Pleasant Lake
Shore Restoration and Management Plan

Prepared for:

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Natural Shore™
Using Science to Improve Land and Water

PLAN OUTLINE

INTRODUCTION

The North Oaks Home Owners Association (NOHOA) retained the services of Natural Shore Technologies to conduct an assessment of the Pleasant Lake shoreland and to create a shore restoration and management plan (SRMP). The premise of this work was to complement and build on the natural resources inventory and plan that was conducted several years ago.

Field surveys were conducted in the summer and fall of 2018. The surveys provided baseline natural resources data. Existing plant communities and any erosional areas were mapped by conducting assessments from the walking trail and from a small boat. The ecological assessments help to define the general quality and condition of the shoreland and are essential in defining strategies for the protection, restoration, and management of the plant communities along Pleasant Lake.

This SRMP defines current shoreland health and identifies the opportunities and challenges for the shoreland restoration. This plan recommends strategies that will improve the diversity and health of the shoreland plant communities, enhance wildlife habitat at the critical interface between the aquatic and upland plant zones and contribute to the enjoyment of resident's experience as they hike the lakeside trail system.

The SRMP approach emphasizes the importance of managing natural resources as a unified system. Discussion and recommendations focus on native vegetation, invasive plant species, protection, enhancement of past restoration projects, wildlife resources, and water resources. This plan also includes recommendations for interim and long-term resource management and planning. Natural Shore Technologies restoration and management strategies for the Pleasant Lake shoreland will also consider cooperative management opportunities that can complement adjacent efforts being made by NOHOA in working to restore the greater natural resources within the North Oaks community. This plan suggests prioritization of future restoration projects and management activities along the Pleasant Lake shoreland.

PLEASANT LAKE'S NATURAL RESOURCES: PAST, PRESENT AND FUTURE

PAST — PRE-SETTLEMENT VEGETATION

Pleasant Lake Shoreland Evaluation, Great River Greening, *July 2009-* offers a variety of historical data describing the pre-settlement plant communities surrounding Pleasant Lake. The report states that *"…there was probably a mix of scrub oak, oak groves, prairie, oak woodland, swamp, marsh, sedge meadow, and wet prairie."*

PRESENT – LAND USE IMPACTS OVER TIME

Over time the native marshes, prairies and woodland forests of North Oaks have been impacted by agriculture; becoming part of the St Paul Water Utility's water system. Today it's a mix of suburban residential development and open space. Each land use has contributed to impacts on Pleasant Lake shoreland. Agriculture replaced native plant communities. Fluctuating water levels caused erosion along the lakeshore. Development further disturbed vegetation and unintentionally introduced invasive species. See descriptions provided under the section titled *Brief Land Use History of Pleasant Lake Site*, in the Pleasant Lake Shoreland Evaluation, Great River Greening, *July 2009*

FUTURE – A VISION OF HIGH QUALITY SHORELAND

Negative impacts associated with land use changes and lake level fluctuations that resulted in shoreland erosion have prompted North Oaks Home Owners Association (NOHOA) to find a way to create a more resilient shoreland ecosystem for Pleasant Lake.

Through a cooperative agreement with the St. Paul Water Regional Services water levels on Pleasant Lake are now maintained at a stable level. During the 2018 field surveys, Natural Shore Technologies' ecologists observed that areas with past shoreland erosion are now showing signs of revegetation and are beginning to stabilize. The surveys revealed that much of the Pleasant Lake shoreland plant communities exhibit low to moderate quality diversity; and invasive plant species, especially buckthorn is a management concern.

There are multiple benefits from implementing shoreland restoration projects. Robust native plant communities will help to protect shore areas from erosion due to wave action and potential storm water runoff. Healthy plant communities in the shoreland riparian zone will improve the ecological function of the critical interface between aquatic and upland habitats, benefiting birds, insects, mammals, amphibians, and aquatic species. The restoration will also improve the walking trail's aesthetic and visual appeal for residents.

The Shore Restoration and Management Plan (SRMP)outlines the restoration and long-term management strategies that will be implemented to improve and maintain a stable, heathy, and resilient shoreland around Pleasant Lake.

NATURAL RESOURCES RESTORATION GOALS

OVERALL GOALS

This restoration plan will significantly contribute to NOHOA's desire to stabilize and improve the overall ecological quality of the Pleasant Lake shoreland. Controlling invasive species, introducing native plant species, and implementing long term monitoring and management strategies will significantly improve the ecological function of the critical interface between aquatic and upland habitats. This improvement in habitat will benefit birds, insects, mammals, amphibians, and other aquatic species. Healthy native plant communities will improve the aesthetic and visual appeal for residents using the Pleasant Lake walking trail.

The SRMP outlines the restoration and long term management strategies that will be implemented to improve and maintain a stable, heathy, and resilient shoreland around Pleasant Lake.

PLANT COMMUNITY CLASSIFICATION

We will focus on improving three main plant community classes in the upland shore areas around Pleasant Lake. To provide some background, the Minnesota Department of Natural Resources *"Ecologists use the term "communities" to describe plant species that occur together in a particular environment.*

Each environment, or habitat, has different conditions of soil, moisture, shade, and climate. This means that specific environmental conditions encourage and promote the growth of specific plant species. These communities of plant species are fairly consistent; wherever conditions are similar, the species that occur there will also be similar." *https://www.dnr.state.mn.us/rys/pg/npc.html*

MNDNR defines a native plant community as a group of native plants that interact with each other and their environment. Sometimes referred to as native habitats, native plant communities are classified by their species makeup, hydrology, soils and landscapes on which they grow. These groups of plant species form communities often recognized as oak savannas, maple forests, prairies and marshes. Detailed descriptions for the plant communities and their environments can be found in MNDNR's Field Guide to Native Plant Communities of Minnesota Easter Broadleaf Forest Province **References**

Defining Target Plant Community Classes will guide restoration and ongoing management strategies. They are based on the site conditions observed during field surveys of the existing landscape conditions, the abundance and densities of native plant species and invasive species, impacts from human disturbance, slope angles, soil types, moisture availability, and water levels.

The 3 upland classes of native plant communities identified for the shoreland of Pleasant Lake are:

Woodland - canopy has scattered openings, growing on sloping lands with a diverse shrub layer, and patchy to continuous herbaceous (non-woody plants) ground layer.

Savanna - has few scattered trees and shrubs with a lush herbaceous ground layer intermixed with grasses and forbs (flowering plants) growing on droughty soils often on steep slopes.

Prairie - will occur between shoreland/wetland areas and upland features. Recurrent fire maintained these native plant communities.

SURVEY METHOD FOR PLEASANT LAKE SHORE: LAYING THE GROUNDWORK

Natural Shore Technologies completed two surveys of the Pleasant Lake shore, one in mid-summer by boat and the other from the walking trail in late fall. This effort was to update the survey work that was completed in 2009. The surveys determine the health of the shore plant communities and stability of the shoreland. The surveys also identified reaches (lengths) of the shoreland that exhibited similar characteristics and plant communities. Survey data was analyzed to prioritize Pleasant Lake restoration strategies.

FIELD SURVEY DATA COLLECTED

Notes and rankings for shoreland reaches were conducted by a team of three restoration ecologists. Collectively, this team has over 80 years of field experience.

PLANT COMMUNITY CLASSES
Three general plant community classes, as described above, were identified within the Pleasant Lake shoreland. The survey mapped the length of the plant community reaches.

- Woodland
- Savanna
- Prairie

PLANT DIVERSITY WITHIN EACH RIPARIAN ZONES
The shoreland was classified into three riparian zones.

- shore/wetland
- slope
- upland zones

See MNDNR's detailed descriptions and example photos of the three *Riparian Zones* https://www.dnr.state.mn.us/rys/pg/npc.htm l

PLANT DIVERSITY RANKINGS

The health of the three riparian zones were ranked with the following criteria.

0 *Very Low Quality /Extremely Degraded* - Requires significant control strategies.

1 *Low Quality/ Highly Degraded* - A poor condition of a native plant community, includes some native plants but is dominated by non-natives and is widely disturbed and altered.

2 *Medium Quality/ Moderately Degraded* - Still recognizable as a plant community type, moderate levels of invasive species with obvious past human disturbance.

3 *High Quality/ Moderately Degraded* - A good quality plant community, but shows some signs of invasive species and human disturbance.

LANDSCAPE CHARACTER – Landform that influences the type of plant community such as; steepness of shoreline, aspect, near shore water levels, and human alteration.

BUCKTHORN ABUNDANCE – This invasive species was qualitatively ranked by average plant height. Generally, much more effort and resources are needed to control mature stands of buckthorn. This type of data is essential in estimating control cost.

0 *Absent* – No buckthorn present

1 *Low growing stands* – 1' to 3' tall

2 *Moderate height stands* – 3' to 6' tall

3 *Mature stands* - over 6' tall

POINTS WITH SUBSTANTIAL EROSION – These are areas that would benefit from revegetation and bio-engineering applications.

PREVIOUS GREENING RESTORATION PROJECT SITES – Assessment of current ecological health.

UNIQUE VIEWS – At trail entry points, park areas, and lakeside residents. Restoration projects in proximity to these locations can enhance the aesthetic appeal along the trail.

SURVEY RESULTS

Approximately six miles of shoreland was surveyed and partitioned into 87 individual reaches, based on plant community type, plant community diversity, and buckthorn presence (figure 1). The average shoreland width from the walking path to the water's edge was 30 feet. A complete dataset for all reaches can be found in *Appendix A*.
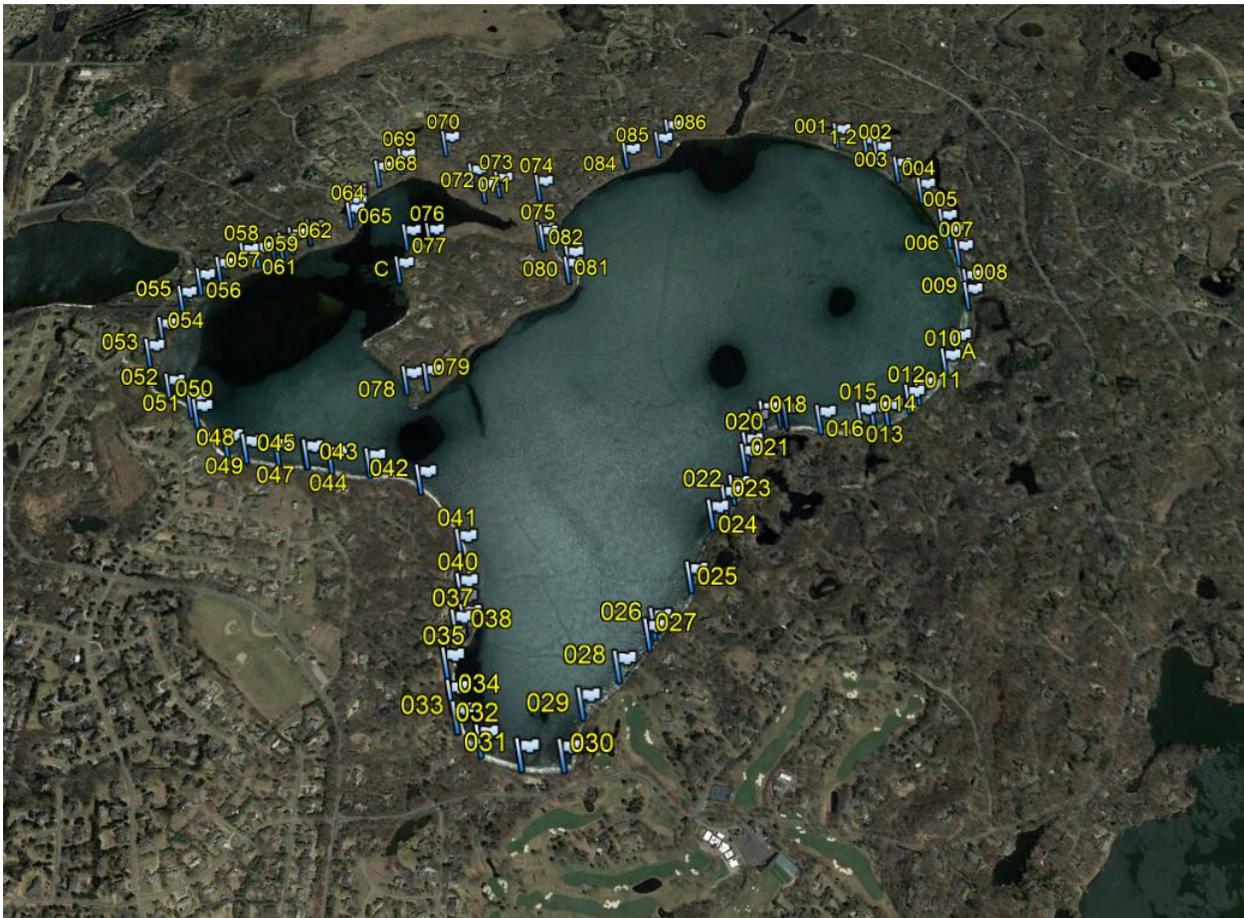
FIGURE 1. INDIVIDUAL SURVEY REACHES.

PLANT COMMUNITY CLASSIFICATION

Figure 2 identifies the major upland shore classes around Pleasant Lake. A majority of the upland is composed of woodland cover (82%). Scattered around the lake in a fairly even distribution are patches of savanna shoreland (15%). We found only a few scattered patches of prairie, which accounted for 3% of the total shore area that was surveyed.
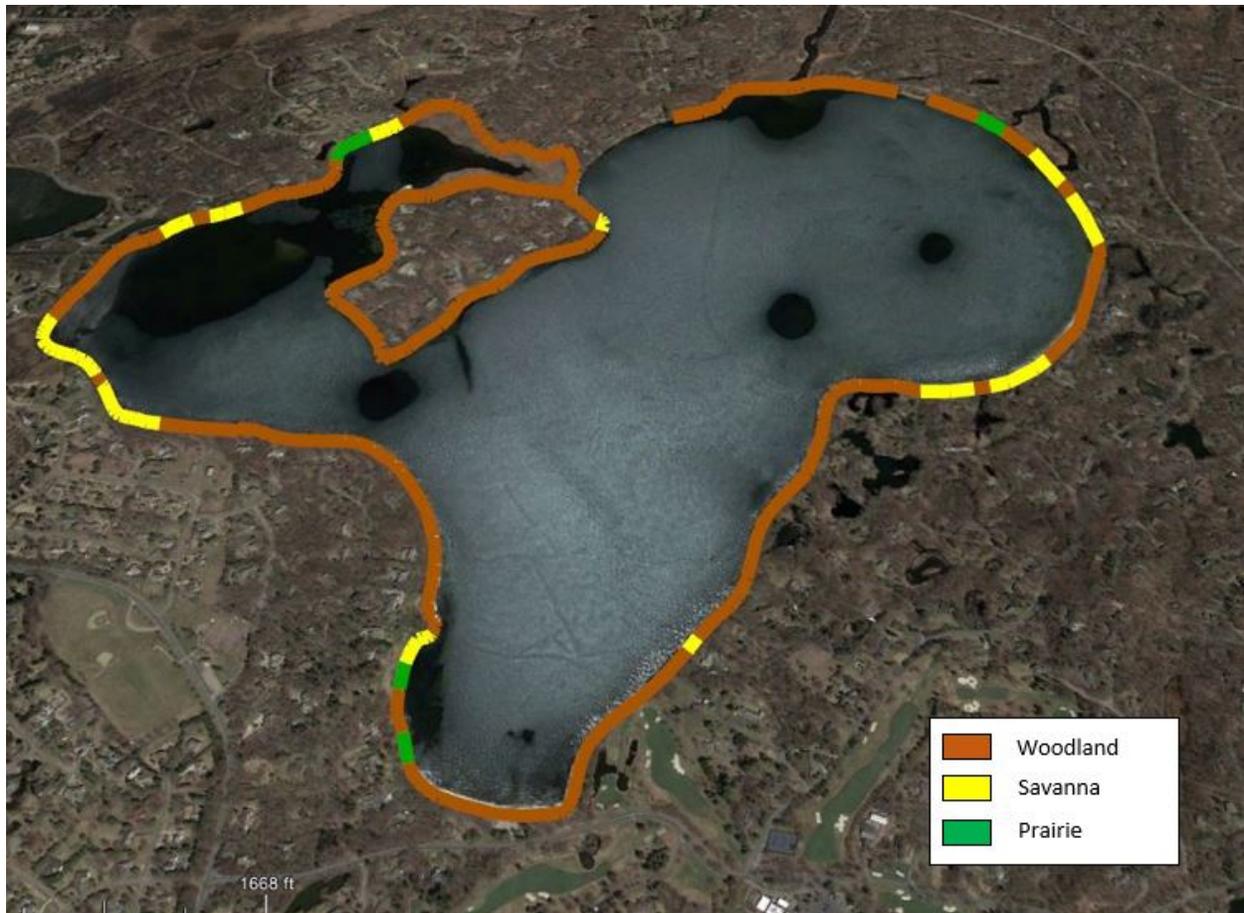
FIGURE 2. UPLAND PLANT COMMUNITY CLASSIFICATION.

SHORELAND EROSION

It was evident that previous water level fluctuations had caused fairly substantial bank cutting and erosion along the shore. It is our opinion through qualitative observation that recent water level stabilization seemed to generally reduce active erosion along the shore. However, there are three locations where erosion is currently taking place at a higher rate, and revegetation and bio-engineering would ensure bank stabilization. These locations are identified in Figure 3 and a picture of each area can be found below. These shore lengths are relatively short, averaging 20 feet in length.

FIGURE 3. SHORELAND AREAS EXPERIENCING SUBSTANTIAL EROSION.
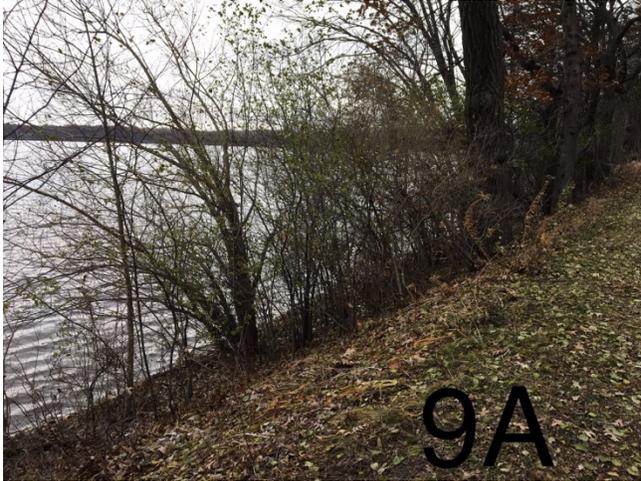
SITE A – ERODED CUT BANK.
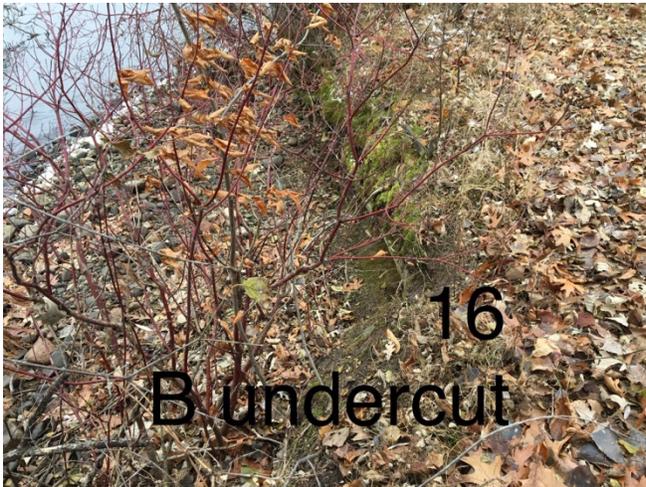
SITE B- UNDERCUT BANK WITH EXPOSED SOIL.

SITE C- RECEDING BANK WITH SOIL LOSS.

EXISTING RESTORATION PROJECTS

Fortunately, over the last several years, the Association had the ability to support shoreland restoration. Figure 4 identifying past restoration efforts. Generally, these sites contained a higher density of native plant species, compared to areas that were not restored. Overall, these restorations were stable but could definitely benefit from routine maintenance. We did notice several sites that were being invaded by noxious weed species and also early successional woody species. This is typical for restoration sites in suburban residential areas that have not been maintained. On a positive note, these sites are not lost. Resuming routine maintenance will reduce invasive plant cover and increase the health of the existing native plant communities.

FIGURE 4. EXISTING SHORELAND RESTORATION PROJECTS.

A WELL-ESTABLISHED SHORE RESTORATION WITH A DIVERSITY OF NATIVE PLANTS.

A RESTORATION WITH WEED INVASION THAT WOULD BENEFIT FROM ROUTINE MAINTENANCE.

BUCKTHORN ABUNDANCE

As the Association is well aware, the invasive buckthorn is a serious concern and threatens the ecological quality of the Pleasant Lake shoreland. The figure 5 below identifies areas of buckthorn abundance. The average height of the plant was used to express abundance, and this data can then be used for formulating control estimates. We found that 8% of the shoreland was free of buckthorn; 47% had low growing buckthorn; 28% had moderately tall plants, and 17% had mature buckthorn over 6' in height. Representative pictures of each abundance ranking can be found below.
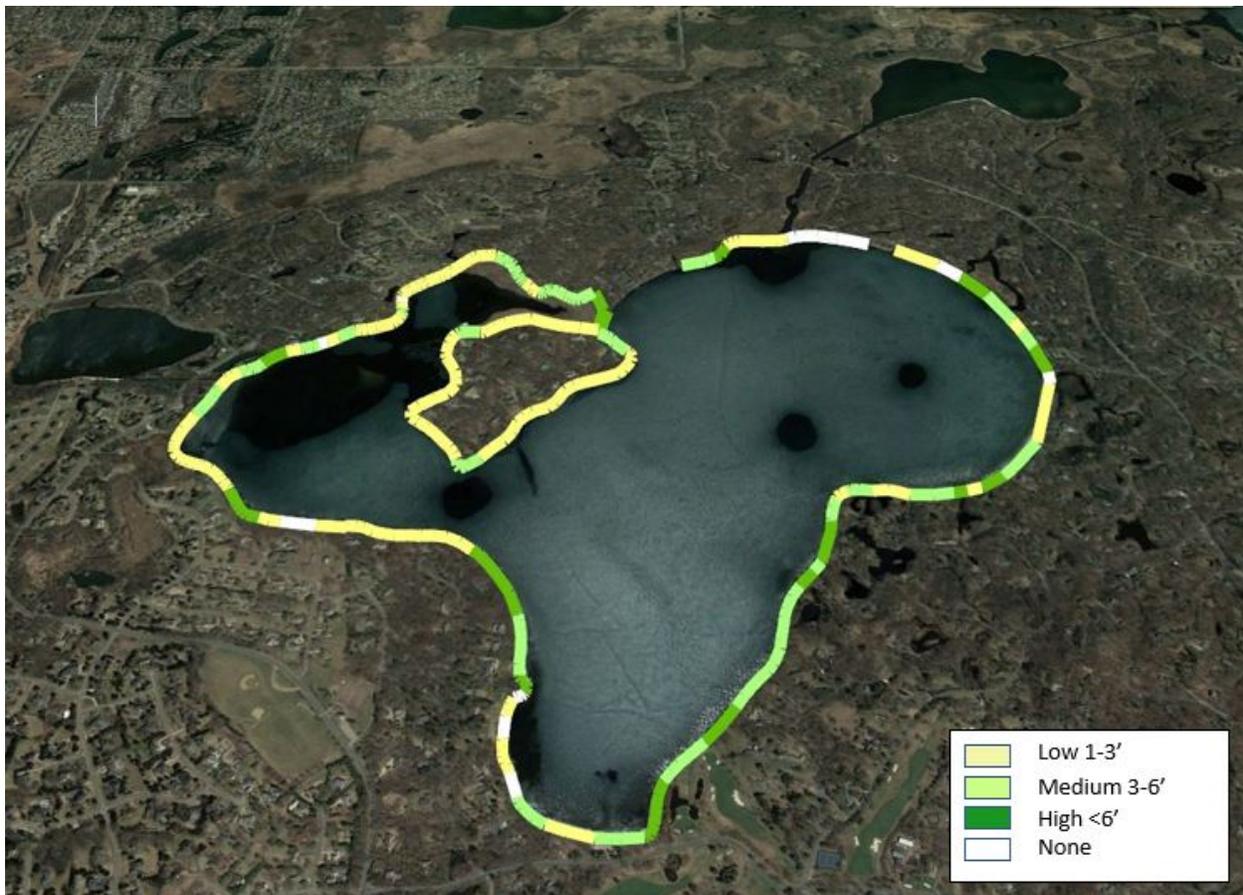
FIGURE 5. BUCKTHORN ABUNDANCE.

LOW BUCKTHORN COVER (1' TO 3')

MODERATE BUCKTHORN COVER (3' TO 6')

TALL BUCKTHORN – WELL ESTABLISHED STAND (OVER 6')

UNIQUE VIEWS – AESTHETIC IMPROVEMENT

In figure 6 it is interesting to note with this classification that a majority of the shoreline would benefit from ecological restoration. This is directly the result of the homes and other key features that exist along the shores of Pleasant Lake. Areas with no direct improvement may be considered a lower level priority when ranking restoration efforts.

FIGURE 6. SHORE SEGMENTS THAT WOULD BENEFIT FROM RESTORATION, IN TERMS OF VIEW AND AESTHETICS ARE HIGHLIGHTED IN BLUE.

Restoration Prioritization

We have included a list of priorities, the basis behind the selection, and general pricing is to help in formulating a plan and a budget to include the maintenance and restoration of the shoreland. This should be considered a starting point, as Association goals and perspectives certainly play into the formulation of a working plan.

1. **ADDRESS AREAS EXPERIENCING ACTIVE EROSION.** THESE STRETCHES OF SHORE ARE AT RISK OF BECOMING MORE OF AN ISSUE IN THE FUTURE. CURRENTLY, EXPOSED SOIL IS PRESENT AND IS BEING LOST TO THE LAKE. COST = $150 PER LF OF SHORE.

2. **MAINTAIN EXISTING SHORE RESTORATION AREAS.** CONSIDERABLE MONEY AND EFFORT WAS PUT TOWARDS THE RESTORATION AREAS. OVERALL, THEY ARE IN GOOD SHAPE AND WOULD BENEFIT GREATLY FROM ROUTINE MAINTENANCE ACTIVITIES. COST = $2 PER LF OF SHORE FOR AN ANNUAL MAINTENANCE PLAN.

3. **TARGET BUCKTHORN IN PRAIRIE AND SAVANNA AREAS.** THESE PLANT COMMUNITY TYPES ARE RELATIVELY UNCOMMON AROUND THE LAKE AND PRESERVATION SHOULD BE CONSIDERED. COST = $6 TO $15 PER LF OF SHORE, DEPENDING ON BUCKTHORN COVER. (LOW = $6, MEDIUM = $12, HIGH = $15)

4. **CONTROL BUCKTHORN IN AREAS RANKED LOW TO MODERATE.** THESE AREAS WOULD BE THE MOST ECONOMICAL TO ADDRESS, WITH THE MOST ECOLOGICAL BENEFIT GAINED. COST = $6 TO $12 PER LF OF SHORE.

5. **CONTROL BUCKTHORN IN AREAS WITH MATURE INFESTATIONS.** THESE AREAS WOULD BE THE MOST COSTLY TO ADDRESS AND SHOULD BE CONSIDERED AFTER HIGHER PRIORITIES ARE ADDRESSED. COST = $15 PER LF OF SHORE.

GENERAL RESTORATION AND MAINTENANCE STRATEGIES

Below are general approaches for restoring and maintaining the upland vegetation classes found around Pleasant Lake. In addition to buckthorn control, we propose using native seed mixes of grasses, sedges, and forbs, as well as planting species (containers) that do not establish well from seed. Our main approach here is to control invasive species, but also introduce native plant species that have been lost over the years from disturbance.

WOODLAND – canopy with scattered openings, growing on shoreland slopes, includes a diverse shrub layer and patchy to continuous herbaceous (non-woody plants) ground layer.

Typical species include: meadow-rue, Pennsylvania sedge, large-leaved aster, zigzag goldenrod, chokecherry, pagoda dogwood, sugar maple, basswood, ironwood, and oaks.

Ground Layer
Target cover - dense to patchy mix of grasses and forbs.

- Control non-native and invasive species. Appropriate strategies include: manual cutting, mechanical brush mowing, and herbicide applications.
- Improve targeted native species diversity/densities by planting and/or inter-seeding.
- Once sufficient fuel has accumulated within herbaceous layer, periodic and patchy prescribed fire can be reintroduced to mimic natural disturbances.

Shrub Layer
Target cover 25% – 50%

- Control non-native and invasive species. Appropriate strategies include: manual cutting, mechanical brush mowing, and herbicide applications
- Existing targeted species should be preserved and promoted.
- Fall Buckthorn control

Canopy
Target 25% – 100% closure

- Potential for selective editing/clearing of canopy
- Control non-native and invasive species. Appropriate strategies include: manual cutting, mechanical brush mowing, and herbicide applications
- Maintain and promote the health of target canopy species

SAVANNA – has few scattered trees and shrubs with a lush herbaceous ground layer intermixed with grasses and forbs (flowering plants) growing on droughty soils often on steep slopes.

Typical species include: grasses like; bluestem, Indian grass, prairie cordgrass, and forbs like: bergamot, mountain mint, and goldenrods. Other plants include; vines, willows, dogwoods, chokecherries, and scattered oaks, cottonwoods and aspen.

Ground Layer
Maintain dense grass coverage of 25%-100% and 5%-50 % for forb layer

- Control non-native and invasive species. Appropriate strategies include: manual cutting, mechanical brush mowing, and herbicide applications.
- Improve targeted native species diversity/densities by planting and/or inter-seeding.
- When sufficient fuel has accumulated within herbaceous layer, periodic and patchy prescribed fire can be reintroduced to mimic natural disturbances.
- If prescribed fire cannot be implemented, frequent mowing in open areas can be used to mimic this natural disturbance strategy.

Shrub Layer
Target cover 25% – 100%

- Control non-native and invasive species. Appropriate strategies include: manual cutting, mechanical brush mowing, and herbicide applications.
- Existing targeted species should be preserved and promoted.
- Fall Buckthorn control

Canopy
Target 25 – 50% closure

- Potential for selective editing/opening up of canopy to promote growth
- Control non-native and invasive species. Appropriate strategies include: manual cutting, mechanical brush mowing, and herbicide applications.
- Maintain and promote the health of target canopy species.

PRAIRIE – Plant community is dominated by grasses and forbs (herbaceous plants). It occurs between the lake shore and/or wetlands and upland areas. Prairies were historically maintained by fire.

Typical species include: grasses like; bluestems, Indian grass, prairie drop seed, switchgrass, prairie cordgrass, and forbs like; goldenrods, prairie clovers, asters, coneflower and some sparse shrubs like dogwood.

Ground Layer
Maintain dense grass and forb layer, coverage of 75%-100%

- Control non-native and invasive species. Appropriate strategies include: manual cutting, mechanical brush mowing, and herbicide applications.
- Areas infested with reed canary grass should be treated with herbicide or burned to prepare a seed bed.
- Broadcast native seed mix that is customized for the changing soil moistures at the top and bottom of slopes.
- Improve targeted native species diversity/densities by planting and/or inter-seeding.
- When sufficient fuel has accumulated within herbaceous layer, periodic and patchy prescribed fire can be reintroduced to mimic natural disturbances.
- If prescribed fire cannot be implemented, frequent mowing in open areas can be used to mimic this natural disturbance strategy.

Shrub Layer
Target cover 25% – 100%

- Control non-native and invasive species. Appropriate strategies include: manual cutting, mechanical brush mowing, and herbicide applications.
- Existing targeted species should be preserved and promoted.
- Fall Buckthorn control

Canopy
Target 25%

- Potential for selective editing/opening up of canopy to promote growth.
- Control non-native and invasive species. Appropriate strategies include: manual cutting, mechanical brush mowing, and herbicide applications.
- Maintain and promote the health of target canopy species.

MONITORING AND MAINTENANCE

Monitoring and maintenance of the Pleasant Lake restoration is critical and ensures the long term health, stability and resiliency of the shoreland. Monitoring is a valuable strategy for guiding the steps in the restoration process and fine tuning short and long term maintenance approaches. We focus on identifying invasive species, gauging cover, assessing the diversity of the native plant community, and evaluating establishment. Detailed notes are taken and these are shared with our clients. Fixed photo stations help us record the condition of our restoration sites.

Our site maintenance plans typically include at least three visits per year during the growing season to monitor and conduct activities that will ensure proper restoration establishment. We use the most appropriate, up-to-date maintenance techniques such as targeted herbicide application, hand pulling, mowing, and spot weed whipping to effectively control invasive weeds. Our lead maintenance supervisor has a B.S. in Biology and 10 years of field experience. You will not find a crew that is more dedicated to establishing and preserving natural areas anywhere.

REFERENCES

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APPENDIX A

Erosion Point - Letter	Previous Greening # (if any)	NST Reach #	Photo #	Woodland - W Savanna - S Prairie - P	Buckthorn rank (1-3)	Unique view improvement (Yes/No)	Native ground cover (1-3)	Native shore slope cover (1-3)	Invasive shore/wetland species (1-3)	Average Width ft	Length ft	Area sf
		1	1, 1.5	W	1	Yes	1	1	1	40	488	19520
	738	2	2	P	0	Yes	0	2	1	40	290	11600
		3	3	W	3	No	1	1	1	42	364	15288
	737	4	4	S	2	No	1	2	1	30	455	13650
		5	5	W	1	Yes	2	1	1	35	171	5985
	736	6	6	S	2	Yes	1	1	1	40	240	9600
		7	7	S	3	Yes	1	1	1	33	373	12309
	735-736	8	8	W	0					30	167	5010
A	733	9	9A	W	1	Yes	3	2	1	30	855	25650
	732	10	10	W	2	Yes	1	1	1	35	435	15225
		11	11	S	2	Yes	3	1	1	22	135	2970
	731	12	12	S	3	Yes	1	1	1	25	259	6475
		13	13	S	1	Yes	2	1	1	23	137	3151
		14	14	W	3	No	2	1	1	20	121	2420
	730-729	15	15	S	2	Yes	2	1	1	18	382	6876
B	728	16	16	S	1	Yes	3	1	1	25	323	8075
	727	17	16B, 17	W	2	No	2	1	1	12	219	2628
		18	18	W	1	No	3	1	1	30	145	4350
		19	19	W	2	Yes	3	1	1	40	263	10520
	726	20	20	W	3	Yes	2	1	1	30	128	3840
		21	21	W	3	Yes	1	2	1	18	350	6300
		22	22	W	2	No	1	1	1	20	123	2460
	724	23	23	W	3	No	2	1	1	22	200	4400
	723-722	24	24	W	2	No	2	1	1	30	649	19470
		25	25	W	2	Yes	2	1	1	20	535	10700

Erosion Point - Letter	Previous Greening # (if any)	NST Reach #	Photo #	Woodland - W Savanna - S Prairie - P	Buckthorn rank (1-3)	Unique view improvement (Yes/No)	Native ground cover (1-3)	Native shore slope cover (1-3)	Invasive shore/wetland species (1-3)	Average Width ft	Length ft	Area sf
	721-720	26	26	S	2	Yes	2	1	1	25	107	2675
	719	27	27	W	3	Yes	2	1	1	20	384	7680
	718-717	28	28	W	2	Yes	1.5-2	1	1	20	435	8700
	716	29	29	W	3	No	2	1	1	50	462	23100
		30	30	W	2	Yes	2	1	1	40	335	13400
		31	31	W	1	Yes	1	1	1	25	347	8675
	775	32	32	W	2	Yes	1	1	1	10	296	2960
	774	33	33	P	0	Yes	3	3	0	10	197	1970
		34	34	W	1	Yes	1	1	1	10	297	2970
		35	35	P	0	Yes	3	3	0	18	176	3168
		36	36	S	1	Yes	2	2	1	25	170	4250
		37	37	S	0	Yes	3	3	1	75	90	6750
	773	38	38	W	3	Yes	1	3	1	70	183	12810
		39	39	W	1	Yes	3	3	1	15	138	2070
	772-771	40	40	W	2	Yes	1	1	1	15	430	6450
	770	41	41	W	3	No	1	1	1	18	794	14292
	769-768	42	42	W	1	Yes	2	1	1	16	523	8368
		43	43	W	1	Yes	1	1	1	10	367	3670
		44	44	W	1	Yes	2	1	1	12	225	2700
		45	45	W	1	Yes	1	1	1	10	11	110
		46	46	W	1	Yes	2	1	1	15	258	3870
	767	47	47	W	0	Yes	2	1	1	20	303	6060
		48	48	W	1	Yes	2	1	1	18	193	3474
		49	49	S	3	Yes	1	1	1	25	490	12250
		50	50	W	1	Yes	1	1	1	22	151	3322
	766	51	51	S	0	Yes	2-3	3	1	16	317	5072

Erosion Point - Letter	Previous Greening # (if any)	NST Reach #	Photo #	Woodland - W Savanna - S Prairie - P	Buckthorn rank (1-3)	Unique view improvement (Yes/No)	Native ground cover (1-3)	Native shore slope cover (1-3)	Invasive shore/wetland species (1-3)	Average Width ft	Length ft	Area sf
	765	52	52	S	1	Yes	3	3	1	15	556	8340
	764	53	53	W	1	Yes	2	1	1	20	257	5140
		54	54	W	2	Yes	2	1	1	25	402	10050
		55	55	W	1	Yes	1	1	1	24	262	6288
		56	56, 56 spurge	W	2	Yes	3	1	1	45	263	11835
		57	57	W	3	Yes	3	1	1	32	254	8128
		58	58	S	1	Yes	3	1	1	20	137	2740
	763	59	59	W	2	Yes	3	2	1	25	173	4325
		60	60	S	0	Yes	1	1	1	15	82	1230
		61	61	W	1	Yes	3	1	1	27	117	3159
		62	62	W	2	Yes	2	1	1	25	186	4650
	762	63	63	W	1	Yes	2	3	1	20	527	10540
		64	64	W	2	Yes	2	1	1	30	98	2940
		65	65	W	1	No	2	1	1	14	105	1470
		66	66	P	0	Yes	0	0	0	11	58	638
		67	67	P	1	Yes	3	3	2	30	388	11640
		68	68	S	1	Yes	3	3	2	20	290	5800
	761	69	69	W	1	Yes	1	1	1	25	560	14000
		70	70	W	2	Yes	1	1	1	85	571	48535
	760	71	71	W	1	Yes	1	1	1	70	219	15330
		72	72	W	2	Yes	1	1	1	40	154	6160
	746-747	73	73	W	2	Yes	1	1	1	20	513	10260
		74	74	W	3	Yes	1	1	1	70	634	44380
	759	75	75	W	1	Yes	1	1	1	40	1230	49200
	758-751	76	76	W	2	Yes	3	3	1	40	232	9280
C		77	77, 77C	W	1	Yes	3	3	1	12	2121	25452
	750	78	78	W	2	Yes	3	3	1	15	326	4890
		79	79	W	1	Yes	3	3	1	12	1937	23244
		80	80	S	1	Yes	3	1	1	12	159	1908
	749-748	81	81	W	2	Yes	3	1	1	12	385	4620
		82	82	W	1	Yes	2	0	0	35	355	12425

Erosion Point - Letter	Previous Greening # (if any)	NST Reach #	Photo #	Woodland - W Savanna - S Prairie - P	Buckthorn rank (1-3)	Unique view improvement (Yes/No)	Native ground cover (1-3)	Native shore slope cover (1-3)	Invasive shore/wetland species (1-3)	Average Width ft	Length ft	Area sf
	745	83	83								0	0
	744	84	84	W	2	Yes	3	3	3	32	382	12224
	743	85	85	W	3	Yes	3	3	3	30	246	7380
	742-739	86	86	W	1	Yes	3	3	3	15	697	10455
		87	87	W	0	Yes				30	877	26310

Benefits of our quality restoration work.

Conserve Soil
Native plants:
* *Build soil health*
* *Capture carbon*

Protect Water Quality
Deep roots:
* *Promote infiltration*
* *Reduce runoff*
* *Prevent erosion from runoff & wave action*

Beautiful Landscapes
* *Connect with nature*
* *Enjoy your view*
* *Wild experiences in your own backyard*

Create Habitat
* *For; birds, fish, insects & other wildlife*
* *Diverse plant communities*
* *Food sources*
* *Attract pollinators*

Educate Future Conservationists
* *Field experience*
* *Make connections between human impact & ecosystem health*