambeau Band of Lake Superior Chippewa Indians, (QAPP) for Beach Monitoring 2008.
34. National Lake Survey Report.
35. http://www.manresa-sj.org/stamps/1_Secchi.htm.
36. http://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=2321800.

Figure Notes for Section 15

Figure 15-1. Goll's Chippewa Lodge. From an undated brochure provided by the Ike Walton Lake Association, 2013.

Figure 15-2. Goll's Chippewa Lodge. From an undated brochure provided by the Ike Walton Lake Association, 2013.

Table Notes for Section 15

Table 15-3. Perceived vs Actual Presence of AIS. *Bear River Watershed Comprehensive Lake Management Plan Survey Data from Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #26. See Appendix.

Table 15-4. Perceived to be Threatened by AIS. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #27. See Appendix.

Table 15-5. Concern about AIS Getting into the Lake. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #29. See Appendix.

Table 15-6. Time spent looking for AIS during open water season. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #28. See Appendix.

Table 15-9. Whether Aquatic Plants Impede Enjoyment of the Lake. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #15. See Appendix.

Table 15-10. Removal of Aquatic Plants from the Lake. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #18. See Appendix.

Table 15-11. Removal of Fallen Trees from the Lake. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #19. See Appendix.

Table 15-12. Whether Aquatic Plant Control is Needed. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #16. See Appendix.

Table 15-13. Preferences for Treating/removing Aquatic Invasive Plants. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #30. See Appendix.

Table 15-14. Current Shoreline Landscaping vs Ideal Shoreline Landscaping. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #20-21. See Appendix.

Table 15-15. Interest in Learning about Landscape Design. *Data from Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #22. See Appendix.

Table 15-17. Perceptions of Environmental Change. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #32. See Appendix.

Table 15-18. Septic Tank Inspections. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #8. See Appendix.

Table 15-19. Lake Water Color. Data from the Citizen lake Monitoring Network database. http://dnr.wi.gov/lakes/clmn/.

Table 15-20. Perception of Current Lake Water Quality. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #23. See Appendix.

Table 15-21. Perception of Change of Lake Water Quality. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #24. See Appendix.

Table 15-22. Number of Fish Stocked. Data provided by the Tribal Natural Resources Department.

Table 15-23. Perception of Current Quality of Fishing. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #11. See Appendix.

Table 15-24. Perception of Change of Fishing Quality. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #12. See Appendix.

Table 15-25. Number of Observations of Lake Water Levels. Data from the Citizen Lake Monitoring Network database. http://dnr.wi.gov/lakes/clmn/.

Table 15-26. Lake Issues of Most Concern. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #31. See Appendix.

Table 15-27. Interest in Attending Workshops. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #33. See Appendix.

Table 15-28. Accessing the Town's Website. Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #34. See Appendix.

Table 15-29. Accessing Sources of Information about AIS Data from *Bear River Watershed Comprehensive Lake Management Plan Survey, Lake-by-lake Comparisons*, June 2012, Question #35. See Appendix.

Figures

Figure 15-1. Goll's Chippewa Lodge.....15-3

Figure 15-2. The Chippewa Lodge 15-3

Figure 15-3. Lake Food Pyramid 15-6

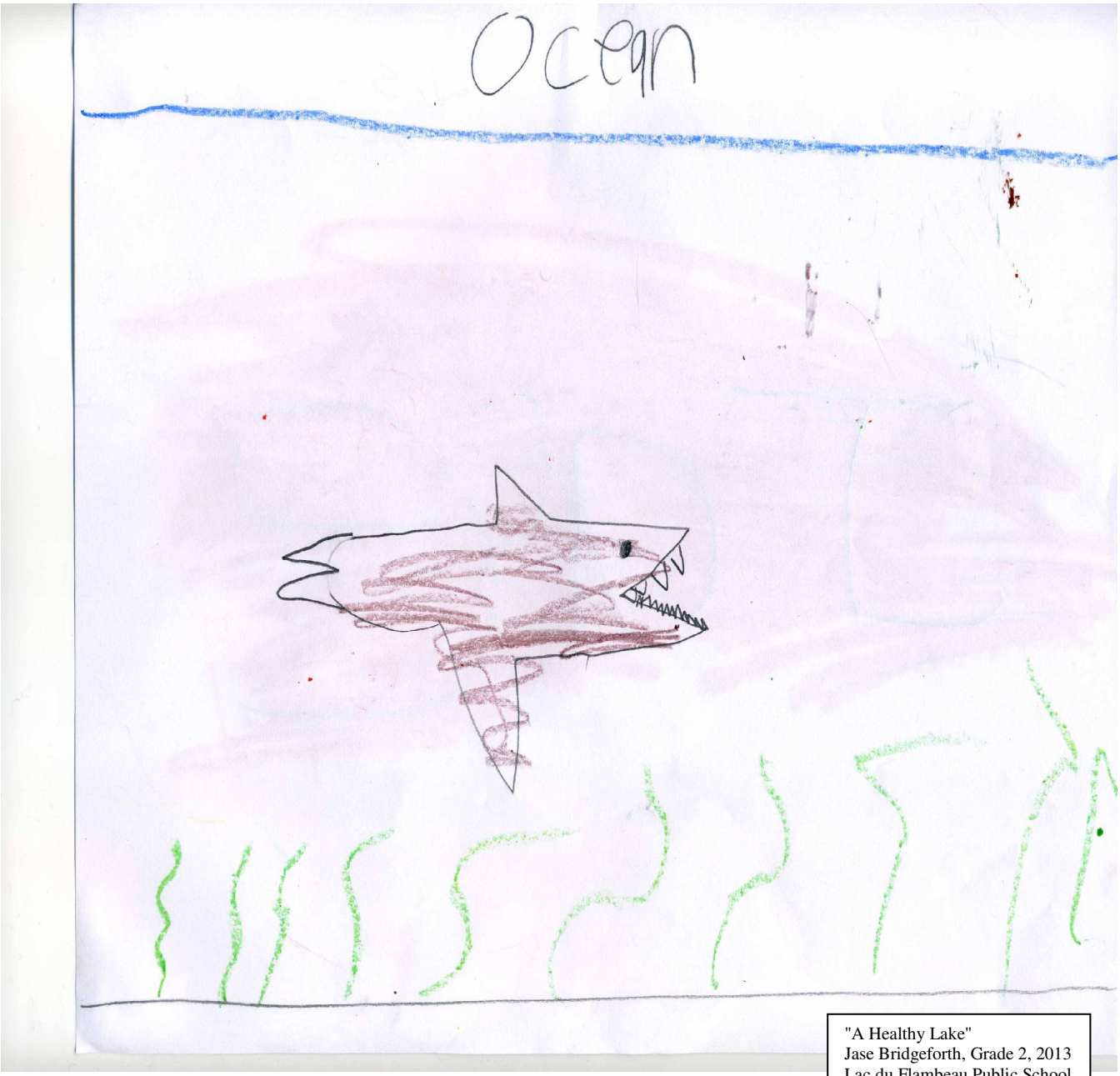
Figure 15-4. Dissolved Oxygen and Temperature Values for Ike Walton Lake at Various Depths 15-8

Figure 15-5. Total Phosphorus Concentrations for Ike Walton Lake.....15-8

Figure 15-6. Chlorophyll *a* Concentrations for Ike Walton Lake 15-9
Figure 15-7. Secchi Depth, Total Phosphorus, and Chlorophyll *a* Values for Ike Walton Lake 15-9
Figure 15-8. Total Phosphorus Loads from Existing Sources in the Ike Walton Lake Area..... 15-9
Figure 15-9. Land Use/Habitat Areas Near Ike Walton Lake (Red – Developed; Blue – Open Water; Light Green – Wetland; Dark Green – Forest) 15-9
Figure 15-10. Substrate Map for Ike Walton Lake..... 15-10
Figure 15-11. Ike Walton Lake 2012 Aquatic Point Intercept Survey 15-12
Figure 15-12. Secchi Depth Trends for Ike Walton Lake 15-18
Figure 15-13. Mercury Concentrations in Fish Tissue vs Size in Inches..... 15-20
Figure 15-14. Lake Water Level Fluctuations During 2012–2014 15-21

Tables

Table 15-1. Basic Data for Ike Walton Lake..... 15-2
Table 15-2. Ike Walton Lake Health Report 15-5
Table 15-3. Ike Walton Lake - Perceived vs Actual Presence of AIS..... 15-7
Table 15-4. Ike Walton Lake - Perceived to be Threatened by Aquatic Invasive Species..... 15-7
Table 15-5. Ike Walton Lake - Concern about AIS Getting into the Lake 15-7
Table 15-6. Ike Walton Lake - Time Spent Checking for AIS During Open Water Season..... 15-7
Table 15-7. 2012 Aquatic Plant Community Statistics, Ike Walton Lake, Vilas County, WI..... 15-10
Table 15-8. 2012 Floristic Quality Index, Ike Walton Lake, Vilas County, WI 15-13
Table 15-9. Ike Walton Lake - Whether Aquatic Plants Impede Enjoyment of the Lake 15-14
Table 15-10. Ike Walton Lake - Removal of Aquatic Plants from the Lake..... 15-14
Table 15-11. Ike Walton Lake - Removal of Fallen Trees from the Lake 15-14
Table 15-12. Ike Walton Lake - Whether Aquatic Plant Control is Needed..... 15-14
Table 15-13. Ike Walton Lake - Preferences for Treating/Removing Aquatic Invasive Plants..... 15-15
Table 15-14. Ike Walton Lake - Current Shoreline Landscaping vs Ideal Shoreline Landscaping ... 15-15
Table 15-15. Ike Walton Lake - Interest in Learning about Landscape Design..... 15-16
Table 15-16. Index Values for Environmental Assessment Perceptions 15-16
Table 15-17. Ike Walton Lake - Perceptions of Environmental Change 15-17
Table 15-18. Ike Walton Lake - Septic Tank Inspection 15-17
Table 15-19. Ike Walton Lake - Lake Water Color..... 15-19
Table 15-20. Ike Walton Lake - Perception of Current Water Quality 15-19
Table 15-21. Ike Walton Lake - Perception of Change in Water Quality 15-19
Table 15-22. Number of Fish Stocked During 2003–2010 - Ike Walton Lake (1,439 acres) 15-20
Table 15-23. Ike Walton Lake - Perceptions of Current Quality of Fishing 15-20
Table 15-24. Ike Walton Lake - Perceptions of Change of Fishing Quality..... 15-21
Table 15-25. Ike Walton Lake - Number of Observations of Lake Water Levels 15-21
Table 15-26. Ike Walton Lake - Lake Issues of Most Concern 15-22
Table 15-27. Ike Walton Lake - Interest in Attending Workshops..... 15-23
Table 15-28. Ike Walton Lake - Accessing the Town's website..... 15-23
Table 15-29. Ike Walton Lake - Accessing Sources of Information for AIS..... 15-23
Table 15-30. Setting the Pace - Ike Walton Lake..... 15-24
Table 15-31. Setting the Pace - Ike Walton Lake..... 15-24
Table 15-32. Setting the Pace - Ike Walton Lake..... 15-26
Table 15-33. Setting the Pace - Ike Walton Lake..... 15-27
Table 15-34. Setting the Pace - Ike Walton Lake..... 15-28
Table 15-35. Setting the Pace - Ike Walton Lake..... 15-29
Table 15-36. Setting the Pace - Ike Walton Lake..... 15-30
Table 15-37. Setting the Pace - Ike Walton Lake..... 15-30
Table 15-38. Setting the Pace - Ike Walton Lake..... 15-31
Table 15-39. Setting the Pace - Ike Walton Lake..... 15-31
Table 15-40. Setting the Pace - Ike Walton Lake..... 15-32
Table 15-41. Setting the Pace - Ike Walton Lake..... 15-32
Table 15-42. Setting the Pace - Ike Walton Lake..... 15-33



"A Healthy Lake"
Jase Bridgeforth, Grade 2, 2013
Lac du Flambeau Public School