



# **Sustainably Financing Operations and Maintenance at Lake Mattamuskeet**

**SEPTEMBER 2022**

# UNC ENVIRONMENTAL FINANCE CENTER

## EXECUTIVE SUMMARY

Lake Mattamuskeet is in need of long-term sustainable funding strategies to support operations and maintenance costs of proposed water control infrastructure over at least a twenty-year period. The Environmental Finance Center (EFC) at the University of North Carolina at Chapel Hill investigated and evaluated sustainable funding mechanisms for this purpose. An endowment was determined to be the most sustainable solution. The partners working on Lake Mattamuskeet restoration are familiar with the operation of endowments, and once the fund is initialized it should be able to cover operations and maintenance costs in perpetuity, allowing for further improvements to water management strategies. Funding streams for operations and maintenance needs are limited; therefore, the partners involved with Lake Mattamuskeet should seek state or federal appropriations to provide the principal investment of the selected funding mechanism.

## ABOUT THE ENVIRONMENTAL FINANCE CENTER

The Environmental Finance Center at the University of North Carolina at Chapel Hill is part of a network of university-based centers that work on environmental issues, including water resources, solid waste management, energy, and land conservation. The EFC at UNC partners with organizations across the United States to assist communities, provide training and policy analysis services, and disseminate tools and research on a variety of environmental finance and policy topics.

The Environmental Finance Center at the University of North Carolina, Chapel Hill is dedicated to enhancing the ability of governments to provide environmental programs and services in fair, effective, and financially sustainable ways.

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This report is a product of the Environmental Finance Center at the University of North Carolina at Chapel Hill. Findings, interpretations, and conclusions included in this report are those of the authors and do not necessarily reflect the views of EFC at UNC funders, the University of North Carolina, the School of Government, or those who provided review. We are grateful to the North Carolina Coastal Federation for funding this research.

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b> .....	<b>1</b>
<b>ABOUT THE ENVIRONMENTAL FINANCE CENTER</b> .....	<b>1</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>1</b>
<b>TABLE OF CONTENTS</b> .....	<b>2</b>
<b>INTRODUCTION</b> .....	<b>3</b>
<b>BACKGROUND</b> .....	<b>3</b>
<b>METHODS</b> .....	<b>4</b>
<b>FUND MECHANISMS</b> .....	<b>5</b>
Endowment.....	5
What is an endowment? .....	5
Application .....	5
Benefits and Drawbacks.....	6
Examples .....	7
Trust Fund.....	9
What is a trust fund?.....	9
Application .....	10
Benefits and Drawbacks.....	10
Examples .....	11
Water Fund .....	12
What is a water fund? .....	12
Benefits and Drawbacks.....	12
Examples .....	12
<b>CONCLUSION</b> .....	<b>14</b>
<b>REFERENCES</b> .....	<b>16</b>

## INTRODUCTION

The North Carolina Coastal Federation (NCCF) and partners seek solutions to fund the operations and maintenance (O&M) costs of an active water management program for the restoration of Lake Mattamuskeet. NCCF and its partners are considering a service district to levy annual fees from the beneficiaries of the water management project for O&M.<sup>i</sup> However, the majority landowner around the lake is the U.S. Fish and Wildlife Service (USFWS). Due to the uncertainty of the federal budgetary process, USFWS has determined they cannot commit to pay an annual fee to the service district or otherwise allocate future funds for O&M. Local landowners have expressed they are unwilling to subsidize the fraction of fees that USFWS would be responsible for if USFWS could be a part of the service district. Therefore, the NCCF and partners need to establish a long-term funding mechanism that satisfies multiple stakeholders' needs and restrictions. As such, NCCF and partners have asked the Environmental Finance Center (EFC) at the University of North Carolina at Chapel Hill (UNC-CH) to identify potential sustainable funding mechanisms, and 3-5 examples of each mechanism in practice, for O&M expenses over a twenty-year period.

## BACKGROUND

The Lake Mattamuskeet Restoration Plan, prepared by NCCF, provides background on key concerns with the lake that led to the development of the plan. Issues include the water quality of Lake Mattamuskeet, which has decreased significantly over the past few years and severe flooding events, which have caused damage to the surrounding community. Additionally, harmful algal blooms threaten the recreational use of the lake. The North Carolina Department of Environmental Quality (NCDEQ) listed the lake in 2016 as an impaired body of water on its 303(d) list, where it has remained since for high turbidity and elevated levels of chlorophyll-a.<sup>ii</sup>

Floods have resulted in septic system failure and crop loss, and the declining water quality negatively impacts recreation opportunities around the lake.<sup>i</sup> Flooding events have increased in recent years due to the passive, gravity-lead drainage system of the lake, which does not effectively maintain the water level of the lake. Therefore, as part of the restoration plan, “active water management capabilities” will be installed to improve the water quality of the lake and to decrease the frequency of flooding events. Introducing active water management benefits lakeside landowners, the Lake Mattamuskeet National Wildlife Refuge, and visitors to the lake, as well as overall local environmental quality. Current plans for the water management project estimate that \$10 million will be needed in upfront capital resources and \$10 million will be needed for O&M over its twenty-year design life.

Partners in the project have identified certain funding resources already, as detailed in an 11-page funding matrix included in the appendix of the restoration

plan report. For the planning stages of this project, funding has been received from various sources, including the Environmental Protection Agency (EPA), NCDEQ, the Clean Water Management Trust Fund, the North Carolina General Assembly, and others.<sup>i, iii</sup> Funding from these sources indicates eligibility for funding under the umbrellas of water quality, coastal resilience, and infrastructure, but funds received in the past were designated for discrete, one time use as opposed to the long-term funding needed for O&M.

While the funding table helps identify potential sources of capital funding, funding for O&M are required over the lifetime of the project to support infrastructure management. One approach being considered is raising O&M funds for the project upfront before construction of the new infrastructure is completed. Specifically, the EFC focused on identification of a mechanism by which these funds can be invested and managed to support O&M long-term. It is likely that the manager of the water management infrastructure will be a service district formed by Hyde County.<sup>i</sup> The county commissioners would be responsible for the budgeting of the service district, which makes the service district a component part of the county. Governance of the service district in conjunction with potential funding mechanisms as described in this report requires further study.

## METHODS

To identify potential funding mechanisms and examples of these mechanisms, the EFC completed a thorough review of white (i.e., peer-reviewed) and grey literature (e.g., reports by The Nature Conservancy). This review indicated that the question the NCCF and partners pose is a common question among local governments and non-profits. Several papers focused on debt and equity instruments, including types of bonds, to finance O&M over time.<sup>iv, v, vi, vii, viii, ix</sup> However, management of these types of debt instruments would most likely fall onto the county exclusively, rather than involving cooperation with NCCF and other partners. Other researchers argued for taxes, fees, or special service districts to cover O&M expenses.<sup>x, xi, xii, xiii, xiv, xv</sup> Few sources recommended insuring natural infrastructure to meet O&M type needs.<sup>xvi, xvii</sup>

These sources confirm the potential utility of the service district and similar streams of revenue but leave the central question of long-term funding strategies unaddressed. However, the EFC identified three mechanisms through our review that offer applicable solutions to the questions posed. To build our understanding of these mechanisms and of the unique challenges posed by financing O&M expenses long-term at Lake Mattamuskeet, the EFC also spoke to knowledgeable parties at the University of North Carolina at Chapel Hill, the Wisconsin Natural Resources Foundation, the St. Mark's National Wildlife Refuge, the City of Tulsa and the Nature Conservancy in Maryland and DC.

## FUNDING MECHANISMS

Potential funding mechanisms for O&M expenses include an endowment, an expendable trust, and a water fund. These three mechanisms capitalize O&M expenses at the beginning of a project, investing the initial funding and disbursing it towards project activities over time. Each mechanism is defined, and then applied in the context of the water management project. The benefits and drawbacks of the mechanisms are discussed, and two to three examples of each mechanism are explored.

### Endowment

#### What is an endowment?

As defined by the Environmental Advisory Finance Board (EFAB) of the EPA, an endowment is “an interest-bearing account with protections against running down the corpus.”<sup>xviii</sup> The corpus, or initial investment, is capitalized by donations, appropriations (state, federal, or local), or via local bond initiatives or tax levies. Interest accrued by the corpus is 1) disbursed to support the activities the endowment is designed to support; and 2) maintains the corpus over time.<sup>xix</sup> As such, an endowment can also be defined as an account where monies are invested to create a source of income for an organization. Endowment types include true endowments, term endowments, and quasi-endowments. True endowments are capitalized by a donor and assets can be distributed at the discretion of the benefactor of the donor in perpetuity. Term endowments are capitalized by a donor with asset distribution delayed after a set amount of time. Quasi-endowments are funds earmarked within institutions that are treated like an endowment for sustainable funding.<sup>xx</sup>

In a true endowment, interest earned from the corpus is spent for a specific purpose without drawing from the corpus itself. True endowments are governed by “payout policies” concerning investment, withdrawal, and use of funds, which can be determined by either the donor or beneficiary.<sup>xxi</sup> In North Carolina, endowments are regulated by the Uniform Prudent Management of Institutional Fund Act (Chapter 36E), which outlines how endowments should be lawfully managed in the state of North Carolina by a responsible institution.<sup>xxii</sup>

#### Application

An endowment could fund O&M of the water management system over its 20-year lifetime. Table 1 models a true endowment, following guidance from the EFAB and assuming a 5% interest rate. This model shows cash flows without considering the effects of the market or inflation on O&M expenditures, service district revenue, or interest. The EFAB recommends an additional revenue stream for the lifetime of endowment, such as entrance fees or service payments, though it is uncommon for endowments to have a source of revenue within the payout period.<sup>xxiii</sup> However,

service district payments could provide revenue in this case, supporting endowment payouts partially. Although rare, having a source of revenue could marginally decrease the required size of the corpus. Table 1 exhibits an endowment fund over twenty years without revenue, while Table 2, exhibits the same model with revenues sourced from annual service district fees. The inclusion of service district revenues results in the growth of the endowment over time when the interest rate equals the yearly withdrawals; in the case of a higher interest rate, service district revenues would serve to further protect the corpus.

Endowment	t=0	t=1	t=5	t=10	t=20
Beginning Balance	\$ 10,000,000.00	\$ 10,000,000.00	\$ 10,000,000.00	\$ 10,000,000.00	\$ 10,000,000.00
Interest, where $i=0.05$	\$ -	\$ 500,000.00	\$ 500,000.00	\$ 500,000.00	\$ 500,000.00
Withdrawals	\$ -	\$ (500,000.00)	\$ (500,000.00)	\$ (500,000.00)	\$ (500,000.00)
Ending Balance	\$ -	\$ 10,000,000.00	\$ 10,000,000.00	\$ 10,000,000.00	\$ 10,000,000.00

Table 1: Performance of an endowment, with no service district revenues, where  $i$  represents interest at 5% over a 20-year period.

Endowment with Revenue	t=0	t=1	t=5	t=10	t=20
Beginning Balance	\$ 10,000,000.00	\$ 10,000,000.00	\$ 10,215,506.25	\$ 10,551,328.22	\$ 11,526,950.20
Interest	\$ -	\$ 500,000.00	\$ 510,775.31	\$ 527,566.41	\$ 576,347.51
Service District	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Withdrawals	\$ -	\$ (500,000.00)	\$ (500,000.00)	\$ (500,000.00)	\$ (500,000.00)
Ending Balance	\$ -	\$ 10,050,000.00	\$ 10,276,281.56	\$ 10,628,894.63	\$ 11,653,297.71

Table 2: Performance of an endowment including service district revenues, where  $i$  represents annual interest at 5% over a 20-year period.

The EFC has provided an interactive Excel tool to NCCF along with this report to offer flexibility in the modelling. The tool can alter the sum initially invested, interest percentages, yearly withdrawals, and revenue streams; it also accounts for inflation and the discount rate of money set aside for future needs.

### Benefits and Drawbacks

An endowment enhances the usefulness of funds, both for shorter and longer terms; using an endowment to cover O&M expenses could be a more efficient allocation of resources overall. Furthermore, an endowment, when managed appropriately, can sufficiently guarantee funding over a set period or infinitely. Its policies can be tailored to the needs of the beneficiary, as funds can be subject to varying degrees of restriction regarding use. Quasi-endowments can even be structured so that the corpus is exhausted at the end of its term.<sup>xxiv</sup>

If modeled as a true endowment, a plan is needed for the corpus at the end of the life of the endowment— this could be returning the value of the corpus to grantors or investing the corpus into the restoration of Lake Mattamuskeet. During

the life of the endowment, risk and reward must be carefully weighed when deciding between public and private management and investment of the fund. Market volatility poses the risk, as with all investment instruments, that the endowment will not grow as expected. This could result in either limited access to O&M funding via growth of the fund or the use of the corpus, which would negatively affect the lifetime of the endowment. The California Fish and Wildlife Service analyzed its mitigation banking endowment program and found that while private managers earned higher returns due to their higher risk investment approaches, it was not without higher risk than public managers.<sup>xxv</sup> Endowments can be managed well publicly, but public management may require a larger corpus to accompany lower interest rates.

## Examples

Endowments are common for conservation and mitigation projects to support land stewardship. For example, when setting aside an area to conserve, an endowment or stewardship fund can support conservation of the land in perpetuity. These examples focus on both the use of endowments in this conservation context as well as use towards other purposes.

### ***Great Lakes Protection Fund:***

The Great Lakes Protection Fund was formed in 1989 as a private nonprofit corporation by the governors of the Great Lakes states.<sup>xxvi</sup> The seven contributing states pledged an amount proportional to their use of the lakes; Pennsylvania, for example, committed \$1.5 million, and Michigan committed \$25 million to the fund. Contributions from all seven states totaled \$81 million. Pennsylvania appropriated funding directly to the fund via the Great Lakes Protection Fund Act; Michigan similarly took legislative steps to directly participate in the fund.<sup>xxvii, xxviii</sup>

The fund operates as an endowment, receiving no ongoing deposits. The original state deposits are invested to grow the endowment and only investment revenue may be spent by the board of directors. The corpus is protected and may not be spent. Two thirds of annual revenues are spent on regional projects benefitting the health of the Great Lakes and the final third is sent back to the contributing states (proportional to their contributions) to fund projects on the state level that benefit the Great Lakes.

Although funding is used to benefit people and the environment, the foundation is not a charitable foundation. Its status as a private corporation allows it to create, control, and support not-for-profit and for-profit corporations.<sup>xxix</sup> It may also profit from any inventions created with its support and may take part in any not-for-profit or for-profit venture. Forming a private not-for-profit corporation to manage an endowment in lieu of a charitable foundation or other mechanism is uncommon; however, this endowment is designed to fund work in the Great Lakes



region in perpetuity, given it continues to be managed prudently by its board. As of 2022, the board has invested \$96 million in regional projects and returned \$55 million to the states for state-specific projects.

### ***Natural Resources Foundation of Wisconsin:***

The Natural Resources Foundation of Wisconsin (NRFW) is a nonprofit organization that boosts private sector investments and involvement of Wisconsin's land, water, and wildlife.<sup>xxx</sup> The NRFW was founded in 1986 and initially funded via private donations from staff at Wisconsin's Department of Natural Resources. The NRFW manages more than one hundred endowment funds for partners of the foundation with more than \$10 million in assets. One of these is the endowment of the Friends of the Cedarburg Bog. The Friends began the fund with an "acorn fund" where regular donations were accumulated over time until a capitalization sum of over \$10,000 was reached. The NRFW operates as the trustee of the endowment while the Friends benefit from access to funding in perpetuity. Cedarburg Bog is owned by the Wisconsin Department of Natural Resources and the University of Wisconsin-Milwaukee and was designated a State Natural Area in 1952.

The Friends support preservation, stewardship, appreciation, scientific study, and management of invasive buckthorn species in the Cedarburg Bog.<sup>xxxi</sup> Over \$312,000 has been raised to cut and kill fruiting-sized buckthorn in 576 acres of the Bog as of 2021. The Friends' funds are pooled with the other funds held by the Foundation to maximize returns and to efficiently invest. The NRFW also manages trust funds.

### ***South Tulsa/Jenks Lake and Related Amenities Endowment & the Zink Lake Endowment:***

The City of Tulsa, Oklahoma used a blended financing structure to capitalize a multimillion-dollar endowment – however, their intention to use the endowment to cover O&M expenses has faced various roadblocks. Tulsa adopted a proposal for low water dam (LWD) projects in the Arkansas River from the Arkansas River Infrastructure Task Force in 2015.<sup>xxxii</sup> Particularly, the Zink Dam proposal aimed to create consistent water flow in the river and bring water sports and attractions to the riverfront area. In 2003, voters of Tulsa City approved a one-penny, 13-year increase in the Tulsa County sales tax for regional economic development and capital improvement. The tax increases were part of the "Vision 2025: Foresight 4 Greater Tulsa" package in which advanced financing (i.e., bonds and loans) were combined with a "pay as you go" approach (i.e., the revenues from the sales tax) to minimize costs of financing to taxpayers. With sales tax collections for Vision 2025 finalized, the project has totaled approximately \$643.8 million in project payments as of early 2022. Tulsa County used Vision 2025 funds to start the federal permitting process for Zink Dam improvements; the funds will be used to match state and federal funds needed for project design, permitting, and construction.

An endowment of \$30 million was included in the proposal for O&M for the dams.<sup>xxxiii</sup> The endowment is not yet in place due to disagreements about funding for the project. The Cities of Tulsa and Jenks applied for federal grant money earlier in 2022 but were denied. They anticipate a two-year extension to secure a third partner, potentially the Muscogee Creek Nation to support the project.<sup>xxxiv</sup> The project will move forward in a reduced form in December 2022, focusing on the Zink Lake dam and endowment, at which time \$18 million will be allocated for its endowment. Although it is not yet in place, an endowment fund will be capitalized and managed by the city for the benefit of this project, regardless of the size of the project.

### *Pennsylvania Land Trusts:*

There are several land trusts in Pennsylvania that rely on endowments for their O&M funding. Berks Nature, for example, was established as a non-profit membership organization in 1974 with the mission to preserve Berks County's cultural and environmental heritage for future generations.<sup>xxxv</sup> Berks Nature focuses efforts on preserving agricultural land and protecting both surface water and groundwater quality. The \$3 million endowment has fifteen total funds: two stewardship funds managed by a community foundation, eight restricted endowments, and five quasi-endowments.<sup>xxxvi</sup>

An anonymous donation of \$25 million significantly increased the strength and capacity of Berks Nature by establishing the Berks Nature Endowment Fund in 2021 to support the annual operating needs of the organization.<sup>xxxvii</sup> Payments of about \$1 million will be made annually to operations of Berks Nature, illustrating the utility of an endowment in a conservation context.

## Trust Fund

### What is a trust fund?

An expendable trust fund is an interest-bearing account where both the principal (the initial deposit in the account) and the interest may be expended for a particular purpose or program.<sup>xxxviii</sup> Money in an expendable trust can be invested and allocated according to investment terms of the account and the restrictions of the cash in it.<sup>xxxix</sup> Time-limited trusts, in which the funds must be spent within a certain lifetime, are common.<sup>xl</sup> During the lifetime of the fund, the principal and interest accrued will be disbursed and the fund will be exhausted at the conclusion of the twenty-year design life of the project. A trust may be capitalized by donations, appropriations (state, federal, or local), or by including generation of a trust in bond initiatives or tax levies on the local level. As with an endowment, a source of revenue like a service district fee would help support payouts and longevity of the trust but is not required for the trust to function. Prudent investment maximizes the utility of the trust as the overall balance of the account is reduced over time.

## Application

Two potential models of funding, assuming an interest rate of 5% annually, are modelled below following the EFAB-derived endowment model. Additionally, it is assumed that the income from the service district is fixed at \$50,000 per year and that withdrawals for operations and maintenance are uniform. Two models are included to demonstrate the effects of various levels of initial investment and sources of income on the longevity of the fund. Neither model accounts for changes in O&M costs, emergencies, variations in interest, inflation, nor a discount rate.

The first model exhibits a trust fund inclusive of income from the service district over 20 years (Table 3). In this model, around \$5.6 million is initially invested, which with interest and service district revenue, sustainably funds the O&M of the project and is depleted at the end of 20 years. The second model is like the first but excludes income from the service district (Figure 3). In a second model (Table 4), the required principal is higher as service district revenues are excluded. At the end of the twenty years, the fund has supported the project throughout its lifetime and is depleted at the end of the project lifetime.

Trust with Revenue	t=0	t=1	t=5	t=10	t=20
Beginning Balance	\$ 5,610,000.00	\$ 5,610,000.00	\$ 4,879,433.81	\$ 3,740,997.35	\$ 433,638.84
Interest	\$ -	\$ 280,500.00	\$ 243,971.69	\$ 187,049.87	\$ 21,681.94
Service District	\$ -	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00
Withdrawals	\$ -	\$ (500,000.00)	\$ (500,000.00)	\$ (500,000.00)	\$ (500,000.00)
Ending Balance	\$ -	\$ 5,440,500.00	\$ 4,673,405.50	\$ 3,478,047.22	\$ 5,320.78

Table 3: Performance of a trust over 20 years with an initial investment of \$5.6 million, inclusive of income from the service district fees. An interest rate of 5% is assumed.

Trust	t=0	t=1	t=5	t=10	t=20
Beginning Balance	\$ 6,250,000.00	\$ 6,250,000.00	\$ 5,441,851.56	\$ 4,182,519.19	\$ 523,936.77
Interest, where $i=0.05$	\$ -	\$ 312,500.00	\$ 272,092.58	\$ 209,125.96	\$ 26,196.84
Withdrawals	\$ -	\$ (500,000.00)	\$ (500,000.00)	\$ (500,000.00)	\$ (500,000.00)
Ending Balance	\$ -	\$ 6,062,500.00	\$ 5,213,944.14	\$ 3,891,645.15	\$ 50,133.61

Table 4: Performance of a trust over 20 years with an initial investment of \$6.25 million, exclusive of income from the service district fees. An interest rate of 5% is assumed.

## Benefits and Drawbacks

An expendable trust is spent down over a set length of time -- at the end of the twenty-year lifespan of this project, there will be no balance remaining. However, an expendable trust is a known tool for special revenues on the local government level, and trusts are common mechanisms in private financial management.<sup>xli</sup> Hyde

County, as well as other partners, may have experience with or knowledge of trusts which would ease the implementation of this mechanism. Additionally, the State of North Carolina has programs to support local government investment of idle funds at a low cost. The Ancillary Governmental Participant Investment Program (AGPIP), managed by BlackRock, allows local governments to invest idle funds.<sup>xlii</sup> Additionally, the North Carolina Investment Pool (NCIP), created by an inter-local agreement, is a state-wide trust for investment of local idle funds.<sup>xliii</sup> The Governance Finance Officers Association cautions that local government investment pools are not backed by the Securities and Exchange Commission, and so they are not insured nor are returns guaranteed.<sup>xliv</sup> The association provides a list of recommendations to take into account when considering such an investment pool.

## Examples

### ***Greenville Housing Fund, Greenville, South Carolina:***

The City of Greenville created the Greenville Housing Trust Fund (GHF) to finance the production and preservation of affordable and workforce housing units through new construction, substantial rehabilitation of vacant units, or conversion of non-residential buildings to residential use.<sup>xlv</sup> The trust is capitalized with philanthropic donations and appropriations from the city. The city does not manage the trust fund; it is managed by CommunityWorks, a non-profit organization. In fiscal year 2021, it funded 583 projects and invested \$8,700,000 into housing in Greenville.<sup>xlvi</sup> While this trust does not fund O&M, it exhibits use of a pooled trust for the benefit of residents. Additionally, the fund represents a partnership between a non-profit as the trustee, and the local government as the beneficiary.

### ***Inland Waterways Trust Fund:***

The Inland Waterways Fund (IWTF) is a fund within the U.S. Treasury that receives revenues from a tax (i.e., the inland waterway user fee) on commercial-barge fuel used on federally designed waterways. Pursuant to the Water Resources Development Act of 1986, IWTF monies are subject to appropriation and used to finance construction and major rehabilitation projects on these waterways.<sup>xlvii</sup> Costs for these projects are shared equally between the IWTF and the General Fund, whereas regular waterway O&M costs are funded entirely from the General Fund. The IWTF is used by the Army Corps of Engineers to pay for 5-15% of construction and major rehabilitation costs on the nation's inland waterways through a \$0.29 cent per gallon diesel tax on users. The fund generates approximately \$110 - \$120 million per year via the Inland Waterways Tax. These funds are, in turn, matched with federal appropriations from the General Fund of the U.S. Treasury. The IWTF represents an example of a successful federal trust fund that has accrued sufficient monies to continue improving the nation's waterways.

## Water Fund

### What is a water fund?

Water funds are typically created to support water quality projects but are more generally focused on addressing water insecurity.<sup>xlviii</sup> In the United States, water funds have been championed by the Nature Conservancy, though the tool has not been extended past projects improving drinking water and source water protection on a large scale. Water funds are conceptualized to sustainably finance projects and may include an endowment or a trust as a part of the overall fund structure.

The definition of a water fund is quite flexible and is an opportunity for innovation and creative asset management; they operate as overall governance structures that include financial mechanisms, scientific research questions, communications strategies, and more. The EFAB recommends a water fund to cover O&M expenses related to green infrastructure, with additional sources of revenue supporting this coverage. Water funds are helpful to examine in their illustration of complex problems and partnership across organizations to address these problems.

### Benefits and Drawbacks

The flexible definition of a water fund reveals its versatility. While a revolving fund or private investment fund are not applicable in the case of Lake Mattamuskeet, a central fund managed by local government is more feasible. Use of water funds have been limited in the United States, but those that have been developed are typically managed by a nonprofit focused on the kinds of projects undertaken by the fund and source funding from donations, grants, taxes, and fees, such as water system enterprise fees. However, a water fund may not be an appropriate mechanism because of its lack of application, vague definition, and the large scale of existing models.

### Examples

These examples of water funds have been arranged from most applicable to least applicable. These examples vary in structure to best suit individual project needs, as water funds are very flexible.

#### ***Rio Grande Water Fund:***

The Rio Grande Water Fund is capitalized from donations. These donations come from private, state (e.g., New Mexico Department of Game and Fish), local (e.g., the City of Albuquerque), and federal sources (US Bureau of Reclamation, USDA Forest Service, National Park Service and US Geological Survey). Funds are used for forest management activities that reduce the risk of massive wildfires that would otherwise damage the water quality of New Mexico. Through pooling resources, \$50.2 million

has been leveraged to treat 148,905 acres of land, including \$5.2 million in private funding.<sup>xlix</sup> The forest treatments they have completed have had a cumulative economic impact of \$130 million. The goal for the fund is to treat 600,000 acres over a twenty-year period to influence fire behavior in the Rio Grande watershed.<sup>1</sup>

This fund exemplifies capitalization via diverse sources for the completion of one objective over the span of 20 years—an objective which, if completed, will benefit water quality for years to come. As with Lake Mattamuskeet, management of the natural resource (whether it be a forest or water levels), will continue past the twenty-year goal of the fund. However, this pooled fund catalyzes source water protection in the Rio Grande Watershed by multiplying the rate of forest and watershed restoration ten times. Through involvement of multiple stakeholders, the foundation will likely sustainably fund these essential restoration activities for years to come.

#### ***Savannah Clean River Water Fund:***

This fund serves the Savannah River Watershed, a large watershed spanning both Georgia and South Carolina. The fund is organized as a nonprofit. The fund is capitalized by fees on ratepayers by utilities and administered by the fund. The leadership of the fund then administers conservation and water quality programs in the Savannah River watershed. The fund aims to retain forested cover in the watershed and to enhance water quality. The funds focus on one geographic area using an approach similar to use of a service district.

#### ***Edwards Aquifer Protection Program:***

The Edwards aquifer spans more than five Texas counties and is culturally important, much like Lake Mattamuskeet. The protection program is funded through a collection of municipal central funds for water protection. These funds have been financed by municipalities in the area for conservation of land in the area and other measures to ensure water quality and health. This water fund exhibits how a nonprofit, the Nature Conservancy, is coordinating the use of nearly \$700 million in municipal funds.

## CONCLUSION

The three financial mechanisms identified in this report all provide the potential to fund O&M for the new infrastructure in Lake Mattamuskeet. However, an endowment represents a stable strategy that could provide resources towards the management of Lake Mattamuskeet beyond the initial needs and time frame established in the current restoration plan. The partners in this project share institutional familiarity with endowments, which will ease implementation of this mechanism. A trust is similarly familiar to partners; however, its expendable nature would require additional funding to be sought for water management needs in the future.

Regardless of what mechanism is eventually selected, each funding option requires millions of dollars for the principal investment. We reviewed multiple federal, state, and private grants as funding mechanisms, but most are too small or come with restrictions on use that disqualify them from consideration. Therefore, seeking special appropriations from the state or federal government for this O&M fund is the best source of funding. This strategy was employed by the Great Lakes Protection Fund, as described in this document. Seeking such an appropriation will require collaboration between Hyde County, NCCF, and partners to communicate directly with elected officials and other figures that could champion the needs of Lake Mattamuskeet in state or federal budget processes. If successful, this effort could support water level management and other goals at Lake Mattamuskeet sustainably over the next twenty years and beyond.



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