



**LAKE ECOLOGY EDUCATION PROGRAM
FALL INDOOR LAB MANUAL**

NAME: _____ **HOUR** _____

<u>LAB MODULE NAME</u>	<u>PAGE</u>	<u>POINTS</u>
Critical Habitat	2-6	_____ (50)
Water Quality	7-8	_____ (45)
Aquatic Plants	9-10	_____ (55)
Invasive Species	11	_____ (50)
	TOTAL	_____ (200)

INSTRUCTOR COMMENTS:

INDOOR CRITICAL HABITAT MODULE LAB SHEET

TEAM MEMBERS:

BACKGROUND:

Things you should learn

- What is Critical Habitat?
- What percent of living things found in lakes and rivers can be found along the shores and shallow margins?
- What part of the lake do 80% of all plants and animals on the state's endangered or threatened species list spend all or part of their life cycle?
- Things that affect critical habitat?

ANSWERED QUESTIONS.....(5 pts)_____

Web site work: Go to the WDNR Critical Habitat Homepage:

<http://dnr.wi.gov/lakes/criticalhabitat/>

Critical Habitat Areas

Assuring Public Rights in Waters of the State

Critical Habitat Designation - The Program

Every body of water has critical habitat - those areas that are most important to the overall health of the aquatic plants and animals. Remarkably, eighty percent of the plants and animals on the state's endangered and threatened species list spend all

or part of their life cycle within the near shore zone. As many as ninety percent of the living things in lakes and rivers are found along the shallow margins and shores.

Wisconsin law mandates special protections for these critical habitats. Critical Habitat Designation is a program that recognizes those areas and maps them so that everyone knows which areas are most vulnerable to impacts from human activity. A critical habitat designation assists waterfront owners by identifying these areas up front, so they can design their waterfront projects to protect habitat and ensure the long-term health of the lake they where they live.

Areas are designated as Critical Habitat if they have Public Rights Features, Sensitive areas or both. Public rights features (defined in NR 1.06, Wis. Adm. Code) include the following:

- Fish and wildlife habitat;
- Physical features of lakes and streams that ensure protection of water quality;



- Reaches of bank, shore or bed that are predominantly natural in appearance;
- Navigation thoroughfares;
- Sensitive Areas. Sensitive Areas are defined in Ch. NR 107 as: areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat to the body of water.

To Print Map:

Using the “Lake Name” Text Box in the upper right corner of this page enter the Lake Name

(Middle Eau Claire)

Click on the “Go” button

Confirm lake choice: Click on [\(Middle Eau Claire Lake\)](#) to display Lake description page

- **Lake Description Page**

Lake Name:

Middle Eau Claire Lake
Bayfield County, 880 Acres

[Overview](#)

[Facts & Figures](#)

[More](#)

Middle Eau Claire Lake is a 880 acre lake located in Bayfield County. It has a maximum depth of 66 feet. Visitors have access to the lake from a public boat landing. Fish include Musky, Panfish, Largemouth Bass, Smallmouth Bass, Northern Pike and Walleye. The lake's water clarity is moderate.

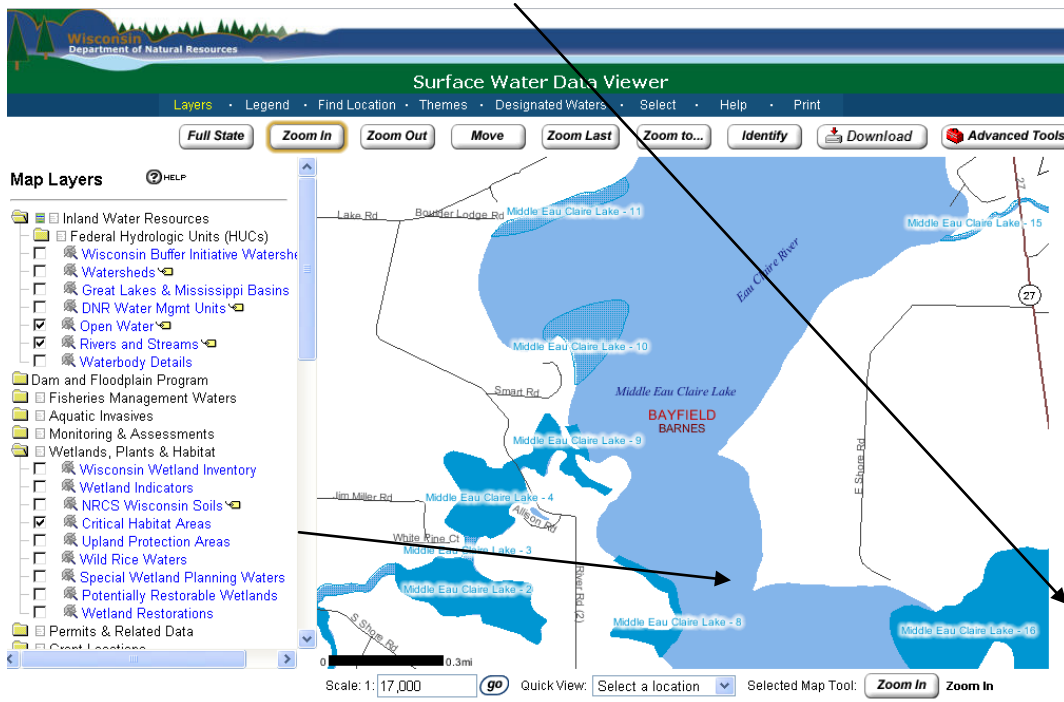
Typical Conditions
Typical Water Clarity: Moderate
Typical Water Temperature: | May: 51 F | June: 68 F | July: 73 F | August: 72 F | September: 70 F

Before You Go
[Fish Consumption Advisories](#)
[State Fishing Regulations](#)

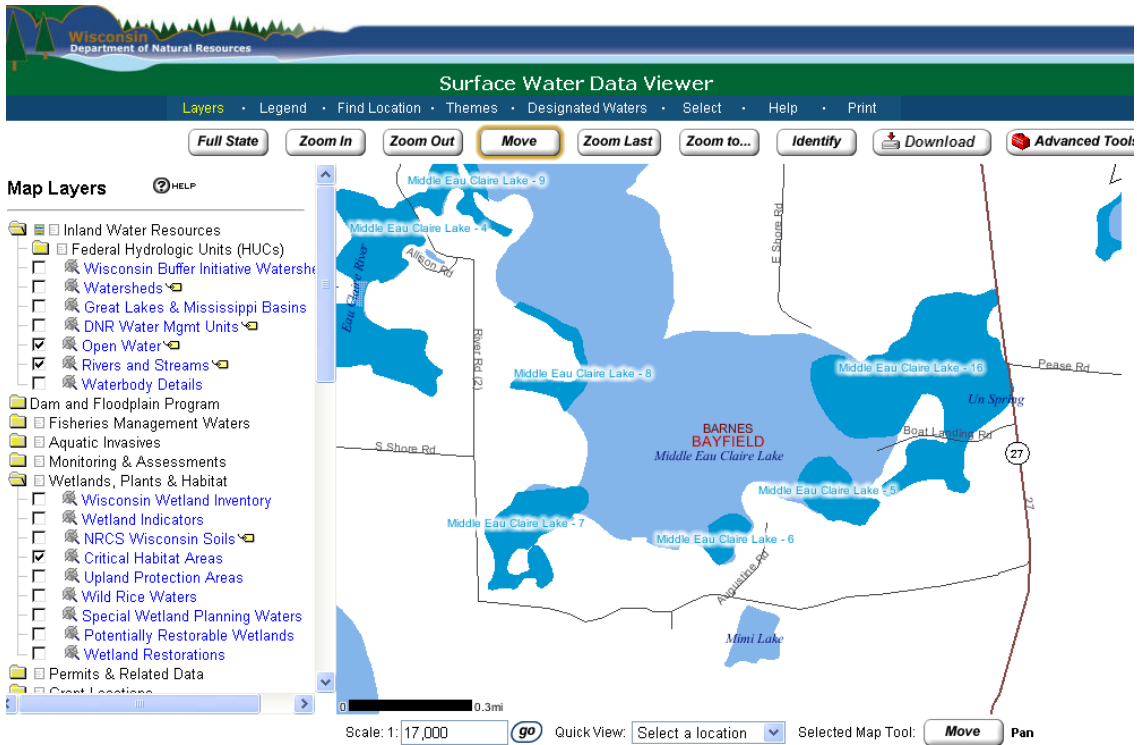
Maps
[Contour \(Bathymetric\) Map](#)
[Interactive Map](#) (click here to display the “surface water viewer” page)

- In the Scale box at the bottom of the map, change the number to **17,000** and click on **“GO”**. This will change the size of the lake in the map
- 2nd, click on the “Layers” button in the upper **‘Blue’** tool bar at the top of the page. This will display many available map layers.
- 3rd, click on the Wetlands, Plant and Habitat folder

- 4th, in that drop down check the “Critical Habitat Area” box. This will display the critical habitat designated areas for the lake
- Screen with Critical Habitat Areas shaded



- Because this is a large lake on a small viewing area, we need to move the lake around on the map and center the area we are going to working on in the viewing area.
- Click on “Move”
- Move your cursor and place the large + over the “Middle Eau Claire Lake – 8”, right on the 8. Hold down the left cursor button and move the + to the middle of the map area and release the cursor button. The map will now be moved and the Critical Habitat areas we will be working in, #16 and # 5, will be more centered in the viewing area. Lake Map is now more centered and better displaying areas we will work in;



- In preparation to printing the map, we need to mark our field trip location and identify our map with our team name:

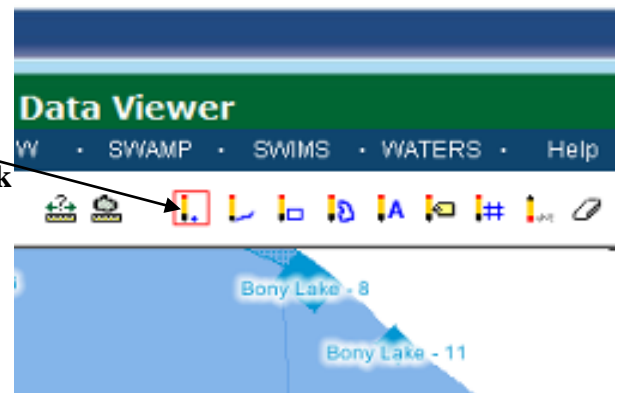
- Click on **“Advanced Tools”**

- Click on the first **“Pencil Point”** tool

- Move cursor to the location of the boat landing (As directed by teacher) and left click to put a Point on the boat landing

(this will open a label text box, type in Boat Landing)

- Click **“Submit”**



To Print Map:

- On the upper dark blue tool bar Click **“Print”**
- In the ‘Map Title Box’ add your team name
- Click **“OK”**
- Click on **“Open Map”**
- Right Click anywhere on the map to get a drop down box.

- Click **“Print”** to print the map.....(20 pts)_____

Students complete the following:

- **Summary paragraph:** in the space below write a brief summary of what you have learned and what they accomplished in today’s computer lab session.
(5 pts)_____

- **Answer the following questions “Things you should have learned”**
 - What is Critical Habitat?(5 pts)_____

 - What percent of living things found in lakes and rivers can be found along the shores and shallow margins?(5 pts)_____

 - What part of the lake do 80% of all plants and animals on the state’s endangered or threatened species list spend all or part of their life cycle?
(5 pts)_____

 - Things that affect critical habitat?.....(5 pts)_____

TOTAL CRITICAL HABITAT POINTS.....(50 pts)_____

TURN IN YOUR MAP WITH THIS LAB SHEET

THESE WILL BE RETURNED AT THE FIELD TRIP.

WATER QUALITY FACTORS

FACTOR	DEFINITION	IMPORTANCE	ACCEPTABLE
Turbidity	Water clarity soil/algae/plankton/ Microbes	Affects water temperature/ oxygen/photosynthesis/ clog fish gills/spawning	50 NTU
Dissolved Oxygen	Oxygen in water More in cold, shade, Running water	For fish to breathe	4-5 mg/L
Phosphorus Phosphate	Plant growth fertilizer, animal Wastes	Cause eutrophication and fish kills	Less than .1 mg/L
Acidity	pH 1-6 range 7-neutral-water	Affects oxygen use by organisms	5.5- 7.5- most fish 6.5- 8.2- optimal
Alkalinity (Base)	pH 8-14 range 7-neutral-water In rocks/soils	Buffers (neutralizes) acids	100-200 mg/l- best
Nitrate	In fertilizers Septic systems	Cause eutrophication fish kills	Unpolluted water < 1 mg/L
Temperature	Certain species can't tolerate warm water		Most fish: 35-65 degrees F

WATER QUALITY MODULE LAB SHEET

Team Members:

Materials: Get the following materials from your instructor:

- Safety goggles
- Water sample (prepared by instructor)
- Oxygen/temperature meter (share)
- Mini secchi disk tube (share) and bucket (share)
- Ph paper

Directions:

1. Put on safety goggles and keep them on for the entire lab
2. Test your water as directed by your instructor
3. Insert the Ph paper in the water and record your findings
4. Check your water for oxygen with the meter and record
5. Check your water for temperature with the meter and record
6. Check your water clarity with the mini secchi disk tube and record
7. We will not test for phosphate/nitrates

DATA TABLE

WATER SAMPLE : _____

<u>FACTOR</u>	<u>FINDINGS</u>	<u>ANALYSIS</u>
TURBIDITY (cm)		(10 pts) _____
DISOLVED (mg/L) OXYGEN		(10 pts) _____
pH		(10 pts) _____
TEMPERATURE (C/F)		(10 pts) _____

Put your data on the front board to compare with other group findings (5 pts) _____

TOTAL WATER QUALITY POINTS.....(45 pts) _____

ASSESSMENT: Provided other factors were okay, would you consider this water good or bad for aquatic life? Why/why not? Be prepared to discuss this at the end of the lab.

AQUATIC PLANTS

FREE-FLOATING- Float, not attached

SUBMERSED- Most below surface

FLOATING LEAF- Leaves on surface

EMERGENT- Leaves above surface

AQUATIC PLANT MODULE LAB SHEET

Team Members:

Materials: Get the following materials from your instructor/assistant:

- Clip board/pencil
- Resource book *Through the Looking Glass* and *Lake Plants You Should Know* or other resources provided

Directions:

1. Take one of the sample plants from the front lab table
2. Look through the resource books and identify the plant
3. Also tell what type of plant you have:
emergent (E)/free floating (FF)/submersed (S)/floating leaf (FL)
4. Also tell if it is native (N) or invasive (I)
5. Return the plant to the front lab table and select the next plant until you have completed all the samples/as many as time will permit.

SAMPLE	PLANT NAME (From Text)	TYPE (E/FF/S/FL)	NATIVE/INVASIVE (N/I)	(pts)
1.	_____	_____	_____	(5 pts)_____
2.	_____	_____	_____	(5 pts)_____
3.	_____	_____	_____	(5 pts)_____
4.	_____	_____	_____	(5 pts)_____
5.	_____	_____	_____	(5 pts)_____
6.	_____	_____	_____	(5 pts)_____
7.	_____	_____	_____	(5 pts)_____
8.	_____	_____	_____	(5 pts)_____
9.	_____	_____	_____	(5 pts)_____
10.	_____	_____	_____	(5 pts)_____
Explain why aquatic plants are important to our lakes				(5 pts)_____

TOTAL AQUATIC PLANTS POINTS (55 pts)_____

INDOOR AQUATIC INVASIVE SPECIES MODULE LAB SHEET

Team Members:

Background: Things you should know. Answer the following:

1. What are the four types of aquatic plants?
2. What is an invasive species?
3. Name at least four things plants provide for other living things:

Directions: Take a sample from the front lab table and identify what kind of invasive species it is and why it is destructive. Use the resource handouts provide by the instructor. Return the sample to the lab table and take another. Continue the process until you have all of the samples identified.

SAMPLE #	NAME	DESTRUCTIVE NATURE
1.	_____	(5 pts)_____
2.	_____	(5 pts)_____
3.	_____	(5 pts)_____
4.	_____	(5 pts)_____
5.	_____	(5 pts)_____
6.	_____	(5 pts)_____
7.	_____	(5 pts)_____
8.	_____	(5 pts)_____
9.	_____	(5 pts)_____
10.	_____	(5 pts)_____
TOTAL INVASIVE SPECIES POINTS.....		(50 pts)_____

Assessment: Write below what you think the major problems are with an invasive species and how we can prevent their spreading to other lakes. Explain what *YOU* can do to prevent the spread of aquatic invasive species.