FORT MYERS BEACH MOSQUITO CONTROL DISTRICT REVIEW FINAL REPORT

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Prepared for

The Florida Legislature

Prepared by

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Executive Summary

The Fort Myers Beach Mosquito Control District (Fort Myers Beach MCD) is located on the west coast of Florida and is comprised of two small barrier islands in a 25 square mile area off the coast of Lee County, Florida. The district's service area also includes areas of mainland properties in Lee County that consist of environmentally sensitive areas with little to no population. The estimated population of Fort Myers Beach was 6,471 persons in 2020, according to the U.S. Census Bureau. Fort Myers Beach was devastated by Hurricane Ian in September 2022, which caused the total destruction of hundreds to possibly thousands of homes in the community; it is unclear if and when many residents will be able to return, and the current population count is uncertain. The majority of residences appeared uninhabitable as of mid-March 2023. Prior to the 2022 hurricane, over 11,000 homes with a total taxable value of over $5 billion were slated to pay ad valorem taxes. However, with the recent destruction of a large percentage of these homes, it is uncertain how much in 2022 ad valorem taxes will ultimately be collected.

Fort Myers Beach MCD was established in 1949 to be supervised by an elected board of three commissioners. Operations have largely focused on prevention of mosquito infestation via surveillance, monitoring, larviciding, and targeted adulticiding.

SCOPE

Section 189.0695, *Florida Statutes,* requires the conduct of performance reviews of Independent Mosquito Control Districts. The Balmoral Group was selected by the Office of Program Policy Analysis and Government Accountability to perform the review, which evaluates the district's programs, activities, and functions, including

- evaluating the district board's primary function and governance;
- assessing service delivery and comparing similar services provided by municipal or county governments located within the district's boundaries;
- describing district purpose, goals, objectives, performance measures, and performance standards and evaluating the extent to which they are achieved;
- analyzing resources, revenues, and costs of programs and activities; and
- providing recommendations for statutory or budgetary changes to improve the special district's program operations, reduce costs, or reduce duplication.

Fort Myers Beach MCD experienced direct and heavy impacts from Hurricane Ian in 2022, resulting in the destruction of its facility down to the foundation and losing its entire truck fleet and most equipment. Fort Myers Beach MCD resumed mosquito control services within one week of the storm and has begun to gradually recover, establishing a temporary office space and obtaining a truck and other equipment to use for operations. The district continues to receive several mosquito control services from a long-standing interlocal agreement with neighboring Lee County MCD. In the aftermath of the storm, the district has prioritized larvicide operations in vacant and abandoned homes to prevent the production of mosquitoes and avoid the need to use harsher adulticide treatments with equipment the district does not currently possess.

The Balmoral Group (TBG) worked in consultation with a mosquito control expert in the course of this review and found that while the district experienced disastrous impacts from Hurricane Ian, it has begun and continues to rebuild its resources to provide regular mosquito control services in several areas of Integrated Pest Management. The district continues to receive several mosquito control services provided by Lee County MCD through an interlocal agreement, and it appears that consolidation of the districts could improve efficiency. It is unclear if Fort Myers Beach MCD will be able to effectively and efficiently manage its resources in the wake of Hurricane Ian, particularly given the limited resources that were in place prior to the storm. Fort Myers Beach MCD does not

have clearly defined, measurable goals and objectives that adequately address its statutory purpose and does not have formally defined performance measures or standards.

Based on its review, The Balmoral Group presents the following recommendations for improving mosquito control services in the Fort Myers Beach MCD:

- The district boundary maps presented by Fort Myers Beach MCD and Lee County MCD conflict. The district could work with Lee County MCD and a professional licensed surveyor or take other action as appropriate to determine the correct property boundaries of each district.
- The Legislature could consider merging the Lee County MCD and the Fort Myers Beach MCD by special act, as provided in s. 189.073, *Florida Statutes*.
- The Lee County MCD and Fort Myers Beach MCD could jointly consider merging into a single independent special district, as provided in s. 189.074, *Florida Statutes*.
- If consolidation with Lee County MCD is not pursued or achieved, Fort Myers Beach MCD could engage in a strategic planning process to guide the rebuilding of the district and to adopt goals, objectives, and performance measures and standards to consistently monitor and maintain performance information over time; the district could seek guidance from other districts that have conducted strategic planning processes.
- The Legislature could consider amending s. 388.46*, Florida Statutes*, to direct the Florida Coordinating Council on Mosquito Control to form a subcommittee consisting of mosquito professionals and researchers from around the state to develop model goals, objectives, and performance measures and standards to assist MCDs with performance monitoring.

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Table of Contents

List of Figures

List of Tables

1. Background

District Description

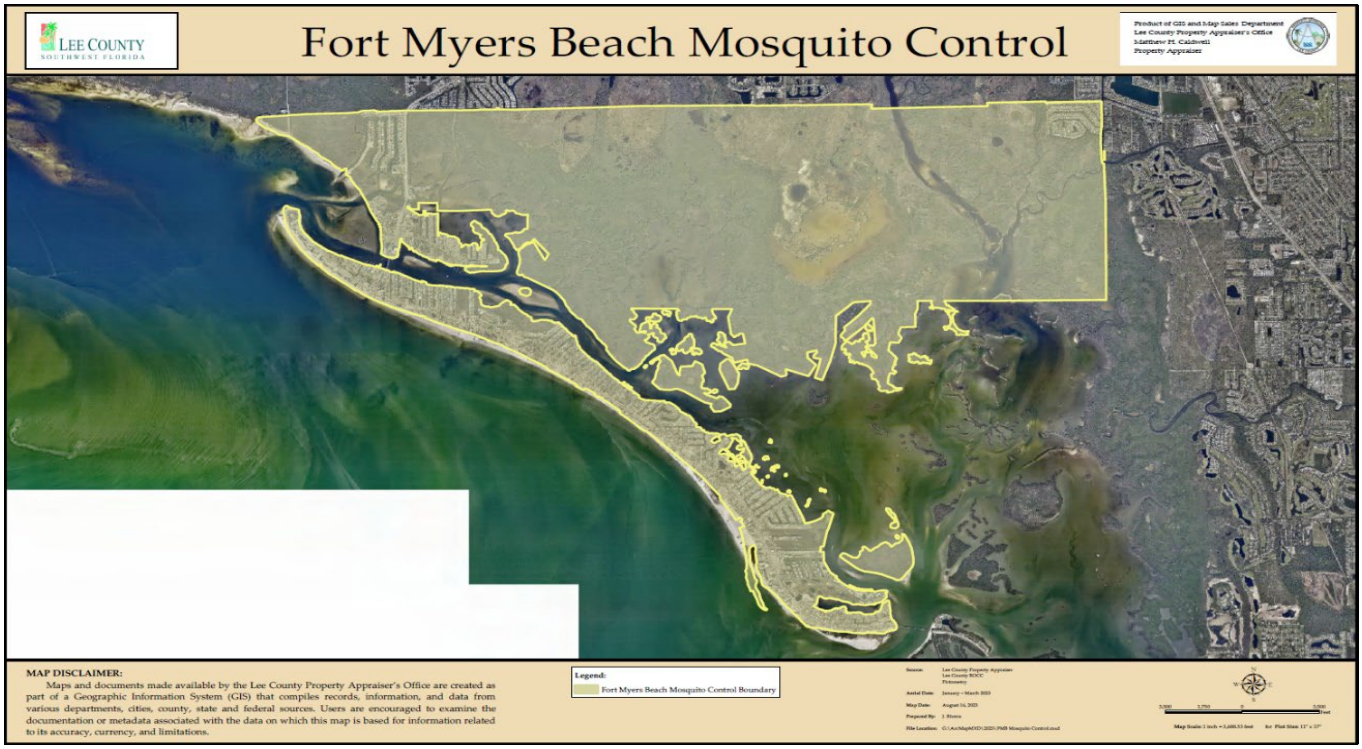
District Purpose

The purpose of Fort Myers Beach Mosquito Control District (MCD), as established in 1949, is to serve the community by managing the mosquito population in the Fort Myers Beach area. Fort Myers Beach MCD's stated mission is promoting the health, safety, and welfare of Fort Myers Beach residents and visitors through an evolving program of integrated pest management practices.

Service Area

Fort Myers Beach MCD is located on the west coast of Florida and is comprised of two small barrier islands, Estero and San Carlos Islands, located in a 25 square mile area off the coast of Lee County, Florida. The district's service area also includes areas of mainland properties in Lee County that lie to the north of the barrier islands, including Estero Bay Aquatic Preserve, Estero Bay Preserve State Park, and San Carlos Bay - Bunche Beach Preserve, the majority of which consist of environmentally sensitive areas with little to no population. The district's entire west coast borders the Gulf of Mexico. The map shown in **Figure 1** represents what the district reported to TBG as its current boundaries and is from the Lee County Property Appraiser dated August 16, 2023. It should be noted that the boundaries of this map conflict with the boundaries shown in the report for Lee County MCD under concurrent review by TBG. Further investigation to clarify the correct district boundaries by each district is warranted.

Figure 1. Map of District Boundaries and Headquarters Location



Source: Lee County Property Appraiser.

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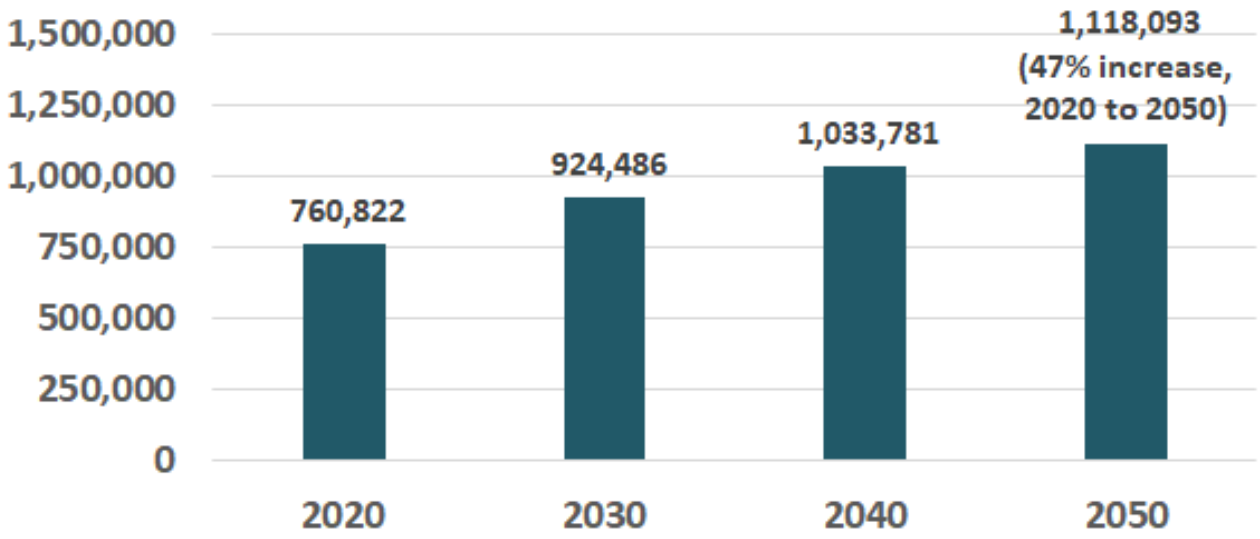
Population

The estimated population of Fort Myers Beach MCD was 6,471 persons in 2020, according to the U.S. Census.[1] Fort Myers Beach was devastated by Hurricane Ian in September 2022, with hundreds and possibly thousands of homes decimated; it is unclear when many residents will be able to return, and the current population is uncertain. The majority of residences appeared uninhabitable as of mid-March 2023. Prior to Hurricane Ian, the population during tourist season (winter months) was estimated at about five times the permanent population.

Lee County's population was estimated at 822,453 persons in 2022 according to the U.S. Census.[2] The Florida Legislature's Office of Economic and Demographic Research (EDR) projects Lee County's population to increase by 47% through 2050 to 1,118,093 residents compared to a 2020 baseline.[3] **Figure 2** shows Lee County's projected population estimates calculated by EDR.

Figure 2. Lee County Population Projection



Source: TBG Work Product, EDR.

District Characteristics

The temperature of Fort Myers Beach averages between 55 (coldest) and 95 (hottest) degrees Fahrenheit, and the area received about 70 inches of rain in 2022. The area is surrounded by the bay waters of Lee County on the east, north, and south. Fort Myers Beach is heavily tourism-oriented and densely built out, and the district includes residential developments as well as local parks, a school, community center, and community recreational facilities. District staff reported that during the six-month winter tourist season, the population of the district typically increases to over 40,000 people, and this transient population introduces higher potential for transmission of arboviruses. The developed areas of the island are occupied predominantly by residential housing, lodging, and other commercial establishments providing hospitality services for the many tourists that visit the area. These developed areas are surrounded by marshy areas and tidal floodplains that are perfect habitats for producing

[1] Block-level data compiled from Decennial Census P.L. 94-171 Redistricting Data Summary Files and matched to the MCD boundary in GIS.
[2] Population Estimates, July 1, 2020 retrieved from U.S. Census Bureau QuickFacts: United States.
[3] Based on 2021 Estimates, Population: 1970-2050, County projections retrieved from Population and Demographic Data - Florida Products (state.fl.us).

mosquitoes. Mosquito populations, if untreated, would likely make it very difficult to support either a visitor or residential population on the island. As described above, the district also includes areas to the north of the two barrier islands on the mainland consisting of state parks and aquatic preserves.

The area recently experienced a devastating weather event through the severely damaging impacts caused by Hurricane Ian in 2022. Meteorology is the primary driving force for producing mosquitoes, with heavy rainfall events creating standing pools of water that serve as larval habitats for mosquito species capable of transmitting several arboviruses. Changing water levels through tidal events can also produce such pools. Humans contribute to the problem by allowing water to stand in waste containers, garden pots, tires, and other vessels.

The proximity of natural areas, which are prime production areas for mosquitoes, to densely developed residential, commercial, and tourist-populated areas of the district and the district's meteorological conditions and history of storm events create an environment conducive to productive mosquito habitats that require constant mosquito control attention. The services needed to control mosquitoes include routine surveillance of mosquito-producing habitats, source reduction, larvicide, and adulticide.

Real Property Data

Fort Myers Beach MCD collects ad valorem taxes to fund district operations. The total taxable value of properties within Fort Myers Beach MCD was almost $5.1 billion in the most recent fiscal year under a millage rate of 0.1123 (**Table 1**). Real property parcels subject to district millage have exceeded 11,000 parcels over the last four years (**Table 2**), exceeding the number of residents substantially and reflecting the high level of second homes owned by part-time residents. Taxable value of real property parcels increased almost 25% in FY 2022-23 compared to FY 2019-20, following changes in property values. However, subsequent to Hurricane Ian, it is unclear how many taxable properties will exist for 2023 tax assessment purposes.

Table 1. Millage Rates and Total Taxable Value of Properties Subject to Fort Myers Beach MCD Millage

Fort Myers Beach MCD	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
Millage Rate	0.0999	0.1123	0.1123	0.1123
Taxable Value of Parcels ($Mil.)	$4,068	$4,241	$4,443	$5,081
Taxable Value of Accounts ($Mil.)	$30	$29	$31	$32
Taxable Value of Centrally Assessed Property ($Mil.)[1]	$0	$0	$0	$0
Total Taxable Value ($Mil.)	**$4,098**	**$4,271**	**$4,474**	**$5,112**

Source: Florida Department of Revenue (FDOR).

[1] Centrally assessed property includes railroad and private carline company assessments as defined in Rule 12D-2.011, *F.A.C.*

Table 2. Real Property Parcels Subject to Fort Myers Beach MCD Millage

Fort Myers Beach MCD	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
Just Value of Parcels ($Mil.)	$4,599	$4,762	$5,132	$6,962
Real Property Parcels Subject to Millage	11,330	11,332	11,324	11,341
Taxable Value of Parcels ($Mil.)	$4,068	$4,241	$4,443	$5,081

Source: FDOR.

Tangible Personal Property Data

In addition to real property, tangible personal property accounts subject to district millage totaled just under 3,000 accounts in FY 2022-23, having declined over 5% since FY 2019-20 (**Table 3**). However, the taxable value of tangible personal property accounts increased in FY 2022-23 by almost 7% compared to FY 2019-20 due to increased account values.

Table 3. Tangible Personal Property Accounts Subject to District Millage

Fort Myers Beach MCD	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
Just Value of Accounts ($Mil.)	$45	$45	$47	$48
Tangible Personal Property Accounts Subject to Millage	3,158	3,140	3,046	2,994
Taxable Value of Accounts ($Mil.)	$30	$29	$31	$32

Source: FDOR.

History and Composition

Fort Myers Beach MCD was established in 1949 pursuant to county resolution. In 2001, the Florida Legislature recreated the district and codified all previous county resolutions and special acts addressing the district into Chapter 2001-335, *Laws of Florida*, which is the most recent legislative enactment governing the district.[4] The district is one of the smallest MCDs in Florida as well as one of the oldest. The district is subject to Chapter 189, *Florida Statutes*, given its status as an independent special district; Chapter 388, *Florida Statutes,* setting forth the requirements for creating and operating MCDs in this state; and Chapter 5E-13, *Florida Administrative Code*, setting forth rules adopted by the Department of Agriculture and Consumer Services (DACS) for mosquito control program administration.

Fort Myers Beach MCD is governed by an elected board of three commissioners and currently has three elected commissioners. The board's positions include a chairperson, secretary, and treasurer. Board members are elected to serve four-year terms, with the current board sitting at full capacity for the current and past three fiscal years. Board meetings are held on a monthly basis. Qualifications for election to the board are not specified in the enabling legislation.

Fort Myers Beach MCD is the first of what was, at one point, five mosquito control districts in Lee County. According to a long-serving retired commissioner interviewed by The Balmoral Group (TBG), three other districts – Sanibel, St. James City, and North Bokeelia – were merged into Lee County MCD in the late 1950s – early 1960s. At that time, the main equipment for managing mosquitoes was heavy dredging and dragline equipment. The equipment was used to excavate and open up canals connecting district marshlands with open water, on the theory that smaller fish would traverse the canals and eat the mosquito larvae. The cost of maintaining and operating heavy equipment, over time, became onerous on the smaller districts, which consolidated into Lee County MCD as an efficiency strategy. Fort Myers Beach MCD, on the other hand, relied almost entirely on spray

[4] http://laws.flrules.org/files/Ch_2001-335.pdf

trucks, and having been formed before Lee County MCD, was not part of the considerations at the time of the major consolidations.

Pursuant to Chapter 388, *Florida Statutes*, and the district's chapter law, the powers and duties of the board of commissioners include:

- Performing all duties necessary for the control and elimination of mosquitoes and other arthropods of public health importance.
- Being authorized to provide for the construction of canals, ditches, drains, dikes, fills, and other necessary works, and to install and maintain pumps, excavators, and other machinery and equipment.
- Preparing and adopting a district budget.
- Being authorized to hold, control, and acquire by gift or purchase for district use any real or personal property and to condemn any land or easements needed for the purposes of the district.
- Having all the powers of a body corporate, including the power to contract; to purchase and convey real estate and personal property; to employ a director, employees, and others; to participate with employees in a family group insurance plan; and to borrow money.

As required by s. 388.151, *Florida Statutes,* the board of commissioners must hold monthly meetings. The meetings must be open to the public and noticed and conducted in accordance with s. 189.015, *Florida Statutes*. Due to the destruction of the district's facility, the district could not provide information regarding meeting dates and minutes to TBG (**Table 4**). The computer on which all records were retained was destroyed during Hurricane Ian, and no backup records survived. Per verbal discussions with the district's executive director and commissioners, meetings are being held on a monthly basis as the district continues to rebuild. TBG requested but did not receive documentation for meetings that have occurred since the hurricane in September 2022.

Table 4. Fort Myers Beach MCD Commissioner Meeting Counts

Commissioner Meetings[1]	2020	2021	2022	2023
Monthly Meetings	Not received	Not received	Not received	Not received
Special Meetings	Not received	Not received	Not received	Not received

Source: TBG Work Product, Fort Myers Beach MCD.
[1] TBG requested but did not receive this information.

Intergovernmental Interactions

Fort Myers Beach MCD reported that it collaborates through an interlocal agreement with Lee County MCD to provide services in some areas of the mainland and other mosquito control services as needed in the district. These services are described in more detail in a later section of the report. Pasco County MCD, another MCD concurrently under review by TBG, reported that it offered to provide or loan mosquito traps to the Fort Myers Beach MCD as the district began to rebuild its resources following the disastrous effects from Hurricane Ian in 2022. Fort Myers MCD staff declined the offer and reported that the district did not require traps because it uses information provided by Lee County MCD on trap counts as part of its interlocal agreement. Similarly, Lee County MCD reported offering to conduct aerial spraying services following the hurricane, but Fort Myers Beach MCD declined the offer and reported to TBG that it did not require aerial spraying services at that time. Lee County

MCD also provided temporary office space with internet access to Fort Myers Beach MCD for approximately two to three weeks following Hurricane Ian in 2022 until the district was able to obtain its own office space with internet access. Lee County Department of Health reported that it does not interact with Fort Myers Beach MCD. Fort Myers Beach MCD is the only MCD among the 15 concurrent MCD reviews with which the local health department reported no interaction. Fort Myers Beach MCD staff reported that it does not have the need to interact with the local DOH office because it would receive notifications if any mosquito-borne diseases were identified in the area due to the monitoring of sentinel chicken flocks by neighboring Lee County MCD.

Resources for Fiscal Year 2021-22

The published FY 2021-22 millage rate established by the Fort Myers Beach MCD was 0.1123. For FY 2021-22, revenues totaled $502,677 with 100% generated by ad valorem taxes. Fort Myers Beach MCD has not received any state grants or federal funding in FY 2021-22, or in the past three fiscal years. Expenditures in FY 2021-22 were requested but not received. Prior to Hurricane Ian, the district had six paid staff (includes the three commissioners), three trucks, and two items of field equipment and operated out of one building. All of the assets were owned by the district. A summary of Fort Myers Beach resources for FY 2021-22 is shown in **Table 5**. Note, most of the equipment was destroyed in the hurricane in September 2022, and, as of mid-March 2023, the district had two operational full-time staff only because the office manager had been on paid leave since October 2022. As of August 2023, the office manager remains on paid leave and district representatives stated they had hired two part-time administrative staff to assume the office manager's duties.

Table 5. Fort Myers Beach MCD Resources for FY 2021-22

Resource Item	FY 2021-22 Amount
Millage Rate	0.1123
FY 2021-22 Revenues[1]	$502,677
FY 2021-22 Expenditures[2]	Not received
Number of Paid Staff	6 (3 commissioners and 3 full-time staff)
Vehicles	3 trucks
Equipment	Field equipment: 2 Lab equipment: 2 Office equipment: Not received Surveillance equipment: None
Facilities	1 building (destroyed during Hurricane Ian in 2022)

Source: TBG Work Product, MCD.
[1] Available from annual district DACS budget.
[2] TBG requested but did not receive this information.

2. Findings

Service Delivery

Fort Myers Beach MCD experienced disastrous impacts from Hurricane Ian but it continues to rebuild its resources to provide regular mosquito control services in several areas of Integrated Pest Management; the district receives several mosquito control services provided by Lee County MCD through an interlocal agreement, and consolidation of the districts may improve efficiency.

To assess the delivery of services in the district, TBG requested information on the geographic characteristics of the district; other local governments to which the district provides services or with which it coordinates efforts; the services provided by the district; similar services provided by other entities; district studies or evaluations of alternative service delivery methods including consolidation of services with other government entities; unique contributions from the district relative to the county or municipalities; and local stakeholder perceptions of the relative value of the district's services. In addition, TBG requested information from representatives of the Board of County Commissioners, local health department, and local parks and recreation department on their perceptions of the district's service delivery and efficiency.

Overview of Services

Most mosquito control programs use an Integrated Pest Management (IPM) approach to control mosquito populations, which targets the different stages of a mosquito's life cycle with various prevention and control measures. IPM addresses eight areas. Surveillance of mosquito populations is an essential component of all IPM programs with chemical treatments based on the surveillance findings. IPM can also include source reduction (e.g., container disposal and water/impoundment management), larviciding and adulticiding (using ground and/or aerial treatments), biological and alternative control, and disease surveillance. Research and education are also important components of IPM programs. See attachment titled, "Integrated Pest Management" for more information. Fort Myers Beach MCD conducts activities in six areas of IPM and also receives services provided by Lee County MCD in four of these areas (**Table 6**).

TBG staff conducted a site visit of Fort Myers Beach MCD's service area and facilities on March 21, 2023, and observed the district's facilities and operations. Based on TBG staff firsthand observation, the operational capacity of Fort Myers Beach MCD appeared at the time of the site visit to be greatly diminished due to catastrophic damage from Hurricane Ian. Fort Myers Beach MCD staff reported during the site visit that they were attempting to adhere as closely as possible to the district's overall general goal of eliminating mosquito infestations before adulticide is needed by manually inspecting and treating properties where appropriate with larvicide to prevent outbreaks of adult mosquitoes.

Fort Myers Beach MCD's mosquito surveillance activities consist of monitoring the extensive Fort Myers Beach drainage system and monitoring new construction, abandoned pools, and standing water. District staff drive the island in a truck and manually inspect individual properties to determine where larvicide treatment is required to prevent outbreaks. Efforts at the time of TBG's site visit included manually recording a list in a paper notebook of

all abandoned pools on the island, street by street. In addition, Fort Myers Beach MCD receives surveillance services through its long-standing interlocal agreement with Lee County MCD. Fort Myers Beach MCD staff reported that this agreement has been in place for at least 25 years. Under the agreement, Lee County MCD provides the district with certain mosquito surveillance and monitoring services. For example, Lee County MCD provides a truck trap route along a three-mile stretch of Fort Myers Beach MCD and shares its monitoring data with Fort Myers MCD to help the district determine appropriate adulticide treatments. In addition, Fort Myers Beach MCD does not have a boat or plane to access the approximately 22,000 acres of Estero Bay Preserve State Park in the northern part of Fort Myers Beach MCD's service area. Lee County MCD accesses these areas with its aircraft and boats and conducts larval sampling through dip counts to estimate the larval density rate in these areas and also inspects potential tide pools or areas of standing water after rain. Lee County MCD also provides surveillance support through its sentinel chicken program that includes flocks distributed throughout Lee County. Fort Myers Beach MCD staff reported that one of the sentinel chicken flocks is located within the Fort Myers Beach MCD boundaries, and that Lee County MCD provides disease surveillance information to the district as appropriate.

Fort Myers Beach MCD's source reduction activities include manual efforts on a daily basis to empty containers that could contain mosquito larvae at abandoned properties.

Fort Myers Beach MCD's larviciding activities include individual treatment in all standing waterbodies wherever surveillance detects mosquito larvae and where treatment is allowable (i.e., not in state preserve lands unless an emergency is declared). TBG shadowed Fort Myers Beach MCD's executive director as he visited on foot abandoned swimming pools and unmaintained bodies of water, performed a dip test, identified larvae, and applied larvicide when necessary. As mosquito season had not yet started at the time of this visit, it is difficult to assess whether current operations will be able to manage full summer conditions when mosquitoes are most active and prolific. The interlocal agreement with Lee County MCD also includes larviciding activities as needed.

Under pre-Ian conditions, Fort Myers Beach MCD's adulticiding activities included the use of two spray trucks. Both trucks were destroyed by Hurricane Ian, and the district has since replaced one of the spray trucks. In addition, Lee County MCD conducts adulticiding for a small portion of Fort Myers Beach MCD's service area on the mainland – Bunche Beach, and also conducts adulticiding via aerial spraying when numbers support such treatment and when requested by Fort Myers Beach MCD.

Fort Myers Beach MCD staff reported that the district monitors several mosquito control ditches that contain fish that consume mosquito larvae, thus serving as a method of biological control. The district does not conduct mosquito control research. The district conducts outreach to residents of the Town of Fort Myers Beach by sending electronic service announcements to residents. The district also conducts informal outreach and education activities when speaking with residents during service calls. In addition, the district reported that it provides an educational program once a year for operators of commercial fishing boats, recreational vessels, and other types of marine transport that come from other Florida counties, other states, and other countries and that dock in the district's marinas. District staff provide an annual educational presentation to this audience about the importance of mosquito control activities on boats, such as removing containers of standing water that could transport mosquito larva from another county, state, or country to Fort Myers Beach or elsewhere.

Table 6. Fort Myers Beach MCD Services Overview

Integrated Pest Management Service	Fort Myers Beach MCD Services Provided
Mosquito Surveillance	Daily on foot inspection of abandoned household swimming pools and unmaintained bodies of water using larval dip tests; surveillance through landing rates, dip tests, and truck trap counts provided by Lee County MCD through an interlocal agreement
Source Reduction	Daily on foot dumping of containers that could contain larvae
Larviciding	Daily on foot application of larvicides as needed in all standing waterbodies as verified by dip tests for larvae and where allowed; additional larviciding provided by Lee County MCD as needed in the district through an interlocal agreement
Adulticiding	Delivery of adulticide from a spray truck as appropriate; additional adulticiding provided by Lee County MCD in Bunche Beach and as needed in the district through an interlocal agreement
Biological and Alternative Control	Monitoring of ditches that contain mosquito-eating (larviverous) fish which serve a biological control function
Disease Surveillance	Lee County MCD's sentinel chicken program flock location in Fort Myers Beach MCD provides data on arboviruses detected in the district
Mosquito Control Research	None
Outreach and Education	Electronic service announcements to residents and informal outreach and education provided during service calls; annual educational presentation made to boat operators concerning controlling mosquitoes on aquatic vessels

Source: TBG Work Product, Ft. Myers Beach MCD.

Analysis of Delivery of Services

Fort Myers Beach MCD continues to rebuild following the disastrous impacts from Hurricane Ian, delivers several mosquito control services, and continues to receive several mosquito control services from Lee County MCD; while district staff report that stakeholders are satisfied with its performance, the district's ability to efficiently continue to deliver services on its own appears uncertain. TBG interviewed staff, inspected site operations, shadowed field staff, and reviewed documents available onsite and online to evaluate service delivery. Fort Myers Beach MCD provides services in a few of the eight areas of IPM as described above and has extremely limited resources currently due to the damage the district experienced from Hurricane Ian. No activities were noted that fall outside the district's charter or applicable administrative code or statute. The current services provided are primitive but effective, and, according to district representatives, provide a high level of attention tailored to the needs of individual households.

TBG conducted a site visit of the district on March 21, 2023, and observed the greatly diminished operational capacity of the district as a result of the recent storm. Fort Myers Beach MCD staff reported to TBG since the site visit occurred that although the operational capacity of the district was immediately diminished following the storm, the district has addressed its challenges through the immediate resumption of monitoring and spraying

activities by its staff, purchases of new equipment, and obtaining contracted administrative support services to allow operations to continue at pre-hurricane levels. District staff reported that staff resumed mosquito control operations within one week following the storm. The district also reported that it is in the process of rebuilding its facility and completing the acquisition of back-up equipment as needed.

The district has historically had a small scale and scope of mosquito control operations compared to most other MCDs in the state. The district continues to receive services through a long-standing interlocal agreement with Lee County MCD, which provides some surveillance, adulticiding, and larviciding services as well as disease surveillance for the district. Fort Myers Beach MCD does not have aerial or aquatic equipment that would allow it to access many areas of the aquatic preserve in the northern portion of the district nor the resources to conduct surveillance in the more remote natural areas of the district. The district must rely on Lee County MCD's equipment to address these issues. Fort Myers Beach MCD also benefits from Lee County MCD's sentinel chicken flock that is located within district boundaries.

District staff reported to TBG that they feel the current level of service provided by the district is efficient and sustainable, and that the district has made good progress in resuming normal levels of mosquito control service provision following the storm. However, even in the absence of storm recovery challenges, the district has historically been relatively small in the scale and scope of its operations and limited in the resources it has to conduct all necessary mosquito control activities in the district. It has historically received and continues to receive services from Lee County MCD, one of the largest and most sophisticated MCDs in the state. Furthermore, the district's current capabilities and resources leave little room for staff attrition or illness. These factors suggest there is uncertainty about how efficiently and effectively the district will be able to continue to operate given the continued extensive storm recovery and restoration efforts, the commencement of summer mosquito season during a record-breaking heat wave in Florida, and the gradual return of residents to the community.[5]

Commissioners and staff reported that residents routinely express their satisfaction with Fort Myers Beach MCD services and that they have received positive feedback from DEP, South Florida Water Management District, U.S. Army Corps of Engineers, Lee County, the Town of Fort Myers Beach, and other stakeholders regarding their performance. Documentation of the feedback was not provided. TBG requested information from the Board of County Commissioners, local health departments, and local parks and recreation units to assess their perceptions of the district's delivery of services but did not receive any response from these stakeholder groups following multiple contact attempts.

Comparison to Other Services

Similar services to those provided by Fort Myers Beach MCD are provided within the county by the Lee County MCD, which has more sophisticated and established operations; Lee County MCD currently already provides several mosquito control services in the district through a long-standing interlocal agreement. A review of Lee County MCD was conducted concurrently with TBG's review of Fort Myers Beach MCD. TBG interviewed staff, inspected site operations, and reviewed documents available online for both districts to determine if services could be or are redundant to or overlapping with other local government services. Fort Myers Beach MCD is rebuilding its operations, and its current operations are limited and labor-intensive. Neighboring Lee County MCD, by comparison, provides a broad spectrum of services across all eight areas of IPM and has extensive equipment,

[5] https://www.noaa.gov/stories/july-2023-brought-record-high-temperatures-devastating-floods-across-us

facilities, materials, and staff. Continued trends in meteorological patterns and weather events, urban development, and storm rebuilding conditions will bring disease-carrying mosquitoes in addition to nuisance outbreaks. In the context of these expected trends, more sophisticated measures than can be currently managed within the existing resources of Fort Myers Beach MCD, such as the methods used by Lee County MCD, may be needed. As discussed above, Lee County MCD already provides a number of services to the district through an interlocal agreement, including surveillance, larviciding and adulticiding, and disease surveillance.

Considerations for Consolidations

It may be appropriate to consolidate Fort Myers Beach MCD into Lee County MCD. TBG interviewed staff and visited the facilities of both Lee County MCD and Fort Myers Beach MCD. In the aftermath of Hurricane Ian, it is not evident that Fort Myers Beach MCD has an effective or sustainable redevelopment plan. After the storm, the district lost its facility and all systems and all records related to current operations.[6] Fort Myers Beach MCD currently operates with two individuals manually inspecting properties for abandoned pools and larval habitats on foot and applying larvicides when appropriate.

Although the Fort Myers Beach MCD has made progress in rebuilding its resources following the storm, the district's relatively small scope and scale, and current and historic reliance on the Lee County MCD to provide services for which the district is not equipped, support consideration of consolidation of the two districts. Additionally, in mid-March 2023, Fort Myers Beach MCD representatives estimated that the cost to rebuild the district's facilities and operations would be at least $2,000,000. More recently in August 2023, district representatives estimated that the cost would be $600,000. Documentation to substantiate the estimates was not provided. The costs to rebuild, however, could be avoided if the district were consolidated with the established operations of Lee County MCD. Such consolidation would likely add nominal costs only to Lee County MCD's operations, namely the cost of Fort Myers Beach MCD's staff of two, plus any dedicated equipment for their responsibilities.

A consideration for the consolidation decision is that the two districts currently have a disparity in their millage rates, with Fort Myers Beach MCD having a rate of 0.1123, which is lower than that of Lee County MCD at 0.2300. As discussed more fully in the "Recommendations" section below, however, the actual increase in tax dollars is relatively nominal on an individual taxpayer basis and local voters will have the opportunity to decide whether to approve the merger. Additionally, it is TBG's understanding that Lee County MCD has, in the past, applied different millage rates in specific areas of the county, which could potentially mitigate the impacts of higher taxes for the residents of Fort Myers Beach MCD. Another consideration for consolidation is the loss of part-time employment for the current commissioners. Discussions with retired Lee County MCD commissioners indicate that the lack of diversity in small boards like Fort Myers Beach MCD, with only three commissioners, frequently raises issues that larger boards, such as the seven-member board of commissioners for the Lee County MCD, can overcome. Larger boards may include representatives from the development, engineering, medical, legal, and other sectors who bring a broad perspective to issues that MCD commissioners may face in the course of their duties.

Lee County MCD has the capacity to absorb the operations of the Fort Myers Beach MCD if the two field staff of the Fort Myers Beach MCD are retained to continue implementing monitoring and treatment processes for the Fort Myers Beach MCD's service area. In addition, Lee County MCD has the administrative capacity to absorb the

[6] A few very old personnel records were recovered but were not related to current operational activities.

statutory reporting requirements, compliance requirements such as chemical inventories and training, and administrative processes that Fort Myers Beach MCD will need to rebuild.[7] If merged with the Lee County MCD, mosquito control in Fort Myers Beach would have access to additional resources, equipment, funding, and the well-established operations of the Lee County MCD, which could help improve service delivery within the Fort Myers Beach area. There are economies of scale that could be achieved with such a merger. For example, existing resources, equipment, and treatment processes established by Lee County MCD - and in some cases already in use in Fort Myers Beach MCD under contract - would provide immediate benefits to mosquito control activities in Fort Myers Beach at nominal additional costs to Lee County MCD. The resources and operational capacity of Lee County MCD could provide the benefit of improved and more efficient mosquito surveillance and control through the regular nightly practice of monitoring truck traps, for example, as opposed to having individuals constantly monitoring on foot.

Given the economies of scale that could be achieved with the Lee County MCD, it is likely a better use of taxpayer funds to consolidate Fort Myers Beach MCD operations into Lee County MCD and coordinate treatment processes and procedures with existing Lee County MCD protocols. Consolidating these two districts could provide more resources and operational capacity to the residents of Fort Myers Beach.

Resource Management

It is unclear if Fort Myers Beach MCD will be able to effectively and efficiently manage its resources in the wake of Hurricane Ian, particularly given the limited resources that were in place prior to the storm.

To assess the district's resource management, TBG analyzed information on revenue sources, revenue and expenditure trends, and their possible causes; analyzed staffing trends and their possible causes; requested data on services delivered by district staff versus third-party contractors for the last three fiscal years; analyzed equipment inventory and capital investment trends; reviewed the activities the district conducts to manage costs and plan personnel; requested information on resident feedback survey data related to finances and spending by the district; reviewed performance reviews and audits; and interviewed district staff and board members.

Current and Historic Revenues and Expenditures

The district's funding is primarily comprised of ad valorem taxes. The Lee County Property Appraiser, with approval from the Florida Department of Revenue (FDOR), certifies the county's tax roll each year and provides the information to the Lee County Tax Collector, which in turn collects monies authorized under the district's taxing authority. Fort Myers Beach MCD's fiscal year begins October 1st and ends on September 30th. Millage rates are set each year by Fort Myers Beach MCD's board of commissioners. Lee County tax collection was delayed due to Hurricane Ian. While Lee County MCD reports that tax revenues as of January 2023 had resumed to nearly 90% of pre-hurricane expectations, Fort Myers Beach MCD has not received an estimate, and the net revenues from ad valorem are uncertain at this writing and likely to be substantially lower than previous years. According to the

[7] Section 189.073, *F.S.* establishes that the Legislature, by special act, may merge independent special districts created and operating pursuant to special act. In addition, s. 189.074, *F.S.*, establishes the processes by which two or more contiguous independent special district created by a special act which have similar functions and elected governing bodies may elect to merge into a single independent district.

Army Corps of Engineers, 97% of all structures on the island were substantially damaged, with at least 1,000 homes expected to require demolition.

To review Fort Myers Beach MCD's current and historic revenues and expenditures, TBG requested financial information from the district for each year of the review period and received information for FY 2019-20 through FY 2020-21. TBG has not received data for FY 2021-22 nor for year-to-date FY 2022-23 and the district requested a one-year extension to comply with the request.

Fort Myers Beach MCD's revenues increased from $410,237 in FY 2019-20 to $470,082 in FY 2020-21, with the majority or all coming from ad valorem taxes as a result of increasing property values (**Table 7**). Expenditures decreased from $340,587 in FY 2019-20 to $332,218 in FY 2020-21 and in both of those years, revenues were greater than expenditures.

Table 7. Revenues and Expenditures

Revenues and Expenditures ($Mil.)	FY 2019-20	FY 2020-21	FY 2021-22[1]	FY 2022-23[1,2]
Revenues	**$410,237**	**$470,082**	**$502,677[2]**	**$573,841[2]**
Ad Valorem	$397,712	$465,664	$502,677[2]	$573,841[2]
Other Sources	$12,525	$4,418	Not received	Not received
Expenditures	**$340,587**	**$332,218**	**Not received**	**Not received**
Administrative Costs[1]	Not received	Not received	Not received	Not received
Direct Program and Activity Costs[1]	Not received	Not received	Not received	Not received
Other Expenditures[1]	Not received	Not received	Not received	Not received

Source: Ft Myers Beach MCD audits, TBG Work Product.
[1] TBG requested but did not receive this information.
[2] Information available from annual district DACS budget.
[3] 2023 YTD through April.

The revenues collected by Fort Myers Beach MCD were sustainable prior to the storm event due to the trend in rising property values, but, as noted above, the hurricane damage has created uncertainty about the future tax base for the small number of properties that comprise Fort Myers Beach MCD. It is uncertain at this writing what the impacts will be on funding for district operations, especially with the funding needed to rebuild the district facility and operations. As stated previously, district representatives have estimated that the cost to rebuild the facility and operations could be $600,000 to more than $2 million. District staff reported that it plans to use reserve funds to rebuild its facility and anticipates ad valorem revenues to increase in the future, which will allow it to establish a new emergency reserve. However, with the above-noted uncertainty about future tax base of the community, it is not clear how quickly the district will be able to rebuild its reserve funds.

Administrative Costs and Direct Program Costs

Financial data were not available in a format that would allow administrative costs and direct program and activity costs to be determined for each district program and activity, nor were the data available in a format that would allow categories with amounts to be determined for administrative, direct program, and activity costs. As stated previously, the district requested a one-year extension to produce additional records. Given that historical data was not backed up electronically, it is not clear that the data will be able to be reconstructed at any point in time.

Contracts for Services

Because Fort Myers Beach MCD does not own its own fleet, the district has contracted for surveillance, adulticiding, larviciding, and disease surveillance services with Lee County MCD for $60,000 per year. Since historical records are not available and the most recent FY 2020-21 audit does not break out contracted services, actual expenditures are not shown. One of the services provided under this contract is spraying on an as-needed basis, and Lee County MCD reports that Fort Myers Beach MCD did not request spraying services last fiscal year or in the current fiscal year, thus far through April. **Table 8** shows contracted amounts.

Table 8. Summary of Contracted Services

	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23[1]
Lee County MCD Interlocal Agreement to Provide Mosquito Control Services	$60,000	$60,000	$60,000	$60,000

Source: TBG Work Product, Fort Myers Beach MCD.
[1] 2023 YTD through April.

Staff

In addition to three commissioners, Fort Myers Beach MCD employs an executive director, a spray inspector, and an office manager. The district manages operations with a very small staff with administrative and technical skills. One commissioner also holds a public health license and can conduct mosquito control spraying when necessary. The district recently added two part-time contracted employees to provide administrative services and has no volunteers. Paid positions are outlined in **Table 9.**

Table 9. Fort Myers Beach MCD Staff Positions

• Commissioners	• Executive Director/ Spray Inspector	• Spray Inspector	• Office Manager

Source: TBG Work Product, Fort Myers Beach MCD.

Analysis of Program Staffing Levels

Fort Myers Beach MCD continues to be staffed at historic levels but may not have adequate staff to continue to meet district needs into the future. The district had six paid, in-house staff members in FY 2021-22, including the three elected commissioners. However, the office manager has been on paid leave since October 2022, which leaves two positions as functional full-time employees in FY 2022-23. The district hired two additional part-time contracted staff in FY 2022-23 to provide computer and administrative support services and help the district rebuild their archive of financial and other administrative records. Two current district staff, other than commissioners, are full-time employees who service the district daily. The district's staffing levels were constant during the previous three fiscal years, with three commissioners each year and three full-time staff each year. For the current fiscal year, it appears as though staffing levels have increased, but the total full-time equivalent of functional personnel has not changed, due to the addition of two part-time staff and the prolonged absence of one full-time staff member (**Table 10**).

Table 10. Fort Myers Beach MCD Staff Counts

Employee Counts	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23[1]
Commissioners	3	3	3	3
Full Time	3	3	3	3[2]
Part Time	0	0	0	2
Contracted	0	0	0	0
Volunteers	0	0	0	0
Vacancies	0	0	0	0
Total	**6**	**6**	**6**	**8**

Source: TBG Work Product, Fort Myers Beach MCD.
[1] 2023 YTD through April.
[2] One full-time employee has been on paid leave since October 2022.

The two current full-time staff members carry out all fieldwork, largely on foot. A significant effort will be required to restore accounting and administrative records, to maintain compliance with environmental regulations and record-keeping and training requirements relative to administering chemicals, and to oversee the reconstruction of the facility. This was previously handled by an office manager who is currently on paid leave, and district staff reported that the two recently hired part-time staff will temporarily fill this role. District staff reported that the district plans to make personnel changes and restore full-time administrative services in the future.

Reportedly, the office manager on paid leave has filed litigation against one or more of the commissioners. The executive director was using a computer at his home to manage records for the district, and there is no fixed facility in which the recently hired part-time administrative staff can work. An RV is currently being used for office purposes. Internet service was still unreliable at the time of TBG's site visit at the Fort Myers Beach MCD former site in March 2023. If a major outbreak of disease-carrying mosquitoes were to occur over the summer, it is questionable whether current staffing levels could provide sufficient mosquito control services, and there is no room for staff attrition or illness.

The staffing levels of Fort Myers Beach MCD at the time of TBG's site visit appeared adequate to provide mosquito control treatment to the areas of the district located on the barrier islands during the off-season when mosquito control services are needed less frequently. During this time, daily activities primarily consisted of two spray inspectors driving through the community and then checking each of the 400 pools on the island by foot and treating for larvae when needed. Most properties have been abandoned or engaged in insurance negotiations in the aftermath of Hurricane Ian. Current staffing levels, however, are likely not sufficient to achieve the district's general goals of mosquito control and restore its administrative records to remain in compliance with statutory requirements due to the continued need for extensive storm damage repair and restoration continues and the increased demands for mosquito control that will occur when summer mosquito season commences and residents return to the area. Staffing levels at the time of TBGs site visit did not appear adequate to maintain administrative functions of the district. While the district has recently added two part-time contracted staff on a temporary basis to assist with rebuilding the financial and administrative records of the district, the existing staffing level may not be sufficient to achieve compliance with records requirements, statutory administrative requirements, or documentation of governance.

Equipment and Facilities

Fort Myers Beach MCD's facility and most equipment were destroyed by Hurricane Ian; the facility will need to be entirely rebuilt and equipment has begun to be replaced. In FY 2021-22, Fort Myers Beach MCD owned two trucks mounted with Pro-Mist ULV (Ultra-Low Volume) machines for spraying adult mosquitoes and one truck for general purposes. However, these trucks were destroyed during Hurricane Ian, and the district now operates with one recently purchased truck, one four-wheeler, two foggers, two hand sprayers, and one ULV sprayer.

Fort Myers Beach MCD historically has operated out of one facility location in Fort Myers Beach, but this building, and most records and equipment, including 2 microscopes for lab equipment and 2 ULV machines mounted to trucks, that had been stored in the building when it was destroyed down to the foundation in Hurricane Ian. The current base of operations for Fort Myers Beach MCD is a camper at the same location with a shed to store chemicals and equipment. The current operational capability with the camper and equipment in use is limited while Fort Myers Beach MCD rebuilds. District staff reported that they are in the process of planning for the construction of a new building. A summary of Fort Myers Beach MCD's equipment and facilities is shown in **Table 11**.

Table 11. District Vehicles, Equipment, and Facilities

	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23[1]
Vehicles	**3**	**3**	**3**	**3**
Airplanes	0	0	0	0
Helicopters	0	0	0	0
Boats	0	0	0	0
Trucks and Vans	3	3	3	1
Campers and Buses	0	0	0	1
ATVs and Utility Vehicles	0	0	0	1
Equipment	**2**	**2**	**4**	**5**
Field Equipment	2	2	2	5
Lab Equipment	Not received	Not received	2	0
Office Equipment	Not received	Not received	Not received	Not received
Facilities	**1**	**1**	**1**	**0**
Buildings	1	1	1	0

Source: TBG Work Product, Fort Myers Beach MCD.
[1] 2023 YTD through April.

Fort Myers Beach MCD relies on the services provided by Lee County MCD for mosquito traps and sentinel chickens, as described in the "Overview of Services" section earlier in the report.

Strategic or Other Formal Plans for the District's Future

Fort Myers Beach MCD does not have a strategic plan or other formal plans in place. Due to the destruction of the district's facility and equipment, Fort Myers Beach MCD is focused on rebuilding first and foremost. Revenue not directly going towards operations is being held in reserve, dedicated to the reconstruction of their facility location and rebuilding resources and equipment. District staff reported that the district plans to rebuild its facility

to meet new hurricane building codes and federal flood plain standards and plans to restock all necessary equipment.

Previous Performance Reviews, Financial Audits, and Resident Feedback Surveys

Prior to Hurricane Ian, the most recent financial audit (FY 2020-21) did not report material findings. TBG reviewed audits of Fort Myers Beach MCD's financial statements from FY 2018-19 to FY 2020-21. The FY 2019-20 audit found a lack of general ledger accounting and a lack of internal controls to correct errors when identified, and the FY 2020-21 audit found these issues to have been resolved. Because no backups of records are available to review, it is unclear whether audit requirements have continued to be met. At this time, a general ledger accounting system is not in place as the accounting system was lost in the hurricane; it can be presumed that the district does not currently have internal controls as it is in the midst of an extensive rebuilding process. No performance reviews or feedback surveys were received from Fort Myers Beach MCD.

Analysis of Management Reports/Data and Performance Information

Fort Myers Beach MCD is in the process of rebuilding its administrative and financial records that were destroyed by Hurricane Ian; no management reports, data, or performance information were available for review. Interviews with Fort Myers Beach MCD staff and inspection of the district's current headquarters determined that there were no formal measurements in place, and operations were based on an as-needed level with no official recordings of performance success in place. Furthermore, almost all records of Fort Myers Beach MCD were destroyed in Hurricane Ian. Analysis of management reports/data and performance information is not able to be completed given the lack of necessary current or historical records.

Evaluation of Cost, Timing, and Quality of Current Program Efforts

Current program efforts are sufficient for operational needs on an interim basis and for off-season, to achieve minimal levels of service only. Program efforts are soon expected to be insufficient; cost, timing, and quality of Fort Myers Beach MCD program efforts need improvement. TBG reviewed available records, interviewed staff, and conducted a site visit of the district and shadowed district staff during their daily operations. Current program efforts are limited due to a lack of facilities and equipment. The district lies in a densely populated barrier island with constraints on spraying due to wind speeds and environmentally sensitive areas; the district has no aerial spraying equipment of its own and therefore cannot reach the vast natural areas in the north part of the district that require surveillance. The district receives services that help it provide surveillance in these areas and additional services like larviciding and adulticiding as needed through an interlocal agreement with Lee County MCD. Fort Myers Beach MCD experienced devastating impacts and damage from Hurricane Ian and has been able to fairly quickly rebuild some of its resources to be able to resume regular mosquito control services throughout the district. The district's two field staff are able to provide the needed services on the island, and one of the commissioners can provide spraying services if needed in an emergency. The district continues to rely on Lee County MCD to provide certain services, and non-aerial spraying operations are significantly impaired with the loss of the majority of the district's equipment. With the advent of peak mosquito season in the summer months, Fort Myers Beach MCD will be under equipped for its required operational needs. Required testing, surveillance, coordination with the local Department of Health, and other elements of IPM are not occurring, and the extent to which the district may or may not have conducted these activities in the past cannot be determined.

Given the barebones operation currently in place, it is reasonable to conclude that layering compliance monitoring and governance on program activity would likely be unattainable for the current level of resources. Current staffing levels are insufficient to deal with a disease outbreak or the illness or vacancy of a staff person.

Goals, Objectives, and Performance Measures and Standards

Fort Myers Beach MCD does not have clearly defined, measurable goals and objectives that adequately address its statutory purpose; the district does not track and measure performance.

To assess the district's goals, objectives, and performance measures and standards, TBG requested and reviewed the district's charter; requested information on performance measures and standards and records of the current and previous three fiscal years' measures, standards; and requested records of success or failure to meet the standards. TBG requested and reviewed previous audits; interviewed district staff and relevant local government entities about district performance; and requested any available results of district-generated resident feedback surveys conducted during the current and previous three fiscal years.

Goals and Objectives

According to Fort Myers Beach MCD staff, the district does not have formalized, written goals or objectives but generally aims to eliminate mosquito infestations before adulticide is needed by manually inspecting and treating properties with larvicide to prevent outbreaks of adult mosquitoes.

Performance Measures and Standards

Fort Myers Beach MCD does not have formally defined performance measures or standards but informally measures the success of the district's operations based on resident service request calls. Due to the destruction of the district's computer records by the hurricane and the inability to interview the district's administrative staff person, TBG was unable to determine whether the district had any records of performance monitoring for the current and past three fiscal years.[8]

According to the district's executive director, the main method for Fort Myers Beach MCD to measure the success of district operations is counting resident service request calls. District staff reported that the district does record and track service requests but was not able to provide annual data on service calls. The district's performance standard is to respond to every resident service request call received by the district and for the number of request calls to decrease over time. District staff reported that they estimate the average number of service calls received during the current and prior three fiscal years has been approximately 36 calls annually (or approximately three calls per month). District staff also reported that the district has responded to every service request. It is not possible for TBG to fully assess the district's performance due to the lack of documentation.

[8] The administrative staff person who maintained district records is no longer employed by the district, and as of April 2023, was in litigation with Fort Myers Beach MCD and unable to be interviewed.

1. **Standard:** Provide adulticiding and larviciding services for all service requests received and decrease annual number of service requests over time.

   Measure: Number of responses to service requests.

Based on the anecdotal data provided by district staff, the district is not meeting its standard of decreasing service requests over time for the period of this review; however, as discussed below, service request calls have historically decreased over a longer period.

Fort Myers Beach MCD also reviews the weekly arbovirus counts published by the DOH but does not have a formal internal tracking system for disease prevalence data. TBG reviewed the publicly available DOH arbovirus data to assess the district's performance based on the following performance measurement.

2. **Standard:** No human cases of arbovirus acquired in Florida and detected in the district service area.

   Measure: Counts of arbovirus incidence in humans from DOH data.

TBG's review of arbovirus case counts identified one human arbovirus case that was acquired in Florida and detected in Lee County in calendar year 2020; however, it is unknown whether this case was detected within the Fort Myers Beach MCD service area because the data is reported at the county level only. There have been no human cases acquired in Florida and detected in Lee County in calendar years 2021 and 2022 nor through June of calendar year 2023.

DOH arbovirus case prevalence data and the anecdotally reported data for service request calls and responses is presented in **Table 12**.

Table 12. Performance Measures for Fort Myers Beach MCD

Performance Measure	CY 2020	CY 2021	CY 2022	CY 2023[3]
Arbovirus Cases (Florida)[1]	1	0	0	0
Arbovirus Cases (Travel)[1]	1	0	32	1
Arbovirus Deaths	0	0	0	0
	FY 2019-20	**FY 2020-21**	**FY 2021-22**	**FY 2022-23[4]**
Service Calls[2]	36	36	36	36 (estimate is for full FY)
Service Responses[2]	36	36	36	36

Source: TBG Work Product, Fort Myers Beach MCD, DOH.
[1] Florida DOH data is published at the county level; it is unknown what portion of Lee County cases may fall within Fort Myers Beach MCD boundaries.
[2] Information was requested from the district but the district was only able to provide anecdotal evidence of the annual number of service calls and responses.
[3] Florida DOH data is provided by calendar year (CY).
[4] 2023 YTD through April.

Analysis of Goals, Objectives, and Performance Measures

Fort Myers Beach MCD does not have clearly defined goals, objectives, or performance measures and standards; the district has kept arbovirus counts low and anecdotal evidence suggests that the district has responded to all service calls in the current and prior three fiscal years. Based on interviews with district staff, the district has responded to every service call it has received in the current and prior three fiscal years. In addition, district staff reported that the number of service requests calls have decreased significantly since the current executive

director took office and initiated the implementation of regularly scheduled treatments. Prior to this change, district staff reported receiving 20-30 calls a week complaining of mosquitoes and requesting treatment. In the current and prior three fiscal years, Fort Myers Beach MCD has received only about three calls a month.

The district does not have formally defined performance measures or standards to allow assessment of its performance or to ensure compliance with statutory requirements and best practices for mosquito control. Formalizing internal controls, reporting milestones, and adopting performance measures and standards would allow transparency into fiscal and operational program decisions. Further, disaster recovery will need to be formalized including proper backup processes. If consolidation with the Lee County MCD is not pursued or achieved, Fort Myers Beach MCD should consider implementing programmatic improvements including the development of a strategic plan and performance metrics. **Table 13** includes information on performance that TBG could assess for Fort Myers Beach MCD based on available information.

Table 13. Assessment of Performance Measures and Standards for Fort Myers Beach MCD

Performance Measure	Performance Standard	Assessment
Number of resident requests for service	Provide adulticiding and larviciding services for service requests received and decreasing service request calls over time	Based on anecdotal evidence reported by district staff, the standard is partially met in that the district responds to every request, but the annual numbers of requests have not declined during the period of review. Full assessment is not possible due to the lack of current and historical data and documentation from the district.
Counts of arbovirus incidence in humans from DOH data for the review period	No human cases of arbovirus acquired in Florida and detected in the district service area.	Based on TBG's review of the DOH arborvirus data, the standard has been met for calendar years 2021 and 2022 and through June of calendar year 2023. It is unknown whether the standard was met for calendar year 2020 because it cannot be determined whether the one case, which was acquired in Florida and detected in Lee County, occurred within the Fort Myers Beach MCD's boundaries.

Source: TBG analysis, based on review of information provided by Fort Myers Beach MCD.

Perceptions of the District's Performance by Local Government Stakeholders, Residents, and Other Relevant Local Stakeholders

The perception of Fort Myers Beach MCD's performance cannot be determined based on stakeholder feedback. TBG interviewed district staff to assess available information on public perceptions of the district. Fort Myers Beach MCD has not completed resident surveys, but public feedback had been formally collected through an online service portal before Hurricane Ian to track resident satisfaction with district services; however, such feedback is no longer available due to the destruction of all computer records. District staff reported to TBG that they have received positive feedback from DEP, SFWMD, U.S. ACE, Lee County, Town of Fort Myers Beach, and

other state and local stakeholders who are satisfied with the district's performance. Documentation of the feedback was not provided.

TBG reached out directly to the Florida DOH in Lee County and the Fort Myers Beach Culture, Parks & Recreation Department for stakeholder input on Fort Myers Beach MCD operations. The Lee County DOH office reported no interaction with Fort Myers Beach MCD. Fort Myers Beach MCD is the only MCD among the 15 concurrent MCD reviews with which the local health department reported no interaction. There was no response from the Fort Myers Beach Culture, Parks & Recreation Department after multiple attempts.

3. Recommendations

Discussion and Analysis

TBG analyzed findings by fiscal year to determine if revisions to district organization or administration can improve the efficiency, effectiveness, and/or economical operation of the district and presents several recommendations for consideration by the Legislature, Fort Myers Beach MCD, and Lee County MCD. TBG determined that Fort Myers Beach MCD and Lee County MCD could work with a professional licensed surveyor or take other action as appropriate to determine the correct boundaries for the districts. TBG also determined that Fort Myers Beach MCD would benefit greatly from consolidation into neighboring Lee County MCD, a much larger and more sophisticated district with significant resources to aid in rebuilding and reequipping Fort Myers Beach MCD. Accordingly, TBG recommends that the Legislature or the Fort Myers Beach and Lee County MCDs pursue consolidation. In addition, if consolidation is not pursued or achieved, TBG recommends that Fort Myers Beach MCD adopt a strategic plan, goals, objectives, and performance measures and standards and that the Legislature consider directing the Florida Coordinating Council on Mosquito Control to develop model goals, objectives, and performance measures and standards to assist MCDs in this state.

District boundaries: The map that depicts the boundaries of Fort Myers Beach MCD as shown in Figure 1 of this report represents what the district reported to TBG as its current boundaries and is from the Lee County Property Appraiser. The boundaries of this map conflict with the boundaries shown in the report and presented in Figure 1 of the concurrent review of Lee County MCD. Professional surveyors and mappers determine property boundaries and are licensed through the Florida Board of Professional Surveyors and Mappers and DACS.[9] To determine the correct boundaries for the districts, the Fort Myers Beach MCD could work with Lee County MCD and a professional licensed surveyor or take other action as appropriate.

Consolidation: Due to the complete destruction of Fort Myers Beach MCD's facility and most of the district's equipment, and records by Hurricane Ian, the district has limited capacity to meet local mosquito control needs. Staffing levels are inadequate to provide ongoing services and rebuild capacity. Funding is needed to rebuild lost equipment and the facility. TBG's concurrent review of Lee County MCD identified that it has a much more expansive, sophisticated, and established operation that could absorb the operations of Fort Myers Beach MCD at nominal cost. In addition, Lee County MCD has administrative capacity to absorb the statutory reporting, pesticide compliance requirements, and ongoing administrative processes that Fort Myers Beach MCD will need to rebuild from scratch. If merged with the Lee County MCD, Fort Myers Beach MCD would have access to

[9] https://www.fdacs.gov/Business-Services/Surveyors-and-Mappers

additional resources, equipment, funding, and the well-established operations of the Lee County MCD, which could help improve service delivery within the Fort Myers Beach area.

TBG's analysis identified potential efficiencies and economies of scale that could be achieved by merging the two districts. Lee County MCD reported that it can absorb the operations of the Fort Myers Beach MCD at nominal cost, whereas the expense for Fort Myers Beach MCD to rebuild its operations is anticipated by MCD representatives to cost at least $2 million. In addition, existing resources, equipment, and treatment processes established by Lee County MCD would provide immediate benefits to mosquito control activities in Fort Myers Beach at nominal additional costs to Lee County MCD. Given the economies of scale that could be achieved with the Lee County MCD, it is likely a better use of taxpayer funds to consolidate Fort Myers Beach MCD operations into Lee County MCD and coordinate treatment processes and procedures with existing Lee County MCD protocols. The consolidation could occur through one of the two following processes, which are outlined in detail in the Florida Special District Handbook, published by the Department of Economic Opportunity's Special District Accountability Program.[10]

1. The Legislature could consider merging the Lee County MCD and the Fort Myers Beach MCD by special act. Section 189.073, *Florida Statutes*, establishes that the Legislature, by special act, may merge independent special districts created and operating pursuant to special act. The special act merging the special districts must be approved at separate referenda of the impacted local governments by a majority of the resident electors. The special act merging the special districts must include a plan of merger that addresses transition issues such as the effective date, governance, administration, powers, pensions, and assumption of all assets and liabilities.

2. The Lee County MCD and Fort Myers Beach MCD could choose to jointly merge into a single independent special district. Section 189.074, *Florida Statutes* establishes that two or more special districts may elect to merge into a single independent special district provided they are contiguous, have similar functions, and have elected governing bodies. The merger proceedings can be initiated through a Joint Merger Plan by Resolution, which is initiated by the governing body of each special district, or through a qualified elector initiative, which is initiated by the electors of each special district. The merger must be approved at separate referenda of the impacted local governments by a majority of the resident electors.

A consideration for this recommendation is that the two districts currently have a disparity in their millage rates, with Fort Myers Beach MCD having a rate of 0.1123, which is lower than that of Lee County MCD at 0.2300. If the merger were to occur at the current Lee County millage rate, the residents of Fort Myers Beach would face a heavier tax burden (e.g., for a property with a taxable value of $500,000, the taxes assessed at the 0.1123 rate for the Fort Myers Beach MCD would be $56.15 and at the 0.2300 rate for the Lee County MCD would be $115). The voters will be informed of the millage rate issue and a majority must approve the merger before it may take effect. Timing may be sensitive for this issue as TBG was advised that Fort Myers Beach MCD intended to issue a request for proposal for architectural services to design the new building within 30 days after the date of TBG's field visit in March 2023.

[10] The Florida Special District Handbook, October 2022.

Strategic Planning and Performance Monitoring: Fort Myers Beach MCD lacks clearly defined goals, objectives, and performance measures and standards. If a merger with Lee County MCD is not pursued, the Fort Myers Beach MCD could consider developing a strategic plan to carefully consider how it will continue to rebuild its operations, including planning for the staffing, facilities, equipment, and materials that will be needed to address future mosquito control issues on the island as post-hurricane recovery and rebuilding continues. Current performance measures and standards do not ensure compliance with statutory requirements nor with best practices for mosquito control. Formalizing internal controls, reporting milestones, and adopting performance measures and standards would allow transparency into fiscal and operational program decisions. Further, disaster recovery will need to be formalized including proper backup processes. If consolidation is not pursued or achieved, Fort Myers Beach MCD should consider implementing programmatic improvements including the adoption of a strategic plan, goals, objectives, and performance measures and standards.

The district could seek guidance on strategic planning processes and the development of goals and objectives from other districts that have recently conducted such processes, such as Anastasia MCD or Indian River MCD. Florida's MCDs vary with regard to geography, incidences of species, and the scale and complexity of operations, however, there are similarities and opportunities for shared resources. Strategic planning processes such as those undertaken by Indian River MCD or Anastasia MCD could serve as a model for other MCDs.

Florida Coordinating Council on Mosquito Control: During TBG's review of the 15 independent MCDs, TBG found that most districts have not developed sufficient goals, objectives, or performance measures and standards. The Florida Coordinating Council on Mosquito Control was established by the Legislature to foster maximum efficient use of existing resources and to assist entities involved in mosquito control with best management practices. Membership on the council includes the agency heads for DACS, the Florida Department of Environmental Protection, and the Florida Fish and Wildlife Conservation Commission, the State Surgeon General, as well as representatives of federal agencies, the University of Florida's Florida Medical Entomology Laboratory, Florida MCDs, and others. The Legislature could direct the council to form a subcommittee consisting of mosquito professionals and researchers from around the state to develop model MCD goals, objectives, and performance measures and standards to assist MCDs with performance monitoring.[11]

Recommendations

Table 14 provides details on each recommendation and associated considerations.

[11] Section 388.46, *F.S.*

Table 14. Recommendations with Associated Considerations

Recommendation	Considerations
The district could work with Lee County MCD and a professional licensed surveyor or take other action as appropriate to determine the correct property boundaries of each district.	• This recommendation would require Fort Myers Beach MCD and Lee County MCD to coordinate efforts to obtain the review of a professional licensed surveyor or take other action. • The districts may incur costs to retain a surveyor or take other action.
The Legislature could consider merging the Lee County MCD and the Fort Myers Beach MCD by special act, as provided in s. 189.073, *Florida Statutes*.	• This recommendation would require the Legislature to create a special act for the consolidation. This would further require a local referendum and approval by a majority of resident electors. • The tax rates are currently different for the two MCDs. This issue will need to be addressed at the local level and ultimately by the voters.
The Lee County MCD and Fort Myers Beach MCD could jointly consider merging into a single independent special district, as provided in s. 189.074, *Florida Statutes*.	• This recommendation would require agreement to the merger by both districts and a local referendum and approval by a majority of resident electors. • The tax rates are currently different for the two MCDs. This issue will need to be addressed at the local level and ultimately by the voters.
If consolidation with Lee County MCD is not pursued or achieved, Fort Myers Beach MCD could engage in a strategic planning process to guide the rebuilding of the district and to adopt goals, objectives, and performance measures and standards to consistently monitor and maintain performance information over time; the district could seek guidance from other districts that have conducted strategic planning processes.	• This recommendation would require additional work by district staff and commissioners, who are already potentially stretched thin due to the rebuilding efforts of the district. • Staff in other districts may incur some additional workload if Fort Myers Beach MCD chooses to seek guidance from other districts regarding strategic planning processes.
The Legislature could consider amending s. 388.46*, Florida Statutes*, to direct the Florida Coordinating Council on Mosquito Control to form a subcommittee consisting of mosquito professionals and researchers from around the state to develop model goals, objectives, and performance measures and standards to assist MCDs with performance monitoring.	• This recommendation would require a statutory change. • This recommendation would impose additional workload on council members and staff. • The council's membership could assemble a subcommittee with a broad range of expertise that could be ideal for the development of such model performance information. • While this guidance will assist all MCDs, it will be of particular benefit to MCDs that lack staff resources for the development of such performance information.

Source: TBG analysis, based on review of information provided by Fort Myers Beach MCD

4. District Response

Each independent MCD under concurrent review by TBG was provided the option of submitting a formal response letter for inclusion in the final published report. Fort Myers Beach MCD's response letter is provided on the following two pages.

300 Lazy Way
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(239) 247-1205
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August 28, 2023

Ms. Valerie Seidel
President, The Balmoral Group

To whom it may concern:

The Fort Myers Beach Mosquito Control District (District) will be celebrating its 75th anniversary in 2024. It is true that the physical operations of the District were obliterated by Hurricane Ian in September of 2023. However, the District resumed service operations one week following the storm. The operations of the District are very direct, streamlined and catered to the needs of our constituents. The small size of our District is also its strength which allows it to be agile, resilient and quickly recoverable. All critical inspection and treatment equipment has been replaced and our ability to service our constituents is at 100%. Our primary focus is to eliminate breeding centers through the use of larvicides thus preventing outbreaks and avoiding the harsher use of spray adulticides. Our ability to achieve this approach is due to an institutional knowledge of our District topography and the ability to personally inspect every property in our District twice a year.

The natural disaster affected the District as well as the District Staff and Commissioners. As such, the immediate priority for the District was to return service as soon as possible to our constituents, while addressing the personal needs of the District personnel. Admittedly, the District was unable to participate in the special audit and requested an extension due to our unprecedented circumstances but was formally denied the extension. As a result of this, the final draft content and opinions are entirely based on the input of The Balmoral Group (TBG) and is subject to opinion, assumption and conjecture. Because documents could not or were not produced, the assumption was that procedures and processes did not exist. We do not fault TBG as we understand their contracted responsibility to provide a report on each MCD regardless of circumstances. However, the District was able to respond to the first draft, provide input and corrections but both factual and subjective corrections were left out of the final report leading to inaccuracies in the final draft. The District has been in operation for almost 75 years using similar resources and has performed exemplary service. Why now does the report suggest that the District is incapable and lacking the resources to provide sustained service?

The District is required to uphold all the same statutory requirements as any municipality or other taxing district. The District has been in compliance and has never received a non-compliance notification from a regulatory agency. The District was excited to participate in the OPAGGA special audit as we were looking forward to identifying improvement areas for the District and were very disappointed in the inability to participate.

The District does not receive state funds nor does it borrow funds. The District maintains a strong financial position and has replaced all primary equipment with insurance settlements. The replacement of a modest administration facility and garage will be entirely funded through emergency reserves.

The District anticipates retaining the current millage rate of 0.1123 for FY23-24. When compared with the Lee County MCD anticipated millage rate of 0.2350, the result would constitute a 109% increase to the District's constituents if a merger took place between districts. In addition, the high level, personalized concierge service that our constituents currently receive cannot be duplicated by a large, bureaucratic MCD. Consequently, the value proposition of receiving lesser service while paying twice the price is a very compelling argument against a change in the current status. There also exists a political concern that constituents will perceive as an unwarranted punitive action against a long-term local district as the community works to recover from a natural disaster.

The Fort Myers Beach Mosquito Control District is consistently seeking continuous improvement in our operations, retain an impeccable service reputation from our constituents and remain a steadfast presence in our community. Legislative evaluation of a District directly hit by the fourth strongest hurricane in the history of the USA is not practical nor just.

Respectfully submitted,

Fort Myers Beach Mosquito Control District

5. TBG Comment to Fort Myers Beach MCD Response

Thank you for your letter in response to the report on the performance review conducted by The Balmoral Group (TBG) for the Fort Myers Beach Mosquito Control District (MCD).

For the review of Fort Myers Beach MCD, TBG collected information and data from the United States Census Bureau and the Florida Department of Revenue; conducted interviews with district staff; visited the district's facilities and observed the district's operations and activities; reviewed budget information for the district from the Florida Department of Agriculture and Consumer Services; reviewed the district's annual audited financial statements; and reviewed and analyzed the services provided by Fort Myers Beach MCD for its service area as well as the services provided by Lee County MCD for its service area and for Fort Myers Beach MCD's service area. TBG applied the same methodology across all concurrent reviews of the state's 14 other independent MCDs and based its findings and recommendations on TBG's review and analysis of all available information, TBG's professional expertise in programmatic review, and the expertise of TBG's subject matter expert, who is a retired MCD Executive Director and a former president of both the state and national mosquito control associations.

The review of Fort Myers Beach MCD commenced in January 2023, with confirmation provided by TBG to the district's Executive Director on January 25. From the first discussion and continuing with the first full interview in early March, TBG recognized the tragic circumstances the district faced, and offered to adjust the process to the district's convenience; we were advised that with the total loss of records, the timing of our work would likely not be critical. The site visit and interviews with district staff took place in March 2023. The district requested a one-year extension from TBG on June 7, 2023, for the district's participation in the review, but due to the September 30, 2023, statutory deadline for the review, a one-year extension could not be granted. The district later requested an extension for its review of the Draft Final Report, which was granted.

The district recommended factual edits to the draft report. TBG discussed these edits with the district on August 16, 2023 and made all recommended edits that were substantiated and not in conflict with TBG's methodology for the 15 performance reviews.

Sincerely,

Valerie Seidel, President

The Balmoral Group

Attachment 1

GLOSSARY OF TERMS
MOSQUITO CONTROL DISTRICT REVIEWS

September 2023

Prepared for

The Florida Legislature

Prepared by

The Balmoral Group

165 Lincoln Avenue

Winter Park, FL 32789

Attachment 1

Term	Definition
Adulticide	A chemical that kills adult insects, which is usually applied as a spray; depending on the circumstances, adulticide applications can be made from the ground (most commonly with ultra-low volume spray trucks) or from the air (with either fixed- or rotary-wing aircraft or helicopters)
***Aedes aegypti* mosquitoes**	The primary type of mosquitoes (commonly referred to as yellow fever mosquitoes) that spread Zika, dengue, chikungunya, and other viruses; because these mosquitoes live near and prefer to feed on humans, they are more likely to spread these viruses to humans than other types of mosquitoes
***Aedes albopictus* mosquitoes**	Although competent vectors of dengue, eastern equine encephalitis, and other viruses that affect humans, these mosquitoes (commonly referred to as Asian tiger mosquitoes) feed on animals as well as humans and are, thus, less likely to spread viruses to humans than *Aedes aegypti* mosquitoes
Altosid	The trade name for a mosquito larvicide that contains a synthetic version of the juvenile hormone insect growth regulator methoprene as the active ingredient
American Mosquito Control Association (AMCA)	A professional association that includes individuals working for mosquito control programs, academics conducting research on mosquitoes and other disease vectors, and industry representatives who support mosquito control efforts around the world; the AMCA is active in member training and educating the public on the health importance of mosquito control in the U.S. and beyond; the association is international in scope and has approximately 1,500 members
***Anopheles* mosquitoes**	A genus of mosquitoes with more than 400 species; female mosquitoes in approximately 40 of these species transmit malaria; this is the only genus of mosquitoes that can transmit malaria
Arbovirus	Arthropod-borne viruses that are transmitted to humans primarily through the bites of infected mosquitoes, ticks, sand flies, or midges; includes West Nile virus, eastern equine encephalitis virus, St. Louis encephalitis virus, dengue, chikungunya, Zika, California encephalitis group viruses, and malaria
Arthropod	As defined in Ch. 388, *Florida Statutes*, titled "Mosquito Control," "arthropods" are insects of public health or nuisance importance, including all mosquitoes, midges, sand flies, dog flies, yellow flies, and house flies

Term	Definition
Barrier island	Land that separates the ocean from the mainland; frequently an estuary or a lagoon will be located between the barrier island and mainland
Biogents	A company that produces mosquito traps with the goal of reducing mosquito populations that are produced in container-type habitats
***Bacillus thuringiensis israelensis* (*Bti*)**	A naturally occurring bacteria commonly used as a mosquito larvicide since the 1980s
Chikungunya	A mosquito-transmitted disease caused by a virus that originated in Africa and is transmitted by *Aedes* mosquitoes; symptoms include fever, joint pain, and rash; the name chikungunya comes from the African Makonde language and means "to bend over in pain," which is the stance that many who contract this disease exhibit
***Culex* mosquitoes**	A genus of mosquitoes, several species of which serve as vectors of one or more important diseases of birds, humans, and other animals; the diseases they vector include West Nile virus, Japanese encephalitis, and St. Louis encephalitis.
***Culiseta melanura* mosquitoes**	A species of mosquitoes (commonly referred to as the black-tailed mosquito) that is significant due to its role in the transmission cycle of eastern equine encephalitis virus and potentially West Nile virus; these mosquitoes primarily feed on birds but can spread arboviruses to mammals as well
Dengue	A mosquito-transmitted virus that causes sudden fever and acute joint pain; occasionally occurs in Florida where the mosquito vector is *Aedes aegypti* or *Aedes albopictus*
Dibrom	The trade name for an organophosphate insecticide with the active ingredient naled; used in mosquito control as an adulticide and is typically applied with aircraft
Dipper	An approximately 300 ml container attached to an extension pole that is used to sample for the presence of mosquito larvae in aquatic habitats
Eastern equine encephalitis virus (EEEV)	A mosquito-transmitted virus that is rare but very dangerous when contracted by a horse, human, or other mammal; an average of 13 cases per year were reported in the United States from 2018-2022; approximately 30% of people with EEEV die and many survivors have ongoing neurologic

Term	Definition
	problems; in Florida, the freshwater swamp inhabiting mosquito *Culiseta melanura* is the primary vector of this disease
Fixed-wing aircraft	Commonly referred to as an airplane, these aircraft include stationary wings that provide lift for the aircraft; in mosquito control, these aircraft are commonly used for larvicide and adulticide applications
Florida Coordinating Council on Mosquito Control	An interagency council created in Ch. 388, *Florida Statutes,* in 1986, primarily to address issues concerning mosquito control applications, possible environmental impacts of control actions, and mosquito control management on State of Florida-owned lands
Florida Department of Agriculture and Consumer Services	The state agency that oversees and regulates mosquito control programs in Florida
Florida Department of Environmental Protection	The state agency responsible for coordinating efforts for intensified mosquito control on protected public lands when needed
Florida Department of Health (DOH)	The state agency responsible for implementing the Florida Sentinel Chicken Surveillance Program, reporting weekly data on the prevalence of arboviruses in this state, issuing public health arbovirus advisories and alerts, conducting or participating in arbovirus epidemiologic investigations, distributing weekly arbovirus epidemiology summary reports for mosquito control agencies, healthcare agencies, researchers, and others, and reporting human and animal arbovirus cases to the national arbovirus surveillance database
Florida Fish and Wildlife Conservation Commission	The state agency responsible for maintaining a database that enables the surveillance of bird mortality from arboviruses and for providing assistance and information on arboviruses in wildlife
Florida Medical Entomology Laboratory	A University of Florida laboratory (within the Institute of Food & Agricultural Sciences) that conducts research primarily on the control of mosquitoes; for the past 70 years, research at this lab has been instrumental in assisting mosquito control programs in Florida and elsewhere
Florida Mosquito Control Association (FMCA)	Created in the 1920s, the FMCA is Florida's professional association that includes individuals working for mosquito control programs, academic personnel conducting research on mosquitoes and other disease vectors,

Term	Definition
	and industry, which supports mosquito control efforts in Florida; the FMCA is active in the training of members and educating the public on the public health importance of mosquito control
Florida Sentinel Chicken Arboviral Surveillance Program	A program of the DOH that provides laboratory assistance to local agencies to monitor for the transmission of mosquito-transmitted viruses; sentinel chickens are stationed at locations throughout the state; when the chicken is bit by an arbovirus-transmitting mosquito, the chicken develops antibodies to the virus (the chicken does not become sick and cannot spread the virus to other mosquitoes); blood samples obtained from the sentinel chickens are submitted to DOH's lab in Tampa to be examined for the presence of antibodies; when present, the results indicate that arbovirus-transmitting mosquitoes are circulating in the location, enabling the increase of mosquito control efforts to reduce the risk of humans and animals from becoming ill
Genetically modified mosquitoes	*Ae. aegypti* mosquitoes that have been genetically modified to carry two genes: 1) a self-limiting gene that prevents female mosquito offspring from surviving to adulthood; and 2) a fluorescent marker gene that glows under a special red light, thereby allowing researchers to identify the genetically modified mosquitoes in the wild; because the female offspring die before becoming adults, the population of *Ae. aegypti* mosquitoes decreases
Geographic Information System (GIS)	Integrated computer hardware and software that stores, manages, analyzes, and visualizes geographic information
Good Laboratory Practices Program (GLP)	The goal of GLP is to ensure the quality and integrity of test data related to non-clinical safety studies
Granular application	Granular applications of chemicals differ from liquid applications by having a solid particle carrying the insecticide, which can better penetrate vegetation; this application is primarily used for larvicides to deliver mosquito toxin to the water where mosquito larvae are developing
Impoundment	Impoundments along Florida's central-east coast were created in the 1950s and 1960s by building earthen dikes around salt marshes known to produce mosquitoes; this allows the mosquito control program to manage the water level within the impoundment to prevent saltmarsh mosquitoes from laying

Term	Definition
	their eggs in these areas, thus effectively reducing their populations with a minimum need for pesticides; approximately 40,000 acres of impoundments were constructed from Volusia County south to Martin County; the impoundments remain a source reduction control method in the region
Landing rates	A surveillance method to determine the extent of a mosquito problem, where a person stands in a specific location and counts the number of mosquitoes that land on them within a designated period (such as 60 seconds)
Larvicide	A chemical that kills insects in their larval stages; for mosquitoes, larvicide must be introduced into the water where the larvae are developing; depending on the circumstances, larvicide applications can be made from the ground or from the air with either fixed- or rotary-wing aircraft or drones
Light Detection and Ranging (LiDAR)	A remote sensing technology used to precisely detect objects, such as mosquitoes, in real space
Malaria	A life-threatening illness transmitted primarily in tropical locations by female mosquitoes in the genus *Anopheles* primarily in tropical locations; symptoms include fever, headache, and chills and usually occur within 10-15 days after a bite
Methoprene	A synthetic juvenile hormone, which is an insect growth regulator, that has been used as a larvicide since the mid-1970s
Millage	A tax rate on property expressed as the number of dollars assessed for each $1000 of property value; for example, the property owner of a house valued at $250,000, which is assessed at a millage rate of 1.0, would be charged $250
Mosquito Control District	A local government entity enabled through a voter-approved local or state legislative act to provide mosquito control services in a geographically defined area
Mosquito counts	Surveillance of mosquito populations using a variety of techniques (*e.g.*, traps or landing rates); this term is usually used in reference to adult mosquitoes rather than immature ones
Natular	The trade name for a larvicide that includes the bacteria spinosid as its active ingredient

Term	Definition
Nuisance mosquito	A term used to designate a mosquito that typically does not transmit a pathogen such as a virus; these mosquitoes are in contrast to disease-transmitting mosquitoes that are readily capable of transmitting a pathogen
Pest resistance	The situation in which mosquitoes are no longer killed by the standard dose of an insecticide or manage to avoid coming into contact with the insecticide
Pyrethrum	A biochemical derived from a chrysanthemum plant that contains insecticidal properties; typically used in mosquito control as an adulticide
Rotary-wing aircraft	Aircraft that use a rotary blade rather than wings; a helicopter is the most common example
Rotational impoundment management	A management technique common in saltmarsh impoundments along Florida's Indian River Lagoon where the impoundment is artificially flooded during part of the spring and summer to prevent mosquitoes from laying their eggs in the marsh and is opened for the remainder of the year through culvert pipes to provide a hydrological connection between the impounded marsh and adjacent estuary or lagoon
Saint Louis encephalitis virus	A virus most commonly transmitted by *Culex* mosquitoes that can affect the central nervous system when a human is infected
Source reduction	Refers to the elimination of habitats that can produce mosquitoes; ranges from the proper disposal of waste containers to the complicated management of impoundments
Spinosid	A naturally occurring bacteria that contains insecticidal properties; is commonly applied as a larvicide; Natular is a commercial product that uses spinosid as its active ingredient
Sterile Insect Technique	A method whereby male insects are sterilized by radiation or other means; when the sterilized male mates with the female insect, viable offspring are not produced
Subcommittee on Managed Marshes	An interagency committee created in 1986 by the Florida Legislature in Ch. 388, *Florida Statutes,* to promote the wise management of Florida's wetlands for the mutual benefit of mosquito control and environmental enhancement
Ultra-low volume	A technique to dispense extremely small droplets of insecticide; while historically used for adulticiding, in some instances the technique is now used for larviciding

Term	Definition
United States Department of Agriculture (USDA)	Through its national Agricultural Research Service, the USDA participates in Florida mosquito control efforts largely with the Center for Medical, Agricultural and Veterinary Entomology, a laboratory in Gainesville, Florida, that conducts research on the biology and control of mosquitoes and other insects
United States Environmental Protection Agency	The federal agency that regulates mosquito control in Florida primarily through their approval and enforcement of chemical labels for insecticides
Unmanned Aerial System (UAS)	Aerial vehicles and associated equipment that do not carry a human operator and are remotely piloted or fly autonomously; drones are an example of a UAS
Vector	A living organism that transmits a pathogen (*e.g.*, virus, plasmodium, nematode) from an infected animal to a human or another animal; mosquitoes are an example of a vector
Vector surveillance	Monitoring for vectors that can be accomplished in several ways (e.g., various types of traps or landing rates)
Waste tires	Vehicle tires that are no longer of value and that have been improperly disposed in a manner that allows water to collect in the tires; some species of mosquitoes (e.g., *Aedes aeypti* or *Aedes albopictus*) lay their eggs in the standing water where the immature mosquitoes will develop to adulthood
Water management	In mosquito control, this term refers to a source reduction technique to minimize the production of mosquitoes in a particular aquatic habitat; the management of saltmarsh impoundments and some ditches are examples of water management projects
West Nile virus (WNV)	Introduced into the United States in New York around 2000, the virus is carried by birds and primarily transmitted by *Culex* mosquitoes; humans who contract the virus can develop a fever and other symptoms including headache, body aches, joint pains, and rash; most recover completely but symptoms can linger for weeks to months
Yellow fly trap	A sticky-type trap used to entangle yellow flies, a type of biting fly that occurs regularly in the Florida Panhandle, to reduce their population without insecticides

Term	Definition
Zika virus	A virus that originated in the Zika region of Africa and is transmitted by the mosquitoes *Aedes aegypti* and *Aedes albopictus;* humans who contract the virus can have symptoms similar to dengue such as fever, rash, headache, and joint pain; Zika passed from a pregnant woman to her fetus can result in birth defects including microcephaly and other brain abnormalities

Source: TBG work product.

Attachment 2

INTEGRATED PEST MANAGEMENT SUMMARY

September 2023

Prepared for

The Florida Legislature

Prepared by

The Balmoral Group

165 Lincoln Avenue

Winter Park, FL 32789

Attachment 2

Term	Summary
Integrated Pest Management	Most mosquito control programs use an Integrated Pest Management (IPM) approach to control mosquito populations, which targets the different stages of a mosquito's life cycle with various prevention and control measures. IPM addresses eight areas. Surveillance of mosquito populations is an essential component of all IPM programs with chemical treatments based on the surveillance findings. IPM can also include source reduction (e.g., container disposal and water/impoundment management), larviciding and adulticiding (using ground and/or aerial treatments), biological and alternative controls, and disease surveillance. Research and education are also important components of IPM programs.
Mosquito Surveillance	The general approach to surveillance is to define area-specific problems with mosquitoes through the establishment of a mosquito surveillance program. The program assists in determining the types of mosquito control efforts needed in each area so that pesticide applications are used only when necessary. Service requests made to mosquito control programs serve as one means of surveillance. Other means for adult mosquito surveillance include monitoring the landing rates and counts of mosquitoes in traps to determine when and where they are most prevalent and observing the effects of adulticide, larvicide, and source reduction efforts. Immature mosquito surveillance is conducted by collecting eggs, larvae, and pupae. Surveillance may also include inventorying and mapping data and using emerging technologies such as geo-referenced maps, geographic information systems (GIS), smart traps (e.g., a trap with an electronic device that differentiates mosquitoes from other insects, counts them, and wirelessly transmits the results), and unmanned aerial vehicles.
Source Reduction	Source reduction, also known as physical or permanent control, is considered the most effective mosquito control technique and is accomplished by eliminating larval habitats in salt marshes, freshwater habitats, temporarily flooded locations, and containers. Current saltmarsh source reduction techniques in Florida include • construction of shallow ditches that enhance drainage and thus eliminate mosquito-producing sites and create connectivity among water bodies to allow larvivorous fish (fish that feed upon insect larvae) access to mosquito habitats; and • management of impoundments by maintaining a sheet of water across a saltmarsh to prevent mosquitoes from laying eggs on the soil; this achieves saltmarsh mosquito control with minimum insecticide use.

Term	Summary
	Source reduction is also conducted in freshwater habitats and is based on the principle that manipulating water levels in low-lying areas will eliminate or reduce the need for insecticide use. The primary strategy used is reducing the amount of standing water or reducing the length of time that water can stand in low areas following significant rainfall. Another important area of source reduction is through aquatic plant management, which can be accomplished using chemical, biological, or mechanical control methods. Waste tire management is also a significant activity for many mosquito control districts because the proliferation and accumulation of discarded tires throughout the state continues to create habitats highly favored by mosquitoes, and these tires can be costly and labor-intensive to remove. Removing any receptacles that can contain water is beneficial in controlling mosquitoes.
Larvicides and Larviciding	Larvicides are insecticides used to kill insects in the larval stage. Most mosquitoes spend three to five days of their life cycle in the larval stage when they are highly susceptible to predation and control efforts; therefore, well-planned and timed larviciding is important for efficient operations to save labor costs and reduce chemical use. This also requires understanding the local mosquito ecology and patterns of arbovirus transmission to select the appropriate control techniques. Equipment used for ground application of larvicide can include trucks with sprayers mounted on the front bumper, all-terrain vehicles (ATVs), boats, and various hand-held and backpack sprayers. Aerial application uses various devices such as nozzles and metered systems that are attached to fixed-wing or rotary-wing aircraft (i.e., helicopters).
Adulticides and Adulticiding	Adulticides are insecticides used to kill adult mosquitoes. The majority of adulticiding in Florida is conducted using ultra-low volume (ULV) spraying during which an aerosol spray is released by specialized spray equipment mounted in aircraft, on the back of trucks or ATVs, or carried by hand or in a backpack. The spray drifts through the air and is effective only while it remains airborne; thus, having a short-term effect only. Where a longer-term effect is needed, residual sprays are applied to barriers or surfaces such as a stadium, park, or resident's yard and are often applied with a modified vehicle-mounted hydraulic sprayer. The mosquito must land on the surface where the residual insecticide has been deposited for it to be effective. Equipment operators must be properly trained in equipment maintenance and adulticide application because timing, targets, and thresholds for the application are based on numerous factors and can be challenging to establish.

Term	Summary
Biological and Alternative Control	Biological control agents include microbial control agents (e.g., bacteria, such as *Bacillus thuringiensis* or *Bt*, that can be sprayed over waterbodies to kill developing mosquito larvae), invertebrate arthropod mosquito predators (e.g., small aquatic crustaceans, such as copepods, that eat insect larvae), and vertebrate mosquito predators (e.g., larvivorous fish and birds). It is common for mosquito control districts in Florida to provide larvivorous fish as a service to the public. For example, Collier Mosquito Control District provides Gambusia mosquitofish to Collier County residents to release in standing water on their property to manage mosquito larvae. Alternative control methods include the sterile insect technique, trapping, repellents, and bug zappers.
Disease surveillance	Because of its geographic location and proximity to the Caribbean, Florida is vulnerable to the introduction of new vector-borne pathogens as occurred with the introduction of Zika virus in 2016 in South Florida. Disease surveillance includes monitoring for human cases of mosquito-borne arboviral diseases including dengue, chikungunya, West Nile virus, St. Louis encephalitis, and others. In addition, many mosquito control programs conduct regular blood testing of sentinel chickens. The state established the Florida Sentinel Chicken Arboviral Surveillance Program (FSCASP) in 1977 to provide laboratory services to local agencies to monitor the transmission of certain vector-borne diseases. The services are primarily used by mosquito control programs around the state. The programs submit sentinel chicken blood samples to the Florida Department of Health's Bureau of Laboratories in Tampa, where an antibody test is performed to identify if the chicken has been exposed to one of several viruses. Results are provided to participating agencies on a weekly basis.
Mosquito Control Research	Mosquito control programs must base their activities on sound and up-to-date scientific research in order to provide safe, effective, and efficient mosquito control services. Research that is either conducted or reviewed by mosquito control programs is essential to developing and implementing new and innovative methods and technologies. Numerous federal, state, and other entities conduct mosquito control research, as do several mosquito control districts in this state.
Outreach and Education	Increasing the public's understanding of the work of the mosquito control districts is an important component of overall mosquito control efforts. Public education helps people understand what is involved in mosquito control, the biology of mosquitoes, ecological issues, arboviral disease transmission, and actions that can be taken to prevent mosquito bites and reduce mosquitoes in yards and

Term	Summary
	neighborhoods. When adequately informed, the public is in a better position to protect themselves and support mosquito control efforts. This state's mosquito control programs and other entities, such as the Florida Department of Agriculture and Consumer Services, Florida Mosquito Control Association, and the University of Florida's, Institute of Food and Agricultural Sciences-Florida Medical Entomology Laboratory, dedicate significant efforts toward education.

Source: TBG work product.