Lower Eau Claire Lake Critical Habitat Designation Report

Bayfield County, WI

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Critical Habitat Designation Program – Introduction

Wisconsites are concerned about the growing number of threats to sustainable healthy lakes in the state. Increases in shoreline development are changing lake ecosystems, and the conversion of natural lakeshore to residential development has greatly accelerated over the past 30 years. While many positive measures have been initiated within Wisconsin over the past few decades, habitat and water quality continue to be impacted.

Critical Habitat Designation is a program that includes formal designations of areas considered important to fish and wildlife. Critical Habitat is classified into three categories: sensitive areas, public rights features, and resource protection areas (uplands within the shoreline zone). These three elements combine to provide regulatory and management advice to the State of Wisconsin, counties, local units of governments, and others who are interested in protecting and preserving these unique habitats for future generations. Designation of Critical Habitat aims to serve four primary purposes:

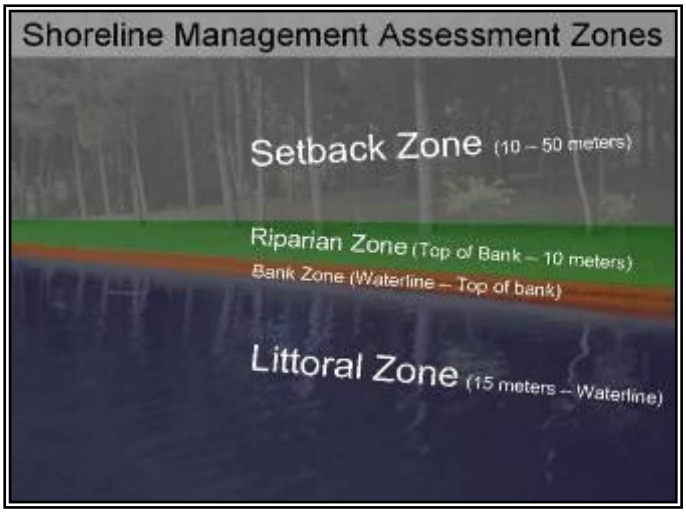
1) Resource protection through science based regulatory review.
2) Community-based resource protection through community education, planning and zoning.
3) As a guide to land-trusts and others acquiring land and conservation easements.
4) A mechanism to track long-term changes in these habitats.

Methods

Critical Habitat Designation occurred on Lower Eau Claire Lake in Bayfield and Douglas Counties during 2007 and 2008. Lower Eau Claire Lake is an 802 acre lake with a max depth of 41 feet and is located downstream of Middle Eau Claire Lake. Access to Lower Eau Claire Lake is via a public boat launch located at Mooney Dam County Park.

Designations were conducted by a team consisting of the county fisheries biologist, water resources specialist, wildlife biologist, and critical habitat coordinator. Initially, DNR staff compiled and reviewed existing natural resource data that helped identify areas of focus related to fish, wildlife, endangered resources, and their habitats before going into the field. In the field, staff used existing natural resource data, delineation guidance, and professional judgment to establish the boundaries of the sites containing critical habitat. Critical Habitat Designation boundaries were recorded in the field using map grade Trimble Geo XM GPS Units. For each site, staff inventoried current shoreline management practices occurring along littoral, bank, riparian, and setback zones following standardized methods. Depending on the features of each area being delineated, standardized sampling of emergent and submergent aquatic vegetation, substrate, and woody habitat was also conducted.

Figure 1. Shoreline Management Zones



Note: A detailed description of the Critical Habitat Designation program, associated methods, and the values of Critical Habitat can be found at http://dnr.wi.gov/lakes/criticalhabitat/. Detailed assessments of each Critical Habitat area including raw sampling data and GIS shape files are available by contacting your local DNR office.

Management Recommendations

General Lakewide Recommendations: most of these management guidelines will be good for the lake regardless if the site is within a designated critical habitat area or not. Emphasis of or exceptions to these general recommendations are discussed in more detail in the specific site management recommendations. For example, planting native vegetation along shorelines will generally be beneficial to the lake and property owner. Shorelines that are dominated by established lawn, however, may be out of compliance with current zoning standards and higher priority for restoration since those areas tend to pollute the resource more while simultaneously being devoid of natural fish and wildlife habitat.

Permanent Land Protection
Permanently protect designated critical habitat areas. Permanent land protection tools include: land acquisition, conservation easements, and mutual covenants. Competitive funding opportunities exist for parcels that are large and of particular conservation value. Voluntary protection or private funding sources may be the primary protection methods for smaller parcels. Specific lakewide and site recommendations emphasize priority areas for permanent land protection.

Shoreland Restoration
Leave natural shorelines undisturbed in accordance with local shoreland zoning rules. If the shoreline buffer does not exist or is disturbed, it should be replanted with native vegetation. The Bayfield County Land & Water Conservation Department may provide shoreline restoration technical and funding assistance. Additionally, the Wisconsin Department of Natural Resources offers competitive shoreline restoration grants. Some local landscaping businesses may be able to assist landowners with site planning, including native plant selection.

Runoff Control
Implement lake and river water quality protection tools like rainwater gardens, rain barrels, infiltration pits and trenches, grass swales, etc. that divert and/or infiltrate water before it enters the lake or river. Similar to shoreland restoration, the Bayfield County Land & Water Conservation Department may provide technical and funding assistance for these practices. Additionally, the Wisconsin Department of Natural Resources offers competitive lake protection grants. Some local landscaping businesses may be able to assist landowners with site planning, including plant selection.

Septic Systems
Inspect and maintain septic systems to prevent excess nutrient addition while protecting present water quality conditions. Ideally, a public sanitary sewer system should be constructed. Septic systems are not designed to remove the nutrients (i.e., phosphorous and nitrogen) that pollute water resources. Furthermore, septic water quickly moves through the local sandy soils and speeds delivery of potentially polluted water to the lake or river.

In-Lake Habitat Protection
Consider local recreational boating ordinances (i.e., slow-no-wake) within designated critical habitat areas. Specific lakewide and site recommendations emphasize priority areas for these ordinances.

In general, native aquatic plants should not be actively managed (i.e., no raking, herbicide use, or mechanized removal) and, if within a designated critical habitat site, will require a permit for manual removal as well as chemical control. Lakewide and site specific recommendations describe exceptions to this general recommendation.

Near shore trees that fall into the water should be left in the water. Site specific recommendations discuss ideal locations for replacing lost woody habitat. There are opportunities with the DNR and Bayfield County Land & Water Conservation Department to implement a Fish Sticks project that replaces this valuable habitat.

Specific Site Recommendations: these management guidelines are specific to the given site and only supersede general and specific lakewide recommendations if explicitly stated.

Sites

Nine areas are designated as Critical Habitat on Lower Eau Claire Lake for a total of 112.5 acres (Figure 2; Tables 1 and 2). Seven areas are classified as Sensitive Areas and two areas are classified as a Public Rights Features.

Figure 2. Lower Eau Claire Lake Critical Habitat Map

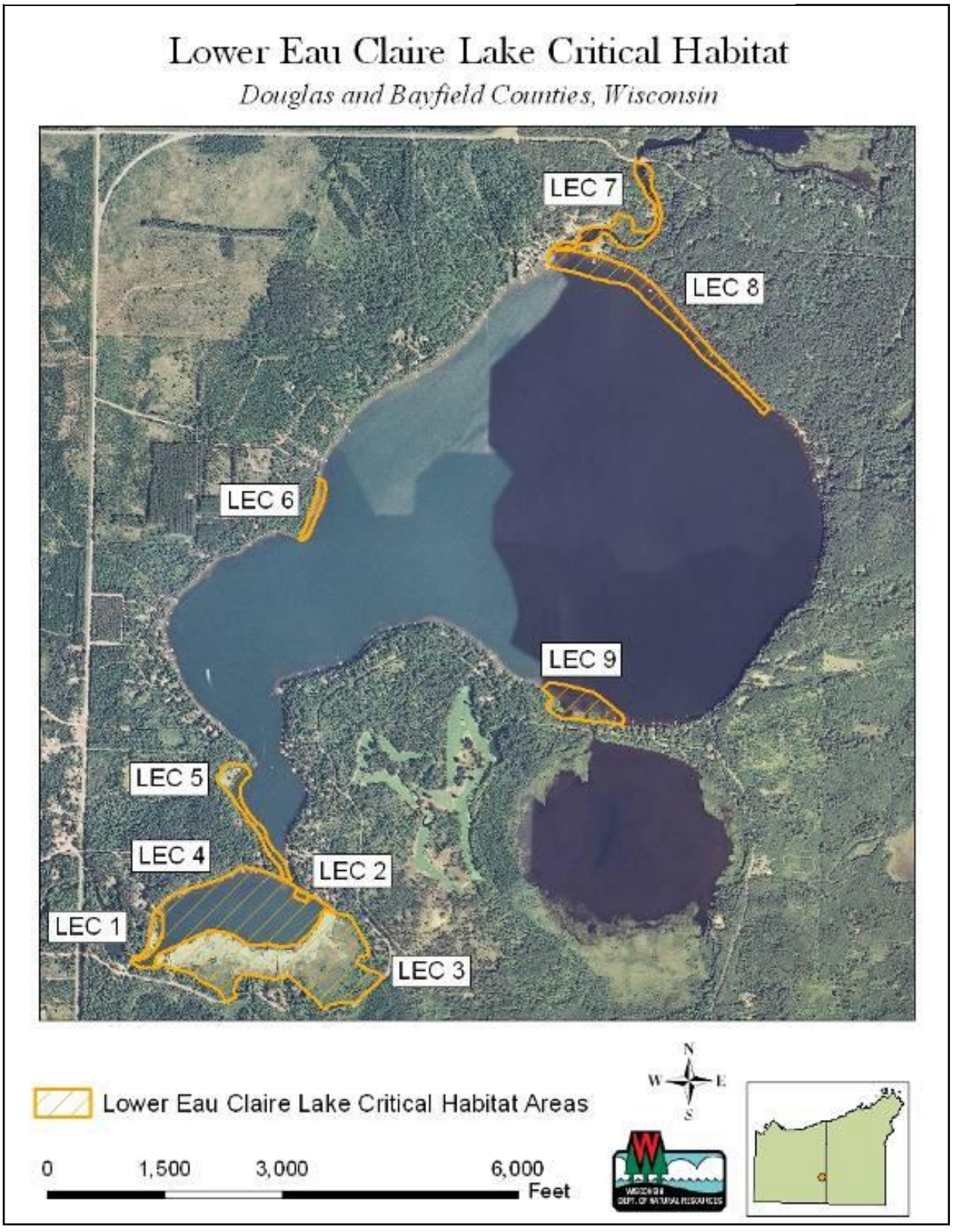


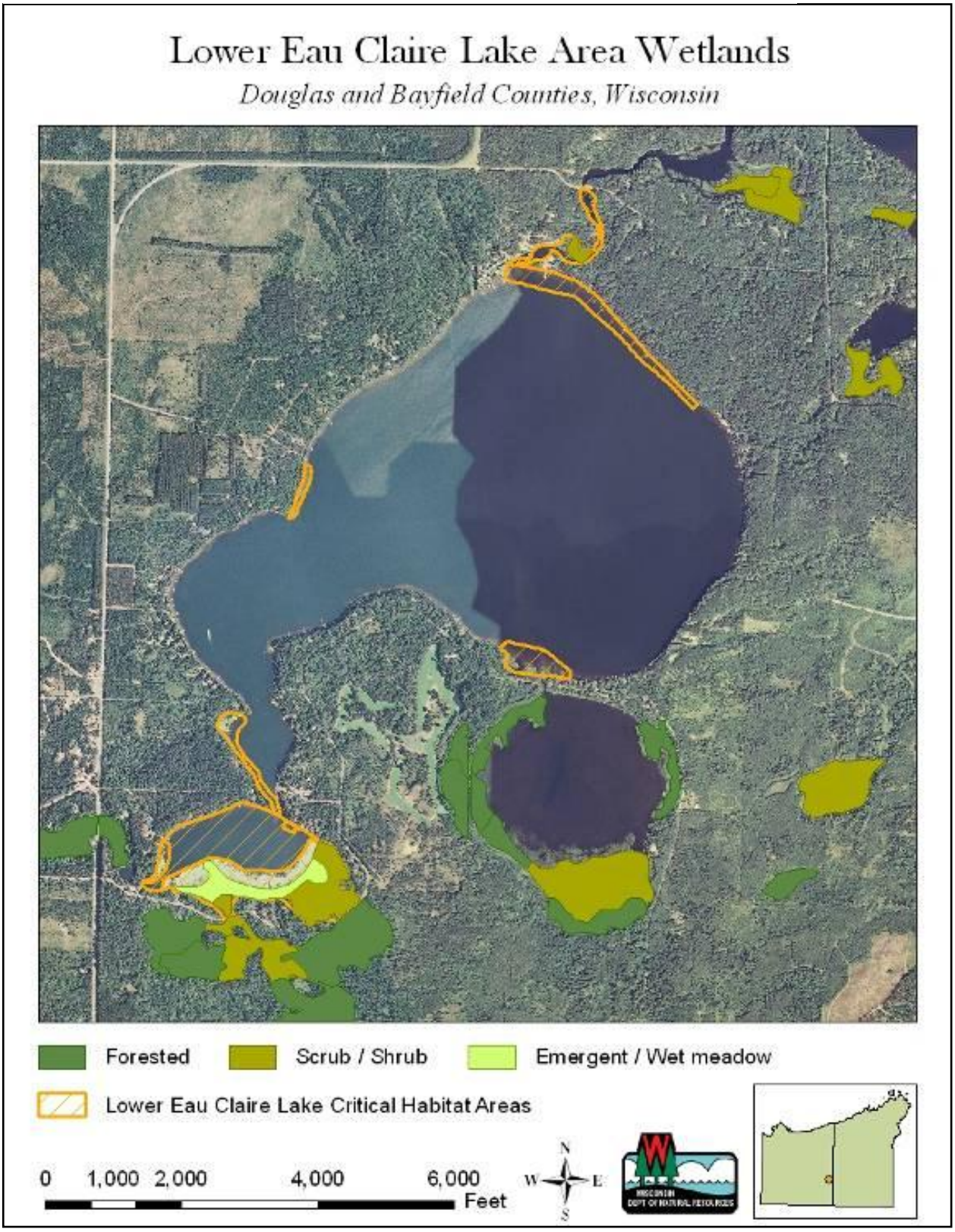
Table 1. Lower Eau Claire Lake Critical Habitat Polygon Justifications

Critical Habitat Polygon ID	Acres	Justification	Justification	Justification	Justification	Justification	Justification	Classification
LEC 1	1.8	3	2	-	-	-	-	Sensitive Area
LEC 2	0.4	3	-	-	-	-	-	Sensitive Area
LEC 3	39.7	3	7	6	-	-	-	Sensitive Area
LEC 4	35.0	2	-	-	-	-	-	Sensitive Area
LEC 5	5.0	7	3	2	-	-	-	Sensitive Area
LEC 6	1.7	7	-	-	-	-	-	Public Rights Feature
LEC 7	7.4	8	11	7	2	3	6	Sensitive Area
LEC 8	14.1	8	7	-	-	-	-	Public Rights Feature
LEC 9	7.4	4	-	-	-	-	-	Sensitive Area

Table 2. Critical Habitat Justification Descriptions

Justifications	Justification Feature	Classification
1	Bio-diverse Submerged Aquatic Vegetation (SAV)	Sensitive Area
2	SAV Important to Fish and Wildlife Habitat	Sensitive Area
3	Emergent and Floating Leaf Vegetation	Sensitive Area
4	Rush Beds	Sensitive Area
5	Wild Rice Bed	Sensitive Area
6	Extensive Riparian Wetland	Sensitive Area
7	Woody Habitat	Public Rights Feature
8	Spawning Substrate	Public Rights Feature
9	Water Quality (springs, etc)	Public Rights Feature
10	Natural Scenic Beauty	Public Rights Feature
11	Navigational Thoroughfare	Public Rights Feature

Figure 3. Lower Eau Claire Lake Area Wetlands Map



Lower Eau Claire Lake Critical Habitat Site LEC 1

Critical habitat site LEC 1 was designated a Sensitive Area because of its Emergent and Floating Leaf Vegetation and Submerged Aquatic Vegetation Important to Fish and Wildlife Habitat (Figure 4). LEC 1 is 1.8 acres in size and is located along the West shore of the South bay, near the public boat launch and dam.

Aquatic Plants were sampled using a standardized Point Intercept method and a summary of the results can be found in Tables 3 and 4. Table 5 summarizes the current management practices within the Setback, Riparian, Bank and Littoral Zones of LEC 1.

Established lawn within 35 feet of the water's edge should be replanted with native vegetation to comply with Douglas County shoreland zoning ordinance, minimize erosion and pollution, and improve fish and wildlife habitat.

According to the shoreline inventory, there is no riprap in LEC 1. Riprap is not necessary because the wave energy is low. Low-energy sites are typically not eligible/authorized for riprap permits. If shoreline erosion is a problem, overland runoff from rooftops, driveways, and lawns or reckless motorboat use are the most likely causes.

Designate site as slow-no-wake along with sites LEC 2, 3, 4 & 5 with the exception of a navigation channel from the boat landing to the main lake, or identify main navigational channel with waterway marker buoys to streamline boating traffic and minimize damage to aquatic plants.

Do not remove rush beds. Place piers outside of rushes, or if that's not possible extend the piers beyond the rushes for boat mooring. Restore/replant rush beds that have been destroyed in the past.

Do not actively manage aquatic plants unless an aquatic invasive species should establish.

Table 3. LEC 1 Aquatic Plants				
Scientific Name	**Common Name**	**Plant Type**	**FQI Coefficient**	**Relative Frequency**
Sagittaria sp.	Arrowhead	Emergent	3	1.0
Typha sp.	Cattail	Emergent	1	4.0
Brasenia schreberi	Watershield	Floating Leaf	7	3.0
Nuphar variegata	Spatterdock	Floating Leaf	6	1.0
Nymphaea odorata	White water lily	Floating Leaf	6	2.0
Ceratophyllum demersum	Coontail	Submergent	3	9.1
Chara	Muskgrasses	Submergent	7	2.0
Eleocharis acicularis	Needle spikerush	Submergent	5	1.0
Elodea canadensis	Common waterweed	Submergent	3	7.1
Heteranthera dubia	Water star-grass	Submergent	6	1.0
Myriophyllum sibericum	Northern water-milfoil	Submergent	7	10.1
Najas flexilis	Bushy pondweed	Submergent	6	3.0
Potamogeton amplifolius	Large-leaf pondweed	Submergent	7	1.0
Potamogeton friesii	Frie's pondweed	Submergent	8	1.0
Potamogeton pusillus	Small pondweed	Submergent	7	3.0
Potamogeton richardsonii	Clasping-leaf pondweed	Submergent	5	14.1
Potamogeton robbinsii	Robbins pondweed	Submergent	8	10.1
Potamogeton strictifolius	Stiff pondweed	Submergent	8	2.0
Potamogeton zosteriformis	Flat-stem pondweed	Submergent	6	14.1
Vallisneria americana	Wild celery	Submergent	6	10.1

Table 4. LEC 1 Aquatic Plant Sampling Summary Statistics	
SUMMARY STATS:	**LEC 1**
Total number of points sampled	29
Total number of sites with vegetation	26
Total number of sites shallower than maximum depth of plants	29
Frequency of occurrence at sites shallower than maximum depth of plants	89.66
Simpson Diversity Index	0.91
Maximum depth of plants (ft)	7.00
Number of sites sampled using rake on Rope (R)	0
Number of sites sampled using rake on Pole (P)	29
Average number of all species per site (shallower than max depth)	3.41
Average number of all species per site (veg. sites only)	3.81
Average number of native species per site (shallower than max depth)	3.41
Average number of native species per site (veg. sites only)	3.81
Species Richness	20
Species Richness (including visuals)	20
Polygon FQI	25.69

Figure 4. LEC 1 Aquatic Plant Diversity Map

Table 5. Shoreline Assessment of LEC 1				
Feature	**Number**	**Density** (per mile)	**Shoreline Length** (feet)	**% of Shoreline**
Setback Zone				
Homes	0	0		
Accessory Structures	0	0		
Commercial Buildings	0	0		
Riparian Zone				
Homes	0	0		
Accessory Structures	0	0		
Commercial Buildings	0	0		
Natural vegetation			705	95.5
Shrub Layer Removed			0	0
Shrub & Ground Cover Removed			0	0
Established Lawn			33	4.5
Pastureland			0	0
Row Crop			0	0
Beach			0	0
Impervious Surface (road, parking lots, etc.)			0	0
Other			0	0
Not Visible			0	0
Total Shoreline			738	100
Bank Zone				
Natural Bank			738	100
Soft bioengineering			0	0
Hard bioengineering			0	0
Riprap			0	0
Pea Gravel Blanket			0	0
Established Lawn			0	0
Artificial Beach			0	0
Seawalls			0	0
Total Shoreline			738	100
Boat Ramp	0	0		
Stormwater Outflow	0	0		
Littoral Zone				
Piers	1	7.2		
Boat Lifts	0	0		
Swims Rafts/ Trampolines	0	0		
Boathouses	0	0		
Mooring Buoys	0	0		
Dredge channels	0	0		
Commercial Marinas	0	0		
Bridges	0	0		
Plant removal devices	0	0		
Recreational/Public Beaches	0	0		

Lower Eau Claire Lake Critical Habitat Site LEC 2

Critical habitat site LEC 2 was designated a Sensitive Area because of its Emergent and Floating Leaf Vegetation. LEC 2 is 0.4 acres in size and is located along the Northeast shore of the South bay, just east of the Slow No Wake channel.

Aquatic Plants were sampled using a standardized Point Intercept method and a summary of the results can be found in Tables 6 and 7. Table 8 summarizes the current management practices within the Setback, Riparian, Bank and Littoral Zones of LEC 2.

Established lawn within 35 feet of the water's edge should be replanted with native vegetation to comply with Douglas County shoreland zoning ordinance, minimize erosion and pollution, and improve fish and wildlife habitat.

According to the shoreline inventory, there is no riprap in LEC 2. Riprap is not necessary because the wave energy is low. Low-energy sites are typically not eligible/authorized for riprap permits. If shoreline erosion is a problem, overland runoff from rooftops, driveways, and lawns or reckless motorboat use are the most likely causes.

Designate site as slow-no-wake along with sites LEC 1, 3, 4 & 5 with the exception of a navigation channel from the boat landing to the main lake, or identify main navigational channel with waterway marker buoys to streamline boating traffic and minimize damage to aquatic plants.

Do not remove rush beds or other emergent plants. Place piers outside of plant beds, or if that's not possible extend the piers beyond the bed edges for boat mooring. Restore/replant plant beds that have been destroyed in the past.

Table 6. LEC 2 Aquatic Plants

Scientific Name	Common Name	Plant Type	FQI Coefficient	Relative Frequency
Carex sp.	Sedges	Emergent	-	Visual
Typha sp.	Cattail	Emergent	1	Visual
Ceratophyllum demersum	Coontail	Submergent	3	14.3
Chara	Muskgrasses	Submergent	7	7.1
Najas flexilis	Bushy pondweed	Submergent	6	21.4
Potamogeton pusillus	Small pondweed	Submergent	7	21.4
Potamogeton richardsonii	Clasping-leaf pondweed	Submergent	5	7.1
Potamogeton robbinsii	Robbins pondweed	Submergent	8	7.1
Potamogeton zosteriformis	Flat-stem pondweed	Submergent	6	7.1
Vallisneria americana	Wild celery	Submergent	6	14.3

Table 7. LEC 2 Aquatic Plant Sampling Summary Statistics	
SUMMARY STATS:	**LEC 2**
Total number of points sampled	6
Total number of sites with vegetation	5
Total number of sites shallower than maximum depth of plants	6
Frequency of occurrence at sites shallower than maximum depth of plants	83.33
Simpson Diversity Index	0.85
Maximum depth of plants (ft)	4.00
Number of sites sampled using rake on Rope (R)	0
Number of sites sampled using rake on Pole (P)	6
Average number of all species per site (shallower than max depth)	2.33
Average number of all species per site (veg. sites only)	2.80
Average number of native species per site (shallower than max depth)	2.33
Average number of native species per site (veg. sites only)	2.80
Species Richness	8
Species Richness (including visuals)	10
Polygon FQI	16.33

Figure 5. LEC 2 Aquatic Plant Diversity Map

Table 8. Shoreline Assessment of LEC 2				
Feature	**Number**	**Density** (per mile)	**Shoreline Length** (feet)	**% of Shoreline**
Setback Zone				
Homes	1	28.2		
Accessory Structures	1	28.2		
Commercial Buildings	0	0		
Riparian Zone				
Homes	0	0		
Accessory Structures	1	28.2		
Commercial Buildings	0	0		
Natural vegetation			0	0
Shrub Layer Removed			0	0
Shrub & Ground Cover Removed			0	0
Established Lawn			187	100
Pastureland			0	0
Row Crop			0	0
Beach			0	0
Impervious Surface (road, parking lots, etc.)			0	0
Other			0	0
Not Visible			0	0
Total Shoreline			187	100
Bank Zone				
Natural Bank			187	100
Soft bioengineering			0	0
Hard bioengineering			0	0
Riprap			0	0
Pea Gravel Blanket			0	0
Established Lawn			0	0
Artificial Beach			0	0
Seawalls			0	0
Total Shoreline			187	100
Boat Ramp	0	0		
Stormwater Outflow	0	0		
Littoral Zone				
Piers	1	28.2		
Boat Lifts	0	0		
Swims Rafts/ Trampolines	0	0		
Boathouses	0	0		
Mooring Buoys	0	0		
Dredge channels	0	0		
Commercial Marinas	0	0		
Bridges	0	0		
Plant removal devices	0	0		
Recreational/Public Beaches	0	0		

Lower Eau Claire Lake Critical Habitat Site LEC 3

Critical habitat site LEC 3 was designated a Sensitive Area because of its Emergent and Floating Leaf Vegetation, Coarse Woody Habitat, and Extensive Riparian Wetland (Figure 6). LEC 3 is 39.7 acres in size and is located along the south and east shores of the south bay.

The point intercept method for aquatic plant sampling was not employed at LEC 3 due to the excessive plant growth and wetland nature of the area in August. However, visuals were noted from what was seen from the boat. Woody habitat was sampled using a standardized transect method and a summary of the results can be found in Table 10. Big Logs are defined as being greater than 10 cm (4 in) in diameter and greater than 150 cm (5 ft) in length. Small Logs are defined as being between 5-10 cm (2-4 in) in diameter and greater than 150 cm (5 ft) in length. Table 11 summarizes the current management practices within the Setback, Riparian, Bank and Littoral Zones of LEC 3.

Prioritize for permanent land protection.

Do not disturb wetland with filling, cutting, or any other modifications.

Established lawn within 35 feet of the water's edge should be replanted with native vegetation to comply with Douglas County shoreland zoning ordinance, minimize erosion and pollution, and improve fish and wildlife habitat.

According to the shoreline inventory, there is no riprap in LEC3. Riprap is not necessary because the wave energy is low. Low-energy sites are typically not eligible/authorized for riprap permits. If shoreline erosion is a problem, overland runoff from rooftops, driveways, and lawns or reckless motorboat use are the most likely causes.

Designate site as slow-no-wake along with sites LEC 1, 2, 4 & 5 with the exception of a navigation channel from the boat landing to the main lake, or identify main navigational channel with waterway marker buoys to streamline boating traffic and minimize damage to aquatic plants.

Do not remove rush beds or other emergent plants. Place piers outside of plant beds, or if that's not possible extend the piers beyond the bed edges for boat mooring. Restore/replant plant beds that have been destroyed in the past.

Leave fallen trees in the water.

Table 9. LEC 3 Aquatic Plants

Scientific Name	Common Name	Plant Type	FQI Coefficient	Relative Frequency
Carex sp	Sedges	Emergent	-	Visual
Schoenoplectus tabernaemontani	Softstem Bulrush	Emergent	4	Visual
Typha latifolia	Broad Leaf Cattail	Emergent	1	Visual
Brasenia schreberi	Watershield	Floating Leaf	7	Visual
Nuphar variegata	Spatterdock	Floating Leaf	6	Visual
Nymphae oderata	White Water Lily	Floating Leaf	6	Visual
Sparganium fluctans	Floating Leaf Bur-reed	Floating Leaf	10	Visual
Rumex orbiculatus	Great Water Dock	Forb	8	Visual
Myrica gale	Sweet Gale	Shrub	9	Visual

Table 10. LEC 3 Woody Habitat Sampling Transects

Transect	# Big Logs	# Small Logs	Transect Length (feet)	Transect Length (m)	Big Logs per Mile	Small Logs per Mile
LEC 3-1	4	3	131.2	40	161.0	120.7
LEC 3-2	10	2	131.2	40	402.4	80.5
LEC 3-3	1	2	131.2	40	40.2	80.5
LEC 3-4	2	4	131.2	40	80.5	161.0
LEC 3 Total	17		524.8	160	171.0	0.0

Figure 6. LEC 3 Woody Habitat Transects Map

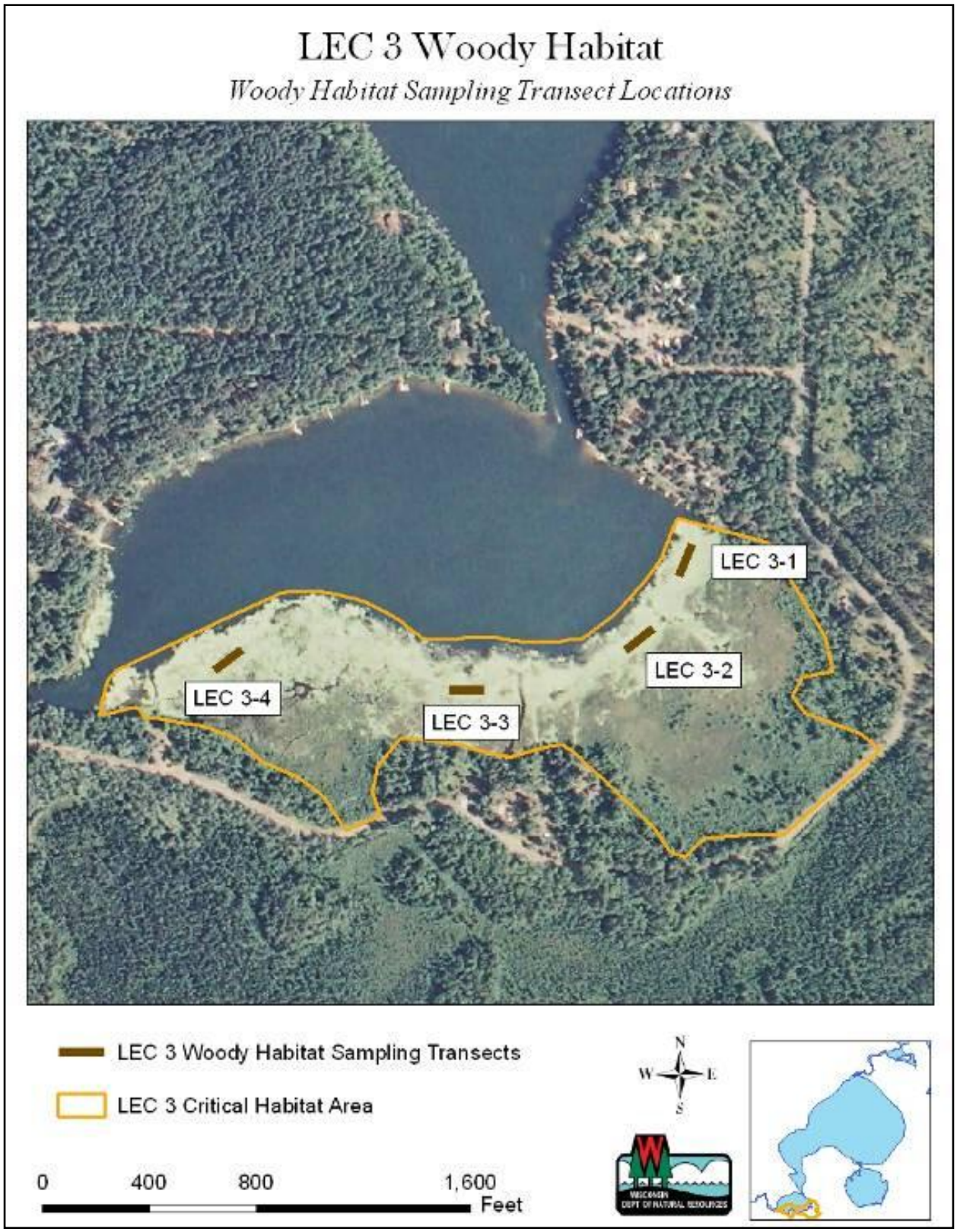


Table 11. Shoreline Assessment of LEC 3				
Feature	**Number**	**Density** (per mile)	**Shoreline Length** (feet)	**% of Shoreline**
Setback Zone				
Homes	6	12.6		
Accessory Structures	4	8.4		
Commercial Buildings	0	0		
Riparian Zone				
Homes	0	0		
Accessory Structures	4	8.4		
Commercial Buildings	0	0		
Natural vegetation			2050	81.7
Shrub Layer Removed			33	1.3
Shrub & Ground Cover Removed			98	3.9
Established Lawn			328	13.1
Pastureland			0	0
Row Crop			0	0
Beach			0	0
Impervious Surface (road, parking lots, etc.)			0	0
Other			0	0
Not Visible			0	0
Total Shoreline			2509	100
Bank Zone				
Natural Bank			2476	98.7
Soft bioengineering			0	0
Hard bioengineering			0	0
Riprap			0	0
Pea Gravel Blanket			0	0
Established Lawn			33	1.3
Artificial Beach			0	0
Seawalls			0	0
Total Shoreline			2509	100
Boat Ramp	0	0		
Stormwater Outflow	0	0		
Littoral Zone				
Piers	5	10.5		
Boat Lifts	2	4.2		
Swims Rafts/ Trampolines	0	0		
Boathouses	0	0		
Mooring Buoys	0	0		
Dredge channels	0	0		
Commercial Marinas	0	0		
Bridges	0	0		
Plant removal devices	0	0		
Recreational/Public Beaches	0	0		

Lower Eau Claire Lake Critical Habitat Site LEC 4

Critical habitat site LEC 4 was designated a Sensitive Area because of its Submerged Aquatic Vegetation Important to Fish and Wildlife Habitat (Figure 7). LEC 4 is 35.0 acres in size and encompasses the open water portion of the South bay.

Aquatic Plants were sampled using a standardized Point Intercept method and a summary of the results can be found in Tables 12 and 13. Table 14 summarizes the current management practices within the Setback, Riparian, Bank and Littoral Zones of LEC 4.

Established lawn within 35 feet of the water's edge should be replanted with native vegetation to comply with Douglas County shoreland zoning ordinance, minimize erosion and pollution, and improve fish and wildlife habitat.

According to the shoreline inventory, there is some riprap in LEC 4. Riprap is not necessary because the wave energy is low. Low-energy sites are typically not eligible/authorized for riprap permits. If shoreline erosion is a problem, overland runoff from rooftops, driveways, and lawns or reckless motorboat use are the most likely causes.

Designate site as slow-no-wake along with sites LEC 1, 2, 3, & 5 with the exception of a navigation channel from the boat landing to the main lake, or identify main navigational channel with waterway marker buoys to streamline boating traffic and minimize damage to aquatic plants.

Unless an aquatic invasive plant species appears, limit aquatic plant control to manual removal (i.e. only hand removal or raking, no herbicides or mechanical devices) for a navigation lane up to 30 feet wide to access piers.

Implement fish sticks project. Contact local DNR Fisheries Biologist to investigate funding and technical assistance opportunities.

Table 12. LEC4 Aquatic Plants				
Scientific Name	**Common Name**	**Plant Type**	**FQI Coefficient**	**Relative Frequency**
Sagittaria sp.	Arrowhead	Emergent	-	1.1
Typha sp	Cattail	Emergent	1	0.1
Brasenia schreberi	Watershield	Floating Leaf	7	Visual
Nuphar variegata	Spatterdock	Floating Leaf	6	Visual
Nymphaea odorata	White water lily	Floating Leaf	6	0.1
Potamogeton natans	Floating-leaf pondweed	Floating Leaf	5	Visual
Sparganium fluctuans	Floating-leaf-bur-reed	Floating Leaf	10	0.1
Ceratophyllum demersum	Coontail	Submergent	3	17.8
Chara	Muskgrasses	Submergent	7	0.3
Eleocharis acicularis	Needle spikerush	Submergent	5	0.7
Elodea canadensis	Common waterweed	Submergent	3	10.3
Eriocaulon aquaticum	Pipewort	Submergent	9	0.1
Isoetes sp.	Quillwort	Submergent	8	0.1
Megalodonta beckii	Water marigold	Submergent	8	0.7
Myriophyllum sibericum	Northern water-milfoil	Submergent	7	8.5
Najas flexilis	Bushy pondweed	Submergent	6	1.9
Potamogeton amplifolius	Large-leaf pondweed	Submergent	7	5.6
Potamogeton friesii	Frie's pondweed	Submergent	8	0.3
Potamogeton gramineus	Variable pondweed	Submergent	7	0.1
Potamogeton illinoensis	Illinois pondweed	Submergent	6	0.1
Potamogeton pusillus	Small pondweed	Submergent	7	0.4
Potamogeton richardsonii	Clasping-leaf pondweed	Submergent	5	8.8
Potamogeton robbinsii	Robbins pondweed	Submergent	8	14.9
Potamogeton strictifolius	Stiff pondweed	Submergent	8	1.8
Potamogeton zosteriformis	Flat-stem pondweed	Submergent	6	19.8
Ranunculus aquatilis	Stiff water crowfoot	Submergent	7	0.1
Ranunculus flammula	Creeping spearwort	Submergent	9	0.1
Stuckenia pectinata	Sago pondweed	Submergent	3	0.7
Vallisneria americana	Wild celery	Submergent	6	5.2

Table 13. LEC 4 Aquatic Plant Sampling Summary Statistics	
SUMMARY STATS:	**LEC 4**
Total number of points sampled	165
Total number of sites with vegetation	162
Total number of sites shallower than maximum depth of plants	163
Frequency of occurrence at sites shallower than maximum depth of plants	99.39
Simpson Diversity Index	0.88
Maximum depth of plants (ft)	13.50
Number of sites sampled using rake on Rope (R)	0
Number of sites sampled using rake on Pole (P)	165
Average number of all species per site (shallower than max depth)	4.42
Average number of all species per site (veg. sites only)	4.45
Average number of native species per site (shallower than max depth)	4.42
Average number of native species per site (veg. sites only)	4.45
Species Richness	26
Species Richness (including visuals)	29
Polygon FQI	33.64

Figure 7. LEC 4 Aquatic Plant Diversity Map

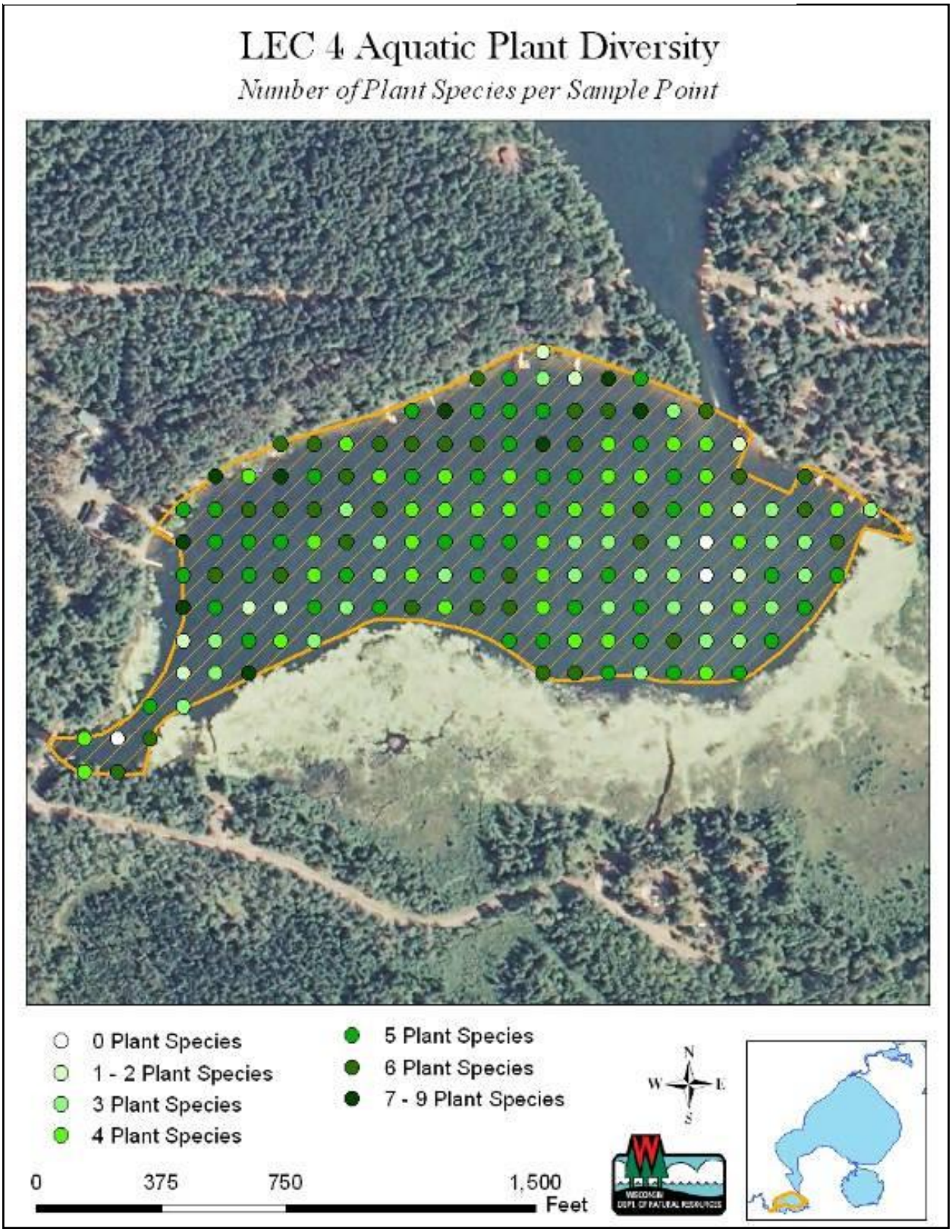


Table 14. Shoreline Assessment of LEC 4				
Feature	**Number**	**Density** (per mile)	**Shoreline Length** (feet)	**% of Shoreline**
Setback Zone				
Homes	16	32		
Accessory Structures	12	24		
Commercial Buildings	0	0		
Riparian Zone				
Homes	2	4		
Accessory Structures	11	22		
Commercial Buildings	0	0		
Natural vegetation			1574	59.6
Shrub Layer Removed			131	5.0
Shrub & Ground Cover Removed			66	2.5
Established Lawn			869	32.9
Pastureland			0	0
Row Crop			0	0
Beach			0	0
Impervious Surface (road, parking lots, etc.)			0	0
Other			0	0
Not Visible			0	0
Total Shoreline			2640	100
Bank Zone				
Natural Bank			2116	80.2
Soft bioengineering			0	0
Hard bioengineering			0	0
Riprap			131	5.0
Pea Gravel Blanket			0	0
Established Lawn			394	14.9
Artificial Beach			0	0
Seawalls			0	0
Total Shoreline			2640	100
Boat Ramp	0	0		
Stormwater Outflow	0	0		
Littoral Zone				
Piers	16	32		
Boat Lifts	4	8		
Swims Rafts/ Trampolines	0	0		
Boathouses	0	0		
Mooring Buoys	0	0		
Dredge channels	0	0		
Commercial Marinas	0	0		
Bridges	0	0		
Plant removal devices	0	0		
Recreational/Public Beaches	0	0		

Lower Eau Claire Lake Critical Habitat Site LEC 5

Critical habitat site LEC 5 was designated a Sensitive Area because of its Coarse Woody Habitat, Emergent and Floating Leaf Vegetation, and Submerged Aquatic Vegetation Important to Fish and Wildlife Habitat (Figures 8 & 9). LEC 5 is 5.0 acres in size and is located along the West shore of the Slow-No-Wake channel.

Aquatic Plants were sampled using a standardized Point Intercept method and a summary of the results can be found in Tables 15 and 16. Woody habitat was sampled using a standardized transect method and a summary of the results can be found in Table 17. Big Logs are defined as being greater than 10 cm (4 in) in diameter and greater than 150 cm (5 ft) in length. Small Logs are defined as being between 5-10 cm (2-4 in) in diameter and greater than 150 cm (5 ft) in length. Table 18 summarizes the current management practices within the Setback, Riparian, Bank and Littoral Zones of LEC 5.

Established lawn within 35 feet of the water's edge should be replanted with native vegetation to comply with Douglas County shoreland zoning ordinance, minimize erosion and pollution, and improve fish and wildlife habitat.

According to the shoreline inventory, there is some riprap in LEC 5. Riprap is not necessary because the wave energy is low. Low-energy sites are typically not eligible/authorized for riprap permits. If shoreline erosion is a problem, overland runoff from rooftops, driveways, and lawns or reckless motorboat use are the most likely causes.

Enforce current slow-no-wake ordinance.

Do not actively manage aquatic plants unless an aquatic invasive species should establish.

Implement Fish Sticks project. Contact local DNR Fisheries Biologist to investigate funding and technical assistance opportunities.

Leave fallen trees in the water.

Table 15. LEC5 Aquatic Plants

Scientific Name	Common Name	Plant Type	FQI Coefficient	Relative Frequency
Sagittaria sp.	Arrowhead	Emergent	-	3.2
Typha sp.	Cattail	Emergent	1	Visual
Brasenia schreberi	Watershield	Floating Leaf	7	1.3
Nymphaea odorata	White water lily	Floating Leaf	6	1.9
Potamogeton natans	Floating-leaf pondweed	Floating Leaf	5	0.6
Ceratophyllum demersum	Coontail	Submergent	3	14.1
Chara	Muskgrasses	Submergent	7	1.9
Elodea canadensis	Common waterweed	Submergent	3	9.6
Heteranthera dubia	Water star-grass	Submergent	6	1.3
Megalodonta beckii	Water marigold	Submergent	8	1.9
Myriophyllum sibericum	Northern water-milfoil	Submergent	7	8.3
Najas flexilis	Bushy pondweed	Submergent	6	5.1
Potamogeton amplifolius	Large-leaf pondweed	Submergent	7	1.9
Potamogeton friesii	Frie's pondweed	Submergent	8	5.1
Potamogeton pusillus	Small pondweed	Submergent	7	1.9

Potamogeton richardsonii	Clasping-leaf pondweed	Submergent	5	1.9
Potamogeton robbinsii	Robbins pondweed	Submergent	8	4.5
Potamogeton zosteriformis	Flat-stem pondweed	Submergent	6	16.0
Ranunculus aquatilis	Stiff water crowfoot	Submergent	7	0.6
Stuckenia pectinata	Sago pondweed	Submergent	3	1.3
Vallisneria americana	Wild celery	Submergent	6	17.3

Table 16. LEC 5 Aquatic Plant Sampling Summary Statistics

SUMMARY STATS:	**LEC 5**
Total number of points sampled	47
Total number of sites with vegetation	46
Total number of sites shallower than maximum depth of plants	47
Frequency of occurrence at sites shallower than maximum depth of plants	97.87
Simpson Diversity Index	0.90
Maximum depth of plants (ft)	8.00
Number of sites sampled using rake on Rope (R)	0
Number of sites sampled using rake on Pole (P)	47
Average number of all species per site (shallower than max depth)	3.32
Average number of all species per site (veg. sites only)	3.39
Average number of native species per site (shallower than max depth)	3.32
Average number of native species per site (veg. sites only)	3.39
Species Richness	20
Species Richness (including visuals)	21
Polygon FQI	25.94

Table 17. LEC 5 Woody Habitat Sampling Transects

Transect	**# Big Logs**	**# Small Logs**	**Transect Length (feet)**	**Transect Length (m)**	**Big Logs per Mile**	**Small Logs per Mile**
LEC 5-1	0	1	98.4	30	0.0	53.7
LEC 5-2	2	1	98.4	30	107.3	53.7
LEC 5-3	3	2	98.4	30	161.0	107.3
LEC 5-4	4	3	98.4	30	214.6	161.0
LEC 5 Total	9	7	393.6	120	120.7	93.9

Figure 8. LEC 5 Aquatic Plant Diversity Map

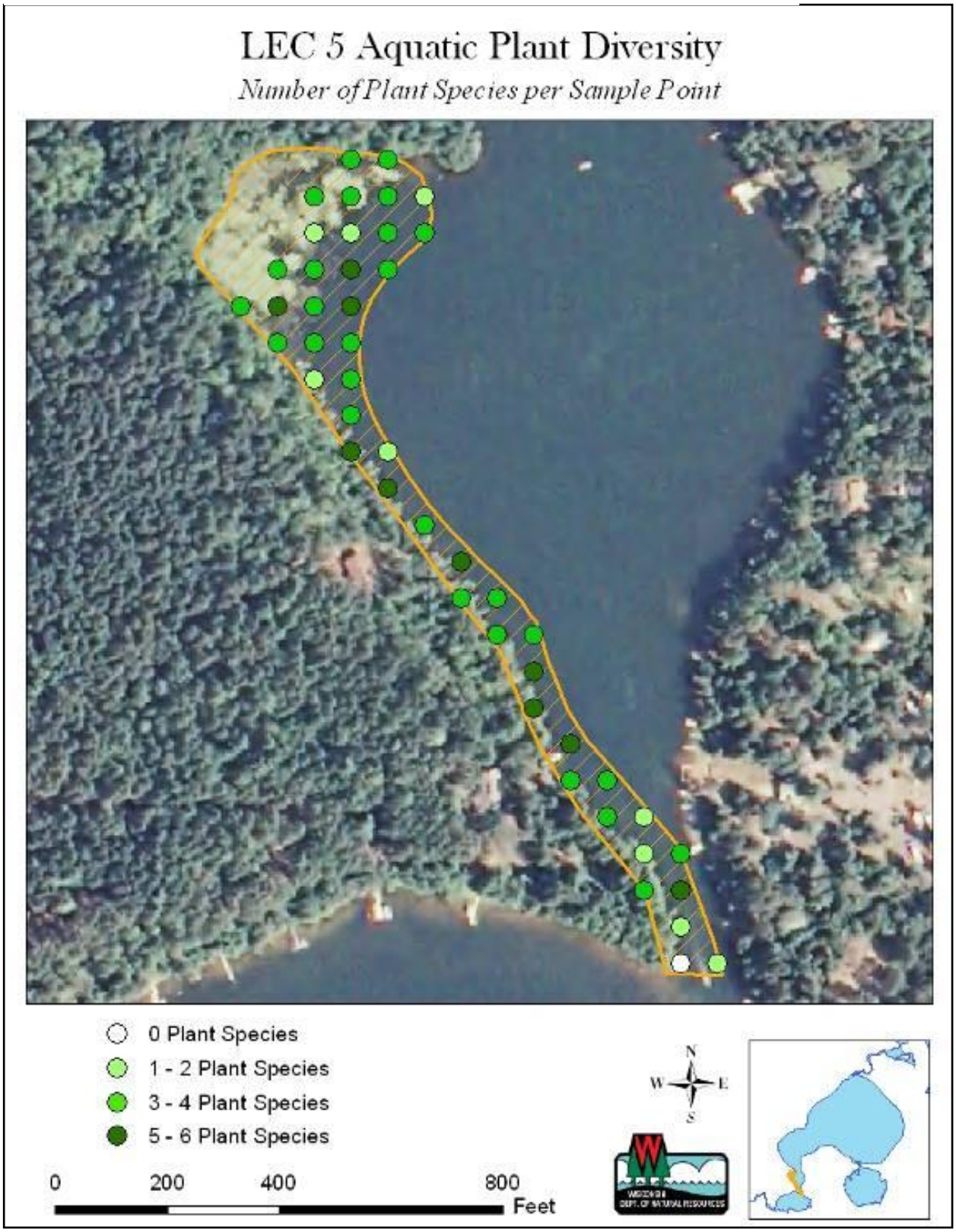


Figure 9. LEC 5 Woody Habitat Transects Map

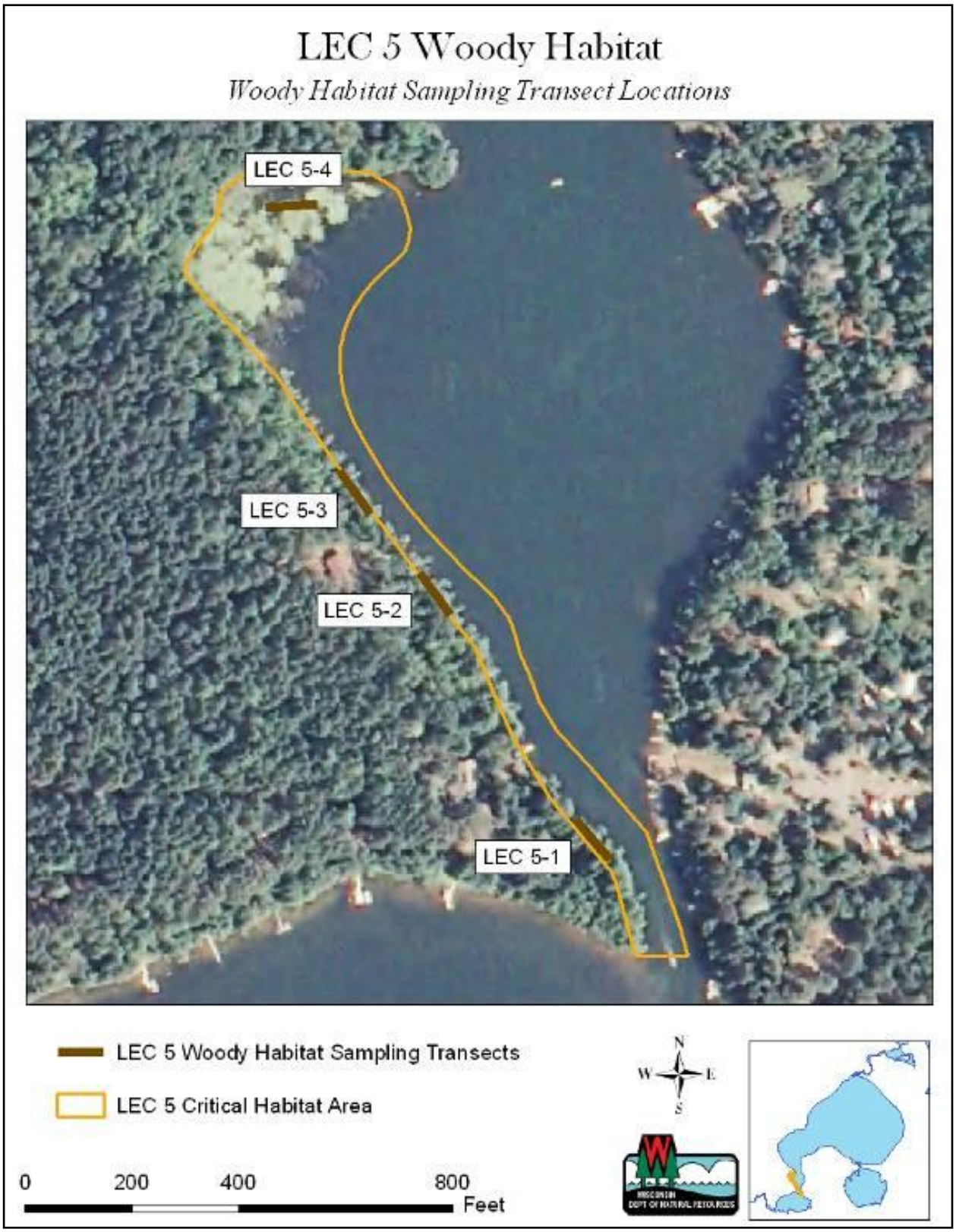


Table 18. Shoreline Assessment of LEC 5				
Feature	**Number**	**Density** (per mile)	**Shoreline Length** (feet)	**% of Shoreline**
Setback Zone				
Homes	2	5.2		
Accessory Structures	2	5.2		
Commercial Buildings	0	0		
Riparian Zone				
Homes	0	0		
Accessory Structures	3	7.8		
Commercial Buildings	0	0		
Natural vegetation			1771	87.1
Shrub Layer Removed			0	0
Shrub & Ground Cover Removed			0	0
Established Lawn			262	12.9
Pastureland			0	0
Row Crop			0	0
Beach			0	0
Impervious Surface (road, parking lots, etc.)			0	0
Other			0	0
Not Visible			0	0
Total Shoreline			2034	100
Bank Zone				
Natural Bank			1902	93.5
Soft bioengineering			0	0
Hard bioengineering			0	0
Riprap			82	4.0
Pea Gravel Blanket			0	0
Established Lawn			49	2.4
Artificial Beach			0	0
Seawalls			0	0
Total Shoreline			2034	100
Boat Ramp	0	0		
Stormwater Outflow	0	0		
Littoral Zone				
Piers	2	5.2		
Boat Lifts	0	0		
Swims Rafts/ Trampolines	0	0		
Boathouses	0	0		
Mooring Buoys	0	0		
Dredge channels	0	0		
Commercial Marinas	0	0		
Bridges	0	0		
Plant removal devices	0	0		
Recreational/Public Beaches	0	0		

Lower Eau Claire Lake Critical Habitat Site LEC 6

Critical habitat site LEC 6 was designated a Public Rights Feature because of its Coarse Woody Habitat (Figure 10). LEC 6 is 1.7 acres in size and is located along the Western shore of Lower Eau Claire Lake. Much of the woody habitat was not within the boundaries of the transects so it wasn't recorded in the survey methods.

Woody habitat was sampled using a standardized transect method and a summary of the results can be found in Table 19. Big Logs are defined as being greater than 10 cm (4 in) in diameter and greater than 150 cm (5 ft) in length. Small Logs are defined as being between 5-10 cm (2-4 in) in diameter and greater than 150 cm (5 ft) in length. Table 20 summarizes the current management practices within the Setback, Riparian, Bank, and Littoral Zones of LEC 6.

Buffers, overhanging vegetation, and floating, emergent, and submersed aquatic plants should be left alone.

According to the shoreline inventory, there is no riprap in LEC6. The wave energy is moderate. Riprap should not be permitted, and alternative bank stabilization methods should be used instead if evidence of erosion develops.

Implement Fish Sticks project. Contact local DNR Fisheries Biologist to investigate funding and technical assistance opportunities.

Leave fallen trees in the water.

Table 19. LEC6 Woody Habitat Sampling Transects

Transect	# Big Logs	# Small Logs	Transect Length (feet)	Transect Length (m)	Big Logs per Mile	Small Logs per Mile
LEC 6-1	0	0	65.6	20	0.0	0.0
LEC 6-2	1	0	65.6	20	80.5	0.0
LEC 6-3	0	0	65.6	20	0.0	0.0
LEC 6-4	0	0	65.6	20	0.0	0.0
LEC 6 Total	1	0	262.4	80	20.1	0.0

Figure 10. LEC 6 Woody Habitat Transects Map

Table 20. Shoreline Assessment of LEC 6				
Feature	**Number**	**Density** (per mile)	**Shoreline Length** (feet)	**% of Shoreline**
Setback Zone				
Homes	0	0		
Accessory Structures	0	0		
Commercial Buildings	0	0		
Riparian Zone				
Homes	0	0		
Accessory Structures	0	0		
Commercial Buildings	0	0		
Natural vegetation			820	100
Shrub Layer Removed			0	0
Shrub & Ground Cover Removed			0	0
Established Lawn			0	0
Pastureland			0	0
Row Crop			0	0
Beach			0	0
Impervious Surface (road, parking lots, etc.)			0	0
Other			0	0
Not Visible			0	0
Total Shoreline			820	100
Bank Zone				
Natural Bank			820	100
Soft bioengineering			0	0
Hard bioengineering			0	0
Riprap			0	0
Pea Gravel Blanket			0	0
Established Lawn			0	0
Artificial Beach			0	0
Seawalls			0	0
Total Shoreline			820	100
Boat Ramp	0	0		
Stormwater Outflow	0	0		
Littoral Zone				
Piers	0	0		
Boat Lifts	0	0		
Swims Rafts/ Trampolines	0	0		
Boathouses	0	0		
Mooring Buoys	0	0		
Dredge channels	0	0		
Commercial Marinas	0	0		
Bridges	0	0		
Plant removal devices	0	0		
Recreational/Public Beaches	0	0		

Lower Eau Claire Lake Critical Habitat Site LEC 7

Critical Habitat site LEC 7 was designated a Sensitive Area because of its Spawning Substrate, Extensive Public Use, Coarse Woody Habitat, Submerged Aquatic Vegetation Important to Fish and Wildlife Habitat, Emergent and Floating Leaf Vegetation, and Extensive Riparian Wetland (Figures 11, 12, 13, & 14). LEC 7 is 7.4 acres in size and encompasses all of the Eau Claire River from the dam on South Shore Road down to Lower Eau Claire Lake. The area immediately below the dam is the primary walleye spawning habitat for the lake.

Aquatic Plants were sampled using a standardized Point Intercept method and a summary of the results can be found in Tables 21 and 22. Woody habitat was sampled using a standardized transect method and a summary of the results can be found in Tables 23 & 24. Big Logs are defined as being greater than 10 cm (4 in) in diameter and greater than 150 cm (5 ft) in length. Small Logs are defined as being between 5-10 cm (2-4 in) in diameter and greater than 150 cm (5 ft) in length. Spawning Substrate was sampled using a standardized transect method and a summary of the results can be found in Table 25. Table 26 summarizes the current management practices within the Setback, Riparian, Bank and Littoral Zones of LEC 7.

Special Note: This area is regulated as a fish refuge from April 15th to May 15th each year due to its importance to both spawning walleye and muskellunge. Large concentrations of white suckers also use the river for spawning in spring which constitutes an important part of the forage base for the lake.

LEC7 includes some of the most zoning non-compliant shoreline on the entire lake.

Established lawn within 50 feet of the water's edge should be replanted with native vegetation to comply with Bayfield County shoreland zoning ordinance, minimize erosion and pollution, and improve fish and wildlife habitat.

Buffers, overhanging vegetation, bog/wetland, and floating, emergent, and submersed aquatic plants should be left alone.

According to the shoreline inventory, there is riprap and seawall in LEC7. Riprap is not necessary because the wave energy is low. Low-energy sites are typically not eligible/authorized for riprap permits. If shoreline erosion is a problem, overland runoff from rooftops, driveways, and lawns or reckless motorboat use are the most likely causes. Previously and potentially illegally placed riprap should be removed.

Dredging should not be allowed. Instead, sedimentation and runoff sources at South Shore Road and impervious rooftops, driveways/parking areas, and established lawn along the river should be restored to natural communities and infiltration/diversion practices implemented.

Enforce current slow-no-wake ordinance.

Implement Fish Sticks project. Contact local DNR Fisheries Biologist to investigate funding and technical assistance opportunities.

Leave fallen trees in the water unless they are impeding navigation.

Table 21. LEC 7 Aquatic Plants				
Scientific Name	**Common Name**	**Plant Type**	**FQI Coefficient**	**Relative Frequency**
Carex sp.	Sedges	Emergent	-	1.0
Typha sp.	Cattail	Emergent	1	1.0
Nymphaea odorata	White water lily	Floating Leaf	6	1.0
Spirodela polyrhiza	Large Duckweed	Free Floating	5	Visual
Ceratophyllum demersum	Coontail	Submergent	3	2.9
Chara	Muskgrasses	Submergent	7	4.9
Elodea canadensis	Common waterweed	Submergent	3	10.8
Heteranthera dubia	Water star-grass	Submergent	6	14.7
Myriophyllum sibericum	Northern water-milfoil	Submergent	7	2.9
Najas flexilis	Bushy pondweed	Submergent	6	6.9
Potamogeton illinoensis	Illinois pondweed	Submergent	6	1.0
Potamogeton richardsonii	Clasping-leaf pondweed	Submergent	5	1.0
Potamogeton robbinsii	Robbins pondweed	Submergent	8	1.0
Potamogeton strictifolius	Stiff pondweed	Submergent	8	17.6
Potamogeton zosteriformis	Flat-stem pondweed	Submergent	6	5.9
Ranunculus aquatilis	Stiff water crowfoot	Submergent	7	3.9
Schoenoplectus tabernaemontani	Softstem bulrush	Submergent	4	2.0
Stuckenia pectinata	Sago pondweed	Submergent	3	1.0
Vallisneria americana	Wild celery	Submergent	6	20.6

Table 22. LEC 7 Aquatic Plant Sampling Summary Statistics	
SUMMARY STATS:	**LEC 7**
Total number of points sampled	56
Total number of sites with vegetation	42
Total number of sites shallower than maximum depth of plants	56
Frequency of occurrence at sites shallower than maximum depth of plants	75.00
Simpson Diversity Index	0.88
Maximum depth of plants (ft)	9.00
Number of sites sampled using rake on Rope (R)	0
Number of sites sampled using rake on Pole (P)	56
Average number of all species per site (shallower than max depth)	1.82
Average number of all species per site (veg. sites only)	2.43
Average number of native species per site (shallower than max depth)	1.82
Average number of native species per site (veg. sites only)	2.43
Species Richness	18
Species Richness (including visuals)	19
Polygon FQI	22.86

Figure 11. LEC 7 Spawning Substrate Transect Map

Figure 12. LEC 7 Woody Habitat Transects Map

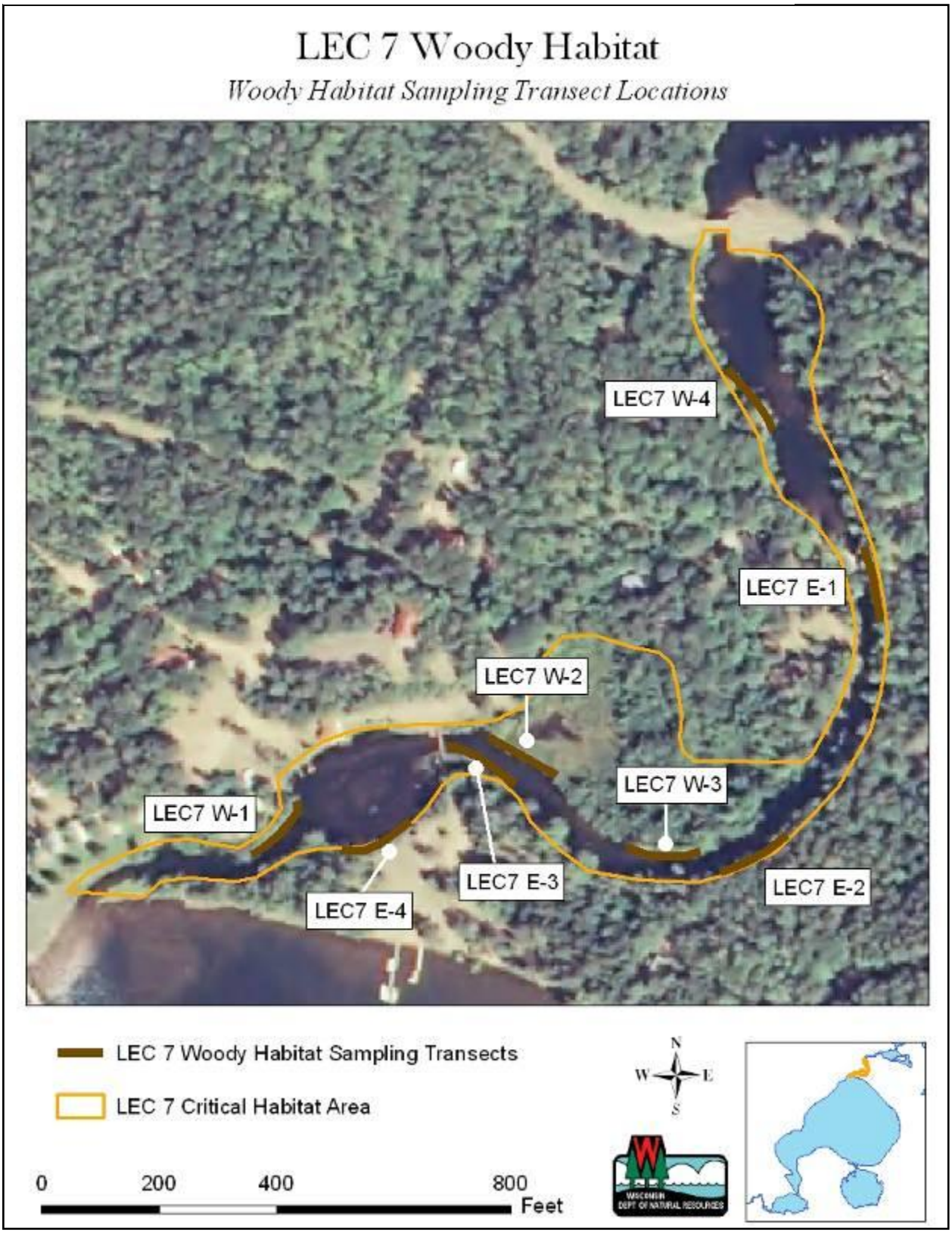


Figure 13. LEC 7 Aquatic Plant Diversity Map

Figure 14. LEC 7 Woody Habitat Transects Map

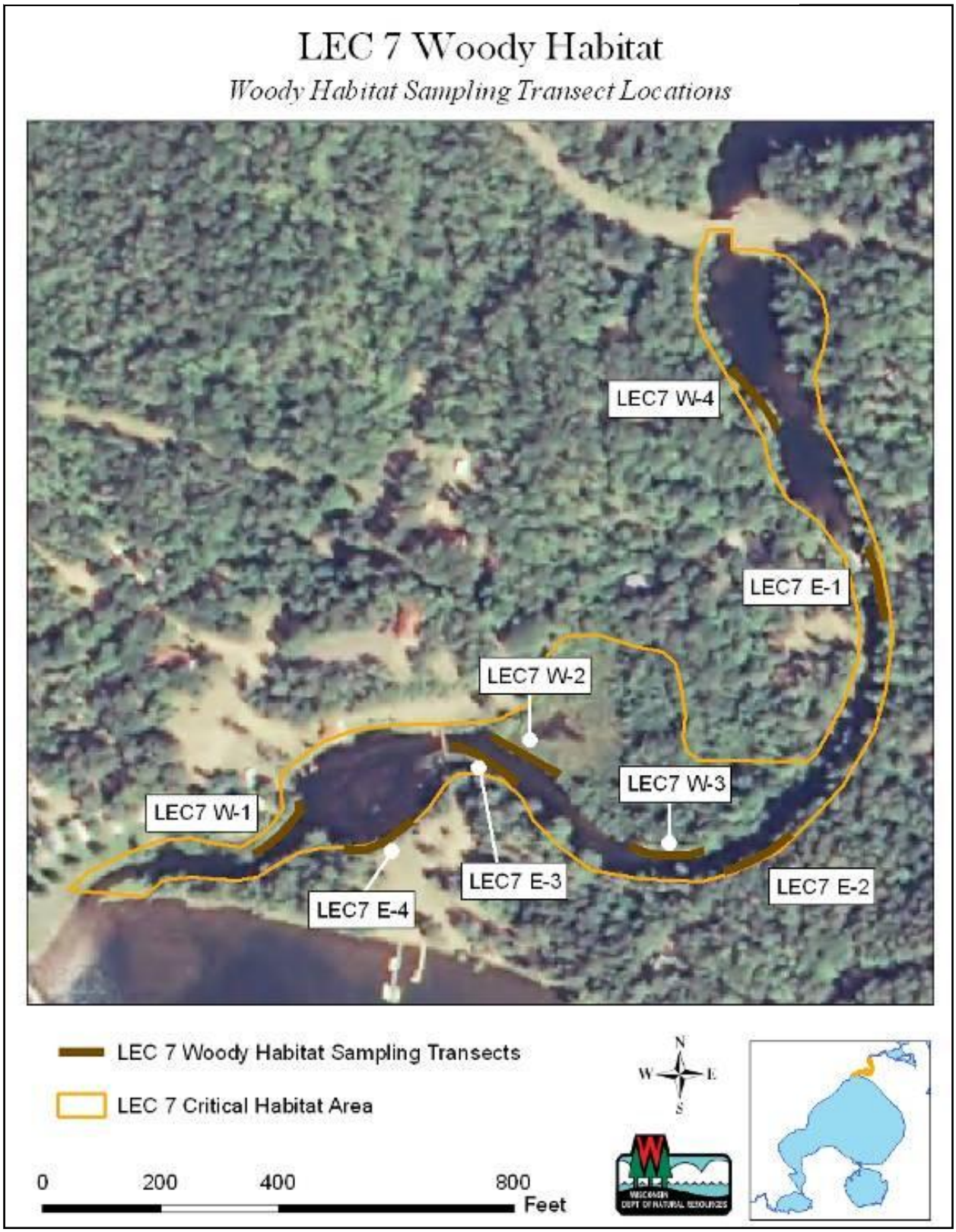


Table 23. LEC 7-East Woody Habitat Sampling Transects						
Transect	**# Big Logs**	**# Small Logs**	**Transect Length (feet)**	**Transect Length (m)**	**Big Logs per Mile**	**Small Logs per Mile**
LEC 7-East-1	0	1	131.2	40	0.0	40.2
LEC 7-East-2	2	4	131.2	40	80.5	161.0
LEC 7-East-3	2	0	131.2	40	80.5	0.0
LEC 7-East-4	0	0	131.2	40	0.0	0.0
LEC 7-East Total	4	5	524.8	160	40.2	50.3

Table 24. LEC 7-West Woody Habitat Sampling Transects						
Transect	**# Big Logs**	**# Small Logs**	**Transect Length (feet)**	**Transect Length (m)**	**Big Logs per Mile**	**Small Logs per Mile**
LEC 7-West-1	0	0	131.2	40	0.0	0.0
LEC 7-West-2	0	0	131.2	40	0.0	0.0
LEC 7-West-3	5	3	131.2	40	201.2	120.7
LEC 7-West-4	2	4	131.2	40	80.5	161.0
LEC 7-West Total	7	7	524.8	160	70.4	70.4

Table 25. LEC 7 Spawning Substrate Sampling Transect Data

Transect Number	Quadrat Number	Band Start	Band End	Band Width (m)	Embeddedness	Marl	Detritus	Clay	Silt	Sand	Fine Gravel	Coarse Gravel	Cobble / Rubble	Small Boulder	Large Boulder	Bedrock
1	1	0	15	15						100						
2	1	0	13	13						100						
3	1	0	4.5	4.5			100									
3	2	4.5	11.9	7.4						100						
3	3	11.9	20	8.1			100									
3	4	20	22.5	2.5						100						
3	5	22.5	25.7	3.2			100									
4	1	0	1.5	1.5			100									
4	2	1.5	16	14.5						100						
4	3	16	25.2	9.2			100									
4	4	25.2	32	6.8						100						
4	5	32	34	2			100									
4	6	34	38.6	4.6						100						
4	7	38.6	52.6	14			100									
5	1	0	2	2			100									
5	2	2	16.5	14.5						100						
5	3	16.5	24.2	7.7			100									
5	4	24.2	25.5	1.3						100						
5	5	25.5	26	0.5			100									
6	1	0	3	3			100									
6	2	3	10.8	7.8						100						
6	3	10.8	15.1	4.3			100									
6	4	15.1	19.3	4.2						100						
6	5	19.3	20.5	1.2			100									
7	1	0	1.6	1.6			100									
7	2	1.6	3.2	1.6						100						
7	3	3.2	8	4.8			100									
7	4	8	13.4	5.4						100						
7	5	13.4	17.6	4.2			100									
8	1	0	3.2	3.2			100									
8	2	3.2	12.9	9.7						100						
8	3	12.9	15.1	2.2			100									
9	1	0	3.4	3.4			100									
9	2	3.4	13.4	10						100						
9	3	13.4	18.4	5			100									
10	1	0	1.4	1.4			100									
10	2	1.4	13.3	11.9						100						

10	3	13.3	16.2	2.9			100									
11	1	0	0.2	0.2	3		30						70			
11	2	0.2	2.2	2			100									
11	3	2.2	15.3	13.1						100						
11	4	15.3	16.6	1.3			100									
12	1	0	1	1			100									
12	2	1	10.7	9.7						100						
12	3	10.7	14.3	3.6	1					80	20					

Table 26. Shoreline Assessment of LEC 7				
Feature	**Number**	**Density** (per mile)	**Shoreline Length** (feet)	**% of Shoreline**
Setback Zone				
Homes	4	4.3		
Accessory Structures	3	3.2		
Commercial Buildings	0	0		
Riparian Zone				
Homes	1	1.1		
Accessory Structures	9	9.6		
Commercial Buildings	0	0		
Natural vegetation			3411	68.9
Shrub Layer Removed			66	1.3
Shrub & Ground Cover Removed			361	7.3
Established Lawn			1115	22.5
Pastureland			0	0
Row Crop			0	0
Beach			0	0
Impervious Surface (road, parking lots, etc.)			0	0
Other			0	0
Not Visible			0	0
Total Shoreline			4953	100
Bank Zone				
Natural Bank			4028	81.3
Soft bioengineering			0	0
Hard bioengineering			0	0
Riprap			203	4.1
Pea Gravel Blanket			0	0
Established Lawn			541	10.9
Artificial Beach			82	1.7
Seawalls			98	2.0
Total Shoreline			4953	100
Boat Ramp	1	1.1		
Stormwater Outflow	0	0		
Littoral Zone				
Piers	17	18.1		
Boat Lifts	1	1.1		
Swims Rafts/ Trampolines	0	0		
Boathouses	2	2.1		
Mooring Buoys	0	0		
Dredge channels	0	0		
Commercial Marinas	0	0		
Bridges	2	2.1		
Plant removal devices	0	0		
Recreational/Public Beaches	0	0		

Lower Eau Claire Lake Critical Habitat Site LEC 8

Critical habitat site LEC 8 was designated a Public Rights Feature because of its Spawning Substrate and Coarse Woody Habitat (Figures 15 & 16). LEC 8 is 14.1 acres in size and is located along the Northeast shore of Lower Eau Claire Lake. LEC 8 includes the second most heavily used walleye spawning habitat.

Woody habitat was sampled using a standardized transect method and a summary of the results can be found in Table 27. Big Logs are defined as being greater than 10 cm (4 in) in diameter and greater than 150 cm (5 ft) in length. Small Logs are defined as being between 5-10 cm (2-4 in) in diameter and greater than 150 cm (5 ft) in length. Spawning Substrate was sampled using a standardized transect method and a summary of the results can be found in Table 28. Table 29 summarizes the current management practices within the Setback, Riparian, Bank and Littoral Zones of LEC 7.

Prioritize for permanent land protection.

Established lawn within 50 feet of the water's edge should be replanted with native vegetation to comply with Bayfield County shoreland zoning ordinance, minimize erosion and pollution, and improve fish and wildlife habitat.

Buffers, overhanging vegetation and fallen trees should remain to provide cover and prevent shoreline erosion which could cause undesirable increases in sedimentation on this valuable walleye spawning shoal, consisting of an abundance of cobble, gravel and sand.

According to the shoreline inventory, there is little riprap in LEC8, and it is not recommended because it could disturb spawning substrates. The wave energy is moderate. Minimize riprap and use alternative bank stabilization methods instead.

Implement Fish Sticks project. Contact local DNR Fisheries Biologist to investigate funding and technical assistance opportunities.

Leave fallen trees in the water. There are several trees that are leaning towards the water, which will provide excellent fish and wildlife habitat when they fall in.

Table 27. LEC 8 Woody Habitat Sampling Transects

Transect	# Big Logs	# Small Logs	Transect Length (feet)	Transect Length (m)	Big Logs per Mile	Small Logs per Mile
LEC 8-1	0	0	164	50	0.0	0.0
LEC 8-2	0	0	164	50	0.0	0.0
LEC 8-3	0	1	164	50	0.0	32.2
LEC 8-4	0	2	164	50	0.0	64.4
LEC 8 Total	0	3	656	200	0.0	24.1

Figure 15. LEC 8 Woody Habitat Transects Map

Figure 16. LEC 8 Spawning Substrate Transects Map

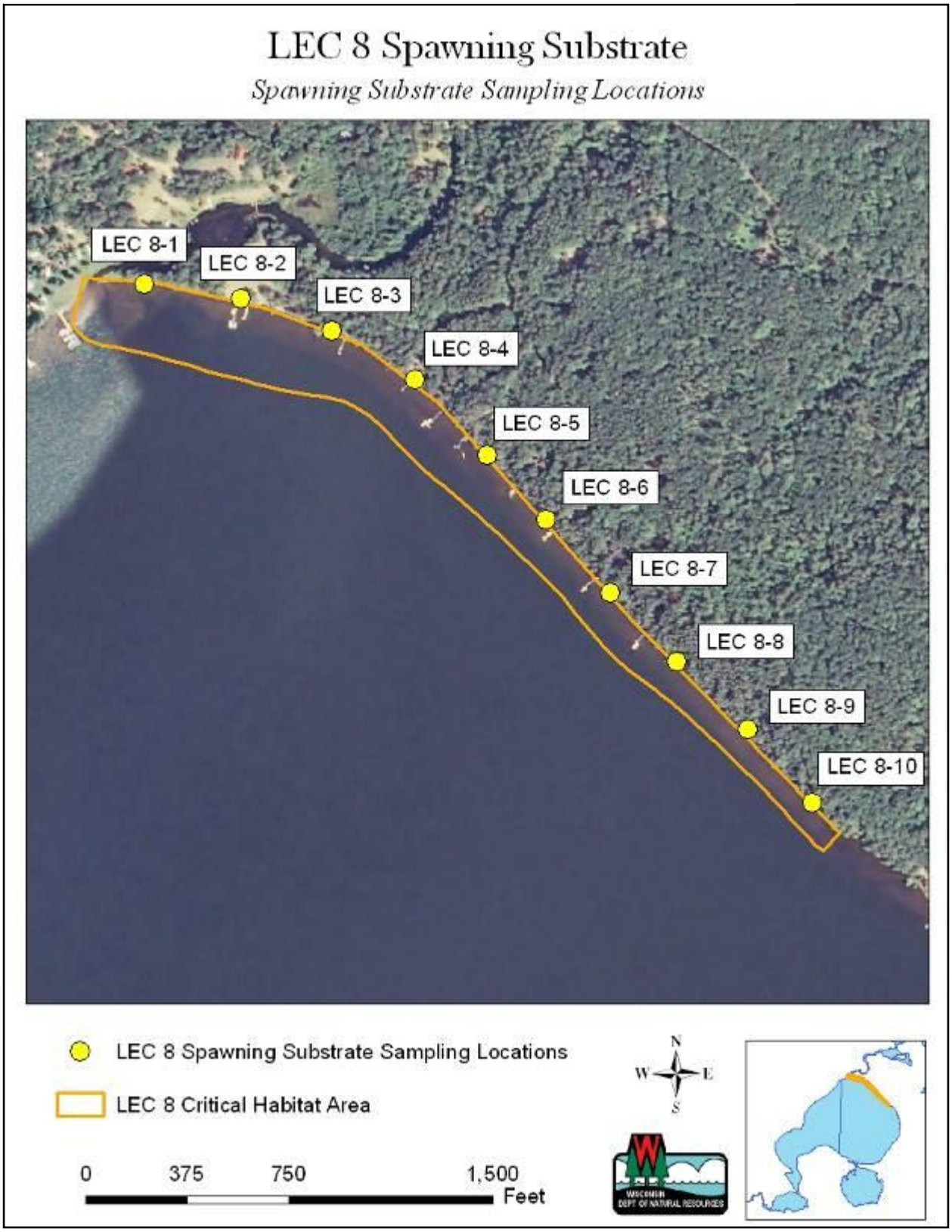


Table 28. LEC 8 Spawning Substrate Sampling Transect Data

Transect Number	Quadrat Number	Band Start	Band End	Band Width (m)	Embeddedness	Marl	Detritus	Clay	Silt	Sand	Fine Gravel	Coarse Gravel	Cobble / Rubble	Small Boulder	Large Boulder	Bedrock
1	1	0	3.1	3.1						95	5					
1	2	3.1	4	0.9	2					20	80					
1	3	4	15	11						100						
2	1	0	0.9	0.9						95	5					
2	2	0.9	2.6	1.7	2					40	60					
2	3	2.6	15	12.4						100						
3	1	0	15	15						100						
4	1	0	0.7	0.7	3					40			60			
4	2	0.7	1.5	0.8						100						
4	3	1.5	4.3	2.8	2					20	70	10				
4	4	4.3	5.8	1.5						100						
4	5	5.8	6.9	1.1	2					30	70					
4	6	6.9	15	8.1						95	5					
5	1	0	0.4	0.4	5						30	20	50			
5	2	0.4	2.4	2	5						70	20	10			
5	3	2.4	15	12.6						100						
6	1	0	2.1	2.1	4					10	65	10	15			
6	2	2.1	15	12.9						100						
7	1	0	2.3	2.3	5					5	10	25	60			
7	2	2.3	15	12.7						100						
8	1	0	3	3	4					20	10	20	50			
8	2	3	15	12						100						
9	1	0	3	3	3					40		55	5			
9	2	3	15	12						100						
10	1	0	2.5	2.5	5					10	10	10	70			
10	2	2.5	15	12.5						100						

Table 29. Shoreline Assessment of LEC 8				
Feature	**Number**	**Density** (per mile)	**Shoreline Length** (feet)	**% of Shoreline**
Setback Zone				
Homes	9	13.3		
Accessory Structures	5	7.4		
Commercial Buildings	0	0		
Riparian Zone				
Homes	0	0		
Accessory Structures	10	14.8		
Commercial Buildings	0	0		
Natural vegetation			2985	83.5
Shrub Layer Removed			0	0
Shrub & Ground Cover Removed			66	1.8
Established Lawn			197	5.5
Pastureland			0	0
Row Crop			0	0
Beach			328	9.2
Impervious Surface (road, parking lots, etc.)			0	0
Other			0	0
Not Visible			0	0
Total Shoreline			3575	100
Bank Zone				
Natural Bank			2903	81.2
Soft bioengineering			0	0
Hard bioengineering			0	0
Riprap			312	8.7
Pea Gravel Blanket			0	0
Established Lawn			164	4.6
Artificial Beach			197	5.5
Seawalls			0	0
Total Shoreline			3575	100
Boat Ramp	0	0		
Stormwater Outflow	0	0		
Littoral Zone				
Piers	11	16.2		
Boat Lifts	9	13.3		
Swims Rafts/ Trampolines	0	0		
Boathouses	0	0		
Mooring Buoys	0	0		
Dredge channels	0	0		
Commercial Marinas	0	0		
Bridges	0	0		
Plant removal devices	0	0		
Recreational/Public Beaches	0	0		

Lower Eau Claire Lake Critical Habitat Site LEC 9

Critical habitat site LEC 9 was designated a Sensitive Area because of its Rush Beds (Figures 17 & 18). LEC 9 is 7.4 acres in size and is located near the channel to Cranberry Lake.

Aquatic Plants were sampled using a standardized Point Intercept method and a summary of the results can be found in Tables 30 and 31. Table 32 summarizes the current management practices within the Setback, Riparian, Bank and Littoral Zones of LEC 9.

Prioritize for permanent land protection.

Established lawn within 50 feet of the water's edge should be replanted with native vegetation to comply with Bayfield County shoreland zoning ordinance, minimize erosion and pollution, and improve fish and wildlife habitat.

Dredging should not be allowed.

Do not remove rush beds. Place piers outside of rushes, or if that's not possible extend the piers beyond the rushes for boat mooring. Restore/replant rush beds that have been destroyed in the past.

Implement Fish Sticks project. Contact local DNR Fisheries Biologist to investigate funding and technical assistance opportunities.

Table 30. LEC 9 Aquatic Plants

Scientific Name	Common Name	Plant Type	FQI Coefficient	Relative Frequency
Carex sp.	Sedges	Emergent	-	3.1
Eleocharis palustris	Creeping spikerush	Emergent	6	26.5
Phragmites australis	Common reed	Emergent	1	Visual
Schoenoplectus pungens	3-square bulrush	Emergent	5	2.0
Schoenoplectus tabernaemontani	Softstem bulrush	Emergent	4	22.4
Sparganium chlorocarpum	Narrow-leaved bur-reed	Emergent	8	2.0
Typha sp	Cattail	Emergent	1	3.1
Brasenia schreberi	Watershield	Floating Leaf	7	2.0
Nuphar variegata	Spatterdock	Floating Leaf	6	2.0
Nymphaea odorata	White water lily	Floating Leaf	6	3.1
Potamogeton natans	Floating-leaf pondweed	Floating Leaf	5	3.1
Spirodela polyrhiza	Large Duckweed	Free Floating	5	Visual
Utricularia vulgaris	Common bladderwort	Free Floating	7	1.0
Ceratophyllum demersum	Coontail	Submergent	3	3.1
Elodea canadensis	Common waterweed	Submergent	3	1.0
Heteranthera dubia	Water star-grass	Submergent	6	2.0
Megalodonta beckii	Water marigold	Submergent	8	Visual
Myriophyllum sibericum	Northern water-milfoil	Submergent	7	2.0
Potamogeton amplifolius	Large-leaf pondweed	Submergent	7	1.0
Potamogeton gramineus	Variable pondweed	Submergent	7	1.0
Potamogeton illinoensis	Illinois pondweed	Submergent	6	1.0
Potamogeton richardsonii	Clasping-leaf pondweed	Submergent	5	Visual
Potamogeton robbinsii	Robbins pondweed	Submergent	8	1.0

Potamogeton strictifolius	Stiff pondweed	Submergent	8	14.3
Potamogeton zosteriformis	Flat-stem pondweed	Submergent	6	1.0
Schoenoplectus subterminalis	Water bulrush	Submergent	9	Visual
Vallisneria americana	Wild celery	Submergent	6	2.0

Table 31. LEC 9 Aquatic Plant Sampling Summary Statistics

SUMMARY STATS:	**LEC 9**
Total number of points sampled	60
Total number of sites with vegetation	55
Total number of sites shallower than maximum depth of plants	60
Frequency of occurrence at sites shallower than maximum depth of plants	91.667
Simpson Diversity Index	0.8505
Maximum depth of plants (ft)	3.00
Number of sites sampled using rake on Rope (R)	0
Number of sites sampled using rake on Pole (P)	60
Average number of all species per site (shallower than max depth)	1.6333
Average number of all species per site (veg. sites only)	1.7818
Average number of native species per site (shallower than max depth)	1.6333
Average number of native species per site (veg. sites only)	1.7818
Species Richness	22
Species Richness (including visuals)	27
Polygon FQI	29.42

Figure 17. LEC 9 Aquatic Plant Diversity Map

Figure 18. LEC 9 Rushes Map

Table 32. Shoreline Assessment of LEC 9				
Feature	**Number**	**Density** (per mile)	**Shoreline Length** (feet)	**% of Shoreline**
Setback Zone				
Homes	1	4.0		
Accessory Structures	1	4.0		
Commercial Buildings	0	0		
Riparian Zone				
Homes	0	0		
Accessory Structures	2	8.0		
Commercial Buildings	0	0		
Natural vegetation			1082	82.5
Shrub Layer Removed			0	0
Shrub & Ground Cover Removed			0	0
Established Lawn			230	17.5
Pastureland			0	0
Row Crop			0	0
Beach			0	0
Impervious Surface (road, parking lots, etc.)			0	0
Other			0	0
Not Visible			0	0
Total Shoreline			1312	100
Bank Zone				
Natural Bank			1263	96.3
Soft bioengineering			0	0
Hard bioengineering			0	0
Riprap			0	0
Pea Gravel Blanket			0	0
Established Lawn			49	3.7
Artificial Beach			0	0
Seawalls			0	0
Total Shoreline			1312	100
Boat Ramp	0	0		
Stormwater Outflow	0	0		
Littoral Zone				
Piers	1	4.0		
Boat Lifts	1	4.0		
Swims Rafts/ Trampolines	0	0		
Boathouses	0	0		
Mooring Buoys	0	0		
Dredge channels	0	0		
Commercial Marinas	0	0		
Bridges	0	0		
Plant removal devices	0	0		
Recreational/Public Beaches	0	0		

Appendix 1. Personnel and dates of Critical Habitat Designation, Lower Eau Claire Lake, Bayfield County

Critical Habitat Designations occurred on 6/27/2007 by Scott Toshner, Pamela Toshner, Greg Kessler, and Paul Cunningham.

Shoreline management inventories occurred on 6/18/2008 by Alex Smith and Paul Riordan.

Aquatic plant sampling occurred on 8/19/2008, 8/20/2008, and 9/4/2008 by Alex Smith, Paul Riordan, Debbie Konkel, and Pamela Toshner.

Woody habitat sampling occurred on 6/17/2008 – 6/18/2008 by Alex Smith, Paul Riordan, and Paul Cunningham.

Spawning substrate sampling occurred on 6/17/2008 by Alex Smith, Paul Riordan, and Paul Cunningham.

Appendix 2: Notice of Public Information Meeting and Hearing for Proposed Critical Habitat Designation

The Department of Natural Resources has located areas that meet the criteria for Critical Habitat Designation on the Eau Claire Chain of Lakes in Bayfield and Douglas Counties. A public information meeting and hearing has been scheduled to discuss the proposed Critical Habitat Sites on Birch Lake, Bony Lake, Cranberry Lake, Devils Lake, Lower Eau Claire Lake, Middle Eau Claire Lake, Robinson Lake, Shunenberg Lake, Smith Lake, Sweet Lake, and Upper Eau Claire Lake in Bayfield and Douglas Counties.

Because the Critical Habitat Designations are in waters held in trust by the state for all citizens and may be adjacent to private lands, state law provides an opportunity for public input to the Department's decision.

The public informational meeting will be held Saturday, May 15, at 9:00 am at the Barnes Town Hall, 3360 Co Hwy N, Barnes, in Bayfield County. The informational meeting will be an open house format that will allow time to talk with DNR staff, ask questions, and provide written comments regarding the designations.

A public hearing will follow the informational meeting at 11:00 am for persons wishing to present oral testimony. During the hearing, the public can provide factual information about the waterway or the areas proposed for designations in light of the standards below.

Critical Habitat is of vital importance to water quality, hunting, fishing, and natural beauty of Wisconsin's lakes and streams. The Department has made a tentative determination that specific locations in the Eau Claire Chain of Lakes contain:

- Fish and wildlife habitat, including specific sites necessary for breeding, nesting, nursery, and feeding.
- Physical features that ensure protection of water quality.
- Reaches of bank, shore or bed that are predominately natural in appearance (not man-made or artificial) or that screen man-made or artificial features.
- Navigation thoroughfares or areas traditionally used for navigation during recreational boating, angling, hunting, or enjoyment of natural scenic beauty.
- Areas of aquatic vegetation 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.

The identified locations are eligible for Critical Habitat Designation, and if approved, they will be sufficiently preserved to ensure healthy aquatic systems and protected to maintain the cultural/aesthetic value of lakes to Wisconsin.
Critical Habitat Designation means that special permit conditions or denial of permits may apply to landowners who wish to alter Critical Habitat Areas through activities such as dredging, installing or repairing riprap, grading, irrigation, building dams, or establishing culverts, piers, and docks. Furthermore, in designated Critical Habitat Areas, manual removal of aquatic plants may require a permit, and the chemical treatment or mechanical removal of native aquatic plants is unlikely to be approved.

Draft reports, maps, and more information on Critical Habitat Designations are all available at http://dnr.wi.gov/lakes/criticalhabitat/ or by contacting Alex Smith at (715) 635-4124.

Response to Public Comments on Critical Habitat Designations

Location: Eau Claire Chain of Lakes in Bayfield and Douglas Counties
Public Hearing Held: May 15, 2010 at Barnes Town Hall, Barnes, WI
Comment Period Ended: July 31, 2010

Thank you to everyone who took the time to submit oral and written comments. Seven individuals provided oral comments during the May 15 public hearing. Ten individuals submitted hearing forms but did not speak. During the comment period, the Department received 14 written comments. We organized descriptive comments into the general categories listed below, followed by specific comments and responses.

Category #1 – Comments related to the boundaries and justifications for each Critical Habitat Area

Comment 1 – This comment is in regards to UEC 20 on Upper Eau Claire Lake. The person disagreed that the shoreline to the south of the channel leading to Birch Lake offers any spawning habitat. They went on to say that the area experiences very, very intense pressure from swimmers and boaters as it is primarily sand bottom is this area.

Response 1 – The Barnes Conservation Club in cooperation with the Wisconsin DNR constructed an off shore spawning reef in this area. The intent of the designation in this area is to protect this off shore reef from becoming covered with silt and sand. Electrofishing surveys have documented walleye spawning in this site.

Comment 2 – Some individuals requested that DNR add Critical Habitat Areas to include the Fish Sticks projects.

Response 2 – Critical habitat sites were identified based on the features present during the survey. Fish Sticks projects are ongoing and will be captured if future surveys occur. Property owners who participate in Fish Sticks projects enter into agreements that the habitat structures will remain.

Comment 3 – This comment is in regards to BON 5 on Bony Lake. It was suggested that the DNR add the justifications of Submerged Aquatic Vegetation Important to Fish and Wildlife Habitat and Extensive Riparian Wetland to this area.

Response 3 – The aquatic plant sampling work done by the DNR and the Wetland Delineation work that was done on the Loon Echo Bay Condo property when a Bayfield County Conditional Use Permit was requested provide evidence to support adding these two justifications.

Comment 4 – The submerged island off of Pickle barrel Point on Middle Eau Claire Lake should be added as a Critical Habitat Area because there used to be bulrushes growing there in the shallow water.

Response 4 – A review of historical data and information did not result in evidence that would warrant adding this site. This comment will be considered for future reference and surveys. DNR welcomes any maps, historical narratives, or other evidence documenting the habitat features.

Category #2 – Comments related to our Management Recommendations

Comment 1 – One person would like to see the island on Upper Eau Claire Lake closed to camping due to the partying and erosion from foot traffic.

Response 1 – In the report, we recommended that the foot paths and stairways be repaired to help mitigate the foot traffic and erosion issues. DNR promotes public access and recreational opportunities. This is the only public camping site in the Eau Claire Lakes area.

Comment 2 – A few people commented on the excessive partying and swimming occurring at the mouth of the Eau Claire River and "Pickle Barrel Point," both on Middle Eau Claire Lake.

Response 2 – Swimming is a form of recreation protected by the Public Trust Doctrine. We cannot restrict this right as long as they are not trespassing. Law enforcement should be contacted if trespassing or rowdy behavior occurs.

Comment 3 – A few individuals commented that they disagree that riprap should not be used in certain Critical Habitat Areas.

Response 3 – Riprap is an unnatural structure that creates a physical barrier between the lake and upland areas, and often transfers erosion problems further along the shoreline. Even though properly installed riprap can prevent shoreline erosion, it often does not address the root causes of the shoreline erosion, usually disturbances and impervious surfaces upland from the lake. Naturally vegetated shorelines are the best for reducing erosion.

Natural shorelines along the lakes of Northern Wisconsin are wooded ecosystems. Terrestrial and aquatic animals have evolved with this ecosystem and it is essential to their life cycles. Shifting the near shore cover from vegetation to rock diminishes the ability of the ecosystem to sustain itself.

Comment 4 – One person commented that we add into our Management Recommendations a recommendation that the rivers and channels between the lakes on the Eau Claire Chain be reclassified to a more protective classification.

Response 4 – The Recommendations have been added to the reports.

Category #3 – Comments related to the shoreline restorations that have occurred since the initial field work in 2008

Comment 1 – Some individuals requested that DNR update the shoreline data to reflect the shoreline restorations that have occurred since 2008. Rip rap and seawalls have been removed and some lawns have been replanted since DNR conducted field work.

Response 1 – The recommendations regarding the removal of riprap have been removed from the reports. The riprap and lawn data remains in the tables however, and an asterisk has been added with a footnote stating that shoreline restoration work has occurred since the initial field work. This data is a snapshot in time, and we intend to revisit the lake in the future to make comparisons.

Category #4 – Comments related to navigable channel from Middle Eau Claire Lake to Bony Lake

Comment 1 – Some individuals commented that the channel from Middle Eau Claire Lake to Bony Lake needs to remain navigable as there is no public access on Bony Lake.

Response 1 – The channel between Bony and Middle Eau Claire Lakes is considered navigable.
Public lakes, rivers, and streams that have a bottom (bed) and side (bank), and enough water to float any boat, skiff, or canoe of the shallowest draft on a reoccurring basis are considered navigable. Occasionally, barriers such as wood or plant debris may impede actual navigation, but waters are public even when multiple portages are required to get around obstructions. A waterway does not need to be regularly used for recreational or other general purposes, but is a public waterway based on its *capacity* to be navigable and public. Provided a small boat can float, it is considered navigable. In other words, there is no requirement that the channel provide navigability to large watercraft or boats with inboard motors.

Category #5 – Comments related to Private Property Rights and Current Regulation

Comment 1 – It was stated that government is consistently imposing new regulation, restrictions, laws and taxes on citizens and that Critical Habitat Designations are a ruse of propaganda by the DNR to make a new power grab and infringe on our property rights.

Response 1 – The Critical Habitat Designation program is not designed to infringe upon the *private* rights of riparian citizens. Instead, the Designations are designed to protect the *public* rights held within the Public Trust Doctrine for all citizens, including those yet unborn.

Wisconsin law recognizes that owners of lands bordering lakes and rivers - "riparian" owners - hold rights in the water next to their property. These riparian rights include the use of the shoreline, reasonable use of the water, and a right to access the water. However, the Wisconsin State Supreme Court has ruled that when conflicts occur between the rights of riparian owners and public rights, the public's rights are primary and the riparian owner's secondary.

Comment 2 – County Zoning and the new statewide NR 115 Shoreland Zoning Ordinance are already in place to protect these lakes. If an effort was put into enforcing the regulations which are already on the books, the lakes would be protected.

Response 2 – The county zoning ordinances are specifically for the shoreland zone above the ordinary high water mark (OHWM). The counties only have jurisdiction above the OHWM. The DNR, and thus Critical Habitat Designations, only have jurisdiction below the OHWM.
The counties can and are encouraged to use our reports to further protect terrestrial areas.

Comment 3 - Why are some of the areas listed as “some of the most zoning non-compliant areas on the lake” and still be listed as Critical habitat areas with a long list of vegetation and fish habitat. Wouldn’t those areas have been destroyed?

Response 3 – Not necessarily. CHDs document in-lake habitat, scenic beauty, and wildlife features. It is correct that how people care for their properties can affect all of these things, but overall the Eau Claire Chain shoreline is in good shape. Eventually the cumulative impacts of unhealthy shoreline and land use management can tip the in-lake features out of balance. When this occurs, native fish and wildlife reproduction are reduced or stop altogether, natural scenic beauty diminishes, and water quality declines.

Comment 4 – It is important property owners have a right to enjoy the lake, including having a swimming area.

Response 4 – Property owners certainly deserve to enjoy the lakes. As such, DNR rules provide property owners an area up to 30 feet wide along their shoreline and out into the water where they may manually remove aquatic plants without a permit. Please note this 30-foot corridor correlates to the 30-foot access and viewing corridor that is allowed on the landward property through county zoning, as well.

Category #6 – Comments related to the support for the Critical Habitat Designation

Comment 1 – Many individuals commented on how they support the Designation. Most commented on how much the lakes have changed since they first started visiting the chain and they fully support protecting what is left for future generations.

Response 1 – Thank you for your support.

Comment 2 – Over the last 30 years I have seen the water quality decline on the whole Eau Claire Chain, (Sweet Lake & Upper Eau Claire in particular). I am pleased to see a proposal to maintain/improve shorelines/water quality for future generations. I feel that private property rights should not trump our children's right to clean lakes and rivers.

Response 2 – As previously stated, the Critical Habitat Program is rooted in the Public Trust Doctrine, which protects the public rights of all citizens including those yet unborn. The science shows shoreline disturbance impacts lake health. Critical Habitat Designation is a tool to protect and improve lake health. The tool is more powerful with community support.

Category #7 – Why did the DNR choose to Designate the Eau Claire Chain?

Comment 1 – Why did the DNR choose to do Critical Habitat Designations on the Eau Claire Chain of Lakes?

Response 1 – There are multiple reasons to do the Critical Habitat Designations on the Eau Claire Chain. First of, the Department knows these lakes are really special and would like to keep them that way. The lakes are classified as Outstanding Resource Waters (ORW), muskellunge recruitment waters, walleye recruitment waters, and have exceptional water quality. Also, both the Town of Barnes Comprehensive Plan and the Eau Claire Lakes Management Plan contain recommendations to have a Critical Habitat Designation completed on the Eau Claire Chain of Lakes.

However, the Eau Claire Chain is not alone in the Critical Habitat Process. The DNR has done Sensitive Area Designations on many lakes statewide. Legislative Act 118, which changed the program from Sensitive Area Designations focusing only on aquatic plants to Critical Habitat Designations considering all public rights features. Currently, several lakes in the area are in the process of having Critical Habitat Designations done as well. Some of those lakes include Amnicon Lake, Upper St. Croix Lake, Gordon Flowage, Minong Flowage, Nancy Lake, Granite Lake, and Beaver Dam Lake.

Closing Statement

While the purpose of the Critical Habitat Designations is to guide state decisions for the public waterway and inform lakeshore owners about the high quality habitat in the lake, we value the input given from local citizens and organizations during the process. State statutes grant primary management responsibilities over navigable waters to the DNR (except planning, land, acquisition, and boating ordinance development, where local units of government hold authority). As such, the DNR reviews all state permit applications relating to shoreline activities. Since the Critical Habitat Designations affect the state permit process, it does not significantly affect regulations administered by local

units of government unless they choose to alter their local regulations and ordinances to utilize the Designations.