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RED LAKE, DOUGLAS COUNTY

2019-23 AQUATIC PLANT MANAGEMENT PLAN

WDNR WBIC: 2492100

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RED LAKE ASSOCIATION

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AQUATIC PLANT MANAGEMENT PLAN-RED LAKE

PREPARED FOR THE RED LAKE ASSOCIATION

INTRODUCTION

In July of 2016, biologists working for the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) found what appeared to be Eurasian watermilfoil (EWM), an invasive aquatic plant near the Red Lake boat landing. After further investigation it was positively identified as EWM which prompted the Red Lake Association (RLA) to request Wisconsin Department of Natural Resources (WDNR) Early Detection and Rapid Response (EDRR) grant funding to begin control measures and to complete an Aquatic Plant Management Plan (APMP) to guide future management actions aimed at preventing the spread of EWM within Red Lake.

In the fall of 2016, a survey of the littoral or plant growing zone in Red Lake was completed to map EWM within Red Lake. This survey provided the information needed to treat EWM with herbicide in the spring of 2017. This rapid response project acted as a stop gap measure to begin to control EWM and prevent its spread within Red Lake until a formal management plan could be created to guide future management.

Although a whole-lake, point-intercept (PI) aquatic plant survey was first completed in 2013, an APM plan was not written, and no EWM was identified. The 2013 plant survey showed the aquatic plant community within Red Lake to be incredibly diverse and healthy while lake users were still able to fully enjoy the lake. Water quality in Red Lake has not been an issue up to this point with most lake users and property owners satisfied with it. Up to 2017, aquatic plant management had not been implemented in the lake.

The Red Lake Association (RLA) started aquatic invasive species (AIS) preventative efforts in 2013 through Clean Boats, Clean Waters and supported a whole-lake point-intercept survey in that same year to establish baseline data in the event active management was needed. Unfortunately, EWM found its way into the lake despite preventative efforts and planning began to determine the best management actions to implement to control the spread of EWM in the lake.

This document is the culmination of that planning effort and is intended to guide the RLA through 5-years of active aquatic plant/lake management, primarily focused on EWM.

RED LAKE ASSOCIATION

The Red Lake Association (RLA) was formed in 2005 with the goal of “protecting the lake and its surroundings, enhancing water quality, fishery, safety, and aesthetics as a public recreational facility or today and for future generation.” Until recently, there has been little need for any management on Red Lake. However with the discovery of EWM in 2016, the RLA began to take the steps necessary to protect the lake from deteriorating conditions as a result of this unwanted invasive species. Because the RLA decided to complete whole-lake plant survey work in 2013, there is a good baseline to determine the impact on native plants that EWM and any future management could have. The WDNR guided the RLA through management planning and actions in 2016 & 2017 with 2018 and future management actions being guided by a new Aquatic Plant Management Plan with oversight from the RLA and their chosen Management Consultant, Lake Education and Planning Services, LLC (LEAPS).

More information about the Red Lake Association can be found at www.redlakeassociation.org and on Facebook and Twitter.

PUBLIC PARTICIPATION AND STAKEHOLDER INPUT

Soon after the Red Lake Association was awarded an Early Detection and Rapid Response grant to help deal with the new Eurasian watermilfoil invasion in 2016, a consultant was contacted to help prepare an Aquatic Plant Management Plan with for Red Lake. The first meeting between the consultant and the RLA occurred on March 29, 2017. The consultant then met with the entire RLA board on April 29, 2017. The consultant presented to the constituency of the RLA on September 2, 2017 and again on May 26, 2018. The presentation to the constituency on May 26, 2018 was focused on the new Aquatic Plant Management Plan and the goals, objectives, and actions that accompanied it. The APM Plan was approved during the May 26, 2018 Annual Meeting of the RLA. In July 2018 a draft of the new APM Plan was made available to the constituency and the board for review and comment. As of early October no comment had been officially made. The APM Plan will be submitted to the WDNR for approval.

OVERALL MANAGEMENT GOAL

The main management goal of this Aquatic Plant Management Plan is to control the spread of EWM while also protecting and enhancing the native aquatic plant diversity, distribution, and density that exists in Red Lake. Maintaining a healthy and diverse native aquatic plant community is the most important factor in ensuring that Red Lake does not experience deteriorating conditions over the next five years. The most important objective for this goal is to prevent management of EWM and/or other AIS from negatively impacting native aquatic plants in the system. This management plan presents a strategy that strives to keep EWM and other AIS in check while protecting native aquatic plants found within Red Lake.

IMPLEMENTATION GOALS

There are seven goals for the Red Lake APMP, each with several objectives and actions to be met and completed. More detail about the Goals and the Objectives and Actions associated with each goal can be found in Appendix F.

The seven goals are as follows:

Goal 1 – Protect and enhance the native aquatic plant community.

Goal 2 – Minimize the negative impact of EWM to the native aquatic plant community through the implementation of management actions.

Goal 3 – Reduce the threat that a new aquatic invasive species will be introduced and go undetected in Red Lake and that existing AIS will be carried to other lakes.

Goal 4 - Improve the level of knowledge property owners and lake users have related to aquatic invasive species and their impact to the lake.

Goal 5 - Improve the level of knowledge property owners and lake users have related to how their actions impact the aquatic plant community, lake community, and water quality.

Goal 6 - Complete APMP implementation and maintenance for a period of five years following adaptive management practices.

Goal 7 - Evaluate and summarize the results of management actions implemented during the entire 5-year timeframe of this plan.

WISCONSIN'S AQUATIC PLANT MANAGEMENT STRATEGY

The waters of Wisconsin belong to all people. Their management becomes a balancing act between the rights and demands of the public and those who own property on the water's edge. This legal tradition called the Public Trust Doctrine dates back hundreds of years in North America and thousands of years in Europe. Its basic philosophy with respect to the ownership of waters was adopted by the American colonies. The US Supreme Court has found that the people of each state hold the right to all their navigable waters for their common use, such as fishing, hunting, boating and the enjoyment of natural scenic beauty.

The Public Trust Doctrine is the driving force behind all management in Wisconsin lakes. Protecting and maintaining that resource for all of Wisconsin's people is at the top of the list in determining what is done and where. In addition to the Public Trust Doctrine, two other forces have converged that reflect Wisconsin's changing attitudes toward aquatic plants. One is a growing realization of the importance of a strong, diverse community of aquatic plants in a healthy lake ecosystem. The other is a great concern over the spread of AIS, such as EWM that can negatively impact the health of the native aquatic plant community, or drastically change the make-up of it. These two forces have been behind more recent changes in Wisconsin's aquatic plant management laws and the evolution of stronger support for the control of invasive plants.

To some, these two issues may seem in opposition, but on closer examination they actually strengthen the case for developing APMPs as part of a total lake management picture. Planning is a lot of work, and has a significant cost associated with it, but a sound management plan can have long-term benefits for a lake and the community living on and using the lake.

The impacts of humans on Wisconsin's waters over the past five decades have caused public resource professionals in Wisconsin to evolve a certain philosophy toward aquatic plant management. This philosophy stems from the recognition that aquatic plants have value in the ecosystem, as well as from the awareness that, sometimes, excessive growth of aquatic plants can lessen our recreational opportunities and our aesthetic enjoyment of lakes. In balancing these, sometimes competing objectives, the Public Trust Doctrine requires that the State's public resource professionals be responsible for the management of fish and wildlife resources and their sustainable use to benefit all Wisconsin citizens. Aquatic plants are recognized as a natural resource to protect, manage, and use wisely.

Aquatic plant protection begins with human beings. We need to work to maintain good water quality and healthy native aquatic plant communities. The first step is to limit the amount of nutrients and sediment that enter the lake. There are other important ways to safeguard a lake's native aquatic plant community. They may include developing motor boat ordinances that prevent the destruction of native plant beds, limiting aquatic plant removal activities, designating certain plant beds as critical habitat sites, and preventing the spread of non-native, invasive plants, such as EWM.

If plant management is needed, it is usually in lakes that humans have significantly altered. If we discover how to live on lakes in harmony with natural environments and how to use aquatic plant management techniques that blend with natural processes rather than resist them, the forecast for healthy lake ecosystems looks bright. To assure no harm is done to the lake ecology, it is important that plant management is undertaken as part of a long-range and holistic plan.

In many cases, the development of long-term, integrated aquatic plant management strategies to identify important plant communities and manage nuisance aquatic plants in lakes, ponds or rivers is required by the State of Wisconsin. To promote the long-term sustainability of our lakes, the State of Wisconsin endorses the development of APMPs and supports that work through various grant programs.

There are many techniques for the management of aquatic plants in Wisconsin. Often management may mean protecting desirable aquatic plants by selectively hand pulling the undesirable ones. Sometimes more intensive management may be needed such as using harvesting equipment, herbicides or biological control agents. These methods require permits and extensive planning.

While limited management on individual properties is generally permitted, it is widely accepted that a lake will be much better off if plants are considered on a whole lake scale. This is routinely accomplished by lake organizations or units of government charged with the stewardship of individual lakes.

RED LAKE WATERSHED CHARACTERISTICS

A watershed is defined as an area of land where all of the water that is under it, falls onto it, and that drains off of it collects into the same place like a lake. Figure 1 shows how a typical watershed works. Imagine a raindrop falling anywhere inside that watershed; no matter where it lands, it will eventually find its way to the main body of water at the bottom. If it lands in another watershed, it will drain to a different waterbody. A lake usually reflects how the land in its watershed is being used. Less human disturbance like home and business building, roadways, and agriculture within a lake's watershed generally means a healthier lake overall. Agricultural land, mowed lawns, and increased impervious (does not allow liquid to pass through) surfaces like roads and rooftops, cause more of the water falling on the land to “run off” into lakes, ponds, rivers and streams carrying dirt and other pollutants with it, rather than soaking into the ground where many pollutants are removed.

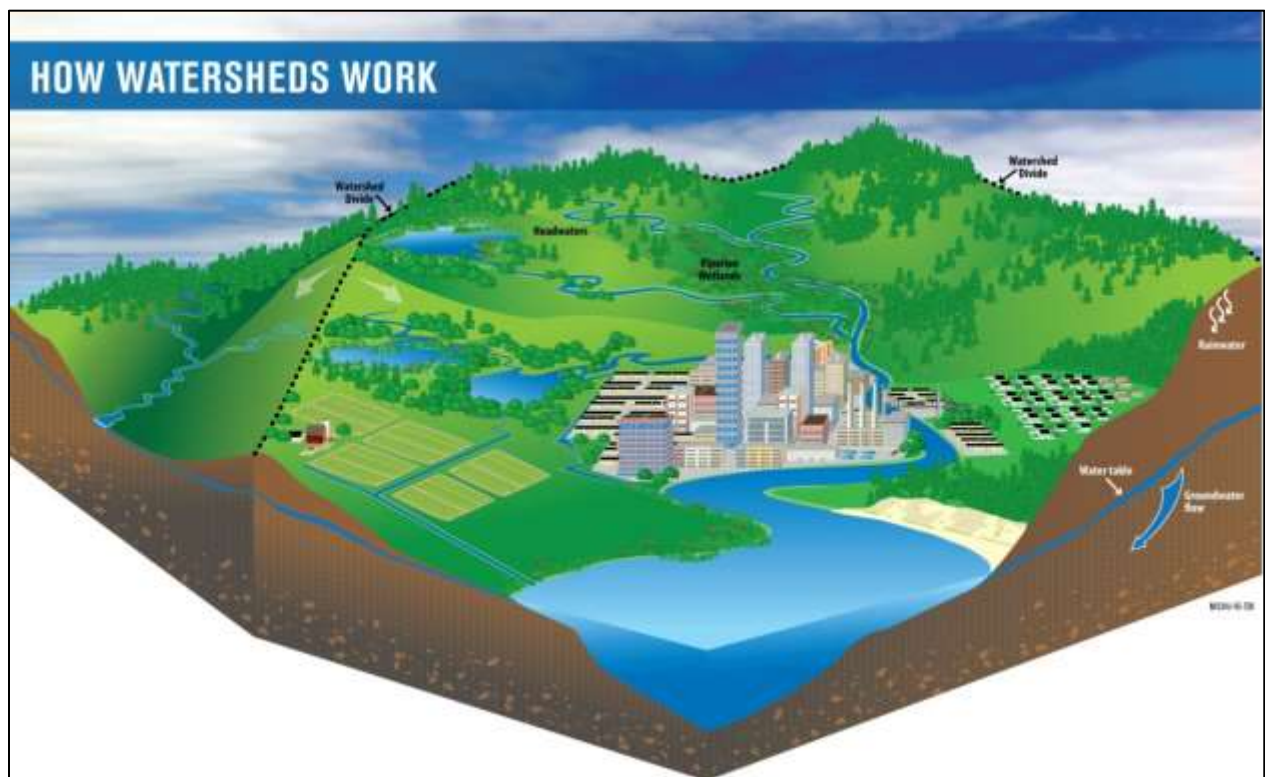


Figure 1: How Watersheds Work, Michigan Sea Grant

The Red Lake Watershed is one of many small watersheds found within the larger Totogatic River Watershed (Figure 2). The Totogatic River Watershed includes over 372 square miles of land across Douglas, Bayfield, Sawyer, and Washburn Counties. Less than 0.5% of this area is in the Red Lake Watershed which only covers 1.6 square miles, or 1,024 acres. Red Lake is considered a deep seepage lake, which means it does not have any tributaries coming into the lake or water draining out, so the main sources of water are groundwater and precipitation (rainfall).

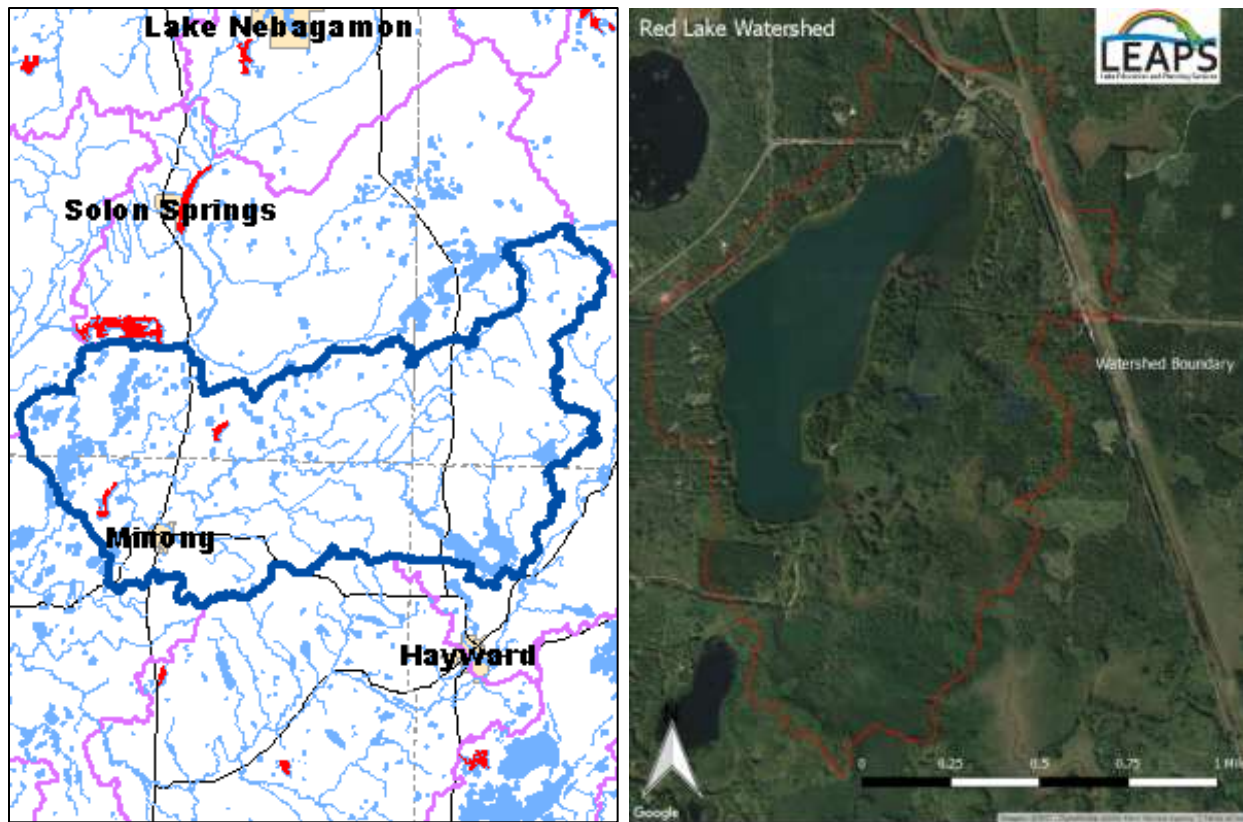


Figure 2: Totagatic River Watershed (left) and Red Lake Watershed (right)

Land use in the larger Totagatic River Watershed is primarily forest (75%), wetlands (16%), developed areas (4%), and miscellaneous other uses including agriculture (5%) (Figure3). Land use within the Red Lake Watershed is primarily made up of forest (67%), with the rest comprised of wetlands (23%), developed land (9%), and miscellaneous other uses (1%). Unfortunately, AIS can get into a lake regardless of the condition of its watershed.

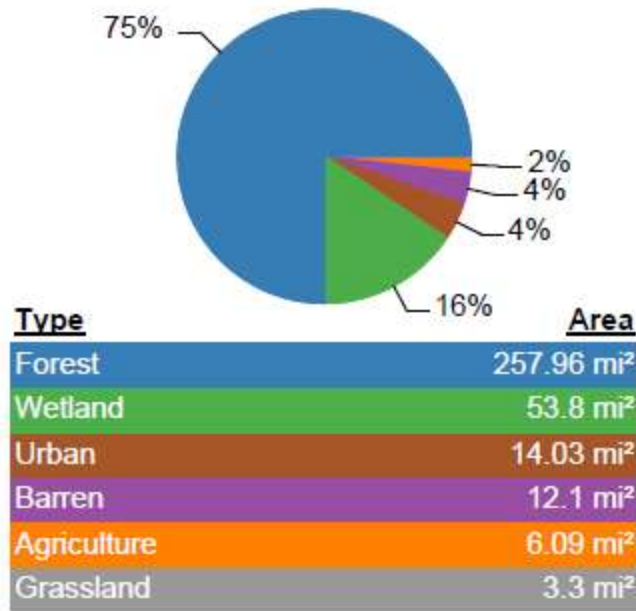


Figure 3: Land use in the Totagatic River Watershed

SOILS

The soil types found in a watershed help determine the capacity for runoff into a lake. Soils are classified into four main groups (A, B, C, and D) to indicate their potential for producing runoff. Group A soils have a high infiltration rate (can soak up lots of water) which makes the potential amount of runoff very low. These soils are, generally very sandy and allow water to pass through unimpeded. Conversely, group D soils have a very low infiltration rate making their runoff potential fairly high. Group D soils are generally very dense with high amounts of organic material. This causes water to move slowly through group D soils often resulting in standing water on flat surfaces and flowing water over sloped surfaces. Group D soils are usually contained to wetland areas.

There are also three sub groups (A/D, B/D, and C/D) these indicate the infiltration rate of the soils with respect to the water table. The water table is how close water in the ground is to the surface of that ground (see Figure 1). When the water table is close to the surface, some of the Group A soils act more like Group D soils, hence the A/D grouping. If the water table is lower, Group A/D soils act more like Group A soils. Within the Red Lake Watershed, 24.6% of the area is covered by Red Lake, 44.4% is covered by group A soils, 29% by group A/D, and the remaining 2% falls into group B (Figure 4). Group B soils drain better than Group D soils but not as well as Group A soils. Because the majority of the soils in the Red Lake Watershed have high infiltration rates, there is a low potential for runoff, but if property owners begin to degrade the shoreline by creating mowed lawns to the edge of the lake, installing impervious pathways or patios, and placing buildings near the water's edge there is much greater likelihood of runoff that will carry sand, sediment, and other pollutants into the lake.

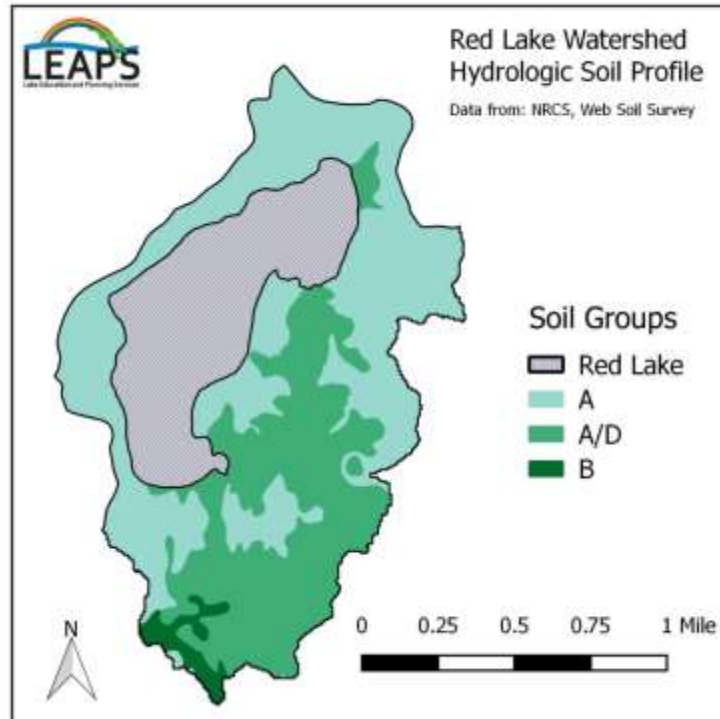


Figure 4: Hydrologic soil profile of the Red Lake Watershed

WETLANDS

A wetland is an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions. Wetlands have many functions which benefit the ecosystem surrounding Red Lake. Wetlands with a higher floral diversity of native species support a greater variety of native plants and are more likely to support regionally scarce plants and plant communities. Wetlands provide fish and wildlife habitat for feeding, breeding, resting, nesting, escape cover, travel corridors, spawning grounds for fish, and nurseries for mammals and waterfowl.

Wetlands also provide flood protection within the landscape. Due to the dense vegetation and location within the landscape, wetlands are important for retaining stormwater from rain and melting snow moving towards surface waters and retaining floodwater from rising streams. This flood protection minimizes impacts to downstream areas. Wetlands provide water quality protection because wetland plants and soils have the capacity to store and filter pollutants ranging from pesticides to animal wastes.

Wetlands also provide shoreline protection to Red Lake by acting as buffers between land and water. They protect against erosion by absorbing the force of waves and currents and by anchoring sediments. This shoreline protection is important in waterways where boat traffic, water current, and wave action cause substantial damage to the shore. Wetlands also provide groundwater recharge and discharge by allowing the surface water to move into and out of the groundwater system. The filtering capacity of wetland plants and substrates help protect groundwater quality. Wetlands can also stabilize and maintain stream flows, especially during dry months. Aesthetics, recreation, education and science are also all services wetlands provide. Wetlands contain a unique combination of terrestrial and aquatic life and physical and chemical processes.

Red Lake is surrounded by a relatively large number of wetlands (Figure 5). The Southern portion of the Red Lake Watershed is almost completely covered by wetlands. While the same cannot be said of the Northern

section of Red Lake's watershed, the wetland area present are found in strategic locations along the shorelines which help minimize nutrient loading into the lake.

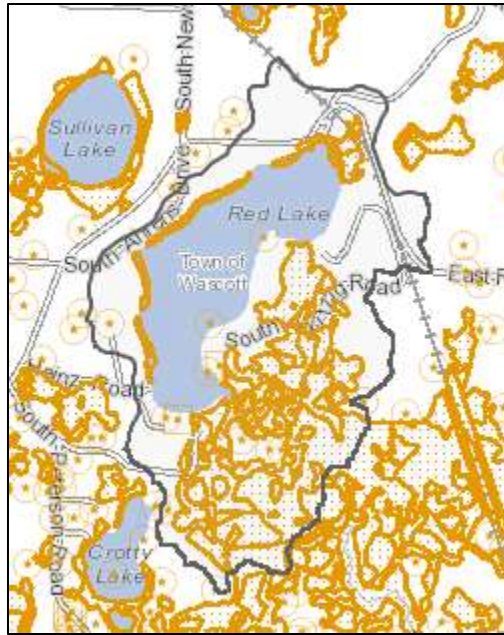


Figure 5: Wetlands within the Red Lake Watershed

LAKE CHARACTERISTICS

In order to make recommendations for aquatic plant and lake management, basic information about the water body of concern is necessary. A basic understanding of physical characteristics including size and depth, critical habitat, water quality, water level, fisheries and wildlife, wetlands and soils is needed to make appropriate recommendations for improvement. One valuable tool for helping to determine lake characteristics is whole-lake, point-intercept survey work. In the case of Red Lake, 539 individual points were created by the WDNR to use for determining depth, bottom type, and documenting aquatic plants.

PHYSICAL CHARACTERISTICS

Red Lake is a 253 acre seepage lake located in south-central/southeastern Douglas County, WI. The lake reaches a maximum depth of 37-ft in the deep hole on the south end of the central basin and has an average depth of 13-ft. Depth readings taken at Red Lake's 539 survey sample points revealed the lake is a crescent-shaped trench that grows gradually deeper as it curves from the northeast bay to the 37-ft deep hole on the south end of the central basin. This crescent is pinched by two gently sloping flats mid-lake. Other notable features include a sunken island that tops out at 7ft on the north end of the western mid-lake flat, and a sandy point on the south end of the shallow flat that dominates the northeast bay (Figure 6).

Based on the 2017 whole-lake point-intercept survey, sandy areas dominate the shoreline and account for 194 (39.3%) of the total survey sites. Away from the shore, the firm sand substrates near the shore transitioned to a nutrient-poor sandy muck at most depths over 10-ft. The broad northeast bay was dominated by sterile marly silt, while the small southeast bay and the northern and southern ends of the northeast bay that were adjacent to wetland bogs had the lake's only nutrient-rich organic muck. Collectively, these mucky areas covered 60.1% of the lake's bottom (297 points). Also found were three small gravel areas along the north shoreline and on the eastern flat, but these totaled just 0.6% of the lake bottom (Figure 6).

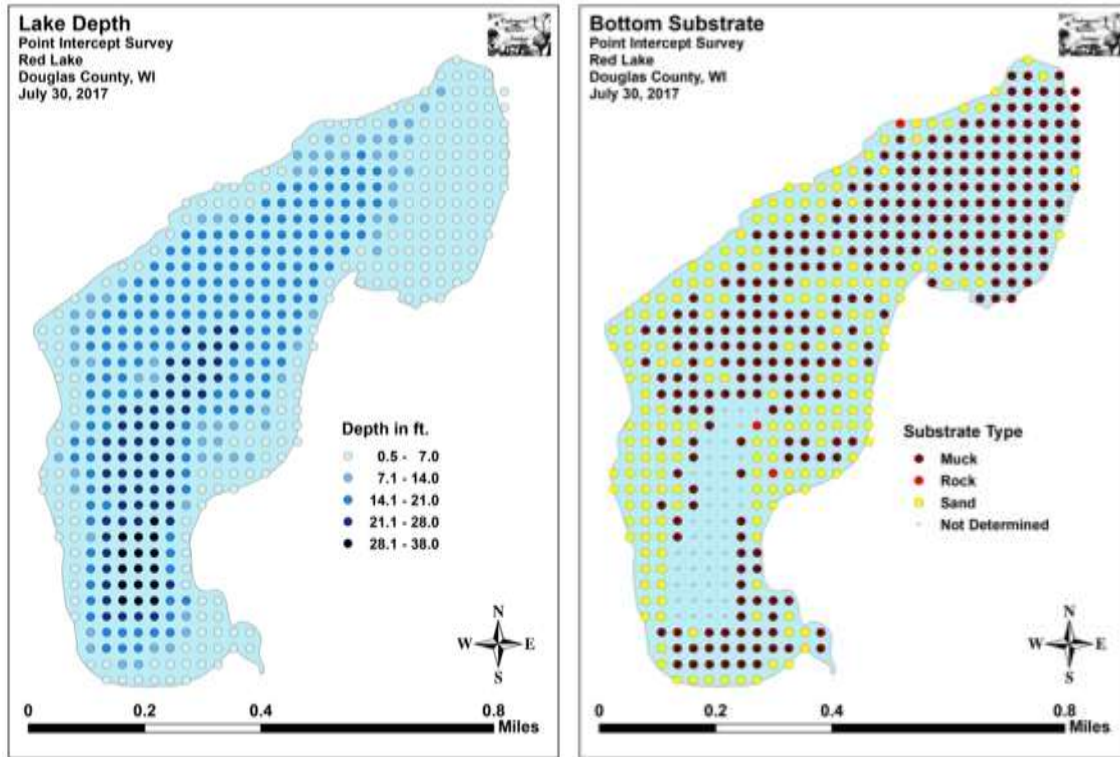


Figure 6: Point-intercept lake depth and bottom type

WATER QUALITY

Water clarity and water chemistry are important indicators of water quality. Secchi disk readings of water clarity have been collected by Wisconsin Citizen Lake Monitoring Network (CLMN), formerly the Self-help Lake Monitoring Program, volunteers since 1993. The WDNR website indicates CLMN volunteers have collected water quality data from 1993-2017. According to the volunteers collecting this data, lake levels appear to be mostly normal. There are several years where lake levels appear to be either high or low, but there is no real pattern or specific conditions that appear to cause this. The appearance of the water in the lake is predominately clear with a few murky readings. The color of the water ranged from blue to green to brown with green being the predominant reported coloration. Perception is based on a volunteer’s familiarity with lake conditions at any given time of year and was predominantly listed as being “beautiful, could not be nicer” or “very minor aesthetic problems”. There are only two years (1993 & 2009) where CLMN data collected by volunteers indicates that the lake may have been somewhat impaired, but with the data available there is no way to tell why this was the case in those years.

WATER CLARITY

Water clarity is a measurement of how deep sunlight can penetrate into the waters of a lake. It can be measured in a number of ways, the most common being an 8” Secchi disk. A Secchi disk is divided into four sections, two black and two white, and is lowered into the lake water from the surface by a rope marked in measurable increments (Figure 7). The water clarity reading is the point at which the Secchi disk when lowered into the water can no longer be seen from the surface of the lake. Water color (like dark water stained by tannins from nearby bogs and wetlands), particles suspended in the water column (like sediment or algae), and weather conditions (cloudy, windy, or sunlight) can impact how far a Secchi disk can be seen down in the water. Some lakes have Secchi disk readings of water clarity of just a few inches, while other lakes have conditions that allow the Secchi disk to be seen for dozens of feet before it disappears from view.



Figure 7: Black and white Secchi disk

Figure 9 shows the average summer (June-August) Secchi disk readings since CLMN began in 1993. In 2017, the average summer (June-Aug) Secchi disk reading for Red Lake at the Deep Hole was 13.33 feet. The average for the Northwest Georegion was 8.1 feet. The Secchi readings have a fairly wide range from as low as 9.40 feet in 1993 up to 15 feet in 2003, but the trend line in Figure 8 shows a strong upward trend suggesting that overall water clarity has actually increased since monitoring first began.

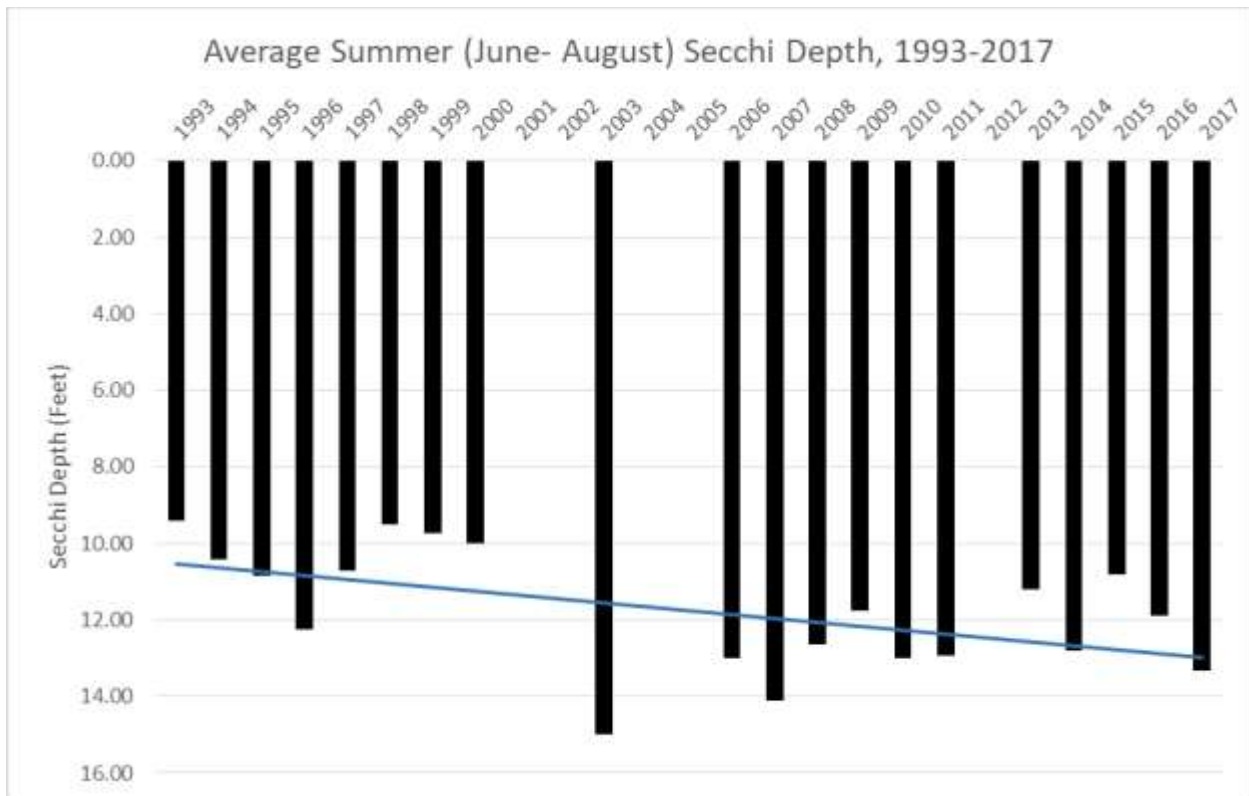


Figure 8: Average summer (June- August) Secchi disk readings at the Deep Hole

Typically the summer (June-Aug) water was reported as CLEAR and GREEN. This suggests that the Secchi depth may be mostly impacted by algae (very small plant particles) suspended in the water. An overabundance of algae is generally considered to decrease the aesthetic appeal of a lake because people prefer

clearer water to swim in and look at. However, the overall perception of Red Lake, as reported by volunteers, is rarely considered negative with only 13 of the total 142 reports being “3-Enjoyment somewhat impaired (algae)” while the rest are either “1-beautiful, could not be nicer” or “2-very minor aesthetic problems.” Algae are always present in a balanced lake ecosystem. They are the photosynthetic basis of the food web. Algae are eaten by zooplankton, which are in turn eaten by fish.

TROPHIC STATE INDEX

One of the most commonly used metrics of water quality is the trophic state of a lake. The trophic state is defined as the total load of biomass in a waterbody at any given time (Carlson & Simpson, 1996). To determine the trophic state of any given lake, the Trophic State Index (TSI) is generally used. This index uses the three main variables for water quality measurement in WI: Secchi depth (water clarity), total phosphorus (nutrients in the water), and chlorophyll concentration (the amount of algae in the water). TSI values are technically limitless, but when applied, they almost always fall between 0 and 100. To make sense of these values, they are broken into different trophic states. The four main trophic states are oligotrophic (TSI<40), mesotrophic (TSI 40-50), eutrophic (TSI 50-70), and hypereutrophic (TSI>70) (Figure 9). Oligotrophic lakes are usually very clear, clean lakes with low nutrient levels. Mesotrophic lakes are moderately clear with some nutrients and more plants present within the system. Eutrophic lakes have excess nutrients that support a great deal of algae growth, and may have a large aquatic plant community. Hypereutrophic lakes are typically very green with dense algae and limited plant growth.

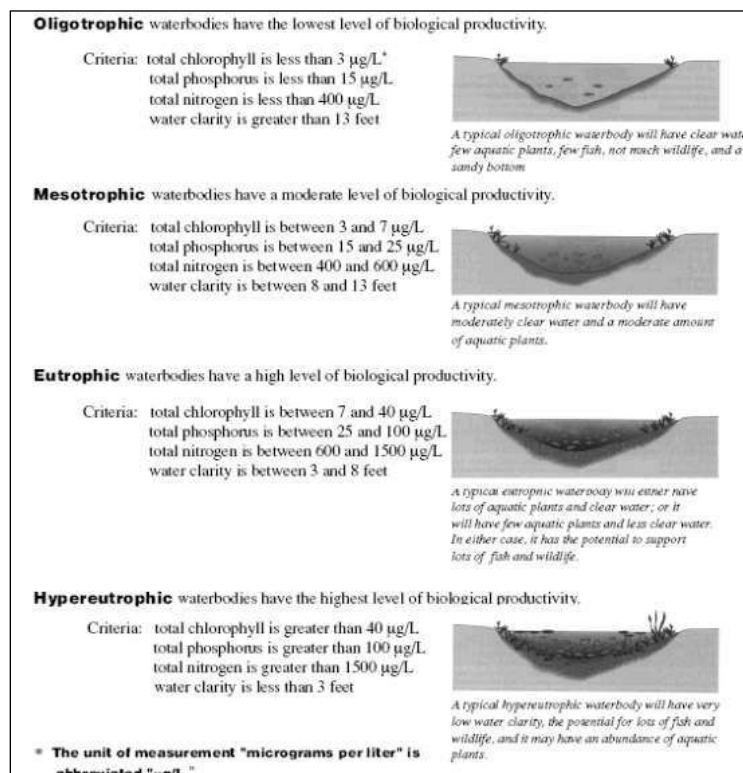


Figure 9: Trophic status in lakes

From 1993-2017, Red Lake has bounced between being oligotrophic and mesotrophic depending on the year (Figure 10). The Secchi depth data is currently the only data available for Red Lake to base the TSI off of. When available, other chemical variables, most commonly total phosphorus and chlorophyll-a concentrations are considered more accurate representations of the trophic state of a lake. High levels of both phosphorus

and chlorophyll are usually indicative of a lake with a worse trophic status, i.e. poorer water quality. Based on the Secchi depth data, Red Lake is considered to be a mesotrophic lake which borders on oligotrophic conditions fairly regularly, which means it is generally thought to have pretty good water quality.

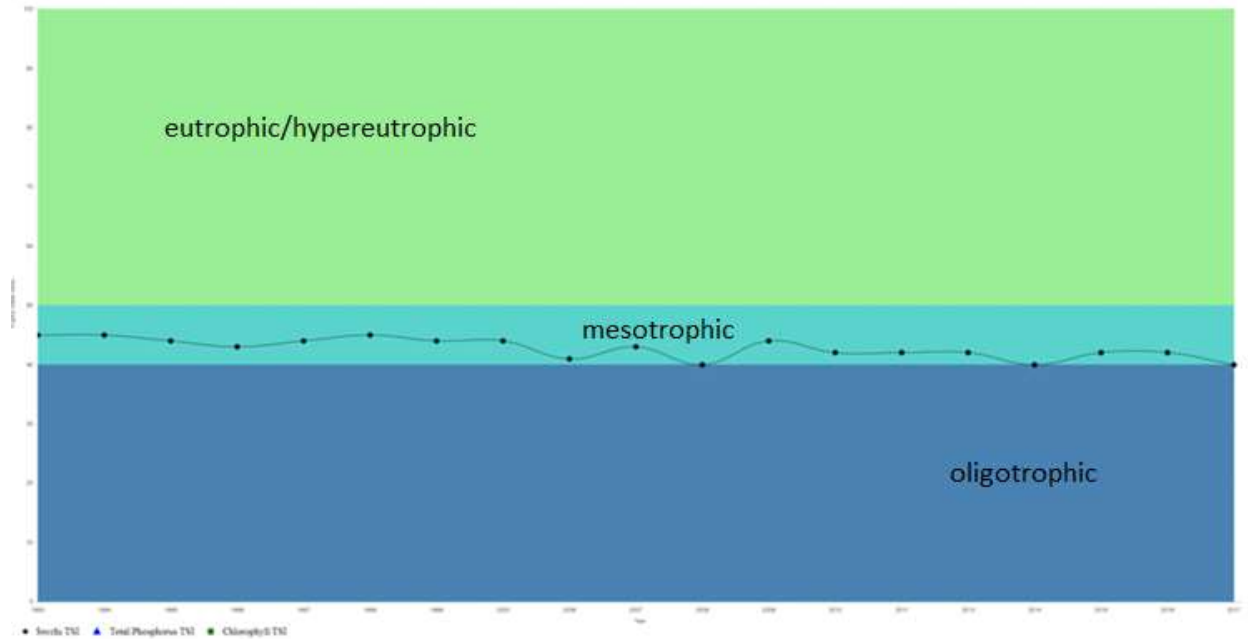


Figure 10: Average seasonal Trophic State Index for Red Lake

TEMPERATURE AND DISSOLVED OXYGEN

Temperature and dissolved oxygen are important factors that influence aquatic organisms and nutrient availability in lakes. As temperature increases during the summer in deeper lakes, the colder water sinks to the bottom and the lake develops three distinct layers as shown in Figure 11. This process, called stratification, prevents mixing between the layers due to water density differences at different temperatures which limits the transport of nutrients and dissolved oxygen between the upper and lower layers. In most lakes in Wisconsin that undergo stratification, the whole lake mixes in the spring and fall when the water temperature top to bottom in the lake is between 53 and 66°F, a process called overturn. Overturn begins when the surface water temperatures become colder and therefore denser, causing that water to sink or fall through the water column. Below about 39°F, colder water becomes less dense and begins to rise through the water column. Water at the freezing point is the least dense which is why ice floats and warmer water is near the bottom (called inverse stratification) throughout the winter.

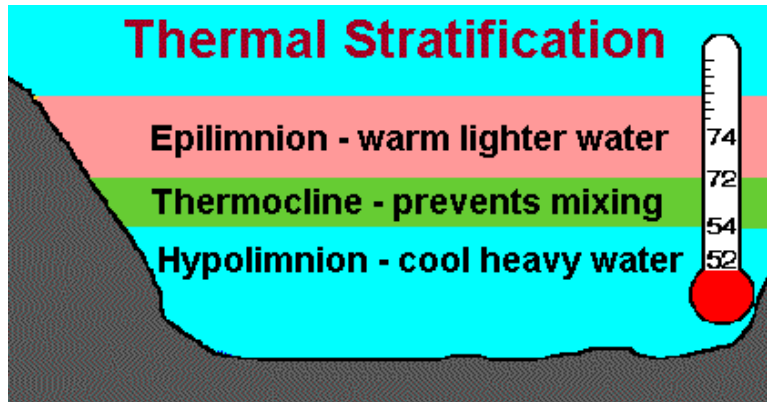


Figure 11: Summer thermal stratification

During the summer months, the upper warm layer, called the epilimnion, remains well oxygenated due to wind and wave action and photosynthesis. Photosynthesis is the process by which green plants use sunlight to synthesize foods for growth from carbon dioxide and water. Photosynthesis in plants generally involves the green pigment chlorophyll and generates oxygen as a byproduct. Much of this oxygen is held in the water in a dissolved state, hence the term dissolved oxygen (DO). The middle layer, called the metalimnion or thermocline, is where changes in temperature and DO between the surface of a lake and the bottom of the lake are greatest. This middle layer acts as a barrier that prevents warmer, oxygen rich waters in the upper layer from mixing with colder, deeper waters called the hypolimnion. It is common for DO levels to be depleted in the hypolimnion, as there are no sources of new oxygen in the deep water when other natural processes that occur in the deep water use up existing oxygen.

The amount of DO in the water (measured in parts per million (ppm)) impacts many lake parameters. Fish need at least 4.0 ppm of DO to survive in a lake. When DO drops below 2.0 ppm in the hypolimnion, a condition called hypoxia, nutrients built up in the sediment at the bottom of the lake can be released back into the lake. If the phosphorus released from bottom reaches the upper part of the lake through spring or fall overturn or when natural or human induced wave action mixes the lake, it can provide a significant internal source of phosphorus to fuel algae growth. Rapid growth of algae is called an algae bloom and can turn a lake from a clearer water state to a cloudy state literally overnight.

To date, no temperature or DO profiles have been collected from Red Lake. While it is likely that the lake stratifies creating a thermocline, it is not likely to fully stratify or remain in place for a long duration due to the shallow nature of much of the lake.

FISHERIES AND WILDLIFE

There are several predatory species within Red Lake, but the main fisheries present are panfish. Table 1 summarizes the results of the most recent fisheries assessment, conducted in 2005. This coincides with the historic fishery records which show small populations of predatory fish paired with a significantly larger panfish fishery. Walleye stocking has been done on a fairly regular basis since as early as 1933 initially meant to increase the walleye population, however in recent years the walleye have been looked at as a sort of natural control for panfish populations. In 2014, the WDNR switched from stocking using small fingerlings (on average 1.5-2 inches in length) to using large fingerlings (about 7 inches in length) in an effort to reduce predation by bass and northern. Currently, there is very little if any natural reproduction of walleye within Red Lake, so stocking efforts with large fingerlings are expected to continue on a regular basis.

Table 1: 2005 Fisheries assessment summary

Species	No.	Mean Size	Size Range	Catch/Unit
Northern Pike	21	19.11	13.6 - 23.5	15.00
Largemouth Bass	37	11.02	5.2 - 17.3	26.43
Walleye	6	15.93	10.6 - 24.3	4.29
Bluegill	525	3.15	1.1 - 7.9	1250.00
Pumpkinseed	46	5.18	2.9 - 8.3	109.52
Black Crappie	7	8.01	7.2 - 10.4	16.67
Rock Bass	4	5.13	4.2 - 6.7	9.52
Yellow Perch	25	3.08	2.2 - 6.1	59.52
Bluegill X Pumpkinseed Hybrid	1	4.60	4.6	2.38
Yellow Bullhead	2	10.05	8.7 - 11.4	4.76

In addition to the fisheries within Red Lake, there are many species that need the area surrounding the lake as habitat. Red Lake is used by loons, furbearers, and several species of ducks and geese. According to the Natural Heritage Inventory there are also several species of concern including insects, turtles, and birds that can be found within the same township and range as Red Lake making it very likely that these animals can be found in the areas around the lake.

COARSE WOODY HABITAT (WOLTER, 2012)

Coarse woody habitat (CWH) in lakes is classified as trees, limbs, branches, roots, and wood fragments at least 4 inches in diameter that enter a lake by natural (beaver activity, toppling from ice, wind, or wave scouring) or human means (logging, intentional habitat improvement, flooding following dam construction). CWH in the littoral or near-shore zone serves many functions within a lake ecosystem including erosion control, as a carbon source, and as a surface for algal growth which is an important food base for aquatic macro invertebrates. Presence of CWH has also been shown to prevent suspension of sediments, thereby improving water clarity. CWH serves as important refuge, foraging, and spawning habitat for fish, aquatic invertebrates, turtles, birds, and other animals. The amount of littoral CWH occurring naturally in lakes is related to characteristics of riparian forests and likelihood of toppling. However, humans have also had a large impact on amounts of littoral CWH present in lakes through time. During the 1800's the amount of CWH in northern lakes was increased beyond natural levels as a result of logging practices. But time changes in the logging industry and forest composition along with increasing shoreline development have led to reductions in CWH present in many northern Wisconsin lakes.

CWH is often removed by shoreline residents to improve aesthetics or select recreational opportunities (swimming and boating). Jennings et al. (2003) found a negative relationship between lakeshore development and the amount of CWH in northern Wisconsin lakes. Similarly, Christensen et al. (1996) found a negative correlation between density of cabins and CWH present in Wisconsin and Michigan lakes. While it is difficult to make precise determinations of natural densities of CWH in lakes it is believed that the value is likely on the scale of hundreds of logs per mile. The positive impact of CWH on fish communities have been well documented by researchers, making the loss of these habitats a critical concern.

Fortunately, remediation of this habitat type is attainable on many waterbodies, particularly where private landowners and lake associations are willing to partner with county, state, and federal agencies. Large-scale CWH projects are currently being conducted by lake associations and local governments with assistance from the WDNR where hundreds of whole trees are added to the near-shore areas of lakes. For more information on this process visit: <http://dnr.wi.gov/topic/fishing/outreach/fishsticks.html> (last accessed on 12-27-2017). These types of projects are more formally called “tree drops” but are popularly are called “fish sticks” (Figure 12).

The amount of CWH around Red Lake has not been quantified, but interested property owners would likely be able to get Healthy Lakes Grant funding to install fishsticks projects along their shoreline.



Figure 12: Coarse woody habitat-Fishsticks projects

SHORELANDS

How the shoreline of a lake is managed can have big impacts on the water quality and health of that lake. Natural shorelines prevent polluted runoff from entering lakes, help control flooding and erosion, provide fish and wildlife habitat, may make it harder for aquatic invasive species to establish themselves, muffle noise from watercraft, and preserve privacy and natural scenic beauty. Many of the values lake front property owners appreciate and enjoy about their properties - natural scenic beauty, tranquility, privacy, relaxation - are enhanced and preserved with good shoreland management. And healthy lakes with good water quality translate into healthy lake front property values.

Shorelands may look peaceful, but they are actually the hotbed of activity on a lake. 90% of all living things found in lakes - from fish, to frogs, turtles, insects, birds, and other wildlife - are found along the shallow margins and shores. Many species rely on shorelands for all or part of their life cycles as a source for food, a place to sleep, cover from predators, and to raise their young. Shorelands and shallows are the spawning grounds for fish, nesting sites for birds, and where turtles lay their eggs. There can be as much as 500% more species diversity at the water's edge compared to adjoining uplands.

Lakes are buffered by shorelands that extend into and away from the lake. These shoreland buffers include shallow waters with submerged plants (like coontail and pondweeds), the water's edge where fallen trees and emergent plants like rushes might be found, and upward onto the land where different layers of plants (low ground cover, shrubs, trees) may lead to the lake. A lake's littoral zone is a term used to describe the shallow water area where aquatic plants can grow because sunlight can penetrate to the lake bottom. Shallow lakes might be composed entirely of a littoral zone. In deeper lakes, plants are limited where they can grow by how deeply light can penetrate the water.

Shorelands are critical to a lake's health. Activities such replacing natural vegetation with lawns, clearing brush and trees, importing sand to make artificial beaches, and installing structures such as piers, can cause water quality decline and change what species can survive in the lake.

PROTECTING WATER QUALITY

Shoreland buffers slow down rain and snow melt (runoff). Runoff can add nutrients, sediments, and other pollutants into lakes, causing water quality declines. Slowing down runoff will help water soak (infiltrate) into the ground. Water that soaks into the ground is less likely to damage lake quality and recharges groundwater that supplies water to many of Wisconsin's lakes. Slowing down runoff water also reduces flooding, and stabilizes stream flows and lake levels.

Shoreland wetlands act like natural sponges trapping nutrients where nutrient-rich wetland sediments and soils support insects, frogs, and other small animals eaten by fish and wildlife.

Shoreland forests act as filters, retainers, and suppliers of nutrients and organic material to lakes. The tree canopy, young trees, shrubs, and forest understory all intercept precipitation, slowing runoff, and contributing to water infiltration by keeping the soil's organic surface layer well-aerated and moist. Forests also slow down water flowing overland, often capturing its sediment load before it can enter a lake or stream. In watersheds with a significant proportion of forest cover, the erosive force of spring snow melts is reduced as snow in forests melts later than snow on open land, and melt water flowing into streams is more evenly distributed. Shoreland trees grow, mature, and eventually fall into lakes where they protect shorelines from erosion, and are an important source of nutrients, minerals and wildlife habitat.

NATURAL SHORELANDS ROLE IN PREVENTING AQUATIC INVASIVE SPECIES

In addition to removing essential habitat for fish and wildlife, clearing native plants from shorelines and shallow waters can open up opportunities for invasive species to take over. Like tilling a home garden to

prepare it for seeding, clearing shoreland plants exposes bare earth and removes the existing competition (the cleared shoreland plants) from the area. Nature fills a vacuum. While the same native shoreland plants may recover and reclaim their old space, many invasive species possess "weedy" traits that enable them to quickly take advantage of new territory and out-compete natives.

The act of weeding creates continual disturbance, which in turn benefits plants that behave like weeds. The modern day practice of mowing lawns is an example of keeping an ecosystem in a constant state of disturbance to the benefit of invasive species like turf grass, dandelions, and clover, all native to Europe. Keeping shoreline intact is a good way to minimize disturbance and minimize opportunities for invasive species to gain a foothold.

THREATS TO SHORELANDS

When a landowner develops a waterfront lot, many changes may take place including the addition of driveways, houses, decks, garages, sheds, piers, rafts and other structures, wells, septic systems, lawns, sandy beaches and more. Many of these changes result in the compaction of soil and the removal of trees and native plants, as well as the addition of impervious (hard) surfaces, all of which alter the path that precipitation takes to the water.

Building too close to the water, removing shoreland plants, and covering too much of a lake shore lot with hard surfaces (such as roofs and driveways) can harm important habitat for fish and wildlife, send more nutrient and sediment runoff into the lake, and cause water quality decline.

Changing one waterfront lot in this fashion may not result in a measurable change in the quality of the lake or stream. But cumulative effects when several or many lots are developed in a similar way can be enormous. A lake's response to stress depends on what condition the system is in to begin with, but bit by bit, the cumulative effects of tens of thousands of waterfront property owners "cleaning up" their shorelines, are destroying the shorelands that protect their lakes. Increasing shoreline development and development throughout the lake's watershed can have undesired cumulative effects.

SHORELAND PRESERVATION AND RESTORATION

If a native buffer of shoreland plants exists on a given property, it can be preserved and care taken to minimize impacts when future lake property projects are contemplated. If a shoreline has been altered, it can be restored. Shoreline restoration involves recreating buffer zones of natural plants and trees. Not only do quality wild shorelines create higher property values, but they bring many other values too. Some of these are aesthetic in nature, while others are essential to a healthy ecosystem. Healthy shorelines mean healthy fish populations, varied plant life, and the existence of the insects, invertebrates and amphibians which feed fish, birds and other creatures. Figure 13 shows the difference between a natural and unnatural shoreline adjacent to a lake home. More information about healthy shorelines can be found at the following website: <http://wisconsinlakes.org/index.php/shorelands-a-shallows> (last accessed 11-29-2017).

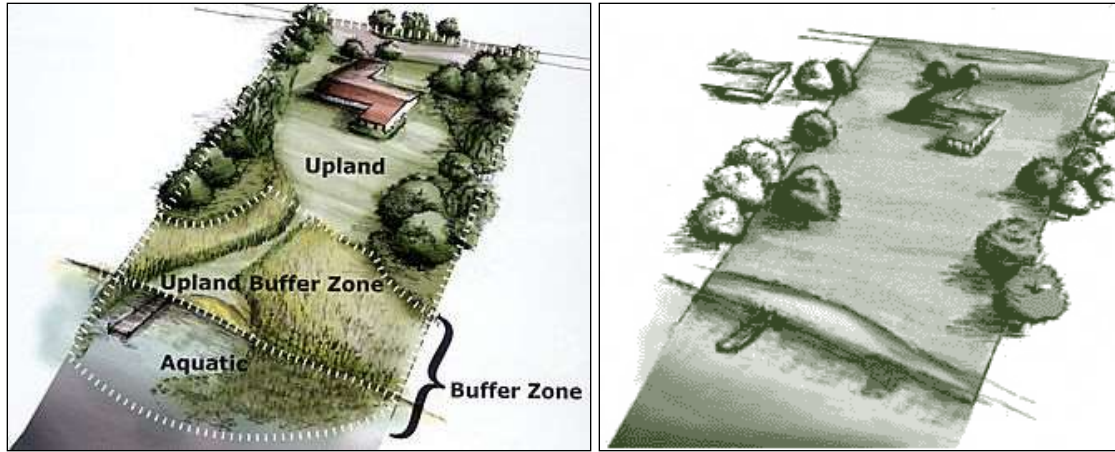


Figure 13: Healthy, AIS resistant shoreland (left) vs. shoreland in poor condition (right)

The shorelands surrounding Red Lake are somewhat developed, but the majority of property owners have buffer strips of undisturbed native vegetation which help maintain the water quality of Red Lake. If property owners begin to remove these buffer strips, the water quality will likely decrease. Property owners should be encouraged to maintain the native plantings that have helped keep the water quality exceptionally high within Red Lake.

PAST AQUATIC PLANT MANAGEMENT

Before the discovery of EWM in July of 2016, there was no need to manage the aquatic plants found within Red Lake. The aquatic plant community was healthy, diverse, and it did not impede lake usage. A whole-lake point-intercept survey was conducted in July of 2013 to establish baseline data for the aquatic plant community within Red Lake and determine if there were any invasive species present. During the 2013 survey no EWM was documented. Following the discovery of EWM in 2016, the RLA through a WDNR grant began a rapid response project to support interim management until a formal management plan could be created. The initial part of this project was a bed mapping survey conducted in the fall of 2016 to determine the extent of EWM in the lake and to support management in the spring of 2017.

Using the data from the 2016 fall bed mapping survey, two separate areas were identified for chemical treatment in the spring of 2017. On May 24, 2017, the RLA in cooperation with the WDNR completed a chemical treatment of the two areas using liquid diquat (Reward) at the maximum label application rate of two gallons per acre. The largest area treated covered 3 acres of the lake and was along the western shore. The second, smaller area covering 1 acre was toward the eastern shoreline (Figure 14). The 2017 spring treatments appeared to be effective with a 2017 fall bed mapping survey finding no EWM in the smaller treated area and only a small patch of EWM in the center of the larger treated area. While this demonstrates that the EWM within Red Lake can be controlled to a certain extent, continued management will be necessary to slow its spread in the lake. Once in a lake, EWM is nearly impossible to eliminate, and will likely keep spreading. The goal is to slow that spread as much as possible.



Figure 14: 2016 EWM beds with 2017 spring treatment areas outlined in red

AQUATIC PLANT SURVEYS

In 2013, a desire to determine if non-native AIS like EWM or curly-leaf pondweed, another problematic plant species had invaded the lake; and to establish baseline data on the richness, diversity, abundance, and distribution of the native aquatic plant community in the lake prompted the RLA in cooperation with the WDNR, to authorize a full lake point-intercept (PI) aquatic plant survey in July of that year. While no EWM was found in the 2013 survey, several individual plants were discovered in 2016 during a different survey. In response the RLA contracted with an aquatic plant surveyor to complete fall bed mapping surveys in both 2016 and 2017 to look for EWM; and to complete a second whole-lake PI survey conducted on July 30, 2017 in preparation for the development of an Aquatic Plant Management Plan as well as examine any changes that might have occurred since the 2013 survey.

WARM-WATER FULL POINT-INTERCEPT AQUATIC PLANT SURVEYS

Using a standard formula that takes into account the shoreline shape and distance, water clarity, depth, and total lake acres, a 539 point sampling grid was created for Red Lake by the WDNR. These points were used in both the 2013 and 2017 surveys. During these surveys each point that is considered to be in the area of the lake that will support aquatic plant growth (called the littoral zone) is sampled with a rake from a boat. All plants that are found on the rake sample are counted as are plants that are visible within 6-ft of the rake sample, but not actually on the rake. In addition, plant species that are identified between points that are not found on a rake are included. Table 2 shows a brief comparison of the 2013 and 2017 surveys.

Table 2: 2013 and 2017 plant survey summary statistics

Summary Statistics:	2013	2017
Total number of points sampled	539	539
Total number of sites with vegetation	423	406
Total number of sites shallower than the maximum depth of plants	453	484
Frequency of occurrence at sites shallower than maximum depth of plants	93.38	83.88
Simpson Diversity Index	0.93	0.92
Maximum depth of plants (ft)	22.5	22.5
Mean depth of plants (ft)	10.1	9.9
Median depth of plants (ft)	8.5	8.0
Average number of all species per site (shallower than max depth)	2.52	1.95
Average number of all species per site (veg. sites only)	2.70	2.32
Average number of native species per site (shallower than max depth)	2.52	1.95
Average number of native species per site (sites with native veg. only)	2.70	2.32
Species richness	57	53
Species richness (including visuals)	58	56
Species richness (including visuals and boat survey)	67	64
Mean rake fullness (veg. sites only)	2.05	2.01

Species richness was high in both years with 57 species in 2013 and 53 in 2017. This total increased to 64 species in 2017 when including visuals and plants seen during the boat survey. This number was down slightly from 67 total species documented in 2013. In the opinion of the aquatic plant surveyor, the decrease in species from 2013 to 2017 was not likely caused by the 2017 treatment. Most of the plants that were present in 2013 but absent in 2017, were emergent and shoreline species found along the north shoreline that most likely lost their habitat when water levels increased between the two years. Along with the decline in overall richness, mean native species richness at sites with vegetation experienced a highly-significant loss

($p < 0.001$) from 2.70 species/site in 2013 to 2.32/site in 2017. Visual analysis of the maps suggested much of this loss occurred in the eastern bays away from areas that were treated with herbicide (Figure 15). Total rake fullness experienced a non-significant decline ($p = 0.23$) from a moderate 2.05 in 2013 to a moderate 2.01 in 2017.

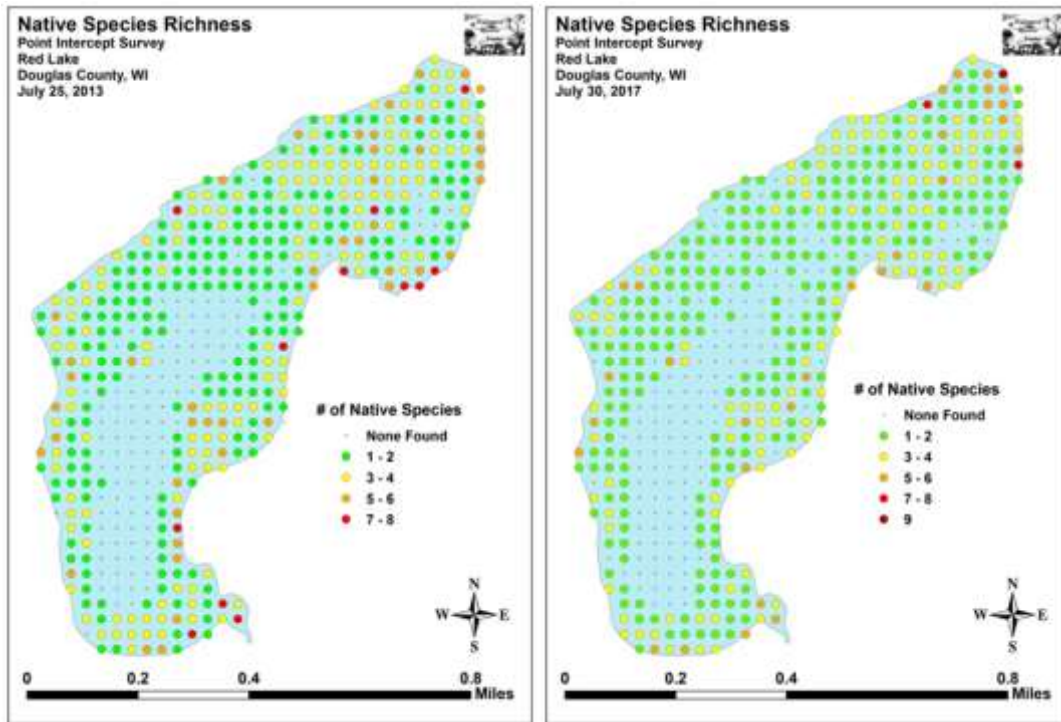


Figure 15: Native species richness 2013 and 2017 (Berg, 2017)

In 2017, the maximum depth plants were found to be growing was 22.5ft (identical to 2013). The 406 points with vegetation (approximately 75.3% of the entire lake bottom and 83.9% of the littoral zone) was a non-significant decline ($p = 0.22$) from 2013 when plants were growing at 423 points (78.5% of the bottom and 93.4% of the littoral zone) (Figure 16).

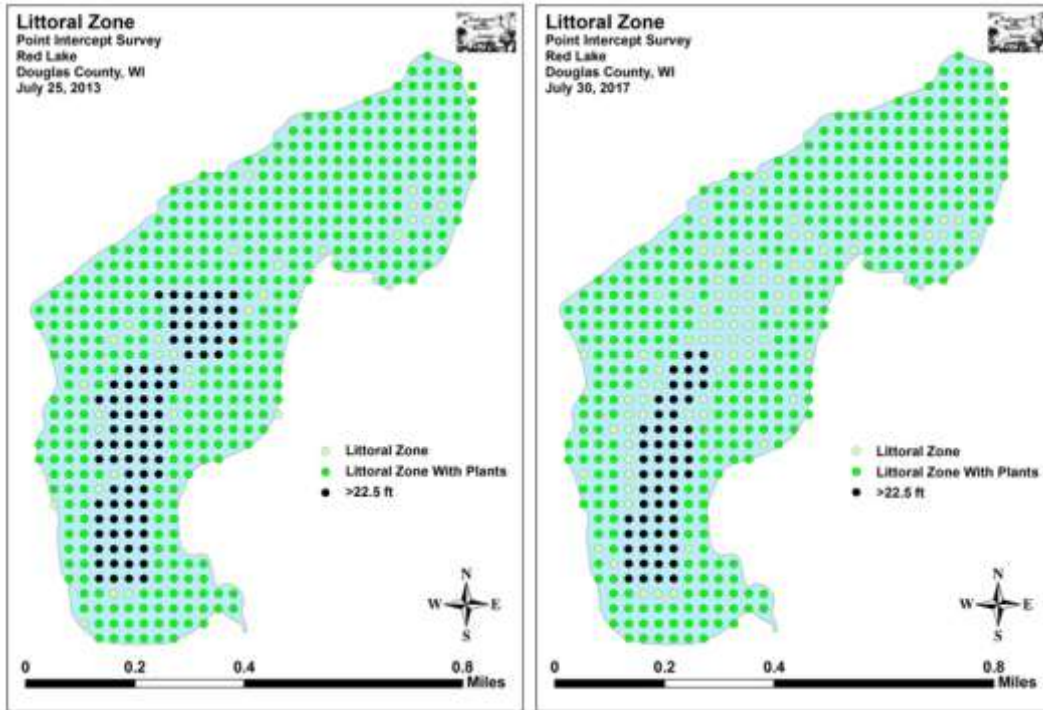


Figure 16: Littoral zone 2013 and 2017 (Berg, 2017)

Growth in 2017 was slightly skewed to deep water as the mean depth of 9.9ft was higher than the median of 8.0ft. Both of these values were similar to the 2013 survey when the mean/median were 10.1ft and 8.5ft respectively. Interestingly, these values are actually deceptive because, unlike most lakes where plant coverage declines with increasing depth and graphs demonstrate a more or less normal distribution with skew to deep water, Red Lake's plants exhibited a bimodal (twin peak) distribution (Figure 17). This unusual growth depth chart captured both the tendency to drop off rapidly from the shallower shoreline areas as well as the nearly universal coverage of Charophytes (valuable habitat producing colonial algae that look like higher plants) from 12ft to the edge of the littoral zone.

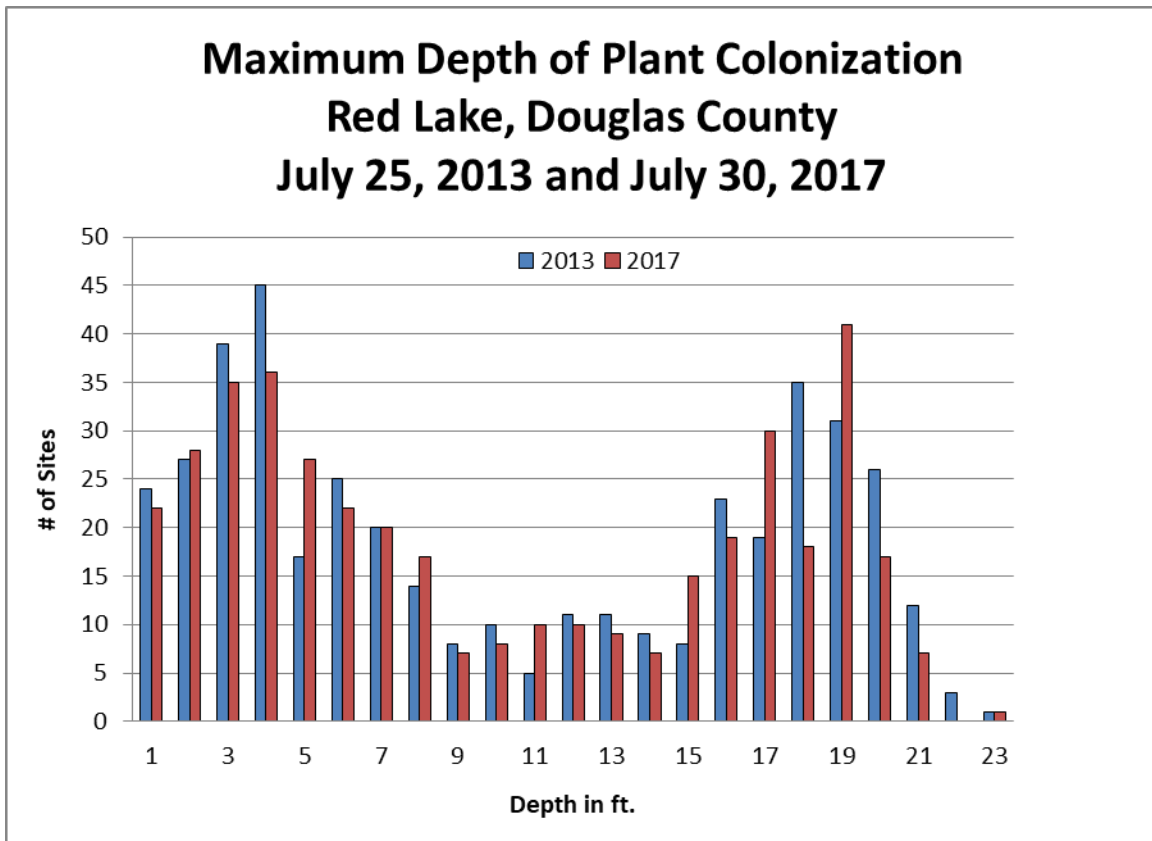
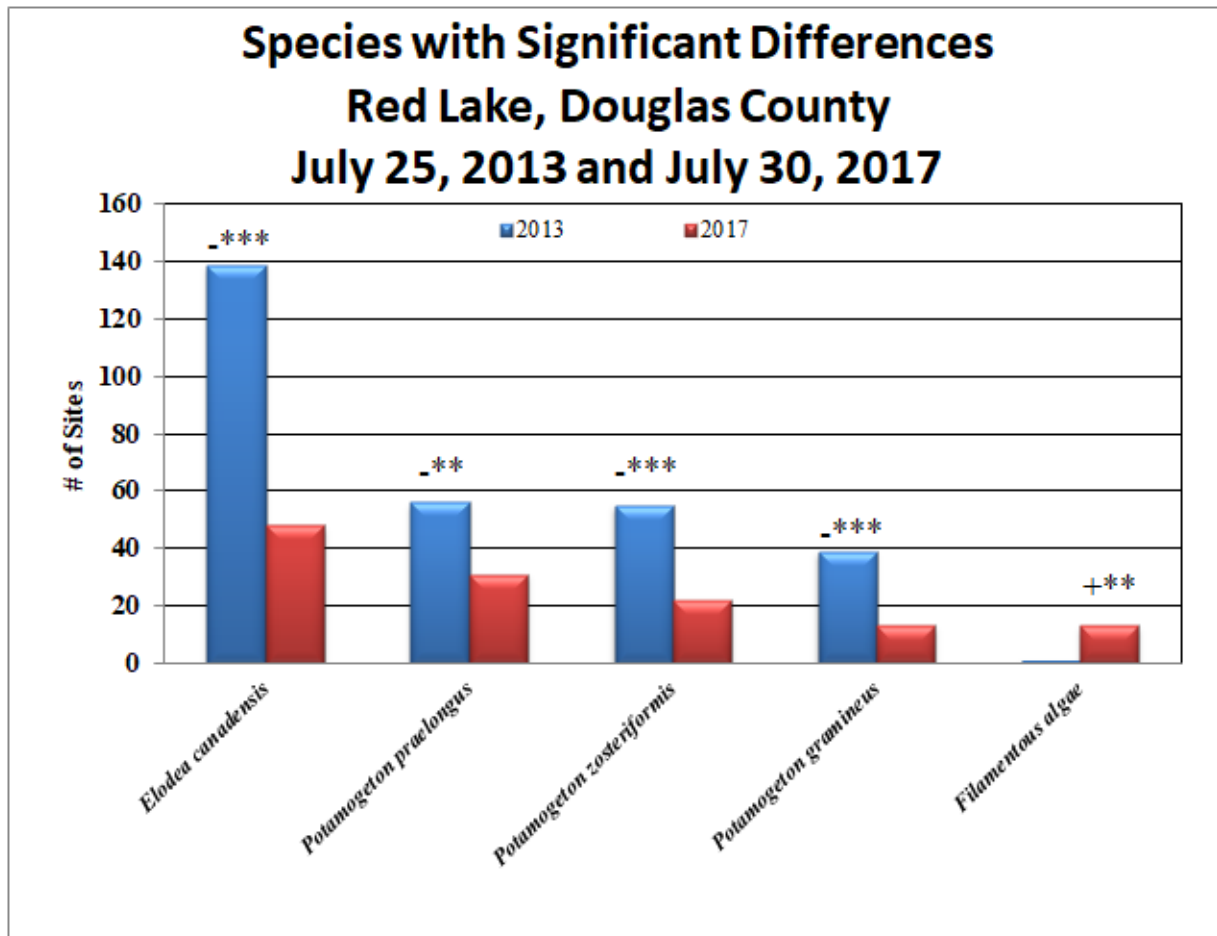


Figure 17: Plant colonization depth distribution (Berg, 2017)

Despite the decrease in native species richness at each of the survey sites, only four individual plant species showed significant decreases lakewide while filamentous algae actually showed a significant increase (Figure 18). Common waterweed, Flat-stem pondweed, and Variable pondweed suffered highly significant declines; and White-stem pondweed experienced a moderately significant decline.



Significant differences = * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 18: Species that showed significant changes between 2013 and 2017 (Berg, 2017)

SIMPSON'S DIVERSITY INDEX:

A diversity index allows the entire plant community at one location to be compared to the entire plant community at another location. It also allows the plant community at a single location to be compared over time thus allowing a measure of community degradation or restoration at that site. With Simpson's Diversity Index, the index value represents the probability that two individual plants (randomly selected) will be different species. The index values range from 0 -1 where 0 indicates that all the plants sampled are the same species to 1 where none of the plants sampled are the same species. The greater the index value, the higher the diversity in a given location. Although many natural variables like lake size, depth, dissolved minerals, water clarity, mean temperature, etc. can affect diversity, in general, a more diverse lake indicates a healthier ecosystem. Perhaps most importantly, plant communities with high diversity also tend to be more resistant to invasion by exotic species. In Red Lake, diversity was incredibly high in 2013 with a Simpson Index value of 0.93 this dropped slightly in 2017 to 0.92, but this is still exceptionally high

FLORISTIC QUALITY INDEX (FQI)

This index measures the impact of human development on a lake's aquatic plants. The 124 species in the index are assigned a Coefficient of Conservatism (C) which ranges from 1-10. The higher the value assigned, the more likely the plant is to be negatively impacted by human activities relating to water quality or habitat modifications. Plants with low values are tolerant of human habitat modifications, and they often exploit

these changes to the point where they may crowd out other species. The FQI is calculated by averaging the conservatism value for each native index species found in the lake during the point-intercept survey, and multiplying it by the square root of the total number of plant species (N) in the lake. Statistically speaking, the higher the index value, the healthier the lake's aquatic plant community is assumed to be. Nichols (1999) identified four eco-regions in Wisconsin: Northern Lakes and Forests, North Central Hardwood Forests, Driftless Area and Southeastern Wisconsin Till Plain. He recommended making comparisons of lakes within ecoregions to determine the target lake's relative diversity and health. Red Lake is in the Northern Lakes and Forests Ecoregion.

In 2013, a total of 52 native index species were identified in the lake during the point-intercept survey. They produced a mean C of 6.7 and a FQI of 48.4. In 2017, a total of 50 native index plants were identified in the lake during the point-intercept survey. They produced a mean C of 6.9 and a FQI of 48.5 (Berg, 2017). Nichols (1999) reported an average mean C for the Northern Lakes and Forest Region of 6.7 putting Red Lake just above average, in 2017, for this part of the state. The FQI was, however, almost double the mean FQI of 24.3 for the Northern Lakes and Forest Region (Nichols, 1999).

EWM FALL BED MAPPING SURVEYS

EWM is not believed to have been present during the 2013 plant survey, so the first EWM fall bed mapping survey was not needed until the fall of 2016 following the discovery of EWM near the boat landing earlier in 2016. During the 2016 fall survey, ten areas were found and considered to be beds in addition to several individual plants (Figure 19). The majority of these beds were very small, but in total covered 1.18 acres or 0.5% of the total lake surface area. During a fall bed mapping survey in the fall of 2017 (after a chemical application in the spring of the same year) plant surveyors only found a single bed of EWM in the center of the largest bed found in 2016 (Figure 19). Several scattered plants were found, but the total was less than what was found in 2016. Individual plants found during the 2017 fall bed mapping were removed by the surveyor with a rake. Fewer EWM plants in 2017 than in 2016 is a positive result, however, it was noted by the surveyor that the water clarity was not as good in 2017, so it is possible that EWM in the deeper parts of the littoral zone, such as the three small beds found in 2016 along the southeast shoreline in 8-11ft of water could have been missed.

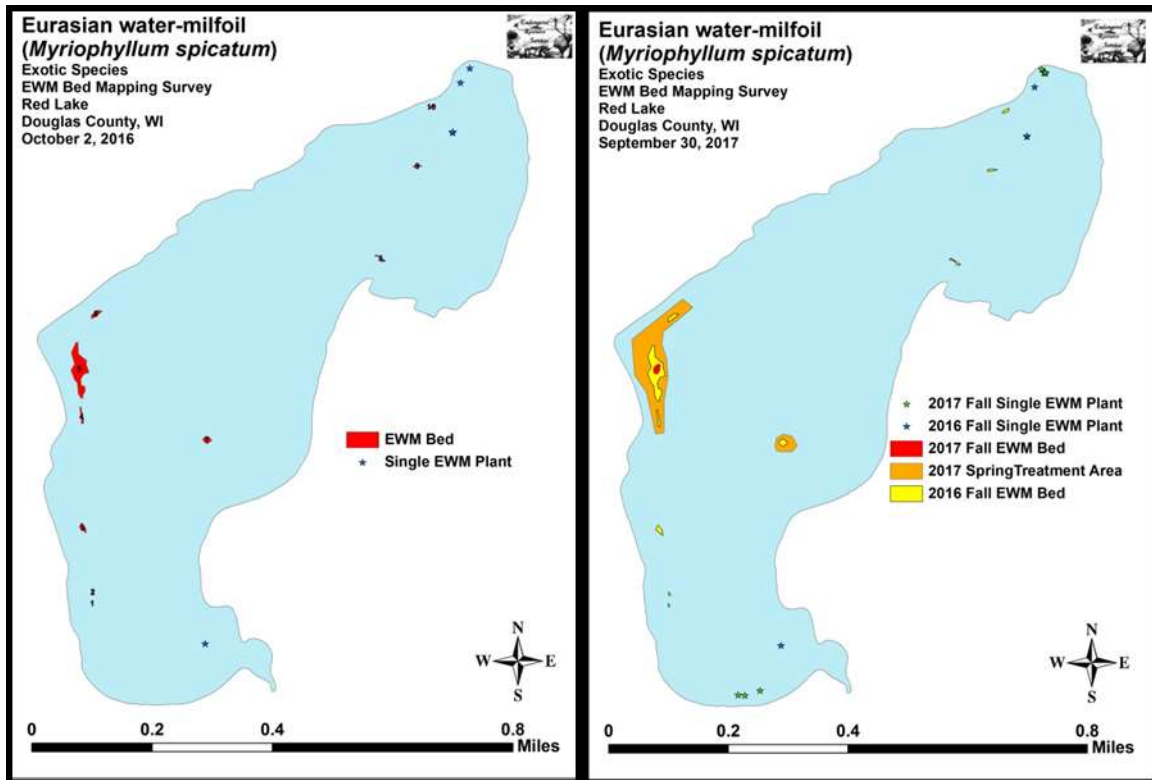


Figure 19: 2016 and 2017 EWM bed maps (Berg, 2017)

WILD RICE

Wild rice is an aquatic grass which grows in shallow water in lakes and slow flowing streams. This grass produces a seed which is a nutritious source of food for wildlife and people. The seed matures in August and September with the ripe seed dropping into the sediment, unless harvested by wildlife or people. It is a highly protected and valued natural resource in Wisconsin. Only Wisconsin residents may harvest wild rice in the state. According to the WDNR Surface Water Data Viewer, Red Lake is not wild rice water. The whole-lake point-intercept surveys in 2013 and 2017 confirmed this.

AQUATIC INVASIVE SPECIES

Until 2016, there were no known non-native invasive species within Red Lake. In July of 2016, Eurasian Watermilfoil was found in Red Lake. This emphasizes the need to evaluate other invasive species that could cause harm to Red Lake if they were to be introduced. Most of these species are considered aquatic, although some are also considered shoreland or wetland type invasive species.

NON-NATIVE, AQUATIC INVASIVE PLANT SPECIES

Eurasian watermilfoil (EWM) is the only known aquatic invasive species in the lake. EWM is a submerged aquatic plant species. It is rooted to the bottom of the lake growing within the water column up to the surface where it can create dense mats of vegetation. Its rapid growth and mat-forming tendencies have the potential to outcompete more desirable native aquatic plants. Reed canary grass is said to be found in some of the wetlands surrounding Red Lake. Reed canary grass and Narrow-leaved cattails have been documented along the shores of Red Lake. Both reed canary grass and narrow-leaved cattails are shoreland or wetland plants not generally problematic within the lake, but can be very problematic on the shores and in the wetlands adjacent to the lake. More information is given for each non-native species in the following sections.

EURASIAN WATERMILFOIL

EWM (Figure 20) is a submersed aquatic plant native to Europe, Asia, and northern Africa. It is the only non-native milfoil in Wisconsin. Like the native milfoils, the Eurasian variety has slender stems whorled by submersed feathery leaves and tiny flowers produced above the water surface. The flowers are located in the axils of the floral bracts, and are either four-petaled or without petals. The leaves are threadlike, typically uniform in diameter, and aggregated into a submersed terminal spike. The stem thickens below the inflorescence and doubles its width further down, often curving to lie parallel with the water surface. The fruits are four-jointed nut-like bodies. Without flowers or fruits, EWM is difficult to distinguish from Northern water milfoil. EWM has 9-21 pairs of leaflets per leaf, while Northern milfoil typically has 7-11 pairs of leaflets. Coontail is often mistaken for the milfoils, but does not have individual leaflets.

EWM grows best in fertile, fine-textured, inorganic sediments. In less productive lakes, it is restricted to areas of nutrient-rich sediments. It has a history of becoming dominant in eutrophic, nutrient-rich lakes, although this pattern is not universal. It is an opportunistic species that prefers highly disturbed lake beds, lakes receiving nitrogen and phosphorous-laden runoff, and heavily used lakes. Optimal growth occurs in alkaline systems with a high concentration of dissolved inorganic carbon. High water temperatures promote multiple periods of flowering and fragmentation.

Unlike many other plants, EWM does not rely on seed for reproduction. Its seeds germinate poorly under natural conditions. It reproduces by fragmentation, allowing it to disperse over long distances. The plant produces fragments after fruiting once or twice during the summer. These shoots may then be carried downstream by water currents or inadvertently picked up by boaters. EWM is readily dispersed by boats, motors, trailers, bilges, live wells, and bait buckets; and can stay alive for weeks if kept moist.

Once established in an aquatic community, milfoil reproduces from shoot fragments and stolons (runners that creep along the lake bed). As an opportunistic species, EWM is adapted for rapid growth early in spring. Stolons, lower stems, and roots persist over winter and store the carbohydrates that help milfoil claim the water column early in spring, photosynthesize, divide, and form a dense leaf canopy that shades out native aquatic plants. Its ability to spread rapidly by fragmentation and effectively block out sunlight needed for native plant growth often results in monotypic stands. Monotypic stands of EWM provide only a single habitat, and threaten the integrity of aquatic communities in a number of ways; for example, dense stands

disrupt predator-prey relationships by fencing out larger fish, and reducing the number of nutrient-rich native plants available for waterfowl.

Dense stands of EWM also inhibit recreational uses like swimming, boating, and fishing. Some stands have been dense enough to obstruct industrial and power generation water intakes. The visual impact that greets the lake user on milfoil-dominated lakes is the flat yellow-green of matted vegetation, often prompting the perception that the lake is "infested" or "dead". Cycling of nutrients from sediments to the water column by EWM may lead to deteriorating water quality and algae blooms in infested lakes.



Figure 20: EWM (Photo on the right is from Red Lake in 2016 (Berg, 2017))

Currently, EWM is the only invasive plant species found within Red Lake. It is likely that EWM was carried to Red Lake from one of several nearby lakes within Douglas and Washburn Counties that have various levels of EWM.

CURLY-LEAF PONDWEED

Curly-leaf pondweed (CLP) is an invasive aquatic perennial that is native to Eurasia, Africa, and Australia (Figure 21). The leaves are reddish-green, oblong, and about 3 inches long, with distinct wavy edges that are finely toothed. The stem of the plant is flat, reddish-brown and grows from 1 to 3 feet long. The plant usually drops to the lake bottom by early July. CLP is commonly found in alkaline and high nutrient waters, preferring soft substrate and shallow water depths. It tolerates low light and low water temperatures. It has been reported in all states but Maine.

CLP spreads through burr-like winter buds (turions), which are moved among waterways. These plants can also reproduce by seed, but this plays a relatively small role compared to the vegetative reproduction through turions. New plants form under the ice in winter, making curly-leaf pondweed one of the first nuisance aquatic plants to emerge in the spring. It becomes invasive in some areas because of its tolerance for low light and low water temperatures. These tolerances allow it to get a head start on and out-compete native plants in the spring. At peak growth mats at and just under the surface can interfere with aquatic recreation. In mid-summer, when most aquatic plants are growing, CLP plants are dying off. Plant die-offs may result in a critical loss of dissolved oxygen. Decaying plants can also increase nutrients which can contribute to algal blooms. Floating mats of dead and dying CLP can inundate shallow water areas and foul shorelines and beaches.

To date, no CLP has been identified in Red Lake, but it is present in several nearby lakes including the Minong and St. Croix Flowages.



Figure 21: CLP plants and turions (not from Red Lake)

PURPLE LOOSESTRIFE

Purple loosestrife (Figure 22) is a perennial herb 3-7 feet tall with a dense bushy growth of 1-50 stems. The stems, which range from green to purple, die back each year. Showy flowers that vary from purple to magenta possess 5-6 petals aggregated into numerous long spikes, and bloom from August to September. Leaves are opposite, nearly linear, and attached to four-sided stems without stalks. It has a large, woody taproot with fibrous rhizomes that form a dense mat. By law, purple loosestrife is a nuisance species in Wisconsin. It is illegal to sell, distribute, or cultivate the plants or seeds, including any of its cultivars.

Purple loosestrife is a wetland herb that was introduced as a garden perennial from Europe during the 1800's. It has since extended its range to include most temperate parts of the United States and Canada. The plant's reproductive success across North America can be attributed to its wide tolerance of physical and chemical conditions characteristic of disturbed habitats, and its ability to reproduce prolifically by both seed dispersal and vegetative propagation. The absence of natural predators, like European species of herbivorous beetles that feed on the plant's roots and leaves, also contributes to its proliferation in North America. Currently, more than 20 states, including Wisconsin have laws prohibiting its importation or distribution because of its aggressively invasive characteristics.

Purple loosestrife was first detected in Wisconsin in the early 1930's, but remained uncommon until the 1970's. It is now widely dispersed in the state, and has been recorded in 70 of Wisconsin's 72 counties. Low densities in most areas of the state suggest that the plant is still in the pioneering stage of establishment. Areas of heaviest infestation are sections of the Wisconsin River, the extreme southeastern part of the state, and the Wolf and Fox River drainage systems.

This plant's optimal habitat includes marshes, stream margins, alluvial flood plains, sedge meadows, and wet prairies. It is tolerant of moist soil and shallow water sites such as pastures and meadows, although established plants can tolerate drier conditions. Purple loosestrife has also been planted in lawns and gardens, which is often how it has been introduced to many of our wetlands, lakes, and rivers.

Purple loosestrife can germinate successfully on substrates with a wide range of pH. Optimum substrates for growth are moist soils of neutral to slightly acidic pH, but it can exist in a wide range of soil types. Most seedling establishment occurs in late spring and early summer when temperatures are high.

Purple loosestrife spreads mainly by seed, but it can also spread vegetatively from root or stem segments. A single stalk can produce from 100,000 to 300,000 seeds per year. Seed survival is up to 60-70%, resulting in an extensive seed bank. Mature plants with up to 50 shoots grow over 2 meters high and produce more than two million seeds a year. Germination is restricted to open, wet soils and requires high temperatures, but seeds remain viable in the soil for many years. Even seeds submerged in water can live for approximately 20 months. Most of the seeds fall near the parent plant, but water, animals, boats, and humans can transport the seeds long distances. Vegetative spread through local perturbation is also characteristic of loosestrife; clipped, trampled, or buried stems of established plants may produce shoots and roots. Plants may be quite large and several years old before they begin flowering. It is often very difficult to locate non-flowering plants, so monitoring for new invasions should be done at the beginning of the flowering period in mid-summer.

Any sunny or partly shaded wetland is susceptible to purple loosestrife invasion. Vegetative disturbances such as water drawdown or exposed soil accelerate the process by providing ideal conditions for seed germination. Invasion usually begins with a few pioneering plants that build up a large seed bank in the soil for several years. When the right disturbance occurs, loosestrife can spread rapidly, eventually taking over the entire wetland. The plant can also make morphological adjustments to accommodate changes in the immediate environment; for example, a decrease in light level will trigger a change in leaf morphology. The plant's ability to adjust to a wide range of environmental conditions gives it a competitive advantage; coupled with its reproductive strategy, purple loosestrife tends to create monotypic stands that reduce biotic diversity.

Purple loosestrife displaces native wetland vegetation and degrades wildlife habitat. As native vegetation is displaced, rare plants are often the first species to disappear. Eventually, purple loosestrife can overrun wetlands thousands of acres in size, and almost entirely eliminate the open water habitat. The plant can also be detrimental to recreation by choking waterways.

Purple loosestrife has not been found around Red Lake, but it has been found in several nearby wetlands including those surrounding the Totagatic River and Lake Nancy. Monitoring efforts should include purple loosestrife.



Figure 22: Purple Loosestrife (not from Red Lake)

REED CANARY GRASS

Reed canary grass (Figure 23) is a large, coarse grass that reaches 2 to 9 feet in height. It has an erect, hairless stem with gradually tapering leaf blades 3 1/2 to 10 inches long and 1/4 to 3/4 inch in width. Blades are flat

and have a rough texture on both surfaces. The lead ligule is membranous and long. The compact panicles are erect or slightly spreading (depending on the plant's reproductive stage), and range from 3 to 16 inches long with branches 2 to 12 inches in length. Single flowers occur in dense clusters in May to mid-June. They are green to purple at first and change to beige over time. This grass is one of the first to sprout in spring, and forms a thick rhizome system that dominates the subsurface soil. Seeds are shiny brown in color.

Both Eurasian and native ecotypes of reed canary grass are thought to exist in the U.S. The Eurasian variety is considered more aggressive, but no reliable method exists to tell the ecotypes apart. It is believed that the vast majority of our reed canary grass is derived from the Eurasian ecotype. Agricultural cultivars of the grass are widely planted.

Reed canary grass is a cool-season, sod-forming, perennial wetland grass native to temperate regions of Europe, Asia, and North America. The Eurasian ecotype has been selected for its vigor and has been planted throughout the U.S. since the 1800's for forage and erosion control. It has become naturalized in much of the northern half of the U.S., and is still being planted on steep slopes and banks of ponds and created wetlands.

Reed canary grass can grow on dry soils in upland habitats and in the partial shade of oak woodlands, but does best on fertile, moist organic soils in full sun. This species can invade most types of wetlands, including marshes, wet prairies, sedge meadows, fens, stream banks, and seasonally wet areas; it also grows in disturbed areas such as berms and spoil piles.

Reed canary grass reproduces by seed or creeping rhizomes. It spreads aggressively. The plant produces leaves and flower stalks for 5 to 7 weeks after germination in early spring and then spreads laterally. Growth peaks in mid-June and declines in mid-August. A second growth spurt occurs in the fall. The shoots collapse in mid to late summer, forming a dense, impenetrable mat of stems and leaves. The seeds ripen in late June and shatter when ripe. Seeds may be dispersed from one wetland to another by waterways, animals, humans, or machines.

This species prefers disturbed areas, but can easily move into native wetlands. Reed canary grass can invade a disturbed wetland in just a few years. Invasion is associated with disturbances including ditching of wetlands, stream channelization, and deforestation of swamp forests, sedimentation, and intentional planting. The difficulty of selective control makes reed canary grass invasion of particular concern. Over time, it forms large, monotypic stands that harbor few other plant species and are subsequently of little use to wildlife. Once established, reed canary grass dominates an area by building up a tremendous seed bank that can eventually erupt, germinate, and recolonize treated sites.

Reed canary grass is located in a few locations along the shoreland of Red Lake, but these have not become monotypic stands that impair the normal function of wetlands. While this should be monitored with other AIS, this is not considered an issue at this time.



Figure 23: Reed Canary Grass (not from Red Lake)

NON-NATIVE AQUATIC INVASIVE ANIMAL SPECIES

Several non-vegetative, aquatic, invasive species are in nearby lakes, but have not been identified in Red Lake. It is important for lake property owners and users to be knowledgeable of these species in order to identify them if and when they show up in Red Lake.

CHINESE AND BANDED MYSTERY SNAILS

Neither Chinese mystery snails nor Banded mystery snails have not been identified in Red Lake, but do exist in other local waters including Upper St. Croix Lake and the St. Croix Flowage.

Chinese mystery snails and banded mystery snails (Figure 24) are non-native snails that have been found in a number of Wisconsin lakes. There is not a lot yet known about these species, however, it appears that they have a negative effect on native snail populations. The mystery snail's large size and hard operculum (a trap door cover which protects the soft flesh inside), and their thick hard shell make them less edible by predators and less susceptible to pesticides.

The female mystery snail gives birth to live crawling young. This may be an important factor in their spread as it only takes one impregnated snail to start a new population. Mystery snails thrive in silt and mud areas although they can be found in lesser numbers in areas with sand or rock substrates. They are found in lakes, ponds, irrigation ditches, and slower portions of streams and rivers. They are tolerant of pollution and often thrive in stagnant water areas. Mystery snails can be found in water depths of 0.5 to 5 meters (1.5 to 15 feet). They tend to reach their maximum population densities around 1-2 meters (3-6 feet) of water depth. Mystery snails do not eat plants. Instead, they feed on detritus and in lesser amounts algae and phytoplankton. Thus removal of plants in your shoreline area will not reduce the abundance of mystery snails.

Lakes with high densities of mystery snails often see large die-offs of the snails. These die-offs are related to the lake's warming coupled with low oxygen (related to algal blooms). Mystery snails cannot tolerate low oxygen levels. High temperatures by themselves seem insufficient to kill the snails as the snails could move into deeper water.

Many lake residents are worried about mystery snails being carriers of the swimmer's itch parasite. In theory they are potential carriers, however, because they are an introduced species and did not evolve as part of the lake ecosystem, they are less likely to harbor the swimmer's itch parasites.



Figure 24: Chinese Mystery Snails (left) and Banded Mystery Snails (right) (not from Red Lake)

RUSTY CRAYFISH

Rusty crayfish have not been identified in Red Lake, but they can be found in several nearby lakes including Upper Saint Croix Lake and the Minong Flowage.

Rusty crayfish (Figure 25) live in lakes, ponds and streams, preferring areas with rocks, logs and other debris in water bodies with clay, silt, sand or rocky bottoms. They typically inhabit permanent pools and fast moving streams of fresh, nutrient-rich water. Adults reach a maximum length of 4 inches. Males are larger than females upon maturity and both sexes have larger, heartier, claws than most native crayfish. Dark “rusty” spots are usually apparent on either side of the carapace, but are not always present in all populations. Claws are generally smooth, with grayish-green to reddish-brown coloration. Adults are opportunistic feeders, feeding upon aquatic plants, benthic invertebrates, detritus, juvenile fish and fish eggs.

The native range of the rusty crayfish includes Ohio, Tennessee, Kentucky, Indiana, Illinois and the entire Ohio River basin. However, this species may now be found in Michigan, Massachusetts, Missouri, Iowa, Minnesota, New York, New Jersey, Pennsylvania, Wisconsin, New Mexico and the entire New England state area (except Rhode Island). The Rusty crayfish has been a reported invader since at least the 1930’s. Its further spread is of great concern since the prior areas of invasion have led to severe impacts on native flora and fauna. It is thought to have spread by means of released game fish bait and/or from aquarium release. Rusty crayfish are also raised for commercial and biological harvest.

Rusty crayfish reduce the amount and types of aquatic plants, invertebrate populations, and some fish populations--especially bluegill, smallmouth and largemouth bass, lake trout and walleye. They deprive native fish of their prey and cover and out-compete native crayfish. Rusty crayfish will also attack the feet of swimmers. On the positive side, rusty crayfish can be a food source for larger game fish and are commercially harvested for human consumption.

Rusty crayfish may be controlled by restoring predators like bass and sunfish populations. Preventing further introduction is important and may be accomplished by educating anglers, trappers, bait dealers and science teachers of their hazards. Use of chemical pesticides is an option, but does not target this species and will kill other aquatic organisms.

It is illegal to possess both live crayfish and angling equipment simultaneously on any inland Wisconsin water (except the Mississippi River). It is also illegal to release crayfish into a water of the state without a permit.

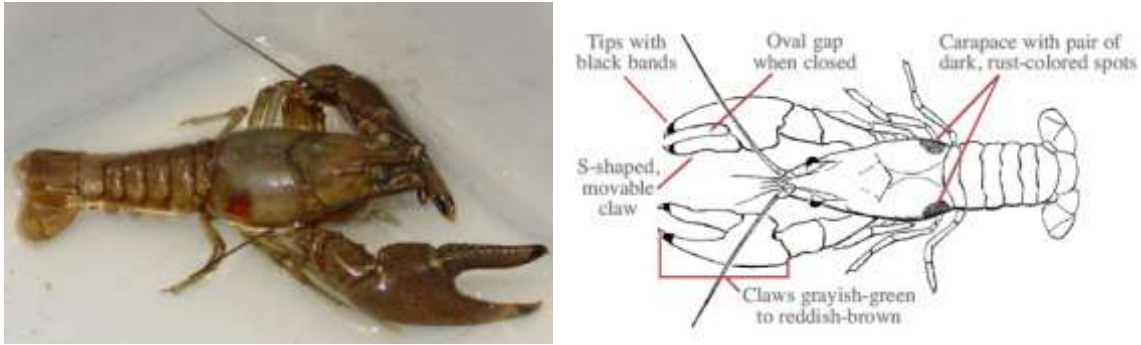


Figure 25: Rusty Crayfish and identifying characteristics

ZEBRA MUSSELS

Zebra mussels have not been identified in Red Lake but are present in feeder waters of Lake Superior and in Big McKenzie Lake in Washburn County.

Zebra mussels (Figure 26) are an invasive species that have inhabited Wisconsin waters and are displacing native species, disrupting ecosystems, and affecting citizens' livelihoods and quality of life. They hamper boating, swimming, fishing, hunting, hiking, and other recreation, and take an economic toll on commercial, agricultural, forestry, and aquacultural resources. The zebra mussel is a tiny (1/8-inch to 2-inch) bottom-dwelling clam native to Europe and Asia. Zebra mussels were introduced into the Great Lakes in 1985 or 1986, and have been spreading throughout them since that time. They were most likely brought to North America as larvae in ballast water of ships that traveled from fresh-water Eurasian ports to the Great Lakes. Zebra mussels look like small clams with a yellowish or brownish D-shaped shell, usually with alternating dark- and light-colored stripes. They can be up to two inches long, but most are under an inch. Zebra mussels usually grow in clusters containing numerous individuals.

Zebra mussels feed by drawing water into their bodies and filtering out most of the suspended microscopic plants, animals and debris for food. This process can lead to increased water clarity and a depleted food supply for other aquatic organisms, including fish. The higher light penetration fosters growth of rooted aquatic plants which, although creating more habitat for small fish, may inhibit the larger, predatory fish from finding their food. This thicker plant growth can also interfere with boaters, anglers and swimmers. Zebra mussel infestations may also promote the growth of blue-green algae, since they avoid consuming this type of algae but not others.

Zebra mussels attach to the shells of native mussels in great masses, effectively smothering them. A survey by the Army Corps of Engineers in the East Channel of the Mississippi River at Prairie du Chien revealed a substantial reduction in the diversity and density of native mussels due to Zebra Mussel infestations. The East Channel provides habitat for one of the best mussel beds in the Upper Mississippi River. Future efforts are being considered to relocate such native mussel beds to waters that are less likely to be impacted by zebra mussels.

Once zebra mussels are established in a water body, very little can be done to control them. It is therefore crucial to take all possible measures to prevent their introduction in the first place. Some of the preventative and physical control measures include physical removal, industrial vacuums, and back flushing.

Chemical applications include solutions of chlorine, bromine, potassium permanganate and even oxygen deprivation. An ozonation process is under investigation (patented by Bollyky Associates Inc.) which involves the pumping of high concentrations of dissolved ozone into the intake of raw water pipes. This method only

works in controlling veligers, and supposedly has little negative impacts on the ecosystem. Further research on effective industrial control measures that minimize negative impacts on ecosystem health is needed.



Figure 26: Zebra Mussels

While zebra mussels have not been identified in Red Lake, they have been found in western Washburn County in 2016. This was the first time that zebra mussels had been found in Northwestern Wisconsin. This discovery led to the development of a suitability model for zebra mussel habitat. While the suitability of Red Lake is currently unknown, monitoring and prevention should remain a top priority for the RLA.

AIS PREVENTION STRATEGY

Red Lake currently only has one established AIS, but there are many more that could be introduced to the lake. The RLA has and will continue to implement a watercraft inspection and AIS Signage program at the public boat landing on the lake. Information will be shared with lake residents and users in an effort to expand the watercraft inspection message. In addition to the watercraft inspection program, an in-lake and shoreland AIS monitoring program should be implemented. Both of these programs will follow UW-Extension Lakes and WDNR protocol through the Clean Boats, Clean Waters program and the Citizen Lake Monitoring Network Aquatic Invasive Species Monitoring program.

Additionally, having an educated and informed lake constituency is the best way to control existing AIS and to keep new non-native AIS from entering the lake. To foster this, the RLA should host and/or sponsor lake community events including AIS identification and management workshops; distribute education and information materials to lake property owners and lake users through the newsletter, webpage, and general mailings.

MANAGEMENT ALTERNATIVES

Nuisance aquatic plants can be managed a variety of ways in Wisconsin. The best management strategy will be different for each lake and depends on which nuisance species needs to be controlled, how widespread the problem is, and the other plants and wildlife in the lake. In many cases, an integrated approach to aquatic plant management that utilizes a number of control methods is necessary. The eradication of non-native aquatic invasive plant species such as EWM or CLP is generally not feasible, but preventing them from becoming a more significant problem is an attainable goal. It is important to remember however, that regardless of the plant species targeted for control, sometimes no manipulation of the aquatic plant community is the best management option. Plant management activities can be disruptive to a lake ecosystem and should not be done unless it can be shown they will be beneficial and occur with minimal negative ecological impacts.

Management alternatives for nuisance aquatic plants can be grouped into four broad categories: manual and mechanical removal, chemical application, biological control, and physical habitat alteration. Manual and mechanical removal methods include pulling, cutting, raking, harvesting, suction harvesting, and other means of removing the physical plant from the water. Chemical application is typified by the use of herbicides that kill or impede the growth of the aquatic plant. Biological control methods include organisms that use the plant for a food source or parasitic organisms that use the plant as a host, killing or weakening it. Biological control may also include the use of species that compete successfully with the nuisance species for resources. Physical habitat alteration includes dredging, installing lake-bottom covers, manipulating light penetration, flooding, and drawdown. It may also include making changes to or in the watershed of a body of water to reduce nutrients going in.

Each of the above control categories are regulated by the WDNR and most activities require a permit from the WDNR to implement. Mechanical harvesting of aquatic plants and under certain circumstances, physical removal of aquatic plants, is regulated under Wisconsin Administrative Rule NR 109 (Appendix A). The use of chemicals and biological controls are regulated under Administrative Rule NR 107 (Appendix B). Certain habitat altering techniques like the installation of bottom covers and dredging require a Chapter 30/31 waterway protection permit. In addition, anytime wild rice is involved one or more of these permits will be required.

Informed decision-making on aquatic plant management implementation requires an understanding of plant management alternatives and how appropriate and acceptable each alternative is for a given lake. The following sections list scientifically recognized and approved alternatives for controlling aquatic vegetation.

NO MANAGEMENT

When evaluating the various management techniques, the assumption is erroneously made that doing nothing is environmentally neutral. In dealing with nonnative species like EWM, the environmental consequences of doing nothing may be high, possibly even higher than any of the effects of management techniques. Unmanaged, these species can have severe negative effects on water quality, native plant distribution, abundance and diversity, and the abundance and diversity of aquatic insects and fish (Madsen, 1997). Nonindigenous aquatic plants are the problem, and the management techniques are the collective solution. Nonnative plants are a biological pollutant that increases geometrically, a pollutant with a very long residence time and the potential to "biomagnify" in lakes, rivers, and wetlands (Madsen, 2000).

Foregoing any management of EWM in Red Lake is not a recommended option. To keep EWM from causing greater harm, some form of EWM management will need to be implemented.

HAND-PULLING/MANUAL REMOVAL

Manual or physical removal of aquatic plants by means of a hand-held rake or cutting implement; or by pulling the plants from the lake bottom by hand is allowed by the WDNR without a permit per NR 109.06 Waivers under the following conditions:

- Removal of native plants is limited to a single area with a maximum width of no more than 30 feet measured along the shoreline provided that any piers, boatlifts, swim rafts and other recreational and water use devices are located within that 30-foot wide zone and may not be in a new area or additional to an area where plants are controlled by another method (Figure 27)
- Removal of nonnative or invasive aquatic plants as designated under s. NR 109.07 is unlimited if performed in a manner that does not harm the native aquatic plant community
- Removal of dislodged aquatic plants that drift on-shore and accumulate along the waterfront is completed.
- The area of removal is not located in a sensitive area as defined by the department under s. NR 107.05 (3) (i) 1, or in an area known to contain threatened or endangered resources or floating bogs
- Removal does not interfere with the rights of other riparian owners
- If wild rice is involved, the procedures of s. NR 19.09 (1) (Appendix C) are followed.

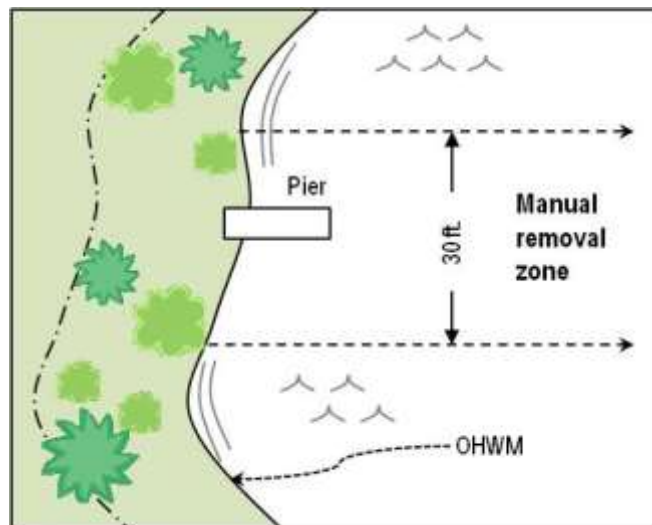


Figure 27: Aquatic vegetation manual removal zone

Although up to 30 feet of aquatic vegetation can be removed, removal should only be done to the extent necessary. There is no limit as to how far out into the lake the 30-ft zone can extend, however clearing large swaths of aquatic plants not only disrupts lake habits, it also creates open areas for non-native species to establish. Physical removal of aquatic plants requires a permit if the removal area is located in a “sensitive” or critical habitat area previously designated by the WDNR. Manual or physical removal can be effective at controlling individual plants or small areas of plant growth. It limits disturbance to the lake bottom, is inexpensive, and can be practiced by many lake residents. In shallow, hard bottom areas of a lake, or where impacts to fish spawning habitat need to be minimized, this is the best form of control. If water clarity in a body of water is such that aquatic plants can be seen in deeper water, pulling aquatic invasive species while snorkeling or scuba diving is also allowable without a permit according to the conditions in NR 106.06(2) and can be effective at slowing the spread of a new aquatic invasive species infestation within a lake when done properly.

Larger scale hand or diver removal projects have had positive impacts in temporarily reducing or controlling aquatic invasive species. Typically hand or diver removal is used when AIS has been newly identified and still

exists as single plants or isolated small beds, but at least in one lake in New York State, it was used as a means to control a large-scale infestation of EWM. Kelting and Laxson (2010) reported that from 2004 to 2006 an “intensive management effort” which involved “the selective removal of Eurasian water milfoil using diver hand harvesting of the entire littoral zone of the lake at least twice each summer for three years” followed by three years of maintenance management successfully reduced the overall distribution of EWM in the lake.

In Red Lake, many of the areas of EWM may be best managed by hand-pulling/manual removal. The RLA should start to work with residents on the lake to teach them how to identify non-native aquatic plant species and how to properly remove them from around their docks and in their swimming areas.

DIVER ASSISTED SUCTION HARVESTING

Diver assisted suction harvesting or DASH, as it is often called, is a fairly recent aquatic plant removal technique. It is called "harvesting" rather than "dredging" because, although a specialized small-scale dredge is used, bottom sediment is not removed from the system. The operation involves hand-pulling of weeds from the lake bed and inserting them into an underwater vacuum system that sucks up plants and their root systems taking them to the surface. It requires water pumps on the surface (generally on a pontoon system) to move a large volume of water to maintain adequate suction of materials that the divers are processing (Figure 28). Only clean water goes through the pump. The material placed by the divers into the suction hose along with the water is deposited into mesh bags on the surface with the water leaving through the holes in the bag. The bags have a large enough 'mesh' size so that silts, clay, leaves and other plant material being collected do not immediately clog them and block water movement. If a fish or other living marine life is sucked into the suction hose it comes out the discharge unharmed and is returned to the body of water. It can have some negative impacts to other nearby non-target plants if not done carefully, particularly those plants that are perennials and expand their populations by sub-sediment runners (Eichler, Bombard, Sutherland, & Boylen, 1993).

In Wisconsin and Michigan, suction harvesting of unwanted aquatic plants is gaining popularity as a treatment method. There are several companies in the mid-west that are offering DASH services. Some of these companies are also building equipment that lake organizations and consultants can purchase to start up their own DASH program. Aquacleaner Environmental, out of Lancaster, NY sells DASH systems of different sizes based on the needs of a given lake. The following is a clip from their website: www.aquacleaner.com last accessed by LEAPS on April 27, 2018.

“Aquacleaner Environmental is the leader in suction harvesting technology with over 12 years of experience manufacturing and performing service work with our equipment. Our large-lake DASH (diver assisted suction harvesting) Boats offer the most efficient machines that we can manufacture with twin pumps that allow multiple divers to fill our filtration bags with ease. We offer you a variety of choices in size, configuration and bagging options for our machines that will work best for your individual needs as well as a comprehensive training program to maximize your productivity... Suction Harvesting offers a true form of remediation of your waterfront problems and is not a band-aid like chemicals, bottom barriers or weed harvesters.”

More locally, TSB Lakefront Restoration and Diving () out of Chippewa Falls, WI offers contracted DASH services, traditional mechanical harvesting, and physical removal of aquatic plants. The following is a clip from their website: www.tsblakefrontrestorationanddiving.com last accessed by LEAPS on April 27, 2018.

“Welcome to TSB Lakefront Restoration & Diving. We specialize in a variety of services to meet your needs. We are based out of the Eau Claire/ Chippewa Falls area, but are willing to travel! We offer multiple services, including: Aquatic Weed Removal • Log/Stump Removal • Underwater Services • Shore Line Restoration/Cleanup • Golf Ball Retrieval/Sales and more. Check out our website or call us at 715-828-5530 for more information.”

Many Waters, LLC (<http://www.manywatersconsulting.com>) out of Iron River, MI has been providing DASH services in northeastern WI for several years. For more information about what they offer and costs

for services contact them at barb@manywatersconsulting.com or 715.617.4688. Also look for them on Facebook.



Figure 28: DASH - Diver Assisted Suction Harvest (Aquacleaner Environmental; Many Waters, LLC)

DASH could be an effective way to manage small areas of EWM in Red Lake, provided the conditions for harvest are conducive to it. Currently, the smaller beds of EWM could be effectively managed with DASH.

MECHANICAL REMOVAL

Mechanical management involves the use of devices not solely powered by human as a means to aid removal. This includes gas and electric motors, ATV's, boats, tractors, etc. Using these instruments to pull, cut, grind, or rotovate aquatic plants is illegal in Wisconsin without a permit. DASH is also considered mechanical removal. To implement mechanical removal of aquatic plants a Mechanical/Manual Aquatic Plant Control Application is required annually. The application is reviewed by the WDNR and other entities and a permit awarded if required criteria are met. Using repeated mechanical disturbance such as bottom rollers or

sweepers can be effective at control in small areas, but in Wisconsin these devices are illegal and generally not permitted.

LARGE-SCALE MECHANICAL HARVESTING

Large-scale mechanical harvesting is more traditionally used for control of CLP, but can be an effective way to reduce EWM biomass in a water body. It is typically used to open up channels through existing beds of EWM to improve access for both human related activities like boating, and natural activities like fish distribution and mobility on lakes in maintenance mode where EWM is well-established and restoration efforts have been discontinued.

Aquatic plant harvesters are floating machines that cut and remove vegetation from the water. The size, and consequently the harvesting capabilities, of these machines vary greatly. As they move, harvesters cut a swath of aquatic plants that is between 4 and 20 feet wide, and can be up to 10 feet deep. The on-board storage capacity of a harvester ranges from 100 to 1,000 cubic feet (by volume) or 1 to 8 tons (by weight). Most harvesters can cut between 2 and 8 acres of aquatic vegetation per day, and the average lifetime of a mechanical harvester is 10 years.

Mechanical harvesting of aquatic plants presents both positive and negative consequences to any lake. Its results - open water and accessible boat lanes - are immediate, and can be enjoyed without the restrictions on lake use which follow herbicide treatments. In addition to the human use benefits, the clearing of thick aquatic plant beds may also increase the growth and survival of some fish. By eliminating the upper canopy, harvesting reduces the shading caused by aquatic plants. The nutrients stored in the plants are also removed from the lake, and the sedimentation that would normally occur as a result of the decaying of this plant matter is prevented. Additionally, repeated treatments may result in thinner, more scattered growth.

Aside from the obvious effort and expense of harvesting aquatic plants, there are many environmentally-detrimental consequences to consider. The removal of aquatic species during harvesting is non-selective. Native and invasive species alike are removed from the target area. This loss of plants results in a subsequent loss of the functions they perform, including sediment stabilization and wave absorption. Shoreline erosion may therefore increase. Other organisms such as fish, reptiles, and insects are often displaced or removed from the lake in the harvesting process. This may have adverse effects on these organisms' populations as well as the lake ecosystem as a whole.

Much like mowing a lawn, harvesting must be conducted numerous times throughout the growing season. Although the harvester collects most of the plants that it cuts, some plant fragments inevitably persist in the water. This may allow the invasive plant species to propagate and colonize in new, previously unaffected areas of the lake. Harvesting may also result in re-suspension of contaminated sediments and the excess nutrients they contain.

Disposal sites are a key component when considering the mechanical harvesting of aquatic plants. The sites must be on shore and upland to make sure the plants and their reproductive structures don't make their way back into the lake or to other lakes. The number of available disposal sites and their distance from the targeted harvesting areas will determine the efficiency of the operation, in terms of time as well as cost.

Timing is also important. The ideal time to harvest, in order to maximize the efficiency of the harvester, is just before the aquatic plants break the surface of the lake. For CLP, it should also be before the plants form turions (reproductive structures) to avoid spreading the turions within the lake. If the harvesting work is contracted, the equipment should be inspected before and after it enters the lake. Since these machines travel from lake to lake, they may carry plant fragments with them, and facilitate the spread of aquatic invasive species from one body of water to another. There is currently only one harvesting contractor in Northwestern Wisconsin, so there is little flexibility in terms of scheduling.

Using mechanical harvesting to manage EWM is not recommended on Red Lake. The level of EWM in Red Lake does not warrant management at this scale, and would likely do nothing more than exacerbate the issue by aiding in the spread

SMALL-SCALE MECHANICAL HARVESTING

There are a wide range of small-scale mechanical harvesting techniques, most of which involve the use of boat mounted rakes, scythes, and electric cutters. As with all mechanical harvesting, removing the cut plants is required. Commercial rakes and cutters range in prices from \$200 for rakes to around \$3000 for electric cutters with a wide range of sizes and capacities. Using a weed rake or cutter that is run by human power is allowed without a permit, but the use of any device that includes a motor, gas or electric, would require a permit. Dragging a bed spring or bar behind a boat, tractor or any other motorized vehicle to remove vegetation is also illegal without a permit. Although not truly considered mechanical management, incidental plant disruption by normal boat traffic is a legal method of management. Active use of an area is often one of the best ways for riparian owners to gain navigation relief near their docks. Most aquatic plants won't grow well in an area actively used for boating and swimming. It should be noted that purposefully navigating a boat to clear large areas is not only potentially illegal it can also re-suspend sediments, encourage aquatic invasive species growth, and cause ecological disruptions.

Small-scale harvesting by human power can be used to help manage EWM on Red Lake, but no form of mechanical harvesting should take place because it would only aid in the spread of EWM throughout the lake.

BOTTOM BARRIERS AND SHADING

Physical barriers, fabric or other, placed on the bottom of the lake to reduce EWM growth would eliminate all plants, inhibit fish spawning, affect benthic invertebrates, and could cause anaerobic conditions which may release excess nutrients from the sediment. Gas build-up beneath these barriers can cause them to dislodge from the bottom and sediment can build up on them allowing EWM to re-establish. Bottom barriers are typically used for very small areas and provide only limited relief. Currently the WDNR does not permit this type of control.

Creating conditions in a lake that may serve to shade out EWM growth has also been tried with mixed success. The general intention is to reduce light penetration in the water which in turns limits the depth at which plants can grow. Typically dyes have been added to a small water body to darken the water. Bottom barriers and attempts to further reduce light penetration in Red Lake are not recommended.

DREDGING

Dredging is the removal of bottom sediment from a lake. Its success is based on altering the target plant's environment. It is not usually performed solely for aquatic plant management but rather to restore lakes that have been filled in with sediment, have excess nutrients, inadequate pelagic and hypolimnetic zones, need deepening, or require removal of toxic substances (Peterson, 1982). In shallow lakes with excess plant growth, dredging can make areas of the lake too deep for plant growth. It can also remove significant plant root structures, seeds turions, rhizomes, tubers, etc. In Collins Lake, New York the biomass of curly-leaf pondweed remained significantly lower than pre-dredging levels 10-yrs after dredging (Tobiessen, Swart, & Benjamin, 1992). Dredging is very expensive, requires disposal of sediments, and has major environmental impacts. It is not a selective procedure so it can't be used to target any one particular species with great success except under extenuating circumstances. Dredging at any level must be permitted by the WDNR. It should not be performed for aquatic plant management alone. It is best used as a multipurpose lake remediation technique (Madsen, 2000).

Dredging is not a recommended management action for Red Lake.

DRAWDOWN

Drawdown, like dredging, alters the plant environment by removing all water in a water body to a certain depth, exposing bottom sediments to seasonal changes including temperature and precipitation. A winter drawdown is a low cost and effective management tool for the long-term control of certain susceptible species of nuisance aquatic plants. Winter drawdown has been shown to be an effective control measure for EWM, but typically only provides 2-3 years of relief before EWM levels return to pre-drawdown levels. A winter drawdown controls susceptible aquatic plants by dewatering a portion of the lake bottom over the winter, and subsequently exposing vascular plants to the combined effect of freezing and desiccation (drying). The effectiveness of drawdown to control plants hinges on the combined effect of the freezing and drying. If freezing and dry conditions are not sustained for 4-6 weeks, the effectiveness of the drawdown may be reduced.

It is not possible to draw down Red Lake as there is no viable outlet. As a seepage lake, the water level in Red Lake can fluctuate greatly with the environmental conditions present at any given time. Under drought conditions the lake level will be very low. Under more normal conditions the lake level may be normal or even high.

BIOLOGICAL CONTROL

Biological control involves using one plant, animal, or pathogen as a means to control a target species in the same environment. The goal of biological control is to weaken, reduce the spread, or eliminate the unwanted population so that native or more desirable populations can make a comeback. Care must be taken however, to insure that the control species does not become as big a problem as the one that is being controlled. A special permit is required in Wisconsin before any biological control measure can be introduced into a new area.

EWM WEEVILS

While many biological controls have been studied, only one has proven to be effective at controlling EWM under the right circumstances. *Euhrychiopsis lecontei* is an aquatic weevil native to Wisconsin that feed on aquatic milfoils (Figure 29). Their host plant is typically northern watermilfoil; however they seem to prefer EWM when it is available. Milfoil weevils are typically present in low numbers wherever northern or Eurasian water milfoil is found. They often produce several generations in a given year and over winter in undisturbed shorelines around the lake. All aspects of the weevil's life cycle can affect the plant. Adults feed on the plant and lay their eggs. The eggs hatch and the larva feed on the plant. As the larva mature they eventually burrow into the stem of the plant. When they emerge as adults later, the hole left in the stem reduces buoyancy often causing the stem to collapse. The resulting interruption in the flow of carbohydrates to the root crowns reduces the plant's ability to store carbohydrates for over wintering reducing the health and vigor (Newman, Holmberg, Biesboer, & Penner, 1996).



Figure 29: EWM weevil

The weevil is not a silver bullet. They do not work in all situations. The extent to which weevils exist naturally in a lake, adequate shore land over wintering habitat, the population of bluegills and sunfish in a system, and water quality characteristics are all factors that have been shown to affect the success rate of the weevil. Weevil rearing is not recommended, but would not hurt if there were interested people to do so on the lake.

OTHER BIOLOGICAL CONTROLS

There are other forms of biological control being used or researched. It was thought at one time that the introduction of plant eating carp could be successful. It has since been shown that these carp have a preference list for certain aquatic plants. EWM is very low on this preference list (Pine & Anderson, 1991). Use of “grass carp” as they are referred to in Wisconsin is illegal as there are many other environmental concerns including what happens once the target species is destroyed, removal of the carp from the system, impacts to other fish and aquatic plants, and preventing escapees into other lakes and rivers. Several pathogens or fungi are currently being researched that when introduced by themselves or in combination with herbicide application can effectively control EWM and lower the concentration of chemical used or the time of exposure necessary to kill the plant (Sorsa, Nordheim, & Andrews, 1988). None of these have currently been approved for use in Wisconsin and are not recommended for use on Red Lake.

CHEMICAL CONTROL

Aquatic herbicides are granules or liquid chemicals specifically formulated for use in water to kill plants or cease plant growth. Herbicides approved for aquatic use by the U.S. Environmental Protection Agency (EPA) are considered compatible with the aquatic environment when used according to label directions. Some individual states, including Wisconsin, also impose additional constraints on herbicide use.

The Wisconsin Department of Natural Resources evaluates the benefits of using a particular chemical at a specific site vs. the risk to non-target organisms, including threatened or endangered species, and may stop or limit treatments to protect them. The Department frequently places conditions on a permit to require that a minimal amount of herbicide is needed and to reduce potential non-target effects, in accordance with best management practices for the species being controlled. For example, certain herbicide treatments are required by permit conditions to be in spring because they are more effective, require less herbicide and reduce harm to native plant species. Spring treatments also means that, in most cases, the herbicide will be degraded by the time peak recreation on the water starts.

The WDNR encourages minimal herbicide use by requiring a strategic Aquatic Plant Management Plan for management projects over 10 acres or 10% of the water body or any projects receiving state grants. WDNR also requires consideration of alternative management strategies and integrated management strategies on permit applications and in developing an APM plan, when funding invasive species prevention efforts, and by

encouraging the use of best management practices when issuing a permit. The Department also supervises treatments, requires that adjacent landowners are notified of a treatment and are given an opportunity to request a public meeting if they want, requires that the water body is posted to notify the public of treatment and usage restrictions, and requires reporting after treatment occurs.

The advantages of using chemical herbicides for control of aquatic plant growth are the speed, ease and convenience of application, the relatively low cost, and the ability to somewhat selectively control particular plant types with certain herbicides. Disadvantages of using chemical herbicides include possible toxicity to aquatic animals or humans, oxygen depletion after plants die and decompose which can cause fishkills, a risk of increased algal blooms as nutrients are released into the water by the decaying plants, adverse effects on desirable aquatic plants, loss of fish habitat and food sources, water use restrictions, and a need to repeat treatments due to existing seed/turion banks and plant fragments. Chemical herbicide use can also create conditions favorable for non-native aquatic invasive species to outcompete native plants (for example, areas of stressed native plants or devoid of plants).

When properly applied, the possible negative impacts of chemical herbicide use can be minimized. Early spring to early summer applications are preferred because exotic species are actively growing and many native plants are dormant, thus limiting the loss of desirable plant species; plant biomass is relatively low minimizing the impacts of de-oxygenation and contribution of organic matter to the sediments; fish spawning has ceased; and recreational use is generally low limiting human contact. The concentration and amount of herbicides can be reduced because colder water temperatures enhance the herbicidal effects. Selectivity of herbicides can be increased with careful selection of application rates and seasonal timing. Lake characteristics must also be considered; steep drop-offs, inflowing waters, lake currents and wind can dilute chemical herbicides or increase herbicide drift and off-target injury. This is an especially important consideration when using herbicides near environmentally sensitive areas or where there may be conflicts with other water uses in the treatment vicinity.

HOW CHEMICAL CONTROL WORKS

Aquatic herbicides are sprayed directly onto floating or emergent aquatic plants or are applied to the water in either a liquid or granular form. Herbicides affect plants through either systemic or direct contact action. Systemic herbicides are capable of killing the entire plant. Contact herbicides cause the parts of the plant in contact with the herbicide to die back, leaving the roots alive and able to re-grow.

Herbicides can be classified as broad-spectrum (kill or injure a wide variety of plant species) or selective (effective on only certain species). Non-selective, broad spectrum herbicides will generally affect all plants that they come in contact with. Selective herbicides will affect only some plants. Often dicots, like Eurasian watermilfoil, will be affected by selective herbicides whereas monocots, such as certain broad-leaf pondweeds will not be affected. The selectivity of a particular herbicide can be influenced by the method, timing, formulation, and concentration used.

Sonar® whose active ingredient is fluridone, is a broad spectrum herbicide that interferes with the necessary processes in a plant that create the chlorophyll needed to turn sunlight into plant food through a process called photosynthesis. Rodeo® whose active ingredient is glyphosate is another broad spectrum herbicide that prevents an aquatic plant from making the protein it needs to grow. As a result the treated plant stops growing and eventually dies.

2,4-D and triclopyr are active ingredients in several selective herbicides including Shredder®, Navigate®, DMA 4®, and Renovate®. These herbicides stimulate plant cell growth causing them to rupture, but primarily in dicots. These herbicides are considered selective as they have little to no effect on monocots in treated areas. Fluridone, glyphosate, 2,4-D, and triclopyr are all considered systemic. When applied to the treatment area, plants in the treatment area draw the herbicide in through the leaves, stems, and roots killing

all of the plant, not just the part that comes in contact with the herbicide. Presently, triclopyr based herbicides are more expensive than 2, 4-D based herbicides, but could be used in a similar fashion to control undesirable AIS.

Research done with triclopyr in 2014 (Vassios, Nissen, Koschnick, & Heilman, 2014) suggest that there is a difference between how the target plant is affected when using liquid or granular formulations of triclopyr. In short, liquid applications of triclopyr tend to build up quicker in the meristem or growing tip of EWM, while granular applications tend to build up more in the root crown of EWM. The indication was that perhaps treating a body of water with both the granular and liquid formulation of the herbicide would affect a greater area of the plant providing better results than either formulation alone. This research was only completed using triclopyr, but it may have some application with 2,4-D as well, and it would be interesting to complete a test treatment using this method.

Aquathol whose active ingredient is endothall; Reward whose active ingredient is diquat; and Cutrine whose active ingredient is a form of copper are considered broad spectrum contact herbicides. They destroy the outer cell membrane of the material they come in contact with and therefore kill a plant very quickly. None of these three are considered selective and have the potential to kill all of the plant material that they come in contact with regardless of the species. As such, great care should be taken when using these products. Certain plant species like curly-leaf pondweed begin growing very early in the spring, even under the ice, and are often the only growing plants present at that time. This is a good time to use a contact herbicide like Aquathol, as few other plants would be impacted. Using these products later in the season, will kill all vegetation in contact with the herbicide and can provide substantial nuisance relief from a variety of aquatic plants.

It is possible to apply more than one herbicide at a time when trying to establish control of unwanted aquatic vegetation. An example would be controlling EWM and CLP at the same time with an early season application, and controlling aquatic plants and algae at the same time during a mid-season nuisance relief application. Applying systemic and contact herbicides together has a synergistic effect leading to increased selectivity and control. Single applications of the two could result in reduced environmental loading of herbicides and monetary savings via a reduction in the overall amount of herbicide used and of the manpower and number of application periods required to complete the treatment.

EFFICACY OF AQUATIC HERBICIDES

The efficacy of aquatic herbicides is dependent on both application concentration and exposure time, and these factors are influenced by two separate but interconnected processes - dissipation and degradation. Dissipation is the physical movement of the active herbicide within the water column both vertically and horizontally. Dissipation rates are affected by wind, water flow, treatment area relative to untreated area, and water depths. Degradation is the physical breakdown of the herbicide into inert components. Depending on the herbicide utilized, degradation occurs over time either through microbial or photolytic (chemical reactions caused by sunlight exposure) processes.

MICRO AND SMALL-SCALE HERBICIDE APPLICATION

The determining factor in designating chemical treatments as micro or small-scale is the size of the area being treated. Small-scale herbicide application involves treating areas less than 10 acres in size. The dividing line between small-scale and micro treatments is not clearly defined, but is generally considered to be less than an acre. Small-scale chemical application is usually completed in the early season (April through May). Micro treatments are as well, but may be used as follow-up spot treatments after an early season application, or in instances where a new infestation has been identified in a lake with EWM already or in a completely new lake. Recent research related to micro and small-scale herbicide application generally shows that these types of treatment are less effective than larger scale treatments due to rapid dilution and dispersion of the herbicide

applied. Some suggested ways to increase the effectiveness is to increase the concentration of herbicide used, use a contact herbicide like diquat that does not require as long a contact time to effective, or in some manner contain the herbicide in the treated area by artificial means. If combined micro or small-scale treatments exceed 10 acres or 10% of the littoral zone of a lake it is considered a large-scale treatment.

Pre- and post-treatment aquatic plant surveys and testing for herbicide residuals are not required by the WDNR for small-scale treatments. Nor is an approved Aquatic Plant Management Plan if the organization sponsoring the application is not using grant funding to help defer the costs. Even though not required by the WDNR, participating in these activities is recommended as it helps to gain a better understanding of the impact and fate of the chemical used.

LARGE-SCALE HERBICIDE APPLICATION

Large-scale herbicide application involves treating areas more than 10 acres in size. Like small-scale applications, this is usually completed in the early-season (April through May) for control of non-native invasive species like EWM and CLP while minimizing impacts on native species. It is generally accepted that lower concentration of herbicide can be used in large-scale applications as the likelihood of the herbicide staying in contact with the target plant for a longer time is greater. If the volume of water treated is more than 10% of the volume of the lake, or the treatment area is ≥ 160 acres, or 50% of the lakes littoral zone, effects can be expected at a whole-lake scale. Large-scale herbicide application can be extended in some lakes to include whole bay or even whole lake treatments. The bigger the treatment area, the more contained the treatment area, and the depth of the water in the treatment area, are factors that impact how whole bay or whole lake treatments are implemented.

Pre- and post-treatment aquatic plant surveying and having an approved Aquatic Plant Management Plan are required by the WDNR when completing large-scale chemical treatments. Residual testing is not required by the WDNR, but highly recommended to gain a better understanding of the impact and fate of the chemical used. Due to the small-scale nature of EWM within Red Lake, large-scale applications will not likely be necessary in the foreseeable future.

PRE AND POST TREATMENT AQUATIC PLANT SURVEYING

When introducing chemical treatments to lakes where the treatment size is greater than ten acres or greater than 10% of the lake littoral area and more than 150-ft from shore, the WDNR requires pre and post chemical application aquatic plant surveying. The protocol for pre and post treatment survey is applicable for chemical treatment of CLP and EWM.

The WDNR protocol assumes that an Aquatic Plant Management Plan has identified specific goals for non-native invasive species and native plants species. Such goals could include reducing coverage by a certain percent, reducing treatments to below large-scale application designations, and/or reducing density from one level to a lower level. A native plant goal might be to see no significant negative change in native plant diversity, distribution, or density. Results from pre and post treatment surveying are used to improve consistency in analysis and reporting, and in making the next season's management recommendations.

The number of pre and post treatment sampling points required is based on the size of the treatment area. Ten to twenty acres generally requires at least 100 sample points. Thirty to forty acres requires at least 120 to 160 sampling points. Areas larger than 40 acres may require as many as 200 to 400 sampling points. Regardless of the number of points, each designated point is sampled by rake recording depth, substrate type, and the identity and density of each plant pulled out, native or invasive.

In the year prior to an actual treatment, the area to be treated must have a mid-season/summer/warm water point intercept survey completed that identifies the target plant and other plant species that are present. A

pre-treatment aquatic plant survey is done in the year the herbicide is to be applied, prior to application to confirm the presence and level of growth of the target species. A post-treatment survey should be scheduled when native plants are well established, generally mid-July through mid-August. For the post-treatment survey, repeat the PI for all species in the treatment polygons, as was done the previous summer. For whole-lake scale treatments, a full lake-wide PI survey should be conducted.

CHEMICAL CONCENTRATION TESTING

Chemical concentration testing is often done in conjunction with treatment to track the fate of the chemical herbicide used. Testing is completed to determine if target concentrations are met, to see if the chemical moved outside its expected zone, and to determine if the chemical breaks down in the system as expected. Monitoring sites are located both within and outside of the treatment area, particularly in areas that may be sensitive to the herbicide used, where chemical drift may have adverse impacts, where movement of water or some other characteristic may impact the effect of the chemical, and where there may be impacts to drinking and irrigation water. Water samples are collected prior to treatment and for a period of hours and/or days following chemical application.

Chemical concentration testing has never been done on Red Lake, and it is not recommended unless at some future point management efforts exceed 10% of the littoral zone. Chemical concentration testing done on other lakes has shown that application of herbicides in micro or small-scale treatment areas is less effective than treating large areas. Furthermore, chemical application in deep water or along deep water edges reduces the success of chemical management. All of the EWM that has been treated in Red Lake was done in micro or small-scale beds. Documenting the success rate of these treatments through aquatic plant surveys is important for making appropriate management decisions.

HERBICIDE USE IN RED LAKE

2,4-D and Triclopyr are systemic herbicides approved for use in WI to control submersed aquatic vegetation like EWM. Systemic herbicides are meant to kill the entire plant by being absorbed into it. Presently triclopyr based herbicides are more expensive than 2, 4-D based herbicides, but could be used in a similar fashion to control undesirable AIS.

A new herbicide that has just been approved for selective use in WI is ProcellaCOR® with the active ingredient Arylpicolinate, a brand new class of auxin-mimic herbicide which mimics the plant hormone auxin (Netherland & Richardson, 2016). The auxins that are produced naturally within plants stimulate stem elongation while suppressing bud growth. However when auxin concentrations within plant tissues reach a certain threshold, the growth response is completely reversed. The plant begins to, essentially, prepare for a dormant period by stopping growth altogether and abscising leaves. At this point, additional auxins (or their mimics) will become toxic to the plant and result in cell death. Marketing by the SePRO Company indicates ProcellaCOR is selective, meaning it won't hurt the plants that are desirable; lasts longer – keeping treated areas free of EWM without as frequent retreatment; does not pose any human risk; and reduces chemical usage through longer control and less product required for treatment. Fewer chemicals also mean cost savings as an added bonus. According to SePRO, ProcellaCOR specifically targets a hormone mechanism that is unique to plants. Only certain plants will respond to this targeting. ProcellaCOR will move to the root of these plants, preventing them from growing back (SePRO Webpage).

In order to effectively manage EWM, herbicides should be applied early in the season. This will allow EWM to be heavily impacted while native plants, which have not yet begun to grow, will be minimally affected. In Red Lake, there has only been one early season treatment which was completed in late May of 2017. This treatment was completed on 4 acres using liquid diquat (Reward) at the maximum label rate of 2-gal/acre. The 2017 treatment was a part of a rapid response plan to manage EWM.

MANAGEMENT DISCUSSION

The littoral or plant growing zone of Red Lake in 2017 was approximately 228 acres (approximately 90% of the total surface area) in 2017. During the 2017 whole-lake PI survey EWM was not found at any of the 539 points surveyed indicating that EWM is still very much in the pioneering stage in the lake. Meandering surveys of the littoral zone in 2016 and 2017 showed, that although the amount of EWM present is very low, it is present in much of the lake. Survey work in the fall of 2016 found either beds or individual plants at 13 different locations around the lake (Figure 30). The number of locations was down in the fall of 2017, but EWM was still found at three sites, one that was not identified in 2016 (Figure 30). Total beds covered 1.18 acres in 2016 or less than 1% of the littoral zone. Keeping EWM in Red Lake below 1.0% of the littoral zone or <2.28 acres as recorded by annual fall meandering bedmapping is a reasonable goal.

EWM management efforts should include physical and diver removal of individual plants, possible diver-aided suction harvest (DASH), and chemical treatment of any area that meets the definition of a “bed” or “high density” area and reaches a tenth of an acre or more. A “bed” is any place where it is estimated that EWM makes up >50% of the area’s plants and is generally continuous with clearly defined borders. High-density areas are similar but the estimated amount of EWM makes up 25-50% of the area’s plants. Multiple individual plants or towers located in close proximity to each other, even if not officially labeled a bed or high density area should be combined to create larger chemical treatment areas, particularly if physical or diver removal and/or DASH is not incorporated or results in plant parts left rooted in the bottom. This result is more likely to occur in deeper water. Use of chemicals to treat small areas of the lake should not be substituted for physical or diver removal and/or DASH, but rather done in cooperation with these other alternatives.

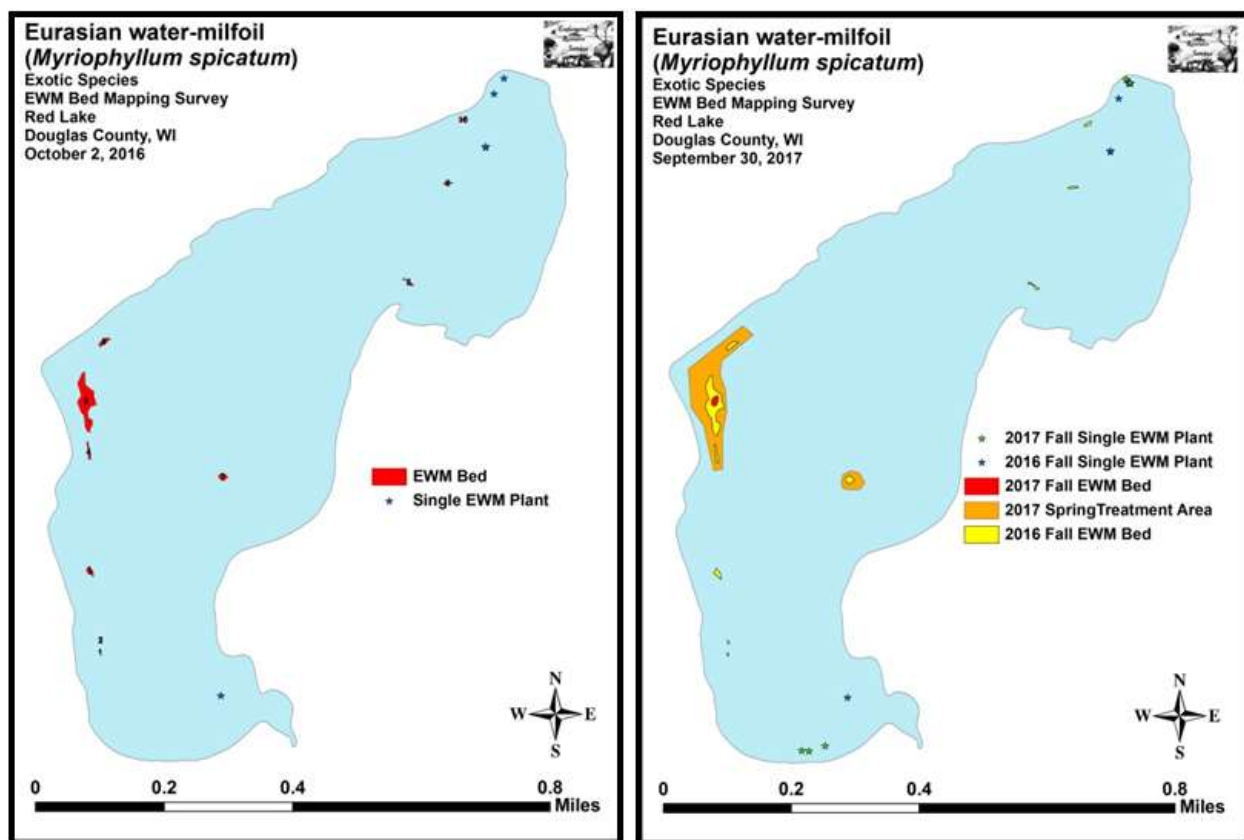


Figure 30: 2016 and 2017 Fall EWM bedmapping results (Berg, 2017)

APPLICATION OF AQUATIC HERBICIDES

Several herbicides are used for control of EWM in a lake. Most common is the use of any aquatic herbicide that has the active ingredient 2,4-D in it – either in a granular or a liquid formulation. Granular forms should be used when treating small areas of a half-acre or less. Larger areas can be treated with liquid formulations. 2,4-D is considered a systemic herbicide, meaning it is drawn into the plant through the roots and vegetative parts of the plant, usually killing the entire plant if applied at an appropriate rate and an appropriate contact time between the herbicide and target plant is reached. Since one of the expected results of applying systemic herbicides is killing of the entire plant, systemic herbicides may provide longer-term results, perhaps even multiple years versus just one season. The active ingredient triclopyr is similar to 2,4-D and could also be used in Red Lake. Systemic herbicides like 2,4-D and triclopyr can be somewhat selective in which plant species they kill, having the most impact on fine leaf plants like the watermilfoils (native and non-native), coontail, and floating-leaf species like white waterlily. Broad-leaf, submersed aquatic plants like the Potamogeton (pondweed) species are generally less susceptible to these herbicides.

Another common aquatic herbicide that has already been used in Red Lake contains the active ingredient diquat. Diquat is considered a contact herbicide that will kill the vegetative plant parts it comes in contact with. In some cases this may mean the root (buried in the sediment) is not entirely killed, which may allow regrowth from existing root structures. The benefit of using a contact herbicide like diquat is its rapid killing of the vegetative part of the plant. Diquat can kill the target plant with as little as 3-hrs contact time. At the concentrations used when chemically treating with 2,4-D and triclopyr, 18-24 hours of contact time are needed to kill the target plant. One disadvantage is that a contact herbicide like diquat is not plant selective. It will kill all plants that it comes in contact with.

It should be recognized that any aquatic herbicide will kill target and non-target species assuming either the contact time is long enough or the concentration of the herbicide applied to the water is high enough. To reduce the impacts of herbicide use on non-target plant species, these herbicides are mostly applied at times during open-water when native aquatic plant species are not actively growing – either in the early spring or very late fall. Invasive species like EWM and curly-leaf pondweed usually grow earlier in the season than most native plants, and at least EWM usually continues active growth much later into the fall.

Depending on the results of its initial use in WI, ProcellaCOR® should be reviewed and considered for future use in the Red Lake.

EWM in Red Lake is scattered throughout the littoral zone in water 3-12 feet deep, with the heaviest growth between 8-12 feet where it appears to be taking advantage of a depth where native plants are not as abundant (Figure 31). As a result most of the chemical treatments applied will be in deep water. Herbicides applied to small beds in deep water typically dissipate much quicker reducing the concentration and contact time with the target plant. To counter this, granular formulations of systemic herbicides like 2,4-D and triclopyr should be applied at a greater concentration to improve the chances that there is sufficient herbicide/plant contact time to kill the target plant. Or possibly, reduced concentrations of both liquid and granular herbicides should be applied that would total what would normally be applied if one or the other were used. Another alternative would be to apply contact herbicides like diquat at maximum label rates over concentrated treatment areas. If ProcellaCOR use in WI reflects what the current marketing is touting, it may be the herbicide of choice in the future.

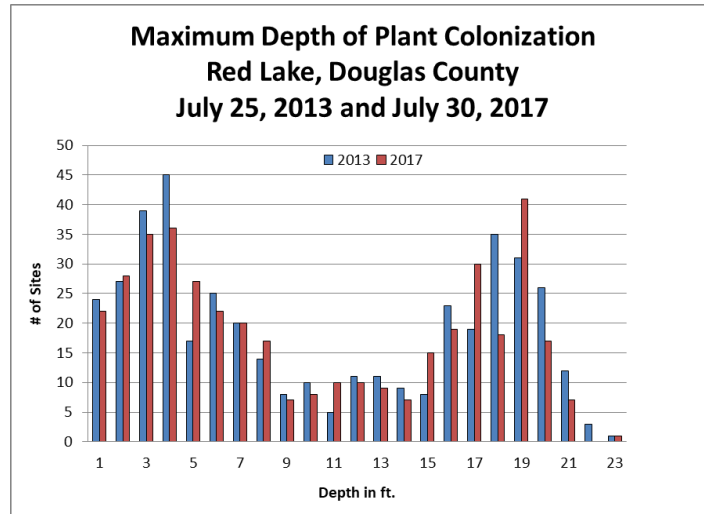


Figure 31: 2013 and 2017 Plant colonization depth chart (Berg, 2017)

EWM in shallow areas of the lake, or that forms larger beds (>0.5 acres) can be chemically treated with liquid formulations of 2,4-D or triclopyr and at lesser concentrations. Liquid formulations of 2,4-D and triclopyr based herbicides are usually much cheaper than their granular counterparts. And at least in treating larger areas, results from using liquid or granular herbicides are mostly the same. Chemical treatment in areas of the lake that may be protected from prevailing winds may also allow the use of lesser concentrations of herbicides that will still provide control of EWM. Diquat may also be used, but it may cause greater harm to native plants in the treated areas, and may not provide longer-term control, only seasonal control. This plan recommends applying aquatic herbicides based on annual conditions presented in the lake and as a compliment to physical, diver, and DASH removal.

In some EWM management plans, same areas with EWM are not chemically treated two or more years consecutively. This concept provides an opportunity to evaluate long-term results of chemical treatments. This concept is not being incorporated in this APMP as EWM is still in a pioneering stage and management aims to prevent greater establishment within the lake.

An EWM chemical treatment proposal for Red Lake in 2018 includes the use of both liquid and granular formulations of 2,4-D and the use of diquat. Annual chemical treatment proposals should be based on the results of prior year treatments, prior year aquatic plant and EWM surveys, new information about available aquatic herbicides, and input from the RLA, WDNR, and other stakeholders.

AQUATIC PLANT SURVEYING

EWM management in Red Lake will include at least three different aquatic plant surveys annually. EWM chemical treatment proposals will be based on prior year fall EWM bedmapping surveys completed between mid-September and mid-October by an experienced aquatic plant surveyor. Fall EWM bedmapping is a meandering survey of the entire littoral zone of the lake with the express purpose of locating and mapping EWM beds and individual plants. If possible, individual plants are removed using a rake. GPS coordinates are taken to mark individual plants and to establish the boundaries of areas of EWM growth that can be considered beds or high density areas. GPS data is mapped and used to assemble chemical treatment proposals for the following year. Year to year fall bedmapping comparisons will be used to document the effect of control measures and the spread of EWM in the lake.

Pre and post chemical treatment aquatic plant surveys will be completed by an experienced aquatic plant surveyor if in a given year the proposed treatment areas exceed 10 acres in size, or if a grant is used to cover the costs of treatment. Pre and post treatment surveys are based on pre-determined points within proposed

treatment areas. The number of points is based on the shape and size of the proposed treatment areas. An experienced aquatic plant surveyor will document plant growth at each of the points in the treatment area prior to the expected treatment date and again approximately 30 days after treatment. The effects of the chemical in the treated areas on both native and non-native species will be documented.

EWM Readiness Surveys will be completed by a lake consultant in cooperation with Red Lake volunteers in all years when pre and post-treatment aquatic plant surveys are not completed. A Readiness Survey consists of multiple rake throws within each proposed treatment area, prior to actual treatment, to determine whether or not the target species is present and ready for treatment. The presence of native plants will be documented but not in a systematic point-intercept manner.

At least one mid-summer meandering survey of the littoral zone with the express purpose of locating and removing new EWM plants will be completed annually by either the lake consultant in cooperation with Red Lake volunteers or by an experienced aquatic plant surveyor. Ideally, more than one summer meandering survey will be completed - one by an experienced surveyor and one by volunteers. During these surveys GPS coordinates will be recorded for all sites with EWM.

Finally, a whole-lake point-intercept summer aquatic plant survey will be completed in the third year of this five year plan (2020), and again in the year following the final year of the plan (2023) in an effort to document the impacts of EWM management on native aquatic plant species in the lake. This survey will be completed by an experienced aquatic plant surveyor using the same points that were surveyed in 2013 and 2017.

OTHER AIS MONITORING AND MANAGEMENT

Other AIS including curly-leaf pondweed (CLP) and purple loosestrife (PL) will be monitored for by RLA volunteers and physical removal completed if possible. It is not expected that any other form of management to control CLP or PL will be necessary during the five years covered by this Aquatic Plant Management Plan.

RLA volunteers will continue to monitor the shoreline for purple loosestrife removing what is found if possible. The RLA will not be involved in rearing beetles for biological control of purple loosestrife at this time.

At the present time, it is expected that no other form of AIS management is necessary on or around Red Lake. RLA volunteers will participate in the Citizen Lake Monitoring Network Aquatic Invasive Species Monitoring Program annually looking for zebra mussels, spiny waterflea, rusty crayfish, hydrilla, and other AIS not already in the lake.

COARSE WOODY HABITAT

An inventory of the lake shore has never been completed. At some point in the five year implementation of this plan one will be completed. Once completed, it is a goal of this plan to restore or in some other way improve 10% or more of the developed shoreline to a more natural state. WDNR Healthy Lakes Grants can be used to complete Fishsticks projects, small lakeshore restoration projects, install rain gardens, and install surface water diversion projects.

AQUATIC PLANT MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS

The following is a complete set of the Goals, Objectives, and Actions associated with the Aquatic Plant Management Plan for Red Lake in Douglas County. A separate document with these goals, objectives, and actions is included as Appendix D.

GOAL 1 – PROTECT AND ENHANCE THE NATIVE AQUATIC PLANT COMMUNITY

It is the goal of the management actions in this plan to protect and enhance the native aquatic plant community in Red Lake, causing no decline in measures of a healthy, diverse, and sustainable aquatic plant community. EWM management actions will be completed in ways proven to cause the least harm to non-target plant species. Additional lake data will be collected to further define and support management actions expected to help meet this goal.

OBJECTIVE 1: MAINTAIN OR EXCEED MEASUREMENTS OF THE HEALTH OF THE AQUATIC PLANT COMMUNITY ESTABLISHED IN THE 2017 WHOLE-LAKE, SUMMER, POINT-INTERCEPT (PI) AQUATIC PLANT SURVEY (TABLE 3)

Table 3: Aquatic plant community health parameters (Berg 2017)

Parameter	2017
Rake Species Identified	53
Visual Survey Species Identified	56
Frequency Occurrence (points with vegetation)	83.88
Simpsons Diversity Index (SDI)	0.92
Ave. Native Species per site with vegetation	2.32
Ave. Coefficient of Conservatism (C)	6.9
Floristic Quality Index (FQI)	48.5

Action Item: Implement aquatic plant management actions that will do the most for protecting and enhancing the native plant population while controlling the target species.

Action Item: Determine appropriate management actions annually based on management and survey results from the previous year.

Action Item: Protect the diversity and density of highly sensitive species with an average $C \geq 9$ including Wild calla, Three-way sedge, Pipewort, Water lobelia, Dwarf water milfoil, Alpine pondweed, Creeping spearwort, Crested arrowhead, Water bulrush, Narrow-leaved bur-reed, Small bladderwort, Smooth sawgrass, and State Species of Special Concern Small purple bladderwort and Robbins' spikerush.

OBJECTIVE 2: MEASURE THE IMPACT OF AIS MANAGEMENT ACTIONS COMPLETED ON NON-TARGET THE AQUATIC PLANT COMMUNITY

Action Item: Repeat the whole-lake, summer, PI survey that was completed in 2013 and 2017, in 2020 and again in 2023

GOAL 2 – MINIMIZE THE NEGATIVE IMPACT OF EWM ON THE NATIVE AQUATIC PLANT COMMUNITY THROUGH THE IMPLEMENTATION OF MANAGEMENT ACTIONS

An integrated approach to management including physical removal and the use of herbicides will be implemented between 2018 and 2023 to prevent EWM growth from reaching or exceeding 1.0 % (2.25 acres) of the littoral zone.

OBJECTIVE 1: PREVENT EWM IN RED LAKE FROM REPLACING NATIVE VEGETATION AND/OR BLOCKING NAVIGATION.

Action Item: Implement physical removal by property owners in nearshore shallow hard-bottom areas of the lake adjacent to developed property

Action Item: Incorporate scuba divers or snorkeling in physical removal efforts

Action Item: Consider the use of Diver-Aided Suction Harvest to aid in control of EWM

Action Item: Manage larger areas or consistently problematic areas with chemical herbicides

OBJECTIVE 2: MEASURE THE EFFECTIVENESS AND IMPACTS OF AIS MANAGEMENT ON TARGET PLANT SPECIES WITHIN THE TREATED AREAS ON AN ANNUAL BASIS.

Action Item: Complete fall EWM bedmapping annually

Action Item: Complete pre and post-treatment point-intercept aquatic plant surveying in years when proposed EWM treatments reach or exceed 10 acres; complete EWM readiness surveys in years when pre and post-treatment surveys are not planned

Action Item: Complete at least one warm-water season meandering survey of the littoral zone to identify EWM growth annually

GOAL 3 – REDUCE THE THREAT THAT A NEW AQUATIC INVASIVE SPECIES WILL BE INTRODUCED AND GO UNDETECTED IN RED LAKE AND THAT EXISTING AIS WILL BE CARRIED TO OTHER LAKES.

Red Lake is now a source lake for EWM being carried out attached to boats and/or trailers and taken to other lakes. Red Lake is at risk of new AIS being introduced in the lake. The RLA will continue to implement a watercraft inspection program according to WDNR/UW-Extension Lakes protocol. This program will either be volunteer-based, or paid for by the RLA through a small-scale CBCW grant. Watercraft inspection data will be entered into the WDNR SWIMS database annually.

Appropriate AIS signage will be maintained at the public access on Red Lake to improve the AIS awareness of many lake users.

AIS monitoring will be completed to monitor for possible new AIS following WDNR/UW-Extension Lakes protocol through the Citizen Lake Monitoring Network (CLMN) AIS Monitoring Program. Zebra mussels, spiny waterflea, hydrilla, banded mystery snails, and other species will be watched for and survey data entered into the WDNR SWIMS database annually.

OBJECTIVE 1: CONTINUE A CLEAN BOATS CLEAN WATERS (CBCW) WATER CRAFT INSPECTION PROGRAM ANNUALLY.

Action Item: Attempt to get 200 hours of volunteer and/or paid watercraft inspection at the public access.

Action Item: Apply for small-scale CBCW grants annually to support watercraft inspection efforts.

OBJECTIVE 2: MAINTAIN AND/OR IMPROVE AIS AND LAKE HEALTH SIGNAGE AT THE PUBLIC ACCESS

Action Item: Inspect the public access for appropriate AIS signage annually.

Action Item: Repair, replace, and/or install current WDNR AIS signs at the public access.

OBJECTIVE 3: REDUCE THE LIKELIHOOD THAT NEW AIS IS UNDETECTED IN RED LAKE AND TRACK EXISTING AIS FOR ADDITIONAL SPREAD.

Action Item: Participate in CLMN AIS Monitoring at least monthly between May and October each year

Action Item: Complete bi-monthly landing inspections and multiple meandering surveys of the lake's entire visible littoral zone annually to look for EWM and new AIS

GOAL 4 - IMPROVE THE LEVEL OF KNOWLEDGE PROPERTY OWNERS AND LAKE USERS HAVE RELATED TO AQUATIC INVASIVE SPECIES AND THEIR IMPACT TO THE LAKE.

The RLA will continue efforts to educate and inform property owners and lake users about AIS already in Red Lake and AIS not already in Red Lake. Efforts may include but are not limited to annual education events, distribution of AIS publications, placement of EWM maps at the public access, and discussion forums of various types related to management actions and alternatives.

OBJECTIVE 1: PLAN, COORDINATE, AND IMPLEMENT AN ANNUAL AIS EDUCATION EVENT(S) ALONE OR IN COOPERATION WITH OTHER STAKEHOLDERS.

Action Item: Seek out other stakeholders including but not limited to the Gordon St. Croix Flowage Association, Minong Flowage Association, Town of Minong AIS Committee, Douglas County Association of Lakes and Streams, and other Town and County entities to explore cooperative education and information events.

OBJECTIVE 2: DISTRIBUTE INFORMATION AND EDUCATION MATERIALS TO PROPERTY OWNERS AND LAKE USERS.

Action Item: Research AIS with little or no cost to attain and make available at events including but not limited to Annual Meetings, Lake Fairs, Summer Picnic, etc.

Action Item: Disseminate educational and informational materials through the RLA newsletter, webpage, door to door visitations, and other RLA social media outlets

OBJECTIVE 3: ENCOURAGE CONSTITUENT PARTICIPATION IN ANNUAL LAKE CONFERENCES INCLUDING THE WISCONSIN LAKES CONFERENCE IN APRIL, THE NW WISCONSIN LAKES CONFERENCE IN JUNE, AND OTHER LAKE OR AIS FOCUSED CONFERENCES

Action Item: Research and share dates and times for various lake and AIS conferences in MN and WI with the lake constituency

OBJECTIVE 4: SOLICIT PUBLIC INPUT AND REVIEW OF ANNUAL AIS MANAGEMENT PLANNING EFFORTS.

Action Item: Complete preliminary AIS management planning by January 31 each year and post on the RLA webpage for public comment.

Action Item: Provide a summary of prior year AIS management results and coming year AIS management plans in a winter or spring newsletter, RLA meeting, or on the RLA webpage

GOAL 5 - IMPROVE THE LEVEL OF KNOWLEDGE PROPERTY OWNERS AND LAKE USERS HAVE RELATED TO HOW THEIR ACTIONS IMPACT THE AQUATIC PLANT COMMUNITY, LAKE COMMUNITY, WATER QUALITY

An important part of controlling undesirable aquatic plant growth and the production of algae is reducing the amount of nutrients (mainly phosphorus) that enters the lake. The RLA will promote and encourage the implementation of simple and generally inexpensive best management practices including but not limited to shoreland buffers and the installation of rain gardens to reduce nutrient loading from the nearshore area.

Trees and other vegetation that naturally fall into a lake or that is intentionally placed in the lake by permit, is known as coarse woody habitat (CWH). CWH provides many benefits to fish and wildlife. Like aquatic vegetation, CWH is essential to the overall health of a lake and should be protected and enhanced, not eliminated. The RLA will provide information about and encourage property owner participation in protecting and/or enhancing CWH.

The RLA will continue to collect water clarity data through the CLMN program, and request participation in the CLMN Expanded Water Quality Monitoring program.

OBJECTIVE 1: PROMOTE AND SUPPORT NEARSHORE AND RIPARIAN BEST MANAGEMENT PRACTICES THAT WILL IMPROVE FISH AND WILDLIFE HABITAT, REDUCE RUNOFF, AND MINIMIZE NUTRIENT LOADING

Action Item: Distribute shoreland improvement education and information materials to lake property owners through the newsletter, webpage, and general mailings.

Action Item: Recognize property owners who participate in and/or complete shoreland restoration and habitat improvement projects in the newsletter, on the webpage, in local news publications, and/or at the site of the project.

Action Item: Recruit property owners for inclusion in projects to be funded by a WDNR Healthy Lakes grant.

OBJECTIVE 2: MAINTAIN AND/OR INCREASE THE AMOUNT OF COARSE WOODY HABITAT PRESENT ALONG THE SHORELINE

Action Item: Provide educational and informational materials to lake property owners that promote the benefits of CWH in a lake.

Action Item: Encourage property owners not to remove woody debris that falls naturally into the lake from their shoreline unless it presents a dangerous and/or undesirable condition.

Action Item: Work with the WDNR and other resource professionals to install at least one Fishsticks demonstration project possibly through a Healthy Lake Initiative project

OBJECTIVE 3: CONTINUE WATER QUALITY TESTING FOR WATER CLARITY AND ADD TEMPERATURE, DISSOLVED OXYGEN, TOTAL PHOSPHORUS, AND CHLOROPHYLL A AT THE DEEP HOLE THROUGH THE CLMN EXPANDED MONITORING PROGRAM

Action Item: Contact the WDNR and request to be included in the CLMN Expanded Monitoring Program

Action Item: Collect CLMN water quality data (water clarity, total phosphorus, chlorophyll a, and dissolved oxygen and temperature) in the Deep Hole

GOAL 6 - COMPLETE APM PLAN IMPLEMENTATION AND MAINTENANCE FOR A PERIOD OF FIVE YEARS FOLLOWING ADAPTIVE MANAGEMENT PRACTICES

This APM Plan is not intended to be a static document, but rather a plan that makes room for management changes that still fall under the guise of the stated goals, but that may make attaining those goals easier and more efficient. Management actions implemented in each year of this plan will be evaluated for how well they helped meet stated goals and objectives. Small changes will be made automatically if it is determined they will improve outcomes. Larger management changes will be presented to the RLA, WDNR, and other Stakeholders for approval before implementation.

OBJECTIVE 1: PREPARE SUMMARY REPORTS FOR ANNUAL AQUATIC PLANT SURVEYS AND MANAGEMENT ACTIONS.

Action Item: Aquatic Plant Survey Results Reports will be completed by the Aquatic Plant Specialist contracted by the RLA.

Action Item: End-of Year Summary Reports will be completed by the Primary Consultant contracted by the RLA.

Action Item: Preliminary management proposals for the following year will be completed by the Primary Consultant contracted by the RLA prior to January 31 each year and posted for public review.

GOAL 7 - EVALUATE AND SUMMARIZE THE RESULTS OF MANAGEMENT ACTIONS IMPLEMENTED DURING THE ENTIRE 5-YEAR TIMEFRAME OF THIS PLAN

An end of project report summarizing the success and failures after five years of management will be completed. This report will be completed by the RLA and its retainers and shared with property owners, lake users, WDNR, and other Stakeholders. A whole-lake, summer, PI, aquatic plant survey will be repeated in the third year included in this plan (2020) to help determine if management actions are accomplishing the goals set for them and that the health of the native aquatic plant community is not being negatively impacted. Another whole-lake, summer, PI, aquatic plant survey will be completed following the last year included in this plan (2022) following the same procedures that were used in 2013, 2017, and 2020. Results from all PI surveys will be compared to each other with the results leading to development of the next five years of EWM management in Red Lake.

OBJECTIVE 1: COMPLETE A SUMMER, WHOLE-LAKE, POINT-INTERCEPT (PI) AQUATIC PLANT SURVEY AFTER 3 YEARS OF IMPLEMENTATION.

Action Item: Repeat PI survey that was completed in 2013 and 2017 in 2020.

Action Item: Compare 2020 PI survey results to 2013 and 2017 PI survey results.

OBJECTIVE 2: REVIEW MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS IN THE 2018-2022 APM PLAN.

Action Item: Review goals, objectives, and actions from the 2018-2022 APM Plan for successful implementation.

Action Item: Compare 2020 and 2023 plant survey results to the goals, objectives, and actions in the 2018-2022 APM Plan to determine success or failure of management actions over the five year period.

OBJECTIVE 3: REVISE/UPDATE 2018-2022 APM PLAN.

Action Item: Contract with a consultant to complete a new APM Plan.

IMPLEMENTATION AND EVALUATION

This plan is intended to be a tool for use by the RLA to move forward with aquatic plant management actions that will maintain the health and diversity of Red Lake and its aquatic plant community. This plan is not intended to be a static document, but rather a living document that will be evaluated on an annual basis and updated as necessary to ensure goals and community expectations are being met. This plan is also not intended to be put up on a shelf and ignored. Implementation of the actions in this plan through funding obtained from the WDNR and/or RLA funds is highly recommended. An Implementation and Funding Matrix is provided in Appendix E. An Annual Calendar of Actions is included in Appendix F.

WISCONSIN DEPARTMENT OF NATURAL RESOURCES GRANT PROGRAMS

The Aquatic Invasive Species (AIS) Prevention and Control grants are a cost-share effort by the DNR to provide information and education on types of existing and potential aquatic invasive species in Wisconsin, the threats that invasive species pose to the state's aquatic resources, and available techniques for invasive species control. These grants also assist in the planning and implementation of projects that will prevent the introduction of invasive species into waters where they currently are not present, controlling and reducing the spread of invasive species from waters where they are present, and restoring native aquatic communities.

There are five AIS Prevention and Control grants subprograms:

- Education, Prevention and Planning Projects (including Clean Boats Clean Waters)
- Early Detection and Response Projects
- Established Population Control Projects
- Maintenance and Containment Projects
- Research and Demonstration Projects

Several of these subprograms are applicable to Red Lake and the Red Lake Association.

EDUCATION, PREVENTION AND PLANNING PROJECTS

Education projects are intended to broaden the public's awareness and understanding of, and ability to identify, AIS; the threats that AIS pose to the health of aquatic ecosystems; the measures to prevent the spread of AIS; and the management practices used for control of AIS. Prevention projects are intended to prevent the introduction of new AIS into a waterbody/wetland, or prevent the spread of an AIS population from one waterbody to another unpopulated waterbody/wetland. Planning projects are intended to assist in the development of plans for the prevention and control of AIS. Eligible projects include:

- Educational programs including workshops, training sessions, or coordinated volunteer monitors. Projects will be reviewed for consistency with the DNR's statewide education strategy for controlling AIS including the use of existing publications and outreach materials.
- Development of AIS prevention and control plans
- Monitoring, mapping, and assessing waterbodies for the presence of AIS or other studies that will aid in the AIS prevention and control.
- Watercraft inspection and education projects following the guidelines of the DNR's Clean Boats, Clean Waters program.

This subprogram is not intended to provide support for any management action that may be taken.

ESTABLISHED POPULATION CONTROL PROJECTS

Established population control grants are intended to assist applicants in eradicating or substantially reducing established populations of AIS to protect and restore native species communities. Established populations are defined as substantial reproducing populations of AIS that are not pioneer populations. Eligible projects include activities recommended in a DNR-approved control plan including monitoring, education, and prevention activities. Ineligible projects include the following:

- Dredging

- Chemical treatments or mechanical harvesting of aquatic plants to provide single season nuisance or navigational relief.
- Maintenance and operation of aeration systems and mechanical structures used to suppress aquatic plant growth.
- Structural facilities for providing boat washing stations. Equipment associated with boat washing facilities is eligible if included in a management plan.

MAINTENANCE AND CONTAINMENT PROJECTS

Maintenance and containment grants are intended to provide sponsors limited financial assistance for the ongoing control of established AIS population without the assistance of an Established Population Control grant. These projects are intended for waters where management activity has achieved the target level of control identified in an approved plan that meets the criteria of s. NR 198.43, Wis. Adm. Code. Ongoing maintenance is needed to contain these populations so they do not re-establish throughout the waterbody, spread to other waters, or impair navigation and other beneficial uses of the waterbody.

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Appendix A

NR 109

Chapter NR 109

AQUATIC PLANTS: INTRODUCTION, MANUAL REMOVAL AND MECHANICAL CONTROL REGULATIONS

NR 109.01	Purpose.
NR 109.02	Applicability.
NR 109.03	Definitions.
NR 109.04	Application requirements and fees.
NR 109.05	Permit issuance.
NR 109.06	Waivers.

NR 109.07	Invasive and nonnative aquatic plants.
NR 109.08	Prohibitions.
NR 109.09	Plan specifications and approval.
NR 109.10	Other permits.
NR 109.11	Enforcement.

NR 109.01 Purpose. The purpose of this chapter is to establish procedures and requirements for the protection and regulation of aquatic plants pursuant to ss. 23.24 and 30.07, Stats. Diverse and stable communities of native aquatic plants are recognized to be a vital and necessary component of a healthy aquatic ecosystem. This chapter establishes procedures and requirements for issuing aquatic plant management permits for introduction of aquatic plants or control of aquatic plants by manual removal, burning, use of mechanical means or plant inhibitors. This chapter identifies other permits issued by the department for aquatic plant management that contain the appropriate conditions as required under this chapter for aquatic plant management, and for which no separate permit is required under this chapter. Introduction and control of aquatic plants shall be allowed in a manner consistent with sound ecosystem management, shall consider cumulative impacts, and shall minimize the loss of ecological values in the body of water. The purpose of this chapter is also to prevent the spread of invasive and non-native aquatic organisms by prohibiting the launching of watercraft or equipment that has any aquatic plants or zebra mussels attached.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03; correction made under s. 13.92 (4) (b) 7., Stats., Register March 2011 No. 663.

NR 109.02 Applicability. A person sponsoring or conducting manual removal, burning or using mechanical means or aquatic plant inhibitors to control aquatic plants in navigable waters, or introducing non-native aquatic plants to waters of this state shall obtain an aquatic plant management permit from the department under this chapter.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03.

NR 109.03 Definitions. In this chapter:

- (1) "Aquatic community" means lake or river biological resources.
- (2) "Beneficial water use activities" mean angling, boating, swimming or other navigational or recreational water use activity.
- (3) "Body of water" means any lake, river or wetland that is a water of this state.
- (4) "Complete application" means a completed and signed application form, the information specified in s. NR 109.04 and any other information which may reasonably be required from an applicant and which the department needs to make a decision under applicable provisions of law.
- (5) "Department" means the Wisconsin department of natural resources.
- (6) "Manual removal" means the control of aquatic plants by hand or hand-held devices without the use or aid of external or auxiliary power.
- (7) "Navigable waters" means those waters defined as navigable under s. 30.10, Stats.
- (8) "Permit" means aquatic plant management permit.
- (9) "Plan" means aquatic plant management plan.

(10) "Wetlands" means an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03.

NR 109.04 Application requirements and fees.

(1) Permit applications shall be made on forms provided by the department and shall be submitted to the regional director or designee for the region in which the project is located. Permit applications for licensed aquatic nursery growers may be submitted to the department of agriculture, trade and consumer protection.

Note: Applications may be obtained from the department's regional headquarters or service centers. DATCP has agreed to send application forms and instructions provided by the department to aquatic nursery growers along with license renewal forms. DATCP will forward all applications to the department for processing.

(2) The application shall be accompanied by all of the following unless the application is made by licensed aquatic nursery growers for selective harvesting of aquatic plants for nursery stock. Applications made by licensed aquatic nursery growers for harvest of nursery stock do not have to include the information required by par. (d), (e), (h), (i) or (j).

(a) A nonrefundable application fee. The application fee for an aquatic plant management permit is:

1. \$30 for a proposed project to manage aquatic plants on less than one acre.

2. \$30 per acre to a maximum of \$300 for a proposed project to manage aquatic plants on one acre or larger. Partial acres shall be rounded up to the next full acre for fee determination. An annual renewal of this permit may be requested with an additional application fee of one-half the original application fee, but not less than \$30.

(b) A legal description of the body of water including township, range and section number.

(c) One copy of a detailed map of the body of water with the proposed introduction or control area dimensions clearly shown. Private individuals doing plant introduction or control shall provide the name of the owner riparian to the management area, which includes the street address or block, lot and fire number where available and local telephone number or other pertinent information necessary to locate the property.

(d) One copy of any existing aquatic management plan for the body of water, or detailed reference to the plan, citing the plan references to the proposed introduction or control area, and a description of how the proposed introduction or control of aquatic plants is compatible with any existing plan.

(e) A description of the impairments to water use caused by the aquatic plants to be managed.

(f) A description of the aquatic plants to be controlled or removed.

(g) The type of equipment and methods to be used for introduction, control or removal.

(h) A description of other introduction or control methods considered and the justification for the method selected.

(i) A description of any other method being used or intended for use for plant management by the applicant or on the area abutting the proposed management area.

(j) The area used for removal, reuse or disposal of aquatic plants.

(k) The name of any person or commercial provider of control or removal services.

(3) (a) The department may require that an application for an aquatic plant management permit contain an aquatic plant management plan that describes how the aquatic plants will be introduced, controlled, removed or disposed. Requirements for an aquatic plant management plan shall be made in writing stating the reason for the plan requirement. In deciding whether to require a plan, the department shall consider the potential for effects on protection and development of diverse and stable communities of native aquatic plants, for conflict with goals of other written ecological or lake management plans, for cumulative impacts and effect on the ecological values in the body of water, and the long-term sustainability of beneficial water use activities.

(b) Within 30 days of receipt of the plan, the department shall notify the applicant of any additional information or modifications to the plan that are required. If the applicant does not submit the additional information or modify the plan as requested by the department, the department may dismiss the aquatic plant management permit application.

(c) The department shall approve the aquatic plant management plan before an application may be considered complete.

(4) The permit sponsor may request an annual renewal in writing from the department under s. NR 109.05 if there is no change proposed in the conditions of the original permit issued.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03.

NR 109.05 Permit issuance. **(1)** The department shall issue or deny issuance of the requested permit within 15 working days after receipt of a completed application and approved plan as required under s. NR 109.04 (3).

(2) The department may specify any of the following as conditions of the permit:

(a) The quantity of aquatic plants that may be introduced or controlled.

(b) The species of aquatic plants that may be introduced or controlled.

(c) The areas in which aquatic plants may be introduced or controlled.

(d) The methods that may be used to introduce or control aquatic plants.

(e) The times during which aquatic plants may be introduced or controlled.

(f) The allowable methods used for disposing of or using aquatic plants that are removed or controlled.

(g) Annual or other reporting requirements to the department that may include information related to pars. (a) to (f).

(3) The department may deny issuance of the requested permit if the department determines any of the following:

(a) Aquatic plants are not causing significant impairment of beneficial water use activities.

(b) The proposed introduction or control will not remedy the water use impairments caused by aquatic plants as identified as a part of the application in s. NR 109.04 (2) (e).

(c) The proposed introduction or control will result in a hazard to humans.

(d) The proposed introduction or control will cause significant adverse impacts to threatened or endangered resources.

(e) The proposed introduction or control will result in a significant adverse effect on water quality, aquatic habitat or the aquatic community including the native aquatic plant community.

(f) The proposed introduction or control is in locations identified by the department as sensitive areas, under s. NR 107.05 (3) (i) 1., except when the applicant demonstrates to the satisfaction of the department that the project can be conducted in a manner that will not alter the ecological character or reduce the ecological value of the area.

(g) The proposed management will result in significant adverse long-term or permanent changes to a plant community or a high value species in a specific aquatic ecosystem. High value species are individual species of aquatic plants known to offer important values in specific aquatic ecosystems, including *Potamogeton amplifolius*, *Potamogeton Richardsonii*, *Potamogeton praelongus*, *Stuckenia pectinata* (*Potamogeton pectinatus*), *Potamogeton illinoensis*, *Potamogeton robbinsii*, *Eleocharis* spp., *Scirpus* spp., *Valisneria* spp., *Zizania* spp., *Zannichellia palustris* and *Brasenia schreberi*.

(h) If wild rice is involved, the stipulations incorporated by *Lac Courte Oreilles v. Wisconsin*, 775 F. Supp. 321 (W.D. Wis. 1991) shall be complied with.

(i) The proposed introduction or control will interfere with the rights of riparian owners.

(j) The proposed management is inconsistent with a department approved aquatic plant management plan for the body of water.

(4) The department may approve the application in whole or in part consistent with the provisions of sub. (3). A denial shall be in writing stating the reasons for the denial.

(5) (a) The department may issue an aquatic plant management permit on less than one acre in a single riparian area for a 3-year term.

(b) The department may issue an aquatic plant management permit for a one-year term for more than one acre or more than one riparian area. The permit may be renewed annually for up to a total of 3 years in succession at the written request of the permit holder, provided no modifications or changes are made from the original permit.

(c) The department may issue an aquatic plant management permit containing a department-approved plan for a 3 to 5 year term.

(d) The department may issue an aquatic plant management permit to a licensed nursery grower for a 3-year term for the harvesting of aquatic plants from a publicly owned lake bed or for a 5-year term for harvesting of aquatic plants from privately owned beds with the permission of the property owner.

(6) The approval of an aquatic plant management permit does not represent an endorsement of the permitted activity, but represents that the applicant has complied with all criteria of this chapter.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03; reprinted to restore dropped language from rule order, Register October 2003 No. 574.

NR 109.06 Waivers. The department waives the permit requirements under this chapter for any of the following:

(1) Manual removal or use of mechanical devices to control or remove aquatic plants from a body of water 10 acres or less that is entirely confined on the property of one person with the permission of that property owner.

Note: A person who introduces native aquatic plants or removes aquatic plants by manual or mechanical means in the course of operating an aquatic nursery as authorized under s. 94.10, Stats., on privately owned non-navigable waters of the state is not required to obtain a permit for the activities.

(2) A riparian owner who manually removes aquatic plants from a body of water or uses mechanical devices designed for cutting or mowing vegetation to control plants on an exposed lake bed that abuts the owner's property provided that the removal meets all of the following:

(a) 1. Removal of native plants is limited to a single area with a maximum width of no more than 30 feet measured along the shoreline provided that any piers, boatlifts, swimrafts and other recreational and water use devices are located within that 30-foot wide zone and may not be in a new area or additional to an area where plants are controlled by another method; or

2. Removal of nonnative or invasive aquatic plants as designated under s. NR 109.07 when performed in a manner that does not harm the native aquatic plant community; or

3. Removal of dislodged aquatic plants that drift on-shore and accumulate along the waterfront.

(b) Is not located in a sensitive area as defined by the department under s. NR 107.05 (3) (i) 1., or in an area known to contain threatened or endangered resources or floating bogs.

(c) Does not interfere with the rights of other riparian owners.

(d) If wild rice is involved, the procedures of s. NR 19.09 (1) shall be followed.

(4) Control of purple loosestrife by manual removal or use of mechanical devices when performed in a manner that does not harm the native aquatic plant community or result in or encourage re-growth of purple loosestrife or other nonnative vegetation.

(5) Any aquatic plant management activity that is conducted by the department and is consistent with the purposes of this chapter.

(6) Manual removal and collection of native aquatic plants for lake study or scientific research when performed in a manner that does not harm the native aquatic plant community.

Note: Scientific collectors permit requirements are still applicable.

(7) Incidental cutting, removal or destroying of aquatic plants when engaged in beneficial water use activities.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03.

NR 109.07 Invasive and nonnative aquatic plants.

(1) The department may designate any aquatic plant as an invasive aquatic plant for a water body or a group of water bodies if it has the ability to cause significant adverse change to desirable aquatic habitat, to significantly displace desirable aquatic vegetation, or to reduce the yield of products produced by aquaculture.

(2) The following aquatic plants are designated as invasive aquatic plants statewide: Eurasian water milfoil, curly leaf pondweed and purple loosestrife.

(3) Native and nonnative aquatic plants of Wisconsin shall be determined by using scientifically valid publications and findings by the department.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03.

NR 109.08 Prohibitions. (1) No person may distribute an invasive aquatic plant, under s. NR 109.07.

(2) No person may intentionally introduce Eurasian water milfoil, curly leaf pondweed or purple loosestrife into waters of this state without the permission of the department.

(3) No person may intentionally cut aquatic plants in public/navigable waters without removing cut vegetation from the body of water.

(4) (a) No person may place equipment used in aquatic plant management in a navigable water if the person has reason to

believe that the equipment has any aquatic plants or zebra mussels attached.

(b) This subsection does not apply to equipment used in aquatic plant management when re-launched on the same body of water without having visited different waters, provided the re-launching will not introduce or encourage the spread of existing aquatic species within that body of water.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03.

NR 109.09 Plan specifications and approval.

(1) Applicants required to submit an aquatic plant management plan, under s. NR 109.04 (3), shall develop and submit the plan in a format specified by the department.

(2) The plan shall present and discuss each of the following items:

(a) The goals and objectives of the aquatic plant management and protection activities.

(b) A physical, chemical and biological description of the waterbody.

(c) The intensity of water use.

(d) The location of aquatic plant management activities.

(e) An evaluation of chemical, mechanical, biological and physical aquatic plant control methods.

(f) Recommendations for an integrated aquatic plant management strategy utilizing some or all of the methods evaluated in par. (e).

(g) An education and information strategy.

(h) A strategy for evaluating the efficacy and environmental impacts of the aquatic plant management activities.

(i) The involvement of local units of government and any lake organizations in the development of the plan.

(3) The approval of an aquatic plant management plan does not represent an endorsement for plant management, but represents that adequate considerations in planning the actions have been made.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03.

NR 109.10 Other permits. Permits issued under s. 30.12, 30.20, 31.02 or 281.36, Stats., or under ch. NR 107 may contain provisions which provide for aquatic plant management. If a permit issued under one of these authorities contains the appropriate conditions as required under this chapter for aquatic plant management, a separate permit is not required under this chapter. The permit shall explicitly state that it is intended to comply with the substantive requirements of this chapter.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03.

NR 109.11 Enforcement. (1) Violations of this chapter may be prosecuted by the department under chs. 23, 30 and 31, Stats.

(2) Failure to comply with the conditions of a permit issued under or in accordance with this chapter may result in cancellation of the permit and loss of permit privileges for the subsequent year. Notice of cancellation or loss of permit privileges shall be provided by the department to the permit holder.

History: CR 02-061: cr. Register May 2003 No. 569, eff. 6-1-03.

Appendix B

NR 107

Chapter NR 107

AQUATIC PLANT MANAGEMENT

<p>NR 107.01 Purpose. NR 107.02 Applicability. NR 107.03 Definitions. NR 107.04 Application for permit. NR 107.05 Issuance of permit. NR 107.06 Chemical fact sheets.</p>	<p>NR 107.07 Supervision. NR 107.08 Conditions of the permit. NR 107.09 Special limitation. NR 107.10 Field evaluation use permits. NR 107.11 Exemptions.</p>
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Note: Chapter NR 107 as it existed on February 28, 1989 was repealed and a new Chapter NR 107 was created effective March 1, 1989.

NR 107.01 Purpose. The purpose of this chapter is to establish procedures for the management of aquatic plants and control of other aquatic organisms pursuant to s. 227.11 (2) (a), Stats., and interpreting s. 281.17 (2), Stats. A balanced aquatic plant community is recognized to be a vital and necessary component of a healthy aquatic ecosystem. The department may allow the management of nuisance-causing aquatic plants with chemicals registered and labeled by the U.S. environmental protection agency and labeled and registered by firms licensed as pesticide manufacturers and labeled with the Wisconsin department of agriculture, trade and consumer protection. Chemical management shall be allowed in a manner consistent with sound ecosystem management and shall minimize the loss of ecological values in the water body.

History: Cr. Register, February, 1989, No. 398, eff. 3-1-89; correction made under s. 13.93 (2m) (b) 7., Stats., Register, December, 2000, No. 540.

NR 107.02 Applicability. Any person sponsoring or conducting chemical treatment for the management of aquatic plants or control of other aquatic organisms in waters of the state shall obtain a permit from the department. Waters of the state include those portions of Lake Michigan and Lake Superior, and all lakes, bays, rivers, streams, springs, ponds, wells, impounding reservoirs, marshes, watercourses, drainage systems and other ground or surface water, natural or artificial, public or private, within the state or its jurisdiction as specified in s. 281.01 (18), Stats.

History: Cr. Register, February, 1989, No. 398, eff. 3-1-89; correction made under s. 13.93 (2m) (b) 7., Stats., Register, December, 2000, No. 540.

NR 107.03 Definitions. (1) “Applicator” means the person physically applying the chemicals to the treatment site.

(2) “Chemical fact sheet” means a summary of information on a specific chemical written by the department including general aquatic community and human safety considerations applicable to Wisconsin sites.

(3) “Department” means the department of natural resources.

History: Cr. Register, February, 1989, No. 398, eff. 3-1-89.

NR 107.04 Application for permit. (1) Permit applications shall be made on forms provided by the department and shall be submitted to the district director for the district in which the project is located. Any amendment or revision to an application shall be treated by the department as a new application, except as provided in s. NR 107.04 (3) (g).

Note: The DNR district headquarters are located at:

1. Southern — 3911 Fish Hatchery Road, Fitchburg 53711
2. Southeast — 2300 N. Dr. Martin Luther King Jr. Dr., Box 12436, Milwaukee 53212
3. Lake Michigan — 1125 N. Military Ave., Box 10448, Green Bay 54307
4. North Central — 107 Sutliff Ave., Box 818, Rhinelander 54501
5. Western — 1300 W. Clairemont Ave., Call Box 4001, Eau Claire 54702
6. Northwest — Hwy 70 West, Box 309, Spooner 54801

(2) The application shall be accompanied by:

(a) A nonrefundable permit application fee of \$20, and, for proposed treatments larger than 0.25 acres, an additional refundable acreage fee of \$25.00 per acre, rounded up to the nearest whole acre, applied to a maximum of 50.0 acres.

1. The acreage fee shall be refunded in whole if the entire permit is denied or if no treatment occurs on any part of the permitted treatment area. Refunds will not be prorated for partial treatments.

2. If the permit is issued with the proposed treatment area partially denied, a refund of acreage fees shall be given for the area denied.

(b) A legal description of the body of water proposed for treatment including township, range and section number;

(c) One copy of a detailed map or sketch of the body of water with the proposed treatment area dimensions clearly shown and with pertinent information necessary to locate those properties, by name of owner, riparian to the treatment area, which may include street address, local telephone number, block, lot and fire number where available. If a local address is not available, the home address and phone number of the property owner may be included;

(d) A description of the uses being impaired by plants or aquatic organisms and reason for treatment;

(e) A description of the plant community or other aquatic organisms causing the use impairment;

(f) The product names of chemicals proposed for use and the method of application;

(g) The name of the person or commercial applicator, and applicator certification number, when required by s. NR 107.08 (5), of the person conducting the treatment;

(h) A comparison of alternative control methods and their feasibility for use on the proposed treatment site.

(3) In addition to the information required under sub. (2), when the proposed treatment is a large-scale treatment exceeding 10.0 acres in size or 10% of the area of the water body that is 10 feet or less in depth, the application shall be accompanied by:

(a) A map showing the size and boundaries of the water body and its watershed.

(b) A map and list identifying known or suspected land use practices contributing to plant-related water quality problems in the watershed.

(c) A summary of conditions contributing to undesirable plant growth on the water body.

(d) A general description of the fish and wildlife uses occurring within the proposed treatment site.

(e) A summary of recreational uses of the proposed treatment site.

(f) Evidence that a public notice of the proposed application has been made, and that a public informational meeting, if required, has been conducted.

1. Notice shall be given in 2 inch x 4 inch advertising format in the newspaper which has the largest circulation in the area affected by the application.

2. The notice shall state the size of the proposed treatment, the approximate treatment dates, and that the public may request within 5 days of the notice that the applicant hold a public informational meeting on the proposed application.

a. The applicant will conduct a public informational meeting in a location near the water body when a combination of 5 or more individuals, organizations, special units of government, or local units of government request the meeting in writing to the applicant

with a copy to the department within 5 days after the notice is made. The person or entity requesting the meeting shall state a specific agenda of topics including problems and alternatives to be discussed.

b. The meeting shall be given a minimum of one week advance notice, both in writing to the requestors, and advertised in the format of subd. 1.

(g) The provisions of pars. (a) to (e) shall be repeated once every 5 years and shall include new information. Annual modifications of the proposed treatment within the 5-year period which do not expand the treatment area more than 10% and cover a similar location and target organisms may be accepted as an amendment to the original application. The acreage fee submitted under sub. (2) (a) shall be adjusted in accordance with any proposed amendments.

(4) The applicant shall certify to the department that a copy of the application has been provided to any affected property owners' association, inland lake district, and, in the case of chemical applications for rooted aquatic plants, to any riparian property owners adjacent to and within the treatment area.

(5) A notice of the proposed treatment shall be provided by the department to any person or organization indicating annually in writing a desire to receive such notification.

History: Cr. Register, February, 1989, No. 398, eff. 3-1-89.

NR 107.05 Issuance of permit. (1) The department shall issue or deny issuance of the requested permit between 10 and 15 working days after receipt of an acceptable application, unless:

(a) An environmental impact report or statement is required under s. 1.11, Stats. Notification to the applicant shall be in writing within 10 working days of receipt of the application and no action may be taken until the report or statement has been completed; or

(b) A public hearing has been granted under s. 227.42, Stats.

(2) If a request for a public hearing is received after the permit is issued but prior to the actual treatment allowed by the permit, the department is not required to, but may, suspend the permit because of the request for public hearing.

(3) The department may deny issuance of the requested permit if:

(a) The proposed chemical is not labeled and registered for the intended use by the United States environmental protection agency and both labeled and registered by a firm licensed as a pesticide manufacturer and labeler with the Wisconsin department of agriculture, trade and consumer protection;

(b) The proposed chemical does not have a current department aquatic chemical fact sheet;

(c) The department determines the proposed treatment will not provide nuisance relief, or will place unreasonable restrictions on existing water uses;

(d) The department determines the proposed treatment will result in a hazard to humans, animals or other nontarget organisms;

(e) The department determines the proposed treatment will result in a significant adverse effect on the body of water;

(f) The proposed chemical application is for waters beyond 150 feet from shore except where approval is given by the department to maintain navigation channels, piers or other facilities used by organizations or the public including commercial facilities;

(g) The proposed chemical applications, other than those conducted by the department pursuant to ss. 29.421 and 29.424, Stats., will significantly injure fish, fish eggs, fish larvae, essential fish food organisms or wildlife, either directly or through habitat destruction;

(h) The proposed chemical application is in a location known to have endangered or threatened species as specified pursuant to s. 29.604, Stats., and as determined by the department;

(i) The proposed chemical application is in locations identified by the department as sensitive areas, except when the applicant demonstrates to the satisfaction of the department that treatments can be conducted in a manner that will not alter the ecological character or reduce the ecological value of the area.

1. Sensitive areas are areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat, including seasonal or lifestage requirements, or offering water quality or erosion control benefits to the body of water.

2. The department shall notify any affected property owners' association, inland lake district, and riparian property owner of locations identified as sensitive areas.

(4) New applications will be reviewed with consideration given to the cumulative effect of applications already approved for the body of water.

(5) The department may approve the application in whole or in part consistent with the provisions of subs. (3) (a) through (i) and (4). Denials shall be in writing stating reasons for the denial.

(6) Permits may be issued for one treatment season only.

History: Cr. Register, February, 1989, No. 398, eff. 3-1-89; corrections in (3) (g) and (h) made under s. 13.93 (2m) (b) 7., Stats., Register, December, 2000, No. 540.

NR 107.06 Chemical fact sheets. (1) The department shall develop a chemical fact sheet for each of the chemicals in present use for aquatic nuisance control in Wisconsin.

(1m) Chemical fact sheets for chemicals not previously used in Wisconsin shall be developed within 180 days after the department has received notice of intended use of the chemical.

(2) The applicant or permit holder shall provide copies of the applicable chemical fact sheets to any affected property owners' association and inland lake district.

(3) The department shall make chemical fact sheets available upon request.

History: Cr. Register, February, 1989, No. 398, eff. 3-1-89.

NR 107.07 Supervision. (1) The permit holder shall notify the district office 4 working days in advance of each anticipated treatment with the date, time, location, and proposed size of treatment. At the discretion of the department, the advance notification requirement may be waived.

(2) Supervision by a department representative may be required for any aquatic nuisance control project involving chemicals. Supervision may include inspection of the proposed treatment area, chemicals, and application equipment before, during or after treatment. The inspection may result in the determination that treatment is unnecessary or unwarranted in all or part of the proposed area, or that the equipment will not control the proper dosage.

History: Cr. Register, February, 1989, No. 398, eff. 3-1-89.

NR 107.08 Conditions of the permit. (1) The department may stop or limit the application of chemicals to a body of water if at any time it determines that chemical treatment will be ineffective, or will result in unreasonable restrictions on current water uses, or will produce unnecessary adverse side effects on nontarget organisms. Upon request, the department shall state the reason for such action in writing to the applicant.

(2) Chemical treatments shall be performed in accordance with label directions, existing pesticide use laws, and permit conditions.

(3) Chemical applications on lakes and impoundments are limited to waters along developed shoreline including public parks except where approval is given by the department for projects of public benefit.

(4) Treatment of areas containing high value species of aquatic plants shall be done in a manner which will not result in adverse long-term or permanent changes to a plant community in a specific aquatic ecosystem. High value species are individual species of aquatic plants known to offer important values in spe-

cific aquatic ecosystems, including *Potamogeton amplifolius*, *Potamogeton Richardsonii*, *Potamogeton praelongus*, *Potamogeton pectinatus*, *Potamogeton illinoensis*, *Potamogeton robbinsii*, *Eleocharis spp.*, *Scirpus spp.*, *Valisneria spp.*, *Zizania aquatica*, *Zannichellia palustris* and *Brasenia schreberi*.

(5) Treatment shall be performed by an applicator currently certified by the Wisconsin department of agriculture, trade and consumer protection in the aquatic nuisance control category whenever:

(a) Treatment is to be performed for compensation by an applicator acting as an independent contractor for hire;

(b) The area to be treated is greater than 0.25 acres;

(c) The product to be used is classified as a “restricted use pesticide”; or

(d) Liquid chemicals are to be used.

(6) Power equipment used to apply liquid chemicals shall include the following:

(a) Containers used to mix and hold chemicals shall be constructed of watertight materials and be of sufficient size and strength to safely contain the chemical. Measuring containers and scales for the purpose of measuring solids and liquids shall be provided by the applicator;

(b) Suction hose used to deliver the chemical to the pump venturi assembly shall be fitted with an on–off ball–type valve. The system shall also be designed to prevent clogging from chemicals and aquatic vegetation;

(c) Suction hose used to deliver surface water to the pump shall be fitted with a check valve to prevent back siphoning into the surface water should the pump stop;

(d) Suction hose used to deliver a premixed solution shall be fitted with an on–off ball–type valve to regulate the discharge rate;

(e) Pressure hose used to discharge chemicals to the surface water shall be provided with an on–off ball–type valve. This valve will be fitted at the base of the hose nozzle or as part of the nozzle assembly;

(f) All pressure and suction hoses and mechanical fittings shall be watertight;

(g) Equipment shall be calibrated by the applicator. Evidence of calibration shall be provided at the request of the department supervisor.

(h) Other equipment designs may be acceptable if capable of equivalent performance.

(7) The permit holder shall be responsible for posting those areas of use in accordance with water use restrictions stated on the chemical label, but in all cases for a minimum of one day, and with the following conditions:

(a) Posting signs shall be brilliant yellow and conspicuous to the nonriparian public intending to use the treated water from both the water and shore, and shall state applicable label water use restrictions of the chemical being used, the name of the chemical and date of treatment. For tank mixes, the label requirements of the most restrictive chemical will be posted;

(b) Minimum sign dimensions used for posting shall be 11 inches by 11 inches or consistent with s. ATCP 29.15. The department will provide up to 6 signs to meet posting requirements. Additional signs may be purchased from the department;

(c) Signs shall be posted at the beginning of each treatment by the permit holder or representing agent. Posting prior to treatment may be required as a permit condition when the department determines that such posting is in the best interest of the public;

(d) Posting signs shall be placed along contiguous treated shoreline and at strategic locations to adequately inform the public. Posting of untreated shoreline located adjacent to treated shoreline and noncontiguous shoreline shall be at the discretion of the department;

(e) Posting signs shall be made of durable material to remain up and legible for the time period stated on the pesticide label for water use restrictions, after which the permit holder or representing agent is responsible for sign removal.

(8) After conducting a treatment, the permit holder shall complete and submit within 30 days an aquatic nuisance control report on a form supplied by the department. Required information will include the quantity and type of chemical, and the specific size and location of each treatment area. In the event of any unusual circumstances associated with a treatment, or at the request of the department, the report shall be provided immediately. If treatment did not occur, the form shall be submitted with appropriate comment by October 1.

(9) Failure to comply with the conditions of the permit may result in cancellation of the permit and loss of permit privileges for the subsequent treatment season. A notice of cancellation or loss of permit privileges shall be provided by the department to the permit holder accompanied by a statement of appeal rights.

History: Cr. Register, February, 1989, No. 398, eff. 3–1–89; correction in (7) (b) made under s. 13.93 (2m) (b) 7., Stats., Register, September, 1995, No. 477.

NR 107.09 Special limitation. Due to the significant risk of environmental damage from copper accumulation in sediments, swimmer’s itch treatments performed with copper sulfate products at a rate greater than 10 pounds of copper sulfate per acre are prohibited.

History: Cr. Register, February, 1989, No. 398, eff. 3–1–89.

NR 107.10 Field evaluation use permits. When a chemical product is considered for aquatic nuisance control and does not have a federal label for such use, the applicant shall apply to the administrator of the United States environmental protection agency for an experimental use permit under section 5 of the federal insecticide, fungicide and rodenticide act as amended (7 USC 136 et seq.). Upon receiving a permit, the permit holder shall obtain a field evaluation use permit from the department and be subject to the requirements of this chapter. Department field evaluation use permits shall be issued for the purpose of evaluating product effectiveness and safety under field conditions and will require in addition to the conditions of the permit specified in s. NR 107.08 (1) through (9), the following:

(1) Treatment shall be limited to an area specified by the department.

(2) The permit holder shall submit to the department a summary of treatment results at the end of the treatment season. The summary shall include:

(a) Total chemical used and distribution pattern, including chemical trade name, formulation, percent active ingredient, and dosage rate in the treated water in parts per million of active ingredient;

(b) Description of treatment areas including the character and the extent of the nuisance present;

(c) Effectiveness of the application and when applicable, a summary comparison of the results obtained from past experiments using the same chemical formulation;

(d) Other pertinent information required by the department; and

(e) Conclusions and recommendations for future use.

History: Cr. Register, February, 1989, No. 398, eff. 3–1–89.

NR 107.11 Exemptions. (1) Under any of the following conditions, the permit application fee in s. NR 107.04 (2) (a) will be limited to the basic application fee:

(a) The treatment is made for the control of bacteria on swimming beaches with chlorine or chlorinated lime;

(b) The treatment is intended to control algae or other aquatic nuisances that interfere with the use of the water for potable purposes;

(c) The treatment is necessary for the protection of public health, such as the control of disease carrying organisms in sanitary sewers, storm sewers, or marshes, and the treatment is sponsored by a governmental agency.

(2) The treatment of purple loosestrife is exempt from ss. NR 107.04 (2) (a) and (3), and 107.08 (5).

(3) The use of chemicals in private ponds is exempt from the provisions of this chapter except for ss. NR 107.04 (1), (2), (4) and (5), 107.05, 107.07, 107.08 (1), (2), (8) and (9), and 107.10.

(a) A private pond is a body of water located entirely on the land of an applicant, with no surface water discharge or a discharge that can be controlled to prevent chemical loss, and without access by the public.

(b) The permit application fee will be limited to the non-refundable \$20 application fee.

(4) The use of chemicals in accordance with label instructions is exempt from the provisions of this chapter, when used in:

(a) Water tanks used for potable water supplies;

(b) Swimming pools;

(c) Treatment of public or private wells;

(d) Private fish hatcheries licensed under s. 95.60, Stats.;

(e) Treatment of emergent vegetation in drainage ditches or rights-of-way where the department determines that fish and wildlife resources are insignificant; or

(f) Waste treatment facilities which have received s. 281.41, Stats., plan approval or are utilized to meet effluent limitations set forth in permits issued under s. 283.31, Stats.

History: Cr. Register, February, 1989, No. 398, eff. 3-1-89; corrections in (4) (d) and (f) made under s. 13.93 (2m) (b) 7., Stats., Register, December, 2000, No. 540.

Appendix C

NR 19

Chapter NR 19

MISCELLANEOUS FUR, FISH, GAME AND OUTDOOR RECREATION

Subchapter I — Miscellaneous

NR 19.001	Definitions.
NR 19.01	Approval deadlines.
NR 19.02	Handling fees for certain approvals.
NR 19.025	Waivers for an educational recreational activity.
NR 19.03	Control of muskrats on cranberry marshes.
NR 19.05	Release, importation and transportation of fish.
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Note: Corrections made under s. 13.93 (2m) (b) 7., Stats., Register, January, 1999, No. 517; CR 03-029; renum. NR 19.75 through 19.84 to be NR 12.30 through 12.41 Register December 2003 No. 576, eff. 1-1-04.

Subchapter I — Miscellaneous

NR 19.001 Definitions. (1) "Active service", for purposes of s. 29.194, Stats., means full time employment as a member of the armed services and does not include annual summer training by members of the national guard or reserves.

(1m) "Animal part or animal byproduct" has the meaning given in s. NR 10.001 (1r).

(2) "Application" means a written request for any approval of a regulatory agency required as a condition of operating a business in this state completed in the form required by and acceptable to the department and accompanied by additional plans, information and the appropriate fee.

(3) "Approval" means a license, permit or other form of approval required from the department to conduct business activities in Wisconsin.

(4) "Bird feeding devices and structures" means any device or structure that has the primary purpose of attracting or feeding birds or small mammals.

(4m) "Business" means a building used primarily to carry out commercial activities at which regular scheduled business hours are maintained for employees and the public such as restaurants and retail stores, but does not include associated lands, warehouses, outbuildings or other buildings that are not normally open to the public.

(5) "Carcass" means the dead body of any animal including the head, hair, skin, plumage, skeleton, eggs, or any other part thereof.

Note: Milk is not considered to be a part of an animal carcass or an animal byproduct for the purposes of this chapter.

(5m) "Daily bag limit" as used in s. NR 19.275, means the maximum number of a turtle species or group of turtle species which may be taken by a person each day.

(6) "Environmental consulting organization" means an individual or consortium of individuals funded to provide consulting services including status assessment of wild animals and their habitats.

(6d) "Feed" has the meaning given in s. NR 10.001 (10).

(6h) "Feeding site" has the meaning given in s. NR 10.001 (10c).

(6m) "Fish, fur, game seal" or "seal" means a numbered, non-reusable, locking device bearing the embossed inscription Fish, Fur, Game F-(number) which is issued by the department.

(7) "File" or "filed" means receipt by the department of a written notice, verified claim or other document.

(7m) "Hooking", as used in s. NR 19.275, means any activity which utilizes a dull-pointed, metal, barbless hook attached to a staff to remove a turtle from a body of water.

(8) "In the process of being mounted" means, for the purposes of the sale of part or all of a private collection, as authorized by s. 29.354, Stats., a physical process which includes taxidermy work accomplished on the carcass, including at least removal of the skin.

(8g) "Live fish" means, for purposes of this chapter, any fish possessed by a person that is handled or treated in a manner that will keep it alive, such as keeping it in water, or that is revived by placement back into water. "Live fish" includes any minnow that is possessed by a person for use as bait and that dies while the person who possesses it is on the water, bank or shore for the purpose of fishing, but only until the minnow is transported away from water, bank or shore where it died.

(8r) "Live fish eggs" means, for purposes of this chapter, fertilized or unfertilized fish eggs that are handled or treated in a manner likely to keep them alive or viable for the purpose of propagation.

(9) "Maintain records" means, for the purpose of s. 29.503 (5), Stats., to legibly prepare triplicate records and retain at least one copy of each record at the place of business for inspection purposes.

(10) "Mount", "mounted", or "mounting" means, for the purposes of ss. 29.354 (3) and 29.506 (1), Stats., and this section, to prepare and preserve the head, skin or carcass in a lifelike manner.

(11) "Natural resources", for purposes of s. 23.095, Stats., includes wild rice growing in navigable lakes.

(12) "Navigable lake", for the purpose of interpreting s. 29.607, Stats., means a natural navigable lake or a flowage or pond, or portion of a flowage or pond, where the bed is in town, county, city, village, state or federal ownership.

(12e) "Owner-occupied residence" for the purpose of this section means a dwelling or building devoted to human occupancy when used while feeding deer as a residence by the owner, members of the owner's immediate family, or when used as a residence by individuals as a rental property while feeding deer.

(12m) "Possession limit" as used in s. NR 19.275, means the maximum number of a turtle species or group of turtle species which may be possessed by a person at any time.

(13) "Private collection" means, for the purposes of s. 29.354, Stats.:

(a) A privately owned collection mounted for the purpose of display, exhibition or personal use and does not include wild animals mounted for the purpose of sale. In determining whether a wild animal was mounted for the purpose of sale, at a minimum, factors to be considered are the intent of the owner at the time of mounting, the length of time from mounting to sale, display or use of the mounted wild animal prior to sale, frequency of such sales by the owner and the reasons provided by the owner for the sale. This does not preclude the ultimate sale of a mount from a private collection.

(b) A mounted collection sold upon the death of the owner.

(13m) "Preserve" means, for the purposes of s. 29.506 (1), Stats., and this chapter, to treat or process the carcass of a wild animal to prevent the carcass from decaying or spoiling for the purpose of mounting the carcass or parts of the carcass in a lifelike manner.

(14) "Protected wild animals" means those animals for which a closed season, bag limit, size limit or possession limit has been provided by statute or administrative rule, and includes:

(a) Nongame species unless specifically designated as unprotected by the department;

(b) Game fish, game animals, game birds and fur bearing animals during closed seasons;

(c) Endangered and threatened species listed in ch. NR 27.

(15) "Records" means, for the purpose of s. 29.506 (7) (b), Stats., the taxidermist permit, sales forms, information records, records of deliveries and shipments, and the identification tag as described in s. 29.506 (5) (b), Stats.

(15m) "Small mammals" mean all mammals other than bear, deer and elk.

(16) "Stationed", for purposes of s. 29.194, Stats., means residing in Wisconsin in compliance with military orders.

(16m) "Turtle", as used in this chapter, means a reptile having horny, toothless jaws and a body enclosed in a bony or leathery shell into which the head, limbs and tail may be partially or fully withdrawn, and includes parts of turtles and turtle eggs.

(17) "Unprotected wild animals" means those animals for which no closed season, bag limit, size limit or possession limit has been provided by statute or administrative rule.

(18) "Verified" means to confirm or establish by oath, normally in the form of a notarized statement.

(19) "Wild animal" means any mammal, bird, fish, or other creature of a wild nature endowed with sensation and the power of voluntary motion.

History: Cr. Register, September, 1978, No. 273, eff. 10-1-78; r. and recr. Register, January, 1980, No. 289, eff. 2-1-80; cr. (5m) and am. (7), Register, August, 1980, No. 296, eff. 9-1-80; r. (2), (3), (4), (5) and (6), Register, January, 1984, No. 337, eff. 2-1-84; renum. (1) to be (3), cr. (1), (2), (4) and (4m), Register, August, 1985, No.

356, eff. 9-1-85; cr. (2m), Register, August, 1986, No. 368, eff. 9-1-86; cr. (2f), (3m), (3p), (3t), (5), (6) and (9), Register, March, 1987, No. 375, eff. 4-1-87; cr. (2e), Register, June, 1988, No. 390, eff. 7-1-88; renum. (1) to (9) to be (2) to (15) and (17) to (19), cr. (1) and (16), Register, October, 1988, No. 394, eff. 11-1-88; emerg. r. (4), eff. 10-16-89; cr. (6m), Register, March, 1990, No. 411, eff. 4-1-90; r. (4), Register, May, 1990, No. 413, eff. 6-1-90; cr. (5m), (7m), (12m) and (16m), Register, February, 1997, No. 494, eff. 3-1-97; CR 04-078: cr. (1m), (4), (4m), (6d), (6h), (12e), and (15m) Register April 2005 No. 592, eff. 5-1-05; emerg. cr. (8g) and (8r), eff. 11-2-07; CR 07-074: cr. (8g) and (8r) Register May 2008 No. 629, eff. 6-1-08; CR 08-021: cr. (13m) Register November 2008 No. 635, eff. 12-1-08; CR 11-030: am. (5) Register February 2012 No. 674, eff. 3-1-12; correction in (2) made under s. 13.92 (4) (b) 6., Stats., Register May 2013 No. 689.

NR 19.01 Approval deadlines. (1) GENERAL. Upon receipt of an application for an approval required to conduct business activities under ch. 29, Stats., ss. 30.50 to 30.54, 350.12 and 350.125, Stats., the department shall review and issue a decision on the application within 10 business days unless a different period is otherwise provided in subs. (2) to (6) or other statutes or rules.

(2) SPECIFIC APPROVAL DEADLINES. The following approvals will be acted on as follows:

APPROVALS	BUSINESS DAYS
(a) Commercial fishing licenses issued under s. 29.519, Stats.	50
(b) Approvals for falconry, wildlife rehabilitation and chemical control of birds and animals under ss. 23.09, 29.053, 29.088 and 29.601, Stats.	30
(c) Boat certificates of number and registration under s. 30.52, Stats.	30
(d) Snowmobile registrations under ss. 350.12 and 350.125, Stats.	30

(2m) APPROVAL TO REMOVE WILD ANIMALS CAUSING DAMAGE. Permits to remove wild animals causing damage shall be issued within 48 hours of receipt of a written complaint. Permits may be granted orally, but shall be confirmed in writing by the department.

(3) STANDARDS AND CONDITIONS. If the department requires standards or conditions to be met or complied with prior to issuance of an approval, the time periods for issuing an approval do not begin to run until the applicant has met such standards or conditions as determined by the department.

Example: An applicant for a wildlife exhibit, game, bird and animal farm, or deer farm license is required to meet pen specifications or fencing requirements before the time system for issuance of approvals begins to apply.

(4) WILDLIFE SURVEYS. If a survey of wildlife on the property is required, the time periods for issuing an approval do not apply until completion of that survey. The survey shall be completed within 30 business days from the time of year that, in the opinion of a professional department wildlife manager, is optimum for determining accurate wildlife populations. At the time the application is received, the department shall inform the applicant of the date by which the survey will be completed.

(5) ENVIRONMENTAL IMPACT. If an environmental analysis, environmental impact report or environmental impact statement is required under ss. 1.11 and 23.11 (5), Stats., and ch. NR 150, the time periods for issuing an approval do not apply until ss. 1.11 and 23.11 (5), Stats., and ch. NR 150 have been complied with.

(6) OTHER APPROVALS. The time for an approval for an activity under sub. (1) will not begin to run until other approvals for that activity are obtained.

History: Cr. Register, August, 1985, No. 356, eff. 9-1-85; cr. (2) (l) and (m), Register, July, 1987, No. 379, eff. 8-1-87; emerg. cr. (2) (n), eff. 9-21-88; cr. (2) (n), Register, January, 1989, No. 397, eff. 2-1-89; emerg. r. (2) (l) to (o), cr. (2m), eff. 10-16-89; r. (2) (l) to (n), cr. (2m), Register, May, 1990, No. 413, eff. 6-1-90; CR 05-031: r. (2) (b) to (h), renum. (2) (i), (j) and (k) to be (b), (c) and (d) and am. (c) and (d) Register November 2005 No. 599, eff. 12-1-05; CR 13-022: am. (5) Register March 2014 No. 699, eff. 4-1-14.

NR 19.02 Handling fees for certain approvals.

(1) PURPOSE. This section establishes and describes handling

fees which may be charged for processing requests for approvals ordered by mail, telephone or electronic means.

(2) APPLICABILITY. The provisions of this section apply to licenses, permits, stamps and other approvals issued under the authority of ch. 29, Stats., and offered by the department under extended issuance options and ordered by mail, telephone, or electronic means.

(3) DEFINITIONS. As used in this section:

- (a) "Approval" has the meaning in s. 29.001 (12), Stats.
- (b) "Department" means the department of natural resources.
- (c) "Extended issuance options" means the ability to obtain an approval in person and by mail, telephone or electronic means.
- (d) "Order" means a single request from a person for an approval or approvals.

(4) FEE FOR HANDLING APPLICATIONS FOR CERTAIN APPROVALS.

(a) In addition to the obligation to pay all fees imposed under s. 29.563, Stats., a person who orders an approval by mail, telephone or electronic means is required to pay a handling fee established in accordance with this section for each order.

(b) The handling fee for each order shall be established by the department based upon projected mailing costs, credit transaction fees, credit verification fees, personnel costs, telecommunications costs and lock box charges associated with processing the order and may not exceed \$5.00 per order.

(c) The handling fee under this section shall be established consistent with par. (b) annually prior to April 1 by the secretary of the department.

(d) An order submitted by mail, telephone, or electronic means without payment of all associated fees required under s. 29.563, Stats., and the handling fee in a manner acceptable by the department is not a complete application for the approval and the order will be returned.

(e) If an application for an approval is denied, the handling fee is not refundable.

History: Cr. Register, July, 1996, No. 487, eff. 8-1-96; CR 04-020: am (2) and (3) (c) Register August 2004 No. 584, eff. 9-1-04; CR 05-086: am. (4) (b) Register June 2006 No. 606, eff. 7-1-06.

NR 19.025 Waivers for an educational recreational activity. (1) PURPOSE. This section contains rules for the procedures required to apply to the department for a waiver of approvals, applicable fees and other requirements pursuant to s. 29.197 (2) and (5), Stats., for an educational, recreational and skills development activity that is sponsored or approved by the department. It further explains the reasonable conditions, limitations and restrictions that will be necessary to allow for approval of the waiver.

(2) DEFINITIONS. As used in this section:

- (a) "Accompany" means be in immediate presence of the novice participant.
- (b) "Educational outdoor skills activity" means a course to teach novice participants how to hunt, trap or fish.
- (c) "Mentor" means a person who is instructing or assisting with teaching of the educational outdoor skills activity.
- (d) "Novice participant" means for hunting any person who is 10 years old or older, who has not received an approval authorizing hunting in any prior hunting license year, including a class B bear license, for the species that will be pursued in the specific educational outdoor skills activity they desire to attend. For fishing, it means any person who is 5 years of age or older who has less than 2 years of fishing experience.

(e) "Substantial loss of revenue" means a loss of fishing, trapping and hunting license fees from persons who are not novice participants.

(3) GENERAL; CONDITIONS, LIMITATIONS AND RESTRICTIONS. (a) An applicant shall submit a request for a waiver at least 30 days prior to a hunting or trapping event and 15 days before a fishing

event. The department may waive the 15 day period for fishing events when the department determines it is not required to conduct criminal history, character or background checks. All applications shall be submitted on forms provided by the department.

(b) A written course outline shall be submitted along with the request for waiver for approval by the department.

(c) There shall be a minimum of 4 hours of classroom and field instruction prior to the hunting or fishing activity.

(d) A novice participant may not obtain more than one waiver of fees for the same hunting or fishing instructional activity.

(dm) If there are more novice participant applicants for a specific educational outdoor skills activity event or location than the department or applicant sponsoring the event is able to accommodate, the department may select which of the novice participant applicants will be allowed to participate. When making this selection, the department shall give preference to those novice participant applicants who have had the least previous exposure, as determined by the department, to that recreational activity or the least opportunity to accompany others and learn about that recreational activity.

(e) Where applicable, written authorization from host landowner shall be obtained and submitted with the application. It shall include the legal description of the lands on which the activity will be conducted. If department lands are to be used, the written approval of the property manager shall be obtained.

(f) Unless otherwise approved, the novice participants and mentors participating in the activity shall comply with all natural resource rules and regulations.

(g) Waivers may not be issued that allow for the shooting of wild animals or the catching of fish by a mentor or instructor.

(h) Novice participants may not be charged a fee which exceeds the costs of materials used in the course, equipment rental, meals and overnight accommodations.

(i) Upon receipt of information indicating prior illegal activity relevant to a mentor's ability to properly assist or instruct novice participants, the department may make appropriate inquiry into criminal history, character and background of mentoring applicants and determine their suitability for the proposed activity.

(j) One of the mentors shall carry the department approved waiver with list of participants during the educational recreational activity.

(k) Waivers under this section shall only apply to novice participants.

(L) The waiver of the approval and applicable fees will not result in a substantial loss of revenue to the department.

Note: Applications may be obtained from any department office.

(4) SPECIAL HUNTING CONDITIONS, LIMITATIONS AND RESTRICTIONS. (a) During the field portion of the hunting activity a mentor shall accompany a novice participant.

(b) During hunting skills field activities the area shall be posted with a sign advising of the activity.

(c) At least one mentor shall be a certified hunter education instructor.

(d) Mentors shall have at least 5 years of hunting experience.

(5) SPECIAL FISHING CONDITIONS, LIMITATIONS AND RESTRICTIONS. (a) Except as provided in par. (b), the applicant, instructors and mentors shall possess a valid fishing approval.

(b) Non-licensed mentors may be involved with assisting but will need approvals if they take part in the actual fishing activity unless they are enrolled as a novice participant.

(6) STATE PARKS. Waivers may be issued that allow the following activities in state parks:

(a) Possession of loaded and uncased firearms.

(b) Possession of strung and uncased bows.

(c) Hunting or trapping on properties opened for the hunting of these species under s. 29.089 (1m), Stats.

(d) Use of unleashed dogs.

(7) EXEMPTIONS. This section does not apply to special hunting events established under s. NR 10.01.

History: Cr. Register, July, 1997, No. 499, eff. 8-1-97; CR 06-012: am. (2) (d) Register December 2006 No. 612, eff. 2-1-07; CR 09-018: am. (3) (a) and (5) (a) Register February 2010 No. 650, eff. 3-1-10; CR 09-024: am. (2) (b), (d) and (e) Register May 2010 No. 653, eff. 6-1-10; CR 10-020: am. (2) (d), cr. (3) (dm) Register October 2010 No. 658, eff. 2-1-11; CR 13-108: am. (6) (c) Register August 2014 No. 704, eff. 9-1-14.

NR 19.03 Control of muskrats on cranberry marshes. (1) The owner or lessee of any improved cranberry marsh area shall comply with s. 29.885, Stats.

(3) The provisions of this section shall not apply to any person or persons who own or are interested in a cranberry marsh situated in the same area wherein said owners are the licensees of a muskrat farm or in which such person or persons have an interest.

(4) The department or its authorized agents may assist any owner or operator of improved cranberry marsh areas with the removal of muskrats from areas that have been damaged, or are being damaged by such muskrats, wherein they believe that the muskrats can be taken alive and removed to other localities deemed advisable by the department.

(5) Any such cranberry marsh areas where muskrats are being controlled as provided in this section shall be open to the inspection of the department or its authorized agents at any time.

History: 1-2-56; r. (2), Register, August, 1966, No. 128, eff. 9-1-66; renum. from WCD 19.03 to be NR 19.03, and am. (1), (4) and (5), Register, April, 1971, No. 184, eff. 5-1-71; r. and recr. (1), Register, August, 1979, No. 284, eff. 9-1-79.

NR 19.05 Release, importation and transportation of fish. (1) No person, persons, firm or corporation may bring into the state to introduce or release or cause to be introduced or released in any manner into the inland or outlying waters any fish or the eggs or spawn thereof, without first applying for in writing and receiving a written permit from the department or its duly authorized agents. The permit shall be granted only after the department or its agents investigate and inspect the fish or the eggs or spawn thereof as it deems necessary to determine that the introduction or release will not be detrimental in any manner to the conservation of the natural resources of the state. Inspection may include removal of reasonable samples of fish and eggs for biological examination. The responsibility of licensees holding private fish hatchery licenses is stated in ss. 29.735 and 29.736, Stats.

(2) Permits to import fish or eggs of the family Salmonidae (trout, char, salmon) shall be issued at no charge to a person who has applied on a special form furnished by the department. Such permit will be issued only if the immediate source of fish or eggs is certified free of infectious hematopoietic necrosis, viral hemorrhagic septicaemia, whirling disease, enteric redmouth and Ceratomyxa shasta, except that eggs from wild stocks do not have to be certified free of whirling disease. Certification shall be made in the state of origin and may be accomplished only by biologists recognized by the department as competent in diagnosis of fish diseases. For informational purposes the source of fish or eggs will also be inspected for infectious pancreatic necrosis, kidney disease and bacterial furunculosis. Inspecting biologists will submit a written inspection report to the department. A copy of the importation permit must accompany each shipment of fish or eggs.

(3) No person may transport live fish or live fish eggs away from any inland or outlying water or its bank or shore, except:

(a) Live fish or live fish eggs being transported out of state in compliance with the United States Department of Agriculture Animal and Plant Health Inspection Service's regulations and orders.

(b) Live fish or live fish eggs that have been tested for Viral Hemorrhagic Septicemia using methods approved by the department of agriculture, trade and consumer protection and that were found to be free of the Viral Hemorrhagic Septicemia virus.

(c) Live fish or live fish eggs being transported with the prior written approval of the department, where the department has determined that the proposed activity will not allow Viral Hemorrhagic Septicemia virus to be transported to other waters.

(d) Live minnows being transported away from the water where they were taken by a bait dealer who harvested the minnows in compliance with a wild bait harvest permit issued under s. NR 19.057.

(e) Live minnows that were obtained from a Wisconsin bait dealer and subsequently possessed by the person while on an inland or outlying water, its bank or shore, if the minnows have not been exposed to water or fish from that inland or outlying water.

(f) Live minnows that were obtained from a Wisconsin bait dealer and subsequently possessed by the person while on an inland or outlying water, its bank or shore, if the minnows will be used for bait only on the same inland or outlying water, its bank or shore.

History: 1-2-56; am. (2), Register, October, 1969, No. 166, eff. 1-1-70; renum. from WCD 19.05 to be NR 19.05, and am. (1), (2) and (3), Register, April, 1971, No. 184, eff. 5-1-71; r. and recr. Register, August, 1977, No. 260, eff. 9-1-77; CR 03-030: am. (1) Register October 2003 No. 574, eff. 11-1-03; emerg. am. (title), cr. (3), eff. 11-2-07; EmR0808: emerg. cr. (3) (e) and (f), eff. 4-4-08; CR 07-074: am. (title), cr. (3) Register May 2008 No. 629, eff. 6-1-08.

NR 19.055 Drainage of water from boats and equipment required. (1) Except as provided in subs. (3) to (5), any person who removes a boat, boat trailer, boating equipment or fishing equipment from any inland or outlying water or its bank or shore shall drain all water from the boat, boat trailer, boating equipment or fishing equipment, including water in any bilge, ballast tank, bait bucket, live well or other container immediately after removing the boat, boat trailer, boating equipment or fishing equipment from the water, bank or shore.

(2) Except as provided in subs. (3) and (4), no person may transport over land from another state any boat, boat trailer, boating equipment or fishing equipment for use on any water of the state or its bank or shore unless the person drains all water from the boat, boat trailer, boating equipment or fishing equipment, including water in any bilge, ballast tank, bait bucket, live well or other container before entering the state.

(3) The department may exempt any boat, boat trailer, boating equipment or fishing equipment in writing from sub. (1) or (2) if it determines that it will not allow Viral Hemorrhagic Septicemia virus to be transported to other waters.

(4) Subsections (1) and (2) do not apply to tanks or containers of potable drinking water or other beverages meant for human consumption.

(5) Subsection (1) does not apply to water in a container that holds live bait minnows obtained from a Wisconsin bait dealer, if the container holds no other fish, contains 2 gallons or less of water, and is used to transport only live minnows that have not been exposed to water or fish from that inland or outlying water or will be used for bait only on the same inland or outlying water, its bank or shore.

History: Emerg. cr. eff. 11-2-07; EmR0808: emerg. cr. (5), eff. 4-4-08; CR 07-074: cr. Register May 2008 No. 629, eff. 6-1-08.

NR 19.057 Bait dealer's wild harvest permit required; criteria; records required. (1) No bait dealer may take minnows for use as bait from any inland or outlying water unless the bait dealer possesses a wild harvest permit issued by the department under this section and the bait dealer complies with all terms and conditions of the wild harvest permit. A bait dealer shall apply for a permit on forms available from the department. Applications may be submitted no earlier than 30 days prior to the proposed starting date of harvesting. The department shall act on a complete permit application within 10 business days after receipt, based on the criteria in sub. (2). Except as provided in sub. (5), permits shall be valid for the dates specified on the permit, not to exceed 30 days, and shall require compliance with all minnow collecting requirements. A complete application shall include the

applicant's name, street address, bait dealer's license number if any, the specific water body where bait will be harvested, the town, range and section where bait will be harvested, the species of bait that will be harvested, the maximum quantity of bait expected to be harvested, and any other information required on the application form.

Note: Permit application forms may be obtained at no charge from the Bureau of Fisheries Management, Department of Natural Resources, PO Box 7921, Madison, WI 53707-7921 or on the Internet at http://dnr.wi.gov/topic/fishing/vhs/vhs_wbh-permit.html.

Note: See s. NR 20.14 for general minnow collecting restrictions, s. NR 20.20 for county and statewide restrictions on waters, authorized methods, open seasons, size limits, bag limits and other restrictions, and s. NR 20.39 for permits authorizing the use of non-standard minnow gear on inland waters.

(2) The department shall grant an application for a wild harvest permit under this section if it determines that all of the following criteria are met, but the department may set specific conditions in permits or deny applications when necessary to ensure compliance with this section and prevent or control the spread of the Viral Hemorrhagic Septicemia virus or other invasive species. By written notice mailed to the permittee's last known address, the department may revoke a permit to ensure compliance with this section or to prevent or control the spread of the Viral Hemorrhagic Septicemia virus or other invasive species.

(a) The applicant is a bait dealer who holds a bait dealer's license or is exempt under s. 29.509 (3), Stats., from the requirement to hold a bait dealer's license.

(b) Minnows may not be taken from Lake Michigan, Green Bay, Lake Superior, the Mississippi River, Lake Winnebago, the Fox River from Lake Winnebago to Green Bay, or any bay, slough or backwater of these waters, or any water connected to these waters, upstream to the first dam or other obstruction impassible to fish, or from any other waters where the department has reason to believe that the Viral Hemorrhagic Septicemia virus may be present, or where other invasive species may be present.

(c) Minnow gear and harvest and transport equipment shall be disinfected after use to prevent the spread of the Viral Hemorrhagic Septicemia virus and other invasive species.

(d) Minnows taken from inland or outlying waters may not be given, sold or bartered to another person unless applicable fish health requirements specified by the department of agriculture, trade and consumer protection in ch. ATCP 10 have been met.

(3) Each permit holder shall maintain a clear, legible daily record in the English language on forms available from the department of all minnows harvested from any inland or outlying water. The record shall include the water body of origin, the town, range and section where harvested, the species harvested, the date of harvest, the quantity or volume harvested, the disposition, except that retail sales to consumers need not be recorded, and any other information required on the record form.

Note: Minnow harvest record forms may be obtained at no charge from the Bureau of Fisheries Management, Department of Natural Resources, PO Box 7921, Madison, WI 53707-7921 or on the Internet at http://dnr.wi.gov/topic/fishing/vhs/vhs_wbhpermit.html.

(4) No bait dealer may possess farm-raised fish while engaged in the harvest of wild bait, or while transporting wild harvested bait from the water where it was harvested to the bait dealer's business location or from the water where it was harvested to the point of sale.

(5) Notwithstanding the 30-day limit in sub. (1), the department may issue a wild harvest permit that is valid for the dates specified on the permit, which may exceed 30 days duration, if the permit is for the harvest of minnows from a water of the state stocked with minnows by the applicant pursuant to a stocking permit under s. 29.736, Stats., or for the harvest of minnows from a lake stocked with minnows by the applicant pursuant to a permit for private management under s. 29.737, Stats. The department may issue a wild harvest permit under this section in conjunction with a stocking permit or a permit for private management.

History: Emerg. cr. eff. 11-1-07; CR 07-074: cr. Register May 2008 No. 629, eff. 6-1-08.

NR 19.058 Sport trolling. No operator of a boat may engage in trolling, as defined in s. NR 20.03 (40), with the use of downriggers on outlying waters, as defined in s. 29.001 (63), Stats., without direct and immediate access to a wire cutter or other hand-held device on board capable of immediately severing any fishing line or cable being used in the water behind the boat.

History: CR 12-022: cr. Register May 2013 No. 689, eff. 6-1-13.

NR 19.06 Fish nets and traps. (1) It shall be unlawful for any person or persons to take, catch or kill fish or fish for fish of any species when such fish are being held in any fish net, fish holding net, fish trap, fish pond, either artificial or natural, or any structure or net placed in any of the waters of the state by the department or under its authority for the purpose of taking or holding fish therein at any time, or for any person or persons to lift, molest, cut or destroy any fish net, fish holding net, fish trap, fish pond, or any structure or net placed in any of the waters of the state by the department or under its authority for the purpose of taking or holding fish therein.

(2) It shall be unlawful for any person or persons to take, catch, capture or kill fish or pursue fish in any fishing operations within 500 feet above or 500 feet below any net, dam or weir wherein the state of Wisconsin is fishing or holding fish for commercial, scientific, or biological purposes, when the area is properly posted by the department.

(3) No provisions in this section shall prohibit the department, its agents, deputy conservation wardens or representatives of the division of fish, game and enforcement of such department from taking any of the fish mentioned in any of the sections of this order at any time or from lifting, setting, or transferring any nets or structures used in holding or capturing fish, wherein they deem it advisable and necessary to promote the department fish management program.

History: 1-2-56; am. (1), Register, December, 1960, No. 60, eff. 1-1-61; am. (1), Register, December, 1961, No. 72, eff. 1-1-62; renum from WCD 19.06 to be NR 19.06 and am. (1), (2) and (3), Register, April, 1971, No. 184, eff. 5-1-71.

NR 19.09 Wild rice conservation. (1) REMOVAL OR DESTRUCTION OF WILD RICE. (a) No person may remove or destroy by hand, mechanical or chemical means wild rice growing in navigable lakes unless the department has approved the removal or destruction under par. (b).

(b) In addition to harvest in accordance with s. 29.607, Stats., and subs. (2) to (8), the department may authorize by written approval the removal of wild rice growing in navigable lakes upon a finding that:

1. The wild rice resource in the navigable lake will not be substantially affected. The department may consider cumulative effects of an approval on such a lake under this paragraph; and

2. The removal or destruction is necessary to allow reasonable access to the lake by the riparian owner.

(c) Persons requesting an approval under this subsection, shall apply on department forms and provide information requested by the department.

Note: The forms may be obtained from department regional offices.

(2) A closed season is established for the harvesting or gathering of wild rice in the following described areas at all times except as hereinafter provided and it is unlawful for any person to harvest or gather wild rice in any manner or at any time during such closed season.

(3) The secretary is authorized and directed, after determining by investigation and study that the wild rice is ripe, to designate the open season for harvesting or gathering wild rice in each of the areas described in sub. (4). The open season in any area may continue in effect for not more than 60 days. The open season in any area as designated by the secretary pursuant to this subsection shall be put into effect by posting of proper notice of the open season on the shores of, and at places of public access to, the lakes and

streams in which the open season is effective at least 24 hours before the beginning of the open season.

(4) There is no closed season for the harvesting of wild rice in any other area of the state of Wisconsin not herein described:

(a) *Ashland county*. All waters north of highway 2 including outlying waters.

(aa) *Barron county*. Bear lake, Beaver Dam lake and Red Cedar lake.

(b) *Bayfield county*. Totogatic lake.

(c) *Burnett county*. Bashaw lake, Big Clam lake, Big Sand lake, Briggs lake, Gaslyn lake, Long lake, Mud lake, town of Oakland, Mud lake, town of Swiss, Mud Hen lake, Spencer lake and Trade lake.

(d) *Douglas county*. In Allouez Bay in the city of Superior and Mulligan lake.

(e) *Forest county*. Atkins lake, Riley lake, Big Rice lake and Wabigon lake.

(f) *Marinette county*. Noquebay lake.

(g) *Oneida county*. Atkins lake, Big lake and Big lake thoroughfare, Gary lake, Little Rice lake, Rice lake and Spur lake.

(h) *Polk county*. Balsam Branch, Big Round lake, East lake, Glenton lake, Little Butternut lake, Nye lake, Rice lake and White Ash lake.

(i) *Sawyer county*. Musky Bay located in sections 10 and 11, T39N, R9W, on Big Lac Court Oreilles lake.

(j) *Vilas county*. Allequash lake, Little Rice lake, Nixon lake, Irving lake, Aurora lake, West Plum lake, Devine lake, West Ellerson lake, Micheys Mud lake, Frost lake, Rice lake, Sand lake and Sugar Bush Chain.

(k) *Washburn county*. Bear lake, Gilmore lake, Little Mud lake, Long lake, Mud lake, Nancy lake, Rice lake, Spring lake and Tranus lake.

(5) No person may harvest or gather any wild rice in any area of the state of Wisconsin between sunset and the following 10:00 a.m. central daylight time.

(6) No person may harvest or gather any wild rice in any navigable lake by the use of any method other than smooth, rounded, wooden rods or sticks not more than 38 inches in length and which are held and operated by hand.

Note: Section 29.607, Stats., prohibits the use of any mechanical device in any water of the state for harvesting or gathering wild rice.

(7) No person may harvest or gather any wild rice in any navigable lake by the use of any boat longer than 17 feet or greater than 38 inches in width or by the use of any boat propelled by other than muscular power using only a push-pole or canoe paddle.

(8) (a) All licensed wild rice dealers shall file reports on forms furnished by the department covering the license period with the Department of Natural Resources, Box 7924, Madison, 53707, prior to obtaining a wild rice dealer's license.

(b) Such reports shall summarize the book records required and shall include the total number of transactions and the total amount of wild rice bought, sold or processed during the period covered by such license.

(9) Nothing in the provisions of this section shall prohibit authorized agents of the department from harvesting or gathering wild rice in the performance of their official duties.

History: Cr. Register, July, 1960, No. 55, eff. 8-1-60; r. and recr. Register, July, 1964, No. 103, eff. 8-1-64; renum. from WCD 19.09 to be NR 19.09 and am. (2), intro. par., (6) and (7), Register, April, 1971, No. 184, eff. 5-1-71; am. (2) (c), (k) and (m), Register, November, 1976, No. 251, eff. 12-1-76; am. (5), Register, April, 1978, No. 268, eff. 5-1-78; am. (1) (c), Register, December, 1978, No. 276, eff. 1-1-79; r. and recr. (2) (a) to (m), and am. (6), Register, August, 1979, No. 284, eff. 9-1-79; am. (2m) (c), Register, September, 1983, No. 333, eff. 10-1-83; emerg. cr. (2m) (aa), am. (2m) (c), (d), (g), (h) and (k), eff. 8-13-84; emerg. am. (3) eff. 8-27-84, cr. (2m) (aa), am. (2m) (c), (d), (e), (g), (h), (k) and (3), Register, May, 1985, No. 353, eff. 6-1-85; r. (8), renum. (1) to (7) to be (2) to (9) and am. (6) and (7), cr. (1), Register, August, 1985, No. 356, eff. 9-1-85; am. (3), Register, July, 1987, No. 379, eff. 8-1-87; am. (3), Register, July, 1988, No. 391, eff. 8-1-88.

NR 19.11 Scientific collectors permits and scientific research licenses. (1) **DEFINITIONS.** For the purposes of implementing ss. 29.614 and 169.25, Stats., and within this section, the following definitions apply:

(a) "Qualified natural person" or "person" means any individual complying with s. 29.614, Stats., and this section, not including a corporation, partnership, cooperative, society, association or other organization.

(b) "Bonafide research program" means planned study and investigation undertaken to discover or establish facts or principles leading to increased, useful scientific knowledge.

(c) "Useful scientific knowledge" means new information contributing to the long-term well-being of wild animals and their habitats, or providing educational opportunities in the natural sciences.

(2) **APPLICABILITY.** (a) *Permits not required.* Scientific collectors permits are not required for the collection of wild plants, unprotected wild animals taken legally, or wild animals obtained from licensed game farms or fish hatcheries.

(b) *Bird banding.* Scientific collectors permits will be required for trapping and banding protected nonmigratory upland game birds.

(c) *Licenses.* A person is not required to possess a separate hunting, fishing or trapping license while collecting under a scientific collector permit.

(d) *Endangered species.* Endangered or threatened wild animals may be collected only under authority of endangered species permits issued by the department pursuant to s. 29.604, Stats., and ch. NR 27.

(e) *Tagging of fish.* Scientific collectors permits are required to capture a wild fish, attach a tag to any part of it, and then to release it back into waters of the state.

(3) **PERMIT APPLICATIONS.** (a) *Forms.* Applications for scientific collectors permits shall be made on application forms provided by the department and include:

1. Name and address of the applicant;
2. Applicant's personal description;
3. Purpose of the request;
4. Species and number of specimens to be collected;
5. Places and times when specimens are to be collected;
6. Method of collecting;
7. Place where collections will be kept; and
8. Such additional information as may be requested by the department.
9. The period of the permit.

(b) *Narrative proposal.* All permit applications shall be accompanied by a written proposal stating the objectives, justifications, procedures, times and places of collection, application of results and sponsor, if any, of the project described in the application.

(4) **PERMIT ISSUANCE.** (a) *Issuance.* Permits shall be issued in the name of the applicant. All agents of the permittee assisting in the permitted collections will be listed on the permit. Separate copies of permits shall be signed and carried by each person named in the permit when that person is acting under it in the absence of the permittee.

(b) *Specimen materials.* A permit will be issued for collections yielding preserved specimen materials only when such materials are to be kept in a place and manner where students and the public have access to them. Private collections to be kept in a manner not open to the public will not be approved.

(c) *Conditions.* 1. 'Contents.' Permits will contain conditions deemed necessary by the department to protect the resources of the state and assure use of specimens taken are in compliance with s. 29.614, Stats.

2. ‘Nonresidents.’ Permits issued to nonresidents will set forth conditions of removal of specimens from the state.

3. ‘Federal permits.’ a. Permits involving the capture, marking, collection, possession or salvage of migratory birds or parts, nests or eggs of migratory birds will not be issued under this section until the applicant possesses a permit issued by the U.S. fish and wildlife service for that activity.

b. Permits under this section are not required for banding or marking capture–and–release activities authorized under a permit issued by the U.S. fish and wildlife service.

4. ‘Size of collections.’ Permits will not be issued which authorize collections endangering the population of animals the collection would draw from, or exceeding the number of animals required to meet the permittee’s objectives.

5. ‘Unprotected species.’ Permits will not be issued for the collection of protected species if unprotected species can be used to accomplish the same purposes.

(5) PERMIT USAGE. (a) *Disposition of specimens.* 1. Living unharmed specimens collected during the course of permitted activities shall be returned to the wild at the point of capture, unless otherwise provided in the permit.

2. Any endangered or threatened species taken unintentionally during the course of permitted activities shall be immediately released if unharmed.

3. Injured or dead wild animal specimens shall be immediately turned over to the department employee named in the permit unless otherwise provided in the permit.

(b) *Notification of department.* Each permittee shall notify the department employee named in the permit at least 48 hours prior to collecting of the time and place where specimens will be collected.

(c) *Marked gear.* All traps, nets and any other gear used for capturing wild animals under terms of a permit shall be marked with the permit number, name and address of the permittee.

(d) *Trap and net tending.* All traps, nets and other capture emptied by the permittee at least once each 24–hour period.

(e) *Fishing gear restrictions.* 1. ‘Gill nets.’ Gill nets may not be used in inland waters unless specifically authorized by a permit.

2. ‘Buoys.’ All buoys and buoy staffs shall be marked and maintained as required by the department. The permit number, name and address of the permittee shall be maintained in plain figures on the bowl of the buoy.

3. ‘Sport fishing equipment.’ Hook and line fishing equipment and spearing equipment may not be possessed on a boat operating under a permit without prior approval of the department.

(6) RECORDKEEPING AND ANNUAL REPORTS. (a) *Records.* Each permittee shall keep current records, in the English language, of all collections under the permit. Records of collections shall be made available to the department during normal business hours, or upon 8 hours notice at other times.

(b) *Required reports.* Permittees shall supply information requested by the department and annually file a complete and accurate report on forms covering activities conducted under authority of the permit. Unless otherwise provided in the permit, such reports shall be filed using a report form provided by the department not later than January 10 of the year following expiration of the permit.

(c) *Content.* Annual reports by permittees shall include:

1. The common name, scientific name and number of each species and type of specimen material collected;
2. The date and geographic location of each collection;
3. Disposition of collected specimens; and
4. Any other information requested by the department.

(7) DISPOSITION. Specimens collected under the authority of the scientific collector permit may be transferred to and possessed by an educational institution for exhibition or education purposes upon completion of the project or expiration of the permit. Environmental consulting organizations may retain specimens following permit expiration provided the specimens are marked in a manner prescribed by the department. An educational institution or environmental consulting organization possessing specimens shall possess written proof of source, including the scientific collector permit number of the source and present that proof upon request by the department.

Note: Application forms for scientific collectors permits under this section may be obtained from any department regional office. Federal permits for migratory birds may be obtained from the Special Agent in Charge, U.S. Fish and Wildlife Service, Federal Building, Fort Snelling, Twin Cities, MN 55111.

History: Cr. Register, April, 1966, No. 124, eff. 5–1–66; renum. from WCD 19.11 to be NR 19.11, and am. (1) intro. par. (1) (h), (2) intro. par. and (2) (c), Register, April, 1971, No. 184, eff. 4–1–71; cr. (5) (e) and (6), Register, September, 1978, No. 273, eff. 10–1–78; r. and recr. (2), r. (5) (a), Register, August, 1979, No. 284, eff. 9–1–79; r. and recr. Register, November, 1981, No. 311, eff. 12–1–81; r. and recr. (2) (c), cr. (3) (a) 9., (4) (c) 3.b. and (7), am. (4) (c) 3., r. (6) (c) 3., renum. (6) (c) 4. and 5. to 3. and 4., Register, August, 1986, No. 368, eff. 9–1–86; CR 03–030: am. (1) (intro.), Register October 2003 No. 574, eff. 11–1–03; CR 03–014: cr. (2) (e) Register October 2003 No. 575, eff. 4–1–04.

NR 19.115 Fish, fur, game seals. Fish, fur, game seals shall be attached by or at the direction of the department to fish, fur or game articles which may be sold pursuant to s. 29.934 (1), Stats. Each seal shall be issued for a particular article only and no seal may be attached or assigned to any other article. No person may possess or transfer any seal to another person except as incidental to the possession, purchase, sale, trade or transfer of the article of fish, fur, or game for which the seal was issued.

History: Cr. Register, March, 1990, No. 411, eff. 4–1–90.

NR 19.12 Tagging the carcasses of wild animals, birds and fish taken on Indian reservations. **(1)** (a) Each authorized person who has taken a protected wild animal, bird or fish on an Indian reservation, under provisions of the reservation’s treaty rights during the off–reservation closed season for such game set by the department of natural resources, shall before removing the carcass or part thereof of such animal, bird or fish from the reservation, contact and exhibit it during ordinary working hours to a conservation warden of the department of natural resources or to any tribal member authorized by the particular tribe and designated by the department of natural resources.

(b) The conservation warden or designated tribal member shall inspect all such carcasses, attach and lock a special lettered and numbered tag to each carcass or part thereof, and maintain a record book containing the following information: the date, the reservation, the name and address of the person being issued the tag, the species and description of the wild animal, bird or fish being tagged, the destination, and the name and address of the person issuing the tag. Such record book shall be exhibited to the department of natural resources at reasonable hours for inspection and duplication. Failure to maintain and exhibit such a record book containing the above information shall be sufficient cause for the department of natural resources to revoke the authority of the official to issue any more tags. The secretary of the department of natural resources may take such revocation action without requiring that a hearing be held on the matter.

(c) The special lettered and numbered tag shall be distributed to the conservation warden or designated tribal member by the department of natural resources at such times and in such numbers as it deems appropriate. During the off–reservation closed season for such wild animal, bird or fish, no person shall remove any such carcass or part thereof from an Indian reservation without such a tag being attached and locked. No person shall remove the tag prior to consumption of the animal, bird or fish carcass tagged. No endangered species shall be tagged. No person other than a conservation warden or designated tribal member shall have unused tags in his or her possession.

(d) If a Wisconsin tribe has a tagging and registration system similar to the department's and an approved memorandum of understanding with the department pertaining to the system, tagging requirements under this section may be waived by the department. Tribal tags shall be validated and affixed to the carcass.

History: Cr. Register, April, 1976, No. 244, eff. 5-1-76; CR 08-021: cr. (1) (d) Register November 2008 No. 635, eff. 12-1-08.

NR 19.13 Disposition of deer accidentally killed by a motor vehicle. (1) The driver of a motor vehicle involved in a vehicle-deer collision may have first priority to the deer killed. However, if the driver does not want to take possession of the deer it may be given to another party at the scene of the accident by the department or its agents.

(2) If a driver collides with and kills 2 or more deer at one time, the driver is eligible to receive as many of these deer as the driver wishes.

(3) No vehicle-killed deer, or any parts thereof, may be sold or bartered by the individual to any other person at any time, except the head or hide, which may be disposed of pursuant to s. 29.539, Stats. Vehicle-killed deer may be given to another person or to charitable organizations, except that spotted hides or velvet antler possession shall comply with sub. (4).

(4) Possession of vehicle-killed deer shall be limited to 90 days. Pursuant to ss. 29.347 (3) and 29.349 (2), Stats., if the vehicle-killed deer is a spotted fawn or a deer with antlers in velvet and the person who possesses the deer wants to retain the spotted hide or velvet antlers for more than 90 days, the person shall contact the department for written authorization to retain the spotted hide or velvet antlers before the end of the 90 day period. Written authorization to possess spotted hides and velvet antlers from a vehicle-killed deer does not allow sale or transfer to another.

(5) White deer may not be released by the department.

(6) No deer may be retained until it has been tagged as required under this section.

(7) Permits shall be issued and attached by the department or its agents for each deer released.

(8) The permit shall contain the following information:

(a) Name and address of permittee.

(b) Vehicle license number if deer given to driver involved in the collision.

(c) Date of accident.

(d) Date of issuance.

(e) Identification of permittee as driver of vehicle, or other.

(f) Sex of deer and approximate weight.

(g) Location of kill as to county and deer management unit.

(h) Name of officer who issued permit carcass tag and the name and address of the officer's agency.

(i) Statement that the permit is valid for a period of 90 days after the date of issuance.

(9) One copy of permit shall be issued to permittee, one copy sent to the department, and one copy retained by issuing agency.

(10) Provisions of permit and restrictions shall be printed on the back of the permit form.

(11) If a deer is not released pursuant to sub. (1), it may be sold by the department at the highest price obtainable or otherwise disposed of.

(12) The entrails or any other parts of deer killed in vehicle-deer collisions may not be disposed of on the highway right-of-way.

History: Cr. Register, June 1976, No. 246, eff. 7-1-76; am. Register, August, 1994, No. 464, eff. 9-1-94; am. (3), Register, October, 1997, No. 502, eff. 11-1-97; CR 04-046: am. (4) and (5) Register September 2004 No. 585, eff. 10-1-04; CR 05-031: am. (3) Register November 2005 No. 599, eff. 12-1-05; correction in (4) made under s. 13.92 (4) (b) 7., Stats., Register May 2013 No. 689.

NR 19.25 Wild animal protection. Unless engaged in dog training or dog trials as authorized by the department in s. NR

17.001 (3) and (5), or other activity specifically authorized by the department, a closed season is established and no person may harass, disturb, pursue, shoot, trap, catch, take, or kill protected wild animals by any means, except as described under s. NR 12.10 (1) (b) 4.

History: Cr. Register, August, 1980, No. 296, eff. 9-1-80; correction made under s. 13.93 (2m) (b) 7., Stats., Register, October, 1997, No. 502; CR 01-006: am. Register August 2001 No. 548, eff. 9-1-01; CR 05-031: am. Register November 2005 No. 599, eff. 12-1-05.

NR 19.26 Season and restrictions for taking frogs.

(1) The open season for frogs runs from the Saturday nearest to May 1 to December 31.

(2) No person may take frogs with the aid of a firearm or air gun.

(3) Possession limits for frogs are established in s. NR 16.12.

History: Cr. Register, May, 2000, No. 533, eff. 6-1-00; CR 03-030: r. and recr. Register October 2003 No. 574, eff. 11-1-03.

NR 19.27 Seasons, limits, restrictions on taking crayfish. There is a closed season established for taking crayfish except when taken during the open season by the following methods:

Animal and locality	Open season (both dates inclusive)	Bag limit	Size limit	Methods of taking
(1) Crayfish All areas except Wis.-Minn. boundary waters. See s. NR 21.04 (12)	Continuous	None	None	Crayfish may be taken by hand, minnow seine, minnow dipnets or minnow traps, as defined in s. NR 20.10, and by crayfish traps with any entrance not to exceed 2 1/2 inches at its greatest diagonal measurement. All traps used to take crayfish shall be raised and crayfish removed at least once each day following the day set unless otherwise authorized by the district director. All traps shall be tagged with a tag clearly bearing in the English language the name and address of the owner and trapper.

(4) ADDITIONAL RESTRICTIONS. (a) *Crayfish*. 1. 'Prohibitions.' No person may:

a. Use live crayfish as bait on the inland waters except on the Mississippi river.

b. Possess live crayfish while on any inland waters of the state, except the Mississippi river, unless that person is engaged in crayfish removal. Simultaneous possession of live crayfish and hook and line fishing equipment while on the inland waters, except the Mississippi river, shall be considered prima facie evidence of a violation of this subsection.

c. Place, deposit, throw or otherwise introduce live crayfish into any waters of the state unless a permit authorizing introduction has been issued by the department.

d. Take, possess or control a crayfish unless the person is in possession of a valid approval which authorizes the hunting of small game or which authorize fishing, unless otherwise exempt from the need to possess one of more of these approvals to hunt or fish under ch. 29, Stats.

2. 'Bait.' a. Crayfish may not be taken with use of bait consisting of fish, including parts of fish lawfully taken, fish by-products including fish meal or prepared parts of fish, except in the same body of water from which the fish was obtained, or if the fish

are minnows obtained from a Wisconsin bait dealer, or with written approval of the department.

b. Bait or parts of bait authorized in this subdivision may not be deposited in the waters of this state unless they are enclosed within the trap.

3. ‘Floats or markers.’ Floats or markers used to locate traps for the taking of crayfish:

a. May not exceed 5 inches in size at its greatest dimension;

b. May not extend more than 4 inches above the surface of the water.

c. Shall plainly and clearly display in the English language the name and address of the owner or operator; and

d. Shall be of a color other than orange or fluorescent colorations.

4. ‘Traps.’ Crayfish traps placed in trout streams shall conform to the dimensions of minnow traps described in s. NR 20.03 (26) unless otherwise authorized by the department.

History: Cr. Register, December, 1982, No. 324, eff. 1–1–83; r. and recr. Register, June, 1984, No. 342, eff. 7–1–84; cr. (4) (a) 4., Register, December, 1984, No. 348, eff. 1–1–85; am. (1), Register, July, 1988, No. 391, eff. 8–1–88; am. (intro.), r. (3), Register, February, 1997, No. 494, eff. 3–1–97; correction in (4) (a) 4. made under s. 13.93 (2m) (b) 7., Stats., Register, September, 1999, No. 525; am. (intro.), r. (2) and (4) (b), Register, May, 2000, No. 533, eff. 6–1–00; emerg. am. (4) (a) 2. a., eff. 11–2–07; CR 07–074: am. (4) (a) 2. a. Register May 2008 No. 629, eff. 6–1–08; CR 09–018: cr. (4) (a) 1. d. Register February 2010 No. 650, eff. 3–1–10.

NR 19.275 Turtles. (1) APPLICABILITY. This section applies to the taking and possession of turtles in Wisconsin, except for the Wisconsin–Minnesota boundary waters and the Wisconsin–Iowa boundary waters, where the taking and possession of turtles is governed by ss. NR 21.13 and 22.13, respectively.

(2) SEASONS; POSSESSION AND DAILY BAG LIMITS. No person may take turtles except during the open seasons established in sub. (4). For the purpose of turtle harvest, the possession limits are the same as the daily bag limits.

(3) ADDITIONAL RESTRICTIONS. No person may do any of the following:

(a) Take, possess or control a turtle unless the person is in possession of a valid approval which authorizes the hunting of small game or which authorize fishing, unless otherwise exempt from the need to possess one of more of these approvals to hunt or fish under ch. 29, Stats.

Note: The s. 29.228, Stats., fishing license exemption for nonresidents under age 16 only applies to taking fish by hook and line. Therefore, any nonresident under age 16 who takes turtles by hand, hooking or with hoop net turtle traps must possess a valid fishing or small game authorization.

(b) Take turtles by methods other than hoop net turtle traps that comply with par. (c), hand, hook, and line when in possession of a fishing license, setline, or set or bank poles when in possession of a setline or set or bank pole license used in compliance with s. NR 20.12, or hooking.

(c) Use a hoop net turtle trap to take turtles unless it complies with all of the following criteria:

1. It is constructed with no less than 6 inch stretch measure mesh net as defined in s. NR 25.02 (28).

2. The net is nylon or other stretchable fabric. Wire may not be used.

3. It is constructed with a funnel entrance at one or both ends which are tied off to the sides or the opposite ends. The opening in the funnel may be round or oval.

4. It is designed and set so the closed sides sit horizontal in the water.

Note: There is no restriction on the size of the trap itself or the number of hoops used in its construction.

(d) Use a hoop net turtle trap unless it is placed on the bed of the stream, river, lake or pond so that a minimum of 2 inches of the trap is above the water’s surface.

(e) Use a hoop net turtle trap unless it is checked and the entrapped contents removed at least once each day.

(f) Place, use or tend more than 3 hoop net turtle traps.

(g) Use a hoop net turtle trap unless a stamped or engraved metal tag, bearing the name and address of the operator of the trap in the English language, is attached in a manner that is visible above water and legible at all times.

(h) Place, use or tend a hoop net turtle trap or remove its entrapped contents unless that person is the operator identified on the trap tag.

(i) Use fish, including parts of fish, as bait except that fish and fish parts may be used as bait in the same body of water from which the fish was obtained, or if the fish are minnows obtained from a Wisconsin bait dealer, or with written approval of the department.

(j) Place, set, or use a hoop net turtle trap within 200 feet of any fishway, lock, or dam.

(k) Place, set or use any hook and line, setline or bank pole for taking turtles in a manner or at any time during which these methods are not allowed for taking fish under ss. NR 20.06 and 20.12.

(4) SEASONS AND LIMITS:

Turtle species	Open seasons (both dates inclusive)	Daily bag and possession limit	Size limit
(a) Snapping turtle	July 15 to Nov. 30	3	12 inch minimum 16 inch maximum top shell measured from front to back
(b) Softshell turtle	July 15 to Nov. 30	3	None
(bm) Blanding’s turtle	None	0	None
(c) All other turtles not listed as threatened or endangered in ch. NR 27	July 15 to Nov. 30	5 in total	None

History: Cr. Register, February, 1997, No. 494, eff. 3–1–97; CR 06–011: am. (3) (a) Register September 2006 No. 609, eff. 4–1–07; emerg. cr. (3) (i), eff. 11–1–07; CR 07–074: cr. (3) (i) Register May 2008 No. 629, eff. 6–1–08; CR 09–018: am. (3) (a) Register February 2010 No. 650, eff. 3–1–10; CR 09–051: cr. (3) (j) and (k) Register June 2010 No. 654, eff. 7–1–10; CR 13–001: am. (3) (b) Register August 2013 No. 692, eff. 9–1–13; CR 14–025: cr. (4) (bm) Register May 2015 No. 713, eff. 6–1–15.

NR 19.28 Taxidermy. (1) TRANSPORTATION. Whenever a permitted taxidermist, or his or her agent, takes a wild animal carcass into possession at a location other than the taxidermist’s place of business, the records required by s. 29.506 (5) (b) and (6), Stats., shall be completed immediately and shall accompany the carcass during transportation.

(2) POSSESSION. (a) If a permitted taxidermist holds wild animal carcasses received in connection with his or her business pursuant to the authorization in s. 29.506 (4), Stats., in the same storage area or freezer with personally acquired wild animal carcasses, every wild animal carcass so held shall be tagged in the manner described in s. 29.506 (5) (b), Stats. Wild animal carcasses so tagged and stored may not be considered to be commingled.

(b) The authorization of s. 29.506 (4), Stats., does not apply to wild animal carcasses acquired by a taxidermist for purposes not related to the business of taxidermy.

(3) MOUNTED COLLECTION OF A TAXIDERMIST. This section does not permit seizure of, nor prohibit possession or sale of a lawfully obtained wild animal carcass by a permitted taxidermist which is mounted or is in the process of being mounted for the private collection of a permitted taxidermist provided that the tagging and record keeping requirements and the commingling prohibitions of s. 29.506, Stats., have been complied with. Included

is any such wild animal carcass received by a permitted taxidermist in connection with his or her business which has been abandoned by the customer.

History: Cr. Register, March, 1987, No. 375, eff. 4-1-87.

NR 19.30 Criminal history checks; volunteer instructors. Whenever application is made to the department by a person interested in becoming certified to instruct as a volunteer all-terrain vehicle, boating, bow hunter, hunter education, Wisconsin cooperative trapper education program or snowmobile safety instructor, the bureau of law enforcement shall conduct a criminal history, character and background check on the applicant. Notwithstanding s. NR 19.025, the bureau of law enforcement shall conduct a background check on any person who applies to serve as an angler or aquatic education instructor, or an educational outdoor skills activity mentor. Upon becoming aware of information indicating prior illegal activity, the department shall make appropriate inquiry into criminal history and character of instructor or mentoring applicants and determine their suitability for the proposed activity.

History: Cr. Register, July, 1996, No. 487, eff. 8-1-96; am. Register, September, 1998, No. 513, eff. 10-1-98; CR 09-018: am. Register February 2010 No. 650, eff. 3-1-10.

NR 19.40 Department authority to void local hunting, fishing and trapping ordinances. (1) PURPOSE. These rules are developed, pursuant to s. 227.11, Stats., to establish procedures for determining when local ordinances should be voided under s. 29.038, Stats., because they have more than an incidental effect on hunting, fishing or trapping, or do not have public health and safety as a primary purpose.

(2) DEFINITIONS. In this section:

(a) "Building devoted to human occupancy" has the meaning used in s. 941.20 (1) (d), Stats.

(b) "Undeveloped lands" has the meaning given in s. 943.13 (1e) (cr), Stats.

(3) DEPARTMENT DETERMINATIONS. Department determinations related to the legality of local ordinances regulating hunting, fishing or trapping shall consider the following factors when determining the validity of a local ordinance. The listed factors are not weighted and are factors which would favor a department decision to void the ordinance.

(a) The extent to which the ordinance affects undeveloped lands or lands which are zoned agricultural, forestry, lowland conservancy, upland conservancy or flood plain.

(b) The extent to which the department has received complaints about the ordinance.

(c) Whether the ordinance purports to directly regulate hunting.

(d) Whether the ordinance requires a permit to discharge a firearm or a bow, whether a fee is charged which exceeds 150 percent of the issuance fee established by s. NR 19.02 (4) (b), creates a higher fee for non-residents or requires a background check.

Note: At the current time, the fee established by s. NR 19.02 (4) (b) is \$3.00.

(e) Whether the ordinance restricts the discharge of fine shot while the shooter is in or on the water more than 100 yards from the nearest developed shoreline, and shooting away from or parallel to that shoreline.

(f) Whether the ordinance prohibits the discharge of fine shot when on undeveloped lands which are more than 100 yards from buildings devoted to human occupancy, and shooting away from the buildings.

(g) Whether the ordinance prohibits hunting, fishing or trapping on department property otherwise open to hunting, fishing or trapping or on property leased by or under easement to the department for the purpose of hunting, fishing or trapping.

(h) Whether the ordinance prohibits the discharge of shotguns or bows within all areas of the municipality.

(i) Whether the ordinance prohibits the discharge of bows.

(j) Whether existing state laws adequately address the local safety concerns.

(k) Whether the ordinance prohibits fishing by individuals located on public waters.

(L) Whether less restrictive alternatives are available to address a municipality's safety concerns.

(m) Whether the ordinance prohibits live trapping.

(n) Whether the ordinance has no apparent health or safety purpose.

(4) EXCEPTION. This section does not apply to fishing rafts subject to regulation under s. 30.126, Stats.

(5) PROCEDURES. (a) Prior to holding a hearing to determine the validity of a local ordinance under s. 29.038, Stats., the department shall mail the affected municipality a notice of the time and location of the hearing. The department shall also publish a class I notice under ch. 985, Stats., of the hearing in the county in which the municipality is located. The notice shall be given at least 30 days prior to the date set for the hearing.

(b) Hearings shall be conducted to the extent possible in a manner consistent with s. 227.18 (1) and (2), Stats.

(c) The final decision shall be made by the secretary or the secretary's designee.

(d) The decision shall be in writing and accompanied by findings of fact and conclusions of law.

(e) The department may void ordinances found to be in violation of s. 29.038, Stats., in whole or in part, or as applied to certain areas, certain classes of persons, certain times of the year, or certain circumstances.

History: Cr. Register, May, 2001, No. 545, eff. 6-1-01; correction in (2) (b) made under s. 13.92 (4) (b) 7., Stats., Register May 2013 No. 689.

NR 19.50 All-terrain vehicle and bowhunter, snowmobile and hunter education program fee. The fee for the all-terrain vehicle and bowhunter, snowmobile and hunter education certification programs shall be \$10.00 per student. The department may authorize the instructors to retain up to 50 percent of the fee to defray authorized expenses incurred locally to operate the program based on the actual cost incurred to the instructor. The remaining funds shall be turned in to the department to defray expenses incurred to operate these programs during the year. The fee for advanced hunter education courses shall only be the amount necessary, but not to exceed \$50 per student. Only instructors certified by the department to teach advanced education courses under this section may charge a fee for the advanced education courses. The department may authorize specialized fees for Internet based all-terrain vehicle and snowmobile education certification programs pursuant to a memorandum of understanding with entities managing these programs for the department. The specialized fee shall be in lieu of the \$10.00 per student fee and shall be sufficient to defray authorized operational costs of entities managing these programs for the department as well as operational costs of the department.

History: CR 00-110: cr. Register April 2002 No. 556, eff. 5-1-02; emerg. am. eff. 10-3-05; CR 05-088: am. Register March 2006 No. 603, eff. 4-1-06; CR 06-134: am. Register August 2007 No. 620, eff. 9-1-07.

NR 19.51 Wisconsin cooperative trapper education program fee. The fee for the course of instruction under the Wisconsin cooperative trapper education program shall be \$12.00 per student. The fee for correspondence trapper education certification program shall be \$12.00 per student for correspondence programs that require in-state mailing of course materials and shall be \$28.00 per student for correspondence programs that require out-of-state mailing of course materials. In addition to the fees established in this section, for correspondence courses, each student shall pay a \$17.00 deposit that shall be refunded when the course materials are returned. The fee for a duplicate copy of a trapper education course certificate of accomplishment

is \$2.75. The fee for advanced trapper education courses shall be that amount needed to pay for the cost of the course, but not to exceed \$50.00 per student. Only instructors who are certified by the department to teach trapper education courses under s. 29.597, Stats., may charge a fee for a trapper education course established under s. 29.597, Stats.

History: CR 07–015: cr. Register September 2007 No. 621, eff. 2–1–08; CR 08–011: am. Register September 2008 No. 633, eff. 2–1–09.

NR 19.60 Feeding of wild animals. (1) GENERAL PROHIBITIONS. (a) No person may place, deposit or allow the placement of any material to feed or attract wild animals for non–hunting purposes including recreational and supplemental feeding, except as provided in sub. (2) or (3), or as specifically authorized in a permit or license issued under s. 29.614 (1) or 169.25 (1) (a), Stats., or s. NR 12.06 (11) or 12.10 (1).

Note: Section 29.614, Stats., states: Scientific collector permit. (1) Application for a scientific collector permit shall be submitted to the department. The department may issue a scientific collector permit if the department determines that the applicant is a natural person and is engaged in a bona fide program leading to increased, useful scientific knowledge.

Note: Section 169.25, Stats., states: Scientific research license. (1) Issuance. (a) The department shall issue a scientific research license to any person who is engaged in a study or in research that the department determines will lead to increased, useful scientific knowledge and who files a proper application and who pays the applicable fee.

(b) Any person placing feed to attract wild animals in violation of this section or s. NR 10.07 (2) or (2m) shall remove all feed or other material illegally placed or deposited when notified by the department to do so.

(c) Landowners, lessees or occupants of any property where feed or other material in violation of this section or s. NR 10.07 (2) or (2m) is present shall remove all feed or other material illegally placed or deposited upon notification by the department of the illegal activity if not otherwise removed in accordance with par. (b).

(d) Except as authorized under sub. (3) (a) 1., no person may place feed in a feeder designed to deposit or replenish the feed automatically, mechanically or by gravity.

(2) FEEDING DEER AUTHORIZED. (a) *Affected area.* This subsection applies statewide, except for those counties where deer baiting and feeding is prohibited under par. (b).

(b) *Excluded area.* Deer baiting and feeding is prohibited in entire counties where any of the following criteria apply:

1. A CWD–affected area has been established in the county or a portion of the county, or

2. A CWD or bovine tuberculosis positive captive or free–roaming, domestic or wild animal has been confirmed after December 31, 1997 from the county, or

3. The county or portion of the county is within a 10 mile radius of a captive or free–roaming, domestic or wild animal that has been tested and confirmed to be positive for CWD or bovine tuberculosis after December 31, 1997.

(c) *Inclusion of additional counties.* 1. The department may add additional counties under par. (b) if they meet the criteria established in par. (b) 1., 2. or 3.

2. The prohibitions and exemptions in this subsection shall become effective upon issuance of an order by the secretary of the department and publication in the official state newspaper. In addition, a notice of the order shall be provided to newspapers, legislators and hunting license outlets in the area affected.

(d) *Deer feeding.* A person may place or deposit material to feed or attract wild deer for recreational and supplemental feeding purposes outside of the counties where deer feeding is prohibited under par. (b), but may not place or allow the placement of any feed material:

1. In excess of 2 gallons of feeding material within 50 yards of any owner occupied residence or business.

2. More than 50 yards from an owner occupied residence or business.

3. Within 100 yards from a roadway, as defined in s. 340.01 (54), Stats., having a posted speed limit of 45 miles per hour or more.

Note: Section 340.01 (54), Stats., “Roadway” means that portion of a highway between the regularly established curb lines or that portion which is improved, designed or ordinarily used for vehicular travel, excluding the berm or shoulder. In a divided highway, the term “roadway” refers to each roadway separately but not to all such roadways collectively.

4. That contains any animal part or animal byproduct.

5. Without the approval of the owner of the owner–occupied residence or business.

6. At a feeding site that the person knows or should have known is also being used by bear or elk. If the owner of the residence or business is notified by the department or otherwise becomes aware that bear or elk have been using a deer feeding site, the owner may not place or allow others to place any feed material that is accessible to deer, bear or elk within 50 yards of the owner–occupied residence or business for a period not less than 30 days.

(3) EXCEPTIONS. (a) This section does not prohibit any of the following activities:

1. Material placed solely for the purpose of attracting and feeding wild birds and small mammals when placed in bird feeding devices and structures at a sufficient height or design to prevent access by deer and only when the structures and devices are no further than 50 yards from a dwelling devoted to human occupancy unless authorized by the department. If the department determines that wild deer are utilizing bird feeding devices or structures, the devices or structures shall be enclosed or elevated higher to prevent access by deer.

2. Feeding of wild animals, other than deer, elk or bear, by hand if:

a. Feed placed not more than 30 feet away from the person feeding, and

b. The person feeding makes all reasonable attempts to clean up the unconsumed feed before moving a distance greater than 30 feet from the deposited feed.

3. Feed deposited by natural vegetation or found solely as a result of normal agricultural or gardening practices.

4. Standing crops planted and left standing as wildlife food plots that may be used by wild animals.

5. Feed material placed for deer or bear hunting or bear dog training as authorized under s. NR 10.07 (2m).

6. Feed material placed for trapping as specified in s. NR 10.13.

7. The use of scents, provided the material is not accessible for consumption by deer or elk or scent placed in compliance with s. NR 10.07 (2) (b) 4.

8. Feed or bait material placed or used for fish, reptiles, amphibians or arthropods, provided the material is not accessible to bear, deer or elk.

9. Feeding of deer as authorized under sub. (2).

Note: These feeding rules do not apply to captive wild animals held and licensed under ch. 169, Stats.

History: CR 04–078: cr. Register April 2005 No. 592, eff. 5–1–05; CR 07–015: cr. (2) (d) 6. Register September 2007 No. 621, eff. 10–1–07; CR 08–013: am. (2) (b) 1., Register August 2008 No. 632, eff. 9–1–08; CR 14–071: am. (2) (b) 1. Register July 2015 No. 715, eff. 8–1–15.

Subchapter II — Wildlife Rehabilitation

NR 19.70 Purpose. This subchapter is adopted to establish consistent standards for the rehabilitation of wildlife in Wisconsin. The intent is to ensure all persons engaged in wildlife rehabilitation are qualified and provide humane care and housing for wildlife being rehabilitated.

History: CR 03–029: cr. Register December 2003 No. 576, eff. 1–1–04.

NR 19.71 Definitions. In this subchapter:

(1) "Advanced license" means a wildlife rehabilitation license issued by the department to a person qualifying under s. NR 19.73 (1) and (3).

(2) "Basic license" means a wildlife rehabilitation license issued by the department to a person qualifying under s. NR 19.73 (1) and (2).

(3) "Department" means the department of natural resources.

(4) "Euthanasia" means the humane killing of a wildlife in accordance with the current American veterinary medical association standards contained in the 2000 Report of the AVMA Panel on Euthanasia.

Note: Copies of the 2000 Report of the AVMA Panel on Euthanasia, JAVA, Vol. 218, No. 5, dated March 1, 2001, are available for inspection at the offices of the Secretary of State, 30 W. Mifflin Street, Madison, WI, the Legislative Reference Bureau, One E. Main Street, Madison, WI, or the department.

(5) "Facilities" means any equipment, housing or shelter used for wildlife rehabilitation.

(6) "Federal permit" means a special purpose permit issued under 50 CFR Part 13 and 50 CFR 21.27 by the United States fish and wildlife service for the rehabilitation of migratory birds and federally endangered or threatened species.

(7) "Protective device" means a device that is designed to prevent the escape of an animal at the entrance of a primary enclosure.

(8) "Sponsor" means an advanced licensee who has volunteered to mentor a basic licensee.

(9) "Sponsorship agreement" means a document that establishes an advanced licensee as a sponsor for a basic licensee.

(10) "Volunteer" means any person, including interns, working in a limited capacity subject to the limits under s. NR 19.73 (3) (d) and under the supervision of an advanced licensee on wildlife rehabilitation activities.

(11) "Wildlife" means "wild animal" as defined in s. 169.01 (37), Stats.

(12) "Wildlife rehabilitation" means "rehabilitate" as defined in s. 169.01 (30m), Stats.

(13) "Wildlife rehabilitation advisory committee" means a group of volunteers appointed by the secretary or secretary's designee to advise and provide recommendations about wildlife rehabilitation to the department.

(14) "Wildlife rehabilitator" means a person authorized to capture, receive, temporarily possess, transport or transfer orphaned, sick or injured wildlife for the purpose of wildlife rehabilitation under a valid license issued pursuant to this subchapter.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04; CR 09-024: am. (10) Register May 2010 No. 653, eff. 6-1-10.

NR 19.72 General wildlife rehabilitation provisions.

(1) The title to all wildlife and their offspring held under a wildlife rehabilitation license remains under the jurisdiction of the department as described in s. 169.02, Stats., and may not be sold, traded or bartered without the consent of the department.

(2) The department may restrict wildlife rehabilitation of specific wildlife species, either statewide or in certain geographic areas to control the spread of disease, to protect public health or to prevent harmful environmental impacts.

(3) The department may restrict wildlife species authorized for rehabilitation based on the facilities and qualifications of the applicant or licensee.

(4) A wildlife rehabilitation license does not authorize the capture, receipt, possession, transportation or transfer of wildlife for any purpose other than wildlife rehabilitation.

(5) This license does not exempt the licensee from local ordinances that apply to activities authorized by this license.

(6) This license does not authorize the practice of veterinary medicine as defined in s. 453.02 (6), Stats.

(7) The licensee shall display his or her license to department agents or other law enforcement agents upon request.

(8) Any costs incurred by the licensee for wildlife rehabilitation activities shall be the responsibility of the licensee.

(9) Unless specifically authorized by the department for educational purposes, no person may place wildlife being rehabilitated on public exhibit, in ways that may lead to inappropriate imprinting, socialization, habituation or stress.

(10) Wildlife being rehabilitated may not be transported outside Wisconsin for release or any other purpose unless the licensee has verbal, or written, permission from the department and possesses a wildlife rehabilitation license pursuant to this subchapter.

(11) No person may import or accept wildlife for rehabilitation from outside Wisconsin unless he or she has verbal, or written, permission from the department and possesses a wildlife rehabilitation license pursuant to this subchapter.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

NR 19.73 Licenses. (1) **GENERAL RESTRICTIONS.** (a) *Requirements.* No person may rehabilitate wildlife unless he or she possesses a valid license pursuant to s. 169.24, Stats.

(b) *Transferability.* A rehabilitation license is not transferable.

(c) *Reporting.* The licensee shall notify the department within 7 days of any change of name, address, telephone number, associated federal permit status, substantial changes to facility, a decision to discontinue as a sponsor or wildlife rehabilitation activities before license expiration.

(2) **BASIC LICENSE.** (a) *Requirements.* An applicant for a basic license shall meet all of the following requirements:

1. Possess a signed sponsorship agreement stating an advanced licensee is willing to mentor the applicant's wildlife rehabilitation activities.

2. Possess a signed consulting veterinarian agreement stating a veterinarian, licensed to practice in Wisconsin or state of residence, is willing to consult and assist with care and treatment of wildlife being rehabilitated.

3. Pass an examination meeting the requirements of s. NR 19.75.

4. Allow an inspection of facilities to assure that the applicant's facilities meet the requirements of s. NR 19.77.

(b) *Restrictions.* Basic licensees may not possess any of the following:

1. Federal migratory birds or federal or state endangered or threatened species unless authorized by appropriate federal and state permit.

2. Mammals belonging to the family cervidae (deer, elk, and moose) or other harmful wild animals designated under s. 169.11, Stats.

3. Species of bird belonging to the order ciconiformes (vultures, bitterns and herons), falconiformes (hawks, eagles, harriers, osprey, kites and falcons) with the exception of American kestrel, the order Strigiformes (all owls), with the exception of saw-whet and screech owls or the families gruidae (cranes) or gaviidae (loons).

(c) *Euthanasia.* Euthanasia may only be performed under direct supervision of the sponsoring advanced licensee or consulting veterinarian.

(d) *Volunteers.* Basic licensees may not list volunteers on their license.

(3) **ADVANCED LICENSE.** (a) *Requirements.* Applicants shall meet all of the following requirements:

1. Possess a basic evaluation form signed by the applicant's advanced licensee sponsor stating that the applicant has been a licensed basic rehabilitator for a minimum of 2 years and has satisfactorily engaged in the practice of wildlife rehabilitation.

2. Possess a signed consulting veterinarian form stating a veterinarian, licensed to practice in Wisconsin or licensee's state of residence, is willing to consult and assist with care and treatment of wildlife being rehabilitated.

3. Allow an inspection of facilities to assure that the applicant's facilities meet the requirements of s. NR 19.77.

(b) *Restrictions.* Advanced licensees may not possess any of the following:

1. Species of wildlife not authorized by their license.
2. Federal migratory birds or federal or state endangered or threatened species unless authorized by the appropriate federal and state permit.

(c) *Euthanasia.* Euthanasia may be performed by the advanced licensee or consulting veterinarian.

(d) *Volunteers.* Volunteers may be authorized to assist with the rehabilitation of wildlife under the authority of an advanced licensee's license provided that all of the following conditions apply:

1. An updated list of volunteers assisting the advanced licensee is retained by the advanced licensee, and shall be provided to a department agent upon request.
2. Volunteers operating at a location other than the advanced licensee's facility shall retain a copy of the advanced licensee's license which shall be provided to a department agent upon request.
3. Advanced licensees accept responsibility for the actions and activities of volunteers and shall be responsible for any violations by volunteers in violation of this chapter or ch. 169, Stats.
4. Advanced licensees that utilize volunteers that are not assisting with wildlife rehabilitation activities under the direct supervision of the advanced licensee shall be responsible for the volunteers' facilities meeting the standards defined in s. NR 19.77.

Note: Wildlife rehabilitation sponsorship and veterinary agreements will be available upon request at DNR Service Centers, by writing the Bureau of Wildlife Management, PO Box 7921, 101 S. Webster St., Madison, WI 53707-7921 or by calling (608) 266-8204.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04; CR 08-021: am. (3) (a) (intro.), r. (3) (e) Register November 2008 No. 635, eff. 12-1-08; CR 09-024: renum. (3) (a) 4. to be (3) (a) 3. Register May 2010 No. 653, eff. 6-1-10.

NR 19.74 Application. (1) A person desiring to rehabilitate wildlife in Wisconsin shall submit all of the following information required by the department on an application form supplied by the department:

(a) A signed consulting veterinarian agreement from a veterinarian who is willing to consult and assist applicant with care and treatment of wildlife being rehabilitated.

(b) A signed sponsorship agreement from an advanced licensee who has agreed to sponsor the basic applicant.

(c) For an advanced license applicant, a signed evaluation form from the advanced sponsor and consulting veterinarian which indicates compliance with s. NR 19.73 (3).

(d) Certification that the applicant has read and understands this subchapter and that the applicant agrees to comply with all provisions of this subchapter.

(2) The department may issue the appropriate rehabilitation license to an individual possessing a valid rehabilitators license or permit from another state or province, provided that the minimum requirements of the basic or advanced rehabilitators licenses described in this subchapter are met.

Note: Wildlife rehabilitation application, evaluation form, sponsorship agreement, and veterinary agreements will be available upon request at DNR Service Centers, by writing the Bureau of Wildlife Management, PO Box 7921, 101 S. Webster St., Madison, WI 53707-7921 or by calling (608) 266-8204.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

NR 19.75 Examination. (1) A person desiring a basic license to rehabilitate wildlife in Wisconsin shall take a written examination, provided and administered by the department, and score 80 percent or greater.

(2) The examination shall be prepared by the wildlife rehabilitation advisory committee and administered by a representative of the department.

(3) An applicant failing to correctly answer at least 80 percent of the questions on the examination described in this section may not be issued a license but may repeat the exam 30 days after the examination was completed.

(4) The department shall provide an examination study guide and other information regarding wildlife rehabilitation to each applicant upon request.

Note: The wildlife rehabilitation study guide will be available upon request at DNR Service Centers, by writing the Bureau of Wildlife Management, PO Box 7921, 101 S. Webster St., Madison, WI 53707-7921 or by calling (608) 266-8204.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

NR 19.76 Facility inspection. (1) By accepting a license under this section a licensee consents to the facility inspection requirements established in s. 169.37, Stats., by the department and its agents.

(2) An applicant for a license under this section shall allow inspection of the applicant's facilities.

(3) Following an inspection, the department may do any of the following:

(a) Remove any wildlife if it is in the best interest of the animals until the facility complies with the standards established in s. NR 19.77.

(b) Deny the licensee or applicant the privilege to rehabilitate certain species until licensee or applicant can prove that the rehabilitation facilities are in compliance with this subchapter.

(c) Suspend a rehabilitation license for 30 days to allow a licensee's facilities to be brought into compliance.

(d) Allow a licensee under this subchapter a specified period of time to comply with s. NR 19.77 without revocation or suspension of license privileges designated in this subchapter.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

NR 19.77 Facility standards. (1) GENERAL OPERATING STANDARDS. Prior to engaging in wildlife rehabilitation activities, protocols for disease prevention and transmission, euthanasia, pharmaceutical use, pest control, carcass and biological waste disposal and adequate veterinary care shall be established by the licensee and reviewed and signed by licensee's consulting veterinarian. Wildlife being rehabilitated shall be subject to all of the following conditions:

(a) If suspected of having an infectious disease, be quarantined in areas designated for that purpose.

(b) Be kept separated from human living quarters and activities.

(c) Have no contact with captive wildlife licensed under ch. 169, Stats., with the exception of other wildlife held under a rehabilitation license.

(d) Have no contact with the general public unless specifically authorized by the department for educational purposes.

(e) Be kept in enclosures at all times, and have contact with the licensee or designated volunteers only to the extent necessary to provide adequate care and treatment.

(f) Not be tamed, used as pets, held with domestic animals or habituated to humans.

(g) Be of compatible species when housed together, and not pose a threat to health or well-being of other wildlife in the same enclosure.

(h) Be raised with other wild animals of the same species held under the authority of a rehabilitation license whenever appropriate and possible, to ensure proper species orientation.

(2) ENCLOSURE SIZE AND CONSTRUCTION. (a) Enclosures shall be structurally sound, of sufficient strength for species involved, and maintained in good repair to prevent escape or injury to wildlife being rehabilitated.

(b) Enclosures shall be constructed to allow sufficient space for individual posture and social movements, unless medical treatment necessitates restricted mobility.

(c) All outdoor wildlife enclosures shall have protective devices at entrances and exits to prevent escapes.

(d) Enclosures shall be secured when unattended.

(e) No exposed sharp objects, ponds with steeply sloped banks, toxic paints or sealants, poisonous vegetation or other hazardous items may be used in the construction of enclosures.

(f) Enclosures shall have visual barriers to restrict wildlife's view of humans, domestic animals, and other species being rehabilitated to reduce inappropriate imprinting, socialization, habituation or stress.

(3) ENVIRONMENTAL CONDITIONS. (a) Ambient temperatures shall be sufficient for species involved.

(b) Adequate ventilation by means of windows, doors, vents, fans or air conditioning shall be provided to protect wildlife health and to minimize drafts, odors and condensation.

(c) Adequate lighting shall be provided by artificial or natural means and cycled for appropriate photoperiod for species involved.

(d) Adequate shade, weatherproof shelters, nest boxes, perches and dens shall be provided to protect wildlife from inclement weather and direct sun.

(e) Wildlife being rehabilitated shall be gradually acclimated before being exposed to extreme outdoor conditions.

(4) FOOD. (a) Adequate feeding schedules shall be maintained for species involved unless medical treatment necessitates restricted food intake.

(b) All food shall be palatable, free of contamination, and of sufficient quantity and nutritive value.

(c) Wildlife's diets shall be supplemented with vitamins and minerals when necessary for species involved.

(d) Food receptacles shall be appropriately sized, easily accessible, kept sanitary and safe.

(5) WATER. (a) Fresh uncontaminated water for drinking shall be provided at all times unless medical treatment necessitates restricted water intake.

(b) Water, separate from drinking water, shall be provided for species requiring bathing, swimming or misting unless medical treatment necessitates restricted water exposure.

(c) Water receptacles shall be appropriately sized, easily accessible, kept sanitary and safe.

(6) SANITATION. (a) Removal and disposal of wildlife food wastes, feces and urine, bedding, carcasses, trash, garbage, and debris from the enclosure and premises shall be performed frequently to maintain sanitary conditions and protect wildlife and human health.

(b) Cages, rooms, hard surfaced pens, kennels, runs, equipment, and food and water receptacles shall be sanitized between each wildlife use to prevent disease transmission.

(c) Excess water shall be drained from enclosures and may not drain into neighboring enclosures.

(d) Wildlife in enclosures shall be protected from contact with cleaning activities and chemicals.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04; CR 08-021: am. (2) (f) Register November 2008 No. 635, eff. 12-1-08.

NR 19.78 Care and treatment of wildlife. (1) Any orphaned, sick or injured wildlife, except endangered or threatened species, that the licensee determines is not capable of being rehabilitated or having a reasonable chance of survival in the wild shall be treated under one of the following options:

(a) Euthanized.

(b) Turned over to the department.

(c) Disposed of as directed by the department.

(d) Retained for the purpose of long-term care at the direction of the department.

(2) A licensee shall notify the department within 48 hours of receipt of federal or state endangered or threatened species.

(3) State endangered or threatened species may be euthanized and disposed of only under direction of the department.

(4) Federally endangered or threatened migratory birds may only be euthanized and disposed of under the direction of the migratory bird permit office, United States fish and wildlife service, and the department.

(5) Federally endangered or threatened mammals shall only be euthanized and disposed of under direction of the endangered species permit office of the United States fish and wildlife service and the department.

(6) No licensee may keep any orphaned, sick or injured migratory bird for the purpose of rehabilitation, including birds not ready for release prior to the onset of cold weather, longer than 180 days unless an extension is granted by the migratory bird permit office of the United States fish and wildlife service, and the department for each individual case.

(7) No licensee may keep any orphaned, sick or injured wildlife for the purpose of rehabilitation, including wildlife not ready for release prior to the onset of cold weather, longer than 180 days unless an extension is granted by the department for each individual case.

(8) When the licensee determines that the injured or sick wildlife have sufficiently recovered, or orphaned wildlife has matured to an age where there is reasonable chance for survival in the wild, wildlife shall be released at an appropriate location with land-owner permission unless otherwise authorized by the department.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04; CR 08-021: am. (2) Register November 2008 No. 635, eff. 12-1-08; CR 09-024: am. (4) Register May 2010 No. 653, eff. 6-1-10.

NR 19.79 Infectious disease reporting. A licensee or consulting veterinarian shall report animal diseases as required by s. ATCP 10.02 if diagnosed in wildlife being rehabilitated and to the department's wildlife health program.

Note: The wildlife health program may be contacted by sending an e-mail to wildlifehealth@dnr.state.wi.us or by calling (608) 266-8204.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

NR 19.80 Record keeping and reporting. (1) A wildlife rehabilitation license may not be renewed until the licensee has submitted an annual report in accordance with s. 169.36 (10), Stats., and any additional required records that the department has specifically requested.

(2) An advanced licensee and a basic licensee shall provide a copy of the records required to be maintained for that license to the department quarterly as follows:

(a) Quarterly submission of records shall be provided to the department by April 30th, July 31st, October 31st and January 31st each year, and shall consist of a copy of all required records maintained during the 3 previous months.

(b) Records to be included in the quarterly report shall consist of complete records of all transactions or activity involving any wild animals of the following families:

1. Canidae (coyotes, foxes, wolves).

2. Ursidae (bears).

3. Mustelidae (badger, mink, otter, skunk).

4. Felidae (bobcat, lynx, cougars).

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04; corrections made to (2) under s. 13.93 (2m) (b) 1., Stats., Register December 2003 No. 576.

NR 19.81 Qualifications of sponsors. Advanced licensees may volunteer to sponsor, or provide consultation and advice to basic licensees. A person desiring to be an advanced sponsor shall do all of the following:

(1) Submit a request to the wildlife rehabilitation advisory committee established in s. NR 19.82 requesting designation as a sponsor.

(2) Have experience rehabilitating those wildlife species which the basic licensee is authorized to possess.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

NR 19.82 Wildlife rehabilitation advisory committee. (1) The secretary shall appoint persons experienced with wildlife biology, rehabilitation, law enforcement, and veterinary medicine to a wildlife rehabilitation advisory committee.

(2) The wildlife rehabilitation advisory committee shall assist the department with development of wildlife rehabilitation examinations, facility inspections, and recommendations which may be used in department decision making as it pertains to wildlife rehabilitation activities.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

NR 19.83 Additional conditions. (1) Any license issued after January 1, 2004, is subject to requirements of this subchapter.

(2) On January 1, 2004, all existing Wisconsin wildlife rehabilitation permittees will be granted a provisional license for 2 years. After 2 years from the effective date of the provisional license, these provisional licensees may apply for a license pursuant to this subchapter.

(3) An individual applying for a license pursuant to s. NR 19.73 (2) and (3) shall take the examination and meet the requirements established in s. NR 19.75.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

NR 19.84 Modifications. The department may amend or add conditions to licenses issued under this subchapter at any time if there is a risk to public health and human welfare or there is a risk to the health and welfare of the environment.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

NR 19.85 Disclaimer. The number of licenses issued under this subchapter may be restricted by the department based on the need for wildlife rehabilitation. Possession and care of any wildlife under this subchapter does not create a property right to the wildlife for the licensee.

History: CR 03-029: cr. Register December 2003 No. 576, eff. 1-1-04.

Subchapter III — Permitting the Use of Natural Bodies of Water as Fish Farms

NR 19.90 Purpose and applicability. (1) **PURPOSE.** The purpose of this subchapter is to establish fees, criteria and procedures to be used for permitting the use of natural bodies of water as fish farms as required under s. 29.733 (2) (f), Stats.

(2) **APPLICABILITY.** The provisions of this subchapter are applicable to:

(a) Fish farms and state-owned hatcheries located in or proposed to be located in freeze-out ponds.

(b) Natural bodies of water that were licensed as a private fish hatchery or licensed as a part of a private fish hatchery in 1997.

(c) A freeze-out pond or more than one freeze-out pond that is proposed as a fish farm at the time of application and is located on the same contiguous parcel of property under the same ownership or leasehold.

(d) Bodies of water for which a person was issued a permit under ss. 30.19, 30.195, or 31.04, Stats.

History: Cr. Register, April, 1999, No. 520, eff. 5-1-99; CR 03-030: renum. from s. NR 16.70 Register October 2003 No. 574, eff. 11-1-03; correction made under s. 13.93 (2m) (b) 1., Stats., Register October 2003 No. 574; CR 13-001: cr. (2) (d) Register August 2013 No. 692, eff. 9-1-13.

NR 19.91 Definitions. In this subchapter:

(1) "Barrier equipped" means the placement of a structure or device which prevents the movement of fish or bait from a fish farm to a natural body of water.

(1m) "Department fish hatching and rearing facilities" means all fish hatching and rearing waterbodies owned by the department, or leased or controlled through a cooperative agreement between the property owner and the department and where the department owns all the fish.

(2) "Freeze-out pond" has the meaning specified in s. 29.001 (29), Stats.

(3) "Natural body of water" means any spring, stream, pond, lake, or wetland that was historically present in a natural state but may have been physically altered over time.

(4) "Preexisting fish rearing facility" has the meaning specified in s. 29.001 (64), Stats.

(5) "Transfer of permit" means the conveyance of a permit from one party to another as a result of change in ownership or leasehold interest of a fish farm.

(6) "Wetland" has the meaning specified under s. 23.32, Stats.

Note: For purposes of this subchapter, a natural body of water does not include an artificial wetland, as defined under s. NR 103.02 (1m) or any swale, bermed area or excavation that is not located in a wetland, pond, lake, stream or spring that was historically present in a natural state, if the artificial wetland, swale, bermed area or excavation retains water as the result of human modification of the landscape or is constructed of man-made materials.

History: Cr. Register, April, 1999, No. 520, eff. 5-1-99; CR 01-128: cr. (1m), am. (3) Register June 2002 No. 558, eff. 7-1-02; CR 03-030: renum. from s. NR 16.71 Register October 2003 No. 574, eff. 11-1-03; correction made under s. 13.93 (2m) (b) 1., Stats., Register October 2003 No. 574; CR 13-001: am. (3) Register August 2013 No. 692, eff. 9-1-13.

NR 19.92 Natural body of water permit application fees. Permit application fees for the use of natural bodies of water for fish farms shall be as follows:

(1) Permit applicants for the initial use of freeze-out ponds as fish farms shall pay a \$500.00 non-refundable permit application fee.

(2) Permit applicants for permit transfers shall pay a non-refundable permit transfer fee of \$100.00.

(3) Permit applicants for permit renewals shall pay a non-refundable permit renewal fee of \$50.00.

History: Cr. Register, April, 1999, No. 520, eff. 5-1-99; CR 03-030: renum. from s. NR 16.72 Register October 2003 No. 574, eff. 11-1-03; correction made under s. 13.93 (2m) (b) 1., Stats., Register October 2003 No. 574; CR 13-001: am. (intro.), r. (1), renum. (2) to (1), renum. (3) to (2) and am., cr. (3) Register August 2013 No. 692, eff. 9-1-13.

NR 19.93 Applicant permit procedures for use of natural bodies of water for fish farms. (1) The deadline for permits reauthorized under s. 29.733 (2) (b), Stats., was January 1, 2003.

(2) For renewal of permits, the applicant shall submit a new application to the department not more than 16 months before the expiration date of the permit granted under this chapter but not less than 2 months from the expiration date of the permit.

(3) Applications for permits under this subchapter shall include documents verifying all of the following:

(a) The land that is riparian to the body of water is owned, leased or controlled by the owners of the fish farm.

(b) None of the owners of the fish farm or of the riparian lands provides access to the body of water to the public by means of an easement or other right-of way or by means of a business open to the public, except that the owners of the fish farm may allow fishing by the public for a fee.

(c) Documentation that the natural body of water may be a freeze-out pond or that the natural body of water is a preexisting fish rearing facility that is barrier equipped.

(d) Copies of any other permits or authorization required by ch. 30 or 31, Stats., the Army corps of engineers and any other federal, state or local laws and zoning ordinances.

(e) All applicants shall identify the water source and quantity used for the fish farm and whether there is any discharge to a water of the state.

(f) Any other information requested by the department to determine whether a permit would or would not be granted by the department.

Note: Permit application forms are available from the Bureau of Fisheries Management, 101 South Webster St., P.O. Box 7921, Madison, WI 53707.

(4) The department may issue a notice of intent to use a natural body of water as a fish hatching or rearing facility that was not being used as of January 1, 1998 by the department. The department shall comply with all provisions of s. NR 19.94 before it may use a natural body of water as a fish hatching or rearing facility.

History: Cr. Register, April, 1999, No. 520, eff. 5-1-99; CR 01-128: am. (1) Register June 2002 No. 558, eff. 7-1-02; CR 03-030: renum. from s. NR 16.73 Register October 2003 No. 574, eff. 11-1-03; corrections made under s. 13.93 (2m) (b) 1. and 7., Stats., Register October 2003 No. 574; CR 13-001: am. (1), (2), (4) Register August 2013 No. 692, eff. 9-1-13.

NR 19.94 Department determinations. (1) The department shall issue a permit for use of a natural body of water as a fish farm or as a part of a fish farm if all requirements of this subchapter have been met and if the department determines that no substantial public interest exists in the body of water and that no public or private rights in the body of water will be adversely impacted. Among the factors considered, the following are indicative of public rights and interests including but not limited to:

(a) Plant and wild animal habitat or plant and wild animal populations.

(b) Threatened or endangered species or their habitat.

(c) Water quality related functional values or uses of wetlands identified in s. NR 103.03.

(d) Surface water quality standards identified in chs. NR 102, 104, 105, 106 and 107 and minimum water quantity requirements identified in s. 31.02, Stats.

(e) The public's right to navigate and associated incidents to navigation including fishing, swimming, wading and canoeing.

(2) Fish farms may not introduce or propagate any non-native fish species if the department has determined that having the fish in that particular self-contained fish rearing facility or preexisting fish rearing facility will pose a risk of being detrimental to the waters of the state.

(3) Physical improvements or modifications to natural bodies of water used as fish farms shall comply with all federal, state and local laws and ordinances.

(4) Permits approved under this subchapter may be transferred to another party if the department determines that all conditions of this subchapter and s. 29.733, Stats., have been satisfied.

(5) The department shall issue or renew a permit issued under s. 29.733 (2) (a) and (b), Stats., for use of a natural body of water as a fish farm or any part of a fish farm in a natural body of water unless the department determines there has been a substantial adverse change affecting one or more of the criteria specified in subs. (1) (a) to (e), (2), or (3), or s. 29.734, Stats., resulting from the operation of the fish farm. The department shall consider the historical condition of the natural water body prior to the presence and operation of the fish farm as part of their permit renewal decision.

Note: Under this paragraph, historical conditions refer to known uses of the natural body of water prior to the inception of the fish farm.

(6) The department shall deny a permit for use of a natural body of water as a fish farm or as part of a fish farm if the requirements of this subchapter have not been met.

(6m) A single permit shall be issued for multiple natural bodies of water located on the same contiguous parcel of property under the same ownership or leasehold.

(7) Upon receipt of a complete permit application, the department shall post notice of every application submitted to the department on the department's Internet Web site. The department may schedule a hearing or provide notice stating that it will proceed on the application without a hearing if no substantive written objections to issuance of the permit is received within 30 days after publication or notice. The notice may be provided to news media and other persons according to the procedures in s. NR 27.07 (1) (b) and (c). The department may provide notice to other persons as it deems appropriate. The department will assume the cost of publishing the notice.

History: Cr. Register, April, 1999, No. 520, eff. 5-1-99; CR 01-128: r. and recr. (5), cr. (6m) Register June 2002 No. 558, eff. 7-1-02; CR 03-030: renum. from s. NR 16.74 Register October 2003 No. 574, eff. 11-1-03; corrections made under s. 13.93 (2m) (b) 1. and 7., Stats., Register October 2003 No. 574; CR 13-001: am. (5), (7) Register August 2013 No. 692, eff. 9-1-13.

NR 19.95 Enforcement. The department may suspend or revoke a permit issued under this subchapter subject to the provisions of s. 29.733 (2) (e), Stats. A fish farmer operating a fish farm in a natural body of water as defined in s. NR 19.91 (3) without a valid permit under this subchapter may be penalized under s. 29.971, Stats.

History: Cr. Register, April, 1999, No. 520, eff. 5-1-99; CR 01-128: am. Register June 2002 No. 558, eff. 7-1-02; CR 03-030: renum. from s. NR 16.75 Register October 2003 No. 574, eff. 11-1-03; corrections made under s. 13.93 (2m) (b) 1. and 7., Stats., Register October 2003 No. 574.

Appendix D

Goals, Objectives, and Actions

APPENDIX D: RED LAKE AQUATIC PLANT MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS

The following is a complete set of the Goals, Objectives, and Actions associated with the Aquatic Plant Management Plan for Red Lake in Douglas County. A separate document with these goals, objectives, and actions is included as Appendix F.

GOAL 1 – PROTECT AND ENHANCE THE NATIVE AQUATIC PLANT COMMUNITY

It is the goal of the management actions in this plan to protect and enhance the native aquatic plant community in Red Lake, causing no decline in measures of a healthy, diverse, and sustainable aquatic plant community. EWM management actions will be completed in ways proven to cause the least harm to non-target plant species. Additional lake data will be collected to further define and support management actions expected to help meet this goal.

OBJECTIVE 1: MAINTAIN OR EXCEED MEASUREMENTS OF THE HEALTH OF THE AQUATIC PLANT COMMUNITY ESTABLISHED IN THE 2017 WHOLE-LAKE, SUMMER, POINT-INTERCEPT (PI) AQUATIC PLANT SURVEY (TABLE 3)

Table 1: Aquatic plant community health parameters (Berg 2017)

Parameter	2017
Rake Species Identified	53
Visual Survey Species Identified	56
Frequency Occurrence (points with vegetation)	83.88
Simpsons Diversity Index (SDI)	0.92
Ave. Native Species per site with vegetation	2.32
Ave. Coefficient of Conservatism (C)	6.9
Floristic Quality Index (FQI)	48.5

Action Item: Implement aquatic plant management actions that will do the most for protecting and enhancing the native plant population while controlling the target species.

Action Item: Determine appropriate management actions annually based on management and survey results from the previous year.

Action Item: Protect the diversity and density of highly sensitive species with an average $C \geq 9$ including Wild calla, Three-way sedge, Pipewort, Water lobelia, Dwarf water milfoil, Alpine pondweed, Creeping spearwort, Crested arrowhead, Water bulrush, Narrow-leaved bur-reed, Small bladderwort, Smooth sawgrass, and State Species of Special Concern Small purple bladderwort and Robbins' spikerush.

OBJECTIVE 2: MEASURE THE IMPACT OF AIS MANAGEMENT ACTIONS COMPLETED ON NON-TARGET THE AQUATIC PLANT COMMUNITY

Action Item: Repeat the whole-lake, summer, PI survey that was completed in 2013 and 2017, in 2020 and again in 2023

GOAL 2 – MINIMIZE THE NEGATIVE IMPACT OF EWM ON THE NATIVE AQUATIC PLANT COMMUNITY THROUGH THE IMPLEMENTATION OF MANAGEMENT ACTIONS

An integrated approach to management including physical removal and the use of herbicides will be implemented between 2018 and 2023 to prevent EWM growth from reaching or exceeding 1.0 % (2.25 acres) of the littoral zone.

OBJECTIVE 1: PREVENT EWM IN RED LAKE FROM REPLACING NATIVE VEGETATION AND/OR BLOCKING NAVIGATION.

Action Item: Implement physical removal by property owners in nearshore shallow hard-bottom areas of the lake adjacent to developed property

Action Item: Incorporate scuba divers or snorkeling in physical removal efforts

Action Item: Consider the use of Diver-Aided Suction Harvest to aid in control of EWM

Action Item: Manage larger areas or consistently problematic areas with chemical herbicides

OBJECTIVE 2: MEASURE THE EFFECTIVENESS AND IMPACTS OF AIS MANAGEMENT ON TARGET PLANT SPECIES WITHIN THE TREATED AREAS ON AN ANNUAL BASIS.

Action Item: Complete fall EWM bedmapping annually

Action Item: Complete pre and post-treatment point-intercept aquatic plant surveying in years when proposed EWM treatments reach or exceed 10 acres; complete EWM readiness surveys in years when pre and post-treatment surveys are not planned

Action Item: Complete at least one warm-water season meandering survey of the littoral zone to identify EWM growth annually

GOAL 3 – REDUCE THE THREAT THAT A NEW AQUATIC INVASIVE SPECIES WILL BE INTRODUCED AND GO UNDETECTED IN RED LAKE AND THAT EXISTING AIS WILL BE CARRIED TO OTHER LAKES.

Red Lake is now a source lake for EWM being carried out attached to boats and/or trailers and taken to other lakes. Red Lake is at risk of new AIS being introduced in the lake. The RLA will continue to implement a watercraft inspection program according to WDNR/UW-Extension Lakes protocol. This program will either be volunteer-based, or paid for by the RLA through a small-scale CBCW grant. Watercraft inspection data will be entered into the WDNR SWIMS database annually.

Appropriate AIS signage will be maintained at the public access on Red Lake to improve the AIS awareness of many lake users.

AIS monitoring will be completed to monitor for possible new AIS following WDNR/UW-Extension Lakes protocol through the Citizen Lake Monitoring Network (CLMN) AIS Monitoring Program. Zebra mussels, spiny waterflea, hydrilla, banded mystery snails, and other species will be watched for and survey data entered into the WDNR SWIMS database annually.

OBJECTIVE 1: CONTINUE A CLEAN BOATS CLEAN WATERS (CBCW) WATER CRAFT INSPECTION PROGRAM ANNUALLY.

Action Item: Attempt to get 200 hours of volunteer and/or paid watercraft inspection at the public access.

Action Item: Apply for small-scale CBCW grants annually to support watercraft inspection efforts.

OBJECTIVE 2: MAINTAIN AND/OR IMPROVE AIS AND LAKE HEALTH SIGNAGE AT THE PUBLIC ACCESS

Action Item: Inspect the public access for appropriate AIS signage annually.

Action Item: Repair, replace, and/or install current WDNR AIS signs at the public access.

OBJECTIVE 3: REDUCE THE LIKELIHOOD THAT NEW AIS IS UNDETECTED IN RED LAKE AND TRACK EXISTING AIS FOR ADDITIONAL SPREAD.

Action Item: Participate in CLMN AIS Monitoring at least monthly between May and October each year

Action Item: Complete bi-monthly landing inspections and multiple meandering surveys of the lake's entire visible littoral zone annually to look for EWM and new AIS

GOAL 4 - IMPROVE THE LEVEL OF KNOWLEDGE PROPERTY OWNERS AND LAKE USERS HAVE RELATED TO AQUATIC INVASIVE SPECIES AND THEIR IMPACT TO THE LAKE.

The RLA will continue efforts to educate and inform property owners and lake users about AIS already in Red Lake and AIS not already in Red Lake. Efforts may include but are not limited to annual education events, distribution of AIS publications, placement of EWM maps at the public access, and discussion forums of various types related to management actions and alternatives.

OBJECTIVE 1: PLAN, COORDINATE, AND IMPLEMENT AN ANNUAL AIS EDUCATION EVENT(S) ALONE OR IN COOPERATION WITH OTHER STAKEHOLDERS.

Action Item: Seek out other stakeholders including but not limited to the Gordon St. Croix Flowage Association, Minong Flowage Association, Town of Minong AIS Committee, Douglas County Association of Lakes and Streams, and other Town and County entities to explore cooperative education and information events.

OBJECTIVE 2: DISTRIBUTE INFORMATION AND EDUCATION MATERIALS TO PROPERTY OWNERS AND LAKE USERS.

Action Item: Research AIS with little or no cost to attain and make available at events including but not limited to Annual Meetings, Lake Fairs, Summer Picnic, etc.

Action Item: Disseminate educational and informational materials through the RLA newsletter, webpage, door to door visitations, and other RLA social media outlets

OBJECTIVE 3: ENCOURAGE CONSTITUENT PARTICIPATION IN ANNUAL LAKE CONFERENCES INCLUDING THE WISCONSIN LAKES CONFERENCE IN APRIL, THE NW WISCONSIN LAKES CONFERENCE IN JUNE, AND OTHER LAKE OR AIS FOCUSED CONFERENCES

Action Item: Research and share dates and times for various lake and AIS conferences in MN and WI with the lake constituency

OBJECTIVE 4: SOLICIT PUBLIC INPUT AND REVIEW OF ANNUAL AIS MANAGEMENT PLANNING EFFORTS.

Action Item: Complete preliminary AIS management planning by January 31 each year and post on the RLA webpage for public comment.

Action Item: Provide a summary of prior year AIS management results and coming year AIS management plans in a winter or spring newsletter, RLA meeting, or on the RLA webpage

GOAL 5 - IMPROVE THE LEVEL OF KNOWLEDGE PROPERTY OWNERS AND LAKE USERS HAVE RELATED TO HOW THEIR ACTIONS IMPACT THE AQUATIC PLANT COMMUNITY, LAKE COMMUNITY, WATER QUALITY

An important part of controlling undesirable aquatic plant growth and the production of algae is reducing the amount of nutrients (mainly phosphorus) that enters the lake. The RLA will promote and encourage the implementation of simple and generally inexpensive best management practices including but not limited to shoreland buffers and the installation of rain gardens to reduce nutrient loading from the nearshore area.

Trees and other vegetation that naturally fall into a lake or that is intentionally placed in the lake by permit, is known as coarse woody habitat (CWH). CWH provides many benefits to fish and wildlife. Like aquatic vegetation, CWH is essential to the overall health of a lake and should be protected and enhanced, not eliminated. The RLA will provide information about and encourage property owner participation in protecting and/or enhancing CWH.

The RLA will continue to collect water clarity data through the CLMN program, and request participation in the CLMN Expanded Water Quality Monitoring program.

OBJECTIVE 1: PROMOTE AND SUPPORT NEARSHORE AND RIPARIAN BEST MANAGEMENT PRACTICES THAT WILL IMPROVE FISH AND WILDLIFE HABITAT, REDUCE RUNOFF, AND MINIMIZE NUTRIENT LOADING

Action Item: Distribute shoreland improvement education and information materials to lake property owners through the newsletter, webpage, and general mailings.

Action Item: Recognize property owners who participate in and/or complete shoreland restoration and habitat improvement projects in the newsletter, on the webpage, in local news publications, and/or at the site of the project.

Action Item: Recruit property owners for inclusion in projects to be funded by a WDNR Healthy Lakes grant.

OBJECTIVE 2: MAINTAIN AND/OR INCREASE THE AMOUNT OF COARSE WOODY HABITAT PRESENT ALONG THE SHORELINE

Action Item: Provide educational and informational materials to lake property owners that promote the benefits of CWH in a lake.

Action Item: Encourage property owners not to remove woody debris that falls naturally into the lake from their shoreline unless it presents a dangerous and/or undesirable condition.

Action Item: Work with the WDNR and other resource professionals to install at least one Fishsticks demonstration project possibly through a Healthy Lake Initiative project

OBJECTIVE 3: CONTINUE WATER QUALITY TESTING FOR WATER CLARITY AND ADD TEMPERATURE, DISSOLVED OXYGEN, TOTAL PHOSPHORUS, AND CHLOROPHYLL A AT THE DEEP HOLE THROUGH THE CLMN EXPANDED MONITORING PROGRAM

Action Item: Contact the WDNR and request to be included in the CLMN Expanded Monitoring Program

Action Item: Collect CLMN water quality data (water clarity, total phosphorus, chlorophyll a, and dissolved oxygen and temperature) in the Deep Hole

GOAL 6 - COMPLETE APM PLAN IMPLEMENTATION AND MAINTENANCE FOR A PERIOD OF FIVE YEARS FOLLOWING ADAPTIVE MANAGEMENT PRACTICES

This APM Plan is not intended to be a static document, but rather a plan that makes room for management changes that still fall under the guise of the stated goals, but that may make attaining those goals easier and more efficient. Management actions implemented in each year of this plan will be evaluated for how well they helped meet stated goals and objectives. Small changes will be made automatically if it is determined they will improve outcomes. Larger management changes will be presented to the RLA, WDNR, and other Stakeholders for approval before implementation.

OBJECTIVE 1: PREPARE SUMMARY REPORTS FOR ANNUAL AQUATIC PLANT SURVEYS AND MANAGEMENT ACTIONS.

Action Item: Aquatic Plant Survey Results Reports will be completed by the Aquatic Plant Specialist contracted by the RLA.

Action Item: End-of Year Summary Reports will be completed by the Primary Consultant contracted by the RLA.

Action Item: Preliminary management proposals for the following year will be completed by the Primary Consultant contracted by the RLA prior to January 31 each year and posted for public review.

GOAL 7 - EVALUATE AND SUMMARIZE THE RESULTS OF MANAGEMENT ACTIONS IMPLEMENTED DURING THE ENTIRE 5-YEAR TIMEFRAME OF THIS PLAN

An end of project report summarizing the success and failures after five years of management will be completed. This report will be completed by the RLA and its retainers and shared with property owners, lake users, WDNR, and other Stakeholders. A whole-lake, summer, PI, aquatic plant survey will be repeated in the third year included in this plan (2020) to help determine if management actions are accomplishing the goals set for them and that the health of the native aquatic plant community is not being negatively impacted. Another whole-lake, summer, PI, aquatic plant survey will be completed following the last year included in this plan (2022) following the same procedures that were used in 2013, 2017, and 2020. Results from all PI surveys will be compared to each other with the results leading to development of the next five years of EWM management in Red Lake.

OBJECTIVE 1: COMPLETE A SUMMER, WHOLE-LAKE, PI AQUATIC PLANT SURVEY AFTER 3 YEARS OF IMPLEMENTATION.

Action Item: Repeat PI survey that was completed in 2013 and 2017 in 2020.

Action Item: Compare 2020 PI survey results to 2013 and 2017 PI survey results.

OBJECTIVE 2: REVIEW MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS IN THE 2018-2022 APM PLAN.

Action Item: Review goals, objectives, and actions from the 2018-2022 APM Plan for successful implementation.

Action Item: Compare 2020 and 2023 plant survey results to the goals, objectives, and actions in the 2018-2022 APM Plan to determine success or failure of management actions over the five year period.

OBJECTIVE 3: REVISE/UPDATE 2018-2022 APM PLAN.

Action Item: Contract with a consultant to complete a new APM Plan.

Appendix E

Implementation Matrix

Recommended Implementation, Funding, and Priority Plan for the Red Lake Aquatic Plant Management Plan (5-2-2018)

Goals/Objectives/Actions		Priority Level	Healthy Lakes Grant	AIS Education Grant	AIS Control Grant	LPL Grant	Implementers	2018	2019	2020	2021	2022
1. Protect and enhance the native aquatic plant community												
1.1 Maintain or exceed measurements of the health of the aquatic plant community established in the 2017 whole-lake point-intercept (PI) aquatic plant survey												
1	Implement aquatic plant management actions that will do the most for protecting and enhancing the native plant population while controlling the target species.			x	x	RLA, RP		x	x	x	x	x
2	Determine appropriate management actions annually based on management and survey results from the previous year.			x		RP		x	x	x	x	x
3	Protect the diversity and density of highly sensitive species with an average C ≥ 9 including Wild calla, Three-way sedge, Pipewort, Water lobelia, Dwarf water milfoil, Alpine pondweed, Creeping spearwort, Crested arrowhead, Water bulrush, Narrow-leaved bur-reed, Small bladderwort, Smooth sawgrass, and State Species of Special Concern Small purple bladderwort and Robbins' spikerush.					RLA, RP		x	x	x	x	x
1.2 Measure the impact of AIS management actions completed on the non-target aquatic plant community.												
1	Repeat the whole-lake, summer, PI survey that was completed in 2013 and 2017, in 2020 and again in 2023			x	x	x	RLA, RP			x		
2. Minimize the negative impact of EWM on the native aquatic plant community through the implementation of management actions.												
2.1 Prevent EWM in Red Lake from replacing native vegetation and/or blocking navigation												
1	Implement physical removal by property owners in nearshore shallow hard-bottom areas of the lake adjacent to developed property			x	x	RLA		x	x	x	x	x
2	Incorporate scuba divers or snorkeling in physical removal efforts			x	x	RLA, RP		x	x	x	x	x
3	Consider the use of Diver-Aided Suction Harvest to aid in control of EWM			x		RLA, RP		x	?	?	?	?
4	Manage larger areas or consistently problematic areas with chemical herbicides			x		RLA, RP		x	?	?	?	?
2.2 Measure the effectiveness and impacts of AIS management on target plant species within the treated areas on an annual basis												
1	Complete fall EWM bedmapping annually			x	x	RLA		x	x	x	x	x
2	Complete pre and post-treatment point-intercept aquatic plant surveying in years when proposed EWM treatments reach or exceed 10 acres; complete EWM readiness surveys in years when pre and post-treatment surveys are not planned				x	RP		x	?	?	?	?
3	Complete at least one warm-water season meandering survey of the littoral zone to identify EWM growth annually			x	x	RP		x	x	x	x	x
3. Reduce the threat that a new AIS will be introduced and go undetected in Red Lake or that an existing AIS will be carried away to other lakes												
3.1 Continue a Clean Boats, Clean Waters (CBCW) watercraft inspection program annually												
1	Attempt to get 200 hours of paid and/or volunteer watercraft inspection at the public access			x	x	x	RLA		x	x	x	x
3	Apply for small-scale CBCW grants annually to support watercraft inspection efforts					RLA		x	x	x	x	x
3.2 Maintain and/or improve AIS and lake health signage at public access												
1	Inspect the public access for appropriate AIS signage annually.			x	x	x	RLA		x	x	x	x
2	Repair, replace, and/or install current WDNR signage at public access			x	x	x	RLA		?	?	?	?
3.3 Reduce the likelihood that new AIS goes undetected in Red Lake and track existing AIS for additional spread.												
1	Participate in CLMN AIS Monitoring at least monthly between May and October each year			x	x	x	RLA		x	x	x	x
2	Complete bi-monthly landing inspections and multiple meandering surveys of the lake's entire visible littoral zone annually to look for EWM and new AIS			x	x	x	RLA		x	x	x	x
4. Improve the level of knowledge property owners and lake users have related to aquatic invasive species and their impact to the lake												
4.1 Plan, coordinate, and implement an annual AIS education event(s) alone or in cooperation with other stakeholders.												
1	Seek out other stakeholders including but not limited to the Gordon St. Croix Flowage Association, Minong Flowage Association, Town of Minong AIS Committee, Douglas County Association of Lakes and Streams, and other Town and County entities to explore cooperative education and information events.			x	x	x	RLA		x	x	x	x
4.2 Distribute information and education materials to property owners and lake users												
1	Research AIS with little or no cost to attain and make available at events including but not limited to Annual Meetings, Lake Fairs, Summer Picnic, etc.			x	x	x	RLA		x	x	x	x
2	Disseminate educational and informational materials through the RLA newsletter, webpage, door to door visitations, and other RLA social media outlets			x	x	x	RLA		x	x	x	x
4.3 Encourage constituent participation in annual lake conferences including the Wisconsin Lakes Conference in April, The NW Wisconsin Lakes Conference in June, and other lake or AIS focused conferences.												
1	Research and share dates and times for various lake and AIS conferences in MN and WI with the lake constituency					RLA, RP		x	x	x	x	x
4.4 Solicit public input and review of annual AIS management planning efforts												
1	Complete preliminary AIS management planning by January 31 each year and post on the RLA webpage for public comment.				x	RLA, RP		x	x	x	x	x
2	Provide a summary of prior year AIS management results and coming year AIS management plans in a winter or spring newsletter, RLA meeting, or on the RLA webpage			x	x	x	RLA, RP		x	x	x	x
5. Improve the level of knowledge property owners and lake users have related to how their actions impact the aquatic plant community, lake community, and water quality												
5.1 Promote and support nearshore and riparian best management practices that will improve fish and wildlife habitat, reduce runoff, and minimize nutrient loading.												
1	Distribute shoreland improvement education and information materials to lake property owners through the newsletter, webpage, and general mailings.			x	x	x	RLA, RP		x	x	x	x
2	Recognize property owners who participate in and/or complete shoreland restoration and habitat improvement projects in the newsletter, on the webpage, in local news publications, and/or at the site of the project.					RLA		x	x	x	x	x
3	Recruit property owners for inclusion in projects to be funded by a WDNR Healthy Lakes grant.					RLA		x	x	x	x	x
5.2 Maintain or increase the amount of coarse woody debris present along the shoreline												
1	Provide educational and informational materials to lake property owners that promote the benefits of CWH in a lake.			x	x	x	RLA, RP		x	x	x	x
2	Encourage property owners not to remove woody debris that falls naturally into the lake from their shoreline unless it presents a dangerous and/or undesirable condition.			x	x	x	RLA		x	x	x	x
3	Work with the WDNR and other resource professionals to install at least one Fishsticks demonstration project possibly through a Healthy Lake Initiative project		x			RLA		x	x	x	x	x
5.3 Continue water quality testing for water clarity and add temperature, dissolved oxygen, total phosphorus, and chlorophyll-a at the deep hole through CLMN Expanded Monitoring program.												
1	Contact the WDNR and request to be included in the CLMN Expanded Monitoring Program					RLA		x				
2	Collect CLMN water quality data (water clarity, total phosphorus, chlorophyll a, and dissolved oxygen and temperature) in the Deep Hole			x	x	x	RLA		x	x	x	x
6. Complete APM Plan implementation and maintenance for a period of five years following adaptive management practices.												
6.1 Prepare summary reports for annual aquatic plant surveys and management actions												

1	Aquatic Plant Survey Results Reports will be completed by the Aquatic Plant Specialist contracted by the RLA.			x	x	x	RLA, RP		x	x	x	x	x
2	End-of Year Summary Reports will be completed by the Primary Consultant contracted by the RLA.			x	x		RP		x	x	x	x	x
3	Preliminary management proposals for the following year will be completed by the Primary Consultant contracted by the RLA prior to January 31 each year and posted for public review.			x	x		RP		x	x	x	x	x

7. Evaluate and summarize the results of management actions implemented during the entire 5-year timeframe of this plan

7.1 Complete a summer whole-lake PI aquatic plant survey after 3 years of implementation.

1	Repeat PI survey that was completed in 2013 and 2017 in 2020.			x	x	x	RLA, RP				x		
2	Compare 2020 PI survey results to 2013 and 2017 PI survey results.			x	x	x	RP				x		

7.2 Review management goals, objectives, and actions in the 2018-2022 APM Plan

1	Review goals, objectives, and actions from the 2018-2022 APM Plan for successful implementation.			x		x	RLA, RP						x
2	Compare 2020 and 2023 plant survey results to the goals, objectives, and actions in the 2018-2022 APM Plan to determine success or failure of management actions over the five year period.			x		x	RLA, RP						x

7.3 Revise/ update 2018-2022 APM Plan

1	Contract with a consultant to complete a new APM Plan			x		x	RLA						x
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Implementers: RLA, Red Lake Association; RP, resource professionals/consultant; WDNR, Wisconsin Department of Natural Resources; CLMN, Citizen Lake Monitoring Network; AIS, aquatic invasive species; CBCW, Clean Boats, Clean Waters; EWM, Eurasian watermilfoil; APM, Aquatic Plant Management; PI, point intercept

Appendix F
Annual Calendar

