

# Parker Pond Watershed-Based Protection Plan 2018



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## ACRONYMS

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<b>30MRWA</b>	30 Mile River Watershed Association
<b>BMPs</b>	Best Management Practices
<b>Chla</b>	Chlorophyll-a
<b>DO</b>	Dissolved Oxygen
<b>EPA</b>	United States Environmental Protection Agency
<b>KCSWCD</b>	Kennebec County Soil and Water Conservation District
<b>MDEP</b>	Maine Department of Environmental Protection
<b>NPS</b>	Nonpoint Source (pollution)
<b>PPA</b>	Parker Pond Association
<b>SDT</b>	Secchi Disk Transparency
<b>TP</b>	Total Phosphorus
<b>UMF</b>	University of Maine at Farmington
<b>YCC</b>	Youth Conservation Corps

## BACKGROUND INFORMATION

### Document Purpose and Scope

The purpose of this Watershed-Based Plan, herein after referred to as the “plan,” is to lay out a strategy and schedule for the 30 Mile River Watershed Association and the Parker Pond Association’s Nonpoint Source (NPS) mitigation and water quality protection efforts for the Parker Pond watershed over the next ten years (2018 to 2028). The 30 Mile River Watershed Association (30MRWA) prepared the plan with assistance and input from the Parker Pond Association (PPA), the Maine Department of Environmental Protection (MDEP) and the United States Environmental Protection Agency (EPA).

30MRWA developed the plan to satisfy national watershed planning guidelines provided by the EPA. The EPA requires *nine-element* plans for impaired watersheds, but allows *alternative* plans in several cases including for protection of high quality or unimpaired waters. MDEP accepts alternative plans for unimpaired lakes that have completed a recent watershed survey provided that the plans follow EPA and MDEP guidance and include minimum planning elements. Parker Pond meets these eligibility criteria, and 30MRWA wrote the plan to include the EPA and MDEP required planning elements.

*Note:* Information collected during the 2011 Parker Pond watershed survey forms the basis for much of the plan. As such, the *Parker, David, and Tilton Ponds Watershed Survey Report* (2012) is attached to the plan in Appendix A.

### Watershed Background

***Location and Physical Characteristics:*** Parker Pond is a 1524-acre waterbody within the 30 Mile River Watershed in Central Maine, northwest of Augusta, spreading across the four towns of Chesterville, Fayette, Mount Vernon, and Vienna in Franklin and Kennebec Counties (Figure 1). The lake has a direct watershed of 6.3 square miles, an average depth of 31 feet, a flushing rate of 0.3 times/year, and above average water quality with moderate dissolved oxygen depletion in deep areas. In 2018 the MDEP placed Parker on its list of *Nonpoint Source Priority Watersheds* due to sediment chemistry (described in “Threatened Status” below). Parker has no known invasive aquatic plant infestations.

***Public Uses and Values:*** Parker Pond is vital to the economy and quality of life in the surrounding towns. Parker has about 230 developed lakefront properties, and taxes from these properties contribute significantly to the towns’ incomes. The lake is a valuable resource for the general public, many of whom use it for fishing, swimming, primitive camping, canoeing, kayaking, cross-country skiing, snowmobiling, and ice fishing. Parker has public access at two locations: a public boat launch owned by the Town of Vienna, and a public hiking trail on a 142-acre conservation easement abutting the lake. There are about a dozen state-owned islands, four of which have free public campsites, established in 2009 by the Maine Bureau of Parks and Lands, with the support of the PPA, and maintained by PPA. Parker Pond attracts a large number of kayakers and canoeists and those users have increased significantly in recent years, as Parker is one of the few lakes in central Maine that provides opportunities to paddle along a large expanse of pristine, undeveloped shoreline. The bass fishery is considered excellent; the Maine Department of Inland Fisheries and Wildlife stocks salmon and brook trout to supplement natural reproduction.

# PARKER POND WATERSHED

## Chesterville, Fayette, Mt. Vernon & Vienna, Maine



**Summary Figure 1:** The Parker Pond Watershed spans across Chesterville, Fayette, Mount Vernon, and Vienna, Maine.

PPA was founded in 1955. For 63 years, the association has been working to care for the natural resources and beauties of Parker Pond, as well as maintaining and operating the dam it owns at the Parker Pond Outlet Stream. PPA organizes a variety of stewardship activities throughout the year.

Since its founding in 2008, the 30MRWA has collaborated with the PPA to protect the lake, and provides services including water quality monitoring, courtesy boat inspections and Youth Conservation Corps (YCC) projects. These programs have all been very successful. The water quality monitoring program tracks long-term trends, which ultimately will guide future action to prevent further decline in water quality. YCC has worked on 27 properties around Parker Pond to reduce erosion and safeguard water quality, installing numerous Best Management Practices (BMPs) for landowners.

In 2012, 30MRWA conducted a watershed survey to identify and document potential erosion threats to water quality. This project was supported by an U.S. EPA Clean Water Act 319 grant and is described below. In 2014, 30MRWA received a second 319 grant to remediate high-priority NPS sites, also described below.

## IDENTIFICATION OF THE CAUSES OR SOURCES OF THE NPS THREAT

### Water Quality Summary

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Water quality data has been collected on Parker Pond since 1976. Until 2016, data was collected by volunteers, with occasional baseline sampling conducted by DEP staff. In 2016, 30MRWA began overseeing water quality monitoring efforts. Monitoring parameters include Secchi Disk Transparency (SDT), dissolved oxygen (DO), temperature, phosphorus, alkalinity, color, conductivity, pH and Chlorophyll-a (Chla). Data is collected bi-weekly, May-October. There are 41 years of basic chemical information in addition to SDT. DEP summarizes Parker Pond water quality as follows, based on data through 2016:

DEP considers water quality of Parker Pond to be above average, based on measures of SDT, total phosphorus (TP), and Chla at Station 1. The potential for nuisance algal blooms on Parker Pond is low. Parker Pond is a relatively clear lake (average color 10 SPU) with an average SDT of 7.2m (23.6 ft). The range of epilimnion core TP for Parker Pond is 5 - 13 parts per billion (ppb) with an average of 7.9 ppb. Chla ranges from 1.5 – 3.6 ppb with an average of 2.5 ppb. Recent DO profiles show moderate DO depletion in deep areas of the lake.

Although Parker has had above average water quality, in 2016, sediment chemistry analysis showed that the lake is vulnerable to the release of sediment-bound phosphorus, discussed in the “Threatened Status” section below.

Gloeotrichia, a cyanobacteria or colonial blue-green algae, is also a known threat to Parker Pond water quality. Blooms have started occurring in higher densities and earlier in the summer season. During the fall and winter, gloeotrichia lies dormant in the sediment. With the correct light conditions, gloeotrichia will incorporate phosphorus that was previously “locked” in the sediment. As gloeotrichia moves into the water column, it will release this previously unusable phosphorus into the water. Similarly, gloeotrichia colonies convert dissolved nitrogen from the atmosphere into a usable form. This release of nutrients increases the phytoplankton population and subsequent algal blooms. Additionally, if large amounts of gloeotrichia are present, they can produce the toxin microcystin-LR, which negatively influences aquatic organisms and poses risks to human health.

## Threatened Status

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Parker Pond currently meets state water quality standards. However, it is listed on the MDEP's *Nonpoint Source Priority Watersheds* List. The purpose of the list is to encourage NPS abatement work in vulnerable watersheds, to prioritize DEP NPS water pollution control efforts, and to attract local communities to take action.

Parker Pond was placed on the *NPS Priority Threatened Watersheds List* in 2018 because it was identified by MDEP as being sensitive due to sediment chemistry. Aluminum to iron and aluminum to phosphorus ratios within lake sediment can indicate whether or not a lake is more vulnerable to the release of sediment-bound phosphorus, which can lead to internal phosphorus recycling. This detrimental process releases phosphorus from sediments, fueling algae growth and creating a destructive positive feedback loop. Lakes with sediment having ratios of aluminum to iron less than 3:1 and aluminum to phosphorus less than 25:1 are more vulnerable. Sediment data collected in 2016 show that Parker Pond's sediment aluminum to iron ratio is 1.6 and aluminum to phosphorus is 31.3. With the aluminum to iron ratio being met and aluminum to phosphorus being close to the chemistry vulnerability threshold, and the development in the watershed, Parker Pond was added to the *NPS Priority Threatened Watersheds List*.

## Watershed NPS Threats

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Like many other lakes in Maine, Parker Pond's water quality is threatened by phosphorus enrichment. Phosphorus is the nutrient that controls the level of algae production in lakes. Small increases in phosphorus cause lake algae populations to increase and water clarity to decline. High levels can cause dense algae blooms, which can also create a biological and chemical reaction that depletes the oxygen from the bottom of the lake and results in the loss of cold water fisheries.

Phosphorus, which is typically attached to soil particles and organic matter, mostly reaches the lake in the stormwater runoff from the lake's watershed. Phosphorus runoff increases significantly in developed landscapes. Stormwater flows across roads, driveways, residential properties and other developed areas and picks up phosphorus in a soluble form or attached to eroded soil particles. MDEP monitoring in paired watersheds found that phosphorus export from the developed watershed was up to 10 times greater than the forested one (Dennis, 1985).

Shoreland development and the resulting NPS pollution are among the biggest threats to Parker Pond and the 30 Mile River Watershed, of which Parker Pond is a part. Development in neighboring watersheds has led to increased phosphate loads and severe algae blooms in those lakes. Parker faces the same prospect unless concerted action is taken to prevent it.

Most of the development on Parker Pond occurred before current shoreland zoning laws were in place and as a result, residential developments have small lots, structures next to the water and limited shorefront buffers. Many septic systems are likely aging and of doubtful effectiveness, yet not monitored or regulated. New development continues, both on the shorefront and in the upper parts of the watershed. Unmonitored logging is also a concern.

There are many private camp roads throughout the watershed, most located very near the lakes, with potential for delivering high phosphorus and sediment loads. Most of these roads were poorly designed for limited seasonal use, though now are used year-round, with much higher traffic. The majority of the roads are not well maintained. The increased frequency of intense rain events as result of climate change poses another serious threat, with increased erosion and culverts and ditches not designed to accommodate the large flow of water.

Internal phosphorus loading poses another threat to the lake ecosystem. Internal loading is the process by which phosphorus is released from lake sediments. Internal loading often represents the greatest source of phosphorus to lakes in the summer, when anoxia occurs in the deepest parts of the lake. Phosphorus binds to iron. During periods of anoxia, iron is reduced and more easily dissolved in water, causing phosphorus to be released into the water and become biologically available. With the correct conditions, a great amount of phosphorus can be released into the lake, causing water quality to significantly decline. However, as waters become re-oxygenated, the iron re-precipitates into the water and can once again bind to the phosphorus.

In 2011, 30MRWA conducted a watershed survey to identify sources of phosphorus to Parker Pond. This work was funded in part by an EPA Section 319 Clean Water Act grant and supported by various groups including the Towns of Chesterville, Fayette, Mount Vernon, and Vienna, PPA, MDEP, and the Kennebec County Soil and Water Conservation District (KCSWCD). The survey followed MDEP guidance described in *Volunteer Lake Watershed Surveys: How to Conduct a Nonpoint Source Phosphorus Survey* (MDEP, 2011). The project was managed by 30MRWA, and technical support was provided by the KCSWCD and MDEP staff.

With the help of 26 volunteers and 10 technical advisers, 30MRWA surveyed nearly all developed areas within the watershed and documented soil erosion sites, identifying 46 sites that are impacting or have the potential to impact water quality on Parker Pond (Table 1). Data collected included type of land use, a description of the problem, and the level of impact on water quality (Figure 2). Teams also recommended solutions to fix each erosion source, along with estimates of the cost and technical level required to do so (Figure 3). The collected data were entered into a database and the documented erosion sites were plotted on a map. These survey findings, including maps and figures, were summarized in the *Parker, David, and Tilton Ponds Watershed Survey Report* (2012, Appendix B).

Twenty-seven of these 46 total sites were identified as high or medium impact, due to site size, slope, amount of soil eroded, and proximity to the water. The greatest problems were associated with residential properties (14), private roads (13), and driveways (9). The remaining problems were associated with town roads (4), boat accesses (3), trails/paths (2), and right of way (1). Aside from soil erosion, no other significant sources of phosphorus were observed during the survey.

Since completing this survey, 30MRWA has utilized the YCC to mitigate priority erosion issues and install conservation practices at 12 sites. 30MRWA also began mitigating erosion on gravel camp roads, one of the biggest sources of polluted runoff, adding large amounts of phosphorus to lakes, streams, and ponds. As part of 319 grant-funded project, from 2014-2016, 30MRWA worked with local stakeholders to improve eroding private gravel roads by designing and implementing BMPs at six high priority sites, and providing road management plans and technical assistance to improve three gravel roads. 30MRWA conducted three well-attended road maintenance workshops. As a result of this work, it is estimated that the annual pollutant loading to the lake was reduced by an estimated 70 tons of sediment and 59 pounds of phosphorus per year.

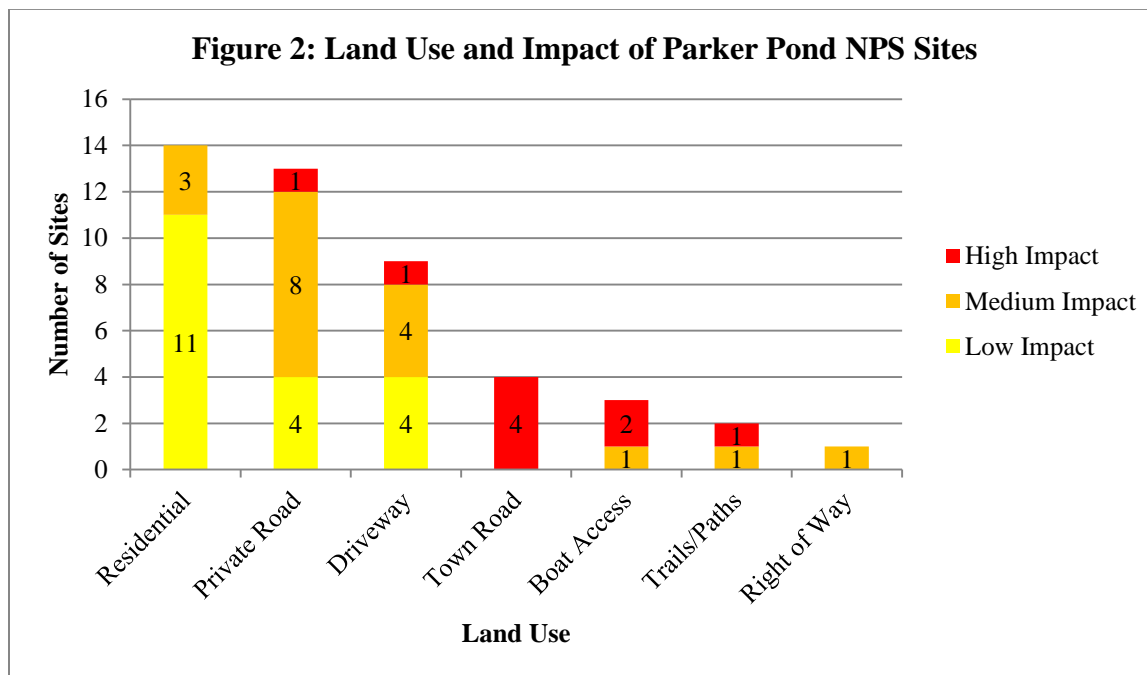
In the fall of 2017, 30MRWA collaborated with the Land Use class at the University of Maine at Farmington (UMF) to survey 13 roads surrounding Parker Pond. Of these roads, five (5) problem sites were identified, most of which had more than one problem associated with them. Four (4) of the sites lacked or did not have an adequate ditch. Three (3) of the sites had inadequate surfaces (i.e., crowning, pitch, elevation, materials). One (1) of the sites had a broken culvert. The following roads demonstrated erosion sites: Arnold Road, Dolloff Woods Road, Fellows Cove Road, and Quimby Lane.

There are currently 41 known NPS sites in the Parker Pond watershed and they are listed in Appendix A: NPS Sites.

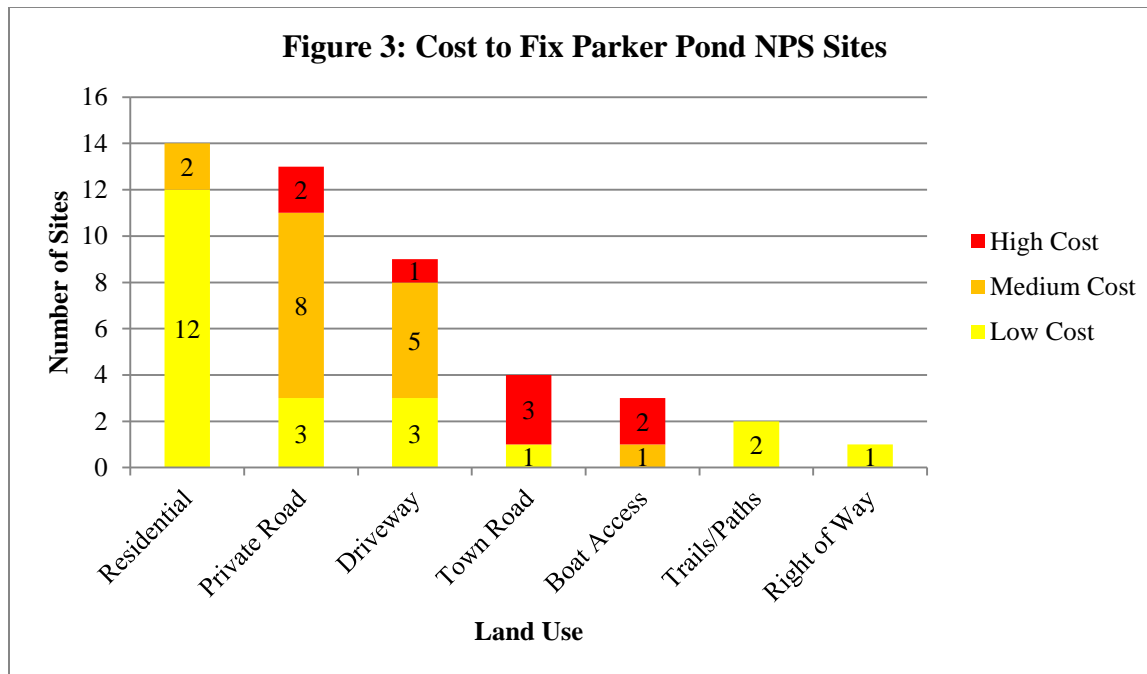
**Table 1: Land Use and Impact of Parker Pond NPS Sites**

Land Use	High Impact	Medium Impact	Low Impact	Total Sites
Residential	0	3	11	14
Private Road	1	8	4	13
Driveway	1	4	4	9
Town Road	4	0	0	4
Boat Access	2	1	0	3
Trail/Path	1	1	0	2
Right of Way	0	1	0	1
<b>Total</b>	<b>9</b>	<b>18</b>	<b>19</b>	<b>46</b>

*Data from the 2011 Watershed Survey*



*Data from the 2011 Watershed Survey*



Data from the 2011 Watershed Survey

## WATERSHED PLAN GOALS AND OBJECTIVES

**Overall Goal:** The overall plan goal is to maintain or improve Class GPA water quality standards in Parker Pond by reducing phosphorus and sediment loading to the lake. This will be achieved through the following actions over the coming ten year period (2018-2028):

- **Reduce current sources of phosphorus loading** by fixing the majority of the 46 sites identified in the 2011 watershed survey and 5 sites identified in the 2017 camp road survey. This will be achieved by providing targeted outreach, technical assistance, cost-sharing assistance and the services of the YCC to install conservation practices at NPS sites identified in the watershed survey.
- **Prevent new sources of phosphorus loading** by facilitating improved land use practices and ongoing maintenance activities. This objective will be met by conducting outreach and providing technical assistance to residents, road associations, and municipal officials.
- **Build local capacity** for watershed stewardship through collaboration between the 30MRWA and the PPA to expand the volunteer base through the creation of a LakeSmart team and raise funds for mitigation work. Continue to work with town officials to promote BMPs for roadwork.
- **Conduct ongoing assessment of lake and watershed conditions** by monitoring lake water quality and maintaining the NPS Site Tracker.

## SCHEDULE AND MILESTONES TO GUIDE PLAN IMPLEMENTATION

### Action Plan and Schedule

30MRWA developed action items, an estimated proposed schedule, and milestones in order to prevent new NPS problems and address existing NPS sites with the highest impact and phosphorus loading to Parker Pond. Other actions in the plan were included because they have proven to be cost-effective and successful in the region.

The plan is designed to be implemented over a ten-year period and a proposed implementation schedule is provided for key functions in Table 2. Table 3 shows specific action items, the timeline, key partners and potential funding sources. The plan will be carried out, in large part, with local funding and resources. However, state and federal funding will also be sought to help implement some actions in the plan.

**Table 2: Implementation Schedule**

Year(s)	Key Functional Activities
<b>2018</b>	<p><b>Funding and Administrative</b></p> <ul style="list-style-type: none"> <li>• Apply for EPA Section 319 Clean Water Act grant through MDEP</li> <li>• Provide matching funds for camp road management plans</li> </ul> <p><b>Monitoring and Assessment</b></p> <ul style="list-style-type: none"> <li>• Revisit past YCC project sites to assess status</li> <li>• Complete survey of camp road conditions, documenting water quality threats</li> <li>• Survey camp road residents about road conditions, associations, needs and challenges</li> <li>• Develop database of camp road associations</li> </ul> <p><b>Outreach</b></p> <ul style="list-style-type: none"> <li>• Conduct camp road workshop(s)</li> </ul>
<b>2019-2020</b>	<p><b>Funding and Administrative</b></p> <ul style="list-style-type: none"> <li>• Conduct EPA 319 project (if funded) with targeted cost sharing and matching grants for remediating priority sites</li> </ul>
<b>2018-2028</b>	<p><b>Funding and Administrative</b></p> <ul style="list-style-type: none"> <li>• Raise funds for ongoing stewardship (30MRWA and PPA)</li> </ul> <p><b>NPS Implementation</b></p> <ul style="list-style-type: none"> <li>• Install BMPs at NPS sites to reduce sources of P</li> <li>• Conduct site visits and maintain NPS site tracker</li> <li>• Form LakeSmart team and conduct LakeSmart evaluations</li> </ul> <p><b>Monitoring and Assessment</b></p> <ul style="list-style-type: none"> <li>• Conduct water quality monitoring, including adding gloeotrichia monitoring in 2018</li> <li>• Complete YCC projects and revisit sites to ensure BMPs are functioning properly</li> </ul> <p><b>Outreach</b></p> <ul style="list-style-type: none"> <li>• Use PPA annual meetings and newsletter to educate members, and town newsletters to educate residents</li> </ul>

**Table 3: Action Items and Milestones**

<b>Action Items and Milestones</b>	<b>Schedule</b>	<b>Who</b>	<b>Potential Funding Sources</b>
<i>Reduce current sources of P loading to the lake by addressing NPS sites identified in the watershed and camp road surveys</i>			
Install BMPs at NPS sites (attempting to address all known sites)			
Driveway sites (9 sites)	2019-2021	Landowners, 30MRWA (YCC)	Private, EPA (319)
Residential sites (13 sites)	2018-2022	Landowners, 30MRWA (YCC)	Private, EPA (319)
Private road sites (13 sites)	2019-2021	Road Associations	Private, EPA (319)
Town road sites (4 sites)	2019-2021	Towns	Town, EPA (319)
Other sites (2 sites)	2019-2021	Landowners, YCC	Private, EPA (319)
<i>Prevent new sources of phosphorus loading to the lake</i>			
Inspect construction and logging sites	2020-2028	30MRWA, Towns	30MRWA, Towns
Hold tours to highlight conservation practices	2019-2028	30MRWA, PPA	30MRWA, PPA, EPA (319)
Work with road associations and town officials to prompt ongoing road maintenance	Ongoing	30MRWA	Town, 30MRWA
Track new development projects and new property sales; conduct outreach with landowners on lake-friendly practices	2019-2028	30MRWA, PPA, towns	30MRWA, EPA (319)
<i>Build local capacity for watershed stewardship</i>			
Apply for 319 Watershed Implementation Grant	2018	30MRWA	30MRWA
Form LakeSmart team	2019	30MRWA, PPA	30MRWA and PPA
Conduct LakeSmart evaluations (outreach & tech assistance)	2019-2028	30MRWA, PPA	PPA
Conduct PPA annual meetings, include educational component	Ongoing	PPA	PPA
Raise funds to support ongoing lake stewardship work	Ongoing	30MRWA, PPA	Private, Town
<i>Conduct ongoing lake and watershed assessment</i>			
Conduct lake water quality monitoring	Ongoing	30MRWA, PPA	30MRWA, PPA
Maintain NPS Site Tracker	Ongoing	MDEP	30MRWA
Complete septic system survey and inspections	2019-2020	30MRWA	Maine Outdoor Heritage Fund

## Plan Oversight and Partner Roles

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The Plan will be carried out by the 30MRWA with support from the PPA. Partners will include MDEP, the Towns of Chesterville, Fayette, Mt. Vernon and Chesterville, the KCSWCD, private road associations and landowners.

- **30MRWA** will oversee plan implementation; provide technical assistance; promote watershed stewardship through its website, newsletters and presentations; work with the towns to provide property inspections and buffer delineation services for new development; conduct water quality monitoring. maintain the NPS Site Tracker to document new NPS sites and prompt ongoing maintenance; and collaborate with PPA to conduct outreach activities and raise funds for stewardship work
- **PPA** will support 30MRWA oversight at the Board level and provide volunteers to assist in implementation tasks through its standing Water Quality, Lake Usage, Stewardship and Communication Committees.
- **The towns, private road associations and landowners** will address NPS issues on their properties and conduct ongoing maintenance of BMPs.
- The towns of **Fayette, Chesterville, Mt. Vernon and Vienna** will provide funding support for plan implementation, such as 30MRWA's YCC and water quality monitoring, and also work to address NPS problems and conduct regular maintenance on town road sites.
- **KCSWCD** will provide technical assistance for YCC and LakeSmart programs and as needed.
- **Maine DEP** will provide technical assistance and provide the opportunity for financial assistance through the NPS Grants Program.
- **EPA** may provide Section 319 funds and guidance.

## Plan Outputs and Milestones

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### Organizational Outputs

- 30MRWA applies for 319 grant for Phase I project
- NPS Tracker updated regularly
- Revisit sites identified in the 2011 Watershed Survey
- Contact made with all property owners, road associations, and town officials with sites identified in watershed survey

### NPS Mitigation Outputs

Including currently identified and new sites:

- 10 NPS sites fixed by voluntary landowner initiative
- 15 NPS sites fixed by YCC
- 10 high and medium impact NPS sites fixed with cost sharing assistance
- 30 technical assistance and LakeSmart visits

## Water Quality Outcomes

- Continues to meet lake Class GPA standards set by MDEP over the next ten years (2018-2028)
- Stable or improved trend for lake water clarity (Secchi disk readings) and dissolved oxygen readings over the next ten years (2018-2028)
- Stable or decrease in total phosphorus levels over the next ten years (2018-2028)

## PROPOSED MANAGEMENT MEASURES

The *Parker, David and Tilton Ponds Watershed Survey Report* (Appendix B) lists specific management measures recommended for each of the NPS erosion problems identified during the survey. Typical problems and management measures for the most common land uses identified in the watershed survey are described in the sections below. Recommendations follow guidelines found in MDEP publications including the *Gravel Road Maintenance Manual*, *Conservation Practices for Homeowners* fact sheet series, and *Erosion and Sediment Control Manual*. The recommended BMPs accomplish the plan goal of reducing phosphorus and sediment loading to the lake by stabilizing bare soil and erosion and diverting, infiltrating or filtering polluted runoff before it reaches the lake.

In addition to structural BMPs recommended for each problem, public education and outreach efforts will also be needed to promote responsible stewardship and ongoing maintenance activities. The NPS Site Tracker will be maintained and used by the 30MRWA on an ongoing basis to document new problems and to prompt maintenance on sites fixed through the plan.

## Residential Shoreline Development

The watershed survey identified 14 residential erosion sites, including 3 medium impact and 11 low impact sites. One site was fixed in 2016. Residential areas (not including driveways) were associated with 30% of the identified sources of polluted runoff. While none of the problems were severe, when added together, these problems pose a threat to Parker Pond water quality. It is the cumulative impact of all the sites that ultimately causes water quality to decline.

Common problems included:

- Slight to moderate surface erosion
- Inadequate shoreline vegetation
- Roof runoff causing erosion
- Shoreline erosion
- Bare soil

Based on the survey results, recommended solutions include:

- Define and stabilize foot paths, add infiltration steps if steep
- Install runoff diverters
- Establish or enhance vegetation buffers
- Install dripline trenches, drywells, or rain gardens to catch roof runoff
- Stabilize bare soil with vegetation mulch
- Stop raking

## Private Roads and Driveways

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Unpaved roads and driveways are one of the biggest sources of pollution to Maine ponds. The watershed survey identified 13 private road sites and 9 driveway sites. They are discussed together since the management measures are similar for both. Impact ratings are relatively higher for these sites compared to other problems in the watershed. For private roads, there were 1 high impact, 8 medium impact and 4 low impact sites. Five of these sites were fixed in 2014-2015. For driveways, there were 1 high impact, 4 medium impact and 4 low impact sites. While a one-time fix may cost more up front, it will reduce pond pollution and reduce maintenance costs for roads, ditches, and vehicles.

The 2017 camp road survey conducted in collaboration with UMF yielded an additional 5 private road sites: 3 low impact, 1 medium impact, and 1 high impact.

Common problems include:

- Moderate to severe surface erosion
- Unstable culvert inlet and outlet
- Moderate shoulder erosion
- Clogged or crushed culvert
- Grader berm
- Undersized culvert or ditch
- Bare soil

Based on the survey results, recommended solutions include:

- Install runoff diverters, such as rubber razors, open top culverts, or water bars
- Crown and reshape the surface
- Add new surface material (gravel, recycled asphalt)
- Armor culvert inlet and outlet with rip-rap
- Rip-rap or vegetate road shoulders
- Replace crushed culverts and clean out clogged culverts
- Remove grader berm

The goal will be to attempt to address all road and driveway sites, using possible 319 grant funding to address higher impact sites. Targeted outreach and technical assistance will be provided to landowners and road associations associated with the remaining low impact sites.

Ongoing maintenance (e.g., grading, removing accumulated sediment from sediment basins and turnouts) is critical to long term performance of these BMPs and prevention of new NPS problems. As a result, the plan calls for periodic inspections of implemented BMPs, documented in the NPS Site Tracker. Follow up contact will be made by the 30MRWA to road associations and landowners with any maintenance needs.

## **Town Roads**

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Although there were only four town road sites identified in the watershed survey, all were classified as high impact, with three out of the four costing a high amount to fix. All four sites will be addressed.

Common problems included:

- Moderate to severe ditch erosion.
- Road shoulder erosion.
- Undersized ditch.

Based on the survey results, recommended solutions include:

- Reshape or armor ditches with stone.
- Remove debris and sediment from ditches.
- Replace or remove clog from culverts.

One high impact town road site is relatively complex and will require engineering support. The goal is to provide cost sharing assistance and engineering oversight to help the town with a site design and construction costs.

## **Other sites (i.e., boat access, trails and paths, right of way)**

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Six other erosion sites were identified around Parker Pond, four of which were fixed by YCC. Three sites were identified at the boat access (two high impact and one medium impact), two sites on trails and paths (one high impact and one medium impact), and one on a right of way (medium impact). Common problems included:

- Severe, moderate, and slight surface or shoulder erosion.
- Clogged culvert.
- Bare soil.
- Lack of shoreline vegetation.

Based on the survey results, recommended solutions include:

- Reshape or crown road.
- Install turnouts or remove debris and sediment from ditches.
- Remove clog from culverts.
- Install runoff diverter or infiltration steps.
- Define and stabilize foot path.
- Add mulch or erosion control mix.

## POLLUTANT LOAD REDUCTIONS

Pollutant load reductions will be estimated for many NPS sites to help demonstrate the value of BMPs to reduce the amount of sediment and phosphorus entering the pond. Pollutant load reductions will be estimated and reported to MDEP for any work funded by 319 grants. Pollutant load reductions will be made using methods approved and recommended by the MDEP and EPA. Preliminary estimates were already made during the watershed survey process of the pollutant loading prior to watershed mitigation efforts (Appendix B). These estimates can be used to further prioritize projects in the watershed.

## WATER QUALITY MONITORING RESULTS

Maine water quality criteria require that lakes and ponds have a stable or improving trophic state and be free of culturally induced algal blooms. 30MRWA will continue to monitor Parker Pond twice a month from May through October for parameters including SDT, temperature, DO, phosphorus, Chla, color, pH, alkalinity, and conductivity. MDEP trend reporting (positive, negative or stable) will assist in determining whether the plan meets its goal of having stable or improving water quality over time.