PERFORMANCE REVIEW WORKSHOP

JANUARY 17, 2023

FLORIDA

Mosquito Control

DISTRICT

KEYS

2023 CALENDAR

January-2023

SUN	MON	TUES	WED	THUR	FRI	SAT
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February-2023

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March-2023

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April-2023

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May-2023

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August-2023

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September-2023

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October-2023

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November-2023

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December-2023

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Holidays Meetings Conferences

Performance Review Workshop

Florida Keys Mosquito Control District
Marathon Office
503 107TH Street, Marathon, FL

January 17, 2023
2:00 pm (approximate)

1. **Call to Order**

2. **Roll Call**

3. **Approval of Agenda**

4. **Purpose of the Workshop:** Chairman Goodman announces the purpose of this workshop is to discuss Operational Performance Reviews (both District and State-initiated), review Florida Mosquito Control District organization and Florida Mosquito Control Association (FMCA) strategic plan, and begin developing Florida Keys Mosquito Control District (FKMCD) action plan.

5. **Discussion**
   - **a.** Update on Performance Reviews (Leal)
   - **b.** Presentation of District-initiated Operational Review (Latham) Pgs. 5-66
   - **c.** Florida Mosquito Control District analysis, FMCA response, discussion on FKMCD plan of action (Goodman) Pgs. 68-72

6. **Good of the Order**

7. **Meeting Adjourned**

Item 5b

Presentation of District-initiated Operational Review

Operational Program Review of the Florida Keys Mosquito Control District

December 2022

Mark Latham, Consultant
(Retired Director, Manatee County Mosquito Control District)

TABLE OF CONTENTS

Executive Summary

Objective. The intent of this review was to observe the current structure and practices of the District, compare with currently accepted practices of other Florida mosquito control districts, determine what recommendations have been followed and improvements made since the previous review in 1999, evaluate the readiness of the District to respond to the state-mandated performance review, and make recommendations where changes and improvements can be made.

History and political organization. The Florida Keys Mosquito Control District (formerly Monroe County Anti-Mosquito District) was formed in 1949 by an act of the legislature (Chapter 26042 of the Laws of Florida (1949)) and voted in through a public referendum. This and future bills were codified into a single creation act in 2002 (Chapter 2002-346 Laws of Florida). The District is an independent special taxing district independent of regular county government with a board of 5 elected officials and the authority to manage its own budget and set ad valorem taxing rates to fund the programs.

Mosquito control practices. The District uses an IPM approach to control mosquitoes, focusing on a combination of environmentally sound, scientifically accepted methods. Significant improvements have been made since the 1999 review, moving away from a predominantly reactive, adulticiding-focused program to more of a proactive surveillance and larviciding program with adulticiding being a secondary method where needed. Greater emphasis has been placed on field staff and methods to control *Aedes aegypti* since the 2009-10 dengue outbreak in Key West.

Quality of Program. The District is using effective and efficient methods to target mosquito problems, with a well-trained professional workforce of 70+ employees overseen by a forward-thinking management team with many years of experience. The relatively low 10% annual turnover results in most field employees having significant experience, an important aspect when local knowledge is key. FKMCD is at the forefront of operational evaluations of new methods and supporting novel techniques through industry collaborations.

Preparation for Performance Review. The District is in a good position for the upcoming state-mandated performance review, having maintained and analyzed both surveillance and operational application data for many years. However, with the review being a completely new State requirement, the specifics of appropriate performance measures are somewhat of an unknown.

Recommendations.
Address the problems associated with the GIS/data management system.
Increase rate at which aging vehicles are replaced.
Fill the outstanding vacancies, particularly the Director of Aerial Operations and Upper Keys Supervisor.
Consolidate administrative positions in the Marathon office, when possible, such as through retirement.
Evaluate increasing routine aerial WALS to other areas apart from Old Town Key West.
Replace office trailer at lower keys facility with a permanent, more weather resilient structure.
Continue to evaluate novel control techniques, but also support refining/improving existing methods.
Prioritize the determination of what constitutes “performance measures” for the upcoming review.

Operational Review/Evaluation of the Florida Keys Mosquito Control District

Introduction

This review was initiated by the board of commissioners of the Florida Keys Mosquito Control District (FKMCD), partly in response to the upcoming state requirement for a "Performance Review" of certain special districts per the newly created (House Bill 1103, 2021 Florida legislative session) section 189.0695 Florida Statutes (included as Appendix B), and partly as a "good practice" to determine whether there were any facets of the program that could be improved. The intent was to receive advice from an experienced source, to have an outside set of eyes look over the operations, and to make sure the District was well prepared for the state mandated performance review.
In the same way that the Annual Financial Audit provides a general overview of the District's finances and compliance with certain financial guidelines, this review provides a general overview of the District's practices and operations in comparison to generally accepted mosquito control practices and the operations of other mosquito control districts in the state of Florida. However, unlike the Annual Financial Audit, there is no standard format to such a review. As such, this review will be broken down into sections that makes sense from a mosquito control district manager's perspective. It is also written to be read and understood by anyone with little to no understanding of mosquitoes and mosquito control practices.

The author of this review has over 40 years of experience in operational mosquito control, including 9 years as an entomologist/field operations supervisor at Miami-Dade mosquito control and 26 years as the director of Manatee County Mosquito Control District (A more detailed CV is available upon request). This broad experience and understanding of Florida mosquito control practices helps guide the development of this document from a professional standpoint as opposed to a simple "governmental audit" standpoint.

The information discussed in this review was obtained from a 4-day visit in early November 2022 to the three FKMCD facilities located in the upper, middle and lower keys, during which time key personnel were interviewed concerning their duties and insights into the program. In addition, a number of documents were provided at the author's request to include budgets, audits, monthly activity reports, chemical usage reports, operational charts, job descriptions, surveillance reports and special activities reports. A previous program review was conducted in the late 1990's by a 3-person team of experienced mosquito control professionals, and the findings/recommendations of that report are discussed in the context of the current state of the District program. The 5 elected members of the board of commissioners who oversee the District were also contacted and asked to provide their thoughts, views and concerns regarding the current state of the District.

This review is a broad overview and is not intended to cover detailed aspects of specific programs, particularly in regards to operational parameters or suggestions on different products and specific methodologies such as aerial application. These can be discussed at future times if requested.

FKMCD - Historical Context and political organization.

The Florida Keys Mosquito Control District (originally named the Monroe County Anti-Mosquito District) was created by an act of the Florida legislature (Chapter 26042 of the Laws of Florida (1949)) in 1949 after a required public referendum. Portions of the enabling legislation were changed in subsequent years, with a codification of these acts occurring in 2002 (Chapter 2002-346 Laws of Florida – included as **Appendix A**) at which time the current legal name (Florida Keys Mosquito Control District) was introduced. The most recent legislative change was made in 2020 (House bill 1041 creating Chapter 2020-195 Laws of Florida), removing the $1 million cap on the District's borrowing limit.

The FKMCD operates under the general rules of chapter 388 Florida Statutes (governing mosquito control) and chapter 189 Florida Statutes (governing special districts), plus any other state or federal laws as may be appropriate.
As an independent special taxing district, FKMCD does not come under the governance of general county government in Monroe County. As such it does not report to the Board of County Commissioners, but to an elected board of 5 mosquito control commissioners that meet once per month at the District headquarters. The District sets its own budget and ad-valorem taxing rate through a process defined by the Florida statutes. Being independent of county government, the District must maintain its own administrative and operational support services to include human resources, financial resources, building and equipment maintenance, information technology and others. This requirement is discussed later in the document.

Over the years, members of senior State government leadership have voiced their concern at the independent special taxing district form of government. In 2012, then Governor Scott signed Executive Order 12-10, requiring a review of all special taxing districts with a "special focus on increasing efficiency, fiscal accountability and the transparency of operations to the public". Mosquito control districts, being the smallest group of special districts, were the first to be reviewed. Excerpts from this review can be found in **Appendix D** at the end of this document.

The final paragraph of the 2012 Executive Order 12-10 review document on mosquito control districts presents the State's somewhat "negative" view of the inefficiencies of the Independent Special Taxing District form of government:
" There are several possible inefficiencies that are present in the creation of an independent special district. Mosquito control districts provide a potential illustration of these inefficiencies since most counties in the state provide the service. The inefficiencies are not in the actual control of the mosquitoes, but in the manner in which the unit of government operates and as such, the independent mosquito control district model creates a potential trade-off. The District may have some inherent inefficiencies, but may also provide a more consistent mosquito control service."

The current requirement for a "performance review" (per the 2021 Florida legislative action, House Bill 1103, creating section 189.0695 Florida Statutes – Included as **Appendix B**) repeats this same mindset by current members of the Florida legislature and thus needs addressing again. The FMCA (Florida Mosquito Control Association) is currently working with their lobbyist in Tallahassee to determine the best course of action in defending the Independent Special Taxing District mosquito control programs and answering the relevance of some of the performance review requirements as it relates to mosquito control as opposed to other government functions.

Mosquito Control Practices in the Florida Keys: An IPM approach

The following statements are copied directly from the introduction in the Florida Mosquito Control White Paper (2018 edition):

"A typical mosquito control program employing IPM principles first determines the species and abundance of mosquitoes through larval and adult surveys and then uses the most efficient and effective means of control. In some situations, water management programs or sanitation programs can be instituted to reduce larval habitats. When this approach is not practical, a larviciding program then is used so that specific larval habitats can be treated. Where larviciding is not effective, adulticides are used. The choice of larvicides and adulticides used is based on the species targeted for control and environmental concerns.
An important part of an IPM program is public education. Public participation can do much to reduce the larval habitats of domestic mosquitoes. Public education can be most effective during disease epidemics to educate the public concerning mosquito habits and the ways individuals can protect themselves from mosquito attack."

(The complete document can be accessed at:
https://fmel.ifas.ufl.edu/media/fmelifasufledu/7-15-2018-white-paper.pdf)

A similar statement is included on the US EPA's website under mosquito control and the sub-heading "Success in Mosquito Control: An Integrated Approach
https://epa.gov/mosquitocontrol/success-mosquito-control-integrated-approach

"EPA and CDC encourage all communities and mosquito control districts, including those in territories like Puerto Rico, to strictly adhere to IPM. IPM is a science-based, common-sense approach for managing pests and vectors, such as mosquitoes. IPM uses a variety of pest management techniques that focus on pest prevention, pest reduction, and the elimination of conditions that lead to pest infestations. IPM programs also rely heavily on resident education and pest monitoring."

The FKMCD is a strong proponent of IPM (or IVM) for mosquito control, employing all aspects where appropriate to combat the different mosquito species and mosquito problems it faces, problems that are in many cases unique to the Florida Keys when compared to other programs in Florida due to its geography, climate and cultural/socio-economic factors. With saltmarsh mosquitoes this has involved a move away from wide area adulticiding with broad spectrum insecticides, instead focusing on more targeted larviciding with highly mosquito-specific microbial larviciding. FKMCD is also a strong supporter of operational research, working with industry partners to evaluate and develop novel methods that address specific mosquito-related problems. In recent years this has included the WALS® (Wide Area Larvicide Spraying, as coined by Valent BioSciences) strategy to target difficult to find-and-access container mosquito habitats, a strategy that is now a major component of FKMCD's control activities against the disease-vectoring *Aedes aegypti* mosquitoes. The District is also currently supporting an evaluation of SIT (sterile insect technique) utilizing Oxitec's OX5034 genetically modified *Aedes aegypti* mosquitoes which have recently been approved for use in Florida and Texas by the US EPA. Most of the cost and work in this project is covered by Oxitec, with FKMCD providing facilities and minimal labor in support. It has also supported another novel SIT project utilizing a different approach (Wolbachia IIT or Incompatible insect technique) and may pursue larger scale evaluations in the future.

Mosquito species and species specific control practices

There are almost 50 different mosquito species that occur in the Florida Keys. However, a quick analysis of almost three years of trapping in the upper keys (predominantly Key Largo) indicates that only 8 of the 46 species identified were collected at an average of greater than 1 mosquito per trap per night and only 3 at greater than 10 mosquitoes per trap per night. This explains why the bulk of mosquito control effort is directed at just three species, *Aedes taeniorhynchus* (the Black Salt Marsh Mosquito), *Aedes aegypti* (the Yellow Fever Mosquito) and to a lesser extent *Culex quinquefasciatus* (the Southern House Mosquito). The standard control measures for each of these three important species are discussed below in relation to an IPM strategy that includes Source Reduction, Larviciding and Adulticiding.

Aedes taeniorhynchus (the Black Salt Marsh Mosquito):

This species is a floodwater mosquito that lays its eggs in damp depressions in the high marsh areas of mangrove swamps (and other associated low lying areas), that is those areas not inundated and flushed by daily tide cycles. The eggs remain dormant until flooded by heavy rainfall or extremely high tides. Significant flooding events can lead to extreme populations of this mosquito, resulting in severe nuisance to residents living within the flight range of mosquito habitats. As the flight range can be miles to tens-of-miles, and the Florida Keys is comprised primarily of low lying mangrove covered islands, this results in most residents being exposed to this mosquito. This is probably the most common mosquito in coastal areas of Florida and the primary species that led to the creation of most Florida mosquito control programs. Although it has been implicated in the transmission of VEE (Venezuelan Equine Encephalitis virus), this is a relatively rare mosquito-borne virus, and as such this species is only considered a nuisance species, albeit quite a significant one. *Aedes taeniorhynchus* is most active during dusk and dawn hours, but may also remain active at lower levels throughout the night, particularly during migratory flights. Adult mosquitoes rest in damp shaded areas during the day, but will actively bite when disturbed by anyone venturing into those areas at any time during the day. This behavior lends itself to using “landing rates” or “biting counts” as a method of surveillance.

Control Measures for *Aedes taeniorhynchus*:

Source reduction (eliminating the mosquito habitat or manipulating the water flow such that the habitat is not suitable for mosquitoes) – In the early years of mosquito control (early to mid 20th century) this was the principal method, with thousands of miles of ditches being dug throughout the coastal areas of Florida. The purpose of ditching was to allow the flushing of mosquito habitats (mangrove swamps) by the daily tide cycle, not allowing water to stand long enough for mosquito larvae to go through their 7 day life cycle from egg hatch to adult. However, this method was terminated in the 1960’s when it was recognized that this environmental manipulation effectively altered (damaged) pristine habitats. The remnants of many miles of mosquito ditches can still be observed in aerial photographs (Google Earth)

of the lower keys.

Larviciding (controlling the aquatic stages, larvae, of the mosquito while concentrated in their habitats) – This method has also been used in mosquito control for many years, first using Paris Green (copper acetoarsenite) in the early days (prior to the 1950's) as an insecticide and various oils as a suffocant/toxin, and then more recently moving onto highly specific microbial toxins that are safe to the environment.
However, until recently (last 20 years), access to much of the remote, publicly owned lands that produce most of the mosquitoes in the Keys was very limited or prohibited and thus larviciding was not very effective, leading to a major reliance on adulticiding. This changed in the early 2000's when multiple agreements were reached with State and Federal land managers, resulting in a major increase in aerial larviciding from 5,000 acres in 1998 to over 70,000 acres in the past year.

Adulticiding (controlling the adult stages, mostly the biting females, after they have dispersed from the larval habitats into residential areas) – Adult mosquito control is probably the most visible operation to the public as it is accomplished by "fogging" or space-spraying using trucks driving through the neighborhoods or aircraft/helicopters flying over the neighborhoods in the evening/nighttiime/early morning hours. It is considered the method of "last resort" since the adult mosquitoes are already widely dispersed and causing problems. However, it is often the only available method when the larval habitats are remote, difficult to access or if larviciding is prohibited due to environmental protection of State and Federal managed public lands. Prior to the scale up of larviciding in the early 2000's, adulticiding was the primary control method utilized by FKMCD, with between 1 and 2 million acres being treated annually (25% by aircraft, 75% by trucks). This number gradually decreased, starting after 2011, and is now around 200,000 acres per year, a 90% reduction.

Aedes aegypti (the Yellow Fever Mosquito):

This species is also a floodwater mosquito, but chooses to lay its eggs almost exclusively in man-made water-holding containers rather than swamps and depressions. These can be anything from small discarded trash items, bottles, buckets, flower pots, tires, etc, to larger items such as rain barrels, gutters, old boats, disused wells and cisterns (large water tanks built into older homes to store rain water collected from roof runoff, the main source for residential water prior to the introduction of piped municipal water). This mosquito is not a strong flyer, typically traveling less than 1000 feet in its lifetime, but it doesn't need to fly far as it is intimately associated with human activities. It is commonly found in tropical and sub-tropical regions of the world, including much of the Florida peninsular. It is both a nuisance species and a vector of some of the most important mosquito-borne viruses, most notably Dengue and Yellow Fever, but also Chikungunya, Zika and others. In many parts of the world, particularly those areas with poorer housing conditions, it is found resting both inside and outside of homes, making

targeting of the adults with truck or aerial space spraying ("fogging") very difficult. And although it is considered to be most active during early morning or late afternoon hours, it is actually more of an "ambush feeder", resting in a shaded area until it detects the presence of a human nearby. Throughout much of its range in Florida it is relegated to being an "outside mosquito" (exophilic behavior), as Florida residents live (and work) in screened and air conditioned buildings, and this significantly limits its ability to feed on multiple hosts and efficiently transmit viruses. However, residents (and tourists) in the Florida Keys tend to lead a more outdoor lifestyle, with "open" bars and restaurants, more open houses eschewing the "comforts" of air conditioning, and more lush tropical planting creating heavily shaded landscapes. In this way life in the Florida Keys is closer to that of the Caribbean islands than the urban areas of peninsular Florida, and exposure to *Aedes aegypti* mosquitoes both inside and outside of buildings is increased. This is likely one of the main factors that has led to outbreaks of Dengue in Key West and Key Largo over the last 15 years, and why control of *Aedes aegypti* mosquitoes carries so much more importance than in other areas of Florida (with the possible exception of Miami).

Control Measures for *Aedes aegypti*:

Source Reduction – As this mosquito uses man-made containers, often in the form of discarded refuse, source reduction in the form of "premise sanitation" is considered the most logical, practical control method. However, despite continual public education programs, it is difficult to get the public to cooperate in cleaning up water-holding containers on their properties, and mosquito control personnel cannot do the job for them, particularly when they cannot access many private residential properties. That being said, FKMCD puts a major emphasis on "domestic inspections", with 8 dedicated domestic inspectors in Key West alone.

Larviciding – As larviciding generally requires access to the mosquito habitats (in this case man-made containers), this method can be as difficult as source reduction for the same reasons, access to private property. Placement of long lasting residual larvicide formulations ("briquets") is important when treating large, immoveable containers such as cisterns, rain barrels and old boats. The development of a novel small droplet, wide area larviciding method (WALS®) using a Bti powder based aqueous formulation (WDG) through a cooperative process between Valent Biosciences and FKMCD has improved the ability to control this mosquito in cryptic urban habitats.

Adulticiding – As the adults of this mosquito species spend the majority of their time resting in sheltered habitats, they are very hard to target with fogging or space spraying techniques which require the mosquito to actively fly through the spray in order to pick up a lethal dose. Some success has been achieved with products that are inherently irritant to the mosquito, stirring them into flight activity, most notably Fyfanon (malathion) and Duet (sumithrin/prallethrin) formulations. FKMCD currently uses truck-based adulticiding with Fyfanon as part of its IPM approach targeting *Aedes aegypti* in Key West.

Culex quinquefasciatus (The Southern House Mosquito):

This species of mosquito differs from the other two floodwater mosquitoes in being a standing water mosquito, laying eggs as a raft on the surface of the water in suitable habitats. The eggs hatch within 1-2 days of laying. The preferred habitats for this mosquito tend to be water bodies with relatively high organic content (hence the name "dirty water mosquito"), from containers to septic tanks, ditches and drains, rarely natural habitats. Thus it is also linked to human development and frequently found in close association with *Aedes aegypti*. The term "urban mosquito" is used interchangeably between this species, *Aedes aegypti* and *Aedes albopictus*. This mosquito is primarily a nighttime biter, with peaks in activity starting after sundown and peaking a few hours later. As with *Aedes aegypti*, when given the opportunity, this mosquito will frequently be found resting inside of houses. *Culex quinquefasciatus* is one of the principal vectors of two important viruses endemic to much of the United States, St Louis Encephalitis virus (SLEv) and West Nile virus (WNv).

Control Measures for *Culex quinquefasciatus* :

Source Reduction – Cleaning up of the same container habitats utilized by *Aedes aegypti* will also help reduce populations of this mosquito. However, it is also commonly found in roadside ditches and underground storm drains, so these should be designed not to hold much water and also frequently cleaned out to prevent blockages and improve water flow. Disused cisterns and septic tanks can be significant sources of mosquito production, so wherever possible these should be filled with dirt or removed.

Larviciding – Long-lasting, residual formulations of larvicides are effective when applied to ditches, storm drains, cisterns and septic tanks. WALS®applications that target cryptic containers in the urban environment are also an effective treatment for larvae of this species that might be sharing container habitats with *Aedes aegypti* larvae.

Adulticiding - Fogging or Space spraying can be quite effective when good coverage of the urban neighborhoods is achieved. However, as this mosquito both rests in underground storm drains AND utilizes them as a larval habitat, consideration should be given to targeted treatments of storm drains wherever feasible utilizing space sprays or longer-lasting volatile emanators (such as the DDVP strips utilized by FKMCD in the Key West storm drain system).

The Florida Keys Mosquito Control District vs representative Districts in Peninsular Florida

While FKMCD bears some similarities to other mosquito control districts in peninsular Florida, there are many more factors that make it unique and account for the specific operational setup and practices.

Similarities:
In common with many coastal programs in Florida, FKMCD was originally created primarily to control the Black Saltmarsh mosquito, *Aedes taeniorhynchus*, an abundant and aggressive nuisance mosquito. The Florida Keys consists of low lying, mangrove-dominated or mangrove-fringed islands, the preferred larval habitat for this mosquito species. Thus control of this species is a primary objective for the District. Developed areas of the keys are also home to the Yellow Fever mosquito, *Aedes aegypti*, which is both a nuisance species and a potential disease vector. This is true for most urban areas of Florida and several districts, including FKMCD, have created programs specific to controlling this mosquito species.

Differences:
As the Florida Keys consists of a chain of small coastal islands surrounded by saltwater, there are few freshwater habitats that might produce significant numbers of freshwater mosquito species. This is a benefit in that FKMCD can focus its efforts on just a few mosquito species.
However there are many hurdles/factors that are somewhat unique to the Florida Keys including:

1) The chain of islands is over 100 miles in length and connected by just one major road. For efficiency of operations this requires the District to operate in three "operational regions" (Upper Keys, Middle Keys and Lower Keys) requiring three buildings/bases (Key Largo, Marathon and Big Coppitt Key)

2) Much of the Florida Keys is considered unique and environmentally sensitive lands, resulting in the creation of multiple state and national parks/refuges, each of which have specific restrictions on what, if any, mosquito control practices can be used. The FKMCD has to work

closely with all the different land managers and develop park-specific agreement documents in order to control the mosquitoes emanating from those lands which are often highly mosquito productive.

3) There are several large military facilities (US Navy) in the lower keys and these require contracts for mosquito control independent of local services. The FKMCD has to bid against private contractors in order to provide these services and maintain continuity of mosquito control practices in the contiguous areas encompassing these facilities.
4) Tourism and associated industries are the main economic drivers for the Florida Keys. Tourists tend to have a lower tolerance for mosquitoes than a resident population, requiring the FKMCD to be efficient and effective in maintaining low mosquito numbers. In addition, the large number of visiting tourists increases the potential for the introduction of a mosquito-borne virus via an infected visitor which could then lead to local transmission.
5) The attraction of the Florida Keys is the island lifestyle reminiscent of tourist areas of the Caribbean. This includes open air bars and restaurants and even accommodations (unlike the screened/air-conditioned practices of most of peninsular Florida), along with lush, dense tropical vegetation favored as harborage areas by *Aedes aegypti* mosquitoes. This increases the exposure between mosquitoes and humans (tourists and residents alike), raising both the nuisance level and the potential for mosquito-borne disease transmission.
6) In 2009-2010, local transmission of Dengue virus occurred in Key West, resulting in 28 locally acquired cases in 2009 and 65 in 2010. This was the first significant outbreak of locally acquired Dengue in the US in over 50 years (sporadic cases occur from year to year along the Texas-Mexico border). Then in 2020 another cluster of 72 cases of locally acquired dengue occurred in the upper keys, most of them in Key Largo. These dengue outbreaks support the premise of a higher potential for *Aedes aegypti* transmitted disease outbreaks in the Florida Keys than elsewhere in Florida (except perhaps Miami) and the need for the labor intensive *Aedes aegypti* specific control programs.

All of the above factors contribute to the need for a modern, efficient program with the funding, equipment and personnel capable of conducting both routine pro-active mosquito control activities and rapid reactive measures when local mosquito-borne disease cases are identified.

Florida Keys Mosquito Control District: Current practices vs 1999 external review

In 1999 an external review of FKMCD was conducted by three mosquito control experts, two retired directors (John Beidler and Oscar Fultz) and a retired USDA scientist (David Dame). At that time the program was in transition, attempting to move away from a primary reactive reliance on aerial and ground adulticiding (averaging 500,000+ acres and 1,000,000+ acres annually respectively), secondarily on larviciding (averaging only 7,500 acres annually, aerial and ground combined) towards a more pro-active larviciding program with adulticiding being secondary.

According to the Executive Summary in the 1999 report:

"***Objectives.*** *Assess the District program and consider strategies for improvement."*

"***Quality of the District Program****. The District is conducting a sound, cost-effective mosquito control program. The staff is well-trained, experienced and meets State certification requirements, which are based on a broad knowledge of mosquito biology, disease transmission, application technology, environmental protection, etc. Interviewed staff members were knowledgeable, exhibited a high level of morale and pride in their jobs, and appeared to be conscientious in the performance of their duties. Although the millage rate for the District is higher than neighboring Lee and Collier counties, the use of FY98 tax-generated funds by the District operation fell between the reported Lee and Collier expenditures."*

The authors made some comments in this this review regarding the Special Taxing District form of government:

*"Other than the observation that the District is conducting an excellent mosquito control program, perhaps the single most salient argument for maintaining the special tax district format is that biology, climate and disease are not entirely predictable. There often are very large variations from year to year in terms of seasonality of mosquito production, inventory needs and operational activities. The mosquito control Board must plan for a variety of expectations and handle this variability as it occurs - and it must make quick decisions often, not rarely****. It is commonly stated by mosquito control directors in Florida, that county-controlled mosquito districts tend to be less responsive and slower to act at the administrative levels than special tax districts."***

"The special tax district form of management is well suited to the needs of Monroe County, in that it provides dedicated equipment, dedicated facilities, dedicated vehicle and aircraft maintenance, and dedicated personnel. Decision making can be rapid, which shortens the response time for action on routine situations, unexpected events and emergency management."

The 1999 report also laid out **recommendations:**

"Establish an acceptable plan for state and federally managed lands and islands that includes the option of larval control to reduce and/or prevent the migration of adult mosquitoes into populated areas. (1)

Maintain the special tax district management structure and format. (2)

Establish a long range plan to upgrade the fleet of aircraft. (3)

Initiate a proactive public information program about mosquito biology and control. Educate the public on the advantages and economics of the special tax district. (4)

Negotiate a workable agreement with the Navy for controlling adult mosquitoes. (5)

Embark on a program to summarize surveillance data, in order to better reflect annual and seasonal trends and program impact." (6)

FKMCD committed to these recommendations and made great strides in improving the overall operations and capabilities of the District beginning in the early 2000's. These can be summarized as answers to the above recommendations:

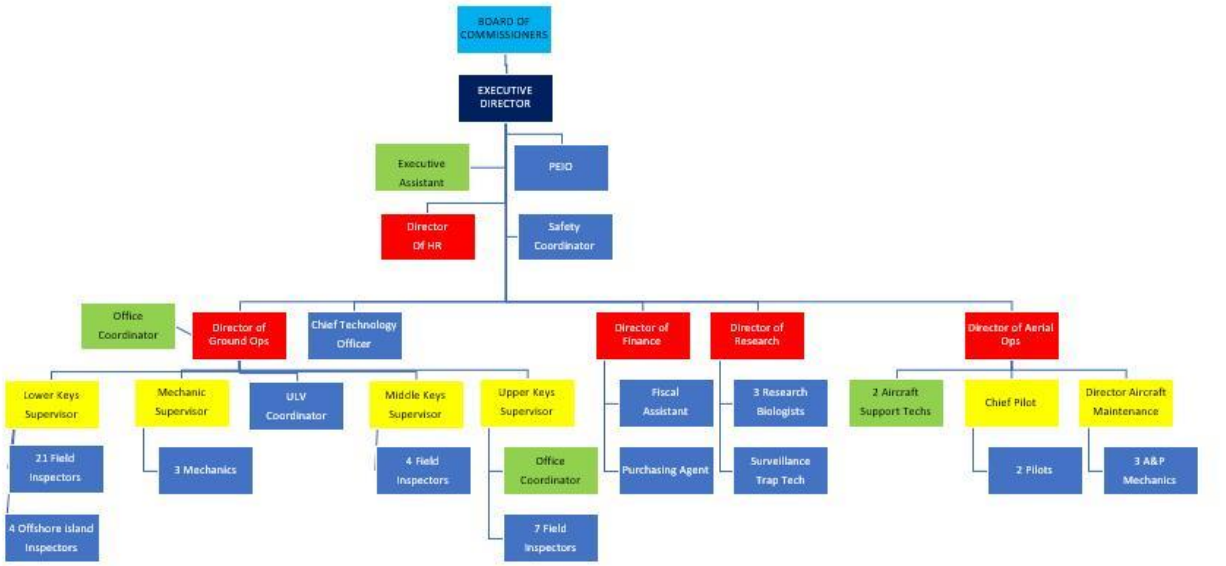
1) The District has entered into agreements with many of the state and federally managed lands and routinely conducts surveillance and treats highly mosquito productive public lands, including islands, with the microbial larvicide Bti (Vectobac). Helicopter applications against saltmarsh mosquitoes with Bti granules have gone from 5,000 acres treated in 1998 to more than 70,000 acres treated in 2022. This has reduced the reliance on adulticing by over 90%, dropping from 1,390,000 acres treated in 1998 to 131,000 acres in 2022.
2) There has been no change in the political organization, with FKMCD remaining an independent special taxing district.
3) The aging DC3's utilized by the District in the 1990's were replaced by smaller and more efficient turbine powered BN-Islander aircraft. Two Bell Long ranger helicopters were added to the existing Bell Jet Ranger to cover the additional aerial larviciding acreage. The current fleet is being upgraded once again, with the intent of replacing the 2 BN-Islanders (currently for sale) and 2 Bell long rangers (still in use) with 4 new Airbus H125 helicopters (2 currently in service and a third on order). The District has been building up its reserve funds such that the new helicopters can be bought outright rather than leased (with the sale proceeds of the older aircraft utilized towards the purchase price).
4) The District created a new PEIO (Public Education and Information Officer) position for the purpose of promoting District programs and educating the public on personal responsibilities in backyard mosquito control, particularly important in light of the dengue outbreaks.
5) The District recently won the bid back from a private mosquito control contractor and currently has two employees dedicated solely to conducting mosquito control on the Navy's different properties in the lower keys/Key West.
6) The Director of Research (who heads up the surveillance/trapping/identification program for FKMCD) maintains detailed records and provides summaries for the commissioners at the monthly board meetings. Detailed surveillance records are also required in support of the agreements for larviciding on State and Federally managed lands.

Conspicuous by its absence in the 1999 report is any mention of the need to improve the "Domestic mosquito control program" (for monitoring and control of *Aedes aegypti*). At the time there was a limited ongoing program, primarily concerned with the nuisance caused by *Aedes aegypti* in the urban tourist areas of Key West. While the potential for local *Aedes aegypti* populations to transmit dengue was recognized, it was considered a low risk. The dengue outbreak in Key West in 2009-2010 changed this outlook and resulted in a significant increase in effort dedicated to the control of *Aedes aegypti*, particularly in Key West. As a direct result of the 2009-10 dengue outbreak, FKMCD hired 10 additional field inspectors primarily to cover the increased focus on *Aedes aegypti* control and the need for an urban/domestic inspection program. The 2020 dengue outbreak in Key Largo reinforced this concern.

Current Organization and Staffing Levels:

While many districts have similar organizational setups, there is no "correct organizational structure", nor is there a formula for the number of employees based on county population size, land mass or mosquito population numbers. Historically, programs have developed an organizational structure and staffing level that works in their unique circumstances. As one might expect, as the program becomes more complex and staffing levels increase, there is a greater need for managers/directors with specific technical expertise to head up the different departments. At the time of the 1999 review FKMCD had 42 full time employees (including the Executive Director) and up to 25 temporary employees during peak mosquito season. By 2022 that number had increased to over 70 full time employees, reflecting the increased operational need of field inspectors for both the domestic (*Aedes aegypti*) and saltmarsh (*Aedes taeniorhynchus*) programs, the creation of new positions (the public education and information officer and the chief technology officer to oversee the computer-based GIS/data management systems), and the increased support needs in the aerial operations department.

One particular area of significant staff increase occurred as a result of the 2009-10 dengue outbreak in Key West. Management realized the importance of "domestic inspections" in controlling container-inhabiting *Aedes aegypti* mosquitoes through both premise sanitation and public education, as well as identifying large containers (cisterns, disused boats, rain barrels) and "hot spot" areas with significant mosquito populations that need special attention/treatment. Ten additional domestic inspector positions were added to the organization in 2010 for this reason.



The FKMCD can be divided into 5 main functional departments, each being overseen by a Director (red box) who reports to the Executive Director. These are Human Resources (one employee), Finance (three employees), Research (five employees), Aerial Operations (ten employees) and Ground Operations (47 employees). There are also four administrative support employees who report directly to the Executive Director.

During this current operational review, interviews were conducted with the Commissioners, Executive Director and each of the five departmental Directors (the Chief Pilot stood in for the vacant Director of Aerial Operations position). Interviews were also held with the Lower Keys Supervisor (responsible for 25 field inspectors), the Mechanic Supervisor and the Chief Technology Officer. The results (impressions) from these interviews, and other observations from the visit and provided documents, are detailed

below with appropriate comments and suggestions, particularly as it relates to the upcoming legislative requirement for an independent “Performance Audit”.

Board of Commissioners:
(Phil Goodman**,** Chairman, Dr Stanley Zuba, Vice Chair, Tom McDonald, Secretary/Treasurer, Jill Cranney, Commissioner, Brandon Pinder, Commissioner)
The Commissioners serve to represent the taxpayers of the Florida Keys. Their primary function is to review and approve the policy decisions of the District, including the annual budget and millage (taxing) rate, as provided by the Executive Director. The Executive Director is the one full time position that is employed by and serves at the pleasure of the Board (all other District employees are hired by the Executive Director utilizing accepted hiring practices). Elected commissioner duties do not involve the day-to-day operations of the District, but their involvement in overall policies, procedures and direction varies widely throughout the Independent Mosquito Control Districts in the State of Florida. Some have little communication with the Director and staff outside of the monthly public board meetings, whilst others become more heavily involved and interested in the various working functions of the District. The FKMCD commissioners fall into the latter group and frequently schedule workshops or Committee meetings prior to or following the regular Board meeting. This review was a suggestion of one of the commissioners and will be discussed at a workshop in conjunction with a regularly scheduled Board Meeting. While this “heavy involvement” of the commissioners might be seen by some Directors as a “double-edged sword”, interference in the Director’s duties and abilities to run the District, it does appear to be a positive influence in the case of the FKMCD. It also demonstrates the advantages of dedicated Mosquito Control District Commissioners who take a significant interest in the program versus County Board of Commissioners (in the case of county or Dependent District mosquito control programs) who are responsible for all aspects of county government and may not have the time or interest to focus on improving mosquito control.
During the interviews, all of the commissioners were very supportive of the Executive Director and overall direction of the District. There were questions regarding the staffing level of the District, could it be reduced, and could modern technological advances including drones, electronic traps and remote sensing be utilized in this regard to replace field staff observations (most relevant in the very labor intensive remote larval habitat surveillance and adult mosquito landing rate surveillance techniques currently being utilized). The need for a currently vacant senior management position was questioned, the Director of Aerial Operations. This will be discussed later in the section on Aerial Operations.

Executive Director (Andrea Leal):
Ms. Leal has been an employee of the District for almost 20 years, first as a field biologist, then as a Deputy Director before becoming Executive Director in 2016. This wide range of experience from field to administrative roles is clearly evident in how she manages the District. She has served as the Deputy Director under two very different Executive Directors, enabling her to gain experience and extract lessons from both. She has the trust and respect from those that she leads, from her senior management staff down to the field technicians, and also from the elected commissioners to whom she reports. Ms. Leal understands what it takes to manage a complex mosquito control program, providing an effective service to the citizens of Monroe County. Whilst the District employs proven methods utilized by other programs in the state, they also continue to look for and support novel alternatives, working with industry partners to evaluate these methods.

Chief Technology Officer (Tony Nunez):
Mr. Nunez has worked at the District for four years, serving a very important role essential to managing a large mosquito control district relying on observations and data collected by field staff to provide

timely mosquito control actions. His responsibility is to ensure the accurate and timely availability of data for decision-making by operations managers through the use of a GIS/data management system comprising cloud computing, a central computer at the District, mobile field units and a specially designed suite of software (in FKMCD's case, "Fieldseeker® GIS" by Frontier Precision inc.). As I heard repeatedly from Mr. Nunez, the Executive Director, and all other managers relying on the data, the Fieldseeker® system is not operating as smoothly as intended and needs constant attention and manipulation to retrieve the data which is essential for efficient operational decision making. The frustration exhibited by all the staff that I interviewed regarding Fieldseeker® is a clear indication that this is an important issue that needs to be addressed and corrected, either by significant improvements by the software manufacturer, or by looking at alternate proven software utilized by other mosquito control districts. A third option voiced by Mr. Nunez is the creation of an inhouse system utilizing the power of Esri ArcGIS, the GIS software on which Fieldseeker® (and the majority of other proven public GIS database systems) is based.

This is one of the operations/positions at the District that may be challenged in the upcoming "performance audit" as "duplication of services", since nearly all County Governments have "Information Technology" departments that may include expertise in GIS and data management. In addition, the separate constitutional office of "Property Appraiser", present in most Florida counties (including Monroe), relies heavily on a publicly accessible, web-based Esri GIS program housing current and historical data on every parcel of land (and building) in the county. However, it could be argued that the GIS/data management services utilized by FKMCD (or other mosquito control District) are unique and would require similar additional manpower/technical expertise and equipment if housed within the County government's department, resulting in little if any savings or improvement in efficiency.

Director of Finance (Bruce Holden):
The finance director has been with the District for 9 years. He is responsible for managing the District's $24 million annual budget (including reserves) and all the financial programs associated with it. This includes 4 different payrolls (regular employees biweekly, commissioners monthly, part-time employees and special payrolls), accounts payable (weekly), working with the director on developing the annual budget, supporting the independent audit process and working with the District's Investment Committee (the Executive Director, the Director of Finance and the Secretary/Treasurer of the Board) to ensure effective and proper investing of District funds. The Finance Department includes two other support personnel besides the finance director, a purchasing agent and a fiscal assistant. Given the limited scope of this report, including a short interview and the review of recent audit and budget documents, it would appear that the finance department is working efficiently and effectively.

This is another operation/department within the FKMCD that could be targeted in the upcoming "performance audit" as "duplication of services" since financial services and accounting practices are similar across local governmental organizations, so why not "contract out" or share these services with the county government finance department. However, considering the size and complexity of the FKMCD (70+ employees, $24 million budget, 3 geographically distinct locations, a large fleet of aircraft and trucks, unique mosquito control purchasing requirements, etc.) it might take the same number (3) of mosquito control dedicated finance employees within the county finance department to provide the same efficient services.

Director of Human Resources (Michael Behrend):
Mr. Behrend is the only employee within this department, and covers a wide range of HR related duties to include performance evaluations, health insurance selections, property insurance, employee benefits, salary surveys, keeping the personnel manual up to date, etc. He also serves as the FRS coordinator for

the District, ensures the FDACS report is filed, and provides financial seminars. He has been with the District almost 13 years, and so has a good understanding of all the unique HR issues that are faced by mosquito control programs.

While the county also has a dedicated HR department to serve its employees, it is unlikely that any significant savings in cost and efficiency could be achieved by transferring Mr. Behrend's duties to the county HR department, given the need to hire at least one additional employee to cover the 70+ at FKMCD. It is also unlikely that the wide range of skills and duties that he brings to his job could be replicated by a single HR employee at the county.

Director of Research (Larry Hribar):
While Dr. Hribar's title is Director of Research, much of the routine work of this five-person department is centered on conducting adult surveillance through the setting of several types of traps and the identification of mosquitoes collected by those traps. This is essential information that is needed by the District to justify the use of both truck and aerial adulticiding when mosquito populations exceed certain thresholds. (Landing rate counts conducted by field inspectors are also used to justify adulticide applications). The department also conducts research to evaluate and improve existing methods, as well as supporting evaluation of potential new control methods (such as the Sterile Insect Technique using the GM methods of Oxitec and Wolbachia methods of MosquitoMate).
Dr. Hribar is the longest serving employee in District management, his 24 years being surpassed only by a 28 year field inspector. He has been responsible for setting up the surveillance and research programs, being the first professional entomologist employed by the District.
The current use of landing rates as a daily surveillance tool is very labor intensive, taking up a significant portion of time from the field inspectors' day, time which could otherwise be used for larval inspections and treatments. The research department has an ongoing project evaluating the use of remotely placed "smart traps" (BG Counter Traps) that count mosquitoes as they catch them and relays that information via mobile signal back to the mosquito office where it can be used to plan timely mosquito adulticide treatments. The goal of this project is to eventually replace human landing counts by these smart traps, freeing up the field inspectors to conduct more timely larval inspections and treatments, with the potential to reduce the staffing levels in the future.
The Research Department in general, and Dr. Hribar in particular, have authored a number of scientific publications documenting operational research at FKMCD that benefits not only the District but the mosquito control industry in general.

Director of Operations (Mikki Coss):
This position oversees the majority of the field work and control operations throughout the Keys and is responsible for the direct or indirect supervision of over 40 individuals. This includes 36 field inspectors (25 in the Lower Keys, 4 in the Middle Keys and 7 in the Upper Keys) plus their 3 regional supervisors, the 4-member fleet maintenance section (3 mechanics and the mechanics supervisor) and the ULV coordinator responsible for overseeing the nighttime truck adulticiding program. And while Ms. Coss does not directly supervise the Aerial Operations department, she works closely with the Director of Aerial Operations to coordinate aerial applications throughout the Keys. The control operations are quite diverse and mean managing a number of different methodologies targeting the three main mosquito species. In addition to the main control operations, there is also the contracted work on the Naval properties and maintaining numerous agreements for work conducted on State and Federal managed lands. These diverse programs require significant understanding for the required planning, record keeping and report writing. Ms. Coss has been employed by the District for almost 20 years, starting in the field and working through increasingly responsible supervisory positions. She, like the

Executive Director, has been with the District during the time that the program has undergone major changes, with an increasing focus on aerial larviciding for saltmarsh mosquito control, and the need to create a more effective urban mosquito control program to prevent future dengue outbreaks. This history and long working relationship with the Executive Director has given her the experience necessary to run the operations efficiently and effectively, and be a key employee in the District's success.

Director of Aerial Operations (Chief Pilot Paul Pignataro interviewed in absence of this position):
The aerial department has changed significantly in the last 30 years, from being primarily an aerial adulticiding program utilizing fixed-wing aircraft (DC3's) to one that puts a far greater emphasis on larviciding with helicopters, both granular formulations for heavily vegetated saltmarsh habitats and liquid formulations for the treatment of containers in urban habitats. The significant increase in aerial larviciding, from approximately 6,000 acres in 1998 to almost 80,000 in 2022, and the off-airport loading closer to the treatment sites, required changes to the aerial larviciding loading/support process. The aerial department added personnel and now has a Director of Aerial Operations overseeing 3 full time pilots (including a Chief Pilot), 3 part time pilots, 4 A&P Mechanics (including a Director of Aircraft Maintenance) and 2 aircraft support techs primarily for transporting the material (tens of thousands of pounds per day) and specialized loading equipment to remote loading sites throughout the Keys. With the current vacancy in the Director of Aerial Operations, some question was given to the need for this position with other mosquito control districts having the Chief Pilot oversee the flight department. Given the significant flight time required for aerial larviciding (approximately 100-150 acres per hour for granular larviciding, including ferry time and loading), with potentially thousands of acres to be treated per day when busy, it isn't really feasible for the Chief Pilot to manage all the functions of the aerial department, including overseeing the support/loading personnel and the mission planning throughout the Keys, whilst also flying many hours of the day. One other unique responsibility of the Director of Aerial Operations not normally associated with a Chief Pilot is the management of the facilities, not just the hangar, but all the offices, buildings and grounds belonging to FKMCD in Marathon. When not busy with the loading of helicopters, the aerial support techs are utilized for basic cleaning and facilities maintenance.

Lower Keys Supervisor (Corey Brindisi):
The Lower Keys Supervisor is responsible for managing by far the largest number of field inspectors (29, compared to 4 for the Middle Keys and 7 for the Upper Keys) and a number of different mosquito control programs. These include the regular saltmarsh inspections, offshore island inspections (4 dedicated inspectors by boat), urban inspections for *Aedes aegypti* (Key West and Stock Island), storm drain inspections for *Culex quinquefasciatus* (Key West), and 2 inspectors dedicated to conducting mosquito control on the naval properties through a contract with FKMCD. A good portion of the aerial larviciding against saltmarsh mosquitoes is conducted in the lower keys, mainly around the Key Deer and Great White Heron National refuges in the area of Sugarloaf, the Torches and Big Pine Key. In addition, most of the liquid aerial larviciding against container habitats of *Aedes aegypti* is conducted in Old Town Key West. Although managed by the flight department, these must be supported by the team from the Lower Keys Office in Big Coppitt Key. One of the newest operational programs being evaluated is the use of mist blowers (A1-Misters) on trucks as an alternative to the aerial liquid larviciding, and this is being done in New Town Key West and Stock Island. The Lower Keys Supervisor is also responsible for assigning service requests, managing the truck adulticiding missions (coordinated with the ULV coordinator and the Director of Operations) to combat both excessive saltmarsh mosquitoes and the targeting of *Aedes aegypti* when traps in Key West exceed 10 mosquitoes per trap.
Mr. Brindisi is a 14 year employee of the District, having previously served in a number of field positions which he now supervises.

Mechanic Supervisor (Roberto Alvarenga):
The Mechanic Supervisor oversees the maintenance of all vehicles and vehicle-based equipment utilized by FKMCD. He is based at the Lower Keys facility in Big Coppitt Key and manages 3 subordinate mechanics, 1 in each of the regional facilities. There are approximately 70 vehicles and numerous ancillary motorized equipment such as ULV adulticide spray units, autoloaders for aerial larvicide loading, mixing units, handheld and backpack sprayers, etc, all of which need to be maintained and kept running in a timely fashion. One complaint/concern of the supervisor was the current inability to get new replacement vehicles through the contract/leasing agreement with Enterprise as there is a shortage of new trucks nationwide. Mr. Alvarenga has been a mechanic with the District for over 7 years.

This position/department was brought up as an example of a "duplication of services" in the 2012 Special District review, since the County has a fleet management department that could potentially perform this function for the District. However, there were "anecdotal" comments made by the State reviewer at the time that indicated that it should be the County who utilizes FKMCD vehicle/equipment maintenance services since they were far more efficient.
One of the concerns of transferring fleet maintenance to the county would be the timeliness of repairs in the case of equipment breakdown, since mosquito control operations are unpredictable (driven by weather events) and extremely time sensitive (a one day delay results in untreated mosquitoes and potential nuisance/disease issues for the public and tourists). Another consideration is that many of FKMCD's vehicles and equipment are used to transport or apply pesticides, and this might require additional training and PPE for county mechanics, or the potential for "sensitive" employees to decline to work on them. And some of the application equipment (ULV sprayers on trucks) is very specialized. This could lead to only a few fleet mechanics being able to work on them, and thus delay repair/maintenance based on those individuals' availability.

General Observations:
Overall, the District functions very efficiently, despite the separation of staff into five different departments and three different locations. The coordination and cooperation between departments is excellent, a testament to the overall management of the organization. While it might increase efficiency to have all administrative functions housed under one roof (the Executive Director and directors of operations, research and flight operations are in the main Marathon/middle keys office, while the directors of finance and HR are located in the Big Coppitt Key/lower keys office), modern methods of communication allow for easy access between the department heads and the Executive Director.
The long tenure amongst most of the management team is a testament to the smooth running and high morale within District employees.
Although there wasn't the time or opportunity to observe the various field programs (mosquito populations and field operations were winding down at the time of the visit in November), the interviews did allow for discussion of the various unique tools and techniques utilized by FKMCD. Management software is a "tool" not often discussed widely in the mosquito control industry, but it is something that is extremely important in efficiency, personnel management and accountability. For example, the Aerial Operations department utilizes a software package, Digital Airware, that tracks all aspects of aviation in a single program. This includes aircraft status, flight planning, repair status, flight rules for pilots, safety programs and everything else of importance. The capabilities of the program were impressive and support the planning/decision making process for the Director of Aerial Operations and Chief Pilot.

State Mandated Performance Review:

The Performance Review mandated by the state is a new process, and as such there is no example to use as a reference. However, the wording in the new section created by House bill 1103 in 2021 (Section 189.0695, Florida Statutes - Independent special districts; performance reviews – Included as **Appendix B**) does layout what is to be included in each independent performance review. The details of the performance review are expanded upon in the "Scope of Work" document (**Appendix C**) that is included in the application document for independent contract reviewers wishing to bid on the project.
The wording from section 189.065, Florida Statutes has been used as headings below (*highlighted and in italics*) to discuss what might be appropriate in terms of current observations at FKMCD.

However, one overarching impression is that the author(s) of this language are treating all Special Districts as easily definable operations, much like public works projects where performance measures are simple numbers such as "miles of road built", or "miles of ditches cleaned out", or "gallons of water treated". This is not the case for mosquito control, so careful thought needs to be given to the selection of "performance measures" that reflect our objectives and goals.

189.0695 Independent special districts; performance reviews.—

(1) For purposes of this section, the term "performance review" means an evaluation of an independent special district and its programs, activities, and functions. The term includes research and analysis of the following:

(a) The special district's purpose and goals as stated in its charter.

The codified act "creating" the District covers this:
"Section 16. Purpose.—The abatement and control of mosquitoes and other arthropods within Monroe County is advisable and necessary for the maintenance and improvement of the health, comfort, welfare, and prosperity of the people thereof, and is found and declared to be for public health and other public purposes."

(b) The special district's goals and objectives for each program and activity, the problem or need that the program or activity was designed to address, the expected benefits of each program and activity, and the performance measures and standards used by the special district to determine if the program or activity achieves the district's goals and objectives.

The question here becomes first, defining how many different programs/activities are conducted by the District (how specific), and secondly defining performance measures and standards for each of those programs. For domestic inspectors it might be "premises inspected per hour or day", and for saltmarsh inspectors a similar "sites inspected per hour or day". But while mosquito habitat inspections are a major function of the field staff and are essential for accurate and effective treatments, they in themselves do not control mosquitoes. Similarly, larviciding performance measures (ground or air) might be acres treated per day, week or month. But during dry periods where no larviciding is being conducted, are the applicators failing to achieve their goals? And in "quiet years" where less than the annual average acreage is being treated, is this considered a poor performance? Other measures/goals might be how many days per month or year maintaining mosquito numbers (landing rates or trap catches) below an acceptable threshold. But this is mosquito population and weather driven, factors outside of the control of the District. The question for any district is "what is an acceptable mosquito

number (trap catch or landing rate)", and secondly "is that number the same throughout the District boundaries"? For FKMCD, with tourism being a primary economic driver, the tolerance level ("acceptable mosquito number") is on the low end of the scale. And that is just for nuisance reasons. Because of the proven threat of mosquito-borne disease (dengue in particular) in the urban areas (tourist center of Key West, the most heavily populated area of the Keys), it is imperative that *Aedes aegypti* numbers are kept very low to minimize disease transmission risk. The problem with setting goals for mosquito control is that it is not an "all or none (mosquitoes)" operation. Program improvements made by increasing budgets and staff numbers result in incremental reductions in mosquito populations. To maintain an average of 50% mosquito number reduction below untreated levels (not normally acceptable) might require a budget 10% of that needed to regularly achieve 90% reduction (and 1/3 the staffing level). But to get to 95% reduction, particularly in the case of *Aedes aegypti*, may mean doubling the budget AND the staffing level over the 90% case. (These numbers are just illustrative, based on an understanding of mosquito control, and not based on any existing data). And one obvious goal would be NO human cases of mosquito-borne disease.

The cost for mosquito control services by FKMCD (through Ad valorem taxes) is higher than any other district by any number of economic-based metrics, such as cost (taxes) per resident person protected (resident population of less than 90,000, although 5,000,000 tourists in 2018), or taxing rate (millage rate of 0.465 mils is higher than all other mosquito control districts, most of which are between 0.2 and 0.3, although Citrus County MCD is close at 0.43 mils). However, comparisons between districts is often not applicable because of the significant difference in mosquito challenges faced by each program. The extensive saltmarsh habitats, proven risk of dengue and local economy reliant on tourism in the Keys are all significant challenges requiring a large, complex and highly effective mosquito control program. The current $16 million taxing budget ($24 million overall budget including reserves) "supports" a tourism industry that brings in almost $2 billion to the local economy, $40 million in local taxes and directly or indirectly supports 26,500 local jobs (30% of the local population). A reduction in mosquito control services that results in increased mosquito nuisance or locally transmitted diseases would certainly cost more to the local tourist economy than the savings in reduced mosquito control taxes.

(c) The delivery of services by the special district, including alternative methods of providing those services that would reduce costs and improve performance, including whether revisions to the organization or administration will improve the efficiency, effectiveness, or economical operation of the special district.

The observations made during this review indicate that FKMCD is running very efficiently, having achieved significant reductions in overall mosquito populations through improvements to many aspects of the program over the past 20 years. The only recommendations I would make in regard to the District operations would be:

1) to attempt to maintain a relatively new fleet of vehicles, setting limits such as 6 years or 100,000 miles before replacing. Experience has shown that this age of vehicle maintain a high resale value at public auctions and most modern vehicles with under 100,000 miles suffer few significant mechanical issues.

2) Improve the functionality of the important GIS/data management systems on which the management relies for timely operational decision making.

Both of these issues were also voiced by the various members of staff that I spoke with.

As far as revisions to the organization or administration, I did not observe any positions that could be eliminated or duties transferred to other staff. None of the management positions had narrowly focused duties, in fact I had to ask the Executive Director why there was no dedicated Building and Facilities

management position (the main offices and hangar in Marathon being overseen by the Director of Aerial Operations, whilst the other two offices are overseen by the regional supervisors and mechanics).

One point highlighted in the Executive Summary of the 2012 Review by the state concerns the salary paid to FKMCD commissioners versus other mosquito control district commissioners:
"Commissioner compensation is set at $4,800 per year, or below, unless a higher amount has been authorized by special act or general act of local application. The Florida Keys MCD commissioners are the only exception at $22,038 to $21,438 per year. Several districts also provide district paid health insurance benefits to commissioners and commissioner dependents."
These two points are likely to be brought up again as an inefficiency in "management" of the district.

In terms of "alternative methods of providing those services", private contracting is really the only other option. This method functions well in a situation where aerial spraying (adulticiding) is only needed a few times per year, is not too time sensitive, and the spray blocks are large (20,000+ acres), making the contractor's time worthwhile. Aerial adulticiding in the Keys tend to be relatively small blocks (5000 acres or less) with 15-20 spray blocks per year. And the aerial larviciding programs, both liquid and granular, are large scale, highly complex operations and extremely time sensitive. It is highly unlikely that there is a private contractor with sufficient aircraft/personnel/equipment available that could respond in a sufficiently timely manner and match the efficient and effective professional services of the District's aerial department.

(d) A comparison of similar services provided by the county and municipal governments located wholly or partially within the boundaries of the special district, including similarities and differences in services, relative costs and efficiencies, and possible service consolidations.

There are four "obvious" functions of the District that have similar functions in county government. These functions, and the argument for maintaining them "in house" at FKMCD, are:
1) Human Resources (1 employee at FKMCD)
It is unlikely that any significant savings in cost and efficiency could be achieved by transferring Mr. Behrend's duties to the county HR department, given the probable need to hire at least one additional employee to cover the 70+ at FKMCD (I do not have access to the county personnel system and so cannot comment on the ratio of HR employees to total county employees). It is also unlikely that the wide range of skills and duties that he brings to his job could be replicated by a single HR employee at the county. One must also consider the benefit system and personnel rules unique to mosquito control, and how this might be handled under the county system.
One potential benefit of sharing services (if it was allowed by the county) would be to participate in the County's health insurance plan, since a larger pool of employees tends to allow for lower premium costs. But this may be counteracted by current or future differences in available plans between County and FKMCD, potentially reducing the benefit to employees.
2) Finance (3 employees at FKMCD)
Financial services and accounting practices are similar across local governmental organizations, so it might make sense to share these services with the county government finance department.
However, considering the size and complexity of the FKMCD (70+ employees, $24 million budget, 3 geographically distinct locations, a large fleet of aircraft and trucks, unique mosquito control purchasing requirements, etc.) it might take the same number (3) of mosquito control dedicated finance employees within the county finance department to provide the same efficient services.
3) Information Services (GIS/data management – 1 employee at FKMCD)
Nearly all County Governments have "Information Technology" departments that may include expertise in GIS and data management. In addition, the separate constitutional office of "Property Appraiser",

present in most Florida counties (including Monroe), relies heavily on a publicly accessible, web-based Esri GIS program housing current and historical data on every parcel of land (and building) in the county. However, it could be argued that the GIS/data management services utilized by FKMCD (or other mosquito control District) are unique and would require similar additional DEDICATED manpower/technical expertise and equipment if housed within the County government's department, resulting in little if any savings or improvement in efficiency.
4) Fleet management (vehicle mechanics – 4 employees at FKMCD)
This position/department was brought up as an example of a "duplication of services" in the 2012 Special District review, since the County has a fleet management department that could potentially perform this function for the District. However, there were "anecdotal" comments made by the State reviewer at the time that indicated that it should be the County who utilizes FKMCD vehicle/equipment maintenance services since they were far more efficient.

One of the concerns would be the timeliness of repairs in the case of equipment breakdown, since mosquito control operations are unpredictable (driven by weather events) and extremely time sensitive (a one day delay results in untreated mosquitoes and potential nuisance/disease issues for the public and tourists). Another consideration is that many of FKMCD's vehicles and equipment are used to transport or apply pesticides, and this might require additional training and PPE for county mechanics, or the potential for "sensitive" employees to decline to work on them. And some of the application equipment (ULV sprayers on trucks) are very specialized. Would this lead to only a few fleet mechanics being able to work on them, and thus delay repair/maintenance based on those individuals availability?

(e) The revenues and costs of programs and activities of the special district, using data from the current year and the previous 3 fiscal years.

As the costs of programs and activities are driven by mosquito population levels, which in turn are driven by highly variable and unpredictable weather patterns, it is difficult to do a meaningful comparison between years.

(f) The extent to which the special district's goals and objectives have been achieved, including whether the goals and objectives are clearly stated, measurable, adequately address the statutory purpose of the special district, provide sufficient direction for the district's programs and activities, and may be achieved within the district's adopted budget.

The Mission Statement of the District is:
"To conduct all District operations with efficiency and environmental sensitivity while protecting the public from health threats and nuisance issues that impact the local economy."
If we consider this statement as the overall goal and objective, without more specific values having been defined, then yes, the special Districts goals and objectives have been achieved.

(g) Any performance measures and standards of the special district's programs and activities using data from the current year and the previous 3 fiscal years, including whether the performance measures and standards:

1. Are relevant, useful, and sufficient to evaluate the costs of the programs and activities.

2. Are being met.

3. Should be revised.

The performance measures and standards need to be defined, carefully, by the District in order to address or answer this question.

(h) Factors that have contributed to any failure to meet the special district's performance measures and standards or achieve the district's goals and objectives, including a description of efforts taken by the special district to prevent such failure in the future.

See previous answers.

(i) Recommendations for statutory or budgetary changes to improve the special district's program operations, reduce costs, or reduce duplication, including the potential benefits to be achieved and the potential adverse consequences of the proposed changes.

This is interesting and potentially "dangerous" language since it is asking a reviewer that is unlikely to understand the nuances of mosquito control programs to make potentially sweeping recommendations.

Strategic Plan:
The language contained in House Bill 1103 (2021) (**Appendix B**) creating the requirement for a "Performance Review" does not mention a Strategic Plan. It is, however, included in the "Detailed Scope of Work" (**Appendix C**) as an item the independent reviewer should ask for.
The District has a comprehensive three-year Strategic Plan in place that covers current needs/improvements with future goals. It is well structured and addresses many important, industry-wide priority areas such as pesticide resistance, improving practices in the domestic mosquito control program, reducing carbon footprint, increasing public awareness, improved safety, increased use of technology to improve efficiency and reduce manpower needs, methods to increase employee retention and addressing long term capital improvements.
This plan demonstrates the forward-thinking culture of FKMCD that has been in place since Director Fussell initiated significant changes and improvements when he took over management of the program in 1998.

Conclusions and Recommendations:

The Florida Keys Mosquito Control District is a large and complex mosquito control program with significant unique challenges not faced by most other peninsular Florida districts. Although it has less diverse mosquito problems when compared to its counterparts to the north, lacking abundant freshwater mosquito habitats, it makes up for it with vast saltmarsh mosquito habitat close to most residential areas, and an increased threat of mosquito-borne disease from the domestic mosquito, *Aedes aegypti*.

The program has improved significantly since the late 1990's (when a previous program review was conducted), moving away from a primary reactionary reliance on adulticiding (by both trucks and aircraft), to much more of a proactive IPM program with a ten-fold increase in use of aerial larviciding against both saltmarsh and domestic mosquitoes, resulting in a 90% reduction in adulticiding acreage. The dengue outbreak that occurred in Key West in 2009-10 highlighted the need for improved control of the vector, *Aedes aegypti*, particularly in the tourism hub of Key West, and led to increasing field staffing levels (the addition of 10 domestic inspector positions) and the introduction of unique control programs (WALS method of small droplet larviciding with Bti by both helicopter and truck-based systems).

The current staffing level of 70+ (compared to 41 in 1998) appears to be adequate, although a second dengue outbreak, this time in Key Largo in 2020, may require rethinking of domestic inspector numbers for the upper keys region. The organization and management of the program appears to be efficient and effective, with a highly professional staff exhibiting good morale. Upper management, including Board members, are forward thinking, leaning favorably towards proactive (rather than reactionary) surveillance and control methods, and supporting operational research into novel programs (such as Sterile Insect Technique). Surveillance, data analysis/management and program evaluation are at a high level, putting the District in a good position for the upcoming independent performance review mandated by the state, although discussion of what constitutes relevant "performance measures" for the different District programs should be a priority.

Recommendations (some of which are already recognized by management staff):

1) Improve functionality and glitches in current GIS/data management system (Fieldseeker) or look at alternatives.
2) Look at consolidating administration functions at main office in Marathon, best achieved if/when vacancies occur in those positions (finance and HR personnel).
3) Increase rate at which aging vehicles are replaced, with the goal of turnover life of 6 years or 60,000 miles (timeframe at which few mechanical problems occur and resale value at public auction remains high). This will also improve carbon footprint with more efficient replacement vehicles.
4) Replace office trailer at lower keys facility with a permanent, more weather resilient structure.
5) Hire a replacement Director of Aerial Operations to continue smooth functioning in that department.
6) Look at increasing WALS aerial larviciding as a routine treatment in areas outside of Old Town Key West (such as New Town, Stock Island, Key Largo, etc) unless ground-based WALS with the A1-mister provides equivalent control.
7) Continue promoting/supporting operational evaluations into novel techniques, but also consider fiscal impacts vs operational efficacy.
8) Prioritize determination of what constitutes relevant "performance measures" for each program within the District such that the FKMCD management team are prepared for the upcoming state-mandated performance review.

CHAPTER 2002-346

House Bill No. 937

An act relating to the Monroe County Mosquito Control District; changing its name to the "Florida Keys Mosquito Control District"; codifying, amending, reenacting, and repealing special acts relating to the Monroe County Mosquito Control District; creating and establishing a mosquito control district in Monroe County; fixing the boundaries of said district; dividing said district into areas and establishing boundaries of said areas for purposes of selecting members of the board of commissioners; providing for the present members of the board of commissioners to continue their present terms of office; providing qualifications for said members; providing for the method and time of elections; prescribing the powers of said board; establishing the duties of said board; establishing the organization of said board; setting the compensation of said board; providing for meetings of the board; providing books to be audited and for the keeping of such books as public records; providing for the adoption of a budget; granting said board the power of eminent domain; granting said board the power to tax; providing for the employment of a director and for the advertisement of certain contracts; providing for the penalty for damage to property; setting out the purpose for said district; providing for the duties of the director of the Monroe County health unit; setting out an alternate plan discretionary with the board of commissioners for relieving the board of commissioners of the duty; providing for the public distribution of mix; repealing all conflicting laws; granting to the district such powers as are provided for mosquito control districts under the laws of this state; providing for liberal construction; providing for severability; providing an effective date.

Be It Enacted by the Legislature of the State of Florida:

Section 1. Pursuant to chapter 97-255, Laws of Florida, this act constitutes the codification of all special acts relating to the Monroe County Mosquito Control District. It is the intent of the Legislature in enacting this law to provide a single, comprehensive special act charter for the district, including all current legislative authority granted to the district by its several legislative enactments and any additional authority granted by this act.

Section 2. Chapters 26042 (1949), 29295 (1953), 31009 (1955), 31013 (1955), 57-1591, 57-2067, 59-1584, 61-2508, 63-1639, 63-1640, 65-1913, 651915, 67-1726, 70-816, 74-537, 76-440, 83-469, 88-548, and 98-518, Laws of Florida, relating to the Monroe County Mosquito Control District, are codified, reenacted, amended, and repealed as herein provided.

Section 3. The Monroe County Mosquito Control District is re-created and reenacted to read:

Section 1. Establishing a mosquito control district; fixing boundaries.—

There is hereby created and established a mosquito control district for Monroe County, to be known as the "Florida Keys Mosquito Control District." Said district shall encompass all the territory in Monroe County.

Section 2. Division of the Florida Keys Mosquito Control District into areas or districts.—For the purpose of selecting commissioners, the county commission districts of Monroe County as the same may now or hereafter be described shall also be commissioner districts of the Florida Keys Mosquito Control District.

Section 3. Board of commissioners; election; terms of office; qualification.—

(1) The Florida Keys Mosquito Control District shall be governed by aboard of commissioners which shall consist of five members and there shall be one member from each of the five districts named and defined in section 2 of this act.

(2) The board of commissioners shall be composed of the present members duly elected under chapter 65-1915, Laws of Florida, who shall continue to serve their regular terms. Members of said board shall thereafter be elected for terms of 4 years each by a vote of the district at large at an election to be held on the date set for the general election of each year in which a general election is held.

(3) Members of the board shall be residents and registered electors of the area from which they are elected and represent. Candidates or incumbents of the office shall qualify in the primaries and general elections which primaries and general elections shall be conducted in accordance with the existing election laws of the state. The terms of the newly elected commissioners shall begin on the day of the first meeting in January following said election and shall extend for 4 years, or until his or her successor shall have been duly elected and qualified. Each member of the board shall, before assuming office, be required to make and execute to the Governor a good and sufficient surety bond in the amount of not less than $2,000 conditioned on the faithful performance of the duties of his or her office and the bond shall be approved by and filed with the Clerk of the Circuit Court of Monroe County, the expense of said bond to be borne by the Florida Keys Mosquito Control District. If any person so elected or appointed fails to make and file a surety bond within 60 days after his or her election or appointment, his or her office shall become vacant and such vacancy shall be filled by the Governor for the unexpired term. Vacancies created by the resignation, death, or removal from said board of commissioners shall also be filled by appointment by the Governor.

Section 4. Election; ballots.—The Board of County Commissioners of Monroe County shall make the necessary arrangements for setting up the elections of the Board of Commissioners of the Florida Keys Mosquito Control District and shall supply the necessary ballots and do all other things necessary for said elections.

Section 5. Powers of the board of commissioners.—The board of commissioners shall have all the powers of a body corporate, including the power to sue and be sued as a corporation in said name in any court; to contract; to adopt and use a common seal and alter the same at pleasure; to purchase, hold, lease, and convey such real estate and personal property as a majority of the board may deem proper to carry out the purposes of this act; to prescribe rules and regulations for the marking of such property; to employ a director and such experts, agents, and employees as the board may require; to participate with employees in a group hospitalization insurance plan providing the entire cost of such a plan; to contract and cooperate with county, state, and other governmental agencies in regard to mosquito control or suppression; to borrow money in an amount not to exceed $150,000 for a period of time not to exceed 2 years; and to issue negotiable promissory notes and bonds or such necessary instruments to secure said loan to enable it to carry out the provisions of this act.

Section 6. Duties of the board.—The Board of Commissioners of the Florida Keys Mosquito Control District shall perform all duties necessary for the control and elimination of mosquitoes and other arthropods of public health importance in the county, and the board is 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, and may also employ oils and chemicals and

all other means and methods, and do any and all things that may be necessary to eliminate and control mosquitoes and other arthropods in Monroe County at the discretion of the board.

Section 7. Organization of the board.—As soon as is practicable after the commissioners have been appointed or elected and have qualified, they shall meet and organize by electing one of their members as chair, one of their members as vice chair, and one of their members as secretary-treasurer. In all meetings three members shall constitute a quorum in order to transact business.

Section 8. Salary and expenses of the board.—The board of commissioners shall have authority to establish the amount of compensation by way of salaries that shall be paid to the individual commissioners of the Florida Keys Mosquito Control District. The commissioners who are selected to serve as chair and secretary-treasurer, respectively, of the Florida Keys Mosquito Control District shall be paid compensation in addition to their regular salary as compensation for their services as chair and secretary treasurer, respectively, of the board, which additional compensation shall be set by the board. All commissioners may be reimbursed from time to time for any moneys expended by them personally in official travel for the district at the rate authorized under the provisions of section 112.061(7)(d), Florida Statutes, insofar as those provisions relate to the allowable amount of payment per mile of travel. All commissioners shall be paid $20 for attendance for each day of each regular or special commission meeting. Authority for payment of mileage and for attendance at each meeting or official travel shall be by a majority approval of the board of commissioners and duly recorded in the minutes of proceedings of the board. However, total payment to each commissioner for any meeting shall not exceed the mileage figure authorized under the provisions of section 112.061(7)(d), Florida Statutes, and $20 for each meeting per day. Official travel in addition to attendance at board meetings is defined as such necessary travel as the board may authorize in connection with meetings of scientists, associations, or groups engaged in mosquito control work, inspection of district activities and projects, and other travel necessary in the conduct of district business. Provided further, that total payments for such official travel made by members of the board in addition to travel for attendance at board meetings shall not exceed 2 percent of the total budget derived from local moneys for any 1 year.

Section 9. Meetings of the board.—The board of commissioners of the district shall hold monthly meetings which shall be open to the public. Special meetings may be called upon the request of any three commissioners but shall not be held within less than 24 hours after notice to each of the commissioners unless a written waiver is obtained from the commissioners who cannot attend such special meetings.

Section 10. Audit, books, and records to be public record.—The books and accounts of said Florida Keys Mosquito Control District shall be audited annually or by the same officers and in like manner as books of other county officers are audited. All books and records of the district created by chapter 26042, Laws of Florida, shall become a part of the records of the district created by this act.

Section 11. District budgets and hearings.—

(1) The fiscal year of the Florida Keys Mosquito Control District shall be the 12-month period extending from October 1 each year through September 30 of the following year. At the discretion of the board, the governing body of the district shall, before June 30, complete the preparation of a detailed work plan budget covering its proposed operations and requirements for arthropod measures during the ensuing fiscal year, and for the purposes of determining eligibility for state aid, shall submit copies by July 1 to the State Board of Health for review and approval. The detailed work plan budget shall set forth, classified by account number, title, and program items, and by the fund from which to be

paid, the proposed expenditures of the district for construction, for acquisition of land and other purposes, for the operation and maintenance of the district's works, and for the conduct of the district generally, to which may be added an amount to be held as a reserve.

(2) The detailed work plan budget shall also show the estimated amount which will appear at the beginning of the fiscal year as obligated upon commitments made but incomplete. There shall be shown the estimated unobligated or net balance which will be on hand at the beginning of the fiscal year, and the estimated amount to be raised by district taxes and from any and all other sources for meeting the district's requirements.

(3) On the date to be fixed by the board of commissioners, said board shall publish a notice of its intent to adopt the budget or as the same may be amended for the district for the ensuing fiscal year. The notice shall set forth the total amount of funds budgeted under each title classification of the budget, subtotals by fund under each title classification, and grand totals. The notice shall advise all owners of property subject to the district taxes that on a date, time, and place specified in the notice, opportunity will be afforded to such owners, and their attorney or agent, to appear before the board, examine the work plan and detailed work plan budget if desired, and to show their objections to adoption of the proposed budget. The notice shall be published for 2 consecutive weeks, at not less than 7-day intervals, in a newspaper of general circulation published in Monroe County. The last insertion shall appear not less than 1 nor more than 2 weeks prior to the date set by the board for the hearing on the budget.

(4) The hearing shall be by and before the board of commissioners of the district on a date to be fixed by said board not earlier than 1 week and not later than 2 weeks after the date of the last publication of notice of intent to adopt the budget, and may be continued from day to day until terminated by the board. Promptly thereafter, the board of commissioners shall give consideration to objections filed against adoption of the budget and in its discretion, may amend, modify, or change the tentative detailed work plan budget, and shall, by the following September 15, adopt and execute on a form furnished by the state board a certified budget for the district, which shall be the operating and fiscal guide for the district. Certified copies of this budget shall be submitted by September 15 to the state board for approval.

Section 12. Eminent domain.—The board of commissioners may hold, control, and acquire by gift or purchase for the use of the district any real or personal property, and may condemn any land or easements needed for the purposes of said district. Said board may exercise the right of eminent domain and institute and maintain condemnation proceedings as provided in chapter 73, Florida Statutes.

Section 13. Tax levy.—The board of commissioners of the mosquito control district may levy upon all of the taxable property in said district a tax not exceeding 11/2 mills on the dollar during each year solely for the purposes authorized and prescribed by this act. Said levy shall be made each year not later than July 1 by resolution of the board or a majority thereof, duly entered upon its minutes. Certified copies of such resolution executed in the name of the board by the chair and secretary-treasurer and under its corporate seal shall be made and delivered to the Board of County Commissioners of Monroe County and to the Comptroller, not later than July 15 of such year. The board of county commissioners shall order the assessor of the county to assess and the collector of the county to collect the amount of taxes so assessed and levied by the board of commissioners of said mosquito control district upon all of the taxable property in the district at the rate of taxation adopted by the board for the year and included in the resolution, and the levy shall be included in the warrants of the tax assessor and attached to the

assessment roll of taxes for the county each year. The tax collector shall collect such taxes so levied by the board in the same manner as other taxes are collected and shall pay the same within the time and in the manner prescribed by law to the secretary-treasurer of the board. The Comptroller shall assess and levy on all the railroad lines and railroad property and telegraph and telephone lines and telegraph and telephone property situated in the county in the amount of each such levy as in the case of other state and county taxes, and collect the taxes thereon in the same manner as he or she is required by law to assess and collect taxes for state and county purposes, and remit the same to the secretary-treasurer of the board. All such taxes shall be held by the secretary-treasurer for the credit of the board and paid out as ordered by the board.

Section 14. Director; advertisement of contracts.—All work done under the provisions of this act, both in construction and maintenance, shall be carried on under the supervision of a competent entomologist, or person qualified under the provisions of chapter 388, Florida Statutes, to be employed by the board. The board may contract and purchase property or equipment without formal bids in any amount not to exceed $4,000. All contracts or purchases in excess of $4,000 shall be by competitive, sealed bids, after advertisement, pursuant to rules and regulations established by the board.

Section 15. Penalty for damage to property.—Whoever shall willfully damage any property of the mosquito control district created under this act or any works constructed, maintained, or controlled by the mosquito control district or who shall obstruct or cause to be obstructed any of the operations of the district shall upon conviction thereof be punished as provided by the laws of the state.

Section 16. Purpose.—The abatement and control of mosquitoes and other arthropods within Monroe County is advisable and necessary for the maintenance and improvement of the health, comfort, welfare, and prosperity of the people thereof, and is found and declared to be for public health and other public purposes.

Section 17. Director, duties of Monroe County health unit.—The Monroe County health unit, also referred to and known as the “Monroe County Health Department,” established by the board of county commissioners is charged with the responsibility of abating or suppressing mosquitoes in Monroe County. The director of said health unit or health department shall cause to be done any and all work and all things necessary for the control and elimination of mosquitoes in the county wherever such work is necessary and he or she is empowered to use such means, physical or chemical, as may be necessary to accomplish the objects of this act. All employees engaged in such work shall be considered employees of the Florida Keys Mosquito Control District, and regardless of the fact that the determination as to who is to be employed and the wages or salaries to be paid is made by the Board of Commissioners of the Florida Keys Mosquito Control District, and the records are kept by said board.

Section 18. Alternate plan.—The purpose of the foregoing section 17 is to coordinate certain activities between the Monroe County health unit or health department and the Florida Keys Mosquito Control District in an effort to best serve the interest and welfare of the Florida Keys Mosquito Control District and the property owners and residents thereof. If the Board of Commissioners of the Florida Keys Mosquito Control District should make a study or, by reason of the experience in handling the affairs of said district, determine that it is not in the best interest of the Florida Keys Mosquito Control District and the property owners and residents thereof to continue in the Monroe County health unit or health department the responsibilities, powers, duties, and authority and that the continuation of the responsibilities, powers, duties, and authority in such unit or department is not advantageous to the Florida Keys Mosquito Control District, it is declared to be the legislative intent that the Board of Commissioners of the Florida Keys Mosquito Control District may pass a resolution as determining and

finding and, upon the passage of such resolution, any and all such powers, duties, responsibilities, and authority given to the Monroe County health unit or health department shall immediately vest in the Florida Keys Mosquito Control District and the employees shall become the employees of the Florida Keys Mosquito Control District and the provisions of section 17 shall, insofar as they or any of them relate to Monroe County health unit or health department, be of no further force and effect.

Section 19. Public distribution of mix.—The board of commissioners of the mosquito control district shall have the authority to set up and maintain a properly controlled public mix program providing for the alleviation of mosquito and other arthropod infestations throughout the district. Any program established pursuant to this section shall provide the following restrictions:

(1) The mix shall be provided to persons for residential use only.

(2) No person may obtain more than 1 gallon of mix at any one time normay any person obtain more than 2 gallons of mix during any month.

(3) Any person seeking to obtain mix shall provide the container therefor.

The board may establish a fee schedule or provide mix to the public free of charge. The board shall maintain records of all distribution or sales of mix under its program.

Section 4. Chapters 26042 (1949), 29295 (1953), 31009 (1955), 31013 (1955), 57-1591, 57-2067, 59-1584, 61-2508, 63-1639, 63-1640, 65-1913, 651915, 67-1726, 70-816, 74-537, 76-440, 83-469, 88-548, and 98-518, Laws of Florida, are repealed.

Section 5. The district created by this act and the board of commissioners shall have the right to use any and all privileges or powers which are granted to mosquito control districts under the general laws of this state.

Section 6. This act shall be construed liberally.

Section 7. It is declared to be the legislative intent that if any section, subsection, sentence, clause, or provision or part thereof of this act is held invalid, unenforceable, or unconstitutional, it shall not affect the remainder of the act and the remainder of the act shall remain in force and effect as if the invalid portions of the act had not been enacted.

Section 8. This act shall take effect upon becoming a law.

Approved by the Governor May 13, 2002.

Filed in Office Secretary of State May 13, 2002.

Appendix B – House Bill 1103 (2021) creating the "Performance Review" requirement

An act relating to special district accountability; creating s. 189.0695, F.S.; defining the term "performance review"; requiring certain independent special districts to contract with an independent entity to conduct performance reviews; providing an exception; specifying the frequency of such reviews; requiring the Office of Program Policy Analysis and Governmental Accountability to conduct performance reviews of certain classifications of independent special districts; providing criteria for contracting for such reviews; requiring the performance reviews to be reported by a time certain to specified entities; amending s. 218.32, F.S.; requiring additional information to be provided by special districts in their annual reports; amending s. 218.39, F.S.; requiring certain data be included in financial audits of special districts; requiring certain community redevelopment agencies to file separate audited financial statements; providing an effective date.

Be It Enacted by the Legislature of the State of Florida:

Section 1. Section 189.0695, Florida Statutes, is created to read:

189.0695 Independent special districts; performance reviews.—

(1) For purposes of this section, the term "performance review" means an evaluation of an independent special district and its programs, activities, and functions. The term includes research and analysis of the following:

(a) The special district's purpose and goals as stated in its charter.

(b) The special district's goals and objectives for each program and activity, the problem or need that the program or activity was designed to address, the expected benefits of each program and activity, and the performance measures and standards used by the special district to determine if the program or activity achieves the district's goals and objectives. (c) The delivery of services by the special district, including alternative methods of providing those services that would reduce costs and improve performance, including whether revisions to the organization or administration will improve the efficiency, effectiveness, or economical operation of the special district.

(d) A comparison of similar services provided by the county and municipal governments located wholly or partially within the boundaries of the special district, including similarities and differences in services, relative costs and efficiencies, and possible service consolidations.

(e) The revenues and costs of programs and activities of the special district, using data from the current year and the previous 3 fiscal years.

(f) The extent to which the special district's goals and objectives have been achieved, including whether the goals and objectives are clearly stated, measurable, adequately address the statutory purpose of the special district, provide sufficient direction for the district's programs and activities, and may be achieved within the district's adopted budget. (g) Any performance measures and standards of the special district's programs and activities using data from the current year and the previous 3 fiscal years, including whether the performance measures and standards:

1. Are relevant, useful, and sufficient to evaluate the costs of the programs and activities.

2. Are being met.

3. Should be revised.

(h) Factors that have contributed to any failure to meet the special district's performance measures and standards or achieve the district's goals and objectives, including a description of efforts taken by the special district to prevent such failure in the future.

(i) Recommendations for statutory or budgetary changes to improve the special district's program operations, reduce costs, or reduce duplication, including the potential benefits to be achieved and the potential adverse consequences of the proposed

(2)(a) Each independent special district as described in subparagraph (d)1. that is not located in a rural area of opportunity as defined in s. 288.0656(2) and each independent special district as described in subparagraph (d)2. must contract with an independent entity to conduct a performance 83 review of the district. The independent entity must have at least 5 years of experience conducting comparable reviews of organizations similar in size and function to the independent special district under review, must conduct the review according to applicable industry best practices, and must have no 88 affiliation with or financial involvement in the reviewed 89 district.

(b) The Office of Program Policy Analysis and Government Accountability must conduct a performance review of each independent special district as described in subparagraph (d)1. 93 that is located in a rural area of opportunity as defined in s. 288.0656(2) and may contract as needed to complete this 95 requirement.

(c) The final report of the performance review must be 97 filed with the governing board of the district, the Auditor General, the President of the Senate, and the Speaker of the House of Representatives no later than 9 months from the beginning of the district's fiscal year according to the schedule provided in paragraph (d). However, a performance audit of an independent special district conducted by the Auditor General during the same fiscal year in which a performance review is due pursuant to paragraph (d) qualifies as that district's scheduled performance review under this section. (d)1. Beginning October 1, 2022, and every 5 years thereafter, each independent special fire control district as defined in s. 191.003, must have a performance review conducted.

2. Beginning October 1, 2023, and every 5 years thereafter, each hospital licensed under chapter 395 which is governed by the governing body of a special district as defined in s. 189.012 or by the board of trustees of a public health trust created under s. 154.07, must have a performance review conducted.

(3) The Office of Program Policy Analysis and Government Accountability must conduct a performance review of all independent special districts within the classifications described in paragraphs (a) and (b) and may contract as needed to complete the requirements of this subsection. The Office of Program Policy Analysis and Government Accountability shall submit the final report of the performance review to the President of the Senate and the Speaker of the House of Representatives as follows:

(a) For all independent mosquito control districts as defined in s. 388.011, no later than September 30, 2023. (b) For all soil and water conservation districts as defined in s. 582.01, no later than September 30, 2024. Section 2. Paragraph (e) of subsection (1) of section 218.32, Florida Statutes, is amended to read:

218.32 Annual financial reports; local governmental entities.—

(1)(e)1. Each local governmental entity that is not required to provide for an audit under s. 218.39 must submit the annual financial report to the department no later than 9 months after the end of the fiscal year. The department shall consult with the Auditor General in the development of the format of annual financial reports submitted pursuant to this paragraph. The format must include balance sheet information used by the Auditor General pursuant to s. 11.45(7)(f). The department must forward the financial information contained within the annual financial reports to the Auditor General in electronic form. This paragraph does not apply to housing authorities created under chapter 421.

2. The annual financial report filed by a dependent special district or an independent special district shall specify separately:

a. The total number of district employees compensated in the last pay period of the district's fiscal year being

b. The total number of independent contractors to whom nonemployee compensation was paid in the last month of the district's fiscal year being reported.

c. All compensation earned by or awarded to employees, whether paid or accrued, regardless of contingency.

d. All compensation earned by or awarded to nonemployee independent contractors, whether paid or accrued, regardless of contingency.

e. Each construction project with a total cost of at least $65,000 approved by the district that is scheduled to begin on or after October 1 of the fiscal year being reported, together with the total expenditures for such project.

3. The annual financial report of a dependent special district or an independent special district amending a final adopted budget under s. 189.016(6) must include a budget variance report based on the budget adopted under s. 189.016(4) before the beginning of the fiscal year being reported.

4. The annual financial report of an independent special district that imposes ad valorem taxes shall include the millage rate or rates imposed by the district, the total amount of ad valorem taxes collected by or on behalf of the district, and the total amount of outstanding bonds issued by the district and the terms of such bonds.

5. The annual financial report of an independent special district that imposes non-ad valorem special assessments shall include the rate or rates of such assessments imposed by the district, the total amount of special assessments collected by or on behalf of the district, and the total amount of outstanding bonds issued by the district and the terms of such bonds.

Section 3. Paragraph (h) of subsection (1) of section 218.39, Florida Statutes, is redesignated as paragraph (i), subsection (3) of that section is amended, and a new paragraph (h) is added to subsection (1), to read:

218.39 Annual financial audit reports.—

(1) If, by the first day in any fiscal year, a local governmental entity, district school board, charter school, or charter technical career center has not been notified that a financial audit for that

fiscal year will be performed by the Auditor General, each of the following entities shall have an annual financial audit of its accounts and records completed within 9 months after the end of its fiscal year by an independent certified public accountant retained by it and paid from its public funds:

(h) As required by s. 163.387(8)(a), each community redevelopment agency with revenues or a total of expenditures and expenses in excess of $100,000, as reported on the trust fund financial statements.

(3)(a) A dependent special district, excluding a community redevelopment agency with revenues or a total of expenditures

and expenses in excess of $100,000, as reported on the trust fund financial statements, may provide for an annual financial audit by being included in the audit of the local governmental entity upon which it is dependent. An independent special district may not make provision for an annual financial audit by being included in the audit of another local governmental entity.

(b) A special district that is a component unit, as defined by generally accepted accounting principles, of a local governmental entity shall provide the local governmental entity, within a reasonable time period as established by the local governmental entity, with financial information necessary to comply with this section. The failure of a component unit to provide this financial information must be noted in the annual financial audit report of the local governmental entity.

(c) The financial audit of a dependent special district or of an independent special district, or the financial audit of a local governmental entity that includes the information of a dependent special district as provided in paragraph (a) of this subsection, shall separately include and specify the information required in s. 218.32(1)(e)2.-5.

Section 4. This act shall take effect October 1, 2021

Appendix C – Detailed "Scope of Work" for upcoming performance review

Research Tasks

1. **Background and descriptive data for the district.**
Tasks related to the examination of this issue must include, but are not limited to, the following for each mosquito control district (district) identified in this contract.

1.1. The Contractor will provide data on the district's service area (i.e., the areas within the district's boundaries) to include:
1.1.1. Size (square mileage) of the district
1.1.2. Map of the district, that includes marked boundaries for counties and municipalities that are within and that overlap the district's boundaries
1.1.3. Population based, as applicable, on: a) July 1, 2022, population estimates from the United States Census Bureau (USCB) for a county or city, the entirety of which is included within the district boundaries; and b) 2020 census tract, block group, or block data from the USCB, as necessary, for a district with boundaries that include portions of a county or city
1.1.4. Identification of district characteristics, such as demographic, environmental, and geographic factors, that impact the types of mosquito control services needed in the district with a description of the impact that each characteristic has on that need
1.1.5. For real property that is subject to the millage levied by the district, the number of parcels, total just value of such parcels, and total taxable value of such parcels for the current tax year and three prior tax years, as determined by the relevant county property appraiser
1.1.6. For tangible personal property that is subject to the millage levied by the district, the number of tangible personal property accounts, the total just value of those accounts, and the total taxable value of those accounts for the current tax year and three prior tax years, as determined by the relevant county property appraiser

1.2. The Contractor will provide data on the district's creation, governance, and responsibilities to include:
1.2.1. A history of the district's creation and governance including the initial effective date of the district, citation to the legal authority initially creating the district (e.g., a special act of the Florida Legislature or a local ordinance), a timeline for and description of substantive changes to that legal authority since its enactment, and a description of and an electronic link to, or an electronic copy of, the current legal authority governing the district
1.2.2. For the current district board of commissioners (board), identification of the qualifications required to be a commissioner; the number of commissioners; the fill/vacancy rate for the board; and the duties of the commissioners
1.2.3. Assessment of whether the board's current composition is in accordance with s. 388.101,*Florida Statutes*, and other legal authority governing the board
1.2.4. Assessment of whether the commissioners have met during the current fiscal year (Fiscal Year 2023: 10/1/2022 – 9/30/2023) and the previous three fiscal years in accordance with ss. 189.015 and 388.151,*Florida Statutes*, and other legal authority governing the district
1.2.5. Summary of applicable federal and state statutes, federal regulations, Florida Administrative Code rules, and local regulations or laws related to district governance and operations

1.3. The Contractor will provide data (to include means, methods, frequency, and purpose of coordination and communication) for the following governmental entities with which the district interacts:
1.3.1. Federal and state agencies
1.3.2. Counties
1.3.3. Municipalities

1.4. The Contractor will provide data on the district's resources for Fiscal Year 2022 (10/1/2021 – 9/30/2022) to include:
1.4.1. Millage rates
1.4.2. Current revenues and most recent fiscal year's expenditures
1.4.3. Number of paid staff
1.4.4. Major equipment and facilities owned, leased, and/or rented

2. District's purpose, goals, and objectives.
The Contractor's examination of these issues must include, but is not limited to, addressing the following research tasks and answering the specified research questions listed under each task.

2.1. Examination of the district's purpose(s), goal(s) and district programs and activities, including:
2.1.1. What is/are the district purpose(s) in the charter or other legal authority establishing the district?
2.1.2. What is/are the district goal(s) in the charter or other legal authority establishing the district?
2.1.3. For each district program and activity, what is/are the goal(s)? objective(s)? problem(s) or need(s) that the program or activity was designed to address? expected benefits? performance measures and standards used by the district to determine if the program or activity achieves the district's goals and objectives?

2.2. Methodology.The Contractor will answer the research questions specified in section 2.1 using, at minimum, the following methods:
2.2.1. Request and review the district's charter
2.2.2. Request and review the district's strategic plan and the last three years of annual reports, if available
2.2.3. Request and review previous performance reviews and/or audits
2.2.4. Request information from the district on its goals, objectives, expected benefits, and performance measures and standards for each program and activity

3. **How well is the district performing relative to goals and objectives?**
The Contractor's examination of this issue must include, but is not limited to, addressing the following research tasks and answering the specified research questions listed under each task.

3.1. Assessment of the extent to which the district's goals and objectives have been achieved, including whether the goals and objectives are clearly stated, are measurable, adequately address the statutory purpose of the district, provide sufficient direction for the district's programs and activities, and may be achieved within the district's adopted budget
3.1.1. Are district goals and objectives clearly stated and measurable? If not, why not?
3.1.2. Do district goals and objectives adequately address the district's statutory purpose? If not, why not?
3.1.3. Do district goals and objectives provide sufficient direction for programs and activities? If not, why not?
3.1.4. Can district goals and objectives be achieved within its adopted budget? If not, why not?

3.1.5. To what extent have district goals and objectives been achieved?
3.1.6. If the district is making progress toward achieving its goals and objectives, what are the contributing factors?
3.1.7. If the district is failing to achieve goals, objectives, and/or performance standards, what are the contributing factors?
3.1.8. What plans does the district have to prevent a future failure to achieve goals, objectives, and/or performance standards, if applicable?

3.2. Assessment of performance measures and standards for the district's programs and activities using data from the current fiscal year (Fiscal Year 2023: 10/1/2022 – 9/30/2023) and the previous three fiscal years
3.2.1.Are any of the previous three fiscal years' performance measures and standards different than those for the current fiscal year? If yes, answer the questions in 3.2.2 and 3.2.3 for the different measures.
3.2.2.Are the current fiscal year performance measures and different performance measures in the previous three fiscal years relevant to the district's programs and activities, useful, and sufficient to evaluate costs? If not, why not?
3.2.3.Are the current year performance standards and different performance standards in the previous three fiscal years relevant to the performance measures, useful, and sufficient to evaluate costs? If not, why not?

3.3. Are the current and three previous years' performance standards being met? If not, why not? What are the factors contributing to failure to meet current performance standards, if applicable?
3.3.1. Should the current year performance measures and standards be revised? If so, why and how?

3.4. How do other government agencies, internal staff, and/or local residents perceive the district's performance?

3.5. Methodology.The Contractor will answer the research questions specified in sections 3.1 – 3.4 using, at minimum, the following methods:
3.5.1. Obtain copies of measurements of district goal and objective achievement (performance measures and standards) and records of current and previous three fiscal years' measures, standards, and records of success or failure to meet the standards; evaluate the district's actual performance in meeting its goals and objectives
3.5.2. Assess whether performance measures and standards:
3.5.2.1. Are relevant, useful, and sufficient to evaluate the performance and costs of the programs and activities
3.5.2.2. Are being met
3.5.2.3. Need to be revised
3.5.3. Request and review previous performance reviews/audits
3.5.4. Request district assessments of why (if applicable) the district failed to meet performance measures and standards and/or goals and objectives
3.5.5. Request information from the district on actions taken to address and prevent such failures in the future
3.5.6. Interview district staff and relevant local government entities about district performance and request, if available, the results of district-generated resident feedback surveys conducted during the current and previous three fiscal years

4. How well does the district manage its resources?
The Contractor's examination of this issue must include, but is not limited to, addressing the following research tasks and answering the specified research questions listed under each task.

4.1. Determination of the revenues by source and expenditures of district programs and activities, using data from the current fiscal year (Fiscal Year 2023: 10/1/2022 – 9/30/2023) and the previous three fiscal years.
4.1.1. What are the categories and amounts of administrative costs? For purposes of Schedules A and B, the term "administrative costs" means expenditures to support the operation of the district that are not directly related to a district program or activity. Such expenditures include, but are not limited to, salaries for staff who do not actively engage in district programs or activities and expenditures for bookkeeping, financial reporting, audits, office supplies, and data programming and processing that are not directly related to a district program or activity.
4.1.2. What are the categories and amounts of direct program and activity costs – i.e., expenses tied to implementing the district's services?
4.1.3. What are trends in revenues for the current and three prior fiscal years and how sustainable are the district's revenue streams?
4.1.4. What are trends in expenditures for the current and three prior fiscal years and major categories of expenditures?
4.1.5. What are the implications of revenue and expenditure trends, if any?
4.1.6. What steps, if any, has the district taken within the last three years to reduce costs?
4.1.7. For what services has the district contracted and at what total costs over the current and prior three fiscal years?

4.2. Identify the total number and type of staff (volunteer/paid, contractor/in-house) for the current and three previous fiscal years
4.2.1. What staffing trends are observable for the current and three prior fiscal years?
4.2.1.1. Include data such as salary costs and historic fill, vacancy, and turnover rates
4.2.1.2. Include data on contracted Full-Time Equivalent (FTE) employees
4.2.2. Are the number and types of staff meeting the district's needs?

4.3. Identify the district's equipment and facilities purchases for the current and three previous fiscal years
4.3.1. What are trends in the number and types of vehicles/major equipment owned or leased by the district for the current and three prior fiscal years and is the current level and current condition of these vehicles/major equipment meeting the district's needs?
4.3. 2.How many and what type of facilities does the district own or lease and do the current number, location, and condition of these facilities meet the district's needs?

4.4. Identify the district's strategic or other future plans (e.g., proposed budgets) 4.4.1.What steps has the district taken to plan for its future?
4.4.2. What is known about district planning for the future that would affect performance and costs, e.g., future service changes, growth, FTE, equipment, acquisition, and construction?

4.5. Review previous performance review and financial audit findings and, if available, review the results of resident feedback surveys conducted during the current and previous three fiscal years
4.5.1. What is the financial position of the district?
4.5.1.1. Is the district covering costs or running a deficit?

4.5.1.2. What do audit findings suggest about stability and accountability?
4.5.1.3. How do leadership (staff, board) and residents perceive its stability?

4.6. Methodology. The Contractor will answer the research questions specified in sections 4.1 – 4.5 using, at minimum, the following methods:
4.6.1. Analyze revenue sources
4.6.2. Analyze revenue trends and expenditure trends and causes of trends
4.6.3. Analyze staffing trends and causes of trends
4.6.4. Analyze equipment inventory/capital investment trends
4.6.5. Describe activities the district conducts to manage costs and personnel planning
4.6.6. Analyze the results of district-generated resident feedback survey data, if available, related to finances and spending by the district
4.6.7. Review/analyze performance reviews and audits (see also 2.2.3)
4.6.8. Interview an appropriate sample of district leaders, e.g., staff and board members

5.How does the district deliver services and are other similar services available in the district's service area?
The Contractor's examination of these issues must include, but is not limited to, addressing the following research tasks and answering the specified research questions listed under each task.

5.1.Review the delivery of services by the district, including alternative methods of providing those services that would reduce costs and improve performance and determine whether revisions to the organization or administration would improve the efficiency, effectiveness, or economical operation of the district; also, determine whether the district conducts activities outside the scope of its charter or purposes as outlined in applicable federal and state statutes, federal regulations, Florida Administrative Code rules, and local regulations or laws related to district governance and operations.
5.1.1. What is/are the service(s) delivered by the district?
5.1.2. Is/are there alternate method(s) to deliver services at reduced costs? If so, what alternate method(s) and how would it/they reduce costs?
5.1.3. Is/are there alternate method(s) to deliver services to improve performance or efficiency? If so, what alternate method(s) and how would it/they improve performance?

5.2. Conduct a comparison of similar services provided by the county and municipal governments located wholly or partially within the district's boundaries, including similarities and differences in service area boundaries, services, relative costs and efficiencies, and possible service consolidations
5.2.1. Are similar or related services provided by the county or municipal governments and, if so, what are they and how much are these local government entities spending on these activities
5.2.2. Are the county or municipal governments providing services more efficiently and, if so, by what mechanisms are they doing so? (Compare relative costsand known operational efficiencies of similar services provided by the county or municipal governments.)
5.2.3. Whether the district is or is not the more efficient entity? Do any relative cost and operational efficiencies warrant consideration of possible service consolidations with the county or municipal governments? If so, what consolidations?

5.3. Methodology. The Contractor will answer the research questions specified in sections 5.1 – 5.2 using, at minimum, the following methods:
5.3.1. Request a map of the district's service area boundaries and a list of all counties and municipalities in the service area to determine the overlap with those counties and municipalities.
5.3.2. Request a list of counties and municipalities outside the service area that the district also assists (if

any)
5.3.3. Request a list of services provided by the district for the last three fiscal years that includes the extent of services provided (e.g., number and type of service requests from the public, number of larvicide application events completed, and square acreage or mileage of areas treated) to determine the extent of overlap with other counties and municipalities.
5.3.4.Request information on coordination, notably, formal or informal agreements that currently exist between the district and county or municipalities relating to the provision of mosquito control services
5.3.5.Request information or conduct interviews with the district and other local governments about similar services provided and cost of services
5.3.6. Compare similarities and differences between services provided by the district and other entities
5.3.7. Request data on services delivered by district staff vs third-party contractors for the last three fiscal years including number of contracts, services provided, and dollar value
5.3.8. Request analyses or reports on outsourcing that was considered but not implemented
5.3.9. Assess district studies or evaluations of alternative service delivery methods including consolidation of services with other government entities
5.3.10. Request documentation of unique contributions from the district relative to the county or municipalities.
5.3.11. Interview local stakeholders on their perceptions of the relative value of the district's services; such stakeholders must include, but are not limited to, representatives of the local health departments and of the local government units which address the operations of and capital projects for public parks and recreational spaces in the district.

6. Recommendations.
The Contractor's development of recommendations must include, but is not limited, to the following. For each specific recommendation, present the condition/problem, criteria that specifies how an activity or program should operate, and cause of the problem that the recommendation is addressing and an analysis of potential benefits and adverse consequences, detailed in a table. If recommendations are not made, this should be stated and a rationale presented.

6.1. What statutory, budgetary, and program changes would improve operations, reduce costs, and reduce duplication?
6.1.1. Statutory recommendations should be posed as options, specifically, "The Legislature could consider…." Statutory recommendations should only be posed if the law presents a particular performance barrier and must include a specific section of statute that would need to be amended.
6.1.2. Budgetary recommendations should be posed as follows "The district could consider…." Subsequent text must describe how cost savings would be achieved and provide an estimate of the savings amount.
6.1.3. Program recommendations should be posed as follows "The special district could consider…." Subsequent text must describe how these changes could be achieved, any efficiencies that would result, and, if applicable, an estimate of related cost savings.

6.2. For each recommendation identified in section 6.1, what are the potential benefits to be achieved and the potential adverse consequences of the proposed changes?

6.3. Methodology. The Contractor will answer the research questions specified in sections 6.1 – 6.2 using, at minimum, the following methods:
6.3.1. Analyze 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? If so, what revisions should the district consider and how would the changes improve operations?

6.3.2. Identify changes that would improve program operations, reduce costs, or reduce duplication
6.3.3. Request district assessments of feasibility, potential benefits, and/or adverse consequences, and other implications of statutory, budgetary or program changes, and assess the district's capacity to implement any of the changes and what support would be needed
6.3.4. Interview and request information from other local government entities (e.g. water management districts) on feasibility, benefits, adverse consequences, and other implications of statutory, budgetary, or program changes

7. District Profile Data.
The Contractor will submit an Excel spreadsheet in a file separate from the report that contains the following data elements listed in section 7.1 – 7.6 for each district (see attached *EXAMPLE "DISTRICT PROFILE DATA"SPREADSHEET*for additional guidance):

7.1. District Background
7.1.1. Citation of and link(s) to the district's current charter or other legal authority establishing the district (e.g., a special act of the Florida Legislature or a local ordinance), including any amendments to that authority since its enactment so that a full version of the currently applicable charter or other legal authority is provided
7.1.2. Link to the district's website
7.1.3. Email address for the district's point of contact
7.1.4. Address of district headquarters
7.1.5. County or counties in which the district resides
7.1.6. Size of the district in square miles
7.1.7. A link to a map of the district
7.1.8. Brief description of the district's purpose and goals
7.1.9. List of services provided (e.g., habitat removal, the establishment of structural barriers, surveillance, larvacide, adulticide, or education)
7.1.10. List of counties, municipalities, and regional governmental agencies outside the district's service area that the district also assists (if any)

7.2. District Administration and Governance
7.2.1. Number of district board commissioners (board)
7.2.2. Number of current vacancies on the board
7.2.3. Whether the board met at least once per month in Fiscal Year 2022 (10/1/2021 – 9/30/22)

7.3. District Revenues – Fiscal Year (FY) 2022 (10/1/2021 – 9/30/22)
7.3.1. Millage rate(s) for Tax Year 2022 7.3.2.For property subject to the millage levied by the district:
7.3.2.1. Number of real property parcels in the district and the taxable value of such parcels for Tax Year 2022
7.3.2.2. Number of tangible personal property accounts in the district and the taxable value of such accounts for Tax Year 2022
7.3.3. Amount of revenue from millage for FY 2022
7.3.4. Amount of revenue from other sources for FY 2022
7.3.5. Total revenue from all sources for FY 2022

7.4. District Expenditures – FY 2022
7.4.1. Amount of administrative costs for FY 2022
7.4.2. Amount of direct program and activity costs (i.e., expenses tied to implementing the district's services) for FY 2022

7.4.3. Amount of other expenditures
7.4.4. Amount of long-term debt
7.4.5. Total amount of expenditures for FY 2022

7.5. District Resources –Current Year
7.5.1. Number of paid, in-house staff
7.5.2. Number of contracted staff
7.5.3. Number of volunteers
7.5.4. Number of major equipment/vehicles owned, leased, and/or rented
7.5.5. Number of facilities owned, leased, and/or rented

7.6. District Performance Information
7.6.1. Whether the district has performance measures and standards for its programs and activities (yes or no)
7.6.2. For a district that has performance measures and standards, include a link to those measures and standards
7.6.3.For arbovirus[1], provide the following data for the county or counties in which the district resides for the current calendar year and the three previous calendar years with citation(s) and a link(s) to the source(s) of the data: the total number of arbovirus cases in humans that were acquired in Florida; and if available, the number of human deaths attributable to arbovirus if acquired in Florida for each type of arbovirus

[1] As used insection 7.6.3, the term “arbovirus” means West Nile virus,eastern equine encephalitis virus,St. Louis encephalitis virus,dengue virus, chikungunya virus, Zika virus, California encephalitis group viruses, and malaria.

Site Visits & Interviews

The Contractor may propose a plan and tentative site visit schedule for fieldwork that includes one site visit per contract group to a mosquito control district the contractor is reviewing, subject to approval by the LCM.

X. SPECIAL DISTRICT MODEL

Efficiencies & Advantages

There are many advantages to the independent special district model for mosquito control. The main benefit is the ability for the special district to concentrate on only mosquito control. With a county providing the service, mosquito control is a secondary objective of the county government and may not receive the focus needed. By having a separate district, the revenue remains more constant and the service is provided on a more consistent basis.

One of the initial reasons for the founding of the district was to guarantee a revenue stream to provide consistent mosquito control to the district when the county commission would not.

Innovation and Efficiency

Another advantage of the independent special districts is that, due to the independent nature of the operation, there tends to be a high level of innovation and utilization of existing resources within the culture of the district. There are several examples from Pasco County MCD. Some of these innovations and efficiencies include:

- Designing and implementing a front boom system with a hose attachment for larviciding/inspector trucks that allows the driver to spray from the cab. This eliminates the need for a second employee to spray from the truck bed.
- Designing in-house spray tools rather than buying them. An example is the hand held ultra low volume (ULV) sprayer that is built for $450 from a weed trimmer, which would cost $2,100 to order from a distributor.
- Utilizing technology. Many of the districts, including Pasco County MCD, have implemented software that allows for quicker response time to taxpayer requests and accurate spraying of mosquito populations.
- Designing in-house truck and ATV ULV spray equipment. Pasco County MCD is able to design and build the system in-house for $5,000 rather than buy the equipment from a distributor for $10,500.

Hand Held ULV Sprayer **Truck Mounted Boom System**

Cross Training

Many of the independent districts utilize cross-training of employee job responsibilities. This allows one employee to be able to perform multiple jobs. A case in point is the Pasco County MCD's operations supervisor. This employee is responsible for coordinating the ground adulticide program, aerial adulticide program, mosquito surveillance program, and chicken surveillance program. Independent MCDs also cross-train field teams to assist shop personnel with equipment rebuild and repair during off-season.

Elected Officials

Another benefit, depending on the size of the district, is the advantage of having elected officials. These officials are more readily accessible to taxpayers of the district regarding mosquito control service. The elected officials hold open meetings at least once a month and have a series of budget and millage hearings open to the public.

Technology

Special district MCDs have been at the forefront of technological advancement in mosquito control and mosquito control techniques. This includes utilizing ULV spraying, which has significantly reduced the amount of pesticides used. MCDs also utilize GPS devices in aircraft and vehicles in order to track and avoid duplicative spraying.

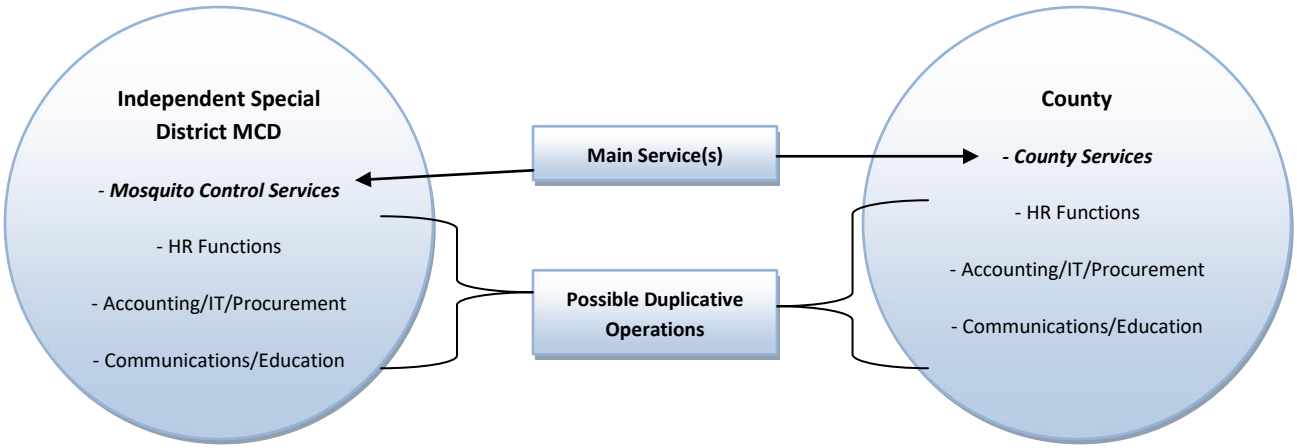
Inefficiencies & Disadvantages

Independent District Model

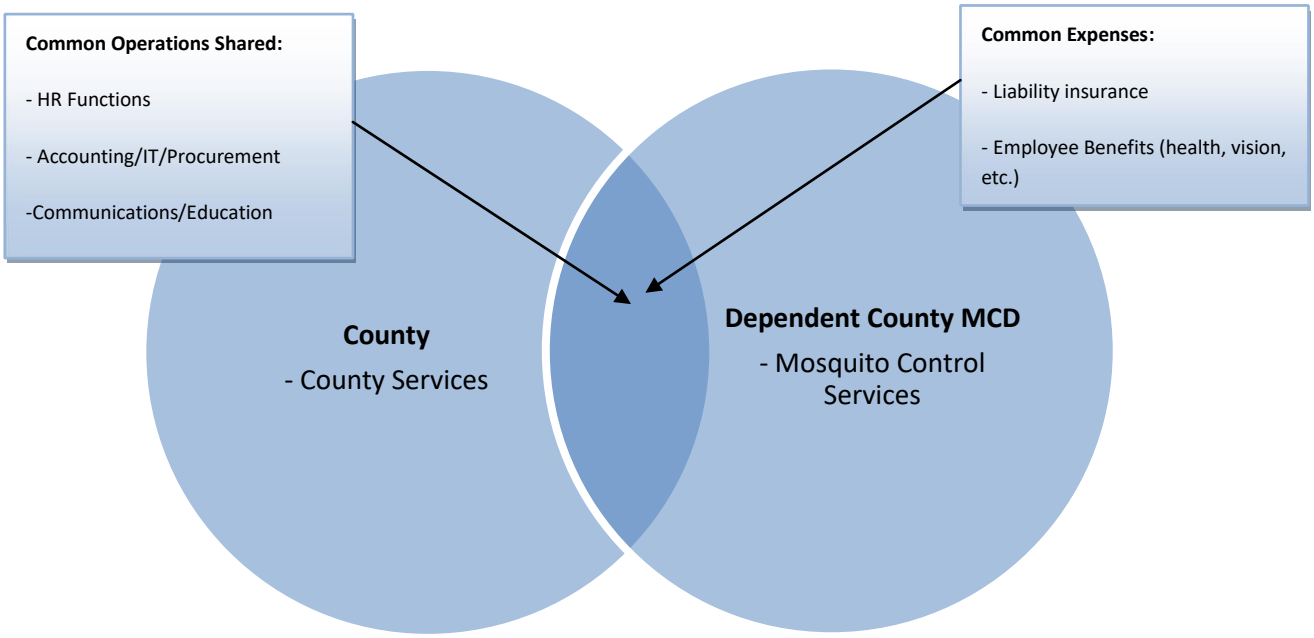
There are possible inefficiencies with the current model of mosquito control delivered by an independent special district versus a dependent special district or county program. An example is that many operations that are unrelated to the actual service (Human resources, IT, etc.) may be duplicated. For example, Lee County Mosquito Control has an administrative and financial unit that includes

accounting, IT, and procurement. There are 10 employees in that section with a total salary per year of over $540,000, not including benefits and retirement contributions. Many of these positions would not be needed if the district was part of the county or dependent special district since the county already has those support functions. There is also possible cost savings in areas like insurance and benefits as counties tend to have lower overall costs per employee because of the larger size of the employee pool. The below chart reflects the possible inefficiencies with the independent special district service model compared to the dependent district model. Because of the duplication and possible inefficiencies in the independent special district model, there is a trade-off in expenses. The independent model may deliver a more consistent revenue stream for the service, but at a potential increased cost due to duplicative operations.

Independent Special District Service Model (Entire County)



Dependent District Service Model (Entire County)



Continued Need and Evaluation

There is no procedure for continued evaluation of the need for independent special district MCDs. The board of commissioners for each independent MCD is elected and thus any concerns or complaints from constituents should be directed to their elected mosquito control commissioner. Most of the MCDs were created from 1925 to 1965 when the counties they served had a much smaller population and mosquito control service was not an expected service from the county. Many of the larger districts were created from smaller districts or expanded over the years to encompass an entire county.

By reviewing the legislative and statutory history of mosquito control, the original intent of the mosquito control statutes was to create a "grass roots" method for citizens of a county to receive much needed mosquito control services, which at that point in Florida history, was not provided by counties. Many of the county commissions were reluctant to devote resources to the service, so chs. 388-390, F.S., and special acts, gave local citizens the option to create a taxing district to provide the service and generate additional revenue to fund the service.

There are several possible inefficiencies that are present in the creation of an independent special district. Mosquito control districts provide a potential illustration of these inefficiencies since most counties in the state provide the service. The inefficiencies are not in the actual control of the mosquitoes, but in the manner in which the unit of government operates and as such, the independent mosquito control district model creates a potential trade-off. The district may have some inherent inefficiencies, but may also provide a more consistent mosquito control service.

THE FLORIDA KEYS MOSQUITO CONTROL DISTRICT REVIEW

February, 1999

ENTOMOLOGICAL SERVICES

Gainesville, Florida

EXECUTIVE SUMMARY

Objectives. Assess the District program and consider strategies for improvement. [For a discussion on mosquito control practices, concepts and insecticides see Appendix B].

Extent of the Problem. Monroe County's land mass exceeds I million acres, much of which is subject to salt water inundation and heavy rainfall events. Due to prohibition of pesticide usage on an estimated 90-95% of these lands, the District program is adversely impacted by mosquitoes that infiltrate from nearby untreated breeding areas. Urban mosquito breeding, while important as potential sources of nuisance and mosquito-borne disease, makes up only 5-10% of the total mosquito population. Biting midges (no-see-ums, primarily Culicoides species) breed in intertidal zones; their bites are frequently mistaken for mosquito bites, but the District is not mandated to treat and there is no practical method of control.

Mosquito Control Practices. The District conducts adult and larval mosquito surveillance, source reduction where practical, and larviciding and adulticiding. Treatment of mosquitoes in larval breeding habitats is generally considered to be the most cost-efficient and environmentally friendly method of control because insecticides must be applied over much larger areas to achieve adult control. For control of salt marsh and floodwater mosquito larvae in 1998, Bli (5,055 acrcs) was applied aerially to sites larger than an acre; smaller sites were treated manually (1,151 acres) with Bti or temephos (Abate@). Mosquito production in urban areas was controlled with methoprene (1,355 acres) and Bti; Bacillus sphaericus was sometimes used in sewage treatment plants, and Bonide@(372 gal.) and Agnique@(8 gal.) were used against mosquito pupae. Adult salt marsh and floodwater mosquitoes were controlled by aerial applications of naled (Dibrom@; 452,784 acres) and ground ultra low volume (ULV) applications of permethrin (938,054 acres).

Quality of the District Program. The District is conducting a sound, cost-effective mosquito control program. The staff is well-trained, experienced and meets State certification requirements, which arc based on a broad knowledge of mosquito biology, disease transmission, application technology, environmental protection, etc. Interviewed staff members were knowledgeable, exhibited a high level of morale and pride in their jobs, and appeared to be conscientious in the performance of their duties. Although the millage rate for the District is higher than neighboring Lee and Collier counties, the use of FY98 tax-generated funds by the District operation fell between the reported Lee and Collier expenditures.

Strategy Development. (l) In Florida, plans for mosquito management on state-managed lands usually authorize the use of Bti and/or methoprene. The District has recently submitted and is aggressively

supporting a proposal which, if accepted, would allow application of Bti in these habitats and thus eliminate a high percentage of the invading salt marsh mosquitoes. (2) Replacement of the bN0 aging DC-3s with one twin-turbine airplane and addition of a twin-turbine helicopter would reduce operating costs and provide both adulticide and larvicide capability even if one aircraft were temporarily out of service. (3) Implementation of an information program would educate the public about mosquito control, health and environmental concerns.

Alternative Management Options. Privatization or conversion to management that does not utilize program dedicated facilities, staff, vehicles, aircraft and maintenance operations or trained and certified personnel would be likely to create a significantly negative impact on the quality of the program - and would probably cost more than the current program if it were set up to accomplish the same objectives. Program permanence could not be guaranteed and abrupt departure of a contractor, if required, could lead to major problems. The current special tax district format is likely to be more responsive to changing needs because of its dedicated equipment and staff and the single tier management system. Because the District program and its governing board address only issues related to mosquito control, their decisions are based not on external matters but on specific program issues. Other than the observation that the District is conducting an excellent mosquito control program, perhaps the single most salient argument for maintaining the special tax district format is that biology, climate and arthropod-borne diseases are not predictable; year to year variability in terms of seasonality of mosquito production, inventory needs and operational activities routinely require rapid, informed decisions at the Board level.

Recommendations. Establish an acceptable plan for control of salt marsh mosquito larvae on state and federally managed lands. Maintain special tax district management structure. Establish a long range plan to upgrade the aerial application capability. Initiate a proactive public information program. Negotiate a workable mosquito adulticide agreement with the Navy. Upgrade data management and summarization.

REVIEW OF THE FLORIDA KEYS MOSQUITO CONTROL DISTRICT

Introduction

The objective of this program review is to evaluate, survey or otherwise study and report on the effectiveness of the Florida Keys Mosquito Control District program and to consider strategies for improving and/or supplementing the current program.

By virtue of many years of public service in the field of vector biology and control, as documented in the curricula vitae provided with the original proposal for this study, each member of the review team is especially well qualified to conduct this assessment. All are certified as public health pesticide applicators in their respective states. John Beidler and Oscar Fultz have had long tenures as Director of a major coastal mosquito control program; David Dame is recognized as a Certified Professional Entomologist by the Entomological Society of America.

Readers of this report may benefit from viewing the discussion on principles of mosquito control provided in Appendix B, which addresses the specific concepts and activities required to successfully IID manage mosquito populations, the insecticides utilized, and other issues related to compliance with state and federal regulations. Many of these factors are not well understood by the general public.

Methods

The mosquito control program was observed by site inspection of the District's three operations units, located in Key Largo, Marathon and Key West. Visits to typical breeding habitats were conducted at each location. Staff members at each location were interviewed and records related to the mosquito abundance, staffing and operational costs were reviewed.

Extent of the Problem

From the District files, the text of an address by the previous Director, presumably at a civic gathering in 1996, reveals that 1.09 million of the l . 14 million acres that make up Monroe County's land mass were at that time owned or managed by federal, state or private not-for-profit environmental organizations that did not allow aerial application of pesticides. He explained that even though the District had a strong larviciding program, supplemented by a stocking program that utilized mosquito fish produced by the District, mosquitoes that come into residential and urban areas from areas restricted from treatment necessitate the use of adulticides. At that time methoprene was the primary larvicide used to treat the 41,373 treatable breeding acres, and Bacillus thuringiensis israelensis (Bti) was used to control urban container-breeding and/or domestic mosquitoes in over 350 cisterns and 200 wells and numerous other natural and man-made breeding sites. Permethrin was being used for ground ULV and naled for aerial adulticide.

Upon inspection of typical breeding sites in and around Key Largo, Marathon and Key West, the review team was able to confirm that the salt marsh mosquitoes which breed abundantly throughout the Keys represent the major mosquito problem. The larvae are found in salt, brackish and freshwater habitats, particularly in mangrove swamps and adjacent grassy depressions. Breeding activity is initiated by tidal flooding, rainfall events and spillover (often windblown) from aquatic habitats onto areas where the mosquito eggs reside in the soil. Multiple floodings can cause multiple broods. Efforts to reduce breeding in such habitats in the past can be seen from the air in the form of drainage ditches (Figure l, top), most of which now are filled in or blocked and ineffective. Permitting for new drainage ditches is no longer available, and efforts to obtain permits to bring the old ditches back to their original conformation usually are unsuccessful.

Before the advent of mosquito control, Keys residents were regularly exposed to hordes of mosquitoes emanating from breeding sites located throughout the 800 islands that comprise the Keys and from the Everglades - causing landing rates well in excess of 100-200 mosquitoes per person per minute. Longtime residents were reported to readily recall the discomfort and annoyance associated with these natural events. As recently as the turn of the century, mosquito-borne diseases such as malaria, yellow fever and dengue were prevalent throughout Florida - the Keys were no exception. In the areas where the District is allowed to perform control activities, this level of mosquito abundance is now preventable most of the time.

The exceedingly large mosquito populations in nearby governmentally managed lands frequently migrate and populated areas, thereby offsetting the generally high level of control expected from the combination of adult and larval mosquito management practices where treatment is allowed. The team was informed that about 50% of the breeding sites along the island chain are located in lands managed by the State and the Federal Government - which currently do not permit treatment or, in some instances, access. In addition to mosquitoes from these nearby untreated habitats, other mosquitoes frequently invade from breeding sites in the Everglades when the prevailing winds support

Figure 1 Top Ditches created in the past to drain breeding areas. Bottom Proximity of populated areas to untreated mosquito habits.

such movement (commonly in the range of 5 miles, but which for this salt marsh mosquito has been recorded at up to 50 miles).

Mosquitoes from fresh water and habitats other than salt marsh apparently constitute about 5-10% of the mosquito problem in Monroe County. These mosquitoes are routinely controlled in the larval stage.

A source of continued annoyance is the biting midge (no-see-ums, primarily Culicoides species) that breeds in intertidal zone habitats and whose bites are frequently mistaken for mosquito bites by new residents and tourists. The District is not mandated to treat for biting midges and there is no practical method for controlling these pests.

Mosquito Control Practices

To protect residents the District is obligated to conduct adult and larval mosquito surveillance, source reduction where practical, and control by larviciding and adulticiding. Treatment of mosquitoes in their larval breeding habitats is generally considered to be the most cost-efficient and environmentally friendly method of temporary control because the target mosquito populations are concentrated in relatively small areas, which minimizes the amount of insecticide required. When adult mosquitoes emerge within the treated areas or immigrate from outside the designated allowable treatment zones to populated areas, it becomes necessary to use adulticides and treat much larger acreage to provide the desired relief.

A variety of control options is available for the specific situations found in Monroe County (see Appendix B for a description of these options). For most of these situations the Program has selected and is practicing the more environmentally friendly and effective control practices applicable.

For salt marsh and floodwater mosquitoes, the selective larvicide Bti is applied aerially in a granular formulation at label rates to sites larger than an acre that have been determined by inspection to be actively breeding. Smaller sites are treated by manual application, either with Bli or liquid temephos (Abate@). In 1998 the county treated 5,055 cumulative acres by air and 1,151 cumulative acres manually. Urban mosquitoes associated with peri-domestic container-breeders and polluted water mosquitoes were controlled with the insect growth regulator methoprene (1,355 cumulative acres) and Bti granules. Bacillus sphaericus is sometimes used to control mosquitoes in sewage treatment

plants. In addition, 372 gallons of Bonide@ oil and 8 gallons of the surface film Agnique@ were used to control mosquito pupae.

Adult salt marsh and floodwater mosquitoes are controlled by aerial applications of naled (Dibrom@) and ground ultra low volume (ULV) applications of permethrin. In 1998 permethrin was used to treat mosquitoes in 938,054 cumulative acres and naled was used in 452,784 cumulative acres. These applications complement the larval treatments cited above and represent an excellent choice of chemicals and appropriate usage for the mosquito situations encountered.

The District has a contract with the Navy to conduct surveillance and control operations on selected government properties. Currently, the effectiveness of this activity is less than optimum because of the need to request specific authorization to adulticide each time mosquito populations become abundant. Permission is usually granted long after the problem has abated naturally. Thus, residents in these areas

do not benefit as much from adulticides as the others in the community even though it has sometimes been possible to overcome this bureaucratic logjam. The District hopes to correct this situation when negotiating the next contract.

The recent assignment of a competent biologist at Marathon was noted by the review team. The District apparently has never had the benefit of a full time mosquito biologist. Control operations are dependent on a sound knowledge of the biology of the target mosquito species and the ecology of their habitats. There is much to be done in terms of characterizing the extent and biology of the mosquito problem. By so doing, it will be possible to better pinpoint control measures, reduce long term costs and minimize environmental concerns. This position will also help the District overcome the sparsity of summarized data related to assessment of mosquito abundance and the levels of control achieved by the program. Records of the daily biting counts conducted by the inspectors were available to the review team but by themselves do not provide a broad picture of population trends. Lack of summarized documentation somewhat inhibited the ability of the review team to fully assess the impact of the program. However, precision in measuring control levels must await the curtailment of adult mosquito migrations from untreated state and federally managed lands

Staff and Facilities

The District staff consists of the Director, 41 full time employees and up to 25 supplementary temporary employees during the peak mosquito season. The operational activities are currently based at three locations: Key West for the lower Keys; Marathon for the middle Keys; and Key Largo for the upper Keys. All three operations units conduct daily larval and adult mosquito surveillance, which provides both the basis for management decisions and the documentation that is required by State statute (Chapter 388) prior to the use of chemicals for mosquito control. In addition, each field staff member is equipped with a belt-holstered hand-held communication device for routine program coordination and contact.

Each operations unit is equipped with truck-mounted ground ULV generators, field vehicles, larvicide application equipment, communications equipment, maintenance-repair shop, computers, and the necessary field equipment. To assist in the short term planning process, each operation unit receives continual weather information on a TV monitor. Each offce complex is adequately equipped for the current level of activity, and all were found to be well maintained and orderly. The pesticide storage facilities at Key Largo appeared to be in compliance with state and federal regulations. At Key West a new pesticide storage facility is required because of recent storm damage to the old facility, and at Marathon a new storage facility is currently under construction. At the main facility there also is a propagation tank for mosquito fish, offces for administrative staff, and a well equipped conference room. Overall, the facilities and equipment housed at the these locations appear to be maintained in excellent operating condition.

Strategy Development

Recent procedural changes have resulted in the utilization of aerial application of Bli in larval breeding habitats replacing the reliance on broad spread use of the growth hormone methoprene, which was usually applied in long term or residual formulations. In many areas throughout Florida where mosquitoes are controlled on state-managed lands, the state-approved management plan authorizes the use of either Bli or methoprene. However, Monroe County does not have a state approved management plan. The current Director has submitted a mosquito management proposal which, if accepted, would allow application of Bti in these habitats. Relief from the need to control adult mosquitoes that infiltrate into populated areas after migrating from state and federal managed lands

(Figure 1, bottom) would further reduce the personal annoyance. Authorization to apply the environmentally acceptable, biorational Bti to these outlying breeding sites would mitigate the recurrent invasions populations of salt marsh mosquitoes. This seemingly simple change in management strategy for the state and federal managed lands would greatly reduce the quantity of chemical required for adult control in residential and urban areas (l .39 million cumulative acres were treated in 1998). This may be the single most important immediate objective because of its potential impact on mosquito abundance. During the week of this review the Director appeared before the Florida Coordinating Council on Mosquito Control to present arguments for this action, and the Council approved a special meeting to deal with the subject as it pertains to mosquito control throughout Florida.

The District aircraft currently in use are still operationally effective, but the two aging DC-3s are prime candidates for replacement when funds are available. The Director plans to replace them with one twin-turbine airplane for adulticiding. The Director's long range plan includes the purchase of a twin-turbine helicopter to assist the single turbine model (1978 Jet Ranger); these aircraft would provide both larvicide and adulticide helicopter capability. With these three aircraft, both adulticiding and larviciding could be conducted even if one is temporarily out of service. The review team agrees with this approach.

The public is not fully aware of the responsibilities of mosquito control, nor of the complexity of its operations. For this reason, the Director plans to embark on a public education program that includes planned exposure through the media. TV, radio, newspaper, classroom and civic groups all present opportunities for positive public education events. Many mosquito programs in Florida have benefitted from their excellent public relations programs.

Quality of the Program

The review team found that the Florida Keys Mosquito Control District is currently conducting a sound, cost-effective mosquito control program. The quality of the professional staff easily meets State standards from the standpoint of formal certification. The review team was informed that all supervisors are certified as public health pesticide applicators, having passed the relevant exams designed to test their knowledge of mosquito biology, the transmission of mosquito-borne diseases, management of application equipment, pesticide application techniques, hazards related to pesticide usage, environmental protection, etc. Staff members interviewed by the review team were found to be knowledgeable about their responsibilities, to exhibit a high level of morale and pride in their jobs and appeared to be conscientious in the performance of their duties.

No attempt was made to determine the appropriate number of field and office staff. However, the fact that the program is functioning at a high level of efficiency at a cost to the taxpayers that falls within the range of two neighboring counties suggests that the staffing is appropriate.

The methods and equipment utilized by the District to conduct mosquito surveillance and control were found to be appropriate for the mosquito species and habitats treated in Monroe County. The appearance and condition of vehicles, aircraft and application equipment at all three operations locations revealed a high level of maintenance and a professional respect for the tools required for the program.

The numbers of acres and domestic sites treated by the District in 1998 and the methods of treatment are consistent with those reported for Lee County and Collier County, which are relatively nearby and

experience similar coastal habitat mosquito breeding. The budgets and treated acreage in 1998 reported for the three counties is as follows:

Parameter	Lee Co.	Collier Co.	Monroe Co.
Adulticide Acreage			
Ground ULV	548,000	0	938,054
Aerial	475,000	1,053,000	452,784
Larvicide Acreage			
Ground	5,000	1390	2,506
Aerial	104,000	6456	5,055
FY 98 tax-generated funds	$9,149,000	$3,242,000	$4,700,000
Millage	0.394	0.182	0.610

Alternative Management Options.

Privatization. There is little doubt that privatization or conversion to management that does not utilize program-dedicated facilities, staff, vehicles, aircraft and maintenance operations or does not utilize trained and certified professionals to carry out the complex task of detecting, documenting and managing the indigenous mosquito populations would significantly impact the relief currently provided to residents by the District. The review team believes that cost-cutting measures associated with privatization would be expected to be directed at reduced emphasis on controlling mosquitoes before they become adults. It is likely that a greater reliance on adult mosquito control would be practiced because of the relatively lower costs of such an approach, resulting in increased treated acreage. Furthermore, it may be not be possible to control the choice of insecticide used by a private contractor. Much greater use of temporary and part-time staff could be expected, with an attendant reduction in institutional and personnel qualification and experience. And, because of the profit motivation and requirement, a privatized program would probably cost more than the current program if it were set up to accomplish the current objectives of the District.

Equally important is the fact that a contract operation would not necessarily provide permanence. Departure of a contractor in a situation in which the County has no alternative (because it has scuttled its own capabilities) could lead to major problems. And should a contractor depart without giving adequate notice (say, 12 months), the County would have no capability to protect residents and tourists from mosquitoes. To protect the long-term interests of the taxpayer when contract-oriented mosquito control operations are being considered, local government management would have to be cognizant of the need to protect its interests by maintaining continued oversight on the contract operation and be prepared to assume direction of the program when and if necessary. The review team does not advocate that privatization be considered.

Abandonment of the special tax district concept. One of the major benefits of the special tax district is the provision of services that are rapidly responsive to changing needs. Mosquito control operations - like other public health oriented services - cannot conduct the activities required and expected by the citizens without dedicated equipment, vehicles, aircraft, maintenance and staff. In a special tax district

these assets are dedicated; they are used for alternative purposes only with the Director's concurrence and assurance that the level of mosquito control would not be jeopardized.

Proper use of insecticidal chemicals to which the public may be exposed requires properly trained operators, just as maintenance of application equipment for insecticide dispersal requires special technical knowledge, calibration, and the capability of rapid repair in the event of breakdown. Decisions on these issues should be based on immediate need requirements, not on whether one county department is more important than another or has greater budgetary or administrative clout than another. Independent management of public health related operations such as mosquito control by trained and qualified professionals provides the greatest likelihood of adequate response to both unexpected and routine situations. Accountability is automatic because the provider and its governing body must satisfy community needs under the umbrella of the relevant state regulations. Because the District program and its governing board address only issues related to mosquito control, their decisions are not based on external matters but rather on the specific needs of the program. Decisions are based on the specific knowledge and experience of the responsible individuals which, in the case of an independent district, results in adequately informed decision making because of the selective nature of the responsibility.

Other than the observation that the District is conducting an excellent mosquito control program, perhaps the single most salient argument for maintaining the special tax district format is that biology, climate and disease are not entirely predictable. There often are very large variations from year to year in terms of seasonality of mosquito production, inventory needs and operational activities. The mosquito control Board must plan for a variety of expectations and handle this variability as it occurs - and it must make quick decisions often, not rarely. It is commonly stated by mosquito control directors in Florida, that county-controlled mosquito districts tend to be less responsive and slower to act at the administrative levels than special tax districts.

Conclusions

The District's program is currently being conducted in a well-organized, highly professional manner. The mosquito control practices that the District has selected for operational use are appropriate for managing the mosquito species of concern in the infested areas where source reduction and temporary control (insecticide application) are allowed. The field staff is well trained and is provided with the appropriate tools with which to manage mosquito populations. All aspects of the program appear to be in compliance with the primary state statute (Chapter 388) that regulates mosquito control practices in Florida.

Control of the salt marsh mosquito, the dominant pest mosquito throughout the Keys, is complicated by the existence of large breeding areas which are off-limits for treatment and in some cases for inspection. Migration of these mosquitoes into populated areas makes it necessary to schedule aerial adulticide applications over relatively large areas rather than follow the accepted practice of treating the relatively small breeding sites with environmentally friendly insecticides (Bli or methoprene).

The special tax district form of management is well suited to the needs of Monroe County, in that it provides dedicated equipment, dedicated facilities, dedicated vehicle and aircraft maintenance, and dedicated personnel. Decision making can be rapid, which shortens the response time for action on routine situations, unexpected events and emergency management.

Recommendations

Establish an acceptable plan for state and federally managed lands and islands that includes the option of larval control to reduce and/or prevent the migration of adult mosquitoes into populated areas.

Maintain the special tax district management structure and format.

Establish a long-range plan to upgrade the fleet of aircraft.

Initiate a proactive public information program about mosquito biology and control. Educate the public on the advantages and economics of the special tax district.

Negotiate a workable agreement with the Navy for controlling adult mosquitoes.

Embark on a program to summarize surveillance data, in order to better reflect annual and seasonal trends and program impact.

Consultant Team *

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Curricula vitae provided in original proposal document

APPENDIX A

STAFF MEMBERS CONTACTED

Interviewed:

Stephen Bradshaw, Middle Keys Supervisor

Laurie Freeling, Secretary Specialist

Edsel Fussell, Director

Lawrence Hribar, Entomologist

Frank Miller, Entomological Inspector

Michael Morgan, Upper Keys Supervisor

Henry Shaner, ChiefPilot

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Contacted:

Ruth Berry, Staff Assistant

Dane Dastugue, Safety Coordinator

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William Southcott, Comptroller

Mary Victores, Executive Secretary

Stephen Wright, Fiscal Assistant

APPENDIX B PRINCIPLES OF MOSQUITO CONTROL

The term "mosquito control" means different things to different people. Much of the activity of a mosquito control organization is seldom seen by the general public, and often this unseen activity involves the main enue of attack for control strategies. This section is intended to provide a brief sketch of the routine operating procedures and objectives of an effective mosquito control program. The primary activities include surveillance, source reduction, temporary control, program coordination, and training and public education.

Surveillance

Proper mosquito control requires continuous monitoring of mosquito population density and distribution. Florida requires fonnal records that document the need for chemical control. This objective is met in a variety of ways, the most common being the regular use of a network of traps to collect adult mosquitoes and determine species identity, density and distribution. Alternatively, and often concurrently, mosquito landing rates are observed at selected sites to determine abundance. In the breeding sites larval population density is observed by sampling the water with standardized dippers. The specific techniques for conducting these population surveys vary from place to place, but the need to conduct these assessments remains constant.

A frequently used passive abundance indicator is the telephone. The number of service requests, complaints and informational calls to the mosquito program headquarters is indicative of the annoyance level of thc mosquitoes. Often more than one type of mosquito precipitates the calls, and progam managers can use the comments of the callers to assess abundance and, if warranted, send technicians to the site(s) to confirm the relative density of the offending mosquitoes. Attention to calls is an important supplement to the conventional surveillance mentioned in the previous paragraph.

Source Reduction

Mosquitoes can be controlled most effectively and surely by eliminating their breeding sources, the practice Imown as source reduction. The objective of source reduction is to prevent breeding by physical means. For example, uith mosquitoes that breed in the high salt marshes (Aedes taeniorhynchus, Ae. sollicitans and Culex species) ditching provides a way for water to mn off, which reduces the amount of habitat available for breeding. It may also provide an access route for fish and other mosquito predators which are natural control agents. In certain circumstances breeding of the two Aedes species cited above may be prevented by impounding the habitat, i.e., flooding. Impoundment covers the soil with water and prevents egg-laying by those mosquitoes which insert their eggs into moist soil (unlike some other mosquito species that place their eggs directly on the water surface). Source reduction can be as simple as the removal or overturning of backyard containers that hold water in which mosquitoes breed.

Permanent source reduction measures can be instigated throughout the year using regular staff members to physically manipulate breeding sites. When successfully applied, these strategies can reduce or eliminate the need to use chemicals for either larval or adult mosquito control because they prevent breeding. Some source reduction techniques require official permits, e.g., new ditches or impoundments, but are worth the effort if breeding can be siÄcantly reduced. These strategies can provide long tenn control.

Temporary control

When source reduction practices have not been applied or have been temporarily overwhelmed by natural events, e.g., rainfall or tidal flooding or by agricultural or industrial inundation, chemicals may be required to control larvae and pupae to prevent the emergence ofhordes ofmosquito adults which could rapidly move into populated areas. [Actually, in Monroe County many residential areas are quite closely associated with breeding areas.] Insecticidal control of the immature stages is often preferable because they may be concentrated in relatively small areas and thus require a minimum amount of insecticide, compared to treating the larger acreage required when targeting adults.

Larval control. Several materials are registered with the EPA and with the State of Florida for the control of immature mosquitoes. When used according to the label (the instructions on the container and accompany ing documents), these materials are considered by EPA and the State of Florida to be reasonably enviromncntally friendly because of, among other reasons, their narrow spectrum of target effect or the low dosage required. For these reasons they are generally used as insecticides of choice for mosquito control throughout the U.S. Chemicals registered for the control of immature mosquitoes include, but are not limited to, the following:

Bacillus sphaericus -- a bacterium whose spores are toxic to mosquitoes of many species. It persists longer than Bti and is more effective in polluted water situations. There is an indication that it may recycle at low levels. [Vectolex@l

Bti an acronym for Bacillus thuringiensis israelensis. Bti is a preparation that contains the toxic components of this bacterium which are specific in their effect for mosquitoes and a few aquatic diptcra, e.g., midges and black flies. Mosquito larvae die after ingesting the toxic components which are found in the water column following application. The bacterium is not live and does not pcrsist in the environment. [Vectobac@, Bactimos@, Teknar@, etc.]

Methoprene -- an insect yowth regulator whose molecular structure mimics a hormone important to the physiological development of the larva. When applied in a manner which ensures that the chemical will be present when the mosquito is approaching the end of larval development, methoprene prevents emergence of the adult mosquito. [Altosid@, ALL@, Altosand, Altosid slow release granules, etc.]

Monomolecular surface film -- an inert material that creates a thin surface film on water that prevents adult mosquitoes from successfully emerging from pupae and may also cause larvae to drown. [Agnique@]

Oil -- mineral oil or light petroleum distillates which suffocate and/or poison mosquito larvae and pupae when inhaled through the respiratory system. [Bonide@, Golden Bear@]

Temephos -- an organophosphorus (OP) insecticide which kills mosquito larvae on contact following application. [Abate@l

Some of these chemicals are available in formulations that allow application before the breeding area is flooded and persist beyond the life span of the target brood. This type of formulation flexibility is less common when controlling adults. Adults are usually controlled by insecticidal aerosols which are applied so as to immediately impact the target mosquito.

Adult control. Control of adult mosquitoes may be required when control of the immature stages has been unsuccessful or when strong fliers, e.g., Ae. taeniorhynchus, migrate from areas outside the control boundaries. Adulticiding is highly visible, unlike larval control and source reduction efforts which often do not attract the attention of the general public. Vehicles with ultra low volume (ULV) aerosol generators and aircraft with spray booms heighten public awareness when working in populated areas because adult mosquitoes have reached annoyance levels.

Like the larval control materials cited above, the chemicals used in Monroe County for control of adult mosquitoes have been approved by both the State of Florida and EPA. With the ex'ception of chemically sensitive individuals, which every program must accommodate in one way or another, application of insecticides registered for adult mosquito control is considered to be a safe practice as long as the requirements spelled out in the label and accompanying documentation are followed. Large safety factors have been incorporated into the application requirements to protect residents, their domestic animals and other non-target organisms. Effective control of adult mosquitoes requires movement of the aerosol through the mosquito-infested habitat in order to impact on the mosquito. Meteorological conditions conducive to this aerosol drift occur in the evening at sundown and often pcrsist until after dawn, so most spraying for adult control is conducted during this period. Chemicals registered for the control of adult mosquitoes include, but are not limited to, the following:

Organophosphorus compounds -- these insecticides have been selected for their high toxicity to mosquitoes and relatively low toxicity to non-target organisms at recommended application rates. They tend to degrade rapidly, i.e., breakdown into less toxic or non-toxic by-products, and thus do not persist in the environment for extended periods. [fenthion (Baytex@), malathion, naled (Dibrom@)l

Pyrethrins -- these chemicals, derived from natural plant products, act very rapidly on mosquitoes and rapidly degrade in the environment. They are extremely safe products with very low mammalian toxicity, but should not be applied to lakes, or ponds where fish or other sensitive aquatic organisms may be exposed. [pyrethrins]

Synthetic pyrethroids -- synthetic pyrethroids used in mosquito control are among the safest adulticides available, in part because very small amounts are required to control mosquitoes and also because they have very low mammalian toxicity. However, they are so effective against arthropods in general that care must be taken to ensure that excessive exposure of non-target arthropods, fish and other sensitive aquatic organisms is avoided. The labels cover these hazards in detail. [resmethrin (Scourge@), permethrin (Permanone@)]

Some of the adulticides and larvicides listed above may be hazardous in the concentrated form which mosquito workers use to fonnulate the diluted material. Workers and/or their supervisors are certified by the State to apply thcse materials only after demonstrating adequate knowledge of the handling and safety procedures required. Well trained staff are essential in mosquito control operations.

Alternative control methods. Natural predators, pathogens and parasites affect mosquitoes and significantly influence their abundance. The intensity of these natural control factors is in state of continual flux. Extensive studies have been conducted with ftngi, nematodes, viruses, protozoans, predatory insects, planaria, copepods, etc., to determine the feasibility of their use in integrated

mosquito management schemes (Laird & Miles, 1985). The mosquito-specific bacteria, whose toxic spores are available commercially for use as larvicides, have not proven to be suitablc for introduction as biocontrol agents in the classical sense because they are not live or do not recycle adequately. With the exception of predatory fish, methodology to enhance the efficacy of naturally occurring control agents has not yet becn developed to a practical level. However, many mosquito districts raise or collect mosquito fish, Gambusia, for stocking abandoned swimming pools, retention ponds and other semi-pennanent aquatic sites.

Proponents of the use of bats and purple martins, etc., have not been able to demonstrate reductions in mosquito densities correlated with their use. Many factors are involved. For example, birds are active in the daytime whereas most mosquitoes are nocturnal and /or crepuscular. The predators are usually omnivorous and mosquitoes represent only a small part of their diet. The late Dr. Herbert Kale, noted Florida omithologist, reported the results of his studies that mosquitoes appear to be a negligible item in the diet of purple martins (Kale, 1968). Similar behavioral patterns were found in bats (Storer, 1926). Probably the most important factor is that mosquitoes are immensely abundant -a study in Florida recently documented the production of 72 lbs ofmosquitoes per acre per brood from a typical breeding habitat.

Furthermore, neither electronic devices (bug zappers) nor sound emitting devices have stood up under scientific scrutiny. So, while there may be circumstances in which a unique form of control is acceptable for a given species, nonstandard methodology of the types mentioned in ülis section do not merit serious consideration.

Program Coordination

Mosquito control is a complex endeavor involving many target species and varying biological phenomena and habitats and is often abruptly impacted by natural events. Daily, weekly, monthly and long-range planning is essential. Effective planning is dependent on timely availability of data, inventories, vehicles, equipment, personnel and communication capabilities.

For example, managers must know the breeding habitats in detail and be able to monitor mosquito densities by species and distribution. They must be able to predict the appropriate timing for insecticide applications and to fit their program requirements into unfavorable meteorological conditions and unexpected turns of events. This requires not only effective top managers, but also well trained and reliable staff. In addition to the need to address surveillance, source reduction, temporary control and administrative functions, the staff must also prepare specifications for purchase and maintenance of complex equipment, and collect, record and analyze biological data, etc. Logs on breeding area locations, acreage, species and conditions that lead to outbreaks must be maintained. Detailed charts, maps, aerial photos must be maintained in order to be able to respond rapidly to biological events.

And mosquito control programs need to be effectively in communication with other community agencies such as planning and development, public health, public works, emergency management, recreational and regulatory groups, not to mention state and federal regulatory and action agencies.

Training and Public Education

Staff are provided opportunities to attend state and regional meetings and training related to mosquito control. This is an important factor in maintaining effective control operations because of the need to remain informed of new methodologies, regulations, safety, hazardous waste, etc. On the job opportunities to enhance skills and capabilities are available on an informal basis.

Formal exposure of Trustees and Commissioners to mosquito control concepts and practices should be recognized as an important management exercise. Selected presentations to the Board could improve its understanding of the concepts and mechanics of mosquito control. Visitations to sites that pose special problems or reflect exceptional progress would help to keep Commissioners and Trustees informed on mosquito and vector related topics that they are bound to hear from their constituents. Attendance at state, regional and national meetings is beneficial and should be sponsored.

Whether aware of specific mosquito control activities or not, the public is concerned about the impact of mosquito control on the environment and on quality of life. Reduction in annoyance and potential transmission of disease, while certainly an important benefit, may not be accepted as sufficient reason to risk perceived undesirable impacts. And the public has been trained to question and strongly protest actions which are thought to have the potential for negative impact. Therefor it is not enough to be excellent custodians of the environment by conducting mosquito control according to state and federal regulations. It is essential to keep the public informed of the nature of the activities and their potential risks and benefits.

Such information can be disseminated in a variety of ways. The more effective programs attempt to reach the public through several media, e.g., video, radio, newspapers, magazines, brochures, handouts, etc. Managers and staff participate in public forums and provide information to the media on a regular basis to keep the public informed and aware. School children may be given classroom exercises or tüen on field trips to expose them to the mosquito habitats and biology'. Correctly practiced, mosquito control is friendly to the environment and the benefits far outweigh thc risks in most circumstances. Keeping the public and custodians of protected habitats and the environment informed is a responsibility that repays mosquito control managers by reducing the likelihood of misunderstandings that might arise because of u.ffarniliarity with the real benefits and risks.

References cited:

Kale, W.W., Il. 1968. The relationship of purple martins to mosquito control. Auk: 85: 654-661.

Laird, M. & J.W. Miles, eds. 1985. Integated mosquito control methodologies Vol. 2: Biocontrol and olhcr innovative components and future directions. Academic Press Inc., New York, 444 pp. Storer, T. T. 1926. Bats, bat towers and mosquitoes. J. Mammology 7:85-90.

Item 5c

FKMCD Analysis FMCA Response FKMCD Plan of Action

Florida Legislature is [redacted] Mosquito Control Districts in Florida (HB 1103 2021)

Overview of the Advantages and Disadvantages of Independent Taxing Districts vs those under BOCC Control

FMCA Response

and Proposed FKMCDs ACTION PLAN

A Chance to show how good we really are

61 total MCDs in Florida Expressed as: Tier 1, 2 and 3

42 BOCC, 15 ITD, 3 DTD

Tier 1: greater than $3M annual budget

16 Tier 1: 4 BOCC, 12 ITD, **0 DTD**

Tier 2: greater than $1M but less than $3M annual budget

9 Tier 2: 8 BOCC, 1 ITD, **0 DTD**

Tier 3: less than $1M annual budget

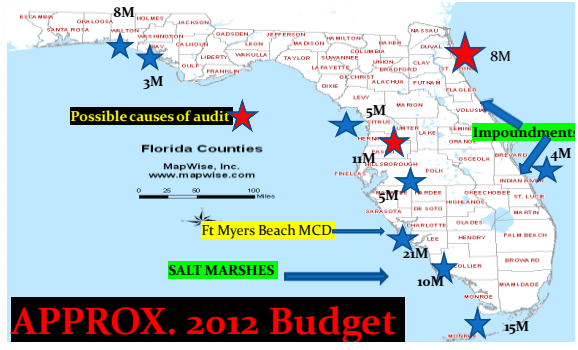
36 Tier 3: 31 BOCC, 2 ITD, 3 DTD

67 Counties and 90 District and Open MC programs In FL

Brief History of MCDs in Florida and Monroe Co.

- State authorized Independent MCD in 1920s through 1950s
- 1980 State Legislature said no more Independent MCD, new ones must be under BOCC control
- 1992 Monroe County BOCC tried to include FKMCD but failed. Results showed FKMCD was more efficient and effective. (DOCUMENT)
- 2012 Florida evaluated all Indep. MCD to see if they would perform better under BOCC and determined Indep. MCDs performed better. (DOCUMENT)
- 2023 the FL Legislature is again looking at Indep. MCD. (Our internal audit showed us to be doing well). What will the State Audit show? (DOCUMENT)
- **NOT ALL MCDs EQUAL AND ARE CHANGING**

Some Tier 1 Independent Districts are Technology Centers



APPROX. 2012 Budget

MCD Tiers 1 and 2 BOCC

APPROX 2012 Budget

TODAY Miami-Dade $20M+ (Zika $30M+) +42 new staff including a Director

Some Issues to Overcome

REMEMBER, THE GOAL OF THE LEGISLATURE IS TO SAVE TAXPAYER MONEY

*Indep. MCD average 9 X higher annual budgets than BOCC run programs (2017-18)

*2012 state audit showed 73% of cost for Mosquito Control in Florida was from Independent Districts serving only 10% of the state's population. WHAT ABOUT TOURIST NUMBERS?

*No good apples to apples effectiveness comparisons, etc. of BOCC controlled MCDs vs Independent MCDs

*Reportedly some BOCC controlled MCDs do everything Independent MCDs do?

*No comparative data on types of nuisance or vector mosquitoes and their immense mosquito habitats that require higher levels of control.

WE ALSO WORK HARD TO OFFER REAL VALUE TO OUR TAXPAYERS, RESIDENTS AND VISITORS

Proposed Strategy to Prove We Offer Real Value

- FMCA hired a PR Firm ($100,000 for 15 months) – promote conceptual advantages of Independent Special Taxing District vs BOCC Controlled Districts to the Legislature and media. **STARTING NOW!**
- PR Firm do some local promotions to our Legislators???
- **Each MCD promote their specific advantages locally to their County Commission, their state legislators, local media (RADIO, PRINT AND SOCIAL) and to the public e.g. clubs, etc.**
- **START SOON TO HEAR FROM US FIRST!**

Possible Outcomes

Next 15 months will be very important

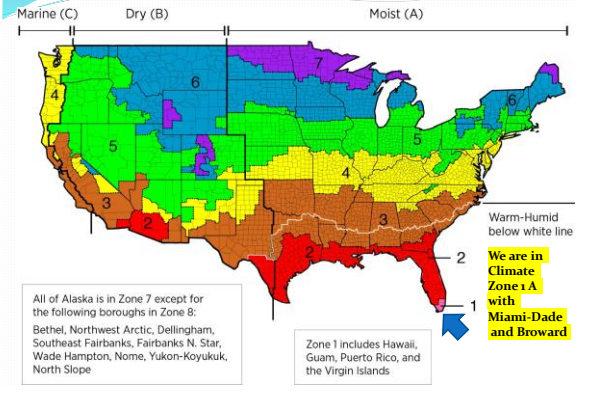
- No Change.
- Eliminate all Independent MCDs (Convert to D or BOCC).
- Hybrid- Keep some and change some.
- Combine duplicated services, e.g. fleet maintenance, purchasing, insurance, etc.

NOT ALL MCDs CREATED EQUALLY

UNIQUE FEATURES OF FKMCD

- Area of State Critical Concern
- Climate Zone 1 A – Tropical****
- South FL has high threat of *Aedes aegypti* and Mosquito Borne Diseases and growing.****
- Mosquito Control is a complex science and our Commissioners become specialists (Long History)****
- Florida Keys are an environmentally sensitive area, surrounded by a Marine Sanctuary and has 44 endangered species including the Key Deer.
- Tourist based economy

Climate Zones USA



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Dengue in the Americas

High Risk Areas in Green

Hundreds of flights per week into Florida

Before 1970, Dengue Fever - endemic in 9 countries, today, more than 125 countries

Dengue Fever In Florida 2022

(very much understated)

Hundreds of flights each week to Florida

- Over 820 Travel related cases – up from 29 in 2021. (2/3 in Miami-Dade)
- Coming from 22 countries but about 90% from Cuba.
- More than 540 travel related cases in Miami-Dade and 90% from Cuba.
- More than 50 local transmitted cases in Miami-Dade.
- Miami-Dade and Broward Counties were under Public Health Alert for Mosquito Borne Disease this yr.
- 12 other Florida Counties have been under Public Health Awareness for Mosquito Borne Disease.
- **2022, No Local Transmission of Dengue in the Florida Keys.**
- **FKMCD / Miami-Dade - Dengue / Zika outbreak 7 of past 14 yrs.**

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ALSO - FKMCD has developed a completely different chemical System for disease vectoring mosquitoes. Approx. 50% of our annual chemical budget is now for vector control

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MCD is a Complex Science With Major Impacts

Many Physical and Life Sciences

- Entomology
- Biology
- Chemistry
- Chemical Engineering
- Physics
- Genetics

AFFECTING

- Public Health
- Quality of LIFE
- Tourism
- Environment
- Taxes

RESULTING

Property Values record high
Year round tourist destination

REAL VALUE

UNIQUE FEATURES OF FKMCD

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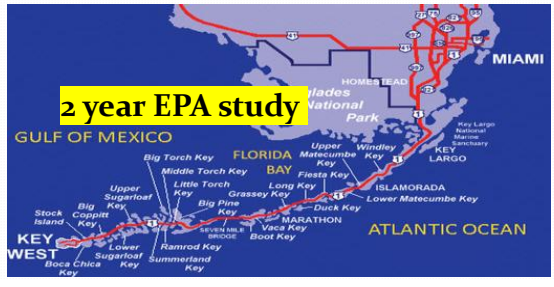
FKNMS

home to the only Living Coral Reef in the Continental USA

Protected by State and Federal Govt.



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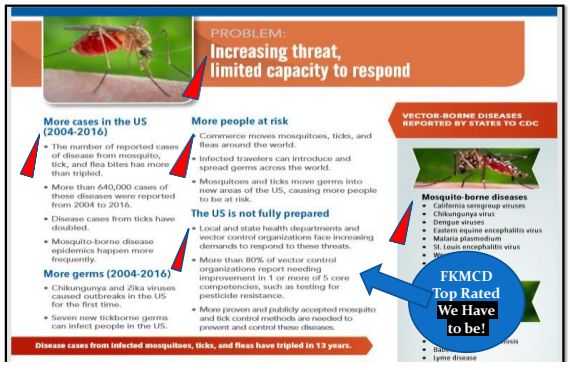
(Pop 80,000/22,000,000 = 0.4%)(Tourism 6,000,000 / 122,000,000 = 5.0%)
MAD vs SICK?

UNIQUE FEATURES OF FKMCD cont.

- Singular Focus – Mosquito Control is not just a single line item on our budget – it is our budget. *Miami-Dade has a $10 Billion Budget and $20 M for MCD. Monroe County has a budget of about $520 M and $18 M for Mosquito Control.*
- MCDs are not political like BOCC.
- FKMCD operates under the principals of using Best Practices and CONTINUOUS IMPROVEMENT and is guided by a **detailed strategic plan**.
- We are **recognized as one of the TOP** technology and research centers for MCDs in Florida. We prefer to use technology rather than expensive labor cost when possible and as a result currently operate with 16% less staff than ten years ago.****
- Good suppliers are a lifeline for MCD in FL and depend on the real tech centers and need capable partners to advance technology.
- We and other Independent MCDs heavily participate in AMCA and FMCA meetings, Committees, give tech presentations on new developments, and provide much information to help smaller MCDs.
- Independent MCDs operate by same logic why School Boards are not part of BOCC and why some municipalities spring up because they believe they can run better independently than by being part of BOCC.

CDC VITALSIGNS WARNING



UNIQUE FEATURES OF FKMCD cont.

- Singular Focus – Mosquito Control is not just a single line item on our budget – it is our budget. *Miami-Dade has a $3.5 Billion Budget and $20 M for MCD. Monroe County has a budget of about $400 M and $18 M for Mosquito Control.*
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- Independent MCDs operate by same logic why School Boards are not part of BOCC and why some municipalities spring up because they believe they can run better independently than by being part of BOCC.
- **Others**

THIS IS NOT A GOOD TIME TO RISK REDUCING OUR MOSQUITO CONTROL EFFORTS

Proposed FKMCD Action

- Develop **PLAN/ AUDIENCE** and be well versed in our talking points and advantages. **EXECUTE THE PLAN**
  Who will deliver this message?
- Understand the FKMCD and FMCA plan.
- Devise timetable to discuss with our BOCC and Local Legislators, etc.
- Be ready to engage locals and media when questioned.
- Remain updated on our progress and developments.
- Have at least one Commissioner attends Tallahassee Days with FMCA in March.
- Must move RATHER quickly!
- **DO NOT OVERREACT!**
- **OPPORTUNITY TO DEMONSTRATE OUR COMPETENCE IN MC**

DISCUSSION AND QUESTIONS?