

China Lake Watershed Survey

Final Report

June 29, 2021



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Contents

Acknowledgements.....	1
Introduction	3
Water Quality Summary	3
Sources of Pollution to China Lake	5
Survey Purpose & Methods	6
Purpose	6
Methods.....	6
Sector Descriptions	7
Watershed Survey Results	8
Summary & Next Steps	12
What You Can Do	12
Contact information & Resources.....	12
Appendices.....	13
Appendix A: Maps	13
Appendix B: Results Table.....	19

List of Tables

Table 1. Breakdown of number of sites by Land Use and Impact Rating.	9
Table 2. Common issues and recommendations for sites identified in each land use category.....	11

List of Figures

Figure 1. Percentage of sites in each impact category.	9
Figure 2. Stacked bar chart showing number of sites within each land use and impact rating.	10
Figure 3. Stacked bar chart showing number of sites within each land use and impact rating, with the Residential category removed.	10

Introduction

China Lake is an impaired, Great Pond Class A (GPA) lake with two basins (east and west). The watershed includes the smaller drainages of Evans Pond, Hunter Brook, Muldoon Stream, Starkey Brook, Jones Brook and Ward Brook in addition to 19 smaller tributaries. The topography within the watershed is a mixture of rolling hills surrounding wetland and pond basins. There are several small islands within the lake, most notably Indian Island, Green Island, Bradley Island, and Moody Island, three of which have seasonal residential use. Predominant land uses include forestland, agriculture, and residential development, as well as some urban and commercial land uses.

The watershed of the east basin is heavily developed, primarily with residential homes, and the shoreline is lined with camps and houses. The watershed of the west basin is

mostly rural with some residential development, and the shoreline is undeveloped because Kennebec Water District (KWD) owns an undisturbed buffer zone of varying width around nearly the entire basin. There are just two developed shorefront lots within the Town of Vassalboro, with the remainder owned by the KWD. China Lake has a single outlet, Outlet Stream, located on the western shore of the west basin, flowing north through Vassalboro to Winslow where it enters the Sebasticook River. The Outlet Dam is owned and operated by the Town of Vassalboro.



A watershed consists of all the land area that drains to a particular body of water.

Water Quality Summary

Algal blooms have been reported yearly since 1983 and DEP currently describes China Lake as blooming annually with a “very high” risk for future blooms. Currently listed as an impaired lake, it appears in the 2016 Integrated Water Quality Report – 303(d) list of impaired waterbodies under Category 4-A. The water quality in China Lake has been monitored since 1970. Data indicate a rapid decline in water quality during the mid-1980s and still remains below standard.

The KWD is an active steward of the lake, and ongoing monitoring efforts have continued since the 2008 watershed-based plan. KWD continues to monitor China Lake bi-weekly for secchi disk transparency (SDT), dissolved oxygen (DO), temperature, total phosphorus (TP), and chlorophyll-a (Chl-a). KWD staff are certified water quality monitors through Lake Stewards of Maine. Monitoring is conducted from ice out (May) until the water is too shallow to put a boat in the water at the Vassalboro boat ramp (typically October/November). TP and Chl-a are monitored May-October/November in the west basin of the lake. The north and south sampling stations (within the eastern basin of the lake) are monitored in August and September. KWD participated in the Maine Drinking Water Program’s cyanotoxin study in 2017 and will be required to sample for cyanotoxins again in 2020 as part of the EPA’s Unregulated Contaminant Monitoring Rule. KWD staff conduct monitoring at the Outlet Dam, taking weekly TP samples since implementation of the revised drawdown method in 2014 when the timing of the lake drawdown was changed to coincide with fall destratification and increased the depth of the drawdown from 1.5 ft to 2.5 ft below the spillway.

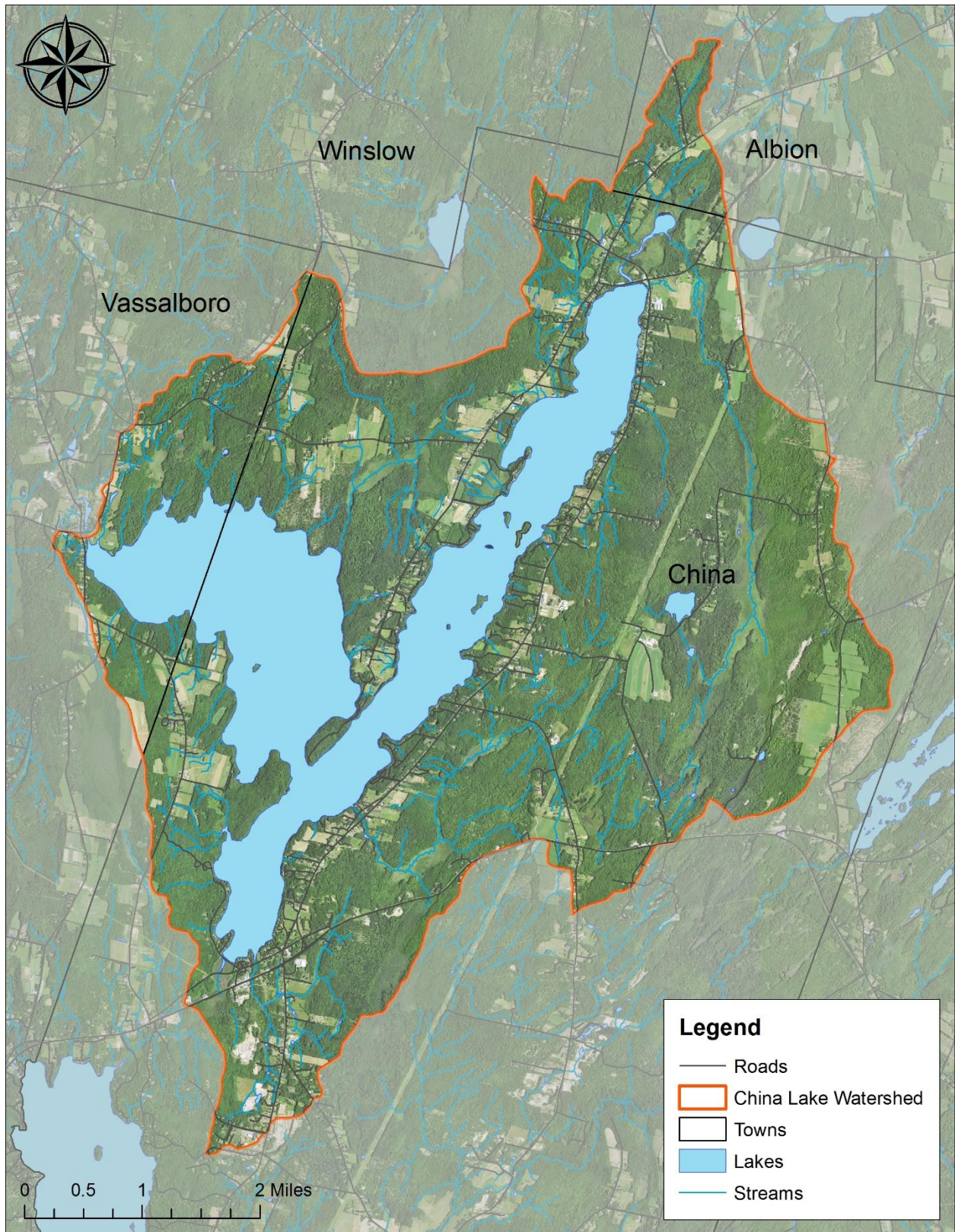



Figure 1. China Lake Watershed

Sources of Pollution to China Lake

China Lake's water quality is impacted by pollution from numerous small, diffuse sources across the lake's watershed. When rain and snowmelt flow across land, they pick up soil, nutrients and other pollutants. This is known as "nonpoint source" pollution (NPS) and is the primary threat to most lakes in Maine.

In an undeveloped, forested watershed, stormwater runoff is slowed and filtered by tree and shrub roots, grasses, leaves, and other natural debris on the forest floor. It then soaks into the uneven forest floor and filters through the soil.



Nonpoint source pollution refers to diffuse pollution from numerous small sources that together can have a significant impact on water quality.

In a developed watershed, however, stormwater does not always receive the filtering treatment the forest once provided. Rainwater picks up speed as it flows across impervious surfaces like rooftops, compacted soil, gravel roads and pavement, and it becomes a destructive erosive force. Studies have shown that runoff from developed areas has 5 to 10 times the amount of phosphorus compared to runoff from forested areas.

Once it enters the lake, this polluted runoff can fuel algae blooms by releasing phosphorus, which is a nutrient that is attached to soil particles, in fertilizers, manure, septic systems and pet waste. Under natural conditions, phosphorus is limited in freshwater systems, which helps limit algae growth. However, when a lake receives extra phosphorus from developed land, algae growth increases dramatically. Sometimes this growth causes choking blooms, but more often it results in small changes in water quality that, over time, damage the ecology, aesthetics and economy of our lakes.

Runoff from historical land uses such as agriculture and forestry that has resulted in delivery of phosphorus-laden sediment to the bottom of the lakes adds a second level of concern. In the absence of oxygen (a common summertime occurrence), the stored phosphorus can be released and mixed up into the upper waters of the lake, where it too can fuel algae growth.

Runoff from current development and roads, as well as future development and seasonal conversions needs to be managed properly to prevent delivery of pollutants into China Lake, especially along the shoreline where soils can easily be washed into the lake. Runoff from forestry activities can also contribute significant inputs of nutrients and sediments if not managed properly. This may include limiting clear cutting, protecting natural vegetative buffers along waterbodies and wetlands, and limiting runoff from roads that serve as access to the forest resources.

Survey Purpose & Methods

Purpose

The primary purposes of the watershed survey are to:

- ❖ Identify and prioritize existing sources of polluted runoff, particularly soil erosion and stormwater runoff in the China Lake watershed
- ❖ Raise public awareness about the connection between land use and water quality and the impact of soil erosion on the water quality of China Lake
- ❖ Inspire people to become active watershed stewards by participating in watershed programs such as YCC and LakeSmart
- ❖ Use the information gathered to help inform the development of a Watershed-Based Management Plan
- ❖ Provide the basis to obtain funding to assist with addressing identified NPS sites
- ❖ Provide recommendations to landowners so that they can voluntarily address NPS issues identified on their properties.

The purpose of the survey was NOT to point fingers at landowners with a documented NPS site, nor was it to seek enforcement action against landowners not in compliance with local ordinances. The China Lake Association (CLA) and China Region Lakes Alliance (CRLA) hope to be able to find ways to work cooperatively with landowners, road associations, and towns to protect water quality.

Local citizen participation was essential in completing the watershed survey and will be even more important in coming years. With the leadership of CLA, CRLA and partners such as Kennebec Water District, Kennebec County Soil & Water Conservation District (KCSWCD), the towns of China and Vassalboro, and the Maine Department of Environmental Protection (Maine DEP), there are ample opportunities for stewardship. The hope is that landowners will reflect on the results of the survey and the recommendations it provides and use some of the recommended conservation measures. Everyone in the watershed has a stake in helping protect the water quality of these lakes.

Methods

The China Lake watershed survey was conducted on October 3, 2020 with the help of 12 volunteers from CLA, CRLA, and the surrounding community. Trained technical staff from Ecological Instincts, KCSWCD, Maine DEP, and independent contractors helped lead volunteers across ten watershed survey sectors. Prior to the survey, CLA sent out 1,300 informational postcards to all of the property owners in the watershed. Sixty-two parcels were excluded from the survey at the landowners' request.

Volunteers were trained in survey techniques during a two-hour workshop led by Ecological Instincts and Maine DEP on the morning of October 2, 2020 virtually via Zoom meeting. Following the training, volunteers and technical staff spent the next day documenting sources of NPS

pollution across a number of land uses, including roads and road crossings, commercial and residential properties and beach/boat-road sites, using tablets/cell phones and standardized digital watershed field survey forms developed by DEP and created using ESRI's Survey123 software. Volunteers were assigned to one of the ten survey sectors.

Follow-up survey work was conducted to finish surveying areas that were not completed on the main survey day. This follow up occurred on October 8th, November 6th, and November 13th. The Hunter Brook subwatershed was surveyed on April 6, 2021.

Sources of nonpoint source pollution were identified within each sector and documented. If there was not a direct connection from the potential source of NPS pollution to a ditch, stream, wetland or the lake, then the site was not documented (e.g., an eroding hillslope in which the soil did not leave the site). Potential solutions were recommended, rough estimates were made for the cost of labor and materials for improving the sites, and the overall impact to water quality was determined in the field for each site. Impact rating was based on the severity of erosion, size of the eroded area, and amount of buffering the runoff received.

The data collected during the survey was downloaded and exported into an Excel spreadsheet. Documented NPS sites were plotted on maps using Geographical Information Systems (GIS). Mapping coordinates were manually corrected if needed to account for poor satellite reception or human error in the field based on recorded address or tax map/lot number. A description of NPS sites, recommended actions, and associated costs are discussed in the next section.

Sector Descriptions

The watershed was broken up into 11 sectors each surveyed by a different technical leader and volunteer group. Sector numbers are referenced in the maps and table in the appendices. For example, site "5-01" refers to the first site identified in sector 5. The following provides brief descriptions of each sector.

Sector 1: Located at the northernmost tip of the watershed, this sector extends from Albion to the northern shore of the lake, encompassing Muldoon Pond, the Causeway, and shorefront properties on Lakeview Drive as well as the following camp roads: Gliman Drive, Fire Roads 19, 20, 21 and 22, Spruce Lane, Peking Street and Rollins Way. This sector contains some commercial development as well as wetlands, agriculture, and residential development.

Sector 2: South of sector 1, encompassing the shorefront from Fire Road 23 to Fire Road 36 along Lakeview Drive. This sector is mostly forested with some residential development.

Sector 3: This sector on the central eastern side of China Lake contains shorefront from Fire Road 37 to Fire Road 44, as well as China Middle and Primary Schools, China Town Office and the Transfer Station. Land uses include residential, commercial, and municipal development, agriculture, and forestry.

Sector 4: Shorefront from Fire Road 45 to Fire Road 48, including Killdeer Point. Also includes areas of wetlands, agriculture, and development clustered around the intersection of Route 3 and Alder Park Road.

Sector 5: This sector is on the southeastern shore of the lake and includes camp roads such as Pond Road, Stevens Lane, Notapine Lane, and Fire Roads 49 through 55. It also includes a large wetland area and portions of Route 3.

Sector 6: Located at the far southern end of the watershed at the southern tip of China Lake. Includes South China Village along Village Road and Route 3/202 and residential and commercial development along Route 32. Shoreline in this sector encompasses Austin Lane, Fire Roads 56 through 61A, and the boat launch on Town Landing Road.

Sector 7: This sector includes the southwest shore of China Lake's east basin along Fire Road 61 and Pellerin Drive, as well as a portion of the west basin. Much of the west basin's shoreline is protected and contains little lakefront development, although there are several streams and agricultural fields within the sector.

Sector 8: Includes the watershed area draining to the northern part of the western basin of the lake in Vassalboro. The shoreline is protected by easements and contains little shorefront development. As a result, no survey sites were identified in this sector. This sector also contains streams, wetlands and agricultural fields.

Sector 9: Comprised of the land area along the central-western shore of the east basin of China Lake and the peninsula on Neck Road Extension between the two basins. Includes Fire Roads 11 – 18 and several other private roads off Neck Road. This area of the watershed is primarily residential.

Sector 10: This sector includes the shoreline of China Lake between Fire Roads 1 and 10. Land use is primarily forest and residential with some hay fields.

Sector 11: Encompasses the entire Hunter Brook sub-watershed that forms the eastern edge of the China Lake watershed. This area contains a large wetland complex, low density residential development, and a few large agricultural operations.

Watershed Survey Results

A total of 161 sites were identified across 11 different land uses (See Table 1). The majority of sites were on residential properties. This land use accounted for nearly two-thirds of all sites documented. Private roads, town roads, and driveways were the next most common locations.

Of the 161 sites documented, 20 sites, or 12% of the total, were considered a high impact to the lake. Medium impact sites accounted for 37% of all sites and the remaining 51% of sites were considered low impact (Figure 1).

Figures 2 and 3 show the breakdown of high, medium, and low impact sites in each land use category. Figure 3 excludes the residential category to make the other land use breakdowns easier to see. Maps showing the locations of identified sites and their impact rating, as well as the full results spreadsheet, can be found in Appendix A and B. The following is a breakdown of results by sector:

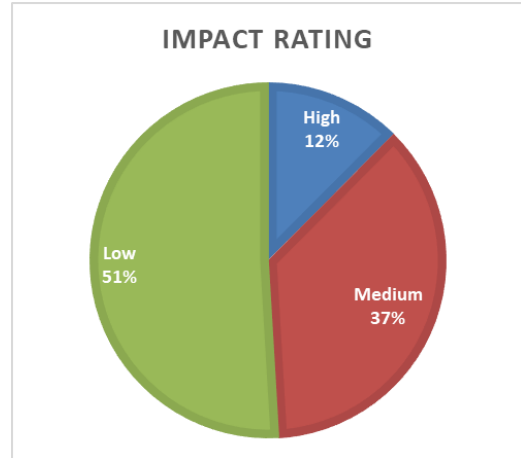


Figure 1. Percentage of sites in each impact category.

Sector 1: 5 sites, all low and medium impact in a variety of land uses.

Sector 2: 27 sites, mainly residential, ranging from low to medium impact.

Sector 3: 23 sites, including 8 high impact sites. Several residential, boat, and beach access sites.

Sector 4: 8 sites, including 2 high impact sites on town roads. Other sites were on private roads, residential properties, and driveways.

Sector 5: 20 sites, including 1 high impact site on a driveway. Most sites in this sector were low impact, residential sites.

Sector 6: 21 sites, including 5 high impact sites. Most sites were residential and town road sites.

Sector 7: 11 sites, including 1 high-impact residential site. Other land uses included residential, private roads, boat access, and driveway.

Sector 8: No sites were identified in sector 8.

Land Use	HIGH	MEDIUM	LOW	TOTAL	% of total
Beach Access	1	4	2	7	4.4%
Boat Access	2	2	0	4	2.5%
Commercial	1	1	0	2	1.2%
Construction Site	0	0	1	1	0.6%
Driveway	2	2	5	9	5.6%
Municipal/Public	0	0	1	1	0.6%
Private Road	4	9	2	15	9.3%
Residential	7	35	65	107	66.5%
State Road	0	2	0	2	1.2%
Town Road	3	4	4	11	6.8%
Trail/Footpath	0	0	2	2	1.2%
TOTAL	20	59	82	161	100%

Table 1. Breakdown of number of sites by Land Use and Impact Rating.

Sector 9: 11 sites, all of which were low and medium impact residential or trail/path sites.

Sector 10: This sector had the most sites, at 29. It contained two high impact sites, both on residential properties. The majority of the sites were residential, with a few driveway, private road, and town road sites.

Sector 11: 6 sites, all low and medium impact, including town road, private road, and driveway sites.

Interestingly, the survey did not

identify any sites in the watershed of the western basin of the lake. The shoreline of this basin is largely protected by a forested buffer, with the land being owned by Kennebec Water District. Although stream crossings and developed streamside parcels were surveyed, no additional sites were found in this portion of the watershed.

Another point of note is the lack of sites with an agricultural land use, despite the prevalence of agriculture in the watershed. As part of the development of the China Lake Watershed-based Management Plan, agricultural properties will be assessed separately through a partnership with the Natural Resources Conservation Service (NRCS). Erosion issues documented in the survey that were related to agricultural properties would be limited to problems visible from the roadside. Additionally, runoff from agricultural properties that impacted a ditch, for example, may have been classified as road sites.

Table 2 groups together similar land uses and lists common erosion issues identified at sites found in the survey, as well as recommended measures to address the erosion. A representative photo from the survey is included in each category.

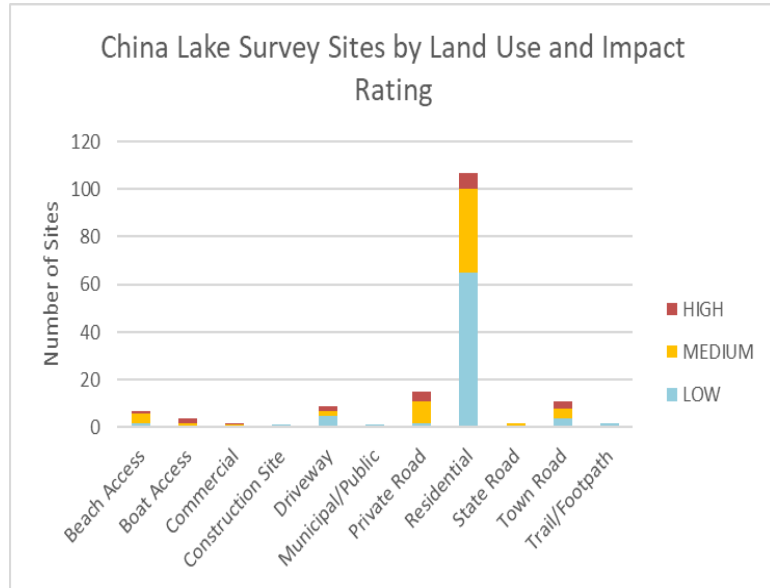


Figure 2. Stacked bar chart showing number of sites within each land use and impact rating.

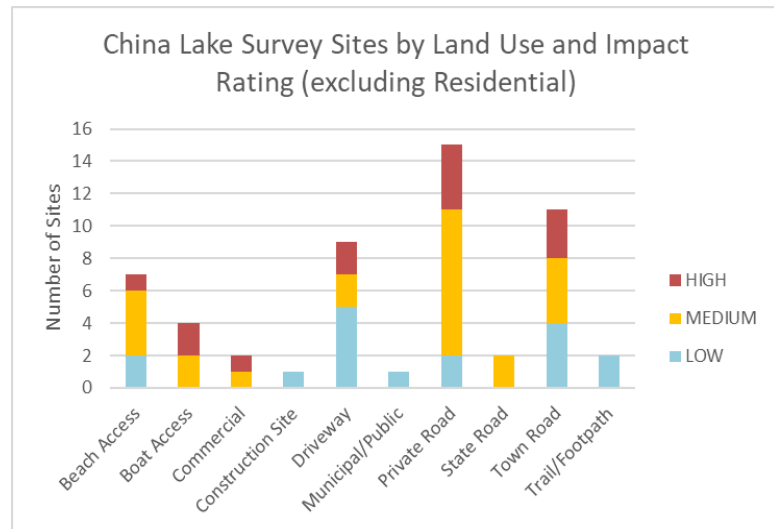







Figure 3. Stacked bar chart showing number of sites within each land use and impact rating, with the Residential category removed.

Table 2. Common issues and recommendations for sites identified in each land use category.

Land Use	Common Issues	Recommendations	Photo
Residential	Surface Erosion	Runoff Diverters, Erosion Control Mulch	
	Bare Soil	Limit Raking, Reseed Lawn, Erosion Control Mulch	
	Lack of Vegetation	Plant Buffer or Rain Garden	
	Roof Runoff Erosion	Infiltration Trench	
	Unstable Paths	Infiltration Steps, Crushed Stone, Runoff Diverters	
Private Road/Driveway	Surface Erosion	Crown, Add Gravel, Add Recycled Asphalt, Pave	
	Road Shoulder Erosion	Vegetate Shoulder, Erosion Control Mulch	
	Plow/Grader Berm	Remove Berm, Work with Contractor to Prevent	
	Ditch Erosion	Reshape Ditch, Armor or Vegetate Ditch, Turnouts, Check Dams	
	Unstable/Broken Culverts	Replace Culvert, Armor Culvert	
State/Town Road	Unstable/Broken Culverts	Replace Culvert, Armor Culvert	
	Ditch Erosion	Reshape Ditch, Armor or Vegetate Ditch, Turnouts, Check Dams	
	Road Shoulder Erosion	Pave, Vegetate, Add Erosion Control Mulch	
Beach/Boat Access, Trails & Paths	Surface Erosion	Add Crushed Stone, Runoff Diverters	
	Bare Soil	Erosion Control Mulch, Crushed Stone	
	Unstable Shoreline Access	Add Vegetation, Add Pavers, Add Crushed Stone	
	Shoreline Erosion	Add Vegetation	
Commercial, Construction, and Municipal	Surface Erosion	Add Crushed Stone, Runoff Diverters, Erosion Control Mulch	
	Ditch Erosion	Reshape Ditch, Armor or Vegetate Ditch, Turnouts, Check Dams	
	Shoreline Erosion	Add Vegetation	
	Bare Soil	Erosion Control Mulch, Crushed Stone, Vegetation	

Summary & Next Steps

The 2020 China Lake watershed survey identified 161 individual nonpoint source (NPS) pollution sites. The survey focused on all developed land (with permitted access) that drains to or has the potential to drain to the lake, carrying stormwater and other pollutants of concern. Survey results indicate that a significant portion of NPS sites are located on residential properties and are associated with access to the shoreline. In fact, residential development accounts for 67% of all sites identified. This does not include the private gravel roads that provide access to these homes and camps, which make up another 9% of documented sites. The cumulative effect of these sites plus the sites located on other land uses result in the excess phosphorus being delivered to China Lake.

With leadership from the CRLA's China LakeSmart Program and help from CRLA's Youth Conservation Corps (YCC) and the watershed towns, landowners can be better informed about the impact that their property has on these lakes and have access to the right tools to address these problems.

The results of this survey will be incorporated into a 10-year Watershed-Based Management Plan that is currently in development. Additional surveys of agricultural and forestry land are also being undertaken to better characterize impacts from these land uses.

What You Can Do

Now that the survey is complete, CLA will reach out to all landowners with NPS sites identified on their property. If you are contacted, please work with CLA and other partners to address the issues identified. If you do not have a site on your property, consider LakeSmart certification and learning more about protecting the lake at the resources included below.

Contact information & Resources

For more information about the survey, specific sites identified, technical assistance, or any other questions related to the forthcoming Watershed-based Management Plan, please contact:

CLA: www.chinalakeassociation.org

CRLA: www.crlamaine.org

Elaine Philbrook – CRLA/China LakeSmart: esphilbrook@gmail.com

Kennebec County Soil and Water Conservation District: www.kcswcd.org

Additional Resources:

Maine DEP Manuals and Guides to Reduce Water Pollution:

www.maine.gov/dep/land/watershed/materials.html

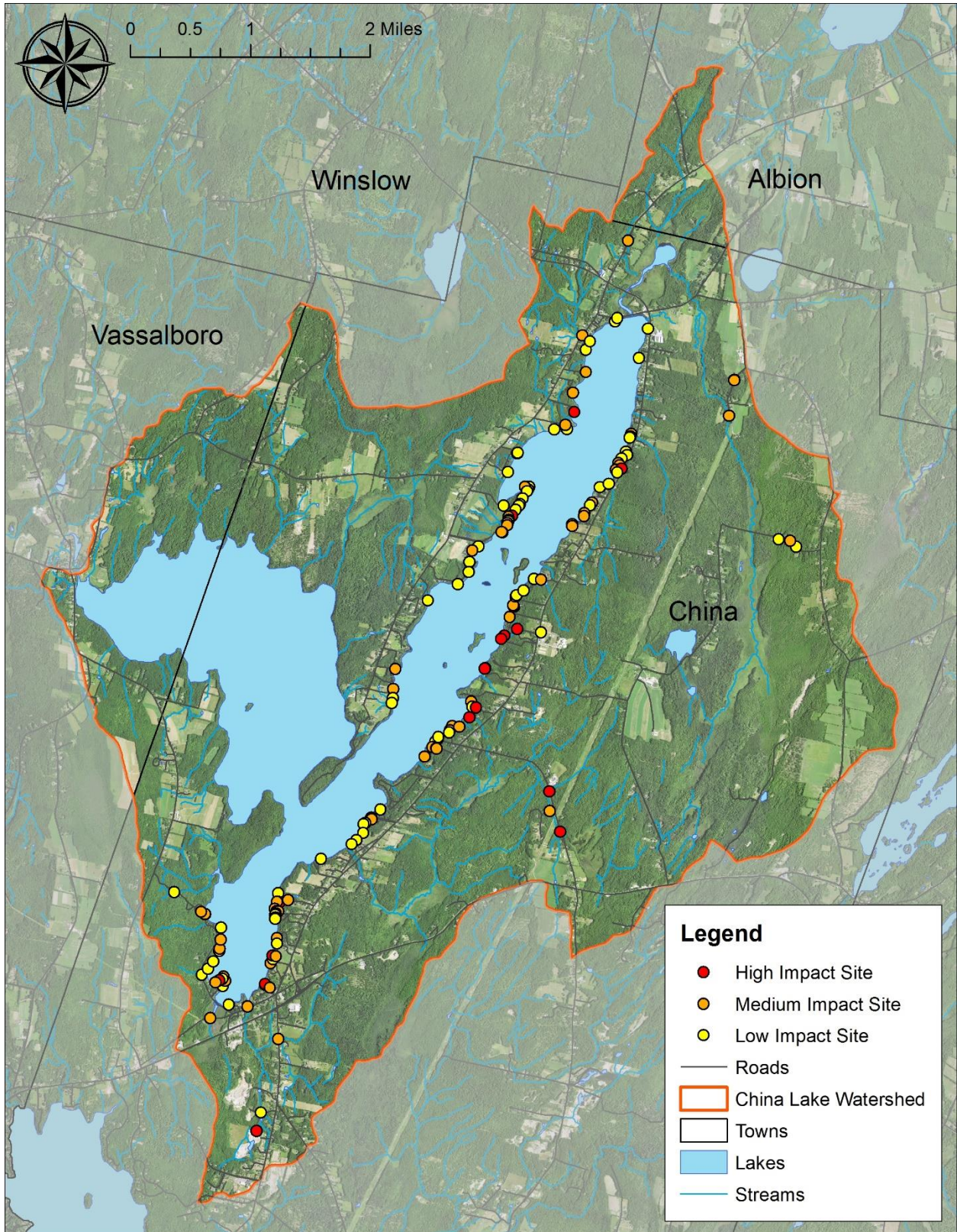
Maine DEP Shorefront Property Owner Information:

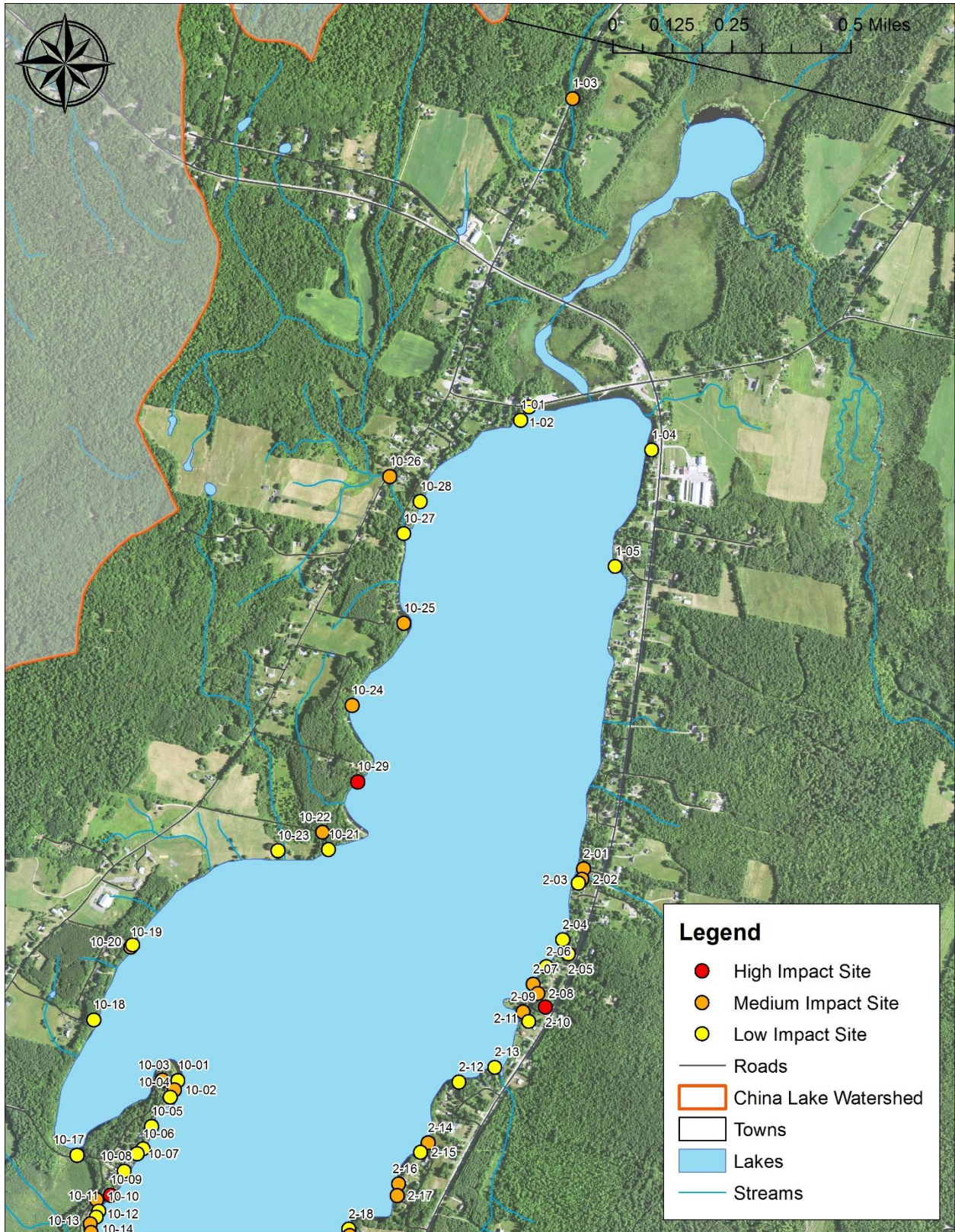
www.maine.gov/dep/land/watershed/camp/index.html

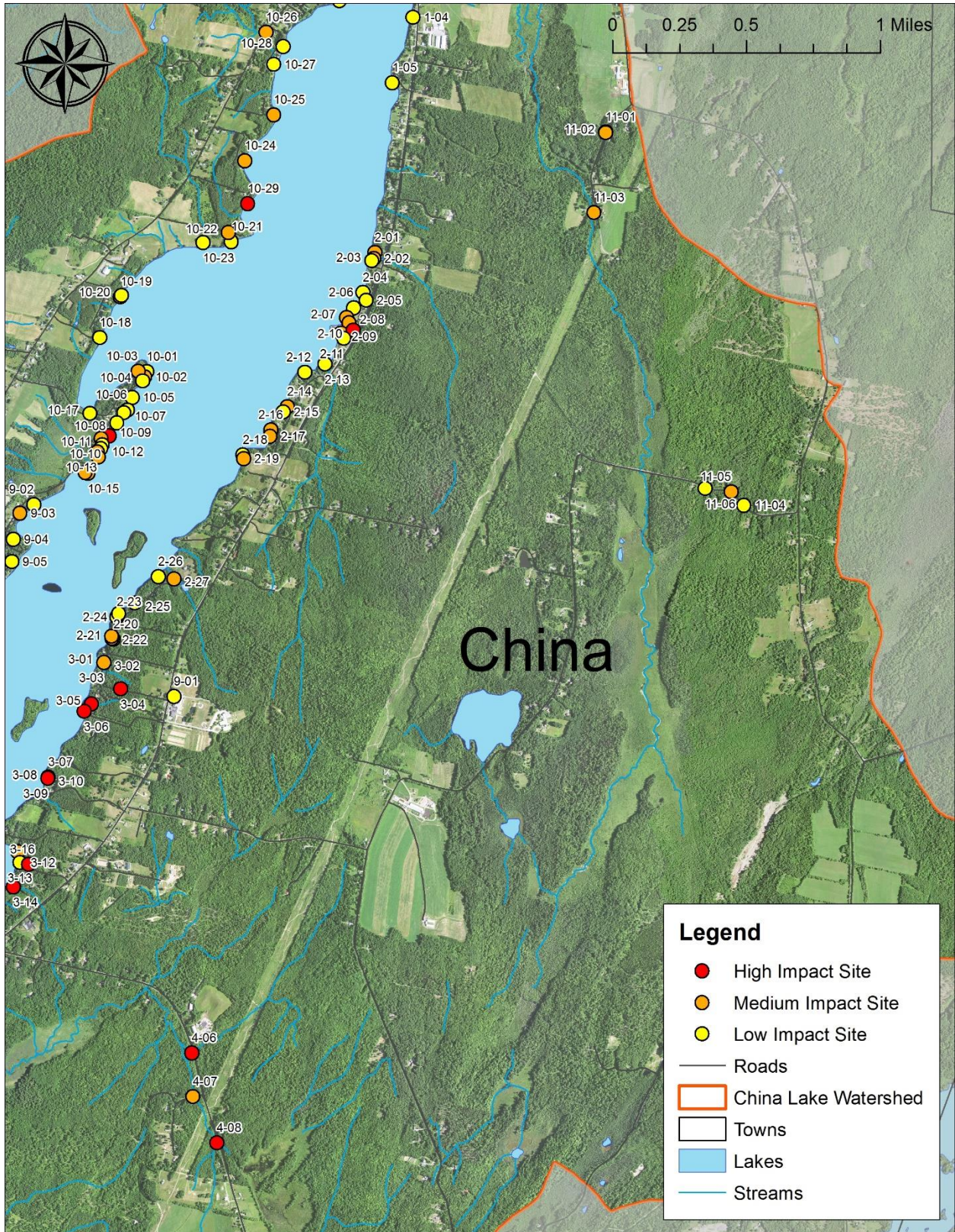
Maine Lakes – LakeSmart Resources: www.lakes.me/lakesmart-resources

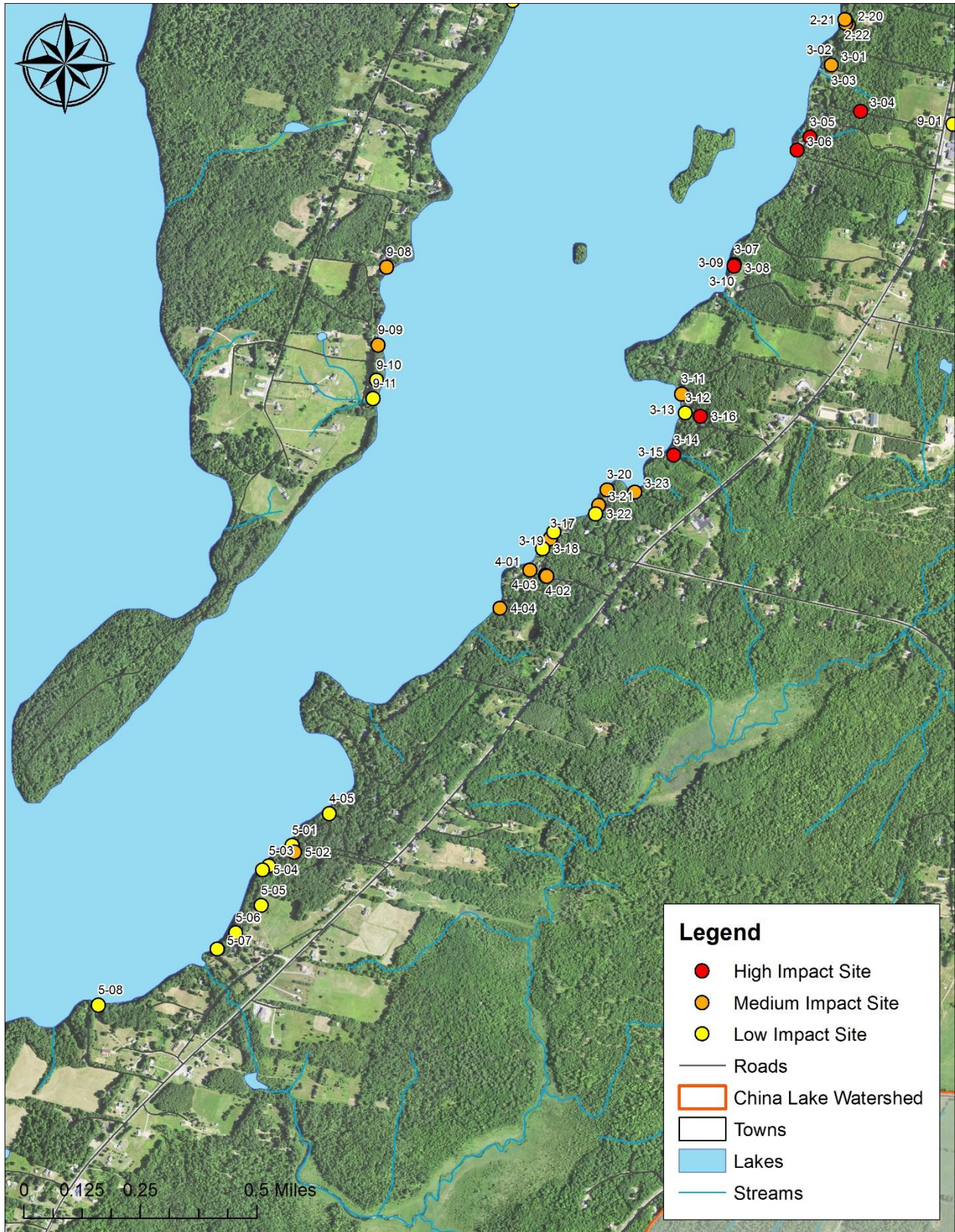
Appendices

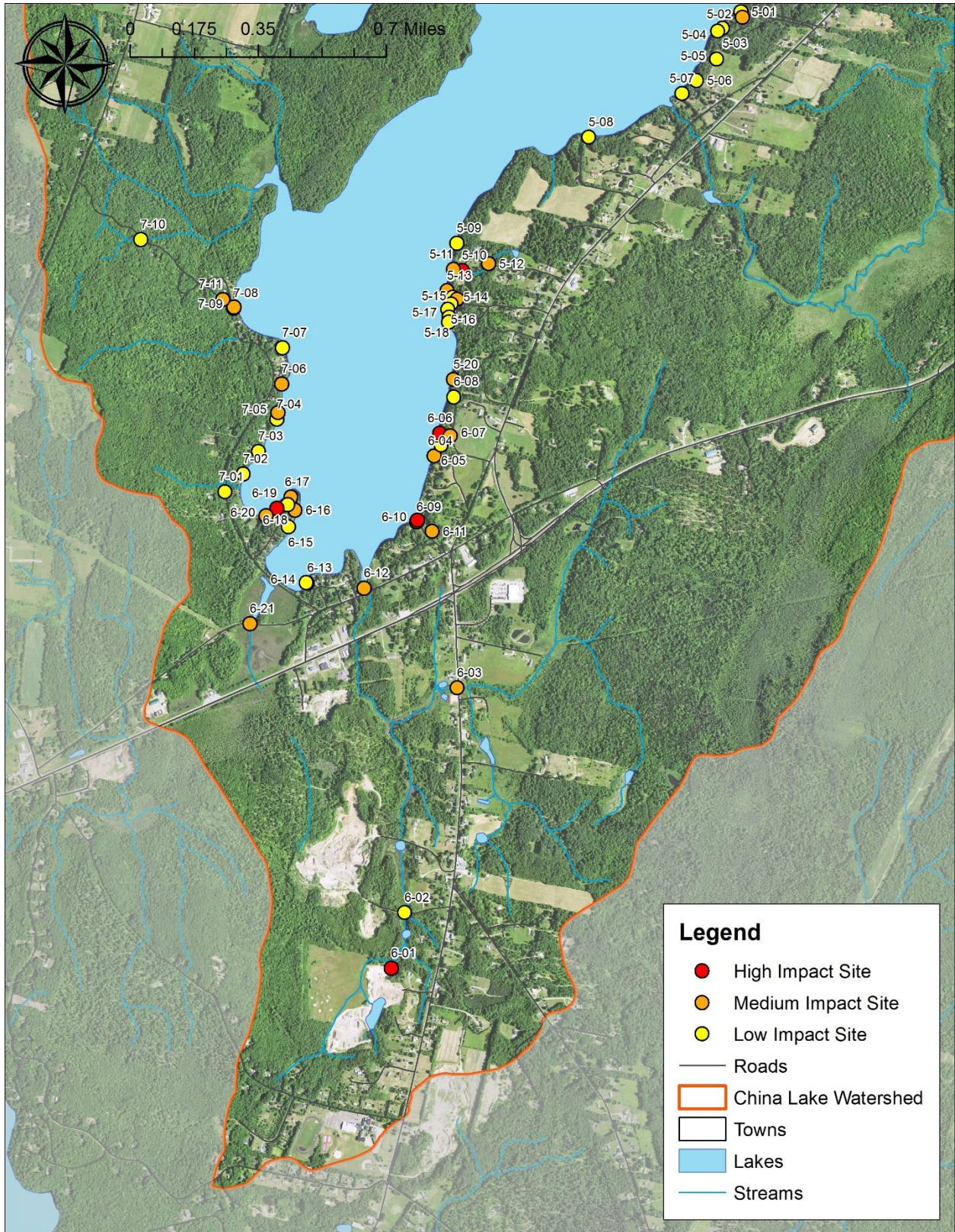
Appendix A: Maps

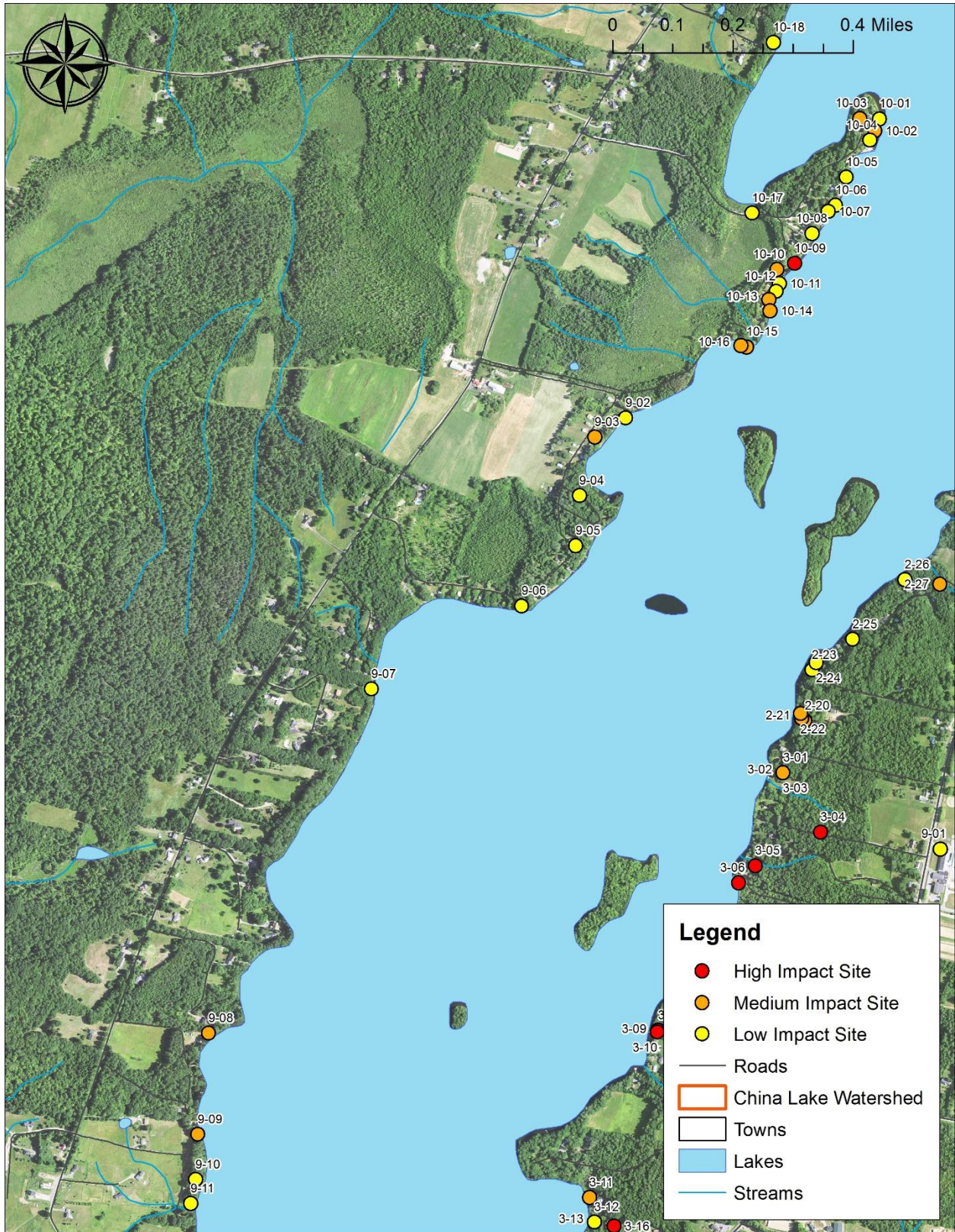












Appendix B: Results Table

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
10/03/20	1-01	Directly into lake	Municipal / Public	Surface Erosion-Sheet	Erosion Control Mulch, Stabilize Foot Path, Infiltration Steps, Add to Buffer, Reseed bare soil & thinning grass, Rip Rap, Remove Invasive Plants	Low	Low	Low
10/03/20	1-02	Directly into lake	Beach Access	Surface Erosion-Sheet	Define Foot Path, Infiltration Steps, Erosion Control Mulch, Establish Buffer, Reseed bare soil & thinning grass, Rip Rap, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	1-03	Stream	State Road	Culvert-Unstable inlet/outlet	Armor Inlet/Outlet	Medium	Medium	Low
10/03/20	1-04	Minimal Vegetation	Residential	Surface Erosion-Sheet, Roof Runoff Erosion	Define Foot Path, Add to Buffer, Rip Rap, Mulch/Erosion Control Mix, Rain Garden	Low	Low	Low
10/03/20	1-05	Directly into lake	Residential	Surface Erosion-Sheet	Erosion Control Mulch, Infiltration Trench @ roof dripline	Low	Low	Low
10/03/20	2-01	Directly into lake	Private Road	Surface Erosion-Gully, Ditch-Gully Erosion	Armor with Stone; Lower portion closer to lake has been armored, may need to be extended higher upstream	Medium	Medium	Medium
10/03/20	2-02	Directly into lake	Residential	Surface Erosion-Gully, Ditch-Gully Erosion	Armor with Stone	Medium	Medium	High
10/03/20	2-03	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation	Add to Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	2-04	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Add to Buffer, Reseed bare soil & thinning grass, No Raking; House side gardens along drip line could use veg and mulch	Low	Low	Low
10/03/20	2-05	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Reseed bare soil & thinning grass, Mulch/Erosion Control Mix; Tough spot for veg so erosion control mulch maybe	Low	Low	Low
10/03/20	2-06	Directly into lake	Residential	Surface Erosion-Sheet, Shoreline-Lack of Shoreline Vegetation, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Erosion	Establish Buffer, Remove Invasive Plants	Low	Low	Low
10/03/20	2-07	Directly into lake	Residential	Surface Erosion-Gully, Ditch-Gully Erosion, Ditch-Bank Failure, Shoreline-Inadequate	Add to Buffer, Rip Rap	Medium	Medium	Medium

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
				Shoreline Vegetation, Shoreline-Erosion				
10/03/20	2-08	Directly into lake	Residential	Shoreline-Undercut, Shoreline-Lack of Shoreline Vegetation, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Erosion	Establish Buffer, Rip Rap	Medium	Medium	Low
10/03/20	2-09	Minimal Vegetation	Residential	Surface Erosion-Sheet, Surface Erosion-Rill, Soil-Bare	Add gravel, Install Runoff Diverters-Waterbar, Large parking area for campers most likely.	Medium	Medium	Medium
10/03/20	2-10	Ditch	Private Road	Surface Erosion-Gully, Surface Erosion-Rill, Surface Erosion-Sheet	Road is flagged by road survey and on the CRLA radar	High	High	High
10/03/20	2-11	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation	Infiltration Trench @ roof dripline, Establish Buffer, Reseed bare soil & thinning grass, No Raking	Low	Low	Low
10/03/20	2-12	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	No Recommendations Given	Low	Medium	Medium
10/03/20	2-13	Stream	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation	Establish Buffer, Add to Buffer; Multiple spots along stream frontage need same care	Low	Low	Low
10/03/20	2-14	Directly into lake	Residential	Surface Erosion-Sheet, Surface Erosion-Rill, Soil-Bare, Shoreline-Erosion	No Recommendations Given	Medium	Medium	Medium
10/03/20	2-15	Directly into lake	Residential	Surface Erosion-Gully, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Erosion	No Recommendations Given	Low	Low	Low
10/03/20	2-16	Directly into lake	Residential	Surface Erosion-Gully, Surface Erosion-Rill, Shoreline-Unstable Access, Shoreline-Erosion, Shoreline-Inadequate Shoreline Vegetation	Erosion Control Mulch, Infiltration Steps, Define Foot Path	Medium	Low	Low
10/03/20	2-17	Directly into lake	Commercial	Surface Erosion-Rill, Shoreline-Unstable Access, Shoreline-Erosion, Shoreline-Inadequate Shoreline Vegetation	Infiltration Steps, Stabilize Foot Path, Add to Buffer, Rip Rap	Medium	Low	Low
10/03/20	2-18	Directly into lake	Residential	Surface Erosion-Rill	Erosion Control Mulch, Install Runoff Diverter (waterbar); Extend buffer closer to dock edges	Low	Low	Low

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
10/03/20	2-19	Minimal Vegetation	Residential	Shoreline-Inadequate Shoreline Vegetation, Shoreline-Erosion	Rip Rap	Medium	Medium	Medium
10/08/20	2-20	Minimal Vegetation	Residential	Surface Erosion-Rill, Shoreline-Lack of Shoreline Vegetation, Shoreline-Inadequate Shoreline Vegetation	Build Up, Reshape (Crown), Install Runoff Diverters-Rubber Razor; Establish Buffer	Medium	Medium	Medium
10/08/20	2-21	Directly into lake	Residential	Surface Erosion-Gully, Shoreline-Inadequate Shoreline Vegetation	Add to Buffer, Mulch/Erosion Control Mix, ECM or rip rap	Medium	Low	Low
10/08/20	2-22	Directly into lake	Residential	Surface Erosion-Rill, Soil-Bare, Shoreline-Unstable Access, Shoreline-Erosion, Shoreline-Inadequate Shoreline Vegetation	Establish Buffer, Rip Rap, Mulch/Erosion Control Mix	Medium	Medium	Medium
10/08/20	2-23	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation	Define Foot Path, Erosion Control Mulch, Establish Buffer, No Raking	Low	Low	Low
10/08/20	2-24	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation, Shoreline-Erosion	Define Foot Path, Erosion Control Mulch, Establish Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/08/20	2-25	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation	Define Foot Path, Add to Buffer, Mulch/Erosion Control Mix	Low	Medium	Low
10/08/20	2-26	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation	Define Foot Path, Erosion Control Mulch, Add to Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/08/20	2-27	Minimal Vegetation	Private Road	Surface Erosion-Rill, Road Shoulder Erosion-Rill	Build Up Road, Add gravel, Reshape (Crown); Entire road needs new surface, crowned	Medium	High	Medium
10/03/20	3-01	Ditch	Trail or Path	Surface Erosion-Rill, Soil-Bare	Erosion Control Mulch	Low	Low	Low
10/03/20	3-02	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Reseed bare soil & thinning grass, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	3-03	Directly into lake	Beach Access	Surface Erosion-Gully, Shoreline-Erosion, Shoreline-Unstable Access	Rip Rap	Medium	Medium	Low

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
10/03/20	3-04	Ditch	Private Road	Ditch-Gully Erosion, Ditch-Bank Failure	Reshape Ditch, Install Check Dams, Reshape (Crown) Road	High	High	Medium
10/03/20	3-05	Directly into lake	Residential	Ditch-Gully Erosion, Ditch-Bank Failure	Install Check Dams	High	High	Medium
10/03/20	3-06	Directly into lake	Boat Access	Shoreline-Erosion, Shoreline-Unstable Access	Rip Rap	High	Medium	Low
10/03/20	3-07	Directly into lake	Beach Access	Shoreline-Erosion, Shoreline-Unstable Access	Rip Rap	High	Low	Low
10/03/20	3-08	Directly into lake	Residential	Ditch-Gully Erosion, Ditch-Bank Failure	Install Check Dams	High	High	Medium
10/03/20	3-09	Minimal Vegetation	Residential	Surface Erosion-Sheet	Establish Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	3-10	Ditch	Private Road	Surface Erosion-Rill, Surface Erosion-Gully	Reshape (Crown) Road ,Install Runoff Diverters-Broad-based Dip	High	High	High
10/03/20	3-11	Directly into lake	Beach Access	Shoreline-Erosion, Shoreline-Unstable Access	Install Runoff Diverter (waterbar), Rip Rap	Medium	Low	Low
10/03/20	3-12	Directly into lake	Beach Access	Shoreline-Erosion, Shoreline-Unstable Access	Rip Rap	Medium	Low	Low
10/03/20	3-13	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare	Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	3-14	Minimal Vegetation	Beach Access	Surface Erosion-Sheet, Soil-Bare	Establish Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	3-15	Ditch	Driveway	Surface Erosion-Gully	Install Runoff Diverters-Broad-based Dip or Waterbar	High	Medium	Medium
10/03/20	3-16	Ditch	Private Road	Ditch-Gully Erosion, Ditch-Undersized	Install Check Dams, Reshape (Crown) Road, Install Runoff Diverters-Broad-based Dip/Open Top Culvert/Rubber Razor/Waterbar	High	High	High
10/08/20	3-17	Directly into lake	Boat Access	Surface Erosion-Rill, Soil-Bare, Shoreline-Unstable Access	Build Up Road, Reshape (Crown) Road, Install Runoff Diverters-Rubber Razor or Waterbar	Medium	Medium	Medium
10/08/20	3-18	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation	Define Foot Path, Erosion Control Mulch, Add to Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/08/20	3-19	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation	Define Foot Path, Erosion Control Mulch, Add to Buffer, Mulch/Erosion Control Mix	Low	Low	Low

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
10/08/20	3-20	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Erosion, Shoreline-Inadequate Shoreline Vegetation	Mulch, Seed/Hay, Erosion Control Mulch, Add to Buffer, Mulch/Erosion Control Mix; ECM all bare soil areas	Medium	Medium	Low
10/08/20	3-21	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Roof Runoff Erosion	Define Foot Path, Erosion Control Mulch, Infiltration Trench @ roof dripline, Add to Buffer, Mulch/Erosion Control Mix	Medium	Medium	Low
10/08/20	3-22	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Roof Runoff Erosion	Install Runoff Diverters-Rubber Razor or Waterbar, Define Foot Path, Erosion Control Mulch, Infiltration Trench @ roof dripline, Add to Buffer, Establish Buffer, Mulch/Erosion Control Mix; ECM berm/layer below driveway	Low	Low	Low
10/08/20	3-23	Minimal Vegetation	Beach Access	Surface Erosion-Sheet, Surface Erosion-Rill, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Unstable Access	Define Foot Path, Erosion Control Mulch, Add to Buffer, Mulch/Erosion Control Mix, Remove Invasive Plants	Medium	Low	Low
10/03/20	4-01	Minimal Vegetation	Residential	Surface Erosion-Gully, Shoreline-Inadequate Shoreline Vegetation	Replace Culvert, Establish Buffer, Rain Garden	Medium	Medium	Medium
10/03/20	4-02	Minimal Vegetation	Private Road	Surface Erosion-Rill	Build Up Road, Add gravel, Install Runoff Diverters-Rubber Razor or Waterbar	Medium	High	Medium
10/03/20	4-03	Minimal Vegetation	Driveway	Surface Erosion-Rill	Build Up Road, Add gravel, Install Runoff Diverters-Rubber Razor, Reshape (Crown) Road	Medium	Medium	Medium
10/03/20	4-04	Directly into lake	Residential	Surface Erosion-Gully, Shoreline-Erosion, Roof Runoff Erosion	Infiltration Trench @ roof dripline, Stabilize bank with riprap	Medium	Low	Low
10/03/20	4-05	Minimal Vegetation	Residential	Surface Erosion-Rill	Build Up Road, Reshape (Crown) Road, Install Runoff Diverters-Rubber Razor, Mulch/Erosion Control Mix	Low	Medium	Medium
10/03/20	4-06	Stream	Town Road	Surface Erosion-Gully, Culvert-Unstable inlet/outlet, Ditch-Bank Failure	Armor Inlet/Outlet, Armor with Stone	High	High	Medium
10/03/20	4-07	Stream	Private Road	Surface Erosion-Gully, Ditch-Bank Failure, Ditch-Gully Erosion; Stream bank erosion	Armor with Stone	Medium	Low	Medium

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
10/03/20	4-08	Stream	Town Road	Surface Erosion-Gully, Culvert-Crushed/Broken, Ditch-Bank Failure, Ditch-Gully Erosion	Replace Culvert; Armor with Stone	High	High	High
10/03/20	5-01	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Roof Runoff Erosion	Drywell @ gutter downspout, Infiltration Trench @ roof dripline, Add to Buffer, Mulch/Erosion Control Mix; Retrofit upper steps for infiltration	Low	Low	Low
10/03/20	5-02	Directly into lake	Private Road	Surface Erosion-Gully	Build Up Road, Add gravel, Install Runoff Diverters-Rubber Razor	Medium	Medium	Medium
10/03/20	5-03	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare	Stabilize Foot Path, Erosion Control Mulch, Install Runoff Diverter (waterbar), Infiltration Trench @ roof dripline	Low	Low	Low
10/03/20	5-04	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Lack of Shoreline Vegetation, Roof Runoff Erosion	Define Foot Path, Stabilize Foot Path, Drywell @ gutter downspout, Add to Buffer, Reseed bare soil & thinning grass	Low	Low	Low
10/03/20	5-05	Minimal Vegetation	Residential	Surface Erosion-Rill	Install Check Dams, Rain Garden	Low	Low	Medium
10/03/20	5-06	Minimal Vegetation	Residential	Surface Erosion-Rill, Shoreline-Lack of Shoreline Vegetation	Install Runoff Diverter (waterbar), Infiltration Steps, Establish Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	5-07	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Roof Runoff Erosion	No Raking, Add to Buffer, Mulch/Erosion Control Mix; Add timber to top of slope on south side of camp	Low	Low	Low
10/03/20	5-08	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation	Mulch/Erosion Control Mix; Add stone to stabilize vehicle access to dock. ECM bank.	Low	Low	Low
10/03/20	5-09	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation, Shoreline-Unstable Access	Stabilize Foot Path, Erosion Control Mulch, Install Runoff Diverter (waterbar), Define Foot Path, No Raking; Timbers and planting terraces to break up slope	Low	Low	Low
10/03/20	5-10	Stream	Driveway	Surface Erosion-Gully, Surface Erosion-Rill, Culvert-Clogged,	Armor Inlet/Outlet, Enlarge Culvert, Replace Culvert, Build Up Road, Add gravel, Reshape (Crown) Road, Install Runoff Diverters-Rubber	High	High	High

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
				Culvert-Unstable inlet/outlet, Culvert-Undersized	Razor. Install new culvert so not under house. Reshape upper driveway to send runoff to turnout.			
10/03/20	5-11	Directly into lake	Residential	Surface Erosion-Rill	Install Runoff Diverter (waterbar), Infiltration Steps, Stabilize Foot Path, Erosion Control Mulch, Add to Buffer, No Raking, Mulch/Erosion Control Mix.	Medium	Low	Medium
10/03/20	5-12	Stream	Private Road	Surface Erosion-Rill, Roadside Plow/Grader Berm	Armor Inlet/Outlet, Build Up Road, Reshape (Crown) Road, Remove Grader/Plow Berms	Medium	Medium	Medium
10/03/20	5-13	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Unstable Access	EC blankets or rolls on bare areas.	Medium	Medium	Medium
10/03/20	5-14	Minimal Vegetation	Residential	Surface Erosion-Sheet, Roof Runoff Erosion	Infiltration Steps, Stabilize Foot Path, Erosion Control Mulch, Add to Buffer	Low	Low	Low
10/03/20	5-15	Directly into lake	Driveway	Surface Erosion-Rill	Build Up Road, Add gravel, Install Runoff Diverters-Rubber Razor; Define parking and enclose edge with timber for runoff	Medium	Medium	Medium
10/03/20	5-16	Directly into lake	Residential	Surface Erosion-Sheet, Roof Runoff Erosion	Infiltration Trench @ roof dripline, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	5-17	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Roof Runoff Erosion	Infiltration Trench @ roof dripline, Add to Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	5-18	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Unstable Access, Roof Runoff Erosion	Stabilize Foot Path, Erosion Control Mulch, Infiltration Steps, Establish Buffer, Reseed bare soil & thinning grass	Low	Medium	Low
10/03/20	5-19	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Define Foot Path, Stabilize Foot Path, Erosion Control Mulch, Install Runoff Diverter (waterbar), Establish Buffer	Low	Low	Low
10/03/20	5-20	Directly into lake	Residential	Surface Erosion-Sheet, Surface Erosion-Rill, Soil-Bare, Shoreline-Unstable Access, Shoreline-Lack of Shoreline Vegetation	Define Foot Path, Erosion Control Mulch, Install Runoff Diverter (waterbar), Stabilize Foot Path, Establish Buffer, No Raking; Plantings on slope	Medium	Medium	Medium
10/03/20	6-01	Stream	Commercial	Surface Erosion-Gully, Culvert-Unstable inlet/outlet, Ditch-Gully Erosion, Road Shoulder Erosion-Gully, Soil-Bare, Soil-Uncovered Pile	Armor Culvert Inlet/Outlet, Vegetate, Armor with Stone, Install Turnouts, Vegetate Shoulder, Silt Fence/EC Berms, Seed/Hay, Mulch/Erosion Control Mix	High	High	High

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
10/03/20	6-02	Stream	Town Road	Culvert-Unstable inlet/outlet, Soil-Uncovered Pile, Soil-Bare	Armor Inlet/Outlet, Vegetate Shoulder; remove pile of road material above culvert	Low	Medium	Low
10/03/20	6-03	Stream	State Road	Culvert-Crushed Broken, Culvert-Unstable inlet/outlet	Armor Culvert Inlet/Outlet, Replace Culvert	Medium	High	High
10/03/20	6-04	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Erosion	Add to Buffer, Establish Buffer, No Raking, Mulch/Erosion Control Mix	Medium	Medium	Low
10/03/20	6-05	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Roof Runoff Erosion	Drywell @ gutter downspout, Rain Barrel, Reseed bare soil & thinning grass, No Raking, Mulch/Erosion Control Mix, rain garden would be great to capture roof and driveway runoff	Low	Medium	Low
10/03/20	6-06	Directly into lake	Residential	Ditch-Gully Erosion	Reshape Ditch, Armor with Stone, Vegetate, Install Check Dams	High	Medium	Medium
10/03/20	6-07	Ditch	Residential	Culvert-Unstable inlet/outlet, Culvert-Crushed Broken, Culvert-Undersized	Replace Culvert, Armor Culvert Inlet/Outlet, Enlarge Culvert, Install Plunge Pool	Medium	Medium	Medium
10/03/20	6-08	Minimal Vegetation	Construction Site	Surface Erosion-Sheet, Soil-Bare	Silt Fence/EC Berms, Mulch, Seed/Hay, Reseed bare soil & thinning grass, Mulch/Erosion Control Mix	Low	Medium	Medium
10/03/20	6-09	Directly into lake	Boat Access	Surface Erosion-Sheet, Surface Erosion-Rill, Soil-Bare, Shoreline-Unstable Access	Pave, Add gravel, Install Runoff Diverters-Waterbar, Infiltration Trench, boat launch pavers/crushed stone	High	High	Medium
10/03/20	6-10	Directly into lake	Town Road	Surface Erosion-Gully	Build Up Road, Reshape (Crown) Road, Install Runoff Diverters-Waterbar or Rubber Razor	High	High	High
10/03/20	6-11	Stream	Driveway	Culvert-Crushed Broken, Culvert-Unstable inlet/outlet	Armor Culvert Inlet/Outlet, Replace Culvert, Lengthen Culvert	Medium	Medium	Medium
10/03/20	6-12	Stream	Town Road	Culvert-Unstable inlet/outlet	Armor Culvert Inlet/Outlet, Replace Culvert, replace rip rap or regrade so it doesn't fall into the stream	Medium	High	High
10/03/20	6-13	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare	Reseed bare soil & thinning grass, Establish Buffer, cover patch of bare soil, plant vegetation	Low	Low	Low
10/03/20	6-14	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation	Establish Buffer	Low	Low	Low

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
10/03/20	6-15	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation	Establish Buffer, Mulch/Erosion Control Mix, more crushed stone, cover bare soil	Low	Low	Low
10/03/20	6-16	Directly into lake	Residential	Surface Erosion-Rill, Soil-Bare, Shoreline-Erosion, Shoreline-Unstable Access	Erosion Control Mulch, Stabilize Foot Path, Define Foot Path, Add to Buffer, No Raking, Mulch/Erosion Control Mix, Install Runoff Diverter (waterbar), vegetation	Medium	Medium	Medium
10/03/20	6-17	Directly into lake	Residential	Surface Erosion-Rill, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Unstable Access, Shoreline-Erosion	Define Foot Path, Stabilize Foot Path, Erosion Control Mulch, Establish Buffer, cover steep area	Medium	Low	Low
10/03/20	6-18	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation	Add to Buffer, cover bare soil on steep slope	Low	Low	Low
10/03/20	6-19	Directly into lake	Residential	Surface Erosion-Rill, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation	Erosion Control Mulch, Add to Buffer, No Raking, Install Runoff Diverter (waterbar), Mulch/Erosion Control Mix	High	Medium	Low
10/03/20	6-20	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Erosion, Shoreline-Unstable Access	Stabilize Foot Path, Define Foot Path, Install Runoff Diverter (waterbar), Erosion Control Mulch, Add to Buffer, No Raking, Mulch/Erosion Control Mix	Medium	Low	Low
10/03/20	6-21	Stream	Town Road	Surface Erosion-Rill, Culvert-Unstable inlet/outlet	Armor Culvert Inlet/Outlet	Medium	Medium	Low
10/03/20	7-01	Ditch	Driveway	Surface Erosion-Sheet, Roadside Plow/Grader Berm	Add gravel, Reshape (Crown) Road, Install Runoff Diverters-Rubber Razor	Low	Low	Medium
10/03/20	7-02	Minimal Vegetation	Residential	Surface Erosion-Sheet, Shoreline-Inadequate Shoreline Vegetation, Roof Runoff Erosion	Drywell @ gutter downspout, Infiltration Trench @ roof dripline, Reseed bare soil & thinning grass, Add to Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	7-03	Minimal Vegetation	Residential	Surface Erosion-Sheet, Shoreline-Inadequate Shoreline Vegetation	Add to Buffer, Mulch/Erosion Control Mix	Low	Low	Low
10/03/20	7-04	Directly into lake	Residential	Surface Erosion-Sheet, Shoreline-Erosion, Shoreline-Inadequate Shoreline Vegetation	Add to Buffer, Rip Rap	Low	Low	Low

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
10/03/20	7-05	Directly into lake	Residential	Surface Erosion-Sheet, Shoreline-Erosion	Stabilize Foot Path, Erosion Control Mulch, Mulch/Erosion Control Mix, Rain Garden; Replace paved path with rock or mulch, add mulch and maybe rain garden to yard to the left of the path.	Medium	Low	Low
10/03/20	7-06	Directly into lake	Residential	Surface Erosion-Sheet, Shoreline-Lack of Shoreline Vegetation, Shoreline-Erosion	Establish Buffer, Add to Buffer, Rip Rap	Medium	Low	Low
10/03/20	7-07	Minimal Vegetation	Residential	Surface Erosion-Sheet, Shoreline-Erosion, Shoreline-Lack of Shoreline Vegetation	Add to Buffer	Low	Low	Low
10/03/20	7-08	Directly into lake	Residential	Soil-Uncovered Pile	Seed/Hay, Mulch, Establish Buffer	High	Medium	Medium
10/03/20	7-09	Directly into lake	Boat Access	Surface Erosion-Gully, Shoreline-Unstable Access	Add gravel, Install Runoff Diverters-Broad-based Dip	Medium	Low	Low
10/03/20	7-10	Stream	Private Road	Surface Erosion-Sheet, Culvert-Clogged, Culvert-Undersized, Culvert-Unstable inlet/outlet	Enlarge Culvert, Armor Culvert Inlet/Outlet	Low	Medium	Medium
10/03/20	7-11	Ditch	Private Road	Surface Erosion-Rill	Build Up Road, Add gravel, Reshape (Crown) Road, Install Runoff Diverters-Waterbar or Rubber Razor	Medium	Medium	Medium
10/03/20	9-01	Directly into lake	Trail or Path	Surface Erosion-Sheet, Soil-Bare	Stabilize Foot Path, Infiltration Steps	Low	Low	Low
10/03/20	9-02	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation	Infiltration Steps, Erosion Control Mulch, Establish Buffer	Low	Low	Low
10/03/20	9-03	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Add to Buffer, Reseed bare soil & thinning grass, Mulch/Erosion Control Mix, Rebuild failing wall, eliminate boat ramp	Medium	Medium	Medium
10/03/20	9-04	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Define Foot Path, Erosion Control Mulch, Infiltration Steps, Establish Buffer	Low	Medium	Medium
10/03/20	9-05	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Erosion Control Mulch, Define Foot Path, Reseed bare soil & thinning grass	Low	Low	Low
10/03/20	9-06	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare	Define Foot Path, Erosion Control Mulch, Reseed bare soil & thinning grass	Low	Low	Low

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
10/03/20	9-07	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Erosion Control Mulch	Low	Low	Low
10/03/20	9-08	Directly into lake	Residential	Surface Erosion-Gully, Shoreline-Erosion, Shoreline-Unstable Access	Stabilize Foot Path, Infiltration Steps	Medium	Low	Medium
10/03/20	9-09	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Define Foot Path, Stabilize Foot Path, Infiltration Steps	Medium	Low	Medium
10/03/20	9-10	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Define Foot Path, Stabilize Foot Path, Infiltration Steps	Low	Low	Medium
10/03/20	9-11	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	Erosion Control Mulch, Stabilize Foot Path, Define Foot Path	Low	Low	Low
10/03/20	10-01	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Erosion, Shoreline-Lack of Shoreline Vegetation	Add to Buffer, Coir log with vegetative stakes plantings and ecm	Low	Low	Low
10/03/20	10-02	Minimal Vegetation	Residential	Surface Erosion-Rill, Soil-Bare, Shoreline-Erosion, Roof Runoff Erosion, Other-Invasive Plants	Erosion Control Mulch, Infiltration Trench @ roof dripline, Add to Buffer, No Raking, Mulch/Erosion Control Mix, Coir logs for terracing and revegetate and mulch	Medium	Medium	Medium
10/03/20	10-03	Minimal Vegetation	Driveway	Surface Erosion-Rill, Road Shoulder Erosion-Rill	Build Up Road, Add gravel, Install Runoff Diverters-Waterbar	Medium	Medium	Medium
10/03/20	10-04	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation, Shoreline-Erosion, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Unstable Access, Roof Runoff Erosion	Infiltration Trench @ roof dripline, Establish Buffer, Add to Buffer, Mulch/Erosion Control Mix, Add mulch to steep banks, Cover bare soil	Low	Low	Low
10/03/20	10-05	Minimal Vegetation	Residential	Surface Erosion-Sheet, Shoreline-Lack of Shoreline Vegetation, Shoreline-Inadequate Shoreline Vegetation, Roof Runoff Erosion	Infiltration Trench @ roof dripline, Establish Buffer, Reseed bare soil & thinning grass, No Raking, Replace invasive plants with natives.	Low	Low	Low
10/03/20	10-06	Minimal Vegetation	Residential	Soil-Bare, Shoreline-Erosion, Shoreline-Lack of Shoreline Vegetation, Shoreline-	Infiltration Trench @ roof dripline, Drywell @ gutter downspout, Add to Buffer, Reseed bare soil & thinning grass, Mulch/Erosion Control	Low	Medium	Medium

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
				Undercut, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Unstable Access, Roof Runoff Erosion, Other - Black pipe coming out of hill creating channel. Connected to gutter.	Mix, Terrace and vegetate and mulch, crushed stone under steps. Disconnect gutter and install drywell			
10/03/20	10-07	Minimal Vegetation	Residential	Surface Erosion-Rill, Soil-Bare, Shoreline-Undercut, Shoreline-Inadequate Shoreline Vegetation, Roof Runoff Erosion, Other-Invasive Plants	Infiltration Trench @ roof dripline, Add to Buffer, Establish vegetation at top of slope to mitigate erosion	Low	Low	Medium
10/03/20	10-08	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Erosion, Shoreline-Inadequate Shoreline Vegetation	Add to Buffer, Mulch/Erosion Control Mix, Stabilize soil at top of slope by stairs. Add crushed stone under stairs to cover bare soil	Low	Low	Low
10/03/20	10-09	Directly into lake	Residential	Surface Erosion-Gully, Shoreline-Erosion, Shoreline-Undercut, Shoreline-Lack of Shoreline Vegetation	Establish Buffer, Reseed bare soil & thinning grass, remove failing retaining wall. Reestablish natural shoreline with rock and native vegetation	High	High	High
10/03/20	10-10	Minimal Vegetation	Driveway	Surface Erosion-Rill, Other-Eroding driveway	Add gravel, Build Up Road, Reshape (Crown) Road, Install Runoff Diverters-Rubber Razor, Define parking area within existing gravel are with parking bollards or timber to prevent compaction on grass	Medium	Medium	Medium
10/03/20	10-11	Minimal Vegetation	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Other-Major cut bank on backside of property, outdoor shower drains to ground, possible sand additions at shoreline. Dog impacts have created large bare area near beach. Bare soil on secondary berm.	Add to Buffer, Reseed bare soil & thinning grass, Mulch/Erosion Control Mix, Minimize beach area to natural shoreline. Stabilize cut bank behind shower. Vegetate bare areas on berm. Do not wash with soaps in or near lake	Low	Low	Medium
10/03/20	10-12	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate	Infiltration Steps, Infiltration Trench @ roof dripline, Add to Buffer, Mulch/Erosion Control	Low	Medium	Medium

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
				Shoreline Vegetation, Shoreline-Unstable Access, Roof Runoff Erosion	Mix, Coir logs and native vegetation on hill slope			
10/03/20	10-13	Minimal Vegetation	Residential	Surface Erosion-Rill, Soil-Bare, Shoreline-Lack of Shoreline Vegetation, Shoreline-Erosion, Roof Runoff Erosion, Other-Paved path to stairs conduit for water. Steep eroding bank above lake.	Infiltration Steps, Infiltration Trench @ roof dripline, Add to Buffer, Mulch/Erosion Control Mix, Terrace with staked coir logs, intall vegetation and ECM to cover all bare soil	Medium	Medium	Medium
10/03/20	10-14	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Unstable Access, Shoreline-Lack of Shoreline Vegetation, Shoreline-Erosion, Roof Runoff Erosion, Other-Ice berm at shoreline.	Infiltration Trench @ roof dripline, Add to Buffer, Establish Buffer, Mulch/Erosion Control Mix, Rip Rap, Terracing needed on slopes with vegetation and ecm	Medium	Medium	Medium
10/03/20	10-15	Directly into lake	Residential	Surface Erosion-Rill, Soil-Bare, Shoreline-Undercut, Shoreline-Erosion, Shoreline-Lack of Shoreline Vegetation	Add to Buffer, Rip Rap, Contact DEP - need PBR / site visit to mix riprap and veg at shoreline	Medium	Medium	Medium
10/03/20	10-16	Directly into lake	Residential	Surface Erosion-Rill, Shoreline-Undercut, Shoreline-Lack of Shoreline Vegetation, Shoreline-Erosion	Establish Buffer	Medium	Medium	Medium
10/03/20	10-17	Stream	Private Road	Culvert-Unstable inlet/outlet, Culvert-Undersized, Other-Beaver activity	Armor Culvert Inlet/Outlet, Rip Rap	Low	Low	Medium
11/06/20	10-18	Directly into lake	Residential	Surface Erosion-Sheet, Surface Erosion-Rill, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation, Shoreline-Lack of Shoreline Vegetation	Install Runoff Diverter (waterbar), Stabilize Foot Path, Infiltration Trench @ roof dripline, Establish Buffer, Reseed bare soil & thinning grass, Mulch/Erosion Control Mix, Infiltration below deck edge	Low	Low	Low
11/06/20	10-19	Directly into lake	Residential	Surface Erosion-Rill, Soil-Bare, Shoreline-Lack of Shoreline Vegetation	Establish Buffer, Mulch/Erosion Control Mix, Don't cut or weedwhack understory	Medium	Medium	Low

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
11/06/20	10-20	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation	Establish Buffer, Mulch/Erosion Control Mix	Low	Medium	Low
11/06/20	10-21	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Unstable Access, Roof Runoff Erosion	Stabilize Foot Path, Infiltration Trench @ roof dripline, Add to Buffer, Add stone from steps to dock	Low	Low	Low
11/06/20	10-22	Stream	Private Road	Surface Erosion-Rill, Culvert-Unstable inlet/outlet, Road Shoulder Erosion-Rill	Armor Culvert Inlet/Outlet, Build Up Road, Reshape (Crown) Road, Add gravel, Reshape shoulder and seed or armor; turnouts on road.	Medium	Medium	Medium
11/06/20	10-23	Minimal Vegetation	Residential	Surface Erosion-Rill	Add gravel, Build Up Road, Reshape (Crown) Road, Install Runoff Diverters-Waterbar	Low	Medium	Low
11/06/20	10-24	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare	No Recommendations Given	Medium	Medium	High
11/06/20	10-25	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Inadequate Shoreline Vegetation	Install Runoff Diverters-Rubber Razor, Define Foot Path, Stabilize Foot Path, Drywell @ gutter downspout, Add to Buffer, Mulch/Erosion Control Mix.	Medium	Medium	Low
11/06/20	10-26	Stream	Town Road	Culvert-Unstable inlet/outlet, Ditch-Rill Erosion	Armor Culvert Inlet/Outlet, Armor with Stone	Medium	Low	Low
11/06/20	10-27	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Unstable Access	Mulch/Erosion Control Mix	Low	Low	Low
11/06/20	10-28	Directly into lake	Residential	Surface Erosion-Sheet, Soil-Bare, Shoreline-Lack of Shoreline Vegetation, Shoreline-Unstable Access	Erosion Control Mulch, Establish Buffer, Reseed bare soil & thinning grass	Low	Low	Low
11/13/20	10-29	Directly into lake	Residential	Surface Erosion-Rill, Soil-Bare	Erosion Control Mulch, Establish Buffer, Add brush and vegetation to stabilize severe bank erosion	High	Medium	High
04/06/21	11-01	Stream	Town Road	Culvert-Unstable inlet/outlet, Culvert-Undersized	Armor Culvert Inlet/Outlet, Enlarge Culvert	Low	Medium	Medium
04/06/21	11-02	Stream	Private Road	Road Shoulder Erosion-Rill	Reshape (Crown) Road, Install some type of runoff diverter	Medium	Medium	Low
04/06/21	11-03	Stream	Driveway	Culvert-Undersized, Culvert-Unstable inlet/outlet, Road Shoulder Erosion-Rill	Armor Culvert Inlet/Outlet, Enlarge Culvert, Reshape (Crown) Road, Add gravel, Mulch/Erosion Control Mix	Medium	Medium	Medium

Date	Site	Flow path to lake	Land use	Problem	Recommendations	Impact Rating	Cost to Fix	Technical Level
04/06/21	11-04	Ditch	Town Road	Ditch-Rill Erosion	Install Check Dams, Vegetate, Remove debris/sediment	Low	Medium	Medium
04/06/21	11-05	Stream	Town Road	Surface Erosion-Sheet, Culvert-Unstable inlet/outlet, Road Shoulder Erosion-Rill	Armor Culvert Inlet/Outlet, Install Turnouts, Vegetate, Riprap bank around culvert outlet	Medium	Medium	Medium
04/06/21	11-06	Stream	Town Road	Culvert-Unstable inlet/outlet, Road Shoulder Erosion-Sheet	Armor Culvert Inlet/Outlet, Potentially pave shoulder or add runoff diverter	Low	Medium	Medium