



BROADFORD LAKE REVENUESHED

PRELIMINARY ANALYSIS

University of Maryland Environmental Finance Center

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ENVIRONMENTAL
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Introduction

Purpose

The purpose of this project was to develop a preliminary revenue analysis to frame potential avenues to fund or finance projects that address excess phosphorus in Broadford Lake, located in Garrett County, Maryland. Revenue analysis, conceptualized by the University of North Carolina Environmental Finance Center (UNC EFC), seek to identify the full range of stakeholders that benefit from a healthy watershed. This approach expands the potential opportunities to implement projects that improve water quality. The revenue analysis framework can be used to cultivate accountabilities for all that contribute to a problem and benefit from a solution. An important function of identifying the users and beneficiaries of a water resource is to promote new discussions and collaborations among state and local governments and other stakeholders. The boundaries for a revenue analysis can be quite different from a watershed's physical boundaries. A revenue analysis extends to encompass the people that receive benefits from a water resource, which can include drinking water, flood control, or recreational opportunities.

For Broadford Lake, this approach considers who benefits from the lake having clean water. The revenue analysis could help partners assess various financing scenarios and the impacts of those scenarios on project selection. It could also help the partners determine whether other stakeholders should be at the table to develop the implementation plan. The unique characteristics of Broadford Lake's situation present specific challenges in terms of financing the implementation of water quality improvement projects. This report highlights questions that need to be answered before (or during) developing a more detailed plan, and it lays out topics to investigate further to understand the most promising and feasible funding and financing strategies for Broadford Lake. Looking at the lake's potential revenue is the first step that lays out what a more detailed implementation plan and accompanying funding and financing feasibility study should evaluate.

Problem Statement

Broadford Lake has elevated phosphorus levels that may induce harmful algae blooms (HABs) and reduce dissolved oxygen levels, which can negatively impact drinking water and aquatic life. In addition to the public health concerns of HABs, these water quality impacts may increase water treatment costs for the Town of Oakland and reduce fish populations.

Relevant documents for this issue that describe the state of the lake and its fishery and detail its pollution issues include the 2000 Total Maximum Daily Load (TMDL) document, the 2014 Garrett County Water and Sewer Master Plan, and the 2021 Broadford Lake Fisheries Report. A 2020 Travel/Tourism Related Economic Analysis for Garrett County, Maryland is also available, but it did not break down the data at a finer scale than the county level, so it is of limited use for determining Broadford Lake-specific visits to the area.

Knowns and Unknowns About Phosphorus Sources

There are no active point source discharges in Broadford Lake's drainage, so all incoming pollutants come from nonpoint sources (developed land, agriculture, etc) or atmospheric deposition. The remainder and apparent majority of nutrient loading in the lake comes from

sediment in the lake itself. Monitoring was conducted in 2022 to better understand the pollution sources and the mechanisms leading to harmful algal blooms (HABs) in the lake. The study results will help managers evaluate and prioritize the most appropriate and cost-effective treatment options in the future and enable the development of a more detailed financing strategy.

Challenges to this Revenueshed Analysis

More information is needed to understand the role that nonpoint sources could play in improving or maintaining water quality and to estimate the potential contributions of these sources to a funding and financing plan for the lake. If nonpoint sources are important to address going forward, those types of projects will require funding, technical assistance, and coordination support. These types of projects (such as agricultural or stormwater BMPs) can also expand the pool of potential funding sources to be applied to nutrient and sediment reduction efforts in the watershed (such as USDA Farm Bill cost-share money). Questions include:

- What are the relative contributions of different sources of nonpoint pollution compared to legacy pollutants stored within the lake? Do we have better information on this now compared to in the 2000 TMDL document?
- What role does nonpoint source reduction play in *maintaining* water quality in the lake over the long term (e.g. if treatments are implemented that remove phosphorus from the lake and/or that reduce the formation of HABs)?
- What is the potential reduction in nutrient runoff that could be achieved in the lake's watershed from agricultural BMPs? Is there a gap in private landowner BMP implementation?

Existing conservation finance tools such as water funds typically generate funds for nonpoint source reduction projects. Without knowing the importance of reducing land-based sources of nutrient inputs to the lake, it will be more difficult to allocate revenue to projects that address this aspect of the problem.

Brief Background

Broadford Lake is owned and managed by the Town of Oakland, where it is the primary water supply for approximately 1,850 people. It is situated within the Little Youghiogheny River subwatershed and the Youghiogheny River watershed. The lake was created by installing a dam in 1971 for flood control, water supply, and recreational purposes. It has a surface area of approximately 140 acres or 0.5 km² and a drainage area (watershed) of 4,352 acres or 19 km². Many streams and lakes in the region are listed as impaired by the Maryland Department of Environment (MDE) via their Integrated Report, which is a water quality assessment report required by the Clean Water Act (CWA). Broadford Lake was added to the list due to water quality problems related to nutrient pollution in the late 1990s, and a Total Maximum Daily Load (TMDL) for phosphorus was established in 2000. The average annual TMDL was set at 1,217 pounds per year, divided across nonpoint sources of pollution and the “margin of safety.” There are no point sources of discharge – regulated entities that would have water quality compliance obligations – in Broadford Lake's drainage basin other than the discharge from the drinking water treatment plant (State permit number 16DP3756 / NPDES permit number MD0071307).¹

¹ Permit information from <http://mes-mde.mde.state.md.us/WastewaterPermitPortal/> as of March 10, 2023.

The Broadford Lake Watershed Committee was formed to discuss the development of a plan to address the lake's phosphorus TMDL. The Committee includes representatives from the Town of Oakland, Garrett County, and private landowners in the area. Because there are no regulated point sources of pollution from which to achieve reductions, the plan will have to rely on voluntary activities to meet pollution reduction targets. The Western Maryland Resource Conservation and Development Council is acting as a facilitator of this process. The lake is facing other water resource management issues, such as dam safety and harmful algal blooms, that could be effectively leveraged in this planning process to address multiple issues at once.

Beneficiaries of Broadford Lake

Beneficiaries of clean water in Broadford Lake

The beneficiaries of clean water in Broadford Lake include residents in the Town of Oakland who depend on the lake for their drinking water supply, people who boat, swim, and fish on the lake, people who visit the lake to engage in other recreation like walking and picnicking, and the wildlife that live in and around the lake. People and infrastructure downstream of the lake benefit from the flood storage it provides. These beneficiaries, whether or not they live near the lake (i.e., people who visit from farther away), comprise most of the potential revenue for Broadford Lake.

There may be a wider range of beneficiaries to consider, such as the lake-related local economy (businesses that rent or sell recreational equipment, restaurants, gas stations, hotels, etc) as well as the people and wildlife who use water downstream from the lake. The larger watersheds in which Broadford Lake is located are attractive for tourism and recreation. More information about recreational users is needed to determine if these linkages are strong enough to include these beneficiaries in Broadford Lake's revenue, because it may be difficult to separate Broadford Lake's economic impact from that of other attractions in the region. A detailed analysis of lake visitors, including visitor surveys, could provide information on the number and type of visitors to the lake and where they live, as well as an estimate of their lake-related expenditures in the region. A study of this type was completed for Garrett County in 2020,² but such surveys and analyses for Broadford Lake by itself are beyond the scope of the current project.

EFC gathered data from ESRI Business Analyst to define the extent of recreational use through market data. ESRI Business Analyst is a powerful tool used in research and business reports to help determine, via consumer choices, what markets are active in specific regions. The data on recreation expenditures and sports and leisure market potential for the Oakland zip code show regional consumers' interest in various recreational activities (see Appendix A). This information on local recreation participation and expenditures is then compared to national averages. The data gathered for Oakland, Maryland indicates that households in the area spent approximately \$1.6 million in 2021 on recreation and more than the national average on boating (33%), hunting

² Deng, Jinyang, and Kathryn Gazal. Travel/Tourism Related Economic Analysis for Garrett County, Maryland. June 25, 2020. West Virginia University. https://publicinterestdesign.wvu.edu/files/d/4752eca6-34b5-4cc4-9357-eb0d7915c301/garrett-county-economic-impact-analysis_2019-2020.pdf

and fishing (22%), and water sports (43%). Over 10% of households participated in freshwater fishing, swimming, and camping, and more than 20% engaged in walking. The market potential index, a measure that compares households with national averages, indicates that household participation in boating (power), fishing, hunting, birdwatching, and camping is above the national average. Other nearby features and destinations, including Deep Creek Lake, likely have a strong influence on these results, but this data still helps demonstrate that the residents within Oakland value outdoor recreation (measured through participation and expenditures) similar to the opportunities provided by Broadford Lake. This type of information – on the recreational expenditures and willingness-to-pay of lake visitors specifically – could be used to support the development of future funding and financing mechanisms such as recreational fees or modified licensing fee requirements. Also, this is difficult to explore without knowing the practices that will be implemented and the resulting benefits. This type of change in fee structure should likely be a state-level consideration for raising revenue to address impaired water bodies beyond Broadford Lake. This is a larger undertaking not only as a study but as a state mechanism to help rural areas pool funds to address problems and is beyond the scope of this project.

Overview of impactors, benefitters, and stakeholders and their potential roles

Groups	Impact or Benefit?	Action?	Funding Role?
Town of Oakland	Beneficiary	Collect revenue, pay for utility operations and lake management	Manage revenue, pursue grants
Utility customers	Beneficiaries	Pay rates to Town	Revenue
Lake users	Beneficiaries	Pay fees	Revenue
Oakland taxpayers	Beneficiaries	Pay taxes	Revenue
Other regional recreational users	Potential beneficiaries	Pay fees	Revenue
Agricultural producers	Impactors	Implement BMPs	NRCS, FSA, MDA ³
Other landowners / residents within Lake’s drainage basin	Impactors	Uncertain	Uncertain
Garrett County	Uncertain	Uncertain	Uncertain

Other potentially relevant issues and interested parties

Funding sources are available to address other lake concerns, such as dam safety. The dam is classified as high hazard potential and a recent inspection in May 2021 rated it to be in fair condition.⁴ If the dam is rehabilitated, the funds for that work could be effectively leveraged in

³ NRCS: Natural Resources Conservation Service; FSA: Farm Services Agency; MDA: Maryland Department of Agriculture

⁴ Fair is defined as: “No existing dam safety deficiencies are recognized for normal operating conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take

this planning process to expand the potential sources of funding for sediment remediation or other project implementation that addresses in-situ phosphorous sources. Financial support may be available to the Town of Oakland through various dam-related funding programs. The Town of Oakland would need to coordinate with Garrett County and the state's Dam Safety Program to explore appropriate funding from the National Dam Safety Program or NRCS's Watershed Rehabilitation Program (REHAB).⁵

Funding and Financing Situation

Current financing mechanisms/revenue

The full cost of providing clean water is a challenge for small rural communities. User fees are a common way to provide services; at times, these can be adjusted to support projects that protect water quality. The Town of Oakland charges residents for water and sewer, collects fees for sewer connection permits, and assesses property taxes. The Town also charges fees to access Broadford Lake as well as to rent boats and pavilions. The potential revenue that could be generated by scenarios involving a utility rate increase, flat fee, or tax can be evaluated as part of a more detailed financing feasibility study; typical components of such a study are described in Appendix B. Scenarios to evaluate the potential revenue that could be raised for lake restoration by changing these recreational use fees can also be prepared in more detail to support the implementation plan. A precise set of recommendations would come after the Town chooses solutions to address phosphorus and understands their potential costs and benefits. Because this is a preliminary report, it is challenging to make tailored recommendations for funding and financing. This report identifies potential funding sources and suggests additional studies to determine a specific funding and financing arrangement. Since this is not an isolated situation (other small rural towns struggle with these clean water challenges) a state-wide or county-wide effort that pools resources could be beneficial.

Estimated funding needs

Rough estimates of the potential costs of treatment/remediation and any non-point source reduction activities are needed to prepare a realistic funding and financing strategy. These estimates should consider potential long-term operations and maintenance needs as well as staffing, administration, and other costs.

An important complement to funding is capacity within the municipal utility and Town as well as across the watershed. Capacity changes may be necessary depending on the solution to the phosphorus problem selected. Capacity includes the number of staff needed at the water utility and partner organizations as well as their level of knowledge about the range of tasks and projects that are needed to improve and sustain lake water quality. Managing entities will need to maintain adequate staffing levels to continue delivering safe drinking water to the Town and potentially expand their capacity in the future to meet more complex needs. Staff may also need additional training to implement and monitor the selected source water protection or lake

further action.” Definition and inspection report from: Dam Safety Inspection, Little Youghiogheny Site 6 (Broadford) (Garrett County, MD). <https://data.rgj.com/dam/maryland/garrett-county/little-youghiogheny-site-6-broadford/md00036/>.

⁵ FEMA. Rehabilitation Of High Hazard Potential Dam (HHPD) Grant Program. <https://www.fema.gov/emergency-managers/risk-management/dam-safety/rehabilitation-high-hazard-potential-dams>.

treatment strategies. Institutional knowledge about the nuances of managing Broadford Lake and the drinking water utility needs to be documented to facilitate the transfer of this information, should new employees be added. The Town may need to intensify water quality monitoring activities or start tracking additional system performance metrics to enable successful adaptive management of the situation. Finally, staff may need additional training or external support to assist with the preparation of funding and financing applications and the administration of grants and loans.

Potential funding and financing options

The most appropriate and feasible funding opportunities can be narrowed down once more information is available on the preferred course of action to address Broadford Lake's water quality issues. The types of technology and projects needed over time can help determine the combination of sources of funding and financing that should be pursued. This section provides an overview of potential options. One factor to keep in mind as these strategies are evaluated is whether an expense is infrequent or reoccurring, such as one-time capital costs versus ongoing maintenance and operational costs. Funding options like grants and loans are better suited for occasional large expenses while more steady, predictable revenue sources are better for supporting ongoing activities or paying back loans (debt service). The matching funds requirements of grants should also be considered.

- Federal and state grant and loan funding
Grants may be the most important – and substantial – source of funding for implementing treatment/remediation strategies within the lake itself. Grants are typically used for specific larger projects rather than ongoing operating costs or recurring maintenance needs, although they can sometimes be used to support collaborative watershed planning activities. Low-interest loans, such as those available through the Drinking Water Revolving Loan Fund (DWRLF) administered by Maryland Department of the Environment, can also help with capital costs; financing packages may incorporate some level of principal forgiveness to maintain affordability for ratepayers. State and federal funding for dam rehabilitation (such as NRCS PL-566) or hazard mitigation might be leveraged into lake restoration work as well.
- Voluntary land management program enrollment
This funding opportunity involves recruiting private property owners or tenants to enroll in state or federal programs, such as Farm Bill programs, that provide cost-share funding and technical support to implement agricultural and other best management practices (BMPs) that can reduce nutrient and sediment runoff while improving productivity or restoring wildlife habitat. Rather than raising funds, this approach seeks to take advantage of available funding within a targeted geography. Watershed groups can also work with program managers at state and federal agencies to allocate additional funding or develop geographically focused applicant pools to better meet local needs and improve the likelihood of applicants receiving support; this may require submitting a proposal or developing a memorandum of understanding (MOU) with agency partners. This has been done in other watersheds via NRCS (such as the National Water Quality Initiative (NWQI) or Regional Conservation Partnership Program (RCPP)) and the USDA Forest Service; NRCS would likely be a more appropriate partner agency for Broadford Lake.

Successful use of this strategy as part of meeting the lake's water quality goals will require well-supported and consistent outreach and engagement efforts by trusted local organizations such as soil conservation districts, extension agents, and/or conservation organizations.

- Drinking water rates and wastewater rates
Increasing rates charged to drinking water and/or wastewater customers is a valid and sustainable (stable over a longer period of time) approach to financing utility operations, source water protection, and capital project costs. The collection mechanism is already in place, which would ease the logistical challenges that come with establishing a new fee, although administrative and legal changes may be required to ensure that the additional funds raised are directed to the desired purpose. Spreading a cost out across the customer base can help reduce the per-household impact of a rate or fee increase.
 - Charging customers different rates for different types and volumes of water use is a common strategy for covering the full costs of water provision and system operations while minimizing impact to residential customers. If the Town anticipates larger water users such as industrial facilities are on the economic development horizon, a more detailed rate structure and customer class study should be undertaken to ensure that adequate revenue is obtained to cover operations.⁶ An example of this type of process can be found in Appendix B.
 - The potential gains in revenue that a rate change would yield is a specific study separate from the scope of this project. In addition, a fee adjustment may not be popular with residents; structuring the rate changes and engaging in effective community outreach to educate residents can be challenging for municipal governments. In lieu of the state or county directing funds to treat Broadford Lake, the local government will be tasked with this challenge.

- Property taxes
Raising property taxes is another way to finance water quality-related projects while spreading the cost out across many taxpayers. This mechanism's potential could also be assessed as part of a more detailed funding and financing feasibility study to determine if the potential revenue gains would be worth the effort involved to raise property taxes, which is typically an unpopular issue among residents.

- Recreational user fees
Increasing the fees charged to Broadford Lake visitors and/or identifying new pools of recreational visitors from which to raise funds is another source of revenue to be explored further. Raising fees for the current set of lake users would likely involve the same administrative arrangement, reducing the transaction cost of using this revenue source to support lake restoration efforts. The potential revenue that could be raised by increasing user fees can be assessed as part of a more detailed funding and financing feasibility study.

⁶ See Appendix B for an example of the steps involved to undertake a drinking water program study. A process like this could be followed for a water utility rate structure evaluation or study.

- EFC compared Broadford Lake’s allowed uses and fee structure/schedule with those of nearby lakes.⁷ Most lakes in the region are owned and managed by the state and many are the basis of state parks. The most comparable lake in size, purpose, and management to Broadford Lake is Piney Reservoir (also known as Frostburg Reservoir). It is located approximately 30 miles northeast of Broadford Lake near the Pennsylvania border. It serves as the water supply for the town of Frostburg. Fishing and ice fishing are allowed but boating is not. It appears that the town does not charge fees to access the shoreline or fish.
- Regional partnerships
For struggling water systems looking to improve efficiency and maintain compliance, regionalization⁸ is commonly recommended. This is a process by which individual water systems consolidate their operations, maintenance, and/or financial management. Regionalizing can improve operational efficiency, achieve economies of scale, and offer financial stability and greater access to capital. These arrangements can range from small-scale collaborations around shared services, procurement, and staffing to more complex and comprehensive intergovernmental agreements with enhancement and expansion of the system. The options to develop regional partnerships are diverse and customizable. As Broadford Lake’s future management needs are clarified, these options can be explored in greater depth to determine if and how partnership arrangements can be structured to be useful and appropriate. The Broadford Lake Committee needs to narrow down its preferred treatment options so that rough cost estimates and implementation needs can be factored into an actual implementation plan that lays out funding/financing and logistical (including any necessary partnership arrangement) options.

Recommendations and Next Steps: What is needed to undertake a detailed funding and financing feasibility study and develop revenue scenarios?

Determination on the practices needed and rough estimates of the potential costs of treatment/remediation and any non-point source reduction activities are needed to prepare a realistic funding and financing strategy. These estimates should consider potential long-term operations and maintenance needs as well as staffing, administration, and other costs. With those general pollution treatment and program management needs to be laid out, the development of a pollution reduction implementation plan can be supported by preparing more specific funding and financing scenarios based on different combinations of revenue streams.

At a minimum, a funding and financing feasibility study should be undertaken to complement the Committee’s preferred treatment/remediation options that assess the potential revenue that could be raised by water rate and lake user fee increases. The potential partnership and collaboration opportunities that are needed to implement the Committee’s preferred treatment/remediation options should be assessed further as well. Important questions and other

⁷ While information on lakes’ allowed activities and fees are easily found online, details on revenue, spending, and management costs are not typically available without conducting a more in-depth investigation.

⁸ Additional resources on regional partnerships can be found on the University of North Carolina Environmental Finance Center’s website: <https://efc.sog.unc.edu/resource/utility-regionalization-and-consolidation/>.

issues to be considered by the Committee and the state, which will narrow the focus of the implementation plan and funding and financing feasibility study include:

- What are the potential treatment solutions to meet the TMDL and address the sources/mechanisms of HABs?
 - In-lake strategies: nutrient removal vs HAB control; at the drinking water intake/plant: raw water treatment needs
 - Would the lake remediation solutions be essentially one-time or need to be repeated? What application and effectiveness timelines apply to nutrient removal vs HAB interventions?
 - What is the range of estimated needs/costs of in-lake remediation and long-term maintenance over the chosen planning horizon/time period?
 - Potential land-based/upstream pollution reduction solutions
 - What is the gap/target in nonpoint source pollution reduction for major land use/landowner types in the lake's watershed? How much of this can be achieved with things like agricultural BMPs? How much funding (and technical assistance (TA) and outreach) is needed to accomplish those activities?
 - Can we better understand the role of different nonpoint source reductions in addressing the issue?
 - agricultural
 - residential
 - stormwater
- Recreational user studies
 - Such a study would need to obtain more detail on who uses Broadford Lake, whether there are downstream recreational water quality benefits, etc.
 - A willingness-to-pay (WTP) survey or willingness to accept fee increases would inform the feasibility of this potential path.
- Where else have these problems been addressed (especially where recreational use/fishing has been involved)?
 - In places with similar problems, what was the cost of remediation? How did they fund/finance the projects and programs?
 - One example of a watershed funding and finance mechanism that uses a revenueshed approach (although that term is not used specifically) is water funds. A recent project that the UMD EFC team completed is the Brandywine Christina Healthy Water Fund⁹ which is now capitalized as a Revolving Water Fund.¹⁰
- How much new development is expected in the watershed and region -- is there any potential for adding fees there? A brief review of the County's and Town's water and sewer plans can inform whether this option is investigated further.
- What is the potential for directing more state and federal cost-share funding for land-based pollutant reductions such as BMPs to the watershed?

⁹ University of Delaware Water Resources Center. Brandywine-Christina Healthy Water Fund. <https://www.wrc.udel.edu/research/brandywine-christina-healthy-water-fund-2/>

¹⁰ I2Capital. Brandywine-Christina Revolving Water Fund. [https://www.revolvingwaterfund.com/water-funds-bird-](https://www.revolvingwaterfund.com/water-funds-bird-1)

- *Note:* This will be important for reducing nutrient and sediment inputs over time, because any preventable land-based sources of pollution will otherwise continue to add to the lake’s pollutant load. However, source reduction is unlikely to make a significant impact on the legacy nutrients currently stored within lake sediments.
- If and when dam repairs take place, how can that opportunity be leveraged for water quality purposes?
- What types and forms of regional collaboration and partnership are needed to implement the management plan successfully and sustainably? What is Garrett County’s role now and in the future? The County could consider entering into agreements with the Town to implement projects or to help pursue and administer grants or loans.
 - The appropriate collaborative arrangements and discussions about regionalization can be determined after the Committee has prioritized its preferred treatment options for the lake. For example, if land-based pollution reductions are part of the pollution reduction strategy going forward, informal or formal partnerships with the agricultural community and relevant agencies will be useful. Regionalization would be part of a broader discussion with the County going forward and it can be discussed in more depth if lake management challenges appear to remain significant into the future.
- Meet with the Town, NRCS, and Maryland Dam Safety Program to determine if it is feasible to leverage funding and project implementation of dam rehabilitation and in-situ projects for phosphorous remediation.
- What are the flood control benefits downstream of the dam? What is the value of these flood control benefits? Would it be possible to monetize these benefits and have the beneficiaries contribute to lake and/or dam restoration?
- Considerations for changing utility and recreational user rates/fees:
 - What is the process for raising rates/fees by different entities?
 - What is the history of rate setting and fee increases?
 - What affordability considerations apply to customers of this water system?
 - Who would administer the funds being directed towards remediation efforts? How would this work if funds were raised via rates/fees vs grants?
 - Are there any future rate or fee increases on the horizon? Can lake remediation funding be added at that time (to avoid needing to go back to utility boards, the public, etc)?

Anticipated challenges specific to this situation

- The worst of the problem *seems* to be confined to the lake. However, the quality of the lake water might impact downstream use, which is a cold-water fishery.¹¹ If this downstream fishery would be improved by addressing water quality in Broadford Lake, this would bring more beneficiaries into the equation to support restoration efforts.
- Small water user customer base (approximately 2,000 customers or less; the U.S. EPA defines a utility as “small” if it serves less than 10,000 people).
- Small watershed influencing and feeding into the lake (approximately 19km² or 4,300 acres), so there is less room for improvement by addressing land-based sources of pollution.

¹¹ <https://mde.maryland.gov/programs/water/tmdl/waterqualitystandards/pages/designatedusesmaps.aspx>

- Pollutant inputs to the lake are nonpoint in nature.
- The recreational user base that is specifically associated with Broadford Lake is likely small compared to the overall region's attractions; however, estimating this potential revenue source could be part of the funding and financing feasibility assessment as the next step.

Appendix A ESRI Business Analyst Data

Table 1 Recreation Expenditures

2021 Recreation Expenditures for Oakland, MD 21550				
Category	Activity	SPI	Average amount Spent	Total
Recreational Vehicles And Fees		100	\$ 113	\$ 627,405
	Docking and Landing Fees for Boats and Planes	97		
	Camp Fees	79		
	Payments on Boats/Trailers/Campers/RVs	133		
	Rental of Boats/Trailers/Campers/RVs	57		
Sports, Recreation and Exercise Equipment		95	\$ 171	\$ 943,607
	Exercise Equipment and Gear, Game Tables	86		
	Bicycles	89		
	Camping Equipment	65		
	Hunting and Fishing Equipment	122		
	Winter Sports Equipment	64		
	Water Sports Equipment	143		
	Other Sports Equipment	72		
	Rental/Repair of Sports/Recreation/Exercise	66		
Total				\$ 1,571,012

A Spending Potential Index (SPI) compares the amount spent for a product or service in your area to the U.S. average. Retailers can quickly identify and compare national and local customer preferences.

Data Note: The Spending Potential Index (SPI) is household-based, and represents the amount spent for a product or service relative to a national average of 100.

Detail may not sum to totals due to rounding.

Source: Esri forecasts for 2021 and 2026; Consumer Spending data are derived from the 2018 and 2019 Consumer Expenditure Surveys, Bureau of Labor Statistics.

Data retrieved from
ESRI 5/19/2022

Table 2 Sports and Leisure Market Potential

2021 Sports and Leisure Market Potential for Oakland, MD 21550		
Demographic Summary	2021	2026
Population	13,599	13,285
Population 18+	11,022	10,759
Households	5,533	5,415
Median Household Income	\$54,233	\$57,899
Product/Consumer Behavior	Percent of Households Participating	MPI
Participated in backpacking in last 12 months	2.5%	70
Participated in bicycling (mountain) in last 12 months	2.9%	76
Participated in boating (power) in last 12 months	5.1%	108
Participated in canoeing/kayaking in last 12 months	6.6%	99
Participated in fishing (fresh water) in last 12 months	15.3%	147
Participated in hiking in last 12 months	9.5%	75
Participated in horseback riding in last 12 months	2.3%	99
Participated in hunting with rifle in last 12 months	6.2%	167
Participated in hunting with shotgun in last 12 months	5.6%	178
Participated in jogging/running in last 12 months	6.4%	58
Participated in swimming in last 12 months	14.6%	92
Participated in walking for exercise in last 12 months	22.3%	88
Spent on sports/rec equip in last 12 months: \$1-99	5.6%	95
Spent on sports/rec equip in last 12 months: \$100-\$249	5.0%	96
Spent on sports/rec equip in last 12 months: \$250+	7.1%	102
Did birdwatching in last 12 months	5.6%	122
Went on overnight camping trip in last 12 months	13.8%	114

The Market Potential Index (MPI) is an index that uses the segment composition of a geography to estimate customer potential based on the segment penetration rates of a chosen product, service or lifestyle.

Appendix B Example: Steps Involved in a Comprehensive Drinking Water Program Study

A Step-by-Step Process for Evaluating a Comprehensive Drinking Water Utility Program

Based on a Process for Planning a Comprehensive Municipal Stormwater Management Program, Developed by the Environmental Finance Center (EFC) at the University of Maryland

The following steps provide general guidelines for a municipality when evaluating their drinking water program and its financial capacity. The EFC can lead municipalities in conducting each step in the process.

Technical process

Step 1: Conduct an assessment of current drinking water program through data gathering

- Gather all relevant written information from appropriate staff and contractors on the drinking water utility. This information may include all permits, memos, annual reports, existing policies and procedures, rate case information, and budget materials dating back at least five years where possible.

Step 2: Evaluate existing drinking water program structure, evaluate current capacity, and identify trends in funding levels

- Conduct in-depth interviews with appropriate departments, staff, and contractors such as planners, engineers, GIS personnel, water resources directors, etc.

Step 3: Begin to identify gaps in existing program and evaluate future needs

- Using information collected from steps 1 and 2, EFC will begin to develop a Level of Service (LOS) document that includes the measures recommended for maintaining and improving a comprehensive drinking water program, as well as other factors such as Operations & Maintenance, Water Quality/Quantity Management, Source Protection, Green Infrastructure, Program Leadership, Design, Engineering, & Enforcement, and Capital Improvements, and Training and Technology needs.

Step 4: Review LOS document with municipal/utility staff

- Meet with municipal/utility staff to determine where their current program fits into the LOS document, and what costs are associated with each element. Agreement will be reached in terms of final costs and recommendations about filling gaps in service.
- When meeting with municipal/utility staff, determine what needs to be put in place to meet any regulatory requirements and develop an estimation of all costs associated with providing the appropriate level of service.

Step 5: Develop proposed drinking water program budget for year one or recommend adjustments to existing program budget

- Based on steps 1-4, develop the LOS expenditures, categorized into the following: personnel costs, capital improvement costs, and operations & maintenance costs.
- Once the year one expenditures are estimated, send to municipal/utility staff for their review.
- After municipal/utility staff review and provision of feedback, finalize year one costs and then project costs for a minimum of five years.

Step 6: Retrieve rate structure and revenue data from municipal/utility staff

- The accuracy of EFC revenue estimates is dependent on the availability of good data.
- The following data is typically needed for analysis:
 - Total number of customers within service area by customer type/class (residential, commercial, industrial, and any other billing categories used by utility)
 - Water usage data by customer type/class

Step 7: Estimate revenues using information retrieved in step 6

- Conduct sensitivity analysis using various rate/fee structures.

Step 8: Meet with municipal/utility staff to review funding recommendations

- Discuss phasing in credits, incentives, and exemptions into the drinking water program if desired.
- Finalize revenues to match expenditure needs.

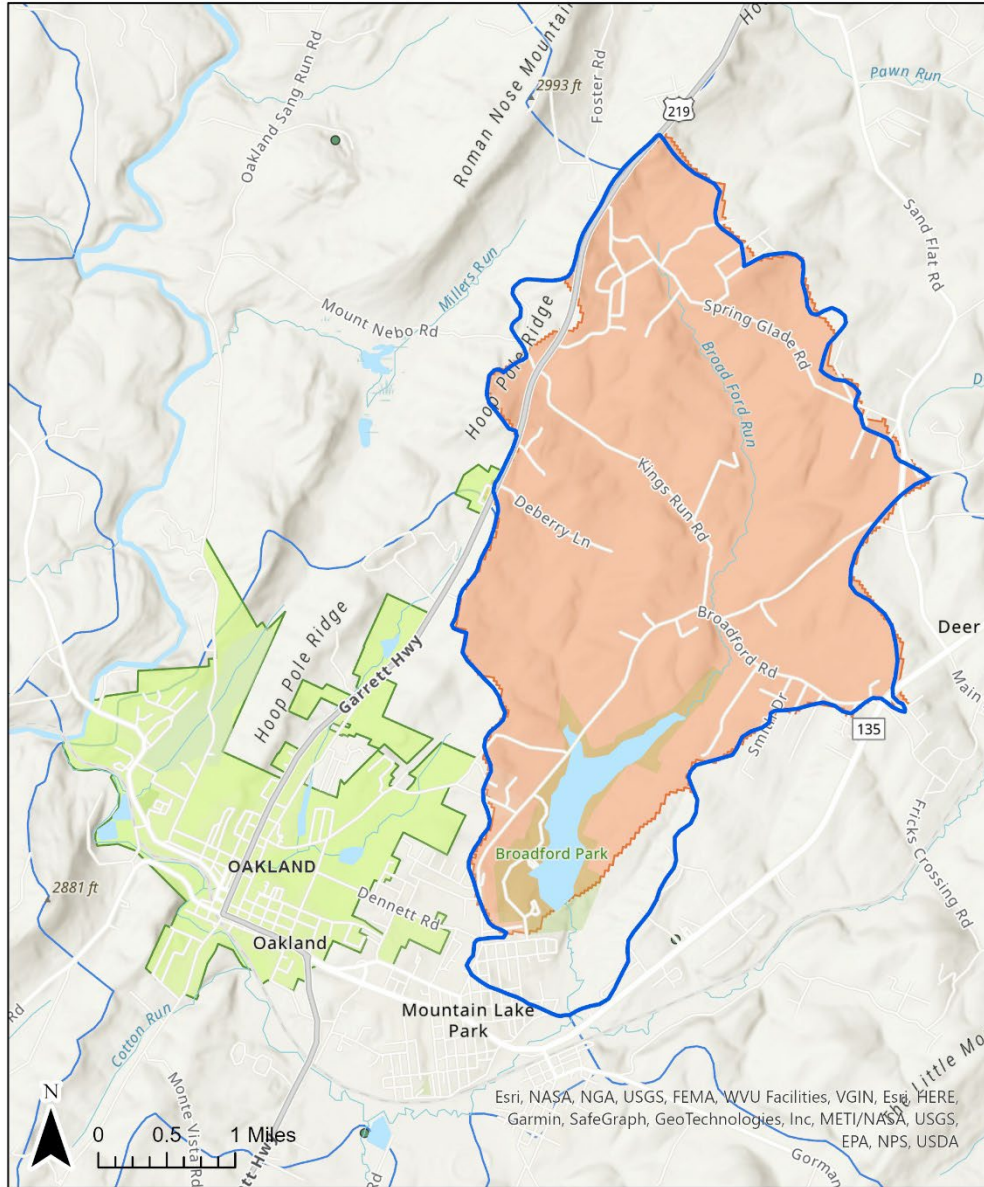
Step 9: Draft final report and share with the municipality for additional feedback

Step 10: Make recommendations to officials and communities

Optional: Consider developing and implementing a community outreach and engagement process if rate increases are anticipated

Appendix C Maps

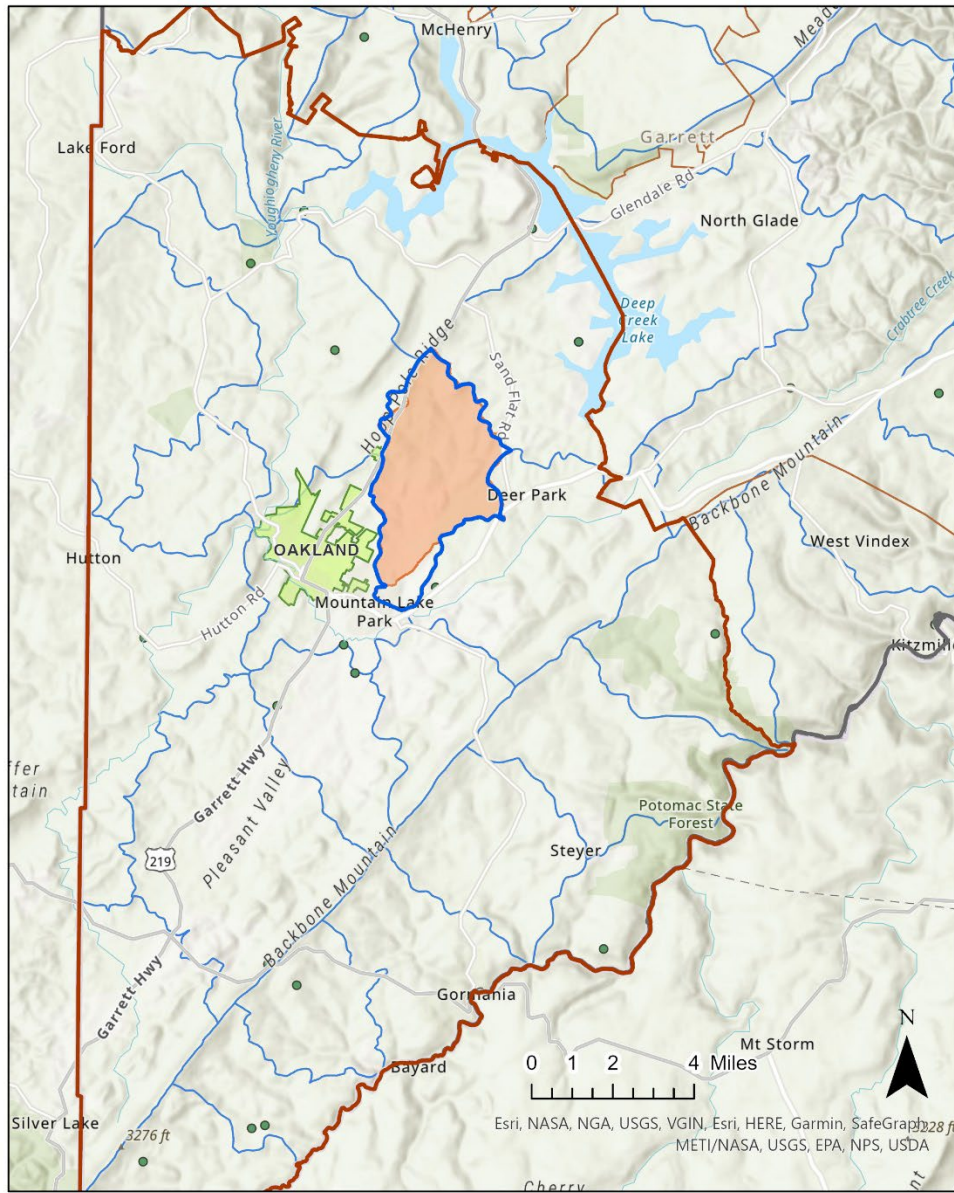
Broadford Lake Drainage and Town of Oakland



Legend

- | | |
|---|---|
| <ul style="list-style-type: none"> Broadford Lake drainage Oakland Municipal Boundary Broadford Lake watershed Watersheds (12-digit HUCs) | <ul style="list-style-type: none"> Point Source Discharges |
|---|---|

Broadford Lake Location within Zip Code



Legend

- Broadford Lake drainage
- Oakland Municipal Boundary
- Broadford Lake watershed
- Watersheds (12-digit HUCs)
- Zip code 21550
- Zip codes
- Point Source Discharges