Regular Board Meeting Agenda - AMENDED

Indian River Mosquito Control District
September 8, 2026 @ 9:00 AM

I. Call to Order

II. Pledge of Allegiance

III. Approval of the Agenda

IV. Approval of Meeting Minutes (Attachment A)

- August 11, 2026 Regular Board Meeting

V. Financial Report (Attachment B)

VI. Public Comment

VII. Old Business

A. Executive Director Contract – Introductory Period
B. Board Book Attachments

VIII. New Business

A. Resolution No. 2026-004 –John's Island/Lost Tree Project (Attachment C)
B. External Advisory Resources (Attachment D)
C. FY 2026-2027 Section 125 Plan (Attachment E)
D. FY 2026-2027 FMIT Insurance Renewal (Attachment F)
E. Classification & Compensation Study Report (Attachment G)
F. FY 2026-2027 Tentative Budget Selection (Attachment H)

IX. Director's Report

X. Commissioner's Comments

XI. Upcoming Meetings and Events

- Tentative Budget Hearing – September 17, 2026 at 5:01 pm
- Final Budget & TRIM Hearing – September 29, 2026 at 5:01 pm
- Regular Board Meeting – October 13, 2026 at 9 AM
- FMCA Annual Meeting – Ponte Vedra Beach– November 9-12, 2026
- Regular Board Meeting – November 17, 2026 at 9 AM

XII. Adjournment

This is a Public Meeting. Should any interested party seek to appeal any decision made by the Board of Commissioners with respect to any matter considered at such meeting or hearing, he will need a record of the proceedings and that, for such purpose he may need to ensure that a record of the proceedings is made which record includes the testimony and evidence upon which the appeal is to be based. Anyone who needs a special accommodation for this meeting may contact the Finance Director at 772-562-2393 at least 48 hours in advance of the meeting.

Indian River Mosquito Control
Financial Report
Month ending August 31, 2026

I. Income				
a. Local Funds			$	(3,190.07)
b. State Funds			$	-
c. Total Income			$	(3,190.07)
II. Disbursements				
a. Local Funds	(16619-16656 & dd16515-dd16585)	$ 422,822.97		
b. State Funds				
c. Total Disbursements		$ 422,822.97		
d. Net			$	(426,013.04)
III. Change in cash position from last month		$ (415,627.09)		
IV. Bank balance (all accounts)			$	5,653,774.50
a. Less reserves and contingency			$	(2,701,357.46)
V. Total available cash			$	2,952,417.04

IRMCD
Monthly Board Disbursement Report
As of August 31, 2026

Type	Date	Num	Memo	Credit
1050 Seacoast Oper-4941				
Paycheck	08/13/2026	dd16515	Direct Deposit	
Paycheck	08/13/2026	dd16516	Direct Deposit	
Paycheck	08/13/2026	dd16517	Direct Deposit	
Paycheck	08/13/2026	dd16518	Direct Deposit	
Paycheck	08/13/2026	dd16519	Direct Deposit	
Paycheck	08/13/2026	dd16520	Direct Deposit	
Paycheck	08/13/2026	dd16521	Direct Deposit	
Paycheck	08/13/2026	dd16522	Direct Deposit	
Paycheck	08/13/2026	dd16523	Direct Deposit	
Paycheck	08/13/2026	dd16524	Direct Deposit	
Paycheck	08/13/2026	dd16525	Direct Deposit	
Paycheck	08/13/2026	dd16526	Direct Deposit	
Paycheck	08/13/2026	dd16527	Direct Deposit	
Paycheck	08/13/2026	dd16528	Direct Deposit	
Paycheck	08/13/2026	dd16529	Direct Deposit	
Paycheck	08/13/2026	dd16530	Direct Deposit	
Paycheck	08/13/2026	dd16531	Direct Deposit	
Paycheck	08/13/2026	dd16532	Direct Deposit	
Paycheck	08/13/2026	dd16533	Direct Deposit	
Paycheck	08/13/2026	dd16534	Direct Deposit	
Paycheck	08/13/2026	dd16535	Direct Deposit	
Paycheck	08/13/2026	dd16536	Direct Deposit	
Paycheck	08/13/2026	dd16537	Direct Deposit	
Paycheck	08/13/2026	dd16538	Direct Deposit	
Paycheck	08/13/2026	dd16539	Direct Deposit	
Paycheck	08/13/2026	dd16540	Direct Deposit	
Paycheck	08/13/2026	dd16541	Direct Deposit	
Paycheck	08/13/2026	dd16542	Direct Deposit	
Paycheck	08/13/2026	dd16543	Direct Deposit	
Paycheck	08/13/2026	dd16544	Direct Deposit	
Paycheck	08/13/2026	dd16545	Direct Deposit	
Paycheck	08/13/2026	dd16546	Direct Deposit	
Paycheck	08/13/2026	dd16547	Direct Deposit	
Paycheck	08/13/2026	dd16548	Direct Deposit	
Paycheck	08/13/2026	dd16549	Direct Deposit	
Paycheck	08/13/2026	dd16550	Direct Deposit	
Paycheck	08/13/2026	dd16551	Annual Sick Check	
Paycheck	08/27/2026	dd16552	Direct Deposit	
Paycheck	08/27/2026	dd16553	Direct Deposit	
Paycheck	08/27/2026	dd16554	Direct Deposit	
Paycheck	08/27/2026	dd16555	Direct Deposit	
Paycheck	08/27/2026	dd16556	Direct Deposit	
Paycheck	08/27/2026	dd16557	Direct Deposit	
Paycheck	08/27/2026	dd16558	Direct Deposit	
Paycheck	08/27/2026	dd16559	Direct Deposit	
Paycheck	08/27/2026	dd16560	Direct Deposit	
Paycheck	08/27/2026	dd16561	Direct Deposit	
Paycheck	08/27/2026	dd16562	Direct Deposit	
Paycheck	08/27/2026	dd16563	Direct Deposit	
Paycheck	08/27/2026	dd16564	Direct Deposit	
Paycheck	08/27/2026	dd16565	Direct Deposit	
Paycheck	08/27/2026	dd16566	Direct Deposit	
Paycheck	08/27/2026	dd16567	Direct Deposit	
Paycheck	08/27/2026	dd16568	Direct Deposit	
Paycheck	08/27/2026	dd16569	Direct Deposit	
Paycheck	08/27/2026	dd16570	Direct Deposit	
Paycheck	08/27/2026	dd16571	Direct Deposit	
Paycheck	08/27/2026	dd16572	Direct Deposit	
Paycheck	08/27/2026	dd16573	Direct Deposit	
Paycheck	08/27/2026	dd16574	Direct Deposit	
Paycheck	08/27/2026	dd16575	Direct Deposit	

IRMCD
Monthly Board Disbursement Report
As of August 31, 2026

Type	Date	Num	Memo	Credit
Paycheck	08/27/2026	dd16576	Direct Deposit	
Paycheck	08/27/2026	dd16577	Direct Deposit	
Paycheck	08/27/2026	dd16578	Direct Deposit	
Paycheck	08/27/2026	dd16579	Direct Deposit	
Paycheck	08/27/2026	dd16580	Direct Deposit	
Paycheck	08/27/2026	dd16581	Direct Deposit	
Paycheck	08/27/2026	dd16582	Direct Deposit	
Paycheck	08/27/2026	dd16583	Direct Deposit	
Paycheck	08/27/2026	dd16584	Direct Deposit	
Paycheck	08/27/2026	dd16585	Annual Sick Check	
Total 1050 Seacoast Oper-4941				0.00
1070 RBC Operating Acct				
Total 1070 RBC Operating Acct				
TOTAL				**0.00**

IRMCD
Monthly Board Disbursement Report
As of August 31, 2026

Type	Date	Num	Name	Memo	Amount
1050 Seacoast Oper-4941					
Liability C...	08/12/2026		QuickBooks Payroll Service	Created by Payroll Service on ...	-73,622.53
Liability C...	08/26/2026		QuickBooks Payroll Service	Created by Payroll Service on ...	-67,876.86
Check	08/04/2026	EFT	Comcast	Acct # 8535115060598219	-130.85
Check	08/02/2026	EFT	Indian River County Utilities	Cust # 0012218-062300 Bill # ...	-74.01
Check	08/06/2026	EFT	FPL	Acct # 90168-13504	-3,393.69
Check	08/08/2026	EFT	First-Citizens Bank & Trust Co	Customer # 2000350988 Inv #...	-163.20
Check	08/21/2026	EFT	MasterCard	Acct # 1603 - Statement Closi...	-5,450.42
Liability C...	08/04/2026	EFT	Florida Retirement System	420000041009- July 2026 Ret...	-49,317.26
Check	08/18/2026	EFT	Waste Management Inc. of Florida	Customer # 9-18548-52001 I...	-280.57
Check	08/18/2026	EFT	Waste Management Inc. of Florida	Customer # 13-91132-63000 ...	-81.17
Liability C...	08/12/2026	EFT	IRMCD-FICA,SS,Med	59-6001309	-24,822.82
Liability C...	08/13/2026	EFT	Child Support		-160.97
Liability C...	08/14/2026	EFT	Nationwide Retirement Solutions, Inc.	0025223001	-616.72
Liability C...	08/14/2026	EFT	Nationwide Retirement Solutions, Inc.	0025223001	-495.00
Check	08/14/2026	EFT	CivicPlus, LLC	Acct # 910320636 Inv # 384410	-3,294.27
Check	08/14/2026	EFT	CivicPlus, LLC	Inv # 378656	-770.00
Check	08/14/2026	EFT	CivicPlus, LLC	Inv # 381639	-770.00
Check	08/18/2026	EFT	Gannett Florida LocaliQ	Account # 1125235 Inv # 782...	-92.16
Check	08/20/2026	EFT	Bamboo HR LLC	INV02885095	-751.42
Check	08/21/2026	EFT	IRMCD-FICA,SS,Med	Underpayment 2026Q1- IRS ...	-13.90
Check	08/25/2026	EFT	AT&T Mobility	Acct # 823540712 Invoice # 8...	-1,212.47
Liability C...	08/27/2026	EFT	Child Support		-238.79
Liability C...	08/27/2026	EFT	FMIT	FH0273 AUG 2026 Contributi...	-45,893.16
Liability C...	08/27/2026	EFT	American Fidelity-Products	MCP#64213 Inv#D942214 Au...	-2,806.70
Liability C...	08/27/2026	EFT	American Fidelity Assurance Comp...	MCP#64213 INV#2683283A ...	-1,400.01
Liability C...	08/27/2026	EFT	Texas Life Insurance Company	SM0A9H Aug 2026 Premiums	-229.42
Check	08/27/2026	EFT	Principal Financial Group	Acct # 1037999-10001 - Sept ...	-861.24
Liability C...	08/27/2026	EFT	LegalShield	Acct# 165168 Sept 2026 Pre...	-83.75
Liability C...	08/27/2026	EFT	IRMCD- OPEB Trust	Boot reimbursement to IRMC...	0.00
Liability C...	08/28/2026	EFT	IRMCD-FICA,SS,Med	59-6001309	-21,433.30
Liability C...	08/28/2026	EFT	Nationwide Retirement Solutions, Inc.	0025223001	-616.72
Liability C...	08/28/2026	EFT	Nationwide Retirement Solutions, Inc.	0025223001	-645.00
Check	08/06/2026	Wire 1 ...	Innovative Diagnostics	Inv # PF26F038, Acct # 103103	-5,242.50
Check	08/14/2026	Wire 2 ...	Innovative Diagnostics	Inv # PF26F038, Acct # 103103	-5,242.50
Check	08/05/2026	16619	Cintas First Aid and Safety	Payer # 14063315 Inv # 9383...	-49.50
Check	08/05/2026	16620	Clarke Mosquito Control Products	Inv # 005117480	-320.00
Check	08/05/2026	16621	Florida Coast Equipment, LLC	Acct # INDIA025 Inv # P4596...	-2,318.15
Check	08/05/2026	16622	Grove Welders, Inc	Inv # 69831	-328.30
Check	08/05/2026	16623	Justifacts Credential Verification, Inc	Customer ID 269730 Inv # 42...	-155.59
Check	08/05/2026	16624	Cintas Corporation No. 2	Payer # 14087358 Inv # 4277...	-1,109.58
Check	08/05/2026	16625	Lowe's	Acct 2096 Inv # 973967, Inv ...	-1,696.89
Check	08/05/2026	16626	Lowndes, Drosdick, Doster, Kantor ...	Inv # 1096250	-2,405.00
Check	08/05/2026	16627	Clarke Mosquito Control Products	Inv # 001040145	-4,916.00
Check	08/05/2026	16628	Mullinax Ford of Vero Beach	Inv # 983024	-275.00
Check	08/05/2026	16629	SHI International Corp.	Inv # B21491823	-87.90
Check	08/05/2026	16630	Summer Agro Services, LLC	Inv # 01896-M26-APL, Inv # 0...	-44,044.90
Check	08/05/2026	16631	Vero Bearing & Bolt	POS 19433	-153.39
Check	08/05/2026	16632	Florida Division of Emergency Man...	Inv # 00-IRMCD-05-Duplicate...	-10,228.60
Check	08/12/2026	16633	Cole Auto Supply	Acct # 1642 Closing Date 7/3...	-494.64
Check	08/12/2026	16634	Florida Coast Equipment, LLC	Acct # INDIA025 Inv # P4621...	-141.93
Check	08/12/2026	16635	Lowe's	Acct 2096 Inv # 995116, Inv ...	-550.96
Check	08/12/2026	16636	SHI International Corp.	Inv # B21513118, Inv # B2153...	-1,297.36
Check	08/12/2026	16637	Cintas Corporation No. 2	Payer # 14087358 Inv # 4278...	-1,056.14
Check	08/12/2026	16638	Jordan Power Equipment Corp.	Inv # 202206	-39.99
Check	08/12/2026	16639	KYOCERA Document Solutions So...	Acct # FP2719 Contract # C...	-176.19
Check	08/12/2026	16640	Staples Advantage	Acct # ATL1067547 Inv # 607...	-30.21
Check	08/12/2026	16641	Sub-Zero Ice Services, Inc	Inv # FLL-003787, Minus $40 ...	-400.00
Check	08/12/2026	16642	Summer Agro Services, LLC	Inv # 01922-M26-APL	-8,316.05
Check	08/19/2026	16643	Board of County Commissioners	Inv # 07/31/2026	-6,640.37
Check	08/19/2026	16644	Grove Welders, Inc	Inv # 69884, Inv # 69905	-224.71
Check	08/19/2026	16645	Specialty Fire Suppression, Inc.	Inv # 12935	-550.98
Check	08/19/2026	16646	Clarke Mosquito Control Products	Inv # 005117654	-112.00
Check	08/19/2026	16647	Synergized HR, LLC.	Inv # 0000103	-1,950.00
Check	08/19/2026	16648	Tommy's Trailer Service & Auto	Inv # 16179	-25.00
Check	08/19/2026	16649	FedEx	Inv # 2-603-35683, Inv # 9-40...	-1,120.77
Check	08/19/2026	16650	Lowndes, Drosdick, Doster, Kantor ...	Inv # 1098172	-9,777.00
Check	08/26/2026	16651	B & E Property Maintenance Inc	Inv # 41073	-1,500.00

IRMCD
Monthly Board Disbursement Report
As of August 31, 2026

Type	Date	Num	Name	Memo	Amount
Check	08/26/2026	16652	Cintas First Aid and Safety	Inv # 5355440313	-53.06
Check	08/26/2026	16653	Cleaning By Mina, LLC	Inv # 99	-1,003.10
Check	08/26/2026	16654	Grainger	Acct # 807931407 Inv # 9049...	-264.14
Check	08/26/2026	16655	Sub-Zero Ice Services, Inc	Inv # FLL-004057	-440.00
Check	08/26/2026	16656	Cintas Corporation No. 2	Payer # 14087358 Inv # 4280...	-486.19
Total 1050 Seacoast Oper-4941					-422,822.97
1060 Seacoast State Funds-5161					
Total 1060 Seacoast State Funds-5161					
TOTAL					**-422,822.97**

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Custom Transa n Detail Report

August 2026

Type	Date	Num	Name	Memo	Account	Amount
Check	08/02/2026	EFT	Indian River County Utilities	Cust # 0012218-062300 Bill # 13713867	1050 Seacoast Oper-4941	-74.01
Check	08/02/2026	EFT	Indian River County Utilities	Cust # 0012218-062300 Bill # 13713867 Water	43.1 Utility Services	74.01
Check	08/04/2026	EFT	Comcast	Acct # 8535115060598219	1050 Seacoast Oper-4941	-130.85
Check	08/04/2026	EFT	Comcast	Acct # 8535115060598219 Internet services 7/2	41.1 Communication Services	130.85
Liability Check	08/04/2026	EFT	Florida Retirement System	420000041009- July 2026 Retirement Contributi	1050 Seacoast Oper-4941	-49,317.26
Liability Check	08/04/2026	EFT	Florida Retirement System	420000041009- July 2026 Retirement Contributi	2006 Payroll Liabilities	7,669.12
Liability Check	08/04/2026	EFT	Florida Retirement System	420000041009- July 2026 Retirement Contributi	20.2 FL Retirement Contrib	41,648.14
Check	08/05/2026	16619	Cintas First Aid and Safety	Payer # 14063315 Inv # 9383873566	1050 Seacoast Oper-4941	-49.50
Check	08/05/2026	16619	Cintas First Aid and Safety	Payer # 14063315 Inv # 9383873566 Waterbrea	30.5 Other Contractual Srv (water cooler service	49.50
Check	08/05/2026	16620	Clarke Mosquito Control Products	Inv # 005117480	1050 Seacoast Oper-4941	-320.00
Check	08/05/2026	16620	Clarke Mosquito Control Products	Inv # 005117480 (14) BG sweet scents lures for	52.4.3.1 General (Gravid traps & supplies, BG lu	320.00
Check	08/05/2026	16621	Florida Coast Equipment, LLC	Acct # INDIA025 Inv # P4596802	1050 Seacoast Oper-4941	-2,318.15
Check	08/05/2026	16621	Florida Coast Equipment, LLC	Acct # INDIA025 Inv # P4596802 For tractor - r	46.6.3 Heavy Eqpt/Boats-IRMCD	2,318.15
Check	08/05/2026	16622	Grove Welders, Inc	Inv # 69831	1050 Seacoast Oper-4941	-328.30
Check	08/05/2026	16622	Grove Welders, Inc	Inv # 69831 brass trigger valves, brass fittings,	52.4.6 Supl Larviciding (Includes tide gauge mat	328.30
Check	08/05/2026	16623	Justifacts Credential Verification, Inc	Customer ID 269730 Inv # 423685	1050 Seacoast Oper-4941	-155.59
Check	08/05/2026	16623	Justifacts Credential Verification, Inc	Customer ID 269730 Inv # 423685 New Hire ch	30.5 Other Contractual Srv (water cooler service	155.59
Check	08/05/2026	16624	Cintas Corporation No. 2	Payer # 14087358 Inv # 4277025044, Inv # 427	1050 Seacoast Oper-4941	-1,109.58
Check	08/05/2026	16624	Cintas Corporation No. 2	Payer # 14087358 Inv # 4277025044 Uniform S	30.4.2 Other Prof Svc/Uniforms	563.96
Check	08/05/2026	16624	Cintas Corporation No. 2	Inv # 4277757997 Uniform Services 08/03/2026	30.4.2 Other Prof Svc/Uniforms	545.62
Check	08/05/2026	16625	Lowe's	Acct 2096 Inv # 973967, Inv # 984280	1050 Seacoast Oper-4941	-1,696.89
Check	08/05/2026	16625	Lowe's	Acct 2096 Inv # 973967 treated wood for Deerfi	52.4.6 Supl Larviciding (Includes tide gauge mat	1,644.20
Check	08/05/2026	16625	Lowe's	Inv # 984280 25' tape measure, reciprocating	46.0.20 Maint by IRMCD	52.69
Check	08/05/2026	16626	Lowndes, Drosdick, Doster, Kantor & Reed,	Inv # 1096250	1050 Seacoast Oper-4941	-2,405.00
Check	08/05/2026	16626	Lowndes, Drosdick, Doster, Kantor & Reed,	Inv # 1096250 Current fees for legal services th	30.1.3 Legal Services	2,405.00
Check	08/05/2026	16627	Clarke Mosquito Control Products	Inv # 001040145	1050 Seacoast Oper-4941	-4,916.00
Check	08/05/2026	16627	Clarke Mosquito Control Products	Inv # 001040145 Drone application 124 acres -	30.4.5/Contract Serv.-Aircraft	4,916.00
Check	08/05/2026	16628	Mullinax Ford of Vero Beach	Inv # 983024	1050 Seacoast Oper-4941	-275.00
Check	08/05/2026	16628	Mullinax Ford of Vero Beach	Inv # 983024 Program new PCM - powertrain c	46.2 Truck/Auto/ATV-Other	275.00
Check	08/05/2026	16629	SHI International Corp.	Inv # B21491823	1050 Seacoast Oper-4941	-87.90
Check	08/05/2026	16629	SHI International Corp.	Inv # B21491823 (2) SonicWall power adapters -	51.3 Computer Hardware	87.90
Check	08/05/2026	16630	Summer Agro Services, LLC	Inv # 01896-M26-APL, Inv # 01899-M26-APL	1050 Seacoast Oper-4941	-44,044.90
Check	08/05/2026	16630	Summer Agro Services, LLC	Inv # 01896-M26-APL Aerial Larviciding 768 ac	30.4.5/Contract Serv.-Aircraft	15,343.55

IRMCD
Custom Transaction Detail Report
August 2026

Check	08/05/2026 16630	Summer Agro Services, LLC	Inv # 01899-M26-APL Aerial Larviciding 1,665 a	30.4.5/Contract Serv.-Aircraft	28,701.35
Check	08/05/2026 16631	Vero Bearing & Bolt	POS 19433	1050 Seacoast Oper-4941	-153.39
Check	08/05/2026 16631	Vero Bearing & Bolt	POS 19433 stainless deck screws, hex nuts, wa	52.4.6 Supl Larviciding (Includes tide gauge mat	153.39
Check	08/05/2026 16632	Florida Division of Emergency Management	Inv # 00-IRMCD-05-Duplicated Payment	1050 Seacoast Oper-4941	-10,228.60
Check	08/05/2026 16632	Florida Division of Emergency Management	Inv # 00-IRMCD-05-Duplicated Payment with che	337.1 Grants and Donations	10,228.60
Check	08/06/2026 EFT	FPL	Acct # 90168-13504	1050 Seacoast Oper-4941	-3,393.69
Check	08/06/2026 EFT	FPL	Acct # 90168-13504 07/20/2026 Shop/Office	43.1 Utility Services	1,835.28
Check	08/06/2026 EFT	FPL	Electric Pumps	43.1.1 Electric Pumps	1,558.41
Check	08/06/2026 Wire 1 of 2	Innovative Diagnostics	Inv # PF26F038, Acct # 103103	1050 Seacoast Oper-4941	-5,242.50
Check	08/06/2026 Wire 1 of 2	Innovative Diagnostics	Inv # PF26F038, Acct # 103103 (26) 10 Screen	52.4.3.2 Arbovirus (ELISA Kit, CO2 tanks, mosq	5,242.50
Check	08/08/2026 EFT	First-Citizens Bank & Trust Co	Customer # 2000350988 Inv # 49498092	1050 Seacoast Oper-4941	-163.20
Check	08/08/2026 EFT	First-Citizens Bank & Trust Co	Customer # 2000350988 Inv # 49498092 Aug 2	44.1.2 Misc Rentals/Leases	163.20
Check	08/12/2026 16633	Cole Auto Supply	Acct # 1642 Closing Date 7/31/2026	1050 Seacoast Oper-4941	-494.64
Check	08/12/2026 16633	Cole Auto Supply	Acct # 1642 Closing Date 7/31/2026 (6) oil filters	46.0.20 Maint by IRMCD	66.32
Check	08/12/2026 16633	Cole Auto Supply	fuel filter and primer bulb assy for office generat	46.5.1 Buildings-IRMCD	42.46
Check	08/12/2026 16633	Cole Auto Supply	f/pump - tk 263, evap canister purge valve kit ar	46.6.1 Truck/Auto/ATV-IRMCD	265.98
Check	08/12/2026 16633	Cole Auto Supply	(12) 10w40 oil	52.1.1 Oil & Lubricants	119.88
Check	08/12/2026 16634	Florida Coast Equipment, LLC	Acct # INDIA025 Inv # P4621102	1050 Seacoast Oper-4941	-141.93
Check	08/12/2026 16634	Florida Coast Equipment, LLC	Acct # INDIA025 Inv # P4621102 for tractor root	46.6.3 Heavy Eqpt/Boats-IRMCD	141.93
Check	08/12/2026 16635	Lowe's	Acct 2096 Inv # 995116, Inv # 970470, Inv # 99	1050 Seacoast Oper-4941	-550.96
Check	08/12/2026 16635	Lowe's	Acct 2096 Inv # 995116 treated wood and stain	52.4.6 Supl Larviciding (Includes tide gauge mat	422.34
Check	08/12/2026 16636	SHI International Corp.	Inv # B21513118, Inv # B21538526, Inv # B2154	1050 Seacoast Oper-4941	-1,297.36
Check	08/12/2026 16636	SHI International Corp.	Inv # B21513118 (3) Logitech Z150 black PC sp	51.3 Computer Hardware	103.77
Check	08/12/2026 16637	Cintas Corporation No. 2	Payer # 14087358 Inv # 4278531705, Overpaym	1050 Seacoast Oper-4941	-1,056.14
Check	08/12/2026 16637	Cintas Corporation No. 2	Payer # 14087358 Inv # 4278531705 Uniform Se	30.4.2 Other Prof Svc/Uniforms	549.16
Check	08/12/2026 16638	Jordan Power Equipment Corp.	Inv # 202206	1050 Seacoast Oper-4941	-39.99
Check	08/12/2026 16638	Jordan Power Equipment Corp.	Inv # 202206 weed eater string head	46.6.4 Mowers/Other Rprs-IRMCD	39.99
Check	08/12/2026 16639	KYOCERA Document Solutions Southeast,LLC	Acct # FP2719 Contract # CONT7691-01 Inv #	1050 Seacoast Oper-4941	-176.19
Check	08/12/2026 16639	KYOCERA Document Solutions Southeast,LLC	Acct # FP2719 Contract # CONT7691-01 Inv #	30.5 Other Contractual Srv (water cooler service	176.19
Check	08/12/2026 16635	Lowe's	Inv # 970470 (250) count stainless screws for De	52.4.6 Supl Larviciding (Includes tide gauge mat	56.98
Check	08/12/2026 16636	SHI International Corp.	Inv # B21538526 (3) APC desktop back-ups	51.3 Computer Hardware	232.80
Check	08/12/2026 16640	Staples Advantage	Acct # ATL1067547 Inv # 6070572215	1050 Seacoast Oper-4941	-30.21
Check	08/12/2026 16640	Staples Advantage	Acct # ATL1067547 Inv # 6070572215 Laminat	51.1 Office Supplies (Include AT&T advertising)	30.21
Check	08/12/2026 16641	Sub-Zero Ice Services, Inc	Inv # FLL-003787, Minus $40 Overpayment with	1050 Seacoast Oper-4941	-400.00

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Check	08/12/2026	16641	Sub-Zero Ice Services, Inc	Inv # FLL-003787 Dry ice pellets for traps - 550	30.5 Other Contractual Srv (water cooler service	440.00
Check	08/12/2026	16641	Sub-Zero Ice Services, Inc	Overpayment with check # 16599 for Inv # FLL-(	30.5 Other Contractual Srv (water cooler service	-40.00
Check	08/12/2026	16642	Summer Agro Services, LLC	Inv # 01922-M26-APL	1050 Seacoast Oper-4941	-8,316.05
Check	08/12/2026	16642	Summer Agro Services, LLC	Inv # 01922-M26-APL Aerial Larviciding 330 acr	30.4.5/Contract Serv.-Aircraft	8,316.05
Check	08/12/2026	16636	SHI International Corp.	Inv # B21543030 NETGEAR AV Line M4250-8G	51.3 Computer Hardware	960.79
Liability Check	08/12/2026		QuickBooks Payroll Service	Created by Payroll Service on 08/11/2026	1050 Seacoast Oper-4941	-73,622.53
Liability Check	08/12/2026		QuickBooks Payroll Service	Created by Payroll Service on 08/11/2026	2111 Direct Deposit Liabilities	73,622.53
Liability Check	08/12/2026	EFT	IRMCD-FICA,SS,Med	59-6001309	1050 Seacoast Oper-4941	-24,822.82
Liability Check	08/12/2026	EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	10,160.02
Liability Check	08/12/2026	EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	1,389.62
Liability Check	08/12/2026	EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	1,389.62
Liability Check	08/12/2026	EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	5,941.78
Liability Check	08/12/2026	EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	5,941.78
Check	08/12/2026	16637	Cintas Corporation No. 2	Overpayment with check # 16596 (Inv # 427552	30.4.2 Other Prof Svc/Uniforms	-5.97
Check	08/12/2026	16635	Lowe's	Inv # 993923 (4) 5 gal buckets, (4) 5 gal screwto	46.6.1 Truck/Auto/ATV-IRMCD	53.44
Check	08/12/2026	16635	Lowe's	Inv # 993923 (4) 3/8" brass hose barbs for shop	46.0.20 Maint by IRMCD	18.20
Check	08/12/2026	16637	Cintas Corporation No. 2	Inv # 4279276525 Uniform Services 08/17/2026	30.4.2 Other Prof Svc/Uniforms	512.95
Liability Check	08/13/2026	EFT	Child Support		1050 Seacoast Oper-4941	-160.97
Liability Check	08/13/2026	EFT	Child Support		2006 Payroll Liabilities	160.97
Liability Check	08/14/2026	EFT	Nationwide Retirement Solutions, Inc.	0025223001	1050 Seacoast Oper-4941	-616.72
Liability Check	08/14/2026	EFT	Nationwide Retirement Solutions, Inc.	0025223001	2006 Payroll Liabilities	616.72
Liability Check	08/14/2026	EFT	Nationwide Retirement Solutions, Inc.	0025223001	1050 Seacoast Oper-4941	-495.00
Liability Check	08/14/2026	EFT	Nationwide Retirement Solutions, Inc.	0025223001	2006 Payroll Liabilities	495.00
Check	08/14/2026	Wire 2 of 2	Innovative Diagnostics	Inv # PF26F038, Acct # 103103	1050 Seacoast Oper-4941	-5,242.50
Check	08/14/2026	Wire 2 of 2	Innovative Diagnostics	Inv # PF26F038, Acct # 103103 (26) 10 Screen	52.4.3.2 Arbovirus (ELISA Kit, CO2 tanks, mosq	5,242.50
Check	08/14/2026	EFT	CivicPlus, LLC	Acct # 910320636 Inv # 384410	1050 Seacoast Oper-4941	-3,294.27
Check	08/14/2026	EFT	CivicPlus, LLC	Prepaid - Acct # 910320636 Inv # 384410 Socia	1320 Prepaid Expense	3,294.27
Check	08/14/2026	EFT	CivicPlus, LLC	Inv # 378656	1050 Seacoast Oper-4941	-770.00
Check	08/14/2026	EFT	CivicPlus, LLC	Inv # 378656 Streamline Operations Pro Renewa	30.5 Other Contractual Srv (water cooler service	770.00
Check	08/14/2026	EFT	CivicPlus, LLC	Inv # 381639	1050 Seacoast Oper-4941	-770.00
Check	08/14/2026	EFT	CivicPlus, LLC	Inv # 381639 Streamline Operations Pro Renewa	30.5 Other Contractual Srv (water cooler service	770.00
Check	08/18/2026	EFT	Waste Management Inc. of Florida	Customer # 9-18548-52001 Inv # 1638874-483	1050 Seacoast Oper-4941	-280.57
Check	08/18/2026	EFT	Waste Management Inc. of Florida	Customer # 9-18548-52001 Inv # 1638874-483	43.1 Utility Services	280.57
Check	08/18/2026	EFT	Waste Management Inc. of Florida	Customer # 13-91132-63000 Inv # 1639118-48	1050 Seacoast Oper-4941	-81.17

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Check	08/18/2026 EFT	Waste Management Inc. of Florida	Customer # 13-91132-63000 Inv # 1639118-483	43.1 Utility Services	81.17
Check	08/18/2026 EFT	Gannett Florida LocaliQ	Account # 1125235 Inv # 7823136	1050 Seacoast Oper-4941	-92.16
Check	08/18/2026 EFT	Gannett Florida LocaliQ	Account # 1125235 Inv # 7823136 Sept. 8th Re	49.2 Advertising (Req'd by Law)	92.16
Check	08/19/2026 16643	Board of County Commissioners	Inv # 07/31/2026	1050 Seacoast Oper-4941	-6,640.37
Check	08/19/2026 16643	Board of County Commissioners	Inv # 07/31/2026 Fuel charges for 7/1/2026-7/3	52.1.2 Gas & Diesel	6,640.37
Check	08/19/2026 16644	Grove Welders, Inc	Inv # 69884, Inv # 69905	1050 Seacoast Oper-4941	-224.71
Check	08/19/2026 16644	Grove Welders, Inc	Inv # 69884 (3) nipple adapters for Fyfannon tot	52.4.4 Supl ULV (Includes mosquito magnet sup	8.91
Check	08/19/2026 16645	Specialty Fire Suppression, Inc.	Inv # 12935	1050 Seacoast Oper-4941	-550.98
Check	08/19/2026 16645	Specialty Fire Suppression, Inc.	Inv # 12935 Afex Compact W1.5-SA Standard A	46.4.1 Heavy Eqpt/Boats-Other	550.98
Check	08/19/2026 16644	Grove Welders, Inc	Inv # 69905 Hose assembly parts for Chopzilla	46.6.3 Heavy Eqpt/Boats-IRMCD	133.99
Check	08/19/2026 16644	Grove Welders, Inc	Inv # 69905 15 gallon spray tanki for ATV # 80	46.6.1 Truck/Auto/ATV-IRMCD	81.81
Check	08/19/2026 16646	Clarke Mosquito Control Products	Inv # 005117654	1050 Seacoast Oper-4941	-112.00
Check	08/19/2026 16646	Clarke Mosquito Control Products	Inv # 005117654 (4) BG Pro textile trap body for	52.4.3.1 General (Gravid traps & supplies, BG lu	112.00
Check	08/19/2026 16647	Synergized HR, LLC.	Inv # 0000103	1050 Seacoast Oper-4941	-1,950.00
Check	08/19/2026 16647	Synergized HR, LLC.	Inv # 0000103 Compensation & Classification -	30.5 Other Contractual Srv (water cooler service	1,950.00
Check	08/19/2026 16648	Tommy's Trailer Service & Auto	Inv # 16179	1050 Seacoast Oper-4941	-25.00
Check	08/19/2026 16648	Tommy's Trailer Service & Auto	Inv # 16179 winch strap for boat trailer	46.6.3 Heavy Eqpt/Boats-IRMCD	25.00
Check	08/19/2026 16649	FedEx	Inv # 2-603-35683, Inv # 9-406-62030, Inv # 9-4	1050 Seacoast Oper-4941	-1,120.77
Check	08/19/2026 16649	FedEx	Inv # 2-603-35683 Shipping Elisa Kits from Innov	52.4.3.2 Arbovirus (ELISA Kit, CO2 tanks, mosq	1,078.54
Check	08/19/2026 16649	FedEx	Inv # 9-406-62030 Shipping Arbo samples	52.4.3.3 Sentinel (Chickens, feed, FedEx, suppli	19.86
Check	08/19/2026 16649	FedEx	Inv # 9-415-94985 Shipping Arbo samples	52.4.3.3 Sentinel (Chickens, feed, FedEx, suppli	12.44
Check	08/19/2026 16649	FedEx	Inv # 9-425-53123 Shipping Arbo samples	52.4.3.3 Sentinel (Chickens, feed, FedEx, suppli	9.93
Check	08/19/2026 16650	Lowndes, Drosdick, Doster, Kantor & Reed,	Inv # 1098172	1050 Seacoast Oper-4941	-9,777.00
Check	08/19/2026 16650	Lowndes, Drosdick, Doster, Kantor & Reed,	Inv # 1098172 Current fees for legal services th	30.1.3 Legal Services	9,777.00
Check	08/20/2026 EFT	Bamboo HR LLC	INV02885095	1050 Seacoast Oper-4941	-751.42
Check	08/20/2026 EFT	Bamboo HR LLC	INV02885095 08/20/2026 - 09/19/2026 HR Soft	51.2 Computer Software	751.42
Check	08/21/2026 EFT	MasterCard	Acct # 1603 - Statement Closing Date 7/27/2026	1050 Seacoast Oper-4941	-5,450.42
Check	08/21/2026 EFT	MasterCard	Acct # 1603 - Statement Closing Date 7/27/2026	30.4 Other Prof/Gov Fees/Permit	500.00
Check	08/21/2026 EFT	MasterCard	IRMCD shirts - Isik & 2 men's, name badges, Isil	30.4.2 Other Prof Svc/Uniforms	116.00
Check	08/21/2026 EFT	MasterCard	Biomedical Hazardous waste pickup	30.5 Other Contractual Srv (water cooler service	40.00
Check	08/21/2026 EFT	MasterCard	cancel hotel stay for PR & Comm Summit - JMA	40.1 Travel & Per Diem (Include Registrations)	-200.38
Check	08/21/2026 EFT	MasterCard	gas for POHA meeting	40.1 Travel & Per Diem (Include Registrations)	53.02
Check	08/21/2026 EFT	MasterCard	Earathlink monthly, Text-em-all	41.1 Communication Services	82.93
Check	08/21/2026 EFT	MasterCard	IRS Qtrly IRS Qtrly 2026 Form 941X amend Cert	42.1 Freight/Transportation (Freight and express	11.60

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Check	08/21/2026 EFT	MasterCard	cut 5 keys for outside shop/yard	46.1.1 Buildings-Other	16.50
Check	08/21/2026 EFT	MasterCard	20hp electric pump motor - Golf Course impounc	46.6.2 Pumps-IRMCD	1,349.00
Check	08/21/2026 EFT	MasterCard	heavy duty chain for pontoon trailer	46.6.3 Heavy Eqpt/Boats-IRMCD	24.29
Check	08/21/2026 EFT	MasterCard	for Honda Gx240 mower engines - carb & air filt	46.6.4 Mowers/Other Rprs-IRMCD	48.62
Check	08/21/2026 EFT	MasterCard	Dum-dums, (3) 100 pk 4x9 rack/menu cards, 12	48.1 Promo/Educational Activ	79.06
Check	08/21/2026 EFT	MasterCard	index tabs, envelopes, lined pads, tissues, batte	51.1 Office Supplies (Include AT&T advertising)	170.97
Check	08/21/2026 EFT	MasterCard	Dropbox Plus - yearly (7/2026-7/2027), Quickboc	51.2 Computer Software	489.88
Check	08/21/2026 EFT	MasterCard	safety boots for Rober Dillon, waterproof boots fc	52.3 Protective Clothing (Every form of PPD i.e.	322.92
Check	08/21/2026 EFT	MasterCard	Gravid mosquito traps, starage boxes, JB weld, /	52.4.3.1 General (Gravid traps & supplies, BG lu	1,121.44
Check	08/21/2026 EFT	MasterCard	sand for chicken house, chicken feed, chicken fe	52.4.3.3 Sentinel (Chickens, feed, FedEx, suppli	1,770.83
Check	08/21/2026 EFT	MasterCard	funnel set, measuring cup set, wasp spray, ins.re	52.4.6 Supl Larviciding (Includes tide gauge mat	226.38
Check	08/21/2026 EFT	MasterCard	3 piece offset screwdriver set	52.4.7 Supl Drone (Drone Program)	5.99
Check	08/21/2026 EFT	MasterCard	FGFOA Treasure Coast Chapter Membership - (	54.1 Publications & Dues (Subscriptions, membe	120.00
Check	08/21/2026 EFT	MasterCard	Refund for cancelled PR & Comms Summit - JM	55.2 Training (Training, core exam, Public Healtl	-1,075.00
Check	08/21/2026 EFT	MasterCard	(4)12pks sodas - Fred Pryor in-house Comms Tr	55.2 Training (Training, core exam, Public Healtl	176.37
Check	08/21/2026 EFT	IRMCD-FICA,SS,Med	Underpayment 2026Q1- IRS Notice CP210 08-2	1050 Seacoast Oper-4941	-13.90
Check	08/21/2026 EFT	IRMCD-FICA,SS,Med	Underpayment 2026Q1- IRS Notice CP210 08-2	10.1 Payroll Expenses	13.90
Check	08/25/2026 EFT	AT&T Mobility	Acct # 823540712 Invoice # 823540712X08122	1050 Seacoast Oper-4941	-1,212.47
Check	08/25/2026 EFT	AT&T Mobility	Acct # 823540712 Invoice # 823540712X08122	41.1 Communication Services	1,212.47
Check	08/26/2026 16651	B & E Property Maintenance Inc	Inv # 41073	1050 Seacoast Oper-4941	-1,500.00
Check	08/26/2026 16651	B & E Property Maintenance Inc	Inv # 41073 Lawn & Landscape maintenance for	30.5 Other Contractual Srv (water cooler service	1,500.00
Check	08/26/2026 16652	Cintas First Aid and Safety	Inv # 5355440313	1050 Seacoast Oper-4941	-53.06
Check	08/26/2026 16652	Cintas First Aid and Safety	Inv # 5355440313 Service First Aid cabinets - re	30.5 Other Contractual Srv (water cooler service	53.06
Check	08/26/2026 16653	Cleaning By Mina, LLC	Inv # 99	1050 Seacoast Oper-4941	-1,003.10
Check	08/26/2026 16653	Cleaning By Mina, LLC	Inv # 99 Sep 2026 Maintenance cleaning	30.4.1 Other Prof Svc/Janitor	1,003.10
Check	08/26/2026 16654	Grainger	Acct # 807931407 Inv # 9049691422, Inv # 905	1050 Seacoast Oper-4941	-264.14
Check	08/26/2026 16654	Grainger	Acct # 807931407 Inv # 9049691422 spring ret	46.0.20 Maint by IRMCD	218.29
Check	08/26/2026 16654	Grainger	Inv # 9051091321 (2) brass reducers	46.0.20 Maint by IRMCD	17.34
Check	08/26/2026 16654	Grainger	Inv # 9051089135 2' air hose	46.0.20 Maint by IRMCD	28.51
Check	08/26/2026 16655	Sub-Zero Ice Services, Inc	Inv # FLL-004057	1050 Seacoast Oper-4941	-440.00
Check	08/26/2026 16655	Sub-Zero Ice Services, Inc	Inv # FLL-004057 Dry ice pellets for traps - 550	30.5 Other Contractual Srv (water cooler service	440.00
Check	08/26/2026 16656	Cintas Corporation No. 2	Payer # 14087358 Inv # 4280027856	1050 Seacoast Oper-4941	-486.19
Check	08/26/2026 16656	Cintas Corporation No. 2	Payer # 14087358 Inv # 4280027856 Uniform Se	30.4.2 Other Prof Svc/Uniforms	486.19
Liability Check	08/26/2026	QuickBooks Payroll Service	Created by Payroll Service on 08/25/2026	1050 Seacoast Oper-4941	-67,876.86

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Liability Check	08/26/2026	QuickBooks Payroll Service	Created by Payroll Service on 08/25/2026	2111 Direct Deposit Liabilities	67,876.86
Liability Check	08/27/2026 EFT	Child Support		1050 Seacoast Oper-4941	-238.79
Liability Check	08/27/2026 EFT	Child Support		2006 Payroll Liabilities	238.79
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	1050 Seacoast Oper-4941	-45,893.16
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.81 Emp. Dental Prem Cont (Employee Den	385.00
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.81 Emp. Dental Prem Cont (Employee Den	480.80
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.81 Emp. Dental Prem Cont (Employee Den	228.96
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.81 Emp. Dental Prem Cont (Employee Den	209.70
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.8 Emp. Health Prem Contrib (Employee He	152.22
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.8 Emp. Health Prem Contrib (Employee He	389.90
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.8 Emp. Health Prem Contrib (Employee He	592.88
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.8 Emp. Health Prem Contrib (Employee He	592.00
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.8 Emp. Health Prem Contrib (Employee He	913.32
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.8 Emp. Health Prem Contrib (Employee He	950.16
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.8 Emp. Health Prem Contrib (Employee He	617.82
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.8 Emp. Health Prem Contrib (Employee He	205.94
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.82 Emp Vision Prem Contr (Employee Visi	78.72
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.82 Emp Vision Prem Contr (Employee Visi	58.94
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.82 Emp Vision Prem Contr (Employee Visi	22.04
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	2006.82 Emp Vision Prem Contr (Employee Visi	48.40
Liability Check	08/27/2026 EFT	FMIT	FH0273 AUG 2026 Contributions / SEPT 2026 P	20.3 Life/Health Insurance	39,966.36
Liability Check	08/27/2026 EFT	American Fidelity-Products	MCP#64213 Inv#D942214 August 2026 Premiur	1050 Seacoast Oper-4941	-2,806.70
Liability Check	08/27/2026 EFT	American Fidelity-Products	MCP#64213 Inv#D942214 August 2026 Premiur	2006.21 AFA/ Accident (post-tax	54.00
Liability Check	08/27/2026 EFT	American Fidelity-Products	MCP#64213 Inv#D942214 August 2026 Premiur	2006.2 AFA/Accident	831.90
Liability Check	08/27/2026 EFT	American Fidelity-Products	MCP#64213 Inv#D942214 August 2026 Premiur	2006.3 AFA/Cancer (pre-tax)	295.60
Liability Check	08/27/2026 EFT	American Fidelity-Products	MCP#64213 Inv#D942214 August 2026 Premiur	2006.4 AFA/Cancer (post tax)	136.00
Liability Check	08/27/2026 EFT	American Fidelity-Products	MCP#64213 Inv#D942214 August 2026 Premiur	2006.83 AFA/Critical Care(post)	39.08
Liability Check	08/27/2026 EFT	American Fidelity-Products	MCP#64213 Inv#D942214 August 2026 Premiur	2006.5 AFA/Disability	1,216.46
Liability Check	08/27/2026 EFT	American Fidelity-Products	MCP#64213 Inv#D942214 August 2026 Premiur	2006.6 AFA/Life Insurance	233.66
Liability Check	08/27/2026 EFT	American Fidelity Assurance Company	MCP#64213 INV#2683283A Aug 2026 Premium	1050 Seacoast Oper-4941	-1,400.01
Liability Check	08/27/2026 EFT	American Fidelity Assurance Company	MCP#64213 INV#2683283A Aug 2026 Premium	2006.1 AFA/Medical Care FSA	1,400.01
Liability Check	08/27/2026 EFT	Texas Life Insurance Company	SM0A9H Aug 2026 Premiums	1050 Seacoast Oper-4941	-229.42
Liability Check	08/27/2026 EFT	Texas Life Insurance Company	SM0A9H Aug 2026 Premiums	2006.7 Texas Life	355.70
Liability Check	08/27/2026 EFT	Texas Life Insurance Company	Isik's June premium not due- coverage eff July	10.1 Payroll Expenses	-126.28

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Check	08/27/2026 EFT	Principal Financial Group	Acct # 1037999-10001 - Sept 2026 Premiums	1050 Seacoast Oper-4941	-861.24
Check	08/27/2026 EFT	Principal Financial Group	Acct # 1037999-10001 - Sept 2026 Premiums	20.3 Life/Health Insurance	861.24
Liability Check	08/27/2026 EFT	LegalShield	Acct# 165168 Sept 2026 Premiums	1050 Seacoast Oper-4941	-83.75
Liability Check	08/27/2026 EFT	LegalShield	Acct# 165168 Sept 2026 Premiums	2006 Payroll Liabilities	83.75
Liability Check	08/27/2026 EFT	IRMCD- OPEB Trust	Boot reimbursement to IRMCD - M. Staggs	1050 Seacoast Oper-4941	0.00
Liability Check	08/27/2026 EFT	IRMCD- OPEB Trust	Boot reimbursement to IRMCD - M. Staggs	2006 Payroll Liabilities	43.49
Liability Check	08/27/2026 EFT	IRMCD- OPEB Trust	Boot reimbursement to IRMCD - M. Staggs	52.3 Protective Clothing (Every form of PPD i.e.	-43.49
Liability Check	08/28/2026 EFT	IRMCD-FICA,SS,Med	59-6001309	1050 Seacoast Oper-4941	-21,433.30
Liability Check	08/28/2026 EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	8,022.00
Liability Check	08/28/2026 EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	1,271.01
Liability Check	08/28/2026 EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	1,271.01
Liability Check	08/28/2026 EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	5,434.64
Liability Check	08/28/2026 EFT	IRMCD-FICA,SS,Med	59-6001309	2006 Payroll Liabilities	5,434.64
Liability Check	08/28/2026 EFT	Nationwide Retirement Solutions, Inc.	0025223001	1050 Seacoast Oper-4941	-616.72
Liability Check	08/28/2026 EFT	Nationwide Retirement Solutions, Inc.	0025223001	2006 Payroll Liabilities	616.72
Liability Check	08/28/2026 EFT	Nationwide Retirement Solutions, Inc.	0025223001	1050 Seacoast Oper-4941	-645.00
Liability Check	08/28/2026 EFT	Nationwide Retirement Solutions, Inc.	0025223001	2006 Payroll Liabilities	645.00

Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

WILTON SIMPSON
COMMISSIONER

MOSQUITO CONTROL MONTHLY REPORT - LOCAL FUN

Rule 5E-13.027, F.A.C.
Telephone: (850) 617-7933; Fax (850) 617-7939

Submit to:
Mosquito Control Program
MosquitoControlReports@FDACS.gov
3125 Conner Blvd, Suite E
Tallahassee, FL 32399-1650

COUNTY/ DISTRICT Indian River Mosquito Co FISCAL YEAR: 2025- 2026 MONTH: August

LOCAL FUNDS RECEIPTS AND BALANCES

ACCT NO	DESCRIPTION	Budgeted Receipts	Monthly Receipts	Receipts Year to Date	Balance to Be Collected
311	Ad Valorem (Current/Delinquent)	$ 7,075,804.67	$ 553.81	$ 7,181,243.91	$ (105,439.24)
334.1	State Grant	$ -		$ -	$ -
362	Equipment Rentals	$ -		$ -	$ -
337	Grants and Donations	$ 5,000.00	$ (10,228.60)	$ 199,367.13	$ (194,367.13)
361	Interest Earnings	$ 42,743.82	$ 5,557.46	$ 45,707.47	$ (2,963.65)
364	Equipment and/or Other Sales	$ -		$ 44,184.75	$ (44,184.75)
369	Misc./Refunds (prior yr expenditures)	$ -	$ 927.26	$ 7,452.25	$ (7,452.25)
380	Other Sources	$ -		$ -	$ -
389	Loans	$ -		$ -	$ -
TOTAL RECEIPTS		$ 7,123,548.49	$ (3,190.07)	$ 7,477,955.51	$ (354,407.02)
BEGINNING FUND BALANCE		$ 4,494,071.67	$ -	$ -	$ 4,494,071.67
Total Receipts & Balance		$ 11,617,620.16	$ (3,190.07)	$ 7,477,955.51	$ 4,139,664.65

LOCAL FUNDS EXPENDITURES AND BALANCES

ACCT NO	Uniform Accounting System Transaction Code	Budgeted Expenditures	Monthly Expenditures	Expenditures Year to Date	Balance to Be Expended
10	Personal Services	$ 2,794,311.37	$ 182,851.68	$ 2,211,782.09	$ 582,529.28
20	Personal Services Benefits	$ 1,427,832.66	$ 96,434.82	$ 1,065,283.33	$ 362,549.33
30	Operating Expense	$ 1,671,665.13	$ 80,045.38	$ 934,303.77	$ 737,361.36
40	Travel & Per Diem	$ 85,471.00	$ 8,804.44	$ 60,648.90	$ 24,822.10
41	Communication Services	$ 47,912.83	$ 1,426.25	$ 32,558.66	$ 15,354.17
42	Freight Services	$ 1,000.00	$ 11.60	$ 421.09	$ 578.91
43	Utility Service	$ 28,256.56	$ 3,829.44	$ 23,786.61	$ 4,469.95
44	Rentals & Leases	$ 38,908.40	$ 163.20	$ 1,846.46	$ 37,061.94
45	Insurance	$ 119,735.45	$ -	$ 118,310.07	$ 1,425.38
46	Repairs & Maintenance	$ 194,555.12	$ 5,768.49	$ 74,131.50	$ 120,423.62
47	Printing and Binding	$ 750.00		$ 684.89	$ 65.11
48	Promotional Activities	$ 8,280.00	$ 79.06	$ 6,286.75	$ 1,993.25
49	Other Charges	$ 3,220.00	$ 94.66	$ 1,976.15	$ 1,243.85
51	Office Supplies	$ 136,570.00	$ 2,734.79	$ 88,716.21	$ 47,853.79
52.1	Gasoline/Oil/Lube	$ 74,000.00	$ 6,760.25	$ 55,424.00	$ 18,576.00
52.2	Chemicals	$ 1,376,703.13		$ 861,512.90	$ 515,190.23
52.3	Protective Clothing	$ 9,164.85	$ 279.43	$ 3,417.08	$ 5,747.77
52.4	Misc. Supplies	$ 101,691.72	$ 17,776.53	$ 68,177.75	$ 33,513.97
52.5	Tools & Implements	$ 2,510.00		$ 2,378.42	$ 131.58
54	Publications & Dues	$ 16,679.66	$ 120.00	$ 14,315.52	$ 2,364.14
55	Training	$ 46,163.00	$ (898.63)	$ 35,835.44	$ 10,327.56
60	Capital Outlay	$ 730,881.82	$ -	$ 521,335.06	$ 209,546.76
71	Principal	$ -	$ -	$ -	$ -
72	Interest	$ -	$ -	$ -	$ -
81	Aids to Government Agencies	$ -	$ -	$ -	$ -
83	Other Grants and Aids	$ -	$ -	$ -	$ -
89	Contingency (Current Year)	$ 444,254.46	$ -	$ -	$ 444,254.46
99	Payment of Prior Year Accounts	$ -	$ -	$ -	$ -
Other	Please Select Other Accounting Code	$ -	$ -	$ -	$ -
Other	Please Select Other Accounting Code	$ -	$ -	$ -	$ -
Other	Please Select Other Accounting Code	$ -	$ -	$ -	$ -
TOTAL BUDGET AND CHARGES		$ 9,360,517.16	$ 406,281.39	$ 6,183,132.65	$ 3,177,384.51
0.001	Reserves - Future Capital Outlay	$ 1,226,250.00	$ -	$ -	$ 1,226,250.00
0.002	Reserves - Self-Insurance	$ -	$ -	$ -	$ -
0.003	Reserves - Cash Balance to be Carried Forward	$ 926,424.83	$ -	$ -	$ 926,424.83
0.004	Reserves - Sick and Annual Leave	$ 104,428.17	$ -	$ -	$ 104,428.17
TOTAL RESERVES ENDING BALANCE		$ 2,257,103.00	$ -	$ -	$ 2,257,103.00
TOTAL BUDGETARY EXPENDITURES AND BALANCES		$ 11,617,620.16	$ 406,281.39	$ 6,183,132.65	$ 5,434,487.51
ENDING FUND BALANCE		$ -	$ (409,471.46)	$ 1,294,822.86	$ (1,294,822.86)

By submission of this monthly report of receipts, expenditures, and balances, I attest it is true and correct.

SIGNED:_____ DATE:_____20_____.
County/District Mosquito Control Director

FDACS-13663 Rev. 09/23

Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

WILTON SIMPSON
COMMISSIONER

MOSQUITO CONTROL MONTHLY REPORT - STATE FUN

Rule 5E-13.027, F.A.C.
Telephone: (850) 617-7933; Fax (850) 617-7939

Submit to:
Mosquito Control Program
MosquitoControlReports@FDACS.gov
3125 Conner Blvd, Suite E
Tallahassee, FL 32399-1650

COUNTY/ DISTRICT Indian River Mosquito C FISCAL YEAR: 2025- 2026 MONTH: August

STATE FUNDS RECEIPTS AND BALANCES

ACCT NO	DESCRIPTION	Budgeted Receipts	Monthly Receipts	Receipts Year to Date	Balance to Be Collected
311	Ad Valorem (Current/Delinquent)	$ -	$ -	$ -	$ -
334.1	State Grant	$ -	$ -	$ -	$ -
362	Equipment Rentals	$ -	$ -	$ -	$ -
337	Grants and Donations	$ -	$ -	$ -	$ -
361	Interest Earnings	$ 1.84	$ -	$ 1.81	$ 0.03
364	Equipment and/or Other Sales	$ -	$ -	$ -	$ -
369	Misc./Refunds (prior yr expenditures)	$ -	$ -	$ -	$ -
380	Other Sources	$ -	$ -	$ -	$ -
389	Loans	$ -	$ -	$ -	$ -
TOTAL RECEIPTS		$ 1.84	$ -	$ 1.81	$ 0.03
BEGINNING FUND BALANCE		$ 736.59	$ -	$ -	$ 736.59
Total Receipts & Balance		$ 738.43	$ -	$ 1.81	$ 736.62

STATE FUNDS EXPENDITURES AND BALANCES

ACCT NO	Uniform Accounting System Transaction Code	Budgeted Expenditures	Monthly Expenditures	Expenditures Year to Date	Balance to Be Expended
10	Personal Services	$ -	$ -	$ -	$ -
20	Personal Services Benefits	$ -	$ -	$ -	$ -
30	Operating Expense	$ -	$ -	$ -	$ -
40	Travel & Per Diem	$ -	$ -	$ -	$ -
41	Communication Services	$ -	$ -	$ -	$ -
42	Freight Services	$ -	$ -	$ -	$ -
43	Utility Service	$ -	$ -	$ -	$ -
44	Rentals & Leases	$ -	$ -	$ -	$ -
45	Insurance	$ -	$ -	$ -	$ -
46	Repairs & Maintenance	$ -	$ -	$ -	$ -
47	Printing and Binding	$ -	$ -	$ -	$ -
48	Promotional Activities	$ -	$ -	$ -	$ -
49	Other Charges	$ -	$ -	$ -	$ -
51	Office Supplies	$ -	$ -	$ -	$ -
52.1	Gasoline/Oil/Lube	$ -	$ -	$ -	$ -
52.2	Chemicals	$ 738.43	$ -	$ 738.40	$ 0.03
52.3	Protective Clothing	$ -	$ -	$ -	$ -
52.4	Misc. Supplies	$ -	$ -	$ -	$ -
52.5	Tools & Implements	$ -	$ -	$ -	$ -
54	Publications & Dues	$ -	$ -	$ -	$ -
55	Training	$ -	$ -	$ -	$ -
60	Capital Outlay	$ -	$ -	$ -	$ -
71	Principal	$ -	$ -	$ -	$ -
72	Interest	$ -	$ -	$ -	$ -
81	Aids to Government Agencies	$ -	$ -	$ -	$ -
83	Other Grants and Aids	$ -	$ -	$ -	$ -
89	Contingency (Current Year)	$ -	$ -	$ -	$ -
99	Payment of Prior Year Accounts	$ -	$ -	$ -	$ -
Other	Please Select Other Accounting Code	$ -	$ -	$ -	$ -
Other	Please Select Other Accounting Code	$ -	$ -	$ -	$ -
Other	Please Select Other Accounting Code	$ -	$ -	$ -	$ -
TOTAL BUDGET AND CHARGES		$ 738.43	$ -	$ 738.40	$ 0.03
0.001	Reserves - Future Capital Outlay	$ -	$ -	$ -	$ -
0.002	Reserves - Self-Insurance	$ -	$ -	$ -	$ -
0.003	Reserves - Cash Balance to be Carried Forward	$ -	$ -	$ -	$ -
0.004	Reserves - Sick and Annual Leave	$ -	$ -	$ -	$ -
TOTAL RESERVES ENDING BALANCE		$ -	$ -	$ -	$ -
TOTAL BUDGETARY EXPENDITURES and BALANCES		$ 738.43	$ -	$ 738.40	$ 0.03
ENDING FUND BALANCE		$ -	$ -	$ (736.59)	$ 736.59

By submission of this monthly report of receipts, expenditures, and balances, I attest it is true and correct.

SIGNED:_____ DATE:_____20_____.
County/District Mosquito Control Director

FDACS-13650 Rev. 09/23

FIFTH THIRD BANK

Account Number: XXXX XXXX XXXX 1603

INDIAN RIVR MOSQUITO CTR

Statement Closing Date: 07/27/26

Corporate Account Summary

Previous Balance		$13,580.36
Payments	-	$13,580.36
Credits	-	$1,275.38
Purchases and Other Charges	+	$6,725.80
Cash Advances	+	$0.00
Late Payment Charge	+	$0.00
Cash Advance Fees	+	$0.00
Finance Charges	+	$0.00
New Balance		$5,450.42
Disputed Amount		$0.00
Past Due Amount		$0.00
Credit Limit		$30,000.00
Available Credit Limit		$24,549.58
Cash Advance Credit Limit		$0.00
Available Cash Advance Credit Limit		$0.00
Statement Closing Date		07/27/26
Days in Billing Cycle		28

Payment Information

New Balance	$5,450.42
Minimum Payment Due	$5,450.42
Payment Due Date	08/21/26

QUESTIONS OR TO REPORT LOST/STOLEN CARDS?

Call Customer Service 1-800-375-1747

Please send billing inquiries and correspondence to:
FIFTH THIRD BANK
PO BOX 740523
CINCINNATI, OH 45274-0523

Or email inquires to CommercialSupport@53.com

Corporate Account Activity

Post Date	Tran Date	Reference Number	Transaction Description	Amount
07/24	07/24		AUTO PAYMENT DEDUCTION	-$13,580.36

MASTERCARD FY 07/26 STATEMENT					
30.4 Other Prof/Gov Fees/ Permit			**52.3 Protective Clothing**		
$500.00	DEPIW GP-Pesticide 5yr Notice of Intent Permit		$184.99	safety boots for Robert Dillon	
			$99.95	LaCrosse waterproof boots for Mike Staggs	
$500.00			$37.98	N95 respirator masks - pack of 50	
30.4.2 Uniforms					
$116.00	IRMCD shirts - Isik,& 2 men's, name badges, Isik & Tom				
			$322.92		
$116.00			**52.4 Miscellaneous Supplies**		
30.5 Contractural Services					
$40.00	Biomedical Hazardous waste pickup		**$0.00**		
			52.4.2 Ecology Supplies		
$40.00					
40.1 Travel/ Per Diem			**$0.00**		
-$200.38	cancel hotel stay for PR & Comm Summit - JMA		**52.4.3.1 Supply Research General**		
$53.02	gas for POHA meeting		$852.00	(4) Gravid mosquito traps	
			$100.96	storage boxes, JB weld, Avery round labels	
-$147.36			$134.52	pipette tips for arbovirus testing & research	
41.1 Communications			$3.54	3 rubber bands for traps	
$22.93	Earthlink monthly		$30.42	adhesive mailbox numbers	
$60.00	Text-em-all				
$82.93			**$1,121.44**		
42.1 Freight/Postage			**52.4.3.3 Sentinnel**		
$11.60	IRS Qtrly IRS Qtrly 2026 Form 941X amend Certified		$180.00	3 tons mason sand for chicken house	
$11.60			$946.80	(40) Purina Layena Pellet 50lb chicken feed	
46.1.1 Buildings-Others			$468.07	(29) Producer's Pride layer pellets chicken feed	
$16.50	cut 5 keys for Outside shop/yard		$26.98	8lb metal chicken feeder	
			$95.02	Sharps container, 2 chick feeders,	
$16.50			$53.96	8lb metal chicken feeder x 2	
46.6.2 Pumps-IRMCD					
$1,349.00	20hp electric pump motor - Golf Course impoundment				
$1,349.00					
46.6.3 Heavy Equipment/Boats-IRMCD					
$24.29	heavy duty chain for pontoon trailer				
$24.29					
46.6.4 Mowers & Other Repairs-IRMCD					
$38.63	for Honda Gx240 mower engines - carb & air filter kits				
$9.99	4pk primer bulb pumps for small engines		**$1,770.83**		
$48.62			**52.4.3.4 Gambusia**		
48.1 Outreach					
$18.63	Dum-dums 500 pieces				
$16.78	100 pack 4x9 rack / menu cards				
$32.86	(2) 100 pack 4x9 rack / menu cards				
$10.79	12 month large dry erase calendar				
			$0.00		
			52.4.4 ULV		
$79.06			**$0.00**		
51.1 Office Supplies			**52.4.6 Larviciding**		
$45.53	index tabs, #9 A/P envelopes, Post-it lined pads		$226.38	funnel set, measuring cup set, wasp spray, ins.repellent	
$47.84	tissues, D batteries, Folgers coffee				
$33.26	Public Health Exam - Bruce Morrison		**$226.38**		
$10.44	Executive Director name plate for Board Room - Isik U.		**52.4.7 Supplies - Drone**		
$33.90	(2) Beltron phone flip cases		$5.99	3 piece offset screwdriver set	
			$5.99		
			52.5 Tools and Small Implements		
			$0.00		
$170.97			**54.1 Subscriptions/Memberships/Educational Costs**		
51.2 Computer Software			$120.00	FGFOA Treasure Coast Chapter Membership - CA	
$119.88	Dropbox Plus - yearly (7/2026-7/2027)				
$370.00	Quickbooks Time Premium and per user fee				
$489.88			**$120.00**		
51.3 Computer Hardware			**55.2 Training**		
			-$1,075.00	Refund for cancelled PR & Comms Summit - JMA	
			$35.97	(4)12pks sodas - Fred Pryor in-house Comms Training	
			$140.40	pizzas for Staff - Comms. Training	
			-$898.63		
$0.00					**$5,450.42**

RESOLUTION NO. 2026-004

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF THE INDIAN RIVER MOSQUITO CONTROL DISTRICT ACKNOWLEDGING ACCEPTANCE OF THE JOHNS ISLAND / LOST TREE PROJECT; AUTHORIZING THE EXECUTIVE DIRECTOR TO EXECUTE DEDICATION AND EASEMENT DOCUMENTS AND TO ADVANCE CONSTRUCTION, PERMITTING, AND MAINTENANCE OF THE PROJECT; LIMITING THE DISTRICT'S RESPONSIBILITY TO CULVERT INFRASTRUCTURE; ALLOCATING PROFESSIONAL COSTS TO THE DEDICATING PARTY; AND PROVIDING AN EFFECTIVE DATE

WHEREAS, the Indian River Mosquito Control District (the "District") is a special district of the State of Florida, established and operating pursuant to Chapter 388, Florida Statutes, with jurisdiction and authority over mosquito control operations within Indian River County, Florida; and

WHEREAS, the District owns, operates, and maintains infrastructure, including drainage systems and related improvements, necessary to fulfill its mosquito control mission; and

WHEREAS, the Johns Island / Lost Tree project (the "Project") involves the dedication of the installation of two (2) culverts within the mosquito impoundment area and two (2) culverts to be placed under Fred Tuerk Road, all of which are improvements that further the District's mission and operational needs; and

WHEREAS, the Project requires coordination among the District, the developer (Lost Tree Development, the "Dedicating Party"), and the Indian River County Land Trust (collectively, the "Project Partners") to advance the Project through construction, permitting, and subsequent maintenance phases; and

WHEREAS, it is necessary and appropriate to authorize the Executive Director to execute dedication documents, as well as any documents necessary to receive any easements associated with the property, and to make design and construction decisions in consultation with her staff to facilitate the timely and efficient completion of the Project; and

WHEREAS, the District's acceptance of the dedicated culvert infrastructure is limited solely to the culverts themselves and does not extend to any peripheral utilities, roads, pavement, concrete, bridges, lighting, landscaping, or other edifications or improvements located in, on, or around the culverts; and

WHEREAS, the Board of Commissioners finds that acceptance of the Project and the authorizations set forth herein are in the best interests of the District and the public it serves.

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of the Indian River Mosquito Control District as follows:

Section 1. Acceptance of the Project. The Board of Commissioners hereby acknowledges and accepts the Johns Island / Lost Tree Project, including the dedication of two (2) culverts within the mosquito impoundment area and two (2) culverts to be placed under Fred Tuerk Road, as improvements that serve the District's operational mission.

Section 2. Limitation of District Responsibility. The District's acceptance and responsibility under this Resolution is strictly limited to the culvert pipes and culvert infrastructure dedicated to the District. The District specifically excludes and disclaims any responsibility for any peripheral utilities located proximately to the culvert pipes, as well as any roads, pavement, concrete, bridges, utilities, lighting, landscaping, or any other edifications or improvements located in, on, or around the culverts. In the event that any culvert accepted by the District requires replacement, repair, or modification, the District shall be responsible solely for the culvert work itself. Any and all site work, excavation, paving, paving removal, repaving, utility work, utility removal, utility relocation, or any other peripheral work necessitated by or associated with the culvert work shall be the sole responsibility of the landowner(s) of the affected property. The District shall assume no responsibility whatsoever beyond the culverts themselves, and all peripheral requirements shall be the responsibility of the landowner(s).

Section 3. Allocation of Professional Costs. All professional costs incurred by the District in connection with the Project, including but not limited to engineering, surveying, legal, permitting, consulting, and any other professional services, shall be borne by and reimbursed to the District by Lost Tree Development, the Dedicating Party. The Dedicating Party shall be responsible for the payment of all such professional costs upon demand by the District or upon such schedule as may be agreed upon by the Executive Director and the Dedicating Party.

Section 4. Authorization to Execute Dedication and Easement Documents. The Board of Commissioners hereby authorizes Isik Unlu, Executive Director, to sign all dedication documents and any documents necessary to receive any easements associated with the property on behalf of the Indian River Mosquito Control District as may be necessary or appropriate in connection with the Project.

Section 5. Authorization to Advance the Project. The Executive Director is hereby authorized and directed to work with her staff, the developer, and the Indian River County Land Trust to advance the Project to construction, permitting, and subsequent maintenance.

Section 6. Design and Construction Authority. The Executive Director and her selected staff are hereby authorized to make such design and construction decisions as may be required for the successful completion of the Project.

Section 7. Reporting Requirement. The Executive Director shall advise the Board of Commissioners on all progress related to the Project on a continuing basis.

Section 8. Effective Date. This Resolution shall take effect immediately upon its adoption.

PASSED AND ADOPTED this __ ***day of*** _____, 20___, by the Board of Commissioners of the Indian River Mosquito Control District.

INDIAN RIVER MOSQUITO CONTROL DISTRICT

_____
Chair, Board of Commissioners

Date: _____

ATTEST:

_____
Secretary/Clerk, Board of Commissioners

Date: _____

Indian River Mosquito Control District has lost institutional knowledge of impoundments due to retirements and role changes within the district in recent years. Faron Tyler, Brandon Chadwick, and Jules Morel have a full workload and substantial responsibilities. If only these knowledgeable and hard-working staff members could be cloned, no additional assistance would be necessary.

The title for this position will be Coastal Impoundment Advisor, and the responsibilities will be as follows:

- Project management for impoundments at Sand Point, Sebastian Inlet, and ORCA impoundments
- Provide guidance and support to the Ecologist, Impoundment Team and Coastal Inspectors
- Provide action and summary reports to the Executive Director
- Assist the Ecologist in developing a maintenance plan for impoundments
- Assist the district to re-establish a cooperative relationship with the US Fish and Wildlife Service and the Indian River Land Trust under the direction of the Executive Director
- Provide a summary of previous work experience and projects on impoundments
- Assist to ensure all operations comply with state and federal permits issued by agencies like the U.S. Army Corps of Engineers, St John Water Management District, and the Florida Department of Environmental Protection, etc.
- Establish logistics for rapid deployment and a monitoring system to prevent major dike damage by identifying the vulnerable areas.

This will be a 3-month position, with consideration for a 3-month extension based on district needs. The major project undertakings will be the Sand Point and John's Island projects that will take place in the next fiscal year.

Douglas Carlson
Indian River Mosquito Control District
P.O. Box 670
Vero Beach, FL 32961-0670

EMPLOYMENT:
- Indian River Mosquito Control District (IRMCD) Director; 2003-Present
- IRMCD Assistant Director; 1992-2003
- IRMCD Biologist; 1978-1992
- Florida Medical Entomology Laboratory; Research Assistant, mid-70's

EDUCATION:
- B.A., 1974, Duke University, Zoology & Economics (Environmental Studies Program)

AMERICAN MOSQUITO CONTROL ASSOCIATION:
- South Atlantic Regional Director; 2002-Present; Executive Board, 2006-Present.
- Environmental Protection Committee; 1988-97 (Chairman 1994-97).
- Legislative and Regulatory Committee; 1999-Present.
- PESP Working Group; 1997-Present (Chairman 1997-2002), developed the AMCA's PESP Strategy Document.
- Recipient of "Presidential Citation" for initiating and administering PESP within the AMCA (1998).
- On behalf of AMCA, recipient of EPA's "PESP Excellence Award for Reducing Pesticide Risk" (1999).
- Co-Chair, Local Arrangements Committee for 2007 AMCA Meeting (Orlando).

FLORIDA MOSQUITO CONTROL ASSOCIATION:
- President 2004-05.
- Finance Committee (member & Chairman; 1997-Present).
- Legislative Committee (member & Chairman; 2003-Present). Annual coordinator of FMCA's participation at AMCA's Washington Days.
- Author of FMCA's PESP Strategy Document (1998); PESP Contact Person, 2001-2005.

SUBCOMMITTEE ON MANAGED MARSHES:
- Member (1983-Present), Chairman (1984-Present).
- This legislatively established committee is responsible for making recommendations on salt marsh management plans taking into account mosquito control and natural resource considerations.

PUBLICATIONS:
- Author of over 50 articles, approx. half of them peer-reviewed.

MISCELLANEOUS:
- Member/Chairman of Indian River County (IRC) Environmental Learning Center's Education Committee.
- ~~Member of IRC Marine Advisory Committee.~~
- Member of IRC Conservation Lands Advisory Committee.
- Recipient of Indian River County Aubudon Society's "Special Merit Award" for environmentally sensitive mosquito control, Rotational Impoundment Management and supervising Beach Cleanups.

DOUG CARLSON'S PROFESSIONAL ACTIVITIES

SINCE RETIRING IN DECEMBER 2020

****

PUBLICATIONS:

Johanna Avril, Sherry Burroughs, Doug Carlson, Kyle Kosinski, Gordon Patterson, Donald Shroyer, Winter 2025. Celebrating 100 years of the Indian River Mosquito Control District. *Wing Beats,* Vol. 36, No. 4, pp. 4-12.

Douglas B. Carlson, Patricia E. Dale, Donald Powers, Cecily Draper, Mark Call, David Brown. 2022. Using chemicals to control mosquitoes in the 21st Century: Observations and challenges in the U.S. and Australia. *Journal of the Florida Mosquito Control Association*, Vol. 69, pp. 1-8.

Ronald E. Brockmeyer, Melinda Donnelly, Jorge R. Rey, Douglas B. Carlson. 2022. Manipulating, managing and rehabilitating mangrove-dominated wetlands along Florida's east coast (USA): balancing mosquito control and ecological values. *Journal of Wetlands Ecology and Management*, Vol. 30, pp. 987-1005.

Douglas Carlson, Alan Curtis, Don Shroyer, John Beidler. Winter 2022. Observations on a century of mosquito control in Florida. *Wing Beats* Vol. 33, No.4, pp. 10-15,

Douglas Carlson, Pat E.R.Dale. Spring 2021. A dozen years later: Updating a comparison of mosquito control between 4 degrees of latitude on the "right" coasts of Florida and Australia, *Wing Beats,* Vol. 32, No. 1, pp. 25-35.

Pat Dale, Doug Carlson . Winter 2020. A dozen years later: Updating a comparison of mosquito control between 4 degrees of latitude on the "right" coasts of Florida and Australia, *Mosquito Bites (Australia),* Vol. 13, No. 2. pp. 38-47.

PRESENTATIONS:

April 2025: Invited speaker at the Indian River Mosquito Control District's 100-year anniversary Open House. Topic was a historical summary of the 100 years of the IRMCD.

April 2023: Invited speaker to provide introductory comments at 2023 Florida Medical Entomology Laboratory's 4th Annual John Beidler Symposium which was comprised of graduate students making presentations on their research projects

OTHER PROFESSIONAL ACTIVITIES:

2022-23: Participated as the *Subject Matter Expert* for *The Balmoral Group* (a Winter Park, FL consulting firm) who undertook a performance review of Florida mosquito control districts for the Office of Public Policy and Governmental Affairs (OPPAGA; at the direction of the Florida Legislature)

CURRICULUM VITAE
June 2021

DOUGLAS B. CARLSON
9345 Seagrape Drive
Vero Beach, FL 32963
dcarlson1@hotmail.com
772-589-3126

PROFESSIONAL INTERESTS:

The management implications of research dealing with wetlands ecology, mosquito-transmitted pathogens and mosquito control technologies. Professional interests also include developing and evaluating salt marsh management plans with the mutual objectives of mosquito control and natural resource enhancement.

EDUCATION:

B.A., 1974, Zoology and Economics (Environmental Studies Program), Duke University, Durham, N.C. Curriculum included graduate level courses in these disciplines. Deans List - 1973, 1974.

PROFESSIONAL EXPERIENCE:

July 2003-December 2020: Director, Indian River Mosquito Control District (IRMCD), Vero Beach, FL. Position involves supervising all aspects of the District's operations which employed 29 full-time employees with an annual budget of $6.5+ million. Specific administrative duties include policy development & implementation along with budget, insurance and equipment bid specification development and evaluation.

1992-2003: Assistant Director, IRMCD. Position involved assisting the Director in supervising all aspects of the District's operations.

1978-1991: Biologist, IRMCD. Position involved conducting research and control projects dealing with salt marsh wetlands management, salt marsh and wastewater inhabiting mosquitoes and arbovirus surveillance. Research duties also include the testing and evaluation of larval and adult mosquito insecticides. Specific duties included administrative tasks such as budget, insurance and equipment bid specification development and analysis, managing research grants, supervising the District's larviciding program, overseeing the impoundment management and St. Louis Encephalitis surveillance programs, and dealing with State and Federal regulatory and permitting agencies in obtaining permits for salt marsh management related activities. Several full-time assistants were supervised.

1976-1980: Biologist supplying pharmaceutical companies with biological materials (insects, pollens) used for the production of allergens.

1974-1976: Entomologist I, Florida Medical Entomology Laboratory (FMEL), Vero Beach, FL. Position involved participating in research on mosquito population dynamics and physiology.

1974: Summer Intern, Harbor Branch Foundation, Inc., Ft. Pierce, FL. Position involved participating in a survey of fishes of the Indian River lagoon.

PROFESSIONAL ACHIEVEMENTS:

1) COMMITTEE APPOINTMENTS:

Subcommittee on Managed Marshes (SOMM):

Appointed to SOMM (1983), a legislatively established subcommittee of the Fla. Coordinating Council on Mosquito Control which consists of approx. 12 salt marsh management experts who serve as advisors providing information and review for salt marsh management plans, served as SOMM Chairman 1984-Present.

Florida Coordinating Council on Mosquito Control:

- Appointed to the Coordinating Council's committee for the development of a "White Paper" on Florida mosquito control, served as Co-Chair & Co-editor of this committee (1995-98) which also organized the 1998 conference "Urban growth and its impact on future mosquito control problems and opportunities".
- Served as Co-Editor (with Roxanne Connelly) to update and reprint the "White Paper" (2009, 2018).

American Mosquito Control Association (AMCA):

- President (2009-10), President Elect (2008-09), Vice President (2007-08), Immediate Past President (2010-11).
- Elected to Board of Directors - South Atlantic Regional Representative (2002-07); Member of Executive Committee -2006.
- Designated as a "Kentucky Colonel" by Kentucky Governor Steven Beshear at 2010 Annual Meeting.
- Appointed to the AMCA's Environmental Protection Committee (1988-1997), Chairman 1994-1997.
- Appointed Chairman of the AMCA's Pesticide Environmental Stewardship Program (PESP) Working Group (1997-2002). As Chairman, designated as AMCA's Primary PESP Contact person, author of the AMCA's PESP Strategy Document and PESP Background Document, served as AMCA's PESP grant administrator (1998-2000).
- Appointed to the AMCA's Legislative and Regulatory Committee (1999-2020).
- Appointed to Central Office Committee (2004-2006).
- 2007 Local Arrangements Committee Co-Chair (for Orlando meeting).

Florida Mosquito Control Association (FMCA):

- President (2004-05), President-Elect (2003-04), Vice-President (2002-03), Immediate Past President (2005-06).
- Research Advisory Committee (1988-1997) & Awards Committee (1996-1997).
- Finance Committee (Member & Chairman-1997-2012).
- Author of the FMCA's PESP Strategy Document (1998), PESP Contact person (2001-2009).
- FMCA Coordinator for Florida's participation in the AMCA's Washington Day (2000-2020).
- Legislative Committee, Co-Chair (2003-2012; 20018-19).

Florida Medical Entomology Laboratory (University of Fla.) Advisory Committee (2004-2020).

Public Health Entomology, Research and Education Center (Fla. A&M University) Advisory Committee (Chairman) (2006).

Appointed to:

- IRC Conservation Lands Advisory Committee (2005-2010).
- IRC Environmental Learning Center's (ELC) Education Committee (1997-2007), Chairman (1998-2006).
- Oslo Riverfront Conservation Area (ORCA) Advisory Group (1998-2015).
- IRC Marine Advisory Narrows Watershed Action Committee (2000-2010).
- U.S. Congressman Dave Weldon's Environmental Advisory Board (1995-2000).
- Biological review/planning committee for the Pelican Island National Wildlife Refuge (Indian River Co., FL) and the Ding Darling National Wildlife Refuge (Lee Co., FL), U.S. Dept. of Interior, U.S. Fish & Wildlife Service (Spring 2000).
- National Estuary Program-Indian River Lagoon Technical Advisory Committee (1991-96).
- Pelican Island National Wildlife Refuge Biological Review Committee (2010).

Chosen by:

- Fla. Dept. of HRS and Cayman Islands government delegation to evaluate the Mosquito Research and Control Unit, Cayman Islands, B.W.I. (June 1986 and Sept. 1990).
- Turks and Caicos government to participate in a workshop to help establish a mosquito control program there, Turks and Caicos, BWI, November 1991.

2) RECIPIENT OF RESEARCH GRANTS:

Co-principal investigator/project coordinator & manager (with R. G. Gilmore-Harbor Branch Oceanographic Institution, Inc. (HBOI) and J.R. Rey-FMEL) on the Fla. Dept. of Environmental Regulation/Coastal Zone Management research grants (1982-1991).

Co-principal investigator (with G. F. O'Meara (FMEL)) on FDHRS research grant: "Factors affecting the abundance of *Aedes taeniorhynchus* and *Aedes sollicitans*" (1985-86).

Co-principal investigator (with R.G. Gilmore) on a two year grant awarded by Seacrest Estates, Inc. to evaluate the effectiveness of the management plan for IR Impoundment #6 (1986-88).

District coordinator (PI-D. Shroyer (FMEL)) on FDHRS grant entitled the "Assessment of the sensitivity of chicken flocks as SLE virus sentinels, and evaluation of the vector competence of *Culex nigripalpus* and *Aedes taeniorhunchus* in IRC" (1986-87).

Technical consultant (PI-G. O'Meara, FMEL) on HRS grant: "Habitat management for the control of wastewater *Culex* mosquitoes" (1987-88).

Co-principal investigator (with P.D. O'Bryan) on U.S. Fish and Wildlife Service grants to evaluate the possibility of improving wading bird feeding opportunities on the Pelican Island National Wildlife Refuge impoundments (1991-1993).

Co-principal investigator with Indian River County Staff & FMEL Staff on Florida Inland Navigation District (FIND) grant for: "Developing educational opportunities and evaluating resource potential for Indian River County's Oslo Riverfront Park" (1993-94).

Co-principal investigator (with J.R. Rey (FMEL) and J.D. Carroll (US Fish & Wildlife Service)) on Fla. Dept. of Community Affairs-Coastal Management & National Estuary Program grant on the "Development of regional salt marsh management plans for the Indian River lagoon" (1993-96).

3) SPECIAL OR INVITATIONAL PRESENTATIONS:

Organizer and moderator of symposium-Physical control methods for salt-marsh mosquitoes: options and implementation, AMCA Annual meeting, Toronto, Canada, March 1984.

Invited participant at Indian River Resources Symposium-American Assembly Session, Marine Resources Council, FIT, Melbourne, FL. January 1985.

Invitational speaker at the Illinois Mosquito Control Association annual meeting. Topic: Biology of wastewater-inhabiting mosquitoes in Fla., Champaign, ILL, October 1985.

Invitational speaker at the American Water Works Association (Florida Section) Conference on Wetlands and Water Reuse. Topic: Mosquito production in wetlands used for wastewater retention, Orlando, FL, May 1986.

Invitational speaker at the Symposium on Waterfowl and Wetlands Management in the Coastal Zone of the Atlantic Flyway. Topic: Salt marsh impoundment management along Florida's Indian River lagoon: historical perspectives and current implementation trends, Wilmington, Delaware, September 1986.

Organizer and moderator of "Workshop on Salt Marsh Management and Research" coordinated by the Subcommittee on Managed Marshes, held at FMEL, October 1988. Editor of abstract collection published as Bulletin #1 - 1989, Journal of the FAMA.

Invited by Cayman Islands government to participate and make presentation on "Rotational Impoundment Management" at "Cayman Islands International Mosquito Control Conference", Grand Cayman, Cayman Islands BWI, September 1990.

Organizer and moderator of session at DNR/DER-Florida Coastal Management Conference - "Navigating the Nineties". Session was entitled: "Current techniques and issues in salt marsh water management", Clearwater, FL, September 1990,

Invited speaker at U.S. Fish and Wildlife Service "Coastal Nongame Workshop". Presentation was entitled: "Multipurpose management of Florida's mosquito control impoundments", Gainesville, FL., Sept. 1991.

Invited by Turks and Caicos government to participate and make presentation at international mosquito control workshop. Presentation was: "Salt marsh management in Florida for mosquito control and natural resource interests", North Caicos, Turks and Caicos, BWI, Nov. 1991.

Invited speaker at INTECOL (International Congress of Ecology) Wetlands Conference. Presentation was entitled: "The management of Florida's (USA) saltmarsh impoundments for mosquito control and natural resource enhancement" in the symposium "Wetlands and Disease Control", Columbus, OH, Sept. 1992. Presentation was published in the book "Global Wetlands: Old World and New".

Organizer of "2nd Workshop on Salt Marsh Management and Research" held in Vero Beach, Sept. 1992. Editor of abstract collection published as Bulletin #2 of the Journal of the FMCA.

Organizer of symposia at 1993 AMCA annual meeting. Symposia entitled: "How the Endangered Species Act may impact mosquito & vector control programs" and "Vector control policies on lands managed by the National Park Service and the US Fish and Wildlife Service", Ft. Myers, FL, April 1993.

Invited speaker at National Estuary Program's Director's Meeting. Title: Florida's scientific and political solutions for salt marsh management issues, Port Canaveral, FL, Jan. 1994. Paper of this presentation is included in proceedings for this annual meeting.

Organizer of symposium at 1995 AMCA annual meeting. Symposium entitled: "Environmental issues resulting from mosquito control operations: problems and solutions", Portland, ORE, April 1995.

Invited participant in the Indian River Lagoon National Estuary Program's television program entitled: "The Indian River Lagoon - Heritage at Risk" broadcast live on WMFE-TV (PBS/Channel 24 - Orlando), November 1995.

Organizer of "3rd Workshop on Salt Marsh Management and Research" held in Vero Beach, Oct. 1996. Editor of abstract collection published as Bulletin #3 of the Journal of the FMCA.

Organizer of symposium at 1998 AMCA annual meeting. Symposium entitled: "Insights into the AMCA's partnership in the EPA's Pesticide Environmental Stewardship Program", Reno, NV, March 1998.

Invited speaker at Annual National PESP Meeting on how the mosquito control community is promoting reduced pesticide risk, Washington, DC, November 1999.

Invited speaker to officials of the New Zealand Ministry of Health. Presentations dealt with typical mosquito control operations in Florida. Wellington and Napier, New Zealand. June 2000

Invited plenary lecturer at the 8th Arbovirus Research in Australia/4th Mosquito Control Association of Australia Symposium, Paper title: The greening of mosquito control in America: mosquito control's interactions with environmental agencies at the federal, state and local levels. Gold Coast, Australia, July 2000.

Organizer of "4th Workshop on Salt Marsh Management and Research" held in Vero Beach, Oct. 2000. Editor of abstract collection published as Technical Bulletin #3 of the FMCA.

Invited speaker at Utah Mosquito Control Association annual meeting. Topic: Florida's mosquito control security issues. Oct. 2002.

Organizer of "5th Workshop on Salt Marsh Management and Research" held in Cocoa Beach, Oct. 2005. Editor of abstract collection published as Technical Bulletin #6 of the FMCA.

4) OTHER: AWARDS, RECOGNITION, ACHIEVEMENTS.

Recipient of the Pelican Island Audubon Society's " Special Merit Award" for environmentally sensitive mosquito control, Rotational Impoundment Management and Supervising Beach Cleanups (May 2003).

On behalf of the AMCA, recipient of the EPA's "PESP Excellence Award for Reducing Pesticide Risk" (Nov. 1999).

Recipient of FMCA resolution in appreciation for contributions to the FMCA and mosquito control in Florida (Nov. 1998).

Recipient of the AMCA's Presidential Citation award for initiating & administering the PESP program within the AMCA (March 1998).

Reviewer of scientific publications (Journal of AMCA, Journal of FMCA, Journal of Vector Ecology, Journal of Medical Entomology, Fla. Entomologist, Wing Beats, Marine Resources Council publications, University of Florida Press) and grant proposals (Florida & Connecticut Sea Grant College Programs).

Certified in Public Health Pest Control which permits the application of restricted use pesticides (issued by Fla. Dept. of Agriculture & Consumer Services (FDACS)), 1984-Present; Directors certification: 2003-2020..

PROFESSIONAL SOCIETY MEMBERSHIPS:

American Mosquito Control Association
Florida Mosquito Control Association

PUBLICATIONS:

Carlson, D.B. 1982. Mosquitoes associated with evaporation-percolation ponds in Indian River County, Florida. Mosquito News, 42(2): 244-250.

Carlson, D.B. 1983. The use of salt-marsh mosquito control impoundments as wastewater retention areas. Mosquito News, 43(1): 1-6.

Carlson, D.B. 1983. Ovipositional response of *Culex quinquefasciatus* to southeast Florida wastewater. Mosquito News, 43(3): 284-287.

Carlson, D.B. and R.R. Vigliano. 1985. The effects of two different water management regimes on marsh flooding and mosquito production. Journal of AMCA, 1(2): 203-211.

Day, J.F. and D. B. Carlson. 1985. The importance of autumn rainfall and sentinel flock location to understanding the epidemiology of St. Louis Encephalitis virus in Indian River County, Florida. Journal of AMCA 1(3): 305-309.

Carlson, D.B. and J.D. Carroll, Jr. 1985. Salt marsh impoundment management in Florida: progress of the Technical Subcommittee on Mosquito Impoundments. In: Proceedings of the 72nd Annual Meeting of the New Jersey Mosquito Control Association (abstract), p. 47.

O'Meara, G.F. and D.B. Carlson. 1985. Oviposition by *Culex nigripalpus* and *Culex quinquefasciatus* into different types of ovitraps. In: Proceedings of the 72nd Annual Meeting of the New Jersey Mosquito Control Association (abstract), p. 142.

Carlson, D.B. and J.D. Carroll, Jr. 1985. Developing and implementing management methods benefiting mosquito control, fish and wildlife: a two year progress report about the Technical Subcommittee on Mosquito Impoundments. Journal of the FAMA, 56(1): 24-32.

Carlson, D.B., R.G. Gilmore and J.R. Rey. 1986. Salt marsh impoundment management on Florida's central east coast: reintegrating isolated high marshes to the estuary. Proceedings of the 12th Annual Conference on Wetlands Restoration and Creation, p. 47-63.

Vigliano, R.R. and D.B. Carlson. 1986. An adjustable restrainer for sentinel chickens used in encephalitis surveillance. Journal of the AMCA 2(3):357-359.

Carlson, D.B., R.R. Vigliano and G.L. Wolfe. 1986. Distribution of mosquitoes in different wastewater stages of secondarily treated domestic effluent and untreated citrus washwater. Journal of the AMCA 2(4): 516-520.

Carlson, D.B. and R.L. Knight. 1987. Mosquito production and hydrological capacity of southeast Florida impoundments used for wastewater retention. Journal of AMCA, 3(1):74-83.

Carlson, D.B. 1987. Salt marsh impoundment management along Florida's Indian River Lagoon: historical perspectives and current implementation trends. In: Proceedings of the Symposium on Waterfowl and Wetland Management in the Coastal Zone of the Atlantic Flyway, pp. 358-69.

Carlson, D.B. and P.D. O'Bryan. 1988. Mosquito production in a rotationally managed impoundment compared to other management techniques. Journal of the AMCA, 4(2):146-151.

O'Meara, G.F., F.E. Vose and D.B. Carlson. 1989. Seasonal and environmental factors influencing oviposition by *Culex* (*Culex*) mosquitoes into two types of traps. Journal of Medical Entomology, 26(6):528-534.

Carlson, D.B. and J.R. Rey. 1989. Editors of "Workshop on Salt Marsh Management and Research". FAMA Bulletin #1, 19 pp.

O'Bryan, P.D. and D.B. Carlson. 1989. The mosquito control benefits of rotational impoundment management. Abstract from "Workshop on Salt Marsh Management and Research", FAMA Bulletin #1, p. 6.

Carlson, D. B., P.D. O'Bryan and R. Andrews. 1989. Mosquito production at the Grand Harbor Open Marsh Water Management system. Abstract from "Workshop on Salt Marsh Management and Research", FAMA Bulletin #1, p. 6.

O'Meara, G.F., J. Juilianna and D.B. Carlson. 1989. Factors affecting the abundance of *Aedes taeniorhunchus* and *Aedes sollicitans*. Abstract from "Workshop on Salt Marsh Management and Research", FAMA Bulletin #1, p. 7.

O'Bryan, P.D., D.B. Carlson and R.G. Gilmore. 1990. Salt marsh mitigation: an example of the process of balancing mosquito control, natural resource and development interests. Fla. Scientist, 53(3):189-203.

Curtis, G.A. and D.B. Carlson. 1990. Evaluation of hand applied naled thermal fog for *Wyeomyia* control. Journal of AMCA, 6(3):421-424.

Carlson, D.B., P.D. O'Bryan and J.R. Rey. 1991. Current issues in salt marsh management in Florida. Journal of AMCA, 7(1):83-88.

Carlson, D.B., J. Salmela and J.R. David. 1991. "Source Reduction" chapter of the Florida Mosquito Control Handbook. 21 pp.

Carlson, D.B., P.D. O'Bryan and J.R. Rey. 1991. Multipurpose management of Florida's mosquito control impoundments. In: Proceedings of the Coastal Nongame Workshop, pp. 163-171.

Carlson, D.B. and J.R. Rey. 1992. Editors of the "2nd Workshop on Salt Marsh Management and Research". Bulletin #2 of the FMCA, 41 pp.

Carlson, D.B. 1992. A summary of Florida's scientific and political solutions for salt marsh management issues. Abstract from "2nd Workshop on Salt Marsh Management and Research", FMCA Bulletin #2, p. 7.

O'Bryan, P.D. and D.B. Carlson. 1992. Evaluating the possibility of impoundment management for wading bird enhancement in the Pelican Island National Wildlife Refuge. Abstract from "2nd Workshop on Salt Marsh Management and Research", FMCA Bulletin #2, p. 29.

Carlson, D.B., P.D. O'Bryan and J.R. Rey. 1994. The management of Florida's (USA) saltmarsh impoundments for mosquito control and natural resource enhancement. In "Global Wetlands: Old World and New", edited by W.J. Mitsch, Elsevier Science B.V., pp. 805-814

Carlson, D.B., P.D. O'Bryan and J.R. Rey. 1994. Florida's scientific and political solutions for salt marsh management issues. In the 1994 National Estuary Program Directors Meeting, Abstract Index, p. 23.

O'Bryan, P.D. and D.B. Carlson. 1995. Managing Florida's mosquito control impoundments to enhance feeding opportunities for wading birds and waterfowl. In: "Waterfowl Habitat Restoration, Enhancement and Management in the Atlantic Flyway", pp. D99-115.

Van Handel, E., D. Wassmer and D. Carlson. 1995. Florida Medical Entomology Laboratory hosts a *Bti* workshop with principal speaker, Dr. Arieh Zaritsky, *Wing Beats*, Vol. 6, No. 1, pp 8-10.

Carlson, D.B., D. A. Wassmer and R. I. Rose. 1996. The Pesticide Environmental Stewardship Program: considering an opportunity to demonstrate the AMCA's commitment to sound environmental management". AMCA Newsletter *Vector Review*, March/April 1996, pp. 21-27.

Carlson, D.B., P.D. O'Bryan and J.R. Rey. 1996. Issues and progress in Florida's mosquito control efforts to manage environmentally sensitive habitats. *Wing Beats*, Vol. 7, No. 3, pp. 8-26.

Carlson, D.B., J.R. Rey and J.D. Carroll. 1997. Editors of the "3rd Workshop on Salt Marsh Management and Research". FMCA Bulletin #3, 48 pp.

Carlson, D.B., J.R. Rey and J.D. Carroll. 1997. Perspectives on the Subcommittee on Managed Marshes: 1983-1996. Abstract from "3rd Workshop on Salt Marsh Management and Research", FMCA Bulletin #3, p. 7.

O'Bryan P. and D.B. Carlson. 1997. A study to evaluate levels of fecal coliform in Indian River Lagoon and Indian River County Impoundment #3 waters. Abstract from "3rd Workshop on Salt Marsh Management and Research", FMCA Bulletin #3, p. 33.

Carlson, D.B., 1997. EPA's Pesticide Environmental Stewardship Program "Partnership Strategy Document". AMCA Newsletter *Vector Review*, May 1997, pp. 10-18.

Heinlein, G.W., J.R. Mason, E.J. Beidler and D.B. Carlson. 1998. A closed transfer system for loading insecticide containers, *Wing Beats,* Vol. 8, No. 4, pp. 4-6.

Baker, R.H. and D.B. Carlson (Eds.). 1998. Florida Coordinating Council on Mosquito Control. *Florida Mosquito Control: the state of the mission as defined by mosquito controllers, regulators, and environmental managers*. Vero Beach, FL: University of Florida, Institute of Food and Agricultural Sciences, Florida Medical Entomology Laboratory.

Rey, J.R., D.B. Carlson and J.D. Carroll, Jr. 1999. Regional marsh management strategies for the Indian River Lagoon. Technical Bulletin of the FMCA, Volume #2.

Nayar, J.K., J.W. Knight, A. Ali, D.B. Carlson and P.D. O'Bryan. 1999. Laboratory evaluation of biotic and abiotic factors that may influence the larvicidal activity of *Bacillus thuringiensis israelensis* (*Bti*) against Florida mosquitoes, Journal of the AMCA, 15(1): 32-42.

Carlson, D.B., P.D. O'Bryan and J.R. Rey. 1999. Florida's salt marsh management issues: 1991-1998, Journal of the AMCA, 15(2): 186-193.

Carlson, D.B. 2001. The greening of mosquito control in America: mosquito control's interactions with environmental agencies at the federal, state and local levels. Arbovirus Research in Australia, Vol. 8, pp. 63-71.

Carlson, D.B. 2001. Editor of the "4th Workshop on Salt Marsh Management and Research". Technical Bulletin of FMCA, Volume #3, 40 pp.

Carlson, D.B. and J. Craig. 2001. Insurance coverage for mosquito control. *Wing Beats*, Vol. 12, No. 1.

Carlson, D.B. 2002. Florida mosquito control security issues. Proceedings of the 55th Annual Meeting of the Utah Mosquito Control Association, pp. 1-3.

Robert, L.L., H.R. Rupp and D.B. Carlson. 2003. Pesticide and equipment security: continued vigilance is the key. *Wing Beats*, Vol. 14, No. 1, pp. 22-31.

Carlson, D.B. 2003. Recognizing John Beidler's 50+ years of contributions to mosquito control. *Wing Beats,* Vol. 14, No. 1, pp. 10-11, 38.

Carlson, D.B. 2003. The Pelican Island National Wildlife Refuge: a century of conservation and mosquitoes. *Wing Beats,* Vol. 14, No. 3, pp. 4-5.

Carlson, D.B. 2003. 20 years of Florida's Subcommittee on Managed Marshes: 2 decades of progress. *Wing Beats,* Vol. 14, No. 3, pp. 20-24.

DeChant, P., D. Carlson & D. Wassmer. 2004. PESP Champion Award. *Wing Beats*, Vol. 14, No. 4, pp. 16, 26.

Beidler, E.J., D. Carlson & D. Moore. 2004. Here's to you, Mr. Robinson. *Wing Beats*, Vol. 15, No. 2, pp. 10-11.

Gayle, W., D.B. Carlson et. al. 2005. A hurricane season like none other in Florida history. *Wing Beats,* Vol. 16, No. 2, pp. 16-23.

Carlson, D.B. 2005. 5th Workshop on Salt Marsh Management & Research. *Wing Beats,* Vol. 16, No. 3, pp. 5-6.

Carlson, D.B., R. Brockmeyer, M. Epstein, D. Scheidt, J. Stiner, D.S. Taylor. 2005. Editors of the 5th Workshop on Salt Marsh Management & Research/4th Biennial Mosquito Lagoon Conference, Technical Bulletin #6 of the FMCA.

Carlson, D.B. 2006. Salt marsh management in Florida: balancing mosquito control & natural resource interests. (presented at Anastasia Mosquito Control District's 2005 Mosquito Control and Arbovirus Surveillance Workshop). Technical Bulletin of the FMCA, Vol. 7, pp. 44-47.

Carlson, D.B. 2006. Back to the future: FMCA recognizes the contributions of Jim Robinson while preparing for upcoming challenges. *Wing Beats*, Vol. 17, No. 1, pp. 22-23.

Carlson, D.B. 2006. Source reduction in Florida's salt marshes: management to reduce pesticide use and enhance the resource (presentation at 2005 AMCA meeting symposium: "Enhancing mosquito control without pesticides"), Journal of the AMCA, 22(3): 534-537.

Wilson, R.& D. B. Carlson. 2007. Mosquito control access and easement issues: helping to ensure the ability to inspect, treat and manage in a shrinking world, *Wing Beats*, Vol. 18, No. 2., pp 28-31.

Dale, P.E.R., D.B. Carlson, C. Easton. 2008. 4 degrees of latitude: mosquito control on the "right" coasts of Australia and Florida, Journal of the AMCA, 24(3): 427-437.

Connelly, C.R. and D.B. Carlson (Eds.). 2009. Florida Coordinating Council on Mosquito Control. *Florida Mosquito Control: the state of the mission as defined by mosquito controllers, regulators, and environmental managers*. Vero Beach, FL: University of Florida, Institute of Food and Agricultural Sciences, Florida Medical Entomology Laboratory.

Rey, J.R., S.M. O'Connell, D.B. Carlson, R.E. Brockmeyer, Jr. 2009. Characteristics of mangrove swamps managed for mosquito control in eastern Florida, USA: a re-examination. Marine Ecology Progress Series Vol. 389:295-300.

Carlson, D.B. 2010. 2010 AMCA Presidential Address: Yes, the AMCA is ready for the New Millennium. Journal of the AMCA, 26(3):239-242.

Rey, J.R., D.B. Carlson and R.E. Brockmeyer, Jr. 2012. Coastal wetland management in Florida: Environmental concerns and human health. Wetlands Ecology and Management 20(3): 197-2011.

Dale, P.E. *et. al.* (including D. Carlson). 2014. Multi-agency perspectives on managing mangrove wetlands and the mosquitoes they produce. Journal of the AMCA, 30 (2): 106-115.

Lord, C., B. Bayer, D. Carlson, A. Rogers, R. Smith, S. Rund. 2018. The collection and public dissemination of mosquito abundance data: Perspectives and options. *Wing Beats*, Vol. 29, No. 2, pp. 9-20.

Lloyd, A.M, C.R. Connelly, D. B. Carlson. 2018 (Eds). Florida Coordinating Council on Mosquito Control. *Florida Mosquito Control: The state of the mission as defined by mosquito controllers, regulators, and environmental managers*. Vero Beach, FL: University of Florida, Institute of Food & Agricultural Sciences, Florida Medical Entomology Laboratory.

Sakolsky, G. D.B. Carlson. A summary of the AMCA's 22+ year participation in the EPA's Pesticide Environmental Stewardship Program, *Wing Beats*, Vol. 30, No. 2, pp. 23-25.

Carlson, D.B., P.E.R. Dale, N. Kurucz, P.G. Dwyer, J.M. Knight, P.I. Whelan, D.D. Richards. 2019. Mosquito control and coastal development: How they have coexisted and matured in Florida and Australia. Journal of the AMCA 35(2): 123-134.

D. B. Carlson, D.D. Richards, J. Reilly. 2020. Hurricane preparedness and response along Florida's central-east coast: Indian River Mosquito Control District's experiences over the years. Special CDC-sponsored issue of the Journal of the AMCA 36(2S):5-10.

Dale, P.E.R., D.B. Carlson. 2020. A dozen years later: Updating a comparison of mosquito control between four degrees of latitude on the "right" coasts of Australia and Florida. *Mosquito Bites*, Vol. 13, Issue 2, pp. 38-47.

Carlson, D.B., P.E.R. Dale. 2021. A dozen years later: Updating a comparison of mosquito control between four degrees of latitude on the "right" coasts of Florida and Australia. *Wing Beats*, Vol 32, No. 1, pp. 25-36.

Brockmeyer, R.E., M. Donnelly, J.R. Rey, D.B. Carlson. A century of manipulating, managing and rehabilitating mangrove-dominated wetlands along Florida's east coast (USA): Balancing mosquito control and ecological values. Journal of Wetlands Ecology and Management, *in preparation.*

Carlson, D.B., P.E. Dale, D. Powers, C. Draper, M. Call, D. Brown. Using chemicals to control mosquitoes in the 21st Century: Observations and challenges in the U.S. and Australia. Journal of the FMCA, *in preparation.*

PROFESSIONAL PAPER PRESENTATIONS:

INTERNATIONAL MEETINGS:

November 1982: Joint week long meeting of the IRMCD and the Mosquito Research and Control Unit, Cayman Islands, B.W.I. Several papers were presented on wastewater mosquitoes, impoundment management and mosquito-borne virus surveillance.

June 1986: Participant in meeting between committee of select mosquito control workers designated by the Fla. Dept. of HRS and the Mosquito Research and Control Unit, Cayman Islands, B.W.I.

October 1988: Organizer of, and speaker at, Workshop on Salt Marsh Management and Research, Vero Beach, FL.

September 1990: Invited participant at "Cayman Islands International Mosquito Control Conference", Cayman Islands, B.W.I. Presentation topic was salt marsh management in Florida, in particular Rotational Impoundment Management.

November 1991: Invited participant at "Turks and Caicos Mosquito Control Workshop". Presentation dealt with salt marsh management in Florida for mosquito control and natural resource interests.

September 1992: Invited speaker in symposium on "Wetlands and Disease Control" at INTECOL Wetlands Conference, Columbus, OH.

September 1992: Organizer of, and speaker at, 2nd Workshop on Salt Marsh Management and Research, Vero Beach, FL.

October 1996: Organizer of, and speaker at, 3rd Workshop on Salt Marsh Management and Research, Vero Beach, FL.

November 1999: Invited participant and speaker at "Mosquito Issues Management Workshop" organized by the U.S. Dept. of Interior, National Park Service, Atlanta, GA.

June 2000: Invited speaker to officials of the New Zealand Ministry of Health. Presentations dealt with typical mosquito control operations in Florida. Wellington and Napier, New Zealand.

July 2000: Invited plenary lecturer at the 8th Arbovirus Research in Australia/4th Mosquito Control Association of Australia Symposium, Paper title: The greening of mosquito control in America: mosquito control's interactions with environmental agencies at the federal, state and local levels. Gold Coast, Australia.

NATIONAL MEETINGS:

AMERICAN MOSQUITO CONTROL ASSOCIATION:

March 1983, Orlando, FL. Title: Mosquito populations and water quality in south Florida wastewater systems. Paper was presented in a "Man-made Mosquito Habitats" symposium.

March 1984, Toronto, Canada. Organizer, moderator, and speaker at symposium entitled: "Physical control methods for salt-marsh mosquitoes: options and implementation".

March 1985, Atlantic City, N.J. Title: Salt-marsh impoundment management in Florida: Progress of the Technical Subcommittee on Mosquito Impoundments (J. Carroll, U.S. Fish and Wildlife Service, co-author).

April 1986, New Orleans, LA. Title: Progress by the Technical Subcommittee on developing guidelines for rotary ditching in Florida.

April 1987, Seattle, WA. Title: Salt marsh management in Florida: establishment of the Subcommittee on Managed Marshes in the Florida Statutes (William R. Opp, FDHRS, co-author).

February 1988, Denver, CO. Title: Salt marsh mitigation in Florida: an example of balancing mosquito control, natural resource and development interests (P.D. O'Bryan, R.G. Gilmore, co-authors).

March 1989, Boston, MASS. Title: Current issues in salt marsh management in Florida (W.R. Opp, co-author).

April 1990, Lexington, KY. Title: Interagency cooperation in developing management plans for Florida's salt marshes (J.R. Rey (FMEL) and J.D. Carroll, co-authors).

March 1991, New Orleans, LA. Title: Salt marsh management in Fla.: the Coastal Zone Management Program's continuing research contribution.

March 1992, Corpus Christi, TX. Title: The 2nd Workshop on Salt Management & Research: an upcoming opportunity to share current information.

April 1993, Ft. Myers, FL. Organizer of symposia entitled: "How the Endangered Species Act May Impact Mosquito & Vector Control Programs" and "Vector Control Policies on Lands Managed by the National Park Service and the US Fish and Wildlife Service".

April 1994, San Diego, CA. Title: The development of regional marsh management plans for the Indian River lagoon (J.R. Rey and J.D. Carroll, co-authors).

March 1995, Portland, OR. Organizer, moderator and speaker at symposium entitled: "Environmental issues resulting from mosquito control operations: problems and solutions".

March 1996, Norfolk, VA. Title: EPA's Pesticide Environmental Stewardship Program: an opportunity to demonstrate the AMCA's commitment to sound environmental management (D.A. Wassmer & R.I. Rose, co-authors).

Title: The 3rd Workshop on Salt Marsh Management & Research: a recurring opportunity to share current information (J.R. Rey & J. D. Carroll, co-authors).

March 1997, Salt Lake City, UT. Titles: (1) The EPA's Pesticide Environmental Stewardship Program (PESP): AMCA's progress and experiences in becoming a PESP partner and (2) A review of the 3rd Workshop on Salt Marsh Management & Research.

March 1998, Reno, NV. Organizer, moderator and speaker at symposium entitled: "Insights into the AMCA's participation in the PESP program". Also speaker in Mosquito control/Department of Interior symposium. Title: Mosquito control and U.S. Fish and Wildlife Service management considerations in federal salt marshes along east-central Florida (P.O'Bryan and D.S. Taylor, co-authors).

Feb. 1999 (St. Louis, MO.) & 2000 (Atlantic City, NJ). Titles: The AMCA's PESP initiatives.

Feb. 2001, Dallas TX. Title: Managing federal, state and locally owned salt marshes.

Feb. 2002, Denver, CO. Participated in symposium dealing with mosquito control safety considerations following 9-11-01.

Feb. 2004, Savannah, GA. 20 years of Florida's Subcommittee on Managed Marshes: 2 decades of progress.

March 2005, Vancouver, BC. Symposium presentations: 1) Source reduction in Florida's salt marshes, 2) Frances & Jeanne: unwelcome back-to-back "sisterly" visits to Florida's Treasure Coast.

Feb. 2006: Detroit, MI. Contracting aerial application services: experiences of the Indian River Mosquito Control District.

Apr. 2007: Orlando, FL. 1) Status of updating the Florida White Paper on mosquito control, 2) Florida's means for coordinating between mosquito control and environmental resource agencies (Trustees Session).

March 2008: Reno, NV. Source reduction along Florida's Indian River Lagoon: controlling salt-marsh mosquitoes while enhancing the resource (IPM operational techniques symposium).

April 2009: New Orleans, LA. 1) Status of revising the Florida White Paper on mosquito control (R.Connelly, co-author), 2) National Wildlife Refuges along Florida's Indian River Lagoon: Pelican Island NWR and Merritt Island NWR.

April 2010: Lexington, KY. 1) Presidential Address, 2) NPDES permit status (presented to Trustees).

March 2011: Anaheim, CA. Organizer of Washington Conference Workshop.

Feb. 2012: Austin, TX. Florida's Subcommittee on Managed Marshes: 29 years, 44 members and still pumping!

Feb. 2013: Atlantic City, NJ. Current issues in saltmarsh management in Florida.

Feb. 2014: Seattle, WA. Florida's Indian River Lagoon: Mosquito control in an estuary in distress.

Feb. 2015: New Orleans, LA. 20+ years of collecting waste tires (D.Shroyer, co-author)

Feb. 2016: Savannah, GA. Controlling mosquitoes on private property: Balancing statutory authority with landowners' experience.

Feb. 2018: Kansas City, Kansas. Florida White Paper 2018: Status of updating the 2009 edition.

Feb. 2019: Orlando, FL: White Paper status, Water Management Symposium: Impoundment management presentation, Commissioners presentation on impoundment management along east-central Florida.

OTHER:

December 1982 (Toronto, CANADA), 1983 (Detroit, MI) & 1985 (Hollywood, FL). Entomological Society of America Annual Meetings. Titles: "Ovipositional response of *Culex quinquefasciatus* to several southeast Florida wastewater sources", "*Culex* mosquito occurrence in a salt-marsh mosquito control impoundment receiving wastewater" & "Managing south Florida salt marsh impoundments for mosquito control, fish and wildlife enhancement" (poster).

September 1986. Symposium on Waterfowl and Wetlands Management in the Coastal Zone of the Atlantic Flyway. Title: Salt marsh impoundment management along Florida's IR Lagoon: historical perspectives and current implementation trends, Wilmington, DEL.

September 1991. Coastal Nongame Workshop, Title: Multipurpose management of Florida's mosquito control impoundments, Gainesville, FL.

January 1994. National Estuary Program's Directors Meeting, Topic: Florida's scientific and political solutions for salt marsh management issues, Port Canaveral, FL.

STATE MEETINGS:

FLORIDA MOSQUITO CONTROL ASSOCIATION:

April 1981, Ft. Lauderdale, FL. Title: The use of impoundments as wastewater treatment plant holding ponds-its impact for mosquito control.

May 1982, Port St. Lucie, FL. Title: Mosquitoes associated with evaporation-percolation ponds in Indian River County.

April 1984, Key West, FL. Titles: (1) Salt marsh impoundments used for wastewater retention: resource value and mosquito potential & (2) Mosquito populations in a salt-marsh mosquito control impoundment under differing water management regimes.

1985, (Sarasota), 1986 (Jacksonville), 1987 (Palm Beach), 1988 (Pensacola), 1989 (Orlando), 1990 (Ocala), 1991 (Clearwater), 1992 (Cocoa Beach), 1993 (Ocala), 1994 (Destin): Topics dealing with progress by the Subcommittee on Managed Marshes in addressing Florida's salt marsh management issues.

April 1995, Naples, FL. Title: From research to RIM: using science to make sound salt marsh management decisions.

Nov. 1996, Kissimmee, FL. Title: A review of the 3rd Workshop on Salt Marsh Management & Research: learning the latest developments in salt marsh mosquito control, regulations and research.

1997 (St. Augustine), 1998 (Clearwater), 1999 (Daytona Beach), 2000 (Panama City). Title: Status of the AMCA's participation in the PESP Program.

April 1999, Crystal River, FL. Title: Worries & woes of insurance.

Nov. 2000, Panama City, FL. Title: Florida's participation in the 4th Mosquito Control Association of Australia Symposium.

Nov. 2001, Ft. Myers, FL. Title: Florida's participation at the AMCA's 2001 Washington Days.

Nov. 2002, Amelia Island, FL. Organizer of symposium entitled: Recognizing John Beidler's 50+ years of contributions to mosquito control.

May 2003, Ft. Pierce, FL. Titles: 1) Florida's participation at the 2003 AMCA Washington Days. 2) 20 Years of the Subcommittee on Managed Marshes.

Nov. 2004, Orlando, FL. Titles: 1) A review of AMCA's Washington Days and FMCA's Tallahassee Days, 2) Cooperation between mosquito control districts on source reduction projects (with J. Stewart).

Nov. 2005, Duck Key, FL. Presidential Address.

Nov. 2006, Jensen Island, FL. 1) Title: The Florida White Paper: efforts to update the 1998 edition (with R. Connelly). 2) IRMCD's Hole-in-the-Wall Gang: surviving 3 hurricanes, 3 permitting agencies, FEMA and a runaway barge (with J. Mason, R. Wilson, M. Hudon & G. Heinlein).

Nov. 2007, Jacksonville, FL. Titles: 1) Status of revising the Florida White Paper (with R. Connelly), 2) Overview of AMCA's Washington Days and FMCA's Tallahassee Days (with D. Moore).

Nov. 2008, Panama City, FL. Titles: 1) Status of revising the Florida White Paper (with R. Connelly), 2) Overview of AMCA's Washington Day and FMCA's Tallahassee Day (with D. Moore).

Nov. 2009, Tampa, FL. Titles: 1) AMCA Update, 2) Overview of AMCA's Washington Day.

Nov. 2010, Duck Key, FL. Titles: 1) AMCA's Washington Day 2010, 2) The Subcommittee on Managed Marshes: 27 years, 41 members and still pumping!

Nov. 2011, Jacksonville, FL, Miramar Beach 2012, Lee Co. 2013, Destin 2014, Westin 2015, St. Augustine 2016, Title: Florida's participation in the AMCA's Washington Conference.

Nov. 2017, Orlando: Titles: 1) Florida's participation in the AMCA's Washington Conference, 2) Thoughts on the difficulties of interpreting shared mosquito abundance data

Nov. 2018, Orlando: White Paper status, AMCA Washington Conference Update

Nov. 2019, St. Augustine: 1) Keynote Address: Fla. Coordinating Council and it's Subcommittee on Managed Marshes: Working since 1983 to bridge the gap between mosquito control and environmental concerns, 2) AMCA Washington Conference update.

MISCELLANEOUS STATE & LOCAL MEETINGS: Includes presentations to the Fla. Coordinating Council on Mosquito Control, St. Johns River Water Management District Governing Board, Florida Institute of Technology IRL symposium, IR Co. Commission, Audubon Society, Sierra Club, U.S. Fish and Wildlife Service, National Estuary Program, Florida A&M/PHEREC, Anastasia MCD, Treasure Coast Council of Local Governments, Indian River State College, Native Plant Society, Mitigation Bank Review Team, IR Co. Environmental Learning Center (ELC), Friends of the Sebastian River, local organizations including service clubs, schools and churches. Also, annually instructed classes at the FMCA Dodd Short Courses.

INTERESTS:

Water sports (surfing, kayaking, paddleboarding), guitar, woodworking, Duke University Alumni Admissions Advisory Committee-local chapter Chairman (1992-2020), blood donor (27+ gallons), Member of Congregational Council (including Past President) and Assistant to Minister at Christ the King Lutheran Church (Sebastian).

The Indian River Mosquito Control District (IRMCD) will need specialized data analysis to support us when we secure grants and contracts. At present, the district does not have a dedicated in-house data analyst with the specialized expertise and capacity necessary to perform comprehensive statistical analysis, data interpretation, and visualization. Dr. Rochlin has over 65 publications and performed most of the data analysis for them. He has served as a consultant for Mercer County Mosquito Control, Salt Lake City Mosquito Abatement District, and the St. Tammany Parish Mosquito Abatement District. IRMCD will use his services only when funds are secured from grants or contracts.

ILIA ROCHLIN, PhD
ENTOSTAT LLC

EXPERIENCE

Centers for Disease Control and Prevention (CDC) 2022- Now
Lead Epidemiologist

Stony Brook University, Micro-biology & Immunology 2022- Now
Research Assistant Professor

Suffolk County (NY), Division of Vector Control 2006-2022
Laboratory Director, Medical Entomologist

New York State, DOH
Research Scientist, 2002-2005

EDUCATION

PhD Health Sciences and Epidemiology, Touro University, New York City

Graduate Program in Entomology, Cornell University, Ithaca, NY

MS in Biology, Weizmann Institute of Science, Israel

BS in Biology, Tel Aviv University, Israel

CONTACT

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E ilia.rochlin@gmail.com

HIGHLIGHTS OF QUALIFICATION

- Mosquito & tick biology, ecology, and control
- West Nile virus, other vector-borne pathogen surveillance
- Salt marsh and wetland ecology & restoration
- Statistical analytical techniques including advanced analytics and modeling with applications in field research and surveillance
- Data science, “big data” analytics including ML/AI
- Geographic Information Systems (GIS)
- Over 70 published studies in leading peer-reviewed journals
- Media coverage by major outlets such as BBC, CNN, National Geographic, the Atlantic, New York Magazine, Newsday, and New Scientist

CONSULTING PROJECTS

Salt Lake City Mosquito Abatement District

- Mosquito biology, ecology, and control
- Pesticide application efficacy assessments
- Wetland restoration and effects on mosquito populations

St. Tammany Parish Mosquito Abatement District

- Mosquito biology, ecology, and control
- Pesticide efficacy assessment
- Surveillance

Ducks Unlimited

- Salt marsh restoration

Central Life Sciences

- Advanced statistical analysis & training

Applied Biomathematics

- Modeling of tick populations and tick-borne disease transmission

PUBLICATIONS

Full list of peer reviewed article at:
https://scholar.google.com/citations?user=qMInRzgAAAAJ&hl=en

The Indian River Mosquito Control District understands that effective mosquito management depends on science-based surveillance, control practices, and environmental stewardship. One of the District's main goals is to use the best available scientific information to monitor mosquito populations and mosquito-borne disease threats, guide control decisions, and protect public health while minimizing environmental impacts. Our approach improves our practices, so mosquito control remains effective in protecting public health.

Dr. Jonathan Day's role as a scientific advisor will be fundamental to the District's efforts to accomplish these goals. Dr. Day is a nationally and internationally recognized expert in medical entomology, with a focus on mosquito-borne diseases, mosquito control, and arbovirus surveillance. He has collaborated with researchers and staff at the District since 1982 and was instrumental in the District's decision-making process during the 1990 St. Louis encephalitis epidemic. His extensive scientific and operational experience, including his substantial work on *Cx. nigripalpus*, one of the most abundant mosquito species in Indian River County, will provide great value to the District as it continues to address the public health challenges posed by mosquitoes, the deadliest animal on earth.

One of Dr. Day's most significant contributions to Florida public health is his research on mosquito-borne disease surveillance and encephalitis viruses. His research has provided the scientific foundation for Florida's mosquito disease surveillance program, which monitors mosquito populations and arboviral activity and provides advanced warning of conditions that may precede human disease outbreaks. Dr. Day's expertise would be particularly valuable to the Indian River Mosquito Control District (IRMCD) because the District must continually evaluate emerging disease threats, changing mosquito populations, environmental conditions, and the effectiveness of mosquito-management strategies.

The District will benefit from Dr. Jonathan Day's appointment to the Scientific Advisory Board. His knowledge and experience with Florida's mosquito-borne diseases would provide the IRMCD with exceptional scientific guidance. His participation would enhance the District's ability to make informed, evidence-based decisions and advance its mission to protect the health and quality of life of the residents and visitors of Indian River County.

Jonathan Fielding Day
Florida Medical Entomology Laboratory
200 9th St. SE
Vero Beach, Florida 32962
Telephone: (772) 226-6655
FAX: (772) 226-6669
email: jfda@ufl.edu

Born February 8, 1952, Boston, Massachusetts.
Married with children.

PROFESSIONAL RESPONSIBILITIES:

Medical Entomologist and Ecologist studying the natural history, epidemiology and ecology of mosquito-borne viruses found in North America. Studies include tracking arboviral transmission by using novel surveillance techniques, tracking vector populations, tracking avian amplification host populations, predicting epidemic and enzootic transmission and creating human and domestic animal transmission risk maps that can be viewed at http://eis.ifas.ufl.edu. In addition, studies are conducted on novel biting fly control strategies including removal trapping protocols directed against saltmarsh mosquitoes and biting midges.

EDUCATION:

B.S. 1974. Lyndon State College, Lyndonville, Vermont. Major: Environmental Science.

M.S. 1978. State University of New York at Fredonia. MAJOR: Biology with an emphasis in Ecology. THESIS: The Population Dynamics and Possible Coevolution of Siphonapteran Nest Parasites Infesting the Southern Flying Squirrel (*Glaucomys volans volans*). GRADUATE ADVISOR: Allen H. Benton.

Ph.D. 1981. University of Massachusetts at Amherst. MAJOR: Medical Entomology. DISSERTATION: The Effect of Host Health on Mosquito Engorgement and its Possible Importance in Disease Transmission. GRADUATE ADVISOR: John D. Edman.

Postdoctoral Training. University of Massachusetts, 1981-1982; Florida Medical Entomology Laboratory, University of Florida, Vero Beach, 1982-1986.

EMPLOYMENT:

1975-1976. Math and Science Teacher, Lyndon Institute, Lyndonville, VT.

1976-1978. Teaching Assistant, State University of New York at Fredonia. Courses taught: biology laboratory, human physiology laboratory, ecology laboratory, biology lecture.

1978-1981. Graduate Research Assistant, University of Massachusetts, Amherst, MA.

1981-1982. Postdoctoral Research Assistant, Departments of Entomology and Zoology, University of Massachusetts, Amherst, MA.

1982-1986. Postdoctoral Research Assistant, Florida Medical Entomology Laboratory, University of Florida, Vero Beach, FL.

1986-1991. Assistant Professor, Department of Entomology and Nematology, Florida Medical Entomology Laboratory, IFAS, University of Florida, Vero Beach.

1991-1998. Associate Professor, Department of Entomology and Nematology, Florida Medical Entomology Laboratory, IFAS, University of Florida, Vero Beach.

1998-Present. Professor of Medical Entomology, Department of Entomology and Nematology, Florida Medical Entomology Laboratory, IFAS, University of Florida, Vero Beach.

TEACHING/ADVISING/INSTRUCTIONAL EXPERIENCE:

1. Member of the University of Florida Graduate Faculty, May 1996.

2. Undergraduate and Graduate Students supervised:

1985, 1991, 1992, 1993, 1994. University of Florida High School Teacher Summer Intern Program.

1998-2001. Member of University of Florida Ph.D. Graduate Committee for Michael R. Patnaude, Department of Entomology and Nematology.

1998-2002. Member of University of Florida M.S. Graduate Committee for Robert Dusek, Department of Wildlife Ecology and Conservation.

1998-2003. Member of University of Florida, Ph.D. Graduate Committee for Pieter Harm A. Van Essen, Department of Entomology and Nematology.

2003. Member of Columbia University, Ph.D. Graduate Committee for Jeffery Shaman, Lamont Doherty Earth Observatory.

2001-2005. Co-chair of University of Florida Ph.D. Graduate Committee for Aissa Doumbouya, Department of Entomology and Nematology.

2002-2005. Chair of University of Florida M.S. Graduate Committee for Justin Harbison, Department of Entomology and Nematology.

2003-2008. Co-chair of University of Florida Ph.D. Graduate Committee for Leslie Viguers Rios, Department of Entomology and Nematology.

2004-2007. Member of University of Florida M.S. Graduate Committee for Kevin Kobylinski, Department of Entomology and Nematology.

2005-2008. Member of University of Florida M.S. Graduate Committee for Kendra Pesco, Department of Entomology and Nematology.

3. Postdoctoral research associates supported:

1987-1988. Dr. Elizabeth A. Graser, National Institutes of Health Postdoctoral Research Associate, Florida Medical Entomology Laboratory, Vero Beach, FL.

2004-2008. Dr. Christopher Vitek, National Institutes of Health Postdoctoral Research Associate, Florida Medical Entomology Laboratory, Vero Beach, FL.

4. Visiting Scientists sponsored:

1987-1988. Jin-tong Zhang, visiting scientist from the Dept. of Vector Biology and Control, Institute of Microbiology and Epidemiology, Beijing, People's Republic of China.

5. Courses taught:

1984. "Measures of vector age" and "Adult nutrition in mosquitoes," **ENY 6934** (Topics in Medical Entomology), Florida Medical Entomology Laboratory, Vero Beach.

1984. "Mosquito Biology and Control," (Florida Mosquito Control Association Short Courses), Florida Medical Entomology Laboratory, Vero Beach.

1985. "Mosquito Biology," (Florida Mosquito Control Association Short Courses), Treeo Center, Gainesville, Florida.

1987. "Methods of vector surveillance," **ENY 6932** (Topics in Medical Entomology), Florida Medical Entomology Laboratory, Vero Beach.

1988. "Encephalitis Viruses," (Florida Mosquito Control Association Short Courses), Tampa, Florida.

1989. "Basic Disease Transmission" and "Encephalitis Viruses," (Florida Mosquito Control Association Short Courses), Tampa, Florida.

1989. "Arboviral Surveillance in Florida," **ENY 6932** (Topics in Medical Entomology), Florida Medical Entomology Laboratory, Vero Beach.

1990. "Principles of Disease Transmission" and "Attractants and Repellents," (Florida Mosquito Control Association Short Courses), Ocala, Florida.

1990. "Arboviral Surveillance in Florida," (Florida Public Health Workers Short Course), Florida Medical Entomology Laboratory, Vero Beach.

1991. "Arboviral Surveillance," (Control of mosquitoes and mosquito-borne diseases in the U.S.) American Mosquito Control Association/University of South Carolina, McClellanville, SC.

1991. "St. Louis Encephalitis: Monitoring and Responding to an Epidemic," (Florida Mosquito Control Association Short Courses), Daytona Beach, Florida.

1992. "Epidemiology of Arthropod-borne Diseases" and "Removal Trapping," (Florida Mosquito Control Association Short Courses), Daytona Beach, Florida.

1992. "Arboviral Surveillance," (Control of mosquitoes and mosquito-borne diseases in the U.S.) American Mosquito Control Association/University of South Carolina, McClellanville, SC.

1994. "SLE: 1993 Outbreak and Prognosis for 1994," (Florida Public Health Workers Short Course), Archbold Biological Station, Lake Placid, Florida.

1994. "Arboviral Surveillance in Florida," **ENY 6932** (Florida Mosquito Ecology), Florida Medical Entomology Laboratory, Vero Beach.

1994-2002. "Mosquito-borne viruses," **ENY 6660/ENY 6665** (Medical and Veterinary Entomology), Department of Entomology and Nematology, University of Florida, Gainesville.

1995. "Biology of Major Florida Pest and Vector Mosquitoes," (Florida Mosquito Control Association Dodd Short Courses), Daytona Beach, Florida.

1996. "Florida Arboviruses," **PHC 6512-001** (Vectors of Human Disease), College of Public Health, University of South Florida, Tampa, Florida.

1997. "Disease Epidemiology" and "Biting Midges, Sandflies and *Glossina*," **ENY 4660** (Medical and Veterinary Entomology), University of Florida, Ft. Lauderdale Research and Education Center.

1997. "Mosquito Surveillance: Objectives and Methods," (Florida Mosquito Control Association Certification Course in Mosquito Identification), Florida Medical Entomology Laboratory, Vero Beach.

1998 and 1999. "Biology, Identification and Control of Sandflies," (Florida Mosquito Control Association Dodd Short Courses), Gainesville, Florida.

1999-2004. "Mosquito-borne disease transmission in Florida," (FMEL Mosquito Identification Course), Vero Beach, Florida.

2000. "St. Louis Encephalitis in Florida," **In-service Training # 10126** (University of Florida, IFAS Extension Training), Florida Medical Entomology Laboratory, Vero Beach.

2001. "Introduction to Florida Mosquito-borne diseases," (Florida Mosquito Control Association Dodd Short Courses), Gainesville, Florida.

2003. "Predicting arboviral epidemics in Florida" (Florida Mosquito Control Association Dodd Short Courses), Gainesville, Florida.

2003. "The good, the bad, and the ugly of media interviews" (Florida Mosquito Control Association Dodd Short Courses), Gainesville, Florida.

2003. "The introduction and movement of West Nile virus in Florida" (Florida Mosquito Control Association Dodd Short Courses), Gainesville, Florida.

2003. "Interpretation of weekly, monthly, and annual sentinel chicken surveillance results–what do the results mean?" (FMEL/FL DOH Sentinel Chicken Workshop), Ft. Pierce, Florida.

2003. "The Florida Medical Entomology Laboratory Encephalitis Information System (Suncoast Arbovirus Symposium) Largo, Florida.

2003. "The North American invasion of West Nile Virus: 1999-2003," **PCB 2441** (Biological Invaders), Department of Agronomy, University of Florida, Gainesville.

2004. "Medical Entomology" (Florida Mosquito Control Association Dodd Short Courses), Gainesville, Florida.

UNIVERSITY GOVERNANCE AND SERVICE:

Institute of Food and Agricultural Sciences :

CRIS Project Review Committees (3)

Florida Medical Entomology Laboratory:

Chair, Arbovirologist Search and Screen Committee
Member, Director Search and Screen Committee
Member, Extension Entomologist Search and Screen Committee
Member, Mathematical Ecologist Search and Screen Committee
Acting Director

SIGNIFICANT CONSULTATIONS:

United States Environmental Protection Agency FIFRA SAP, 2000-2006

National Institutes of Health, 2000
Centers for Disease Control and Prevention, 1999-2002
City of Boynton Beach, Florida, 1994-1998
City of Ocean Ridge, Florida, 1994-1998
Expert Witness, State of Florida, 1991, 2001, and 2003
United States Fish and Wildlife Service, 1989-2006

PATENTS:

U.S. Patent 5,943,815 awarded 8-31-99. Paganessi, J., R. Lee and J.F. Day. Method and delivery system for the carbon dioxide-based area-specific attraction of insects, Part One.

U.S. Patent 6,272,790 awarded 8-14-01. Paganessi, J., R. Lee and J.F. Day. Method and delivery system for the carbon dioxide-based area-specific attraction of insects, Part Two.

CREATIVE WORKS:

2001-2004: Florida Medical Entomology Laboratory Encephalitis Information System Florida Risk Maps which can be viewed at the http://eis.ifas.ufl.edu web site.

AWARDS/HONORS:

1978. Sigma Xi
1980. Awarded the Daniel M. Jobbins Scholarship. Presented by the Northeast Mosquito Control Association
1981-1984. National Institutes of Health Postdoctoral Trainee
1990. Served on the Grant Review Board for the Louisiana Board of Regents
1990. Awarded the Florida Mosquito Control Association Short Courses Outstanding Contributor and Teacher
1992. Awarded the Florida Entomological Society Achievement for Outstanding Research
1997. Invited presenter of the Highlights in Medical Entomology Lecture at the Annual Meeting of the Entomological Society of America
2001. USDA Secretary's Honor Award
1999-2002. Peer Review Team for CDC, Ft. Collins, Colorado
2001-06. Member of the Florida West Nile Partners Task Force
2003. Pelican Island Audubon Society Board Member of the Year
2003. University of Florida/NSF Alliance for Graduate Education and the Professoriate Award
2004-2007. University of Florida Research Foundation Professorship
2004. National Science Foundation/AAAS Science and Engineering Visualization Challenge Award
2005. UF IFAS Gold IMAGE Award
2005. Joseph Y. Porter Distinguished Achievement Award from the Florida Mosquito Control Association
2015. Memorial Lecturer Award from the American Mosquito Control Association
2018. Maurice W. Provost Memorial Award from the Florida Mosquito Control Association
2019. Medal of Honor from the American Mosquito Control Association

GRANTS AND CONTRACTS (Career total = $4,477,697):

Carbon dioxide as a biological control agents against adult mosquitoes. Canadian Liquid Air, Ltd., Chicago, IL and Montreal, Quebec, Canada. 1-1-85 to 12-1-91, $17,796, **Principal Investigator**.

The evaluation of adult mosquito population changes in West Pasco County. Florida Department of Health and Rehabilitative Services. 12-1-85 to 6-30-86, $22,190, **Co-principal Investigator**.

Evaluation of mosquito flight behavior in a wind tunnel. National Institutes of Health. 4-1-86 to 12-31-89, $182,869,

Principal Investigator.

Field testing of arthropod repellent formulations with humans. U. S. Army through BIOTEK, Inc. Woburn, Massachusetts. 5-1 to 9-30-86, $24,676, **Principal Investigator**.

The mathematical evaluation of St. Louis encephalitis virus seroconversions in sentinel flocks from the east and west Florida coasts. Florida Department of Health and Rehabilitative Services. 9-16-86 to 9-15-87, $8,867, **Principal Investigator**.

The evaluation of adult mosquito population changes in West Pasco County II. Florida Department of Health and Rehabilitative Services. 12-1-86 to 11-30-87, $25,319, **Co-principal Investigator**.

NIH Small Instrumentation Grant; Recording wind systems. National Institutes of Health. 9-30-87 to 6-30-88, $9,719, **Principal Investigator**.

Laboratory evaluation of S.N.20 insecticidal activity against three mosquito species. RD & Associates. 5-2 to 10-1-88, $4,200, **Principal Investigator**.

Rodent surveillance for the earlier detection of SLE & EEE virus activity in southern Florida. Florida Department of Health and Rehabilitative Services. 9-16-88 to 9-15-89, $23,160, **Principal Investigator**.

Identification of the maintenance and amplification hosts of St. Louis encephalitis virus in Florida. Florida Department of Health and Rehabilitative Services. 7-1-89 to 6-1-90, $30,600, **Principal Investigator**.

Arboviral research and mosquito surveillance at Reedy Creek Improvement District, Orange County, Florida. Reedy Creek Improvement District. 4-1-91 to 9-30-93, $43,760, **Principal Investigator**.

Carbon dioxide and other attractants as biological control agents against biting insects. Canadian Liquid Air, Ltd., Chicago, IL and Montreal, Quebec, Canada. 9-1-92 to 8-31-93, $5,000, **Principal Investigator**.

Role of mosquitoes associated with waste tire piles in the ecology of arboviruses. Florida Department of Agriculture and Consumer Services. 1-1 to 11-30-93, $64,567, **Co-principal Investigator** .

Dispersal of container breeding mosquitoes from tire dumps in Indian River County, Florida. Florida Department of Agriculture and Consumer Services. 7-1-93 to 6-30-94, $45,675, **Principal Investigator**.

The impact of arboviral infection on a Volusia County emu farm. American Emu Association. 4-7-94 to 4-6-95, $2,500, **Principal Investigator**.

Evaluation of emus for St. Louis encephalitis virus and antibody. Florida Emu Association. 7-1-94 to 6-30-95, $1,500, **Principal Investigator**.

Mosquito management on National Wildlife Refuges: Ecosystem Effects Study. United States Department of the Interior, Fish and Wildlife Service. 2-1-96 to 2-1-97, $11,000, **Principal Investigator**.

Removal trapping for the control of sand flies in Boynton Beach, Florida. FDACS, Bureau of Entomology and Pest Control. 12-18-96 to 11-30-97, $69,618, **Principal Investigator**.

Removal trapping for the control of sand flies in Boynton Beach, FL, Year 2. FDACS, Bureau of Entomology and Pest Control. 12-15-97 to 11-28-98, $23,667, **Principal Investigator**.

Modeling St. Louis encephalitis transmission. University of Florida Research Project Enhancement Award. 7-1-97 to 6-30-98, $11,050, **Co-principal Investigator**.

The use of satellite-generated meteorological data to predict mosquito-borne encephalitis transmission in North

America: preliminary studies. NASA. 10/1/98 to 9/30/00, $36,000, **Principal Investigator.**

Modeling St. Louis encephalitis transmission. NIH. 2-1-99 to 1-31-03, $201,214, **Co-principal Investigator**.

Removal trapping for biting fly control. Walt Disney Imagineering. 3-1-99 to 9-30-07, $214,804, **Principal Investigator**.

Culex nigripalpus dispersal from daytime resting sites. FDACS, Bureau of Entomology and Pest Control. 2-9-99 to 11-30-99, $31,227, **Principal Investigator**.

Surveillance and control of St. Louis encephalitis virus in Florida. FDACS, Bureau of Entomology and Pest Control. 1-1-00 to 12-31-00, $101,210, **Principal Investigator**.

Seasonal changes in the *Culex nigripalpus* human biting index. FDACS, Bureau of Entomology and Pest Control. 2-8-00 to 11-30-00, $29,081, **Principal Investigator**.

Aedes taeniorhynchus adult dispersal from island larval habitats. FDACS, Bureau of Entomology and Pest Control. 1-1-00 to 12-31-00, $42,525, **Principal Investigator**.

Implementing a method to improve arboviral surveillance in Florida. FDACS, Bureau of Entomology and Pest Control. 3-5-02 to 3-31-03, $112,938, **Principal Investigator**.

Rapid determination of real-time arboviral transmission rates using the FMEL ARDS protocol. FDACS, Bureau of Entomology and Pest Control. 4-1-03 to 3-31-04, $88,788, **Principal Investigator**.

The importance of a *Culex nigripalpus* species complex to arboviral transmission in Florida. FDACS, Bureau of Entomology and Pest Control. 4-1-03 to 3-31-04, $48,779, **Principal Investigator**.

The FMEL Sentinel Chicken Workshop. Florida Department of Health. 6-11-03, $825, **Principal Investigator**.

Barrier system management. Walt Disney World, Research and Development. 10-01-03 to 09-30-07, $15,098, **Principal Investigator**.

Real-time spatiotemporal arboviral transmission maps and animations for Florida. FDACS, Bureau of Entomology and Pest Control. 2-18-04 to 12-31-04, $54,159, **Principal Investigator**.

The importance of a *Culex nigripalpus* species complex to arboviral transmission in Florida: Year 2. FDACS, Bureau of Entomology and Pest Control. 2-20-04 to 12-31-04, $55,377, **Principal Investigator**.

Modeling and empirical studies of arboviruses in Florida. NIH. 6-1-04 to 5-31-09, $2,868,074, **Co-investigator.**

University of Florida Research Foundation Professorship Award. University of Florida. 9-1-05 to 6-30-07, $3,000, **Principal Investigator.**

Using modeled water table depth to help reduce emergency mosquito control insecticide applications in Florida. FDACS, Bureau of Entomology and Pest Control. 7-6-07 to 6-30-08, $41,475, **Principal Investigator**.

Adapting the Keetch-Byram Drought Index to achieve statewide prediction of arboviral epidemic risk and vector abundance in support of mosquito control operations in Florida. FDACS, Bureau of Entomology and Pest Control. 10-15-08 to 9-30-09, $38,010, **Principal Investigator**.

Integration of EEE virus into the FMEL statewide surveillance models for mosquito population and arboviral transmission prediction in support of mosquito control operations in Florida. FDACS, Bureau of Entomology and Pest Control. 9-22-09 to 9-15-10, $36,083, **Principal Investigator**.

Field testing carbon dioxide-baited tent traps. Mainstream Engineering and U.S. Department of Defense. 10-07-10 to

11-30-10, $9,652, **Principal Investigator**.

Integration of real time avian population data into the FMEL Arboviral Epidemic Risk Models. FDACS, Bureau of Entomology and Pest Control. 11-12-10 to 9-30-11, $32,936, **Principal Investigator**.

Migration of the Linux-based FMEL Arboviral Epidemic Risk Models for South Florida to a Windows-based form in Support of Florida Mosquito Control Programs. FDACS, Bureau of Entomology and Pest Control. 12-15-11 to 9-30-12, $32,760, **Principal Investigator**.

Field testing the Lebost-Evarcha mosquito trap. Evarcha, Inc. 7-1-13 to 10-31-13, $10,000, **Principal Investigator**.

Teaching critical thinking in the Brevard Public School System school age child care. Brevard County, Florida. 8-19-13 to 6-30-14, $3,000, **Principal Investigator**.

A Cost-effectiveness Analysis of Sentinel Chicken Arboviral Surveillance in Orange County, Florida. FDACS, Bureau of Entomology and Pest Control. 2-1-15 to 9-15-15, $11,880, **Principal Investigator**.

Implementation of a Comprehensive and Sustainable Arbovirus Surveillance Program at the County Level. FDACS, Bureau of Entomology and Pest Control. 9-1-15 to 8-31-17, $67,089, **Principal Investigator**.

Evaluation of the Association of Long-Term Breeding Bird Surveys and Audubon Christmas Counts Data with the Transmission of Saint Louis Encephalitis Virus and West Nile Virus to Sentinel Chickens. FDACS, Bureau of Entomology and Pest Control. 9-1-15 to 8-31-16, $17,024, **Principal Investigator**.

PROFESSIONAL SERVICE:

Service to Professional Societies:

Board of Directors and Southeastern Regional Director, Society for Vector Ecology, 1995-2000.
Editorial Board, *Journal of the American Mosquito Control Association*, 1997-2000, Chair 2000.
Editorial Board, *Journal of Medical Entomology*, 1995-2000, Chair 2000.
Subject Editor, *Journal of Medical Entomology*, 2001-2005.
Centers for Disease Control and Prevention West Nile Virus Planning Panel, 1999, 2000 and 2001.
Co-Chair, National Institutes of Health Select Panel on Vector Biology Research Priorities, 2000.
Environmental Protection Agency Scientific Advisory Panel on Insect Repellent Product Performance Testing Guideline Evaluation, 2000-2005.
Editorial Board, *Journal of the Florida Mosquito Control Association*, 1998-2002.
Board of Directors, Pelican Island Audubon Society, 1994-2003.
NIH SBRI Study Section, 2005.

Manuscripts and Grants Reviewed:

1982 = 3; 1983 = 5; 1984 = 3; 1985 = 6; 1986 = 3; 1987 = 4; 1988 = 5; 1989 = 15; 1990 = 17; 1991 = 9; 1992 = 15; 1993 = 13; 1994 = 11; 1995 = 11; 1996 = 10; 1997 = 9; 1998 = 13; 1999 = 8; 2000 = 23; 2001 = 28; 2002 = 31; 2003 = 31. **Total to date = 673**.

MEDIA INTERVIEWS:

1982 = 1; 1983 = 1; 1984 = 2; 1985 = 5; 1986 = 3; 1987 = 1; 1988 = 2; 1989 = 7; 1990 = 114; 1991 = 54; 1992 = 31; 1993 = 21; 1994 = 5; 1995 = 16; 1996 = 5; 1997 = 7; 1998 = 97; 1999 = 105; 2000 = 54; 2001 = 49; 2002 = 31; 2003 = 42. **Total to date = 653**.

LECTURES, SPEECHES OR POSTERS PRESENTED AT PROFESSIONAL CONFERENCES:

International (Invited)

"Vector-host interplay, factors affecting disease transmission." Mosquito Ecology Workshop, Florida Medical Entomology Laboratory and the University of Florida, Welaka, Florida, February, 1984.

"Removal trapping for vector control." International Hematophagous Insect Attractants Symposium, University of Minnesota, Minneapolis, 1989.

"Carbon dioxide insect trapping." International Air Liquide Innovation Competition, Milan, Italy, 1997.

"Interaction of *Culex nigripalpus* and wild birds in Florida St. Louis encephalitis virus transmission cycles." XXI International Congress of Entomology, Iguassu Falls, Brazil, 2000.

International (Contributor)

"A review of arthropod-borne disease in the southeastern United States: 1990-1993." Society of Vector Ecology International Conference, San Diego, California, 1993.

"Eastern equine encephalomyelitis, satellites and swamps, Asian Tiger Mosquitoes and emus: New insights on an old disease." Seventh International Conference on Equine Infections Diseases, Tokyo, Japan, 1994.

"Removal trapping for the control of biting midges in southern Florida." Second International Attractants Workshop, Vero Beach, Florida, 1997.

"Encephalitis virus in Blue Jays in Florida." American Ornithologists' Union International Congress, Memorial University of Newfoundland, St. John's, Newfoundland, 2000.

National (Invited)

"St. Louis encephalitis virus in south Florida: The influence of meteorological events on the biology of the vector mosquito: *Culex nigripalpus*." Department of Entomology, University of Maryland, 1986.

"The 1990 Florida St. Louis encephalitis epidemic." Virginia Mosquito Control Association, Williamsburg, Virginia, 1991.

"A review of the 1990 Florida St. Louis encephalitis epidemic." American Mosquito Control Association, New Orleans, 1991.

"A history of mosquito-borne encephalitis viruses in the South Atlantic Region." American Mosquito Control Association, New Orleans, 1991.

"Surveillance for mosquito-borne encephalitis viruses in the South Atlantic Region." American Mosquito Control Association, New Orleans, 1991.
"Forecasting St. Louis encephalitis virus activity in Florida." New Jersey Mosquito Control Association, Atlantic City, New Jersey, 1991.

"St. Louis encephalitis virus surveillance and forecasting human epidemic activity in Florida." Centers for Disease Control, Ft. Collins, Colorado, 1991.

"Arboviral serosurvey of Florida Scrub Jays and Blue Jays in Highlands County during 1994." Animal Disease Research Worker's Conference, Gainesville, Florida, 1995.

"Predicting outbreaks of mosquito-borne encephalitis virus." Kansas Vector-borne Disease Prevention Conference,

Kansas State University, Manhattan, Kansas, 1995.

"Mosquito control decisions based on wild avian surveillance." Symposium organizer, "Using surveillance data to make vector control decisions." American Mosquito Control Association, Norfolk, Virginia, 1996.

"Avian population dynamics as a key factor in virus amplification." Symposium organizer, "Recent trends in research on mosquito-borne viruses." Entomological Society of America, Louisville, Kentucky, 1996.

"Carbon dioxide insect trapping." National Air Liquide Innovation Competition, Houston, Texas, 1996.

"Highlights of Medical Entomology: 1997." Entomological Society of America, Nashville, Tennessee, 1997.

"Predicting St. Louis encephalitis virus epidemics in central Florida." Walt Disney World Environmental Conference, Wabasso, Florida, 1998.

"The Boynton Beach, Florida biting midge removal project." And Symposium Organizer, "The development of a biting arthropod removal trapping program." Society for Vector Ecology, College Station, Texas, 1998.

"Host seeking behavior of arthropod disease vectors." Entomological Society of America, Atlanta, Georgia, 1999.

"Mosquito-borne arbovirus transmission in Florida during 1999." American Mosquito Control Association, Atlantic City, New Jersey, 2000.

"Host-seeing behavior of arthropod disease vectors." American Mosquito Control Association, Atlantic City, New Jersey, 2000.

"West Nile virus detection vs. surveillance." Centers for Disease Control and Prevention West Nile Virus planning meeting, Charlotte, North Carolina, 2001.

"Health and nuisance factors associated with Culicoides populations in southeastern North America." Entomological Society of America, San Diego, California, 2001.

"Integrated Arboviral Surveillance." Society for Vector Ecology, Boston, Massachusetts, 2004.

"From wind tunnels to West Nile virus: The mentorship of John D. Edman." Society for Vector Ecology, Boston, Massachusetts, 2004.

"West Nile virus in the Southeastern USA: 2001-2005." Entomological Society of America, Ft. Lauderdale, Florida, 2005.

National (Contributor)

"Malaria infection alters host defensive behavior toward blood feeding mosquitoes." Entomological Society of America, Denver, 1979.

"Mosquito blood feeding success on malaria-infected mice." Entomological Society of America, Atlanta, 1980.

"Using estradiol in mosquito blood meals to determine host age." American Society of Tropical Medicine and Hygiene, Atlanta, Georgia, 1980.

"Changes in behavioral patterns of malaria-infected mice." Entomological Society of America, San Diego, 1981.

"The impact of malaria infection on mosquito blood feeding success." American Mosquito Control Association, Orlando, Florida, 1983.

"Malaria-infected mice are least defensive against host seeking mosquitoes when gametocytes are most abundant." Entomological Society of America, Detroit, 1983.

"The epidemiological significance of host defensive behavior." Entomological Society of America, San Antonio, 1984.

"Florida arboviruses." Entomological Society of America, Hollywood, FL, 1985.

"The importance of adult mosquito surveillance to understanding the epidemiology of St. Louis encephalitis virus in southern Florida." American Mosquito Control Association, New Orleans, 1986.

"Rainfall directed oviposition behavior of *Culex nigripalpus* in southern Florida." Entomological Society of America, Boston, 1987.

"Distribution of St. Louis encephalitis virus in sentinel chickens from Sarasota County, Florida." Entomological Society of America, Louisville, KY, 1988.

"Eastern equine encephalitis virus from small mammals in southern Florida." Entomological Society of America, Louisville, KY, 1988.

"Yearly distribution of St. Louis encephalitis virus in Sarasota County, Florida: 1978-1988." American Mosquito Control Association, Boston, 1989.

"Seasonal changes in vector size and parity." American Mosquito Control Association, Lexington, Kentucky, 1990.

"Pinpointing the nectar feeding times of Florida mosquitoes." American Mosquito Control Association, Lexington, Kentucky, 1990.

"Control of a Florida population of *Aedes aegypti* by removal trapping with carbon dioxide gas." American Mosquito Control Association, New Orleans, 1991.

"Removal trapping of mosquitoes." Entomological Society of American, Reno, Nevada, 1991.

"Nectar feeding of *Aedes aegypti* for Puerto Rico; males yes, females no, implications for dengue transmission." American Mosquito Control Association, Corpus Christi, Texas, 1992.

"The exotic bird trade, are we creating artificial arboviral foci?" American Mosquito Control Association, Ft. Myers, Florida, 1993.

"A rapid diagnostic assay for eastern equine encephalitis viral RNA." American Mosquito Control Association, Ft. Myers, Florida, 1993.

"Intense autumn transmission of St. Louis encephalitis virus in southeast costal Florida." American Mosquito Control Association, San Diego, California, 1994.

"*Culex nigripalpus*: the perfect St. Louis encephalitis virus vector in Florida." Society for Vector Ecology, Gainesville, Florida, 1994.

"Are *Aedes aegypti* females energetically unique?" Entomological Society of America, Dallas, Texas, 1994.

"Mosquito control in Florida salt marshes." Entomological Society of America, Dallas, Texas, 1994.

"Accumulation and persistence of males in resting adult populations of *Culex nigripalpus*." American Mosquito

Control Association, Portland, Oregon, 1995.

"Nutritional history of the St. Louis encephalitis virus vector *Culex nigripalpus*." American Mosquito Control Association, Norfolk, Virginia, 1996.

"Simulation studies of the epidemiology of St. Louis encephalitis and *Culex nigripalpus* in Florida." Entomological Society of America, Nashville, Tennessee, 1997.

"Host preference and population dynamics in St. Louis encephalitis virus epidemiology." Entomological Society of America, Las Vegas, Nevada, 1998.

"Modeling St. Louis encephalitis virus in Florida: what factors affect yearly variation in transmission?" American Society of Tropical Medicine and Hygiene, Washington, DC, 1999.

"Identification and serological characterization of a virus isolated from a cotton mouse in Florida." American Society of Tropical Medicine and Hygiene, Washington, DC, 1999.

"Modeling St. Louis encephalitis virus in Florida: what factors affect yearly variation in transmission?" Entomological Society of America, Atlanta, Georgia, 1999.

"Seasonal forecast of St. Louis encephalitis transmission in Florida." American Society of Tropical Medicine and Hygiene, Washington, DC, 2002.

"FMEL arbovirus rapid deployment system: sentinel surveillance for WN virus in Florida." American Mosquito Control Association, Denver, Colorado, 2002.

"Seasonal forecast of St. Louis encephalitis transmission in Florida," and "Interaction of bird and mosquito seasonality in simulations of St. Louis encephalitis virus." Entomological Society of America, Hollywood, Florida, 2002.

"A local forecast of land surface wetness conditions, drought, and St. Louis encephalitis virus transmission derived from seasonal climate predictions." American Geophysical Union, San Francisco, California, 2002.

Regional (Invited)

"Malaria, mice and mosquitoes." USDA Insects Affecting Man and Animals, Gainesville, FL, 1981.

"Malaria, mice and mosquitoes." Department of Entomology, University of Georgia, Athens, 1981.

"Malaria, mice and mosquitoes." University of Massachusetts, Department of Entomology, 1981.

"Malaria, mice and mosquitoes." Florida Medical Entomology Laboratory, IFAS, University of Florida, Vero Beach, 1981.

"Malaria renders mice susceptible to mosquito blood feeding when gametocytes are most abundant." Florida Medical Entomology Laboratory, IFAS, University of Florida, Vero Beach, 1982.

"Mosquito flight in a large outdoor wind tunnel." USDA Insects Affecting Man and Animals, Gainesville, Florida, 1983.

"Mosquito flight in a large outdoor wind tunnel." University of Massachusetts, Department of Entomology, 1984.

"Mosquito flight in a large outdoor wind tunnel." Florida Medical Entomology Laboratory, IFAS, University of Florida, Vero Beach, 1984.

"St. Louis encephalitis, sentinel chickens and mosquito trapping." Florida Anti-Mosquito Association Mosquito Surveillance Program, Vero Beach, 1987.

"North American encephalitis viruses." Florida Anti-Mosquito Association Short Courses, Ocala, 1988.

"Disease transmission." Florida Anti-Mosquito Association Short Courses, Ocala, 1989.

"North American encephalitis viruses." Florida Anti-Mosquito Association Short Courses, Ocala, 1989.

"Principles of disease transmission." Florida Anti-Mosquito Association Short Courses, Ocala, 1990.

"Arthropod attractants." Florida Anti-Mosquito Association Short Courses, Ocala, 1990.

"Arboviral transmission in Florida." IFAS REC, Homestead, Florida, 1990.

"St. Louis encephalitis virus surveillance in Indian River County, Florida." Emergency meeting of the Florida Mosquito Control Directors, Bartow, Florida, 1990.

"The ecology of arboviruses in Florida." Department of Biology, Florida Atlantic University, Boca Raton, Florida, 1990.

"St. Louis encephalitis virus surveillance and response to a widespread epidemic." Florida Mosquito Control Association Short Courses, Daytona Beach, 1991.

"Dispersal and blood feeding of *Culex nigripalpus* mosquitoes in Indian River County, Florida." USDA Laboratory, Gainesville, Florida, 1991.

"A review of St. Louis encephalitis virus surveillance in Florida." Florida Mosquito Control Association, Clearwater, 1991.

"A review of the 1990 St. Louis encephalitis virus epidemic in Indian River County, Florida." Florida Entomological Society, Naples, 1991.

"Arboviral surveillance and the 1990 Florida St. Louis encephalitis virus epidemic." University of South Carolina, Charleston, 1992.

"St. Louis encephalitis virus epidemiology." Dodd Short Courses, Daytona Beach, Florida, 1992.

"The removal trapping of mosquitoes." Dodd Short Courses, Daytona Beach, Florida, 1992.
"Surveillance and detection of arthropod-borne encephalitis viruses in Florida." Southeast Agromedicine Inter-University Consortium, Gainesville, Florida, 1992.

"Deciding when to spray during a medical emergency." University of Florida Video Teleconference, Gainesville, Florida, 1993.

"Vector-borne medical emergencies in Florida, when to spray and when to pray." Florida Environmental Health Association, Tampa, 1994.

"Vector-borne medical emergencies in Florida, when to spray and when to pray." Florida Institute of Technology Humanities Lecture Series, Melbourne, 1994.

"The art of predicting mosquito-borne arboviral epidemics." Archbold Biological Station Lecture Series, Lake Placid, Florida, 1995.

"Carbon dioxide insect trapping." Southeast Regional Air Liquide Innovation Competition, Atlanta, Georgia, 1996.

"Predicting arboviral epidemics: What really happened in Rhode Island during the summer of 1996?" University of Massachusetts Seminar Series, Amherst, MA, 1996.

"Review of Dengue surveillance, prevention and intervention activities." Dade County Health Department, Pan American Hospital, Miami, Florida, 1997.

"The history of St. Louis encephalitis virus in Florida." Florida State Health Department Supervisors, FMEL, Vero Beach, Florida, 1998.

"Avian serology in a St. Louis encephalitis virus epicenter before, during and after a widespread epidemic in south Florida." Florida Mosquito Control Association, Crystal River, 1999.

"A panel discussion on measured responses to the introduction of West Nile virus to Florida." Florida Mosquito Control Association, Safety Harbor, 2000.

"Biting midge removal trapping in temperate and subtropical salt marshes." 4th Workshop on Salt Marsh Management and Research, Vero Beach, Florida, 2000.

"The true extent of West Nile virus transmission in North America: 1999 and 2000." Florida Mosquito Control Association, Winter Haven, 2001.

"Review of West Nile virus transmission in Florida during 2001." Florida Mosquito Control Association, Sanibel Island, 2001.

"The natural history of St. Louis encephalitis virus in eastern North America." Fordham University Department of Biology, New York City, 2001.

"Predicting human arboviral epidemics." New York Medical College, New York City, 2001.

"The challenge of vector control during medical emergencies." Southeastern Center for Emerging Biologic Threats, Emory University, Atlanta, Georgia, 2002.

"Involvement of wild birds in arboviral transmission cycles." Florida Mosquito Control Association, Orlando, Florida, November 2004.

"A meteorological review of the 2004 West Nile virus transmission season in Florida." Florida West Nile Virus Partners Conference, Tallahassee, Florida, February, 2005.

"The importance of birds to Florida arboviral transmission cycles." Second arbovirus surveillance and mosquito control workshop, St. Augustine, Florida, March, 2005.

"Rise and fall of West Nile virus in Florida: 2001-2005." Florida Mosquito Control Association, Hawk's Cay, Duck Key, Florida, November 2005.

Regional (Contributor)

"Mosquitoes associated with sentinel chicken flocks in Indian River County, Florida." Florida Anti-Mosquito Association, Key West, 1984.

"The influence of rainfall on mosquito flight behavior around sentinel chicken flocks in Indian River County, Florida." Florida Anti-Mosquito Association, Sarasota, 1985.

"A history of St. Louis encephalitis virus in Florida." Florida Anti-Mosquito Association, Jacksonville, 1986.

"A comparison of three surveillance methods for adult *Culex nigripalpus*." Florida Anti-Mosquito Association, West Palm Beach, 1987.

"Evaluation of St. Louis encephalitis virus activity as measured by sentinel flocks from 1978-1985." Florida Anti-Mosquito Association, Daytona Beach, 1987.

"Evaluation of St. Louis encephalitis virus activity in Sarasota County from 1978-1986." Florida Anti-Mosquito Association, Pensacola, 1988.

"Arbovirus surveillance in Florida: What function do sentinel chickens serve?" Florida Anti-Mosquito Association, Orlando, 1989.

"The use of wild rodents for arboviral surveillance in Florida." Florida Anti-Mosquito Association, Ocala, 1990.

"Different nectar and blood feeding strategies of *Culex nigripalpus* and *Aedes taeniorhynchus*." Florida Anti-Mosquito Association, Ocala, 1990.

"Forecasting St. Louis encephalitis epidemics." Florida Mosquito Control Association, Vero Beach, 1990.

"Dispersal of container breeding mosquitoes from tier dumps in Indian River County, Florida." Florida Mosquito Control Association, Ocala, 1993.

"Removal trapping for biting midge control." Florida Mosquito Control Association, St. Augustine, 1997.

"Modeling St. Louis encephalitis virus in Florida." Florida Mosquito Control Association, St. Augustine, 1997.

"Future biting fly control strategies." Florida Mosquito Control Association, Orlando, 1998.

"The Boynton Beach Mangrove Park biting midge removal program: an update." Florida Mosquito Control Association, Clearwater, 1998.

"Host preference and population dynamics in models of St. Louis encephalitis virus." Florida Mosquito Control Association, Clearwater, 1998.

"Modeling St. Louis encephalitis virus in Florida: what factors affect yearly variation in transmission?" Florida Mosquito Control Association, Daytona, 1999.
"Frequency of St. Louis encephalitis virus transmission to humans in Florida, USA: 1990-1999." Florida Mosquito Control Association, Daytona, 1999.

"A summary of the 1999 Centers for Disease Control and Prevention West Nile virus workshop in Ft. Collins, Colorado: 11-8 to 11-9-99." Florida Mosquito Control Association, Daytona, 1999.

"*Culex nigripalpus* dispersal from daytime resting sites." Florida Mosquito Control Association, Safety Harbor, 2000.

"St. Louis encephalitis virus transmission in Florida." Florida Mosquito Control Association, Panama City, 2000.

"An FMEL ARDS response to West Nile virus in Volusia County, Florida during 2002," and "The good, the bad, and the ugly of media interviews." Florida Mosquito Control Association, Amelia Island, Florida, 2002.

"Interactive West Nile virus Workshop, Interpretation of the current surveillance data." Florida Mosquito Control Association, Vero Beach, Florida, May 2003.

"Spatiotemporal Arboviral Surveillance in Florida: Tracking West Nile Virus using GIS and Animation." South Florida GIS Expo, West Palm Beach, Florida, September 2003.

"West Nile virus epidemiology in Florida: What we know." Florida Mosquito Control Association, Orlando, Florida, November 2004.

"Population age structure of *Culex nigripalpus* in Florida." Florida Mosquito Control Association, Hawk's Cay, Duck Key, Florida, November 2005.

Local (Invited)

"The epidemiology of St. Louis encephalitis virus in southern Florida." Pelican Island Audubon Society, Vero Beach, Florida, 1986.

"Everything you want (but much more than you need) to know about mosquitoes." National Park Service Flamingo Guest Lecture Series, Flamingo, Florida, 1990.

"The natural history of mosquito-borne viruses in Florida." Pelican Island Audubon Society, Vero Beach, Florida, 1993.

"The truth about AIDS and mosquitoes." Pelican Island Audubon Society, Vero Beach, Florida, 1995.

"The establishment and movement of West Nile virus in Florida." Pelican Island Audubon Society, Vero Beach, Florida and University of Florida Department of Entomology and Nematology Graduate Student Seminar Series, Gainesville, Florida, 2002.

"The importance of birds to Florida arboviral transmission cycles." McKee Botanical Garden Seminar Series, Vero Beach, Florida, March, 2005.

"Mosquito-borne Diseases in Florida: Past and present." University of Florida Mosquito ID Course, Vero Beach, Florida, March, 2005.

"The importance of birds to Florida arboviral transmission cycles." University of Florida, Everglades Research and Education Seminar, Belle Glade, Florida, April, 2005.

"Integrated arboviral surveillance and control." 2005 Florida Keys integrated arboviral surveillance and control workshop, Key West, Florida, June, 2005.

"The importance of birds to Florida arboviral transmission cycles." University of Florida, Entomology and Nematology Department Seminar, Gainesville, Florida, September, 2005.

"A summary of West Nile virus control efforts in Pinellas County during 2005." Pinellas County Board of County Commissioners, St. Petersburg, Florida, September, 2005.

PROFESSIONAL MEMBERSHIPS:

Entomological Society of America, since 1978.
National Audubon Society, since 1982.
Florida Audubon Society, since 1982.
American Mosquito Control Association, since 1978.
Florida Mosquito Control Association, since 1982.
Society for Vector Ecology, since 1994.

INTERNATIONAL ACTIVITIES:

Canada, 1984 to present. An ongoing research collaboration exists between the FMEL and Air Liquide, Canada. The emphasis of this research collaboration is biting arthropod control by using carbon dioxide baited removal traps.

France, 1984 to present. An ongoing research collaboration exists between the FMEL and Air Liquide, France. The emphasis of this research collaboration is biting arthropod control by using carbon dioxide baited removal traps. In addition, we have collaborated on the construction and analysis of dynamic models to predict the flow patterns of carbon dioxide odor plumes.

Thailand, 1994 to 1998. Research was conducted in Thailand to investigate the importance of adult mosquito nutritional status to Dengue transmission in several Thai villages.

Puerto Rico, 1994 to 1998. Research was conducted in San Juan, Puerto Rico and at the FMEL to investigate the relationship of adult mosquito nutritional reserves and Dengue transmission.

Bahamas, 1999 to present. A biting midge/mosquito removal trapping demonstration project is currently being conducted on an isolated island in the Bahamas.

REFEREED PUBLICATIONS:

1. Day, J.F. and A.H. Benton. 1980. Population dynamics and Coevolution of adult Siphonapteran parasites of the southern flying squirrel (*Glaucomys volans volans*). *American Midland Naturalist* 103:333-338.

2. Benton, A.H. and J.F. Day. 1980. Seasonal changes in the flea fauna of nests of the southern flying squirrel. *In* Fleas. (R. Traub and H. Starcke, Eds.) Proceedings of the International Conference on Fleas, Ashton Wold, Peterborough, UK 420 pp.

3. Day, J.F., K.M. Ebert and J.D. Edman. 1982. Age of murine hosts determined by binding of estradiol to mosquito blood meals. *J. Med. Entomol.* 19:357-360.

4. Day, J.F. and J.D. Edman. 1983. Malaria renders mice susceptible to mosquito feeding when gametocytes are most infective. *J. Parasitol.* 69:163-170.

5. Day, J.F., K.M. Ebert and J.D. Edman. 1983. Feeding patterns of mosquitoes simultaneously exposed to malarious and healthy mice, including methods for separating blood meals from conspecific hosts. *J. Med. Entomol.* 20:163-170.

6. Day, J.F. and G.A. Curtis. 1983. Opportunistic blood-feeding on egg-laying sea turtles by salt marsh mosquitoes. *Florida Entomologist* 66:359-360.

7. Edman, J.D., J.F. Day and E.D. Walker. 1984. Field confirmation of laboratory observations on the differential antimosquito behavior of herons. *Condor* 86:91-92.

8. Day, J.F. and J.D. Edman. 1984. The importance of disease induced changes in mammalian body temperature to mosquito blood feeding. *J. Comp. Biochem. Physiol.* 77A:447-452.

9. Day, J.F. and J.D. Edman. 1984. Mosquito engorgement success on normally defensive hosts depends on host activity patterns. *J. Med. Entomol.* 21:732-740.

10. Edman, J.D., J.F. Day and E.D. Walker. 1985. Vector-host interplay--factors affecting disease transmission. In *Ecology of Mosquitoes: Proceedings of a Workshop*. (L.P. Lounibos, J.R. Rey, J.H. Frank, Eds.) Florida

Medical Entomology Laboratory Publication. 579 pp.

11. Day, J.F. and D.B. Carlson. 1985. The importance of autumn rainfall and sentinel flock location to understanding the epidemiology of St. Louis encephalitis virus in Indian River County, Florida. *Journal of the American Mosquito Control Association* 1:305-309.

12. Day, J.F. and E. van Handel. 1986. Differences between the nutritional reserves of laboratory-maintained and field-collected adult mosquitoes. *Journal of the American Mosquito Control Association* 2:154-157.

13. Lacey, L.A., J.F. Day and C.M. Heitzman. 1987. Long-term effects of *Bacillus sphaericus* on *Culex quinquefasciatus*. *J. Invertebrate Pathol.* 49:116-123.

14. Allan, S.A., J.F. Day and J.D. Edman. 1987. Visual ecology of biting flies. *Ann. Rev. Entomol.* 32:297-316.

15. Day, J.F. and J.D. Edman. 1988. Host location, blood feeding and oviposition behavior of *Culex nigripalpus* (Diptera: Culicidae): Their influence on St. Louis encephalitis virus transmission in southern Florida, pp. 1-8. *In* T.W. Scott & J. Grumstrup-Scott (eds.), Proceedings of a symposium: The role of vector-host interactions in disease transmission. Miscellaneous Publication 68, Entomol. Soc. Am., Lanham, Md.

16. Van Handel, E. and J.F. Day. 1988. Assay of lipids, glycogen and sugars in individual mosquitoes: correlations with wing length in field-collected *Aedes vexans*. *Journal of the American Mosquito Control Association* 4:549-550.

17. Day, J.F. and E. Van Handel. 1988. Differences in carbohydrate reserves between resting and flying *Culex nigripalpus* (Diptera: Culicidae) collected in the field. *Journal of the American Mosquito Control Association* 4:547-548.

18. Bentley, M.D. and J.F. Day. 1989. Chemical ecology and behavioral aspects of mosquito oviposition. *Ann. Rev. Entomol.* 34:401-421.

19. Day, J.F. and G.A. Curtis. 1989. Influence of Rainfall on *Culex nigripalpus* (Diptera: Culicidae) blood-feeding behavior in Indian River County, Florida. *Ann. Entomol. Soc. Am.* 82:32-37.

20. Van Handel, E. and J. F. Day. 1989. Correlation between wing length and protein content of mosquitoes. *Journal of the American Mosquito Control Association* 5:180-182.

21. Day, J. F. 1989. The use of sentinel chickens for arbovirus surveillance in Florida. *J. Fl. Anti-Mosquito Asso.* 60:56-61.

22. Day, J. F. 1990. A fatal attraction for blood seekers. *Wing Beats* 1(2):16-18.

23. Day, J.F., G.A. Curtis and J.D. Edman. 1990. Rainfall-directed oviposition behavior of *Culex nigripalpus* (Diptera: Culicidae) and its influence on St. Louis encephalitis virus transmission in Indian River County, Florida. *J. Med. Entomol.* 27:43-50.

24. Van Handel, E. and J. F. Day. 1990. Nectar-feeding habits of *Aedes taeniorhynchus*. *Journal of the American Mosquito Control Association* 6:270-273.

25. Day, J.F., A.M. Ramsey and J-t. Zhang. 1990. Environmentally mediated seasonal variation in mosquito body size. *Environmental Entomol.* 19:469-473.

26. Day, J.F., R. Winner, R.E. Parsons and J-t. Zhang. 1991. Distribution of St. Louis encephalitis viral antibody in sentinel chickens maintained in Sarasota County, Florida: 1978-1988. *J. Med. Entomol.* 28:19-23.

27. Day, J. F. 1991. Epidemic proportions. *Natural History* July, 50-53.

28. Day, J. F. and A.L. Lewis. 1991. An integrated approach to arboviral surveillance in Indian River County, Florida. *J. Fl. Mosq. Control Assoc.* 62:46-52.

29. Day, J. F. 1991. A review of the 1990 St. Louis encephalitis virus epidemic in Indian River County, Florida. *Proc. N. J. Mosq. Control Assoc.* 78:32-39.

30. Van Handel, E., T.W. Scott, J.F. Day and P. Reiter. 1992. Sugar feeding habits of *Aedes aegypti* females from San Juan, Puerto Rico. *Journal of the American Mosquito Control Association* 8:311.

31. Day, J.F. 1992. Review of *Biology of Blood-sucking Insects* by M. J. Lehane. *Quarterly Review of Biology* 67:536.

32. Day, J.F. and A.L. Lewis. 1992. An integrated approach to St. Louis encephalitis surveillance in Indian River County, Florida. *Florida Journal of Public Health* 4:12-16.

33. Day, J.F. 1992. St. Louis Encephalitis, pp. 2-12, 46-48. *In* C. S. Mehan (ed.), Surveillance and control of diseases spread by mosquitoes and ticks in Florida. Florida Department of Health and Rehabilitative Services, HRSP 150-12, Tallahassee, Fl.

34. Van Handel, E. and J.F. Day. 1993. A day in the life of *Culex nigripalpus*, pp. 288-293. *In* D. Borovsky & A. Spielman (eds.). Proceedings of the Third Symposium: Host regulated development mechanisms in vector arthropods. University of Florida, Vero Beach, FL.

35. Day, J.F. and G.A. Curtis. 1993. Annual emergence patterns of *Culex nigripalpus* females before, during and after a widespread St. Louis encephalitis epidemic in south Florida. *Journal of the American Mosquito Control Association* 9:249-255.

36. Vodkin, M.H., G.L. McLaughlin, J.F. Day, R.E. Shope and R.J. Novak. 1993. A rapid diagnostic assay for eastern equine encephalomyelitis viral RNA. *Am. J. Trop. Med. Hyg.* 49:772-776.

37. Van Handel, E., J.D. Edman, J.F. Day, T.W. Scott, G.G. Clark, P. Reiter and H Lynn. 1994. Plant-sugar, glycogen, and lipid assay of *Aedes aegypti* collected in urban Puerto Rico and rural Florida. *Journal of the American Mosquito Control Association* 10:149-153.

38. Day, J.F., J.D. Edman and T.W. Scott. 1994. Reproductive fitness and survivorship of *Aedes aegypti* (Diptera: Culicidae) maintained on blood, with field observations from Thailand. *J. Med. Entomol.* 31:611-617.

39. Day, J.F. and R.D. Sjogren. 1994. Vector control by removal trapping. *Am. J. Trop. Med. Hyg.* 50:(6) Suppl.:126-133.

40. Day, J.F. and G.A. Curtis. 1994. When it rains, they soar--and that makes *Culex nigripalpus* a dangerous mosquito. *American Entomologist* 40:162-167.

41. Linley, J.R., A.H. Benton and J.F. Day. 1994. Ultrastructure of the eggs of seven flea species (Siphonaptera). *J. Med. Entomol.* 31:813-827.

42. Day, J.F., E.E. Storrs, L.M. Stark, A.L. Lewis and S. Williams. 1995. Antibodies to St. Louis encephalitis virus in armadillos from southern Florida. *Journal of Wildlife Diseases* 31:10-14.

43. Bidlingmayer, W.L., J.F. Day and D.G. Evans. 1995. Effect of wind velocity on suction trap catches of some Florida mosquitoes. *Journal of the American Mosquito Control Association* 11:295-301.

44. Day, J.F. and L.M. Stark. 1996. Transmission patterns of St. Louis encephalitis and eastern equine encephalitis viruses in Florida: 1978-1993. *Journal of Medical Entomology* 33:132-139.

45. Day, J.F., L.M. Stark, J.-t. Zhang, A.M. Ramsey and T.M. Scott. 1996. Antibodies to arthropod-borne encephalitis viruses in small mammals from southern Florida. *Journal of Wildlife Diseases* 32:431-436.

46. Day, J.F. and L.M. Stark. 1996. Eastern equine encephalitis transmission to emus (*Dromaius novaehollandiae*) in Volusia County, Florida: 1992 through 1994. *Journal of the American Mosquito Control Association* 12:429-436.

47. Day, J.F., D. Duzak, Y. Braverman, A. Chizov-Ginzburg smf J.R. Linley. 1997. Ultrastructure of the eggs of *Culicoides circumscriptus*, *Culicoides gejelensis* and *Culicoides imicola* (Diptera: Ceratopogonidae). *Journal of the American Mosquito Control Association* 13:76-83.

48. Scott, T.W., A. Naksathit, J.F. Day, P. Kittayapong and J.D. Edman. 1997. A fitness advantage for *Aedes aegypti* and the viruses it transmits when females fed only on human blood. *American Journal of Tropical Medicine and Hygiene* 57:235-239.

49. Day, J.F. and L.M. Stark. 1998. St. Louis encephalitis transmission to emus (*Dromaius novaehollandiae*) in Palm Beach County, Florida with evidence of western equine encephalitis virus antibody transport to Florida by emus infected in other states. *Florida Entomologist* 81:104-111.

50. Day, J.F. and G.A. Curtis. 1999. *Culex nigripalpus* (Diptera: Culicidae) blood feeding and oviposition before, during and after a widespread St. Louis encephalitis virus epidemic in Florida, USA. *J. Med. Entomol.* 36:176-181.

51. Day, J.F. 1999. An insect repellent cage match. *OutdoorLife* June/July: 94-95.

52. Day, J.F. and L.M. Stark. 1999. Avian serology in a St. Louis encephalitis epicenter before, during, and after a widespread epidemic in south Florida, USA. *J. Med. Entomol.* 36:614-624.

53. Day, J.F. and L.M. Stark. 2000. Frequency of St. Louis encephalitis in humans from Florida, USA: 1990-1999. *J. Med. Entomol.* 37:626-633.

54. Day, J.F., J.D. Edman, S.E. Kunz and S.K. Wikel. 2000. Direct injury caused by arthropods, Chapter 4. *In* B.F. Eldridge and J.D. Edman (eds.), A Text Book of Medical Entomology; Human and Animal Diseases Caused by Insects and Other Arthropods. Kluwer Academic Publishers, New York, 697pp.

55. Eldridge, B.F., T.W. Scott, J.F. Day and W.J. Tabachnick. 2000. Arbovirus diseases, Chapter 11. *In* B.F. Eldridge and J.D. Edman (eds.), A Text Book of Medical Entomology; Human and Animal Diseases Caused by Insects and Other Arthropods. Kluwer Academic Publishers, New York, 697pp.

56. Lord, C.C. and J. F. Day. 2000. Attractiveness of chickens and bobwhite quail for *Culex nigripalpus*. *Journal of the American Mosquito Control Association* 16:271-273.

57. Lord, C.C. and J.F. Day. 2000. First record of *Amblyomma auricularium* (Acari: Ixoididae) in the USA. *Journal of Medical Entomology* 37:977-978.

58. Day, J.F. 2001. Predicting St. Louis encephalitis virus epidemics: Lessons from recent, and not so recent, outbreaks. *Annual Review of Entomology* 46:111-38.

59. Day, J.F., C.V. Duxbury, S. Glasscock and J.E. Paganessi. 2001. Removal trapping for the control of coastal biting midge populations. *Technical Bulletin of the Florida Mosquito Control Association* 3:15-16.

60. Lord, C.C and J.F. Day. 2001. Simulation studies of St. Louis encephalitis in south Florida. *Vector-borne and Zoonotic Diseases* 1:299-315.

61. Lord, C.C and J.F. Day. 2001. Simulation studies of St. Louis encephalitis and West Nile viruses: the impact of bird mortality. *Vector-borne and Zoonotic Diseases* 1:317-329.

62. Zyzak, M., T. Loyless, S. Cope, M. Wooster and J.F. Day. 2002. Seasonal abundance of *Culex nigripalpus* Theobald and *Culex salinarius* Coquillett in north Florida, USA. *Journal of Vector Ecology* 27:155-162.

63. Shaman, J., J.F. Day and M. Stieglitz. 2002. Drought-induced amplification of St. Louis encephalitis virus in Florida. *Emerging Infectious Diseases* 8:575-580.

64. Fukuda, T., D.L. Kline and J.F. Day. 2002. An iridescent virus and a microsporidium in the biting midge, *Culicoides barbosai* from Florida. *Journal of the American Mosquito Control Association* 18:128-130.

65. Fradin, M.S. and J.F. Day. 2002. Comparative protection times for 17 arthropod repellent formulations in low-density arm-in-cage laboratory tests. *New England Journal of Medicine* 347:13-18.

66. Fradin, M.S. and J.F. Day. 2002. Insect repellents and mosquito bites–Letter to the Editor, Reply. *New England Journal of Medicine* 347:1720-1721.

67. Darsie, R.F. and J.F. Day. 2002. Mosquito collections from an urban habitat, Vero Beach, Florida 2000-2001. *Wing Beats* 13(3):6-7.

68. Darsie, R.F. and J.F. Day. 2003. Studies of the genus *Culex* Linnaeus in Florida I. Re-description of the pupae of *Culex nigripalpus* Theobald and *Culex tarsalis* Coquillett, vectors of St. Louis encephalitis and a key to pupae of *Culex* species in eastern United States. *Proceedings of the Entomological Society of Washington* 105:100-107.

69. Rutledge, C.R., J.F. Day, C.C. Lord, L.M. Stark and W.J. Tabachnick. 2003. *Culex nigripalpus* Theobald (Diptera: Culicidae) transmission of West Nile virus in Florida: Infection rates in Florida *Culex* mosquitoes do not accurately reflect transmission rates in nature. *Journal of Medical Entomology* 40:253-258.

70. Shaman, J., J.F. Day and M. Stieglitz. 2003. St. Louis encephalitis virus in wild birds during the 1990 south Florida epidemic: The importance of drought, wetting conditions, and the emergence of *Culex nigripalpus* (Diptera: Culicidae) to arboviral amplification and transmission. *Journal of Medical Entomology* 40:547-554.

71. Rutledge, C.R., J.F. Day, C.L. Lord, G.F. O'Meara, J.R. Rey and W.J. Tabachnick. 2003 (2004 publication date). Florida mosquito control response to the challenge of West Nile virus. *Technical Bulletin of the Florida Mosquito Control Association* 4:1-43.

72. Garvin, M.C., K.A. Travin, L.M. Stark, G. E. Woolfenden, J.W. Fitzpatrick and J.F. Day. 2004. Arboviral infection on two species of wild Jays (Aves: Corvidae): evidence for population impacts. *Journal of Medical Entomology* 41:215-225.

73. Shaman, J., J.F. Day, M. Stieglitz, S. Zebiak and M. Cane. 2004. Seasonal forecast of St. Louis encephalitis virus transmission, Florida. *Emerging Infectious Diseases* 10:802-809.

74. Shaman, J., M. Stieglitz, S. Zebiak, M. Crane and J.F. Day. 2003 (2004 Publication). A local forecast of land surface wetness conditions, drought, and St. Louis encephalitis transmission derived from seasonal climate predictions. *Proceedings of the 2003 Environmental and Water Resources Institute* Released on CD-ROM.

75. Shaman, J., J.F. Day and M. Stieglitz. 2004. The spatial-temporal distribution of drought, wetting, and human cases of St. Louis encephalitis in south-central Florida. *American Journal of Tropical Medicine and Hygiene* 71:251-261.

76. Darsie, R.F. and J.F. Day. 2004. Studies of the genus *Culex* in Florida II. Redescription of the fourth instar of *Culex nigripalpus*. *Journal of the American Mosquito Control Association* 20:110-114.

77. Spielman, A., T.G. Andreadis, C.S. Apperson, A.J. Cornel, J.F. Day, J.D. Edman, D. Fish, L.C. Harrington, A.E. Kiszewski, R. Lampman, G.C. Lanzaro, F.R. Matuschka, L.E. Munstermann, R.S. Nasci, D.E. Norris, R.J. Novak, R.J. Pollach, W.K. Reisen, P. Reiter, H.M. Savage, W.J. Tabachnick and D.M. Wesson. 2004. Outbreak of West Nile Virus in North America. *Science 306:1473-1475*.

78. Douglas, H.D., J.E. Co, T.H. Jones, W.E. Conner and J.F. Day. 2005. Chemical odorant of colonial seabird repels mosquitoes. *Journal of Medical Entomology* 42:647-651.

79. Darsie, R.F. and J.F. Day. 2005. Redescription of the pupa of *Culex (Culex) declarator* Dyar and Knab (Diptera, Culicidae), with amendments to the *Culex* pupae of the eastern United States. *Journal of the American Mosquito Control Association* 21:128-130.

80. Shaman, J., J.F. Day and M. Stieglitz. 2005. Drought-Induced amplification and epidemic transmission of West Nile Virus in south Florida. *Journal of Medical Entomology* 42:134-141.

81. Shaman, J. and J.F. Day. 2005. Achieving operational hydrologic monitoring of mosquito-borne disease. *Emerging Infectious Diseases* 11:1343-1350.

82. Day, J.F. 2005. Host-seeking strategies of mosquito disease vectors. *Journal of the American Mosquito Control Association* 21 (4 Supplement):17-22.

83. Rutledge-Connelly, C.R., J.F. Day and G.K. Ross. 2006. Enhancing mosquito-borne disease surveillance in Florida. *Journal of Extension* 44 (5):Article Number 5IAW4.

84. Shaman, J., J.F. Day, M. Stieglitz, S. Zebiak, and M. Cane. 2006. An ensemble seasonal forecast of human cases of St. Louis encephalitis in Florida based on seasonal hydrologic forecasts. *Climatic Change* 75:495-511.

85. Darsie, R.F., J.R. Almasi, and J.F. Day. 2006. Studies of the genus *Culex* Linnaeus in Florida III. Redescription of the fourth-stage larva of *Culex salinarius* Coquillett and comparison with that of *Cx. nigripalpus* Theobald. *Journal of the American Mosquito Control Association* 22:179-184.

86. Darsie, R.F. and J.F. Day. 2006. Redescription of the pupa of *Culex salinarius* Coquillett and comparison with *Culex nigripalpus* Theobald. *Journal of the American Mosquito Control Association* 22(3):547-549.

87. Harbison, J.E., E.M. Mathenge, G.O. Misiani, W.R. Mukabana, and J.F. Day. 2006. A simple method for sampling indoor-resting malaria mosquitoes *Anopheles gambiae* and *Anopheles funestus* (Diptera: Culicidae) in Africa. *Journal of Medical Entomology* 43:473-479.

88. Dusek, R.J., M.G. Spaulding, D.J. Forrester, N. Komar and J.F. Day. 2006. Morbidity and mortality factors in pre-fledged Florida Sandhill Crane (*Grus canadensis pratensis*) chicks. *Proceedings North American Crane Workshop* 9:45-52.

89. Xue, R., A. Ali and J.F. Day. 2006. Commercially available insect repellents and criteria for their use, Chapter 25. *In* M. Debboun, S.P. Frances and D. Strickman (eds.), Insect Repellents: Principles, Methods, and Uses. CRC Press, Boca Raton, FL, 495pp.

90. Vlach, J.J., K.J. Hall, J.F. Day, G.A. Curtis, L.J. Hribar and E.M. Fussell. 2006. Interisland dispersal of the black salt marsh mosquito, *Ochlerotatus taeniorhynchus* (Diptera: Culicidae) in the Florida Keys. *Journal of the American Mosquito Control Association* 22(4):615-621.

91. Shaman, J. and J.F. Day. 2007. Reproductive phase locking of mosquito populations in response to rainfall frequency. *PloS ONE* 2(3): e331. doi:10.1371/journal.pone.0000331.

92. Darsie, R.F. and J.F. Day. 2007. Redescription of the pupa of *Culex restuans* and a comparison with *Culex nigripalpus*. *Journal of the American Mosquito Control Association* 23(2):95-98.

93. Day, J.F. and J. Shaman. 2008. Using hydrologic conditions to track the risk of focal and epidemic arboviral transmission in peninsular Florida. *Journal of Medical Entomology* 45(3):458-469.

94. Vitek, C.J., S.L. Richards, C.N. Mores, J.F. Day and C.C. Lord. 2008. Arbovirus transmission by *Culex nigripalpus* Theobald in Florida, 2005. *Journal of Medical Entomology* 45(3):483-493.

95. Day, J.F. 2008. In My Opinion: Chikungunya virus in Florida: Lessons from Italy, 2007. *Florida Journal of Environmental Health* 199 (Summer 2008):11-14.

96. Day, J.F. 2008. A brief history of dengue virus in Florida. *Florida Journal of Environmental Health* 201 (Winter 2008):7-10.

97. Connelly, R., J.F. Day and C. Lord. 2008. Competition as a teaching tool. *Wing Beats* 19 (4):4-9.

98. Day, J. F. 2009. Disease surveillance, outbreaks, and control in Florida, Chapter 8. *In*, C.R. Connelly and D.B. Carlson (Eds.), *Florida Mosquito Control: The state of the mission as defined by mosquito controllers, regulators, and environmental managers*, Florida Coordinating Council on Mosquito Control, University of Florida, Institute of Food and Agricultural Sciences, Florida Medical Entomology Laboratory, Vero Beach, Florida, 259pp.

99. Day, J.F. and J. Shaman. 2009. Severe winter freezes enhance St. Louis encephalitis virus amplification and epidemic transmission in peninsular Florida. *Journal of Medical Entomology* 46(6):1498-1506.

100. Rios, L.M.V., J-J Sheu, J.F. Day, J.E. Maruniak, H. Zaretsky and M.T. Long. 2009. Extrinsic risk factors associated with West Nile virus infection in Florida Horses. *Medical and Veterinary Entomology* 23(4):357-366.

101. McCann, S., J.F. Day, S. Allan and C. Lord. 2009. Age modifies effect of body size on fecundity in *Culex quinquefasciatus* (Diptera: Culicidae). *Journal of Vector Ecology* 34(2):174-181.

102. Shaman, J., J.F. Day and N. Komar. 2010. Hydrologic conditions describe West Nile virus risk in Colorado. *International Journal of Environmental Research and Public Health* 7:494-508; doi:10.3390/ijerph7020494.

103. Day, J.F. 2010. A brief history of St. Louis encephalitis virus in Florida. *Florida Journal of Environmental Health* 205 (Spring 2010):21-25.

104. Day, J.F. 2010. "*Surveillance, prevention and control of vector-borne infections" In* Edman, J. (ed.), Vector-Borne Diseases: The Biomedical & Life Sciences Collection, Henry Stewart Talks Ltd, London (online at http://hstalks.com?t=BL1182831-Day).

105. Tabachnick, W.J., W. R. Harvey, J. J. Becnel, G. G. Clark, R. Connelly, J. F. Day, P. J. Linser and K. J. Linthicum. 2011. Countering a bioterrorist introduction of pathogen-infected mosquitoes through mosquito control. *Journal of the American Mosquito Control Association* 27(2):175-177.

106. Day, J.F. and J. Shaman. 2011. Mosquito-borne arboviral surveillance and the prediction of disease outbreaks,

Chapter 6. *In* Daneil Ruzek (editor), *Flavivirus Encephalitis*. InTech-Open Access Publisher, 478pp., ISBN 978-953-307-344-6.

107. Qualls, W.A., J.F. Day, R. Xue and B.F. Bowers. 2011. Altered response to DEET repellent after infection of *Aedes aegypti* (Diptera: Culicidae) with Sindbis virus. *Journal of Medical Entomology* 48 (6): 1226-1230.

108. Qualls, W.A., J.F. Day, R. Xue and B.F. Bowers. 2012. Sindbis virus infection alters blood feeding responses and DEET repellency in *Aedes aegypti* (Diptera: Culicidae). *Journal of Medical Entomology* 49(2): 418-423.

109. Qualls, W.A., J.F. Day, R. Xue, and B.F. Bowers. 2012. Altered behavioral responses of Sindbis virus-infected *Aedes aegypti* (Diptera: Culicidae) to DEET and non-DEET based insect repellents. *Acta Tropica* 122:284-290, doi: 10.1016/j.actatropica.2012.01.012.

110. Day, J.F., G.K. Ross and C.R. Connelly. 2013. The biology of arboviral transmission in Florida. *Technical Bulletin of the Florida Mosquito Control Association* 9:3-12.

111. Tabachnick, W.J. and J.F. Day. 2014. The impact of climate change on vector-borne arboviral episystems, Chapter 2. *In* Sunit Singh (editor), *Viral Infections and Climate Change*. John Wiley &Sons/Wiley Blackwell Press. Pages 21-34. ISBN 978-953-307-344-6.

112. Lord, C.C., B.W. Alto, S.L. Anderson, C.R. Connelly, J.F. Day, S.L. Richards, C.T. Smartt and W.J. Tabachnick. 2014. Can Horton hear the Whos? The importance of scale in mosquito-borne disease. *Journal of Medical Entomology* 51(2): 297-313.

113. Day, J.F. 2014. A history of the FMCA Dodd Short Courses. *Wing Beats* 24(4):25-31.

114. Day, J.F. 2014. Obituary, Richard Floyd Darsie, Jr., 1915-2014. *Journal of the American Mosquito Control Association* 30(2):147-151.

115. Day, J.F. 2014. The natural history of eastern equine encephalitis virus in Florida. *One Health Newsletter* 7(2): 1-4.

116. Xue, R.D., G.C. Muller and J.F. Day. 2014. Commercially available insect repellents and criteria for their use, Chapter 19, pp: 337-348. *In* M. Debboun, S.P. Frances and D. Strickman (eds.), Insect Repellents: Principles, Methods, and Uses, 2nd edition. CRC Press, Boca Raton, FL.

117. Day, J.F. 2014. "*Surveillance, prevention and control of vector-borne infections, Second Edition" In* Edman, J. (ed.), Vector-Borne Diseases: The Biomedical & Life Sciences Collection, Henry Stewart Talks Ltd, London (online at http://hstalks.com?t=BL1182831-Day).

118. Richards, S.L., C.R. Connelly, J.F. Day, T. Hope and R. Ortiz. 2015. Arthropods associated with carrion in a salt marsh habitat in southeastern Florida. *Florida Entomologist* 98(2):613-619.

119. Day, J.F., W.J. Tabachnick and C.T. Smartt. 2015. Factors that influence the transmission of West Nile virus in Florida. *Journal of Medical Entomology* 52(5):743-754; DOI:10.1093/jme/tjv076.

120. Day, J.F. 2015. AMCA Memorial Lecture Honoree: Dr. Richard Floyd Darsie, Jr. *Journal of the American Mosquito Control Association* 31(4):392-400.

121. Day, J.F. 2016. Mosquitoes and the Diseases They Carry: What is Your Risk of Infection? *Fix.com* July 7, 2016, https://www.fix.com/blog/mosquito-borne-illness-explained/

122. Day, J.F. 2016. Mosquito oviposition behavior and vector control. *Insects* 7(4):65-87; doi:10.3390/insects7040065

123. Day, J.F. 2016. The worldwide reemergence of Zika virus. *One Health Newsletter* 9(2): 7-12.

124. Day, J. F. 2017. Disease surveillance, outbreaks, and control in Florida, Chapter 8. *In*, C.R. Connelly and D.B. Carlson (Eds.), *Florida Mosquito Control: The state of the mission as defined by mosquito controllers, regulators, and environmental managers*, Florida Coordinating Council on Mosquito Control, University of Florida, Institute of Food and Agricultural Sciences, Florida Medical Entomology Laboratory, Vero Beach, Florida, 259pp.

125. Diaz, A. L.L., Coffey, N. Burkett-Cadena, and J.F. Day. 2018. Reemergence of St. Louis encephalitis virus in the Americas. Emerging Infectious Diseases. 24 (12):2150-2157.

126. West, R.G., D.K. Mathias, J.F. Day, C. Acevedo, T.R. Unnasch, and N.D. Burkett-Cadena. 2020. Seasonal changes of host use by *Culiseta melanura* (Diptera: Culicidae) in Central Florida. *J. Med. Entomology*. 57 (5):1627-1634.

127. Lozano, S., J.F. Day, L. Ortega, M. Silver, and R. Connelly. 2021. Perceived risk of mosquito-borne arboviruses in the continental United States. *Pathogens* 10:1562 https://doi.org/10.3390/pathogens10121562.

128. Burkett-Cadena, N., J.F. Day, and T.R. Unnasch. 2022. Ecology of eastern equine encephalitis virus in the southeastern United States: Incriminating vector and host species responsible for virus amplification, persistence, and dispersal. *J. Med. Entomology*. 59 (1):41-48.

129. Day, J. F. 2023. The rise and fall of St. Louis encephalitis virus in Florida. J*ournal of the Florida Mosquito Control Association*. 70:1-6. JFMCA-Vol.70.2023final.pdf

130. Tavares, Y, JF Day, BV Glordano, B Eastmond, N Burkett-Cadena, RP Guralnick, E Martin, and LP Campbell. 2024. Regional variation in the landscape ecology of West Nile virus sentinel chicken seroconversion in Florida. *PLOS ONE.*19 (10): https://doi.org/10.1371/journal.pone.0305510

Indian River Mosquito Control District understands the fiscal challenges and responsibilities and continues to be a proactive, science-based program. One of the district's goals for the next fiscal year is to reestablish and build working relationships with stakeholders and apply for grants. **Dr. Roxanne Connelly**, recently hired by the American Mosquito Control Association for a part-time position, is recommended to assist with finding and applying for grants. Given Dr. Connelly's background in Florida, we see great value in her serving as a consultant to the Indian River Mosquito Control District, providing grant development and proposal support.

Dr. Connelly's expertise is an excellent fit for grant development, grant proposal review, and technical review of scientific materials. She can provide valuable support in identifying funding opportunities, developing and writing grant proposals, strengthening project narratives, assisting with reviewing budgets and supporting documentation, and ensuring the District has competing proposals as grant funding has become more challenging than before.

Dr. Connelly can also review proposals, manuscripts, reports, and other materials prepared by District staff, particularly those involving mosquito surveillance, arbovirus prevention, modeling, and statistical analyses. Her role would complement the District's findings and ensure their accuracy, rather than duplicating the work.

Hiring Dr. Connelly on an as-needed basis as a consultant for grant writing and other scientific reviews would provide significant value to the Indian River Mosquito Control District. Given overall trends and potential changes in funding resources, the district is fully aware of the challenges ahead; therefore, we are exploring all avenues of funding and would like to focus heavily on grant funding. This funding source has historically been limited for the district. We are exploring all options to reduce the burden on taxpayers, and with Roxanne's expertise and resources, she will be an asset to our community. Our neighboring counties, St. Lucie and Brevard, are using grant funds to maintain and improve their impoundments. In addition, once the district secures external funding, Dr. Connelly's services will be funded through grants.

Dr. Roxanne Connelly, PhD
Fort Collins, CO U S A

QUALIFICATIONS

- BS (Environmental Science); MS (Entomology); PhD (Medical Entomology)
- 25 years of specialized experience in providing technical assistance and guidance on the best practices, policies, and implementation of surveillance activities for prevention and control of mosquito-borne diseases
- 25 years of specialized experience in providing guidance on monitoring and controlling the entomological vectors of Zika, West Nile, yellow fever, and other arboviruses
- Medical Entomologist/Biologist – 30 years

PROFESSIONAL EXPERIENCE

August 2026 – present: Part-time Grant Writer, Contractor, American Mosquito Control Association.

October 2017 – December 2025: Research Entomologist, Team Lead for Entomology and Ecology
Centers for Disease Control and Prevention, National Center for Emerging Zoonotic and Infectious Diseases (NCEZID); Division of Vector-Borne Diseases (DVBD); Arboviral Diseases Branch (ADB).

Duties
Lead a team of experts focused on public health entomology applied research, control, and response in the area of vector surveillance and control within the framework of existing and emerging arboviral diseases. Responsible for planning, implementation, coordination, monitoring and evaluation of entomological/vector surveillance and control programs developed and conducted collaboratively between CDC and national and international partner organizations and associations with the overall goal of reducing the burden of vector- borne viral diseases in the United States.

July 2012–September 2017: Professor, Medical Entomology Extension State Specialist
July 2006-June 2012: Associate Professor, Medical Entomology State Specialist
October 1999-June 2006: Assistant Professor, Medical Entomology State Specialist University of Florida, Institute of Food and Agricultural Sciences, Florida Medical Entomology Laboratory (UF/IFAS/FMEL) 200 9th Street SE, Vero Beach, FL 32962

Duties
Extension 80%, Research 20% - 12-month, tenure-track. Responsibilities include maintaining close contact with over 50 mosquito control districts in the state of Florida to address their entomological research and training needs; providing extension education to the mosquito control districts in Florida; maintaining contact with the county and state cooperative extension faculty and the public at large by developing and participating in short courses on topics related to medical entomology; assisting mosquito control districts through the application of new and innovative technical procedures; working with state, national, and international media outlets on mosquito and vector-borne disease concerns.

Research includes biology and identification of mosquitoes, protection from mosquito-borne diseases, insecticide resistance in mosquitoes, and arthropod pest control methodology. Teaching medical entomology at the graduate level; mentoring graduate students in medical entomology. Areas of specialization: Entomology, Medical Entomology, Mosquito Biology, Mosquito Control, Insecticide Resistance, Mosquito Morphology and Identification, Extension Entomology, Integrated Pest Management.

Dec 1998–Sept 1999: Post-Doctoral Associate, Louisiana State University, Dept. of Entomology
Duties
Maintained Red Imported Fire Ant (RIFA) colonies; surveyed Louisiana for RIFA populations; organized and participated in Community-Based Fire Ant Management Program, Historic Spanish Town (Baton Rouge, LA)

EDUCATION

DATE COMPLETED	DEGREE	MAJOR	MINOR	INSTITUTION
May 1998	Doctor of Philosophy	Entomology	Epidemiology and Community Health	Louisiana State University, Baton Rouge, LA
May 1995	Master of Science	Entomology		Louisiana State University, Baton Rouge, LA
December 1992	Bachelor of Science	Environmental Science		Louisiana State University, Baton Rouge, LA

Refereed Publications (*=Graduate Student)

Karen M. Holcomb, James C. Dunford, C. Roxanne Connelly. 2026. Estimated suitability distribution for *Culicoides (Haematomyidium) paraensis* (Diptera: Ceratopogonidae) in the contiguous United States and associated Caribbean territories. Journal of Medical Entomology. 63(2). https://doi.org/10.1093/jme/tjag038

James C. Dunford, Stacey L. Vigil, Mark G. Ruder, Lewis Long, Stephanie Zapata, Dana C. Price, Cassandra H. Steele, , Emily G. McDermott, Bethany L. McGregor, Karen Holcomb, Dominic Rose, Brent C. Newman, David B. Pecor, Yvonne-Marie Linton, Donald Roberts, James F. Harwood, and C. Roxanne Connelly. 2026. A review and update of the distribution, bionomics, and medical importance of *Culicoides (Haematomyidium) paraensis* (Diptera: Ceratopogonidae) in the United States in response to recent Oropouche virus expansion in the Americas. Journal of Medical Entomology. 63(1):1-17.

Freed, S., Jr., Chandler, S., Davis, E., Herzog, K. S., Pella, Z., Burkhalter, K., McCutchen, E. L., Bartling, A. M., Broadhurst, M. J., Hughes, H. R., Brault, A. C., Iwen, P. C., Connelly, R., Hamik, J., & Fauver, J. 2025. Retrospective West Nile Virus Lineage 3 surveillance in *Culex* mosquitoes: Nebraska, USA 2012–2024. The American Journal of Tropical Medicine and Hygiene, 113(6), https://doi.org/10.4269/ajtmh.25-0383

Lozano, Saul, Raman, Vivek, Connelly, C. R. 2025. The expansion of the yellow fever mosquito (*Aedes aegypti*) and evidence of its establishment in the Las Vegas metropolitan area, Nevada, United States of America. Journal of Medical Entomology. 62. 10.1093/jme/tjaf115.

Craig M, Sither C, Mullin M, Foster M, Turner E, Kenney J, Connelly R, Doyle M, Williams C, Byrd B. 2025. Improved surveillance of *Aedes triseriatus* using the BG-pro trap: implications for sampling host-seeking La Crosse virus vectors. Journal of the American Mosquito Control Association. 10.2987/24-7204.

Morreale R., Stenhouse S., Bajonero J., Carvalho D., Foley N., Connelly R., Lloyd A., Hoel D. 2025. Overview of the sterile insect technique for *Aedes aegypti* in Lee County, Florida, USA. Infect Dis Poverty **14**, 37. https://doi.org/10.1186/s40249-025-01307-7

Campbell M, Mullin M, Connelly R, Super PE, Byrd BD. 2025. *Aedes japonicus*: a tenant invader in the Great Smoky Mountains National Park. J Am Mosq Control Assoc. doi: 10.2987/24-7203. Epub ahead of print. PMID: 39814051.

Guagliardo SAJ, Connelly CR, Lyons S, Martin SW, Sutter R, Hughes HR, Brault AC, Lambert AJ, Gould CV, Staples JE. Reemergence of Oropouche Virus in the Americas and Risk for Spread in the United States and Its Territories, 2024. Emerg

Infect Dis. 2024 Nov;30(11):2241-2249. doi: 10.3201/eid3011.241220. Epub 2024 Oct 1. PMID: 39353409; PMCID: PMC11521165.

Carpenter A, Kojima N, Dulski TM, Calvert AE, Burkhalter KL, Ballard JR, Blount K, Fagre A, Thrasher E, Lazenby K, Hedges DS, Longa A, Miazgowicz K, Wood E, Owens P, Connelly CR, Gould GV, Staples JE, Rothfeldt L, Martin SW, Burke J. A One Health approach to investigating Cache Valley virus in Arkansas, United States, July 2023. Emerg Infect Dis. 2025 Jun;31(6):1231-1234. doi: 10.3201/eid3106.250052. PMID: 40439544.

Kuczynski Lange S, Connelly CR, Tai Z, Foley N, De Leon Rivera J, Lozano S, Nett RJ. A scoping review to determine if adverse human health effects are associated with use of pyrethroids for mosquito control. J Med Entomol. 2025 Mar 17;62(2):277-288. doi: 10.1093/jme/tjaf012. PMID: 39928406.

Tai Z, Connelly CR, Kuczynski Lange S, Foley N, De Leon Rivera J, Lozano S, Nett RJ. A scoping review to determine if adverse human health effects are associated with use of organophosphates for mosquito control. J Med Entomol. 2025 Jan 13;62(1):8-18. doi: 10.1093/jme/tjae130. PMID: 39425905; PMCID: PMC11808927.

Fagre AC, Soto R, Magleby R, Cuadera M, Sun A, Cervantes K, Crans S, Panella N, Kenney J, Angelus A, Burkhalter K, Woell D, Horiuchi K, Biggerstaff BJ, Staples JE, Connelly CR, Martin SW, Komar N. Enhancing Eastern Equine Encephalitis Virus Surveillance in New Jersey: Optimized Collection of Culiseta melanura. J Am Mosq Control Assoc. 2024;40(2):92-101.

Morrison A, White JL, Hughes HR, Guagliardo SAJ, Velez JO, Fitzpatrick KA, Davis EH, Stanek D, Kopp E, Dumoulin P, Locksmith T, Heberlein L, Zimler R, Lassen J, Bestard C, Rico E, Mejia-Echeverri A, Edwards-Taylor KA, Holt D, Halphen D, Peters K, Adams C, Nichols AM, Ciota AT, Dupuis AP, Backenson PB, Lehman JA, Lyons S, Padda H, Connelly RC, Tong VT, Martin SW, Lambert AJ, Brault AC, Blackmore C, Staples JE, Gould CV. Oropouche Virus Disease Among U.S. Travelers - United States, 2024. MMWR Morb Mortal Wkly Rep. 2024;73(35):769-773.

Campbell M, Mullin M, Connelly R, Super PE, Byrd BD. Aedes japonicus: A tenant invader in the Great Smoky Mountains National Park, USA. J Am Mosq Control Assoc. 2025 Jan 16. doi: 10.2987/24-7203. Epub ahead of print. PMID: 39814051.

Gual-Gonzalez L., Dye-Braumuller K., Warner A., Bunting T., Bryant D., Connelly R., Burkhalter K., Nolan M.S. 2023. Do Aedes triseriatus respect state boundaries?: A paucity of La Crosse virus in the South Carolina Appalachian Mountains. Vector-Borne and Zoonotic Diseases. https://www.liebertpub.com/doi/epub/10.1089/vbz.2023.0018

Aldridge RL, Alto BW, Connelly R, Okech B, Siegfried B, Eastmond BH, Alomar AA, Linthicum KJ. 2023. Does prior exposure to larvicides influence dengue virus susceptibility in *Aedes aegypti* (Diptera: Culicidae)? Journal of Medical Entomology. https://doi.org/10.1093/jme/tjad137

Connelly R. 2023. Obituary, Florence (Flo) Anne Jones. July 24, 1948 – January 21, 2023. Journal of the American Mosquito Control Association. 39(2):146-148.

Elson G, Silver M, Connelly R, Seman C, Drexler N. 2023. Assessment of protective behaviors and communication strategies in audiences at-risk for tick and mosquito-borne diseases: Results from several focus groups. *WingBeats.* 34(3):35 – 38.

Mueller A, Thomas A, Brown J, Young A, Smith K, Connelly R, Richards SL. 2023. Geographic information system protocol for mapping areas targeted for mosquito control in North Carolina. PLoS One 18(3): e0278253. https://doi.org/10.1371/journal.pone.0278253

*Aldridge RA, Alto BW, Connelly CR, Okech B, Siegfried B, Linthicum K. 2022. Lethal and sublethal concentrations of formulated larvicides against susceptible *Aedes aegypti.* Journal of the American Mosquito Control Association. 38(4):250-260.

Lozano S, Pritts K, Fredregill C, Connelly R. 2022. Independent evaluation of *Wolbachia* infected male mosquito releases for control of *Aedes aegypti* in Harris County, Texas, using a Bayesian abundance estimator. *PLoS Neglected Tropical Diseases*. 16(11): e0010907. https://doi.org/10.1371/journal.pntd.0010907

Connelly R, Silver M. 2022. Climate change and mosquito-borne diseases: preparing to talk to the public. *WingBeats.* 33:17-25.

*Parker-Crockett C, Lloyd A, Ramirez D, Connelly CR. 2022. Impacts of differential mosquito control treatment regimens on insecticide susceptibility status of *Aedes aegypti* (Diptera: Culicidae). *SN Applied Sciences.* 4:249.

Brown JS, Byrd BD, Connelly CR, Richards SL. 2022. Operational insights into mosquito control disaster response in North Carolina: experiences with the Federal Emergency Management Agency after Hurricane Florence. *Journal of Environmental Health.* 85(2):24-31.

Parker-Crockett C, Rampold SD, Galindo S, Bunch, Yoder H, Thoron A, Andenoro A, Connelly CR, Lucky A, Telg R. 2022. Fight the bite: implementation of mosquito-based curriculum in elementary, middle, and high schools in Florida. Journal of Agricultural Education. 63(2):37-51.

Barcelo C, Blanda V, del Castillo-Remiro A, Chaskopoulou A, Connelly CR, Ferrero-Gomez L, LaRussa F, Parker- Crockett C, Serafin-Perez I, Sousa CA, Torina A, Vontas J, Miranda MA. 2022. Surveillance of invasive mosquito species in islands with focus on potential vectors of zoonotic diseases. *In:* Ecology of diseases transmitted by mosquitoes to wildlife. Ecology and control of vector-borne diseases. Vol. 7: 179-207.

Lozano S, J F Day, L Ortega, M Silver, R Connelly. 2021. Perceived risk of mosquito-borne arboviruses in the continental United States. Pathogens. 10:1562. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8706029/

McGregor B L, C R Connelly, J L Kenney. 2021. Infection, dissemination, and transmission potential of North American *Culex quinquefasciatus, Culex tarsalis,* and *Culicoides sonorensis* for Oropouche Virus. Viruses. 13:226. https://www.mdpi.com/1999-4915/13/2/226

*Parker-Crockett C, C R Connelly, B. Siegfried, B. Alto. 2021. Influence of pyrethroid resistance on vector competency for Zika Virus by *Aedes aegypti* (Diptera: Culicidae). Journal of Medical Entomology. 58(4):1908-1916. https://pubmed.ncbi.nlm.nih.gov/33724374/

Connelly C R, J A Gerding, S M Jennings, A Ruiz, R Barrera, S Partridge, C B Beard. 2020. Continuation of mosquito surveillance and control during public health emergencies and natural disasters. MMWR. 69(28):938-940. https://www.cdc.gov/mmwr/volumes/69/wr/mm6928a6.htm

Connelly C R, J Borchert. 2020. Mosquito Control Emergency Preparedness and Response to Natural Disasters. Journal of the American Mosquito Control Association: June 2020, Vol. 36, No. 2s, pp. 2-4. https://meridian.allenpress.com/jamca/article/36/2s/2/446123/Mosquito-Control-Emergency- Preparedness-and

Connelly C R, J Borchert., Guest Editors. 2020. Special issue of the Journal of the American Mosquito Control Association: Mosquito Control Emergency Preparedness and Response to Natural Disasters. Journal of the American Mosquito Control Association. 36(2s). https://meridian.allenpress.com/jamca/issue/36/2s

McGregor B L, C R Connelly. 2020. A review of the control of *Aedes aegypti* (Diptera: Culicidae) in the continental United States. Journal of Medical Entomology. doi: 10.1093/jme/tjaa157

Riles, M T, C R Connelly. 2020. An update of the mosquito records of Florida Counties, USA. Journal of the American Mosquito Control Association: June 2020, Vol. 36, No. 2, pp. 107-111. https://doi.org/10.2987/20-6923.1

*Parker C, D Ramirez, C Thomas, C R Connelly. 2020. Baseline susceptibility status of Florida populations of *Aedes aegypti* (Diptera: Culicidae) and *Aedes albopictus.* Journal of Medical Entomology. 57(5):1550-1559.

McAllister J C, M Porcelli, J M Medina, M J Delorey, C R Connelly, M S Godsey, N A Panella, N Dzuris, K A Boegler, J L Kenney, L Kothera, L Vizcaino, A E Lenhart, J P Mutebi, V. Vasquez. 2020. Mosquito control activities during local transmission of Zika virus, Miami-Dade County, Florida, USA, 2016. Emerging Infectious Diseases. 26(5):872-880.

Connelly, R. 2019. Highlights of Medical Entomology 2018: The importance of sustainable surveillance of vectors and vector-borne pathogens. Journal of Medical Entomology. 56(5):1183-1187.

*Parker, C, D Ramirez, C R Connelly. 2019. State-wide survey of *Aedes aegypti* and *Aedes albopictus* (Diptera: Culicidae) in Florida. Journal of Vector Ecology. 44(2): 1-6.

*Reeves, LE, K Krysko, C R Connelly. 2019. *Crocodylus acutus* Ectoparasites. Natural History Notes. Herpetology Review. 50(1): 131-132.

Jules M, R Connelly, F Jones. 2019. Education and outreach efforts of the Haiti Mosquito Control Association. *WingBeats*. 30:15-20.

*Holderman, CJ, Gezan SA, Stone AES, Connelly CR, Kaufman PE. 2018. Mosquitoes (Diptera: Culicidae) Collected from residential yards and dog kennels in Florida using two aspirators, a sweep net, or a CDC Trap. Journal of Medical Entomology, Volume 55, Issue 1, 10 January 2018, Pages 230–236.

*Reeves LE, Krysko KL, Avery ML, Gillett-Kaufman JL, Kawahara AY, Connelly CR, Kaufman PE. 2018. Interactions between the invasive Burmese python, *Python bivittatus* Kuhl, and the local mosquito community in Florida, USA. PLoS ONE 13(1): e0190633.

Riles MT, Smith JP, Burkett-Cadena N, Connelly CR, Morse, GW, Jr., and Byrd, BD. 2017. First record of *Aedes japonicus* in Florida. Journal of the American Mosquito Control Association. 33(4):340-344.

Connelly CR, Alto BW, O'Meara GF. 2016. The spread of *Culex coronator* (Diptera: Culicidae) throughout Florida. Journal of Vector Ecology. 41(1): 195-199.

Lloyd A. and R. Connelly. 2015. Skeeter Life: Exemplifying the professional commitment of mosquito control employees. *WingBeats*. Vol. 25, Issue: Winter 2014. P. 11 – 13

Richards, S.L., C. R. Connelly, J. F. Day, T. Hope, R. Ortiz. 2015. Arthropods associated with carrion in a salt marsh habitat in southeastern Florida. Florida Entomologist. 98(2):613-619.

Connelly, CR. 2015. Editor, Special Issue. Insects. http://www.mdpi.com/journal/insects/special_issues/mosquito-control.

Alto, BW, Connelly, CR, O'Meara, GF, Hickman, D, Karr, N. 2014. Reproductive biology and susceptibility of Florida *Culex coronator* to infection with West Nile virus. Vector-Borne and Zoonotic Diseases. 14:606-614.

Connelly, CR. 2014. 2014. Getting to Z: 2014 AMCA Presidential Address. Journal of the American Mosquito Control Association. 30:165-168.

Lord, CC, Alto, BW, Anderson, SL, Connelly, CR, Day, JF, Richards, SL, Smartt, CT, Tabachnick, WJ. 2014. Can Horton hear the Whos? The importance of scale in mosquito-borne diseases. Journal of Medical Entomology. 51:297-313.

Day, JF, Ross, GK, Connelly, CR. 2013 The Biology of Arboviral Transmission in Florida. Technical Bulletin of the Florida

Mosquito Control Association 9:3-12.

Dale PER, Connelly R. 2012. Wetlands and human health: an overview. Wetlands Ecology and Management. http://www.springerlink.com/content/m18u585h8j562065/fulltext.pdf

Dale PER, Connelly CR. (Eds.). 2012. Wetlands Ecology and Management. Special Issue. Wetland and human health. http://www.springerlink.com/content/m18u585h8j562065/fulltext.pdf

Rey JR, WE Walton, RJ Wolfe, CR Connelly, SM O'Connell, J Berg, GE Saklosky-Hoopes, AD Laderman. 2012. North American wetlands and mosquito control. Int. J. Environ. Res. Public Health. 9:4537-4605.

*Chaskopoulou A., Latham MD, Pereira RM, Connelly CR, Bonds JAS, Koehler PG. 2011. Efficacy of aerial ultra- low volume applications of two novel water-based formulations of unsynergized pyrethroids against riceland mosquitoes of Greece. Journal of the American Mosquito Control Association. 27(4):414-422.

Tabachnick, WJ, Harvey WR, Becnel JJ, Clark GG, Connelly CR, Day JF, Linser PJ, Linthicum K. 2011. Countering a bioterrorist introduction of pathogen-infected mosquitoes through mosquito control. Journal of the American Mosquito Control Association. 27(2):165-167.

*Chaskopoulou A, Koehler PG, Connelly CR. 2010. West Nile fever/encephalitis: How to interrupt the disease by effectively controlling the vector. Acta Microbiologica Hellenica. 55(4):291-294

*Larrick SK, Connelly CR. 2010. A novel device to test the movement of a larvicide. Journal of the American Mosquito Control Association. 26(3):342-343.

Connelly CR. 2009. 2009 AMCA Memorial Lecture Honoree: Dr. Chester Lamar Meek. Journal of the American Mosquito Control Association. 25(3):237-245.

*Kobylinski KC, Allan SA & Connelly CR. 2007. Aspirator modification for the removal of mosquitoes from tight spaces. Journal of the American Mosquito Control Association. 23(4):492-495.

Connelly CR, Day JF, Ross GK. 2006. Enhancing Mosquito-Borne Disease Surveillance in Florida. Journal of Extension. 44(5). http://www.joe.org/joe/2006october/iw4.php

Brown JM, Rutledge CR, Reynolds WR, Dame DA. 2006. Minimal application rates of Dibrom for *Anopheles quadrimaculatus* in Florida under operational and optimized flight conditions. Journal of the American Mosquito Control Association. 22(1)87-92.

Lord CC, Rutledge CR, Tabachnick WJ. 2006. Relationships between host viremia and vector susceptibility for arboviruses. Journal of Medical Entomology. 43(3):623-630.

Godsey MS Jr., Blackmore MS, Panella NA, Burkhalter K, Gottfried K, Halsey LA, Rutledge CR, Langevin SA, Gates R., LaMonte KM, Lambert A, Lanciotti RS, Blackmore CGM, Loyless T, Stark, L, Oliveri, R, Conti L, Komar N. 2005. West Nile virus epizootiology in the Southeastern United States, 2001. Vector-borne and Zoonotic Diseases. 5(1):82-89.

Connelly (Rutledge) CR, Day JF, Lord CL, O'Meara GF, Rey JR, and Tabachnick WJ. 2003.
Florida Mosquito Control Response to the Challenge of West Nile Virus. A series of 2 workshops sponsored by the Florida Medical Entomology Laboratory. Vero Beach, FL. http://mosquito.ifas.ufl.edu/Documents/2003_FMCA_TB_Volume_4.pdf

Rutledge CR, Day JF, Lord CC, Stark LM, Tabachnick WJ. 2003. West Nile virus infection rates in *Culex nigripalpus* (Diptera: Culicidae) do not reflect transmission rates in Florida. Journal of Medical Entomology. 40(3):253- 258.

Ham CM, Brown JR, Musser RO, Rutledge CR, Meisch MV. 1999. Comparison of electrostatic versus non- electrostatic ULV sprays of Aqua-Reslin® against *Anopheles quadrimaculatus* adults. Journal of the American Mosquito Control Association. 15(3): 312-314.

Rutledge CR, Wesson DM, Meek CL. 1999. PCR to identify all immature stages of two species of the *Anopheles quadrimaculatus* sibling species complex. Journal of the American Mosquito Control Association. 15(4):573- 575.

Weidner E, Canning EU, Rutledge CR, Meek CL. 1999. Mosquito (Diptera: Culicidae) host compatibility and vector competency for the human myositic parasite *Trachiplestophora hominis* (Phylum Microspora). Journal of Medical Entomology. 36(4):522-525.

Foil L, Andress E, Freeland RL, Roy AF, Rutledge CR, Triche PC, O'Reilly K. 1998. Experimental infection of domestic cats with *Bartonella henselae* by inoculation of cat flea, *Ctenocephalidies felis* (Siphonaptera: Pulicidae), feces. Journal of Medical Entomology. 35(5):625-628.

Rutledge CR, Meek CL. 1998. Distribution of the *Anopheles quadrimaculatus* sibling species complex in Louisiana. Southwestern Entomology. 23(2):161-167.

Rutledge CR, Cornel AJ, Meek CL, Collins FH. 1996. Validation of a ribosomal DNA-polymerase chain reaction species diagnostic assay for the common malaria mosquito (Diptera: Culicidae) sibling species complex. Journal of Medical Entomology. 33(6):952-954.

Rutledge CR, Meek CL. 1994. A new species of malaria mosquito in Louisiana. Louisiana Agriculture. 37(4):26.

Rutledge CR, Meek CL. 1994. Record of *Anopheles quadrimaculatus* species C in Louisiana. Journal of the American Mosquito Control Association. 10(4):585-586.

Extension/Outreach/Training

Selected workshops/presentations: Average 25 Extension presentations/workshops per year; list of all presentations available on request.

Connelly CR, Burkett-Cadena, ND. Annual (2000 – 2017). Advanced Mosquito Identification and Certification Course. 2-week advanced mosquito identification; covers adult and larval mosquitoes of North America. National and international attendees. ~ 25 students per year.

Connelly, R. 2017. Zika in Florida. Quality Cities. Publication of the Florida League of Cities. Jan/Feb 2017. P.42- 43. http://publications.flcities.com/qc/201701/#?page=42

Connelly CR, Day JF, Tabachnick WJ. 2014. Protecting Florida from Dengue and Chikungunya through control of *Aedes aegypti* and *Aedes albopictus.* 120 attendees. http://mosquito.ifas.ufl.edu/Workshop/Documents/Dengue_Workshop_Introductory_Talks.pdf

Harvey, WR, Tabachnick, WJ, Becnel JJ, Clark GG, Day, JR, Linser PJ, Linthicum, K, and Connelly, CR. 2010. "Counteracting Bioterrorist Introduction of Pathogen-Infected Vector Mosquitoes,". Workshop involving Florida mosquito control, USDA, and University experts. Gainesville, FL. 120 attendees.

Connelly CR, Day JF, O'Meara GF, Tabachnick WJ. 2005. Hurricane Workshop. FMCA Spring Meeting. http://fmel.ifas.ufl.edu/fmel---about-us---v3/fmca-hurricane-workshop-2005/ Naples, FL. 90 attendees.

Connelly (Rutledge) CR, Day JF, Lord CL, O'Meara GF, Rey JR, and Tabachnick WJ. 2002, 2003. Florida Mosquito Control

Response to the Challenge of West Nile Virus. A series of 2 workshops sponsored by the Florida Medical Entomology Laboratory. Vero Beach, FL. 130 attendees. http://mosquito.ifas.ufl.edu/Documents/2003_FMCA_TB_Volume_4.pdf

Connelly, CR. 2016. Zika virus transmission in Florida. Center for Public Issues Education. http://www.piecenter.com/2016/08/18/roxanne-connelly-zika-virus-transmission-in-florida/

Connelly, CR, Bolles, E, Culbert, D, DeValerio, J, Donahoe, M, Gabel, K, Jordi, R, McLaughlin, J, Neal, A, Scalera, S, Toro, E, Walter, J. 2014. Florida resident's guide to mosquito control. University of Florida, Institute of Food and Agricultural Sciences. 40 pp. ENY-753. http://ifasbooks.ifas.ufl.edu/p-1273-mosquitoes-their- control.aspx

Connelly, CR. 2007. Integrated Pest Management for Mosquito Control: The Basics. DVD. Basic components of mosquito control based on Integrated Pest Management principles. Training modules provide background on mosquito management for new mosquito control programs, new employees in mosquito control agencies, and existing mosquito control programs that have not incorporate IPM into their control program. http://ifasbooks.ifas.ufl.edu/p-439-integrated-pest-management-for-mosquito-control- the-basics.aspx

Connelly, CR. 2006. Common mosquitoes of Florida. ID Card Set. Small, bound set of laminated cards with series of photos and biological information of 33 most common mosquitoes in Florida. http://ifasbooks.ifas.ufl.edu/p- 273-common-mosquitoes-of-florida-id-deck.aspx

Books, Edited (Editor, Co-editor)

Lloyd AM, Connelly CR, and Carlson DB (Eds.). 2018. Florida Coordinating Council on Mosquito Control. *Florida Mosquito Control: The state of the mission as defined by mosquito controllers, regulators, and environmental managers*. Vero Beach, FL: University of Florida, Institute of Food and Agricultural Sciences, Florida Medical Entomology Laboratory. 281 pp.

Connelly CR, Carlson DB (Eds.). 2009. Florida Mosquito Control: The state of the mission as defined by mosquito controllers, regulators, and environmental managers. Florida Coordinating Council on Mosquito Control. University of Florida, Institute of Food and Agricultural Sciences, Florida Medical Entomology Laboratory. 259 pp.

Rutledge CR. Editor. Florida Mosquito Control Handbook, 3rd Edition. Florida Mosquito Control Association, Ft. Myers, FL. 2004. 471 pp.

Books, Contributor of Chapter(s)

Connelly R, Gimnig H. Mosquitoes, ticks, and other arthropods. 2026. CDC Yellow Book: Health Information for International Travel. https://www.cdc.gov/yellow-book/hcp/environmental-hazards-risks/mosquitoes-ticks-and-other-arthropods.html

Barcelo C, Blanda V, del Castillo-Remiro A, Chaskopoulou A, Connelly, CR, Ferrero-Gomez L, LaRussa F, Parker- Crockett C, Serafin-Perez I, Sousa CA, Torina A, Vontas J, Miranda MA. 2022. Surveillance of invasive mosquito species in islands with focus on potential vectors of zoonotic diseases. *In:* Ecology of diseases transmitted by mosquitoes to wildlife. Ecology and control of vector-borne diseases. Vol. 7: 179-207.

Rutledge CR. Eastern equine encephalitis. J. L. Capinera (Ed.), *In* Encyclopedia of Entomology. Kluwer Academic, Dordrecht, The Netherlands. 2004. pp. 733-735.

Rutledge CR. Introduction to Culicidae. *In* J. L. Capinera (Ed.), Encyclopedia of Entomology. Kluwer Academic, Dordrecht, The Netherlands. 2004. pp. 1463-1468.

MEMBERSHIP AND ACTIVITIES IN THE PROFESSION

American Mosquito Control Association
Advisory Board Member, CDC/Zika Training Grant Zika Task Force, member, 2016
Founder/Mentor, AMCA Young Professionals, 2010 - 2020
Board of Directors, Past President, 2014-15; President, 2013-14; President-Elect, 2012- 13; Vice-President, 2011-12; South Atlantic Regional Director, 2007-2010
Chair, Washington Conference, 2015
Chair, AMCA Awards Committee 2014-15
Organizer & Moderator, Student Awards, 2001 - 2012
Program Chair, 78th Annual Meeting, 2012
Chair, Training and Member Education Committee, 2001-2007; 2009- 2011
Bylaws Committee, 2017 – 2022.

Entomological Society of America
Board Certified Entomologist: Med/Vet Entomology, 2000 – current Board Certification Committee Chair, 2010 – 2011; Member, 2008 – 2012
ESA Awards Committee Chair: Entomological Foundation Scholarship, 2005
ESA Awards Committee: Entomological Foundation Undergraduate Scholarship; 2003- 2005
Education and Youth Committee, 2001-2005

Florida Mosquito Control Association
Board of Directors, Executive Board, Past-President, 2011-2012; President, 2010-2011; President- elect, 2009-2010; Vice-President, 2008-2009; Member-at-Large, 2007-2008; Southeast Regional Representative, 2001-2003
Chair, FMCA Annual Meeting Program, 2010
Chair, Florida Mosquito Control Foundation Scholarship Committee, 2007 - 2020.
Editor, *Buzz Words* Newsletter Committee, 1998-2015
Chair, Managing Ed., FMCA Handbook Committee, 1998-2020
Dodd Short Course Committee, 1999-2015
Chair, Dodd Short Course Committee, 2011-2015
FMCA Finance Committee, Chair, 2016 - 2017
FMCA Awards Committee, 2002-2013
WingBeats Magazine Editorial Review Board, 2013 - 2025

Haiti Mosquito Control Association
Founding Member, Member, Parliamentarian, 2015 – 2026

<u>Honors and Awards</u>

Medal of Honor. 2024. American Mosquito Control Association. Service to the profession and the association.

University of Florida Awards of Excellence for Graduate Research – Advisor. 2020. Casey Parker-Crockett, Best Dissertation – Natural Resources.

Certificate of Appreciation. 2019. Florida Mosquito Control Association. In recognition of 10 years of service as Chair of the Florida Mosquito Control Foundation Scholarship Committee

Merit Award. Florida Mosquito Control Association. 2018. Service to the Association.

Superior Accomplishment Award (University Level). 2017. Created by Florida Legislature to recognize excellence in

university service. Recognition for response to Zika virus in Florida in 2016.

Superior Accomplishment Award (IFAS Level). 2017 for role in response to Zika outbreak in Florida during 2016

Florida Entomological Society. 2015. Annual Achievement Award for Extension. For contributions on the development of mosquito control strategies in Florida.

Presidential Citation. 2012. Florida Mosquito Control Association.

Chuck Alexander Operational Award. 2011. Louisiana Mosquito Control Association. Invited Keynote Speaker and Award Recipient.

Presidential Citation. 2011. American Mosquito Control Association. For outstanding service to the American Mosquito Control Association for Leadership in the Student Competition. 77th Annual Meeting of the American Mosquito Control Association, Anaheim, CA

Memorial Lecturer Award. 2009. American Mosquito Control Association. Lecture honoring C. Lamar Meek. Presidential Citation. 2008. Florida Mosquito Control Association.

Individual Program Leadership Award of Excellence. 2005. Florida Association of Natural Resources Extension Professionals. University of Florida.

Gerald Hollandsworth Award. 1998. Winner - Student Paper Competition, American Mosquito Control Association, Sparks, NV.

L. D. Newsom Award. 1995. Outstanding Master's Student. Louisiana State University, Department of Entomology, Baton Rouge, LA.

Louis T. Graham Award. 1994. Student Research Award; Louisiana Mosquito Control Association, Shreveport, LA.

CDC Activities

West Nile Virus Technical Advisory Committee, City of Fort Collins, 2017 - 2025
National Association of County and City Health Officials (NACCHO) Vector Control Workgroup, 2018 – 2025
Technical Advisor on Cooperative Agreements with American Mosquito Control Association; Pacific Islands Health Officers Association; CDC Centers of Excellence in Vector-Borne Diseases; CDC Training and Evaluation Centers; Federal Hurricane Funding (2017, 2019, 2023); Epidemiology and Laboratory Capacity program (64 jurisdictions).
Mentoring: ORISE, PHEFA Interns and Fellows

University Affiliations

Courtesy Professor, University of Florida. 2017 – 2025.
Faculty Affiliate, Colorado State University. 2018 – 2025.

List of presentations available upon request.

Dr. Randy Gaugler is exceptionally qualified to serve as Scientific Advisor to the Indian River Mosquito Control District, given his extensive experience in mosquito biology, integrated mosquito management, and, most importantly, the development and field validation of innovative mosquito control technologies.

Dr. Gaugler's research has combined fundamental mosquito biology with practical, field-based applications, and he understands the importance of collaborating with mosquito control agencies to achieve meaningful public health outcomes. His work includes extensive research on insect growth regulators, autodissemination technologies, biological control, mosquito behavior, and area-wide integrated pest management. His research has influenced daily operational decisions and addressed operational challenges faced by mosquito control districts.

Dr. Gaugler also brings unmatched national and international recognition, with more than 40 awards and honors, including the AMCA Medal of Honor, AMCA Memorial Lecturer, AAAS Fellow, ESA Fellow, Einstein Professorship, and Fulbright appointments. He has published numerous scientific papers and patents in mosquito control and medical entomology.

His expertise in applied research problems, extensive collaboration with mosquito control professionals at every level, and demonstrated ability to develop innovative solutions make Dr. Gaugler a highly appropriate and valuable Scientific Advisor to IRMCD. His advice, vision, and experience will strengthen the district's scientific foundation, support science-based decision-making, and advance effective, environmentally responsible, and innovative mosquito management programs to protect public health.

We also would like to utilize his skills to assist us generate and finalize reports. His service will only be used when we secure grants or contracts.

RANDY GAUGLER

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EDUCATION

B.S., Entomology, North Dakota State University, 1972.
M.S., Entomology, North Carolina State University, 1974.
Ph.D., Entomology, University of Wisconsin, 1978.

POSITIONS

Senior Scientist, New York State Museum, 1979-82.
Assistant Professor, Rutgers University, 1982-86.
Associate Professor, Rutgers University, 1986-91.
Professor, Rutgers University, 1991-95.
Research Director, Ecogen, 1993-95.
Associate Director, New Jersey Agricultural Experiment Station, 2007-10.
Director, Rutgers Center for Vector Biology, 2006-2016.
Distinguished Professor, Rutgers University, 1995-2020.
Albert Einstein Professor, Chinese Academy of Sciences, 2006-present.
Distinguished Professor Emeritus, Rutgers University, 2020-present.

PUBLICATIONS

Gaugler R & W Brooks. 1975. Sublethal effects of infection by *Nosema heliothidis* in the com earworm, *Heliothis zea*. *J Invertebr Pathol* 26:57-63.

Gaugler R & G Boush. 1978. Effects of ultraviolet radiation and sunlight on the nematode *Neoaplectana carpocapsae*. *J Invertebr Pathol* 32:291-6.

Gaugler R & G Boush. 1979. Effects of gamma radiation on the nematode *Neoaplectana carpocapsae*. *J Invertebr Pathol* 33:121-3.

Gaugler R & G Boush. 1979. Nonsusceptibility of rats to the entomogenous nematode *Neoaplectana carpocapsae*. *Environ Entomol* 8: 658-60.

Gaugler R & G Boush. 1979. Tests on ultraviolet protectants of an entomogenous nematode. *Environ Entomol* 8:810-3.

Gaugler R, L LeBeck, B Nakagaki & G Boush. 1980. Orientation of the entomogenous nematode *Neoaplectana carpocapsae* to carbon dioxide. *Environ Entomol* 9:649-52.

Molloy D, R Gaugler & H Jamnback. 1980. Pathogenicity of *Neoaplectana carpocapsae* to black fly larvae. *J Invertebr Pathol* 6:302-6.

Gaugler R, D Molloy, T Haskins & G Rider. 1980. A bioassay system for the evaluation of black fly (Diptera: Simuliidae) control agents under simulated stream conditions. *Can Entomol* 112:1271-6.

Gaugler R & D Molloy. 1980. Feeding inhibition in black fly larvae (Diptera: Simuliidae) and its effects on the pathogenicity of *Bacillus thuringiensis* var. *israelensis*. *Environ Entomol* 9:704-8.

Molloy D, R Gaugler & H Jamnback. 1981. Factors influencing efficacy of *Bacillus thuringiensis* var. *israelensis* as a biological control agent of black fly larvae. *J Econ Entomol* 74:61-4.

Gaugler R. 1981. Biological control potential of neoaplectanid nematodes. *J Nematol* 13:241-9.

Gaugler R & D Molloy. 1981. Instar susceptibility of *Simulium vittatum* to the entomogenous nematode *Neoaplectana carpocapsae*. *J Nematol* 13:1-5.

Gaugler R & D Molloy. 1981. Field evaluation of the nematode *Neoaplectana carpocapsae* as a blackfly larvicide. *Mosq News* 41:459-64.

Gaugler R & J Finney. 1982. *Bacillus thuringiensis* var. *israelensis* as a biological control agent of black flies (Diptera: Simuliidae). *Misc Publs Entomol Soc Am* 12:1-17.

Gaugler R & S Jaronski. 1983. Assessment of the mosquito pathogenic fungus *Culicinomyces clavosporus* as a black fly pathogen. *J Med Entomol* 20:575-6.

Gaugler R & H Kaya. 1983. A bibliography of the entomogenous nematode family Steinernematidae. *Bibl Entomol Soc Am* 1:43-64.

Gaugler R, B Kaplan, C Alvarado, J Montoyo & M Ortega. 1983. Assessment of *Bacillus thuringiensis* serotype 14 and *Steinernema feltiae* for control of the *Simulium* vectors of onchocerciasis in Mexico. *Entomophaga* 28:309-15.

Gaugler R, S Wraight & D Molloy. 1984. Bionomics of a mermithid parasitizing snowpool *Aedes* spp. mosquitoes. *Can J Zool* 62: 670-4.

Sofield R & R Gaugler. 1985. Oviposition behavior of *Chrysops atlanticus* (Diptera: Tabanidae). *N Y Entomol Soc* 92:403-4.

Gaugler R. 1987. Non-infectious diseases. In "Epizootiology of Insect Diseases" (J Fuxa & Y Tanada, eds), pp. 245-56. John Wiley & Sons, New York. 555 pp.

Gaugler R. 1987. Entomogenous nematodes and their prospects for genetic improvement. In "Biotechnological Advances in Invertebrate Pathology and Cell Culture" (K Maramorosch, ed), pp. 457-484. Academic Press, New York. 511 pp.

Timper P, H Kaya & R Gaugler. 1988. Dispersal of the entomogenous nematode *Steinernema feltiae* (Rhabditida: Steinernematidae) by infected adult insects. *Environ Entomol* 17:546-50.

Gaugler R. 1988. Ecological considerations in the biological control of soil-inhabiting insect pests with entomopathogenic nematodes. *Agric. Ecosys Environ*. 24:351-60.

Gaugler R, T McGuire & J Campbell. 1989. Genetic variability among strains of the entomopathogenic nematode *Steinernema feltiae. J Nematol* 21:247-53.

Gaugler R & S Schutz. 1989. Environmental influences on hovering behavior of *Tabanus nigrovittatus* and *T. conterminus* (Diptera: Tabanidae). *J Insect Behav* 2:775-86.

Costa S & R Gaugler. 1989. Influence of *Solanum* host plants on Colorado potato beetle susceptibility to the entomopathogen *Beauveria bassiana. Environ Entomol* 18:531-6.

Gaugler R, S Costa & J Lashomb. 1989. Stability and efficacy of *Beauveria bassiana* soil inoculations. *Environ Entomol* 18:412-7.

Costa S & R Gaugler. 1989. Sensitivity of *Beauveria bassiana* to solanine and tomatine: plant defensive chemicals inhibit an insect pathogen. *J Chem Ecol* 15:697-706.

Schutz S & R Gaugler. 1989. Honeydew feeding by salt marsh horse flies (Diptera: Tabanidae). *J. Med. Entomol.* 26:471-3.

Choo Y, H Kaya, T Burlando & R Gaugler. 1989. Entomopathogenic nematodes: host-finding ability in the presence of plant roots. *Environ. Entomol* 18:1136-40.

Schutz S, R Gaugler & R Vrijenhoek. 1989. Genetic and morphometric discrimination of coastal and inland *Tabanus lineola* (Diptera: Tabanidae). *Ann Entomol Soc Am* 82:220-4.

Gaugler R, J Campbell & T McGuire. 1989. Selection for host finding in *Steinernema feltiae*. *J Invertebr Pathol* 54:363-72.

Gaugler R, T McGuire & J Campbell. 1989. Genetic variability among strains of the entomopathogenic nematode *Steinernema feltiae*. *J Nematol* 21:247-53.

Gaugler R & H Kaya (Eds). 1990. Entomopathogenic Nematodes in Biological Control. CRC Press, Boca Raton. 365 pp.

Kung S-P, R Gaugler & H Kaya. 1990. Soil type and entomopathogenic nematode persistence. *J Invertebr Pathol* 55:401-6.

Schutz S, R Gaugler & R Vrijenhoek. 1990. Genetic variability associated with hovering time in *Tabanus nigrovittatus* (Diptera: Tabanidae). *J Insect Behav* 3:579-87.

Kung S-P, R Gaugler & H Kaya. 1990. Influence of soil pH and oxygen on persistence of *Steinernema* spp. *J Nematol* 22:440-5.

Jansson R, S LeCrone, R Gaugler & G Smart. 1990. Potential of entomopathogenic nematodes as biological control agents of sweetpotato weevil. *J Econ Entomol* 83:1818-26.

Gaugler R & D Freckman. 1990. A program officer's guide to effective grantsmanship. *Am Entomol* 36:206-12.

Gaugler R, J Campbell & T McGuire. 1990. Fitness of a genetically improved entomopathogenic nematode. *J Invertebr Pathol* 56:106-16.

Gaugler R. 1990. Salinity tolerance of the stable fly. *J Econ Entomol* 83:887-91.

Jansson R, R Gaugler & S Lecrone. 1991. Biological control of *Cylas spp.* *In* "Rencontres Caraibes en Lutte Biologique" (C. Pavis & A. Kermarrec, Eds), pp. 167-82. INRA, Paris.

Georgis R & R Gaugler. 1991. Predictability in biological control using entomopathogenic nematodes. *J Econ Entomol [Forum]* 84:713-20.

Gaugler R & R Georgis. 1991. Culture method and efficacy of entomopathogenic nematodes. *Biol Contr* 1:269-74.

Hara A, R Gaugler, H Kaya & L LeBeck. 1991. Natural populations of entomopathogenic nematodes from the Hawaiian Islands. *Environ. Entomol*. 20:211-6.

Gaugler R & J Campbell. 1991. Selection for enhanced host-finding to scarab larvae (Coleoptera: Scarabaeidae) in an entomopathogenic nematode. *Environ Entomol* 20:700-6.

Roberts D, J Fuxa, R Gaugler, M Goettle & J Maddox. 1991. Use of pathogens in insect control. *In* "CRC Handbook of Pest Management" (D Pimentel, Ed), pp. 243-78. CRC Press.

Gaugler R, J Campbell & P Gupta. 1991. Characterization and basis of enhanced host-finding in a genetically improved strain of *Steinernema carpocapsae. J Invertebr Pathol* 57:234-41.

Campbell L & R Gaugler. 1991. Mechanisms for exsheathment of entomopathogenic nematodes. *Intern J Parasitol* 21:219-24.

Kung S-P, R Gaugler & H Kaya. 1991. Effects of soil temperature, moisture and relative humidity on entomopathogenic nematode persistence. *J Invertebr Pathol* 57:242-9.

Gaugler R & J Campbell. 1991. Behavioural response of the nematodes *Steinernema carpocapsae* and *Heterorhabditis bacteriophora* to oxamyl. *Ann Appl Biol* 119:131-8.

Glazer I, R Gaugler & D Segal. 1991. Genetics of the nematode *Heterorhabditis bacteriophora* strain HP88: the diversity of beneficial traits. *J Nematol* 23:324-33.

Georgis R, H Kaya & R Gaugler. 1991. Effect of steinernematid and heterorhabditid nematodes on nontarget arthropods. *Environ Entomol* 20:815-22.

Campbell L & R Gaugler. 1991. Role of the sheath in desiccation tolerance of two entomopathogenic nematodes. *Nematologica* 37:324-32.

Jansson R, S LeCrone & R Gaugler. 1991. Comparison of single and multiple releases of *Heterorhabditis bacteriophora* for control of *Cylas formicarius*. *Biol Contr* 1:320-8.

Schutz S & R Gaugler. 1992. Thermoregulation and hovering behavior of salt marsh horse flies (Diptera: Tabanidae). *Ann Entomol Soc Am* 85:431-6.

Gaugler R, A Bednarek & J Campbell. 1992. Ultraviolet inactivation of heterorhabditids and steinernematids. *J Invertebr Pathol* 59:155-60.

Campbell L & R Gaugler. 1992. Effect of exsheathment on motility and pathogenicity of two entomopathogenic nematode species. *J Nematol* 24:365-70.

Lewis E, R Gaugler & R Harrison. 1992. Entomopathogenic nematode host finding: response to host contact cues by cruise and ambush foragers. *Parasitology* 105:309-15.

Gaugler R, J Campbell, M Selvan & E Lewis. 1992. Large-scale inoculative releases of the entomopathogen *Steinernema glaseri:* assessment 50 years later. *Biol Contr* 2:181-7.

Kaya H & R Gaugler. 1993. Entomopathogenic nematodes. *Ann Rev Entomol* 38:181-206.

Gaugler R. 1993. Ecological genetics. *In* "Nematodes and the Biological Control of Insect Pests" (R Bedding, R Akhurst & H Kaya, Eds), pp. 79-87. CSIRO, Canberra.

Selvan S, R Gaugler & J Campbell. 1993. Efficacy of entomopathogenic nematode strains against Japanese beetle, *Popillia japonica*, larvae. *J Econ Entomol* 86:353-59.

McMahon M & R Gaugler. 1993. Effect of salt marsh drainage on the distribution of *Tabanus nigrovittatus* (Diptera: Tabanidae). *J Med Entomol* 30:474-6.

Grewal P, R Gaugler & S Selvan. 1993. Host recognition by entomopathogenic nematodes: behavioral response to contact with host feces. *J Chem Ecol* 19:1219-31.

Selvan S, R Gaugler & E Lewis. 1993. Biochemical energy reserves of entomopathogenic nematodes. *J Parasitol* 79:167-72.

Lewis E, R Gaugler & R Harrison. 1993. Response of cruiser and ambusher entomopathogenic nematodes to host volatile cues. *Can J Zool* 71:765-9.

Grewal P, R Gaugler, H Kaya & M Wusuty. 1993. Infectivity of the entomopathogenic nematode *Steinernema scapterisci. J Invertebr Pathol* 62:22-8.

Selvan S, R Gaugler & P Grewal. 1993. Water content and fatty acid composition of infective juvenile entomopathogenic nematodes during storage. *J Parasitol* 79:510-6.

Cui L, R Gaugler & Y Wang. 1993. Penetration of steinernematid nematodes into Japanese beetle larvae, *Popillia japonica* (Coleoptera: Scarabaeidae). *J Invertebr Pathol* 62:73-8.

LeBeck L, R Gaugler, H Kaya & A Hara. 1993. Host stage suitability of the leafminer *Liriomyza trifolii* to the nematode *Steinernema carpocapsae. J Invertebr Pathol* 62:92-8.

Grewal P, S Selvan, E Lewis & R Gaugler. 1993. Male insect-parasitic nematodes: a colonizing sex. *Experientia* 49:605-8.

McMahon M & R Gaugler. 1993. Spatial distribution of hovering male *Tabanus nigrovittatus* (Diptera: Tabanidae). *Environ Entomol* 22:796-801.

Grewal P, C Keil, M Tomalak & R Gaugler. 1993. Evaluation of a genetically selected strain of *Steinernema feltiae* against the sciarid *Lycoriella mali*. *Ann Appl Biol* 123:695-702.

Selvan S, J Campbell & R Gaugler. 1993. Density dependent effects on entomopathogenic nematodes within an insect host. *J Invertebr Pathol* 62:278-84.

Lacey L, A Bettencourt, F Garrett, N Simoes & R Gaugler. 1993. Factors influencing parasitism of adult Japanese beetles by entomopathogenic nematodes. *Entomophaga* 38:501-9.

Jansson R, S LeCrone & R Gaugler. 1993. Field efficacy and persistence of entomopathogenic nematodes for control of sweetpotato weevil (Col: Apionidae). *J Econ Entomol* 87:1055-63.

Rahimi F, T McGuire & R Gaugler. 1993. Morphological mutant in the nematode *Heterorhabditis bacteriophora. J Hered* 84:475-8.

Campbell J & R Gaugler. 1993. Nictation behavior and its ecological implications in the search strategies of entomopathogenic nematodes. *Behavior* 126:155-170.

Grewal P, R. Gaugler & E. Lewis. 1993. Host recognition behavior by entomopathogenic nematodes during contact with host gut contents. *J Parasitol* 79:495-503.

Hara A, H Kaya, R Gaugler, L LeBeck & C Mello. 1993. Entomopathogenic nematodes for biological control of the leafminer *Liriomyza trifolii*. *Entomophaga* 38:359-70.

Gaugler R, I Glazer, J Campbell & N Liran. 1994. Laboratory and field evaluation of an entomopathogenic nematode genetically selected for host finding. *J Invertebr Path* 63:68-73.

Thurston G, H Kaya & R Gaugler. 1994. Characterizing the enhanced susceptibility of milky disease-infected scarabaeid grubs to entomopathogenic nematodes. *Biol Contr* 4:67-73.

Grewal P, E Lewis, R Gaugler & J Campbell. 1994. Host finding behaviour as a predictor of foraging strategy in entomopathogenic nematodes. *Parasitology* 108:207-15.

Wang Y, R Gaugler & L Cui. 1994. Variations in immune response of *Popillia japonica* and *Acheta domesticus* to *Heterorhabditis bacteriophora* and *Steinernema* spp. *J Nematol* 26:11-8.

Selvan S, P Grewal, R Gaugler & M Tomalak. 1994. Evaluation of steinernematid nematodes against *Popillia japonica:* species, strain and rinse after application. *J Econ Entomol* 89:605-9.

Stuart R & R Gaugler. 1994. Patchiness in populations of entomopathogenic nematodes. *J Invertebr Pathol* 64:39-45.

Grewal P, S Selvan & R Gaugler. 1994. Thermal adaptation of entomopathogenic nematodes: niche breadth for infection, establishment, and reproduction. *J Thermal Biol* 19:245-53.

Gaugler R, Y Wang & J Campbell. 1994. Aggressive and evasive behaviors in *Popillia japonica* larvae: defenses against entomopathogenic nematode attack. *J Invertebr Pathol* 64:193-9.

Lewis R & R Gaugler. 1994. Entomopathogenic nematode sex ratio relates to foraging strategy. *J Invertebr Pathol* 64:238-42.

Lewis E, P Grewal & R Gaugler. 1995. Hierarchical order of host cues in parasite foraging strategies. *Parasitology* 110:207-13.

Grewal S, P Grewal & R Gaugler. 1995. Endophytes of fescue grasses enhance susceptibility of *Popillia japonica* to an entomopathogenic nematode. *Entomol Exper appl* 172:219-26.

Lewis E, S Selvan, J Campbell & R Gaugler. 1995. Changes in foraging in infective stage insect-parasitic nematodes. *Parasitology* 110:583-90.

Trimmer W, P Ling, C-K Chin, P Orton, R Gaugler, S Hashmi, G Hashmi, B Brunett & M Reed. 1995. Injection of DNA into plant and animal tissues with micromechanical piercing structures. Micro Electro Mech Syst 95:111-8.

Hatab MA & R Gaugler. 1995. Role of proteases in penetration of insect gut by the entomopathogenic nematode *Steinernema glaseri*. *J Invertebr Pathol* 66:125-30.

Wang Y, J Campbell & R Gaugler. 1995. Infection of entomopathogenic nematodes *Steinernema glaseri* and *Heterorhabditis bacteriophora* against *Popillia japonica* larvae. *J Invertebr Pathol* 66:178-84.

Hashmi S., P. Ling, G. Hashmi, M. Reed, R. Gaugler & W. Trimmer. 1995. Genetic transformation using arrays of micromechanical piercing structures. *Biotechniques* 19:766-70.

Campbell J, E Lewis, F Yoder & R Gaugler. 1995. Entomopathogenic nematode seasonal population dynamics and impact on insect populations in turfgrass. *Biol Contr* 5:598-606.

Hashmi S, G Hashmi & R Gaugler. 1995. Genetic transformation of an entomopathogenic nematode by microinjection. *J Invertebr Pathol* 66:293-6.

Gaugler R & S Hashmi. 1996. Genetic engineering of an insect parasite. *In* "Genetic Engineering Principles and Methods" (J Setlow, Ed), pp. 135-57. Plenum Press.

Stuart R & R Gaugler. 1996. Genetic adaptation and founder effect in laboratory populations of the entomopathogenic nematode, *Steinernema glaseri. Can J Zool* 74:164-70.

Ricci M, I Glazer, J Campbell & R Gaugler. 1996. Comparison of bioassays to measure virulence of different entomopathogenic nematodes. *Biocontr Sci Technol* 6:235-45.

Brown I & R Gaugler. 1996. Cold tolerance of steinernematid and heterorhabditid nematodes. *J Therm Biol* 21:115-21.

Grewal P, R Gaugler & C Schupe. 1996. Rapid changes in thermal sensitivity of entomopathogenic nematodes in response to selection at temperature extremes. *J Invertebr Pathol* 68:65-73.

Caroli L, I Glazer & R Gaugler. 1996. Entomopathogenic nematode infectivity assay: comparison of infection rate into different hosts. *Biocontr Sci Technol* 6:227-33.

Lewis E, I Glazer & R Gaugler. 1996. Location and behavioral effects of lectin binding on entomopathogenic nematodes with different foraging strategies. *J Chem Ecol* 22:455-66.

Selvan S, P Grewal, T Leustek & R Gaugler. 1996. Heat shock enhances thermotolerance of infective juvenile insect parasite *Heterorhabditis bacteriophora*. *Experientia* 52:727-30.

Hashmi G, I Glazer & R Gaugler. 1996. Molecular comparisons of entomopathogenic nematodes using randomly amplified polymorphic DNA (RAPD) markers. *Fund Appl Nematol* 19:399-406.

Stuart R & R Gaugler. 1996. Selection alters the pattern of emergence from the host cadaver in the entomopathogenic nematode *Steinernema glaseri*. *Parasitology* 113:183-9.

Campbell J, E Lewis, F Yoder & R Gaugler. 1996. Entomopathogenic nematode spatial distribution in turfgrass. *Parasitology* 113:473-82.

Glazer I, E Kozodoi, G Hashmi & R Gaugler. 1996. Biological characteristics of the nematode *Heterorhabditis bacteriophora* IS5: a heat tolerant isolate from Israel. *Nematologica* 42:481-92.

Grewal P, R Gaugler & Y Wang. 1996. Enhanced cold tolerance of *Steinernema feltiae* through genetic selection. *Ann Appl Biol* 129:335-41.

Solon E, A Gupta & R Gaugler. 1996. Signal transduction during exocytosis in *Limulus polyphemus* granulocytes. *Devel Comp Immunol* 20:307-21.

Lewis E, M Ricci & R Gaugler. 1996. Host recognition behavior predicts host suitability in the entomopathogenic nematode *Steinernema carpocapsae*. *Parasitology* 113:573-9.

Gaugler R, E Lewis & R Stuart. 1997. Ecology in the service of biological control. *Oecologica* 109:483-9.

Hashmi S & R Gaugler. 1997. Application of micromechanical piercing structures for genetic transformation. *In* "Methods in Molecular Biology: Recombinant Gene Expression Protocols." (R Tuan, Ed), pp. 393-8. Humana Press.

Hatab MA & R Gaugler. 1997. Growth-mediated variations in fatty acids of *Xenorhabdus* sp. *J Appl Microbiol* 82:351-8.

Hashmi G, S Hashmi, S Selvan, P Grewal & R Gaugler. 1997. Polymorphism in shock protein gene (*hsp*70) in an entomopathogenic nematode. *J Therm Biol* 22:143-9.

Gaugler R. 1997. Alternative paradigms for biopesticides. *Phytoparasitica* 25:179-82.

Hashmi S, MA Hatab & R Gaugler. 1997. GFP: green fluorescent protein a versatile gene marker for entomopathogenic nematodes. *Fund Appl Nematol* 20:323-7.

Stuart R, S Polavarapu, E Lewis & R Gaugler. 1997. Differential susceptibility of *Dysmicocus vaccinii* (Homoptera) to entomopathogenic nematodes. *J Econ Entomol* 90:925-32.

Solon E, A Gupta & R Gaugler. 1997. Location of a putative inositol 1,4,5-triphosphate receptor of the *Limulus* granulocyte. *Devel Comp Immunol* 21:277-85.

Grewal P, E Lewis & R Gaugler. 1997. Response of infective stage parasites to volatile cues from infected hosts. *J Chem Ecol* 23:503-15.

Bednarek A & R Gaugler. 1997. Compatibility of soil amendments with entomopathogenic nematodes. *J Nematol* 29:220-7.

Gaugler R, M Wilson & P Shearer. 1997. Field release and environmental fate of a transgenic entomopathogenic nematode. *Biol Contr* 9:75-80.

Brown I & R Gaugler. 1997. Temperature and humidity influence emergence and survival of entomopathogenic nematodes. *Nematologica* 43:363-75.

Hashmi G, S Hashmi & R Gaugler. 1997. Molecular trends in entomopathogenic nematology. *In* "Recent Research Developments in Entomology" (S Pandalai, Ed), pp. 161-86. Research Signpost.

Lewis E, J Campbell & R Gaugler. 1997. The effects of aging on the foraging behavior of *Steinernema carpocapsae*. *Nematologica* 43:355-62.

Hatab MA & R Gaugler. 1997. Influence of growth temperature on fatty acids and phospholipids of the entomopathogen *Steinernema riobravis*. *J Therm Biol* 22:237-44.

Campbell J & R Gaugler. 1997. Inter-specific variation in entomopathogenic nematode foraging strategy: dichotomy or variation along a continuum? *Fundam Appl Nematol* 20:393-8.

Baur M, H Kaya, R Gaugler & B Tabashnik. 1997. Effects of adjuvants on entomopathogenic nematode persistence and efficacy against *Plutella xylostella*. *Biocontr Sci Techn* 7:513-25.

Brown I & R Gaugler. 1998. Survival of steinernematid nematodes exposed to freezing. *J Therm Biol* 23:75-80.

Koppenhofer A, J Campbell, H Kaya & R Gaugler. 1998. Estimation of entomopathogenic nematode population density in soil using the correlation between bait insect mortality and nematode penetration. *Fund Appl Nematol* 21:95-102.

Campbell J, G Orza, F Yoder, E Lewis & R Gaugler. 1998. Spatial and temporal distribution of endemic and released entomopathogenic nematodes in turfgrass. *Entomol Exper Appl* 86:1-11.

Hatab MA, R Gaugler & R Ehlers. 1998. Influence of culture method on *Steinernema glaseri* lipids. *J Parasitol* 84:215-21.

Wang Y & R Gaugler. 1998. Host and penetration site location by entomopathogenic nematodes against Japanese beetle larvae. *J Invertebr Pathol* 72:313-8.

Hashmi S, G Hashmi, I Glazer & R Gaugler. 1998. Thermal response of *Heterorhabditis bacteriophora* transformed with the *Caenorhabditis elegans hsp70*-encoding gene. *J Exper Zool* 281:164-70.

Lewis E, J Campbell & R Gaugler. 1998. A conservation approach to using entomopathogenic nematodes in turf and landscapes. *In* "Conservation Biological Control" (P Barbosa, Ed), pp. 235-54. Academic Press.

Hashmi G & R Gaugler. 1998. Genetic diversity in *Heterorhabditis* spp. as revealed by molecular markers. *J Invertebr Pathol* 72:185-189.

Stuart R, MA Hatab & R Gaugler. 1998. Sex ratio and the infection process in entomopathogenic nematodes: are males the colonizing sex? *J Invertebr Pathol* 72:288-95.

Georgis R & R Gaugler. 1998. Entomopathogenic nematodes for insect management. *In* "Mass-Reared Natural Enemies: Application, Regulation & Needs" (R Ridgway et al, Ed), pp. 139-48. *Thomas Say Publ*.

Hatab MA, R Stuart & R Gaugler. 1998. Antibiotic resistance and protease production by *Photorhabdus luminescens* and *Xenorhabdus poinari* bacteria symbiotic with entomopathogenic nematodes: variability among species and strains. *Soil Ecol Biochem* 30:1955-61.

Hashmi S, G Hashmi & R Gaugler. 1999. Transformation of nematodes by microinjection. *In* "Methods and Tools in Biosciences & Medicine: Microinjection" (J Lacal, R Perona, J Feramisco, Eds), pp. 233-40. Birkauser Verlag.

Wilson M, W Xin, S Hashmi & R Gaugler. 1999. Risk assessment and fitness of a transgenic entomopathogenic nematode. *Biol Contr* 15:81-7

Hatab MA & R Gaugler. 1999. Lipids of in vivo and in vitro cultured *Heterorhabditis bacteriophora*. *Biol Contr* 15:113-8.

Wang Y & R Gaugler. 1999. *Steinernema glaseri* surface coat protein suppresses the immune response of Japanese beetle larvae. *Biol Contr* 14:45-50.

Yoo S, I Brown & R Gaugler. 2000. Liquid media development for *Heterorhabditis bacteriophora*: lipid source and concentration. *Appl Microbiol Biotechnol* 54:759-63.

Koppenhöfer A, I Brown, R Gaugler, P Grewal, H Kaya & M Klein. 2000. Synergism of entomopathogenic nematodes and imidacloprid against white grubs: greenhouse and field evaluation. *Biol Contr* 19:245-51.

Wilson M & R Gaugler. 2000. Terrestrial mollusc pests. *In* "Field Manual for Application and Evaluation of Invertebrate Pathogens" (L Lacey & H Kaya, Eds), pp. 787-804. Kluwer Academic.

Koppenhofer A, M Wilson, I Brown, H Kaya & R Gaugler. 2000. Biological control agents for white grubs in anticipation of establishment of the Japanese beetle in California. *J Econ Entomol* 93:71-80.

Gaugler R, P Grewal, H Kaya & D Smith-Fiola. 2000. Quality assessment of commercially produced entomopathogenic nematodes. *Biol Contr* 17:100-9.

Yoo S, I Brown, N Cohen & R Gaugler. 2001. Medium concentration influencing growth of the entomopathogenic nematode *Heterorhabditis bacteriophora* and its symbiotic bacterium *Photorhabdus luminescens*. *J Microbiol Biotechnol* 11:644-8.

Wilson M, S Hashmi & R Gaugler. 2001. Risk assessment, fitness and field release of a transgenic entomopathogenic nematode. *In* "Enhancing Biocontrol Agents and Handling Risks." (M Vurro et al., Eds), pp. 177-87. IOS Press.

Yoo S, R Gaugler & C Brey. 2001. Growth optimization of *Photorhabdus luminescence* isolated from the entomopathogenic nematode *Heterorhabditis bacteriophora*. *Kor J Appl Microbiol Biotechn* 29:104-9.

Hatab M & R Gaugler. 2001. Diet composition and lipids of in vitro-produced *Heterorhabditis bacteriophora*. *Biol Contr* 20:1-7.

Shapiro-Ilan D & R Gaugler. 2002. Production technology for entomopathogenic nematodes and their bacterial symbionts. *J Industr Microbiol Biotechnol* 28:137-46.

Gaugler R & R Han. 2002. Mass Production Technology. *In* "Entomopathogenic Nematology" (R Gaugler, Ed), pp. 289-310. CABI Publ.

Cohen N, I Brown & R Gaugler. 2002. Physiological ageing and behavioural plasticity of *Heterorhabditis bacteriophora* infective juveniles. *Nematology* 4:81-87.

Sasnarukkit A, R Gaugler & S Sontirat. 2002. Effects of the entomopathogenic nematode *Steinernema siamkayai* and its symbiont's metabolites on *Meloidogyne incognita. Intern J Nematol* 12:169-74.

Gaugler R, I. Brown, D. Shapiro-Ilan & A Atwa. 2002. Automated technology for in vivo mass production of entomopathogenic nematodes. *Biol. Contr*. 24:199-206.

Fallon D, H Kaya, R Gaugler & B Sipes. 2002. Effects of entomopathogenic nematodes on *Meloidogyne javanica* on tomatoes and soybeans. *J Nematol* 34:239-45.

Lewis E, B Barbarosa & R Gaugler. 2002. Mating and sexual communication in *Steinernema carpocapsae*. *J Nematol* 34:328-31.

Shapiro-Ilan D, I Brown, W Tedders & R Gaugler. 2002. Optimization of inoculation for *in vivo* production of entomopathogenic nematodes. *J Nematol* 34:343-50.

Gil G, H Choo & R Gaugler. 2002. Enhancement of entomopathogenic nematode production in *in vitro* liquid culture of *Heterorhabditis bacteriophora* with glucose supplementation. *Appl Microbiol Biotechnol* 58:751-5.

Brown I, B Lovett, P Grewal & R Gaugler. 2002. Latent infection: a low temperature survival strategy in steinernematid nematodes. *J Therm Biol* 27:531-9.

Gaugler R. (Ed). 2002. "Entomopathogenic Nematology." CABI Publ. 388 pp.

Sasnarukkit A, R Gaugler & S Sontirat. 2003. Pathogenicity of entomopathogenic nematodes against diamondback moth, *Plutella xylostella*. *Thai J Agric Res* 37:441-51.

Wilson M, E Lewis, F Yoder & R Gaugler. 2003. Application pattern and persistence of the entomopathogenic nematode *Heterorhabditis bacteriophora*. *Biol Contr* 26:180-8.

Gaugler R. 2003. Ticks. *In* "The Encyclopedia of New Jersey" (M. Mappen & M. Lurie, Eds.), Rutgers University Press, 912 pp.

Gaugler R. 2003. Evolution of solid culture production for entomopathogenic nematodes. *Eg J Biol Pest Contr* 1:121-4.

Wilson M & R Gaugler. 2004. Factors limiting short-term persistence of entomopathogenic nematodes. *J Appl Entomol* 128:250-3.

Fallon D, H Kaya, R Gaugler & B Sipes. 2004. Effect of *Steinernema feltiae – Xenorhabdus bovienii* insect pathogen complex on *Meloidogyne javanica*. *Nematology* 6:671-80.

Bilgrami A & R Gaugler. 2004. Introduction and overview. *In* "Nematode Behaviour" (R Gaugler & A Bilgrami, Eds), pp. 1-18. CABI Publ.

Bilgrami A & R Gaugler. 2004. Feeding behavior. *In* "Nematode Behaviour" (R Gaugler & A Bilgrami, Eds), pp. 91-126. CABI Publ.

Shapiro-Ilan D, R Gaugler & E Lewis. 2004. In vivo production of entomopathogenic nematodes. *Intern J Nematol* 14:13-18.

Gaugler R & A Bilgrami (Eds). 2004. "Nematode Behaviour." CABI Publ. 419 pp.

Bai C, D Shapiro-Ilan, R Gaugler & Y Shuxia. 2004. Effects of entomopathogenic nematode concentration on survival during cryopreservation in liquid nitrogen. *J Nematol* 36:281-4.

Nguyen K, M Tesfamariam, U Gozel, R Gaugler & B Adams. 2004. *Steinernema yirgalamense* n. sp. (Rhabditida: Steinernematidae) from Ethiopia. *Nematology* 6:839-56.

Bai C, D Shapiro-Ilan, R Gaugler & K Hopper. 2005. Stabilization of beneficial trains in *Heterorhabditis bacteriophora* through creation of inbred lines. *Biol Contr* 32:220-7.

Mekete T, R Gaugler, K Nguyen, W Mandfro & M Tessera. 2005. Biogeography of entomopathogenic nematodes in Ethiopia. *Nematropica* 35:31-6.

Bilgrami A & R Gaugler. 2005. Feeding behavior of the predatory nematodes *Laimydorus baldus* and *Discolaimus major* (Nematoda: Dorylamida). *Nematology* 7:11-20.

Kepenekci I, A Gokce & R Gaugler. 2005. Virulence of three species of entomopathogenic nematodes to the chestnut weevil, *Curculio elephas. Nematropica* 34:199-204.

Bilgrami A, R Gaugler & C Brey. 2005. Prey preference and feeding behavior of the diplogasterid predator *Mononchoides gaugleri* (Nematoda: Diplogasterida). *Nematology* 7:333-42.

Bai C, D Shapiro-Ilan, Y Wang, R Gaugler, E Cowles & W Yi. 2005. Protein changes in the symbiotic bacterium *Photorhabdus luminescens* during *in vitro* serial culture. *Intern J Nematol* 15:126-35.

Brown I, D Shapiro-Ilan & R Gaugler. 2006. Entomopathogenic nematode infectivity enhancement using physical and chemical stressors. *Biol Contr* 39:147-153.

Bilgrami A, R Gaugler, D Shapiro-Ilan & B Adams. 2006. Source of trait deterioration in entomopathogenic nematodes *Steinernema carpocapsae* and *Heterorhabditis bacteriophora* during in vivo culture. *Nematology* 8:397-409.

Shamseldean M, E Platzer & R Gaugler. 2006. Ultrastructure of the cellular immune responses of *Anopheles quadrimaculatus* to *Romanomermis culicivorax* infection. *Nematropica* 36:243-9.

Wang Y, A Bilgrami, D Shapiro-Ilan & R Gaugler. 2007. Stability of symbiotic bacteria, *Xenorhabdus nematophila* and *Photorhabdus luminescens*, during in vitro culture. *J Industr Microbiol Biotechnol* 34:73-81.

Bilgrami A & R Gaugler. 2007. Stress-induced loss of heat tolerance in the entomopathogenic nematodes *Heterorhabditis bacteriophora* and *Steinernema carpocapsae*. *Nematology* 9:161-7.

Li X, R Cowles, E Cowles, R Gaugler & D Cox-Foster. 2007. Relationship between successful infection by entomopathogenic nematodes and the host immune response. *Intern J Parasitol* 37:365-74.

Shamseldean M, E Platzer & R Gaugler. 2007. Role of the surface coat of *Romanomermis culicivorax* in immune evasion. *Nematology* 9:17-24.

Bai X, P Grewal, S Hogenhout, B Adams, T Ciche, R Gaugler & P Sternberg. 2007. Expressed sequence tag analysis of gene representation in insect parasitic nematode *Heterorhabditis bacteriophora*. *J Parasitol* 93:1343-9.

Bilgrami A, C Brey & R Gaugler. 2008. First field release of a predatory nematode, *Mononchoides gaugleri* (Nematoda: Diplogasterida). *Nematology* 10:143-6.

Bartlett-Healy K, W Crans & R Gaugler. 2008. Phonotaxis to amphibian vocalizations in *Culex territans* (Diptera: Culicidae). *Ann Entomol Soc Amer* 101:95-103.

Hashmi S, Q Ji, J Zhang, R Parhar, R Rodriguez, C Huang, C Brey & R Gaugler. 2008. A Krüppel-like factor in *Caenorhabditis elegans* with essential roles in fat regulation, cell death and phagocytosis. *DNA & Cell Biol* 27:545-51.

Williges E, A Farajollahi, J Scott, L McCuiston, W Crans & R Gaugler. 2008. Laboratory colonization of *Aedes japonicus japonicus* (Theobald). *J Am Mosq Contr Assoc.* 24:591-3.

Bartlett-Healy K, W Crans & R Gaugler. 2008. Temporal and spatial synchrony of *Culex territans* (Diptera: Culicidae) with their amphibian hosts. *J Med Entomol* 45*:*1031-8.

Li X, R Cowles, E Cowles, R Gaugler & D Cox-Foster. 2009. Characterization of immunosuppressive surface coat proteins from *Steinernema glaseri* that selectively kill blood cells in susceptible hosts. *Mol Biochem Parasitol* 165:162-9.

Farajollahi A, B Kesavaraju, M Nelder, S Crans & R Gaugler. 2009. An unusual larval collection and survival of *Orthopodomyia signifera* in the presence of the predator *Toxorhynchites rutilus septentrionalis*. *J Am Mosq Contr Assoc* 25:370-3.

Bai X, B Adams, T Ciche, S Clifton, R Gaugler, S Hogenhout, J Spieth, P Sternberg & P Grewal. 2009. Transcriptomic analysis of the entomopathogenic nematode, *Heterorhabditis bacteriophora* TT01. *BMC Genomics* 10:205 doi:10.1186/1471-2164-10-205.

Bartlett-Healy K, W Crans & R Gaugler. 2009. Vertebrate hosts and phylogenetic relationships of amphibian trypanosomes from a potential invertebrate vector, *Culex territans*. *J Parasitol* 95:381-7.

Williges E, A Farajollahi, M Nelder & R Gaugler. 2009. Comparative field analysis of rapid analyte measurement platform and reverse transcriptase polymerase chain reaction assays for West Nile virus surveillance. *J Vect Ecol* 34:324-8.

Koppenhöfer H & R Gaugler. 2009. Entomopathogenic nematode and bacteria mutualism. *In* "Defensive Mutualism in Microbial Symbiosis" (J White & M Torres, Eds), pp. 99-116. Taylor & Francis.

Molaei G, A Farajollahi, J Scott, R Gaugler & T Andreadis. 2009. Human blood feeding by the recently introduced mosquito, *Aedes japonicus japonicus* (Diptera: Culicidae) and public health implications. *J Am Mosq Contr Assoc* 25:210-4.

Farajollahi A, B Kesavaraju, D Price, G Williams, S Healy, R Gaugler & M Nelder. 2009. Field evaluation of BG-Sentinel and industry-standard traps for *Aedes albopictus* and West Nile virus surveillance. *J Med Entomol* 46:919-25.

Zhang J, C Huang, C Brey, M Rodriguez, Y Oksov, R Gaugler & S Hashmi. 2009. Mutation in *Caenorhabditis elegans* Krüppel-like factor, KLF-3 results in fat accumulation and alters fatty acid composition. *Exper Cell Res* 315:2568-80.

Brey C, M Nelder, T Hailemariam, R Gaugler & S Hashmi. 2009. Krüppel-like family of transcription factors: an emerging new frontier in fat biology. *Intern J Biol Sci* 5:622-36.

Adhikari B, C Lin, X Bai, T Ciche, P Grewal, A Dillman, J Chaston, D Shapiro, A Bilgrami, R Gaugler, P Sternberg & B Adams. 2009. Transcriptional profiling of trait deterioration in the insect pathogenic nematode *Heterorhabditis bacteriophora. BMC Genomics* 10:609 doi:10.1186/1471-2164-10-609.

Kesavaraju B, A Afify & R Gaugler. 2009. Growth and survival of the invasive *Aedes albopictus* larvae on *Diospyrus virginiana* (American persimmon) leaves. *J Med Entomol* 46:465-70.

Nelder M, B Kesavaraju, A Farajollahi, S Healy, I Unlu, T Crepeau, D Fonseca & R Gaugler. 2010. Suppressing *Aedes albopictus*, an emerging vector of dengue and chikungunya viruses, by a novel combination of a monomolecular film and insect-growth regulator. *Amer J Trop Med & Hyg* 82:831-7.

Kesavaraju B, B Alto, A Afify & R Gaugler. 2010. Malathion influences competition between *Aedes albopictus* and *Aedes japonicus. J Med Entomol* 47:1011-8.

Bartlett-Healy K, G Hamilton, S Healy, T Crepeau, I Unlu, A Farajollahi, D Fonseca, R Gaugler, G Clark & D Strickman. 2011. Source reduction behavior as an independent measurement of the impact of a public health education campaign in an integrated vector management program for the Asian tiger mosquito. *Intern J Environ Res Publ Health* 8:1358-67.

Price D, D Gunther & R Gaugler. 2011. First collection records of Phlebotomine sand flies from New Jersey. *J Med Entomol* 48: 476-8.

Chaston J, A Dillman, D Shapiro-Ilan, A Bilgrami, R Gaugler, K Hopper & B Adams. 2011. Outcrossing and crossbreeding recovers deteriorated traits in laboratory cultured *Steinernema carpocapsae* nematodes. *Intern J Parasitol* 41:801-9.

Kesavaraju B, C Brey, A Farajollahi, H Evans & R Gaugler. 2011. Effect of malathion on larval competition between *Aedes albopictus* and *Aedes atropalpus. J Med Entomol* 48:479-84.

Unlu I, A Farajollahi, S Healy, T. Crepeau, K Bartlett-Healy, E Williges, D Strickman, R Gaugler & D Fonseca. 2011. Area-wide management of *Aedes albopictus*: choice of study sites based on geospatial characteristics, socioeconomic factors and mosquito populations. *Pest Manag Sci* 67:965-74.

Kesavaraju B, D Khan & R Gaugler. 2011. Behavioral differences of invasive container dwelling mosquitoes to a native predator. *J Med Entomol* 48:526-32.

Chun-Hwi C, K Whang, R Gaugler & S Yoo. 2011. Submerged monoxenic culture medium development for *Heterorhabditis bacteriophora* and its symbiotic bacterium *Photorhabdus luminescens*: protein sources. *J Microbiol Biotech* 21:869-73.

Gaugler R, D Suman & Y Wang. 2012. An autodissemination station for the transfer of an insect growth regulator to container mosquitoes. *Med Vet Entomol* 26:37-45.

Bartlett-Healy K, I Unlu, P Obenauer, T Hughes, S Healy, T Crepeau, A Farajollahi, B Kesavaraju, D Fonseca, G Schoeler, R Gaugler & D Strickman. 2012. Larval habitat utilization and community dynamics of *Aedes albopictus* and *Aedes japonicus* (Diptera: Culicidae). *J Med Entomol* 49:813-24.

Gaugler R. 2012. The golden age of mosquito control. *Wing Beats* Winter p. 8-13.

Halasa Y, D Shepard, E Wittenberg, D Fonseca, A Farajollahi, S Healy, R Gaugler & G Clark. 2012. Willingness to pay for an area-wide pest management program to control Asian tiger mosquito in New Jersey. *J Am Mosq Control Assoc* 28:225-236.

Kesavaraju B, A Afify & R Gaugler. 2012. Strain specific differences in intraspecific competition in *Aedes albopictus* (Diptera: Culicidae). *J Med Entomol* 49:988-92.

Farajollahi A, I Unlu, S Healy, D Fonseca & R Gaugler. 2012. Effectiveness of ultra-low volume nighttime applications of an adulticide against *diurnal Aedes albopictus*, a critical vector of dengue and chikungunya viruses. *PLoS ONE 7:e49181.*

Wang Y, Z Lutfi, D Suman, M Sanad & R Gaugler. 2012. Host cues induce egg hatch and preparasite foraging behavior in the mosquito-parasitic nematode *Strelkovimermis spiculatus*. *Intern J Parasitol* 42:881-6.

Suman D, S Healy, A Farajollahi, S Crans & R Gaugler. 2012. Efficacy of a dual-action pyrethroids on caged *Aedes albopictus* using ULV truck-mounted sprayers. *J Am Mosq Control Assoc* 28:338-40.

Rochlin I, E Williges, R Gaugler & A Farajollahi. 2012. The rise of the invasives and decline of the natives: insights of competitive displacement and reduction gleaned from the adult populations of the mosquitoes *Aedes albopictus, Aedes japonicus* and *Aedes triseriatus* in temperate North America. *Biol Invasions* 15:991-1003.

Fonseca D, I Unlu, T Crepeau, A Farajollahi, S Healy, K Bartlett-Healy, D Strickman, R Gaugler, G Hamilton, D Kline & G Clark. 2013. Area-wide management of *Aedes albopictus*: II. Gauging the efficacy of traditional integrated pest control measures against urban container mosquitoes. *Pest Manag Sci* 69:1351-61.

Sanad M, M Shamseldean, A Elgrindi & R Gaugler. 2013. Host penetration and emergence patterns of the mosquito-parasitic mermithids *Romanomermis iyengari* and *Strelkovimermis spiculatus* (Nematoda: Mermithidae). *J Nematol* 45:30-8.

Worobey J, D Fonseca, C Espinosa, S Healy & R Gaugler. 2013. Child outdoor physical activity is reduced by prevalence of the Asian tiger mosquito, *Aedes albopictus. J Am Mosq Cont Assoc* 29:78-80.

Gaugler R. 2013. Tommy Mulhern and the lost crusade. *J Am Mosq Contr Assoc* 29:181-90.

Suman D, C Brey, Y Wang, M Sanad, M Shamseldean & R Gaugler. 2013. Effects of insect growth regulators on the mosquito-parasitic nematode *Romanomermis iyengari*. *Parasitol Res* 112:817-24.

Wang Y, D Suman, J Bertrand, L Dong & R Gaugler. 2013. Dual treatment autodissemination station with enhanced transfer of insect growth regulator to mosquito oviposition sites. *Pest Manag Sci* 70:1299-304

Zhang J, F Cheema, N Al-Nasser, R Bakheet, R Parhar, F Al-Mohanna, R Gaugler, M Hussain & S Hashmi. 2013. Regulation of lipoprotein assembly, secretion and fatty acid β-oxidation by Krüppel-like transcription factor, *klf-3*. *J Mol Biol* 425:2641-55.

Bai X, B Adams, T Ciche, S Clifton, R Gaugler, K Kim, J Spietch, P Sternberg, R Wilson & P Grewal. 2013. A lover and a fighter: the genome sequence of an entomopathogenic nematode. *PLoS ONE* 8:e69618.

Suman D, A. Farajollahi, S Healy, G Williams, Y Wang, G Schoeler & R Gaugler. 2013. Point source and area-wide field studies of pyriproxyfen autodissemination against container-inhabiting mosquitoes in urban environments. *Acta Tropica* 135:96-103.

Armstrong P, J Anderson, A Farajollahi, S Healy, I Unlu, T Crepeau, R Gaugler, D Fonseca & T Andreadis. 2013. Isolations of Cache Valley virus from *Aedes albopictus* (Diptera: Culicidae) in New Jersey and evaluation of its role as a regional arbovirus vector. *J Med Entomol* 50:1310-4.

Suman D, Y Wang, L Dong & R Gaugler. 2013. Effects of larval habitat substrate on pyriproxyfen efficacy against *Aedes albopictus* (Diptera: Culicidae). *J Med Entomol* 50:1261-6.

Hashmi S, Y Wang, R Parhar, K Collison, W Conca, F Al-Mohanna & R Gaugler. 2013. A *C. elegans* model to study human metabolic regulation. *Nutr Metab* 10:31 doi:10.1186/1743-7075-10-31.

Suman D, A Bilgrami, Y Wang & R Gaugler. 2013. Ovicidal activity of three insect growth regulators against *Aedes* and *Culex* mosquitoes. *Acta Tropica* 128:103-9.

Worobey J, L Lelah & R Gaugler. 2013. Environmental barriers to children's outdoor summer play. *J Behav Hlth* 2:362-5.

Farajollahi A, G Williams, G Condon, B Kesavaraju, I Unlu & R Gaugler. 2013. Assessment of a direct application of two *Bacillus thuringiensis* var. *israelensis* formulations for immediate and residual control of *Aedes albopictus. J Am Mosq Control Assoc* 29:385-8.

Sun D, E Williges, I Unlu, S Healy, G Williams, P Obenauer, T Hughes, G Schoeler, R Gaugler, D Fonseca & A Farajollahi. 2014. Taming a tiger in the city: comparison of motorized backpack applications and source reduction against the Asian tiger mosquito, *Aedes albopictus. J Am Mosq Control Assoc* 30:99-105.

Unlu I, A Farajollahi, I Rochin, T Crepeau, D Strickman & R Gaugler. 2014. Differences in male-female ratios and spatial distribution of *Aedes albopictus* (Diptera: Culicidae) following ultra-low volume adulticide applications. *Acta Tropica* 137:201-5.

Williges E, A Farajollahi & R Gaugler. 2014. Vertical oviposition preference in the Asian tiger mosquito, *Aedes albopictus* in temperate North America. *J Am Mosq Contr Assoc* 30:169-74.

Dong L M Sanad, Y Wang, Y Xu, M Shamseldean & R Gaugler. 2014. Mating clusters in the mosquito parasitic nematode, *Strelkovimermis spiculatus. J Invertebr Pathol* 117:19-25.

Halasa Y, D Shepard, E Wittenberg, D Fonseca, A Farajollahi, S Healy, R Gaugler, K Healy, D Strickman & G Clark. 2014. Quantifying the impact of mosquitoes on quality of life and enjoyment of yard and porch activities in New Jersey. *PLoS ONE* 9:e89221.

Shepard D, Y Halasa, D Fonseca, A Faraji, S Healy, R Gaugler, K Bartlett-Healy, D Strickman & G Clark. 2014. Economic evaluation of an area-wide integrated pest management program to control the Asian tiger mosquito in New Jersey. *PLoS ONE* 9:e111014.

Farajollahi A, A Egizi, I Unlu, T Crepeau, S Healy, D Fonseca & R Gaugler. 2014. Comparative host feeding patterns of the Asian tiger mosquito, *Aedes albopictus*, in urban and suburban Northeastern USA and implications for disease transmission. *PLoS Negl Trop Dis* 8:e3037.

Williams G, A Faraji, I Unlu, S Healy, M Farooq, R Gaugler, G Hamilton & D Fonseca. 2014. Area-wide ground applications of *Bacillus thuringiensis* var. *israelensis* for the control of *Aedes albopictus* in residential neighborhoods: from optimization to operation. *PLoS ONE* 9:e110035.

Villiard A & R Gaugler. 2015. Long-term effects of carbohydrate availability on mating success of newly eclosed *Aedes albopictus* (Diptera: Culicidae) males. *J Med Entomol* 52:308-14.

Faraji A & R Gaugler. 2015. Experimental host preference of diapause and non-diapause induced *Culex pipiens pipiens* (Diptera: Culicidae). *Parasit Vectors* 8:1-7.

Suman D, Y Wang, K Chandel & R Gaugler. 2015. The insect growth regulator pyriproxyfen terminates egg diapause in the Asian tiger mosquito, *Aedes albopictus*. *PLoS ONE* 6:e0130499.

Hashmi S, Y Wang, D Suman, R Parhar, K Collison, W Conca, F Al-Mohanna & R Gaugler. 2015. Human cancer: is it linked to dysfunctional lipid metabolism? *Biochim Biophys Acta (BBA) – General Subjects* 1850:352-64.

Faraji A, I Unlu, T Crepeau, S Healy, S Crans, G Lizarraga, D Fonseca & R Gaugler. 2016. Droplet characterization and penetration of an ultra-low volume mosquito adulticide spray targeting the Asian tiger mosquito, *Aedes albopictus*, within urban and suburban environments of northeastern USA. *PLoS ONE* 11:e0152069.

Chandel K, D Suman, Y Wang, I Unlu, E Williges, G Williams & R Gaugler. 2016. Targeting a hidden enemy: pyriproxyfen autodissemination strategy for control of the container mosquito *Aedes albopictus* in cryptic habitats. *PLoS Negl Trop Dis* 10:e0005235.

Ling J, C Brey, M Schilling, F Lateef, Z Lopez-Dee, K Fernandes, K Thiruchelvam, Y Wang, K Chandel, K Rau; R Parhar, F AL-Mohanna, R Gaugler & S Hashmi. 2017. Defective lipid metabolism associated with mutation in klf-2 and klf-3: important roles of essential dietary salts in fat storage. *Nutr Metabol* 14:22. 10.1186/s12986-017-0172-8.

Unlu I, D Suman, Y Wang, I Rochlin, K Klingler, A Faraji & R Gaugler. 2017. Effectiveness of autodissemination stations containing pyriproxyfen in reducing immature *Aedes albopictus* populations. *Parasit Vectors* 10:139. 10.1186/s13071-017-2034-7.

Allahverdipour H, J Karimi, R Talaei-Hassanloui, J Karimi, Y Wang & R Gaugler. 2017. Production of *Culex pipiens* (Dip.: Culicidae) adults infected by *Strelkovimermis spiculatus* (Nematoda: Mermithidae) in autodissemination control strategy. *J Entomol Soc Iran* 37:125-34.

Dong L, Y Wang, M Sanad, Y Xu & R Gaugler. 2017. Foraging strategy for mosquito parasitic nematodes *Romanomermis iyengari* and *Strelkovimermis spiculatus*. *Biol Contr* 110:56-61.

Lan Y, Y Wang & R Gaugler. 2017. The role of copulatory plugs in the mosquito-parasitic nematode *Strelkovimermis spiculatus*. *J Invertebr Pathol* 146:53-7.

Suman D, Yi Wang, Ary Faraji, G Williams, E Williges & R Gaugler. 2017. Seasonal field efficacy of autodissemination stations against container-inhabiting mosquito *Aedes albopictus* under different habitat conditions. *Pest Manag Sci* 75:885-95. doi:10.1002/ps.4780.

Sanad M, M Shamseldean, Y Wang, J Sun & R Gaugler. 2017. Superparasitism and population regulation of the mosquito-parasitic mermithid nematodes *Romanomermis iyengari* and *Strelkovimermis spiculatus*. *J Nematol* 49:316-20.

Unlu I, D Suman, Y Wang, G Williams, I Rochlin, K Chandel & R Gaugler. 2018. Evaluation of lambda-cyhalothrin and pyriproxyfen barrier treatments for *Aedes albopictus* management in urbanized areas of New Jersey. *J Med Entomol* 55:472-6.

Unlu I, A Faraji, G Williams, S Marcombe, D Fonseca & R Gaugler. 2018. Truck-mounted areawide applications of larvicides and adulticides for extended suppression of adult *Aedes albopictus*. *Pest Manag Sci* doi:10.1002/ps.5227.

Suman D, K Chandel, A Faraji, R Gaugler & K Chandra. 2018. Mosquito-borne diseases: Prevention is the cure for dengue, chikungunya and Zika viruses. *In*: Benelli, G & H Mehlhorn, Eds. Mosquito Borne Diseases. Parasitol Res Monogr, Vol 10, pp. 235-79. Springer, Cham.

Brey C, S Alavijeh, J Ling, B Shaikh, F Al-Mohanna, Y Wang, R Gaugler & S Hashmi. 2019. Salts and energy balance: A special role for dietary salts in metabolic syndrome. *Clin Nutr* 38:1971-85. doi.org/10.1016/j.clnu.2018.10.021.

Williams G, I Unlu, I Rochlin, Y Wang & R Gaugler. 2019. Timing of lambda-cyhalothrin and pyriproxyfen barrier treatments for *Aedes albopictus* (Diptera: Culicidae) management. *J Econ Entomol* 20:392-8. doi.org/10.1093/jee/toz020.

Allahverdipour H, R Talaei-Hassanloui, J Karimi, Y Wang, I Rochlin & R Gaugler. 2019. Behavior manipulation of mosquitoes by a mermithid nematode. *J Invertebr Pathol* 168, [107273] doi.org/10.1016/j.jip.2019.107273.

Wang Y, D Suman, K Chandel, G Williams, I Unlu & R Gaugler. 2020. Heterodissemination: precision targeting container *Aedes* mosquitoes with a cohabiting midge species carrying insect growth regulator. *Pest Mgt Sci* 76:2105-12. doi.org/10.1002/ps.5749.

Unlu, I, I Rochlin, D Suman, Y Wang, K Chandel, & R Gaugler. 2020. Large-scale operational pyriproxyfen autodissemination deployment to suppress immature Asian tiger mosquito (*Aedes albopictus*) populations. *J Med Entomol* doi.org/10.1093/jme/tjaa011.

Falahzadah, M, J Karimi & R Gaugler. 2020. Biological control chance and limitation within integrated pest management programs in Afghanistan. *Egy J Biol Pest Contr* 30:1-10.

Williams G, Y Wang, I Unlu & R Gaugler. 2020. The development of autonomous unmanned aircraft systems for mosquito control. *PLoS ONE* doi.org/10.1371/journal.pone.0235548.

Suman D, K Chandel, Y Wang & R Gaugler. 2021. A membrane and blood-free approach to rear adult *Aedes albopictus*. *Acta Tropica* doi.org/10.1016/j.actatropica.2021.105895.

Unlu I, A Faraji, Y Wang, I Rochlin & R Gaugler. Heterodissemination: precision insecticide delivery to mosquito larval habitats by cohabiting vertebrates. *Sci Rep* 11 doi.org/10.1038/s41598-021-93492.

Wang H, S Akbari-Alavijeh, R Parhar, R Gaugler & S Hashmi. 2023. Partners in diabetes epidemic: A global perspective. Wor*ld J Diabetes* 14:1463-77 doi: 10.4239/wjd.v14.i10.1463.

Wang H, C Brey, Y Wang, R Gaugler & S Hashmi. 2023. KLF regulation of insulin pathway genes. *3 Biotech* doi: 10.1007/s13205-023-03502-5.

Suman D, C Chandel,Y Wang & R Gaugler. 2024. Efficacy of sugar-protein non-membranous dietary system for diapause egg production in *Aedes albopictus* mosquitoes under short-day conditions. *Physiol Entomol* doi.org/10.1111/phen.12461.

PATENTS

Gaugler R & M Hatab. Disposable bioreactor for culturing microbes and cells. US 6,432,698. Granted 18 March, 2002.

Gaugler R. Apparatus & method for mass production of insecticidal nematodes. US 6,474,259. Granted 5 November, 2002.

Gaugler R & I Brown. Apparatus and method for separation of nematodes. US 6,532,891. Granted 18 March, 2003.

Gaugler, R, D Suman, B Tao & Y Wang. Methods and apparatus for management of mosquito populations with habitat sharing heterospecific insects carrying insect growth regulators. WO 096381 A1 Published 8 June, 2017.

Gaugler R, D Suman, K Chandel & Y Wang. Non-membrane feeding device and diet formulation for mosquito colony production. US 0246608. Published 15 August, 2019.

Gaugler R, D Suman & Y Wang. Autodissemination of an insect growth regulator for insect management. US 10,258,027. Granted 16 April, 2019.

Williams G & R Gaugler. Dispensers and methods of use thereof for dispensing solid mosquito larvicides and other materials of interest. US 10,499,628. Granted 10 December, 2019.

Gaugler R, Y Wang, K Chandel, D Suman. Collapsible stackable disposable inexpensive pesticide free traps and attractant for surveillance and control of Aedes container breeding mosquitos and other container breeding insects. US 10,506,804. Granted 17 December, 2019.

TECHNOLOGY TRANSFER

Gaugler R. 1993. Exclusive for novel nematode strain to Biosys (U.S.).

Gaugler R. 1994. Genetically improved nematode strain to Ecogen-Australia (Australia).

Gaugler R & R Stuart. 1996. Exclusive for genetically improved strain to Bio-Integrated Technol (Italy).

Gaugler R & M Hatab. 1998. Culture medium to Integrated BioControl Systems (U.S.).

Gaugler R. 1999. Novel entomopathogen strain (#326) to SDS Biotech (Japan).

Gaugler R. 2000 & 2009. Nematode micrographs (3) to Environ Factor (Canada) & Bio-Insecta (Greece).

Gaugler R. 2005. Novel entomopathogen strain to Nematec (U.S.).

Gaugler R. 2009. Novel entomopathogen strain to AEF Global (Canada).

Gaugler R, Y Wang & D Suman. 2014. Option for autodissemination station to SpringStar (U.S.).

COMMERCIAL PRODUCTS

VECTOR-WG™ - Biosys (U.S.), 1993.

OTINEM-HB™ - Ecogen-Australia (Australia), 1994.

CRUISER™ - Ecogen (U.S.), 1995.

NEMA-BIT™ - Bio-Integrated Technologies (Italy), 1997.

NEMA-TOP™ & *NEMA-GREEN*™ - E-Nema GmbH (Germany), 1997.

TERRANEM™ - Koppert Biological Systems (The Netherlands), 2001.

BIOTOPIA™ - SDS Biotech (Japan), 2001.

BIO-VANTAG™ - Nematec (U.S.), 2005.

BIOPROTEC™ – AEF Global (Canada), 2009.

GRUB BUSTERS™ – Environmental Factor (Canada), 2013.

INVITED PRESENTATIONS

1989 to present

1989 Department of Entomology, Ohio State University (OARDC).
Dept. Crop Protection, University of Puerto Rico, Mayaquez., Puerto Rico.
Biosys, Palo Alto.
Projects Discovery, American Cyanamid, Princeton.
New Jersey Society for Parasitology, Rahway.
International Symposium on Entomopathogenic Nematodes, Asilomar.

Entomological Society of America (EB), Providence.
Chief Executive Officer, American Cyanamid, Princeton.
Department of Entomology, North Dakota State University, Fargo.

1990 Station de Zoologie, Centre de Recherches, INRA, Guadeloupe.
Urania Corporation, Hamburg, West Germany.
Ciba-Geigy Corporation, Basil, Switzerland.
Entomological Society of America (EB), Baltimore.
CARDI, University of the West Indies, Jamaica.

1991 Society of Invertebrate Pathology, Flagstaff - 1.
Society of Invertebrate Pathology, Flagstaff - 2.
Turfgrass Research Workshop, New Brunswick.
Biosys, Palo Alto.
New Jersey Turfgrass Expo, Somerset.
Entomological Society of America, Reno - 1.
Entomological Society of America, Reno -2.
Table Ronde Roussel-Uclaf, Institute Scientifique Roussel, Paris, France.

1992 Department of Biology, Temple University, Philadelphia.
Department of Entomology, University of Delaware, Newark.
Ecogen, Langhorne.
Division of Entomology, CSIRO, Canberra, Australia.
Ecogen Australia, Hobart, Tasmania.
National Turfgrass Breeders, New Brunswick.
New Jersey Ornamental IPM Conference, Toms River.
Department of Turf and Ornamentals, Ciba-Geigy, Orlando.
International Congress of Entomology, Beijing, China.

1993 U.S. Forest Service, All Scientists Meeting, Mobile.
ARO-Volcani Center, Bet-Dagan, Israel.
Entomological Society of America (EB), Williamsburg.
Ecogen Board of Directors, Langhorne.
Turfgrass Research Workshop, New Brunswick.
Agricultura, Alimenti & Ambiente S.r.l., Todi, Italy.
Northeast Crop Protection Meeting, New Brunswick.
E-Tech Board of Directors, New York City.
Natural Enemies Special Conference, Indianapolis.
Ecogen Symposium, Club 21, New York City.
Ecogen Seminar Series, Langhorne.
Department of Zoology, University of Cairo, Egypt.

1994 VIth International Colloquium of Invertebrate Pathology, Montpellier, France – 1.
VIth Intern. Coll. Invertebrate Pathol., Montpellier, France - 2.
APHIS Japanese Beetle Airport Management Meeting, Mt. Laurel.
Entomological Society of America (EB), Newport.
Northern Crops Research Laboratory, USDA-ARS, Fargo.
Entomological Society of America, Dallas.
COST Meeting, Debrecen, Hungary.

1995 Czech Academy of Sciences, Czech Republic - 1.
Czech Academy of Sciences, Czech Republic -2.
Rutgers Turfgrass Symposium, New Brunswick.
Institute of Electrical & Electronics Engineers, Amsterdam, Netherlands.
Bodega Bay Marine Research Laboratory, Bodega Bay.
Department of Nematology, University of California, Davis.
Second International Symposium of Entomopathogenic Nematology, Honolulu.

New Jersey Turf Expo, Atlantic City.
Landscape Organic Producers, Boston.
Department of Entomology, Penn State University, State College.

1996 Genetic Engineering Institute, Chinju, South Korea.
Sussex College, Sussex.
Rutgers Turfgrass Science Seminar, New Brunswick.
Integrated BioControl Systems, Aurora.
Kyoto University, Kyoto, Japan.
Saga University, Saga, Japan.
National Institute of Forestry, Tsukuba, Japan.
Japanese Society of Applied Zoology & Entomology, Yamaguchi, Japan.

1997 COST Meeting, Antibes, France -1.
COST Meeting, Antibes, France - 2.
COST Meeting, Antibes, France - 3.
Department of Entomology & Nematology, University of Florida, Gainesville.
Rutgers Turfgrass Science Symposium, New Brunswick.
New Jersey Society for Parasitology, Princeton.
Department of Entomology, Texas A&M University, College Station.

1998 Duke Seminar, North Carolina State University, Raleigh.
Environmental Protection Agency, Washington D.C.
Dept. Parasitology, University of Pennsylvania, Philadelphia.
Rutgers Turfgrass Science Symposium, New Brunswick.
Eco Soil Systems, San Diego.
Entomological Society of America (EB), Cherry Hill.
Tri-State Research Foundation, Elmsford.
Alternative Paradigms for BioControl Workshop, New Brunswick.
OECD Sustainable Pest Management Workshop, Montreal, Canada.
VIIth International Colloquium on Invertebrate Pathology, Sapporo, Japan.
Office of Research and Sponsored Programs, Rutgers University, Piscataway.
Thermo Trilogy Corporation, Columbia.
Plant Protection Research Institute, Ankara, Turkey.

1999 Instituto de Investigaciones Agropecuarias, Chillan, Chile.
Johnson & Johnson World Headquarters, New Brunswick.
SARE Insecticidal Nematode Workshop, New Brunswick.

2000 Tri-State Research Foundation, Elmhurst.
Rutgers Turfgrass Symposium, New Brunswick – 1.
Rutgers Turfgrass Symposium, New Brunswick – 2.
Halim University, South Korea.
Kang Won University, South Korea.
Yang Pharmaceuticals University, South Korea.
InBionet, South Korea.
International Congress of Entomology, Iguasso, Brazil.

2001 Kasetsart University, Bangkok, Thailand.
Organizacion de Nematologos de los Tropicos Americanos, Varadero, Cuba.
Industrial Society for Microbiology, St. Louis.
Lockwood Lecture, Connecticut Agricultural Experiment Station, New Haven.

2002 U.S.-Egypt Biopesticide Workshop, Sharm El-Sheik, Egypt - 1.
U.S.-Egypt Biopesticide Workshop, Sharm El-Sheik, Egypt - 2.
U.S.-Egypt Biopesticide Workshop, Sharm El-Sheik, Egypt - 3.
Ethiopian Agricultural Research Organization, Ambo, Ethiopia.
Ministry of Agriculture, Ras-Al Khaimah, United Arab Emirates -1.

Ministry of Agriculture, Ras-Al Khaimah, United Arab Emirates - 2.
Royal Golden Jubilee Congress, Bangkok, Thailand.
Centro Nacional de Sanidad Agropecuaria, Havana, Cuba.
Plant Protection Conference, Cheng Mai, Thailand.

2003 Rutgers Turfgrass Science Symposium, New Brunswick.
Indian Agricultural Research Institute, Delhi, India.
Institute of Plant Protection, Ministry of Agriculture, Chisinau, Moldova.
American Phytopathology Society, Charlotte.
Third International Symposium on Entomopathogenic Nematodes, Eilat, Israel.

2004 Society of Invertebrate Pathology, Helsinki, Finland.
USDA-ARS Laboratory, Stoneville.
University of Neuchatel, Neuchatel, Switzerland - 1.
University of Neuchatel, Neuchatel, Switzerland - 2.
Shawnee State University, Portsmouth.

2005 CRDF & MRDA International Conf., Chisinau, Moldova.
International Conference, Chisinau, Moldova.
Chinese Academy of Sciences, Harbin, China.
Institute of Environment, Beijing, China.
(a) Chinese Academy of Sciences, Guangzhou, China.
(b) Chinese Academy of Sciences, Guangzhou, China.
University of Sao Paulo, Jacoticabal, Brazil.
Andermatt Biocontrol AG, Grossdietwil, Switzerland.
Biotechnology Conference, Cairo, Egypt.

2006 Egyptian Ministry of Agriculture, Cairo, Egypt.
Faculty of Agriculture, Cairo University, Cairo, Egypt - 1.
Faculty of Agriculture, Cairo University, Cairo, Egypt - 2.
Faculty of Science, Cairo University, Cairo, Egypt - 1.
Faculty of Science, Cairo University, Cairo, Egypt - 2.
Department of Entomology, Cairo University, Cairo, Egypt.
National Research Centre, Cairo, Egypt.
Fulbright Association, Washington D.C.
Chinese Academy of Sciences, Harbin, China.
Shanghai Forestry Station, Shanghai, China.
Chinese Academy of Sciences, Beijing, China.
VIIth Latin American Scarabaeoidology Meeting, Santa Cruz, Bolivia.

2007 Applied Centre for Entomonematology, Cairo University, Cairo, Egypt.
First International Forum on EPN, Quebec City, Canada.
Vector Biology Summit, New Brunswick.
Bolley Distinguished Alumni Lecture, North Dakota State University, Fargo.
CSREES Review of NJAES, New Brunswick.
NorthEast Mosquito Control Association, Plymouth.
Inaugural Distinguished Faculty Colloquium, Rutgers University, New Brunswick.

2008 Plant & Animal Genome XVIth Conference, San Diego.
NJ State Mosquito Control Commission, New Brunswick.
International Congress of Nematology, Brisbane, Australia.
New Jersey Mosquito Control Association, Atlantic City.
Heilongjiang Academy of Agricultural Sciences, Harbin, China
Harbin Medical University, Harbin, China
Northeast Agricultural University, Harbin, China
Chinese Academy of Sciences, Harbin, China.
New Jersey Quarterly Mosquito Biologists Workshop, New Brunswick.

US Naval Medical Research Unit No. 3, Cairo, Egypt.

2009 Keystone Symposia: Complications of Diabetes & Obesity, Vancouver, Canada.
Chinese Academy of Sciences, Harbin, China.
New Jersey Quarterly Mosquito Biologists Workshop, New Brunswick.
New Jersey Mosquito Control Association, Atlantic City.
Risk Assessment Modeling Workshop, New Brunswick.
Fulbright 60th Anniversary Symposium, Alexandria, Egypt.

2010 Deployed WarFighters Fund, New Brunswick.
MGK Corp., New Brunswick.
Clarke Mosquito Control, New Brunswick.
Chinese Academy of Sciences, Harbin, China.

2011 Naval Entomology Center for Excellence, Jacksonville.
Valent Bioscience Corp., New Brunswick.
Anastasia County Mosquito Control District, St. Augustine.
Clarke Mosquito Control, New Brunswick.
Northeast Agricultural University, Harbin, China.
MGK Corp., New Brunswick.
International Conference on Biopesticides, Chiang Mai, Thailand.

2012 Chinese Academy of Sciences, Harbin, China.
NorthEast Agricultural University, Harbin, China.
US Naval Medical Research Unit No. 3, Cairo, Egypt.
Cairo University, Cairo, Egypt.
Naval Entomology Center for Excellence, Jacksonville.
MGK Corp., Minneapolis.
Vector Biology Section, NAMRU3, Cairo, Egypt.

2013 Vector Biology Section, US Naval Medical Research Unit No. 3, Cairo, Egypt.
Fulbright Enrichment Seminar Series, Cairo, Egypt.
Agricultural Research Center, Cairo, Egypt.
American Mosquito Control Association, Atlantic City.
Department of Zoology, Cairo University, Cairo, Egypt.
Fulbright Symposium, Za'afarana, Egypt.
Sumitomo Chemical, New Brunswick.

2014 Entomological Society of America, Portland.
Department of Entomology, Rutgers University, New Brunswick.
MGK Corp., Minneapolis.
NorthEast Agricultural University, Harbin, China.
Sumitomo Corp and MGK Corp, Minneapolis.

2015 AMCD 12th Annual Arbovirus Surveillance & Control Workshop, St. Augustine - 1.
AMCD 12th Annual Arbovirus Surveillance & Control Workshop, St. Augustine - 2.
Department of Entomology, Rutgers University, New Brunswick.
EPN Production Technologies, Center for Vector Biology, Rutgers University, New Brunswick.
Department of Entomology, Tarbiat Modares University, Kiraj, Iran.
Department of Medical Entomology, University of Tehran, Iran.
Department of Plant Protection, Ferdowsi University, Mashad, Iran.
Department of Medical Entomology, Shiraz University of Medical Sciences, Shiraz, Iran.
Iranian Research Institute of Plant Protection, Tehran, Iran.
Daqing University, Daqing, China.
Center for Vector Biology, People's Liberation Army, Beijing, China.

2016 Keynote Address, West Central Mosquito & Vector Control Association, Grand Junction - 1
West Central Mosquito & Vector Control Association, Grand Junction – 2
Keynote Address, Williston Vector Control District Banquet, Williston.

Center for Unmanned Aerial Systems, Rutgers University, Piscataway.
Turfgrass Expo, Atlantic City.
Keynote Address, Mosquito Control of Australia Association, Gold Coast, Australia.

2017 Rollins Chemical Corporation, New Brunswick.
American Mosquito Control Association, San Diego.
5th Intern. Forum for Surveillance of Mosquitoes and Mosquito-borne Diseases. Nanking, China.
Kolkata Zoological Survey of India, Kolkata, India.
Pyriproxyfen autodissemination for Malaria Suppression Conference, Geneva, Switzerland
Keynote Address, Utah Mosquito Control Association, Park City.

2018 Keynote Address, North Center Mosquito Control Association, Winnipeg, Canada.
Clarke Mosquito Control, Chicago.

2019 Keynote Address, Society for Vector Ecology, San Juan, Puerto Rico.
American Mosquito Control Association, Orlando
Sixth International Forum for Surveillance of Vector-Borne Diseases, Xiamen, China.
Vector & Pest Management Workshop, Taipei, Taiwan.
Vietnamese Academy of Sciences, Hanoi, Vietnam.

2020 USDA/ARS & Entomology/Nematology Department, U Florida, Gainesville.
International Congress of Entomology, Helsinki, Finland.
Keynote Address, Florida Mosquito Control Association, Duck Key.
Distinguished Lecture One, King Abdulaziz University, Jeddah, Saudi Arabia

2021 Scientific Research Week, King Abdulaziz University, Jeddah, Saudi Arabia
Fasilabad University, Fasilabad, Pakistan.

2024 Legend Speaker, Entomopathogenic Nematode Centennial, Logrono, Spain.

COMPETITIVE GRANTS

- USAID-PSTC, 1987-89. Biocontrol of *Phyllophaga* spp. Gaugler & Gonzalez. $125,000.
- USDA-CRGP, 1987-89. Genetic improvement of parasites. Gaugler & McGuire. $90,000.
- SeaGrant, 1988-89. Mating habits of saltmarsh tabanids. Gaugler & Schutz. $1300.
- USDA-CRGP, 1988-89. Advances with insect nematodes. Gaugler & Kaya. $16,000.
- Turfgrass Research Fund, 1988-93. Host-parasite interactions with scarab larvae. Gaugler. $69,000.
- USDA-Subtropical, 1988-91. Biocontrol of sweetpotato weevil. Jansson et al. $135,000.
- BARD, 1989-92. Enhanced biocontrol potential by mutant analysis. Gaugler et al. $220,000.
- USDA Subtropical, 1989-92. Biocontrol of *Liriomyza*. Hara, Kaya & Gaugler. $125,000.
- USDA-IPM Pilot Project, 1990-93. Biocontrol of Japanese beetle. Klein et al. $171,500.
- USAID, 1991-92. Development of biocontrol cottage industry. Jansson & Gaugler. $5000.
- USDA, 1991-93. Biocontrol of white grubs. Harrison, Gaugler, Kaya & Klein. $339,000.
- U.S. Golf Association, 1991-94. Environmental fate of entomopathogens. Klein et al. $60,000.
- USDA-Subtropical, 1991-94. Soil characteristics of insect nematodes. Jansson et al. $145,000.
- NJ Dept. Agriculture, 1992-95. Insect-parasite population dynamics in turf. Yoder et al. $22,400.
- USDA-OICD, 1992. Biological insecticides for scarabs. Kaya & Gaugler. $5000.
- BARD, 1992-95. Host selection & adaptation in an entomopathogen. Gaugler et al. $220,000.
- USAID, 1992-95. Genetic engineering for environmental tolerance. Gaugler et al. $600,000.
- USDA, 1993-95. Biocontrol of diamondback moth. Kaya, Tabashnik & Gaugler. $134,000.
- BARD, 1993-96. Enhancement of pathogen stability by mutagenesis. Glazer et al. $275,000.
- Turfgrass Research Fund, 1994-97. Development of bioinsecticides for scarabs. Gaugler. $207,000.
- National Biological Control Institute, 1995. Intern. Symposium. Gaugler & Kaya. $5000.
- LT/GCSANE Fund, 1995. Insect-nematode population dynamics. Lewis & Gaugler. $8700.
- National BioControl Institute, 1996-97. Inoculative release strategies. Gaugler et al. $18,750.

- CDFA, 1996-99. Comparing biocontrol *vs* diazinon. Kaya, Gaugler & Koppenhofer. $140,000.
- USDA-NRI, 1996-98. Risk assessment of a transgenic organism. Gaugler et al. $145,750.
- GCSAA Foundation, 1997-00. Culturing of white grub parasites. Gaugler. $30,000.
- Foreign Agricultural Service, 1997-00. Parasite discovery: Chile. Gaugler & France. $30,000.
- National Biological Control Institute, 1997-98. New biocontrol paradigms. Gaugler. $5000.
- Tri-State Foundation, 1997-00. New technology for insecticidal nematodes. Gaugler. $30,000.
- SARE, 1997-00. Multi-media aids & in-service training for a biological. Gaugler et al. $59,000.
- Turfgrass Research Fund, 1997-04. Insect defenses against nematode infection. Gaugler. $124,000
- USDA-SBIR, 1998. Nematodes as slug parasites. Shapiro et al. $64,275.
- Geraldine Dodge Foundation, 1998. Alternative paradigms for biocontrol. Gaugler. $10,000.
- Horticultural Research Institute, 1998-99. Biocontrol of mollusks. Gaugler & Wilson. $10,000.
- USDA, 1998-01. Biocontrol of plant-parasitic nematodes. Sipes, Kaya & Gaugler. $152,000.
- BARD, 1998-01. A molecular approach to entomopathogen stability. Gaugler et al. $280,000.
- U.S-Egypt Science & Techn. Fund, 1999-01. Parasite genetic engineering. Gaugler et al. $50,000.
- Horticultural Research Institute, 1999-00. Introduction of exotic parasite. Brown & Gaugler. $12,000.
- Thailand Research Fund, 2000-2002. Training in biological control. Gaugler. $7900.
- USDA-NRI, 2000-03. New micro-fermentation technology. Gaugler. $178,000
- Science & Technology Fund, 2001-02. International symposium. Gaugler et al. $50,000.
- BARD, 2001-02. Entomopathogenic nematodes and symbionts. Gaugler & Glazer. $35,000.
- U.S.-Egypt Science & Techn. Fund, 2002-04. In vivo mass production system. Gaugler et al. $47,000.
- USDA-NRI, 2002-05. Genetic engineering anti-immune proteins. Cox-Foster et al. $299,000.
- USDA-NRI, 2002-05. Entomopathogen strain stability. Shapiro, Gaugler & Adams. $300,000.
- Civilian R&D Foundation, 2003-05. Discovery & ID of EPN. Gaugler & Gebre. $35,000.
- Lindbergh Foundation, 2003-05. Achieving sustainability via biopesticides. Gaugler. $10,580.
- Fulbright, 2005-06. Entomopathogen production in the Middle East. Gaugler. $24,200.
- NIH, National Human Genome Research Institute, 2005-08. Genome sequencing of *H. bacteriophora.* Grewal, Adams, Ciche, Gaugler & Sternberg. $1,840,000.
- NSF/NRI, 2006-08. The entomopathogenic nematode genome consortium: sequence annotation for *Heterorhabditis bacteriophora.* Grewal, Adams, Ciche, Gaugler & Sternberg. $240,000.
- U.S.-Egypt Science & Technology Fund, 2007. Entomonematology training. Gaugler. $51,870.
- EPA-PESP, 2007-08. New Jersey light traps and risk assessment. Reed et al. $50,000
- NJDEP, 2007-09. Free-ranging birds and mosquito-borne arboviruses. Reed et al. $51,029.
- Academic Excellence Fund, 2008-09. Climate & health initiative. Fefferman et al. $75,000.
- Academic Excellence Fund, 2008-09. Climate change. Broccoli et al. $75,000.
- Academic Excellence Fund, 2008-09. Risk assessment modeling. Fefferman et al. $5760.
- USDA-CSREES, 2008-09. International Asian tiger mosquito symposium. Gaugler et al. $10,000.
- Busch Biomedical Research Fund, 2008-10. RIDL transgenic mosquitoes. Gaugler et al. $50,000.
- USDA-ARS, 2008-2013. Area-wide suppression of Asian tiger mosquito. Clarke et al. $3,787,300.
- Deployed War Fighter Protection, 2010-12. Strategies for using pyriproxyfen. Gaugler et al. $307,110.
- Proof-of-Concept Fund, Rutgers, 2011. Apparatus for autodissemination of an IGR. Gaugler. $35,000.
- Robert Wood Johnson Foundation, 2011-13. Mosquitoes & child obesity. Worobey et al. $124,015.
- NIH–SBIR, 2012-13. Phase I: Development of an AD station. Banfield & Gaugler. $150,000.
- Deployed War Fighter Protection, 2012-15. Autodissemination technologies. Gaugler et al. $300,000.
- USDA-ARS, 2014. Suppl: Area-wide suppression of Asian tiger mosquito. Clarke et al. $115,803.
- NIH–SBIR, 2014-16. Phase II: Development of an AD station. Banfield, Wang & Gaugler. $1,482,580.
- Ctr. for Unmanned Aerial Systems. 2016-17. Precision mosquito control. Gaugler & Williams. $10,000.
- NIH, 2018-20. Remote identification of mosquito species related to infectious diseases using a dual-wavelength polarization-sensitive LIDAR. Thomas, Williams & Gaugler. $143,000.

- TechAdvance, 2019-20. Development of small unmanned aircraft for mosquito control pesticide application. Gaugler & Williams. $10,000.

CONTRACTS & GIFTS

- Various industry sources 1990-2006 (e.g., Biosys, Cyanamid, Ecogen, Mycogen, etc.). $704,500.
- New Jersey State Mosquito Control Commission, 2006. $192,028
- New Jersey State Mosquito Control Commission, 2007. $246,442.
- Clarke Mosquito Control Company, 2008. $160,000.
- Zoecon, 2008. $76,000.
- NJ State Mosquito Control Commission, 2008. $277,000.
- New Jersey & NorthEast Mosquito Control Association(s), 2008. $3500.
- TIFA Worldwide, Adapco, SpringStar, 2009. $4000.
- Clarke Mosquito Control, w/ Farajollahi, Crans et al., 2009. $32,000.
- Valent, w/ Williams et al., 2009. $22,000.
- NJ State Mosquito Control Commission, 2009. $137,000.
- Clarke Mosquito Control, w/ Crans et al., 2010-11. $52,000.
- Valent, w/ Williams & Farajollahi, 2010. $20,000.
- MGK Corporation, 2010-12. $100,000.
- Clarke Mosquito Control, w/ Crans et al., 2012-14. $30,000.
- SpringStar, 2014-16. $24,000
- Syngenta, Barrier treatments, w/ Unlu, Williams & Gaugler. $60,000.

ADVISORY BOARDS

- Editorial Board (Associate Editor), *Journal of Nematology*, 1981-83.
- Review Panel, USDA Competitive Research Grants Program, Biological Stress, 1983, 1985 & 1987.
- Program Manager, USDA Competitive Research Grants Program, Biological Stress, 1988-89.
- Scientific Advisory Board, Biosys (Palo Alto, Calif.), 1989-92.
- Editorial Board, *Biological Control* (Academic Press), 1990-01.
- Scientific Advisory Board, Ecogen (Langhorne, Penn.), 1992-94.
- Editor, *Journal of Nematology*, 1992-96.
- Michigan Human Living Environment IPM Advisory Taskforce, 1994-95.
- Scientific Advisory Board, Chair, Ecogen-Europe (Perugia, Italy), 1994-95.
- Editorial Board, *Applied Soil Ecology,* 1997-2003.
- Review Team, USDA/ARS Application Technology Research Unit – Wooster, 1998.
- Board of Scientific and Policy Advisors, American Council on Science & Health, 1999-2010.
- Advisory Board, *International Journal of Biology & Biotechnology*, 2003-present.
- Scientific Advisor, International Foundation for Science (Sweden), 2003-08.
- External Review Team, Department of Plant & Soil Science, West Virginia University, 2003.
- Advisory Board, Applied Centre for Entomonematology, Cairo University, Egypt, 2005-16.
- Editorial Board, *Pakistan Journal of Nematology*, 2007-present.
- Editorial Board, *Trends in Biosciences*, 2008-present.
- Busch Biomedical Research Advisory Committee, 2010-present.
- Review Team, AAAS panel for King Abdulaziz City for Science & Technology (Saudi Arabia), 2010.
- New York City Zika Virus Expert Panel, 2016-17.
- Editorial Board, *Insects*, 2019-2022.
- Advisory Board, *Journal of Entomological Society of Iran*, 2022-present.
- Associate Editor, *Wing Beats*, 2022-present.

PROFESSIONAL SERVICE

- Program Committee, Entomological Society of America (EB), 1983.
- Local Arrangements Committee, Society of Nematologists, 1983-84.
- Membership Committee, Entomological Society of America (EB), 1983-84.
- Chair, Color Atlas Committee, Society for Invertebrate Pathology, 1983-86.
- Employment Committee, Entomological Society of America (EB), 1984-86.
- Linnaean Games Committee, Entomological Society of America (EB), 1984-86.
- Local Arrangements Committee, Entomological Society of America (EB), 1987.
- Chair, Tellers Committee, Society for Invertebrate Pathology, 1988.
- Secretary, Subsection Ce, Entomological Society of America, 1988-89.
- Display Presentations Coordinator, Entomological Society of America, 1989.
- Organizer (w/ H. Kaya), First International Symposium of Entomopathogenic Nematodes, 1989.
- Chair, Nematode Subcommittee, S-135 Regional Research Project, 1989-93.
- Chair-Elect, Subsection Ce, Entomological Society of America, 1989-90.
- ESCOP Working Group on Biological Control, 1991-99.
- Regulatory Workshop Organizing Committee, ESCOP WG on Biocontrol, 1990-91.
- Head Judge, President's Prize, Entomological Society of America, 1990.
- Tropical Pest Biology Center Organizing Committee, University of Hawaii, 1990-92.
- Chair, Subsection Ce, Entomological Society of America, 1990-91.
- Membership Committee, Society of Nematologists, 1991-92.
- Nominations Committee, Section C, Entomological Society of America, 1991.
- Honors and Awards Committee, Society of Nematologists, 1991-94.
- Liaison Journal Committee, Entomological Society of America, 1991-92.
- External Examiner, Institute of Plant Protection, Poznan, Poland, 1993-present.
- CSRS Study of the Science of Nematology, 1992-94.
- Entomophilic Nematode Executive Committee, Society of Nematology, 1992-96.
- Member-at-Large, S-235 Regional Research Project, 1992-94.
- Secretary, S-240 Regional Research Project, 1994-96.
- Coordinator, Student Awards Committee, Society of Invertebrate Pathology, 1995.
- Organizer (w/ H Kaya), Second Intern. Symposium of Entomopathogenic Nematology, 1995.
- Black Fly Joint Study Group, Rutgers / New Jersey DEP / Pennsylvania DEP, 1995-97.
- Chair, S-265 Regional Research Project "Entomopathogens in IPM Systems", 1996-98.
- Co-Chair, ESCOP Working Group on Biological Control, 1996-99.
- Organizer, Alternative Paradigms for Commercializing BioControl Intern. Workshop, 1997-98.
- Co-Major Advisor, A. Sasnarukkit, PhD Committee, Kasetsart University, Thailand, 1999-04.
- Board of Examiners, Randa Abdel Rahman, University of Cairo, 2000.
- Donors Relations Committee, Society of Nematologists, 2000-04.
- Board of Examiners, P. Sundararaj, Bharathiar University, India, 2001.
- Consultant for the Darwin Foundation, Galapagos Islands., 2001.
- Led fund-raising effort establishing the Entomophilic Nematode Endowment, 2001.
- Board of Examiners, Lourdes Portales, University of Havana, Cuba, 2002.
- Co-Organizer, U.S.-Egypt Symposium on Entomopathogenic Nematodes, Egypt, 2002.
- Board of Examiners, P. Alagesan, Madurai Kamaraj University, India, 2003.
- Co-Chair, Rules Committee, Entomological Society of America (EB), 2002-06.
- Co-Organizer, Rutgers – Ethiopian Agricultural Research Organization EPN Workshop, 2004.
- International Organizing Committee, International Conference on Biodiversity of Insects, 2005-06.

- Fulbright Orientation Leader for North Africa, Middle East and South Asia. Washington, DC, 2006.
- BioControl Review Committee (*Beddingsia* release petition), No. America Plant Protection Org., 2006.
- New Jersey West Nile Virus Task Force, 2006-09.
- Chair, NE-507 Multistate Research Project "Mosquitoes, Disease & Public Health," 2008-present.
- Board of Examiners, Manar Sanad, University of Cairo, 2009-2013.
- Board of Examiners, Mustafa Hemmant, University of Cairo, 2010-13.
- EPA Experimental Use Permit awarded for pyriproxyfen, DWFP/IR4 Team, 2011.
- Board of Examiners, Hana Haji Allahverdi, University of Tehran, Iran, 2014-2017.
- Conference Council, 5th Intern Forum for Mosquito Surveillance & Disease. Nanking, China, 2017.
- Conference Council, 6th Intern Forum for Mosquito Surveillance & Disease. Xiamen, China, 2019.

OUTREACH

Leader, Insecticidal Nematode Outreach Team, 1997-2001. Development of multi-media instructional aids (e.g., video, website, workshop, electronic expert panel, consumer guide, fact sheets, wall poster, manual, bibliography, etc.) that provide extension personnel with tools to assist growers in using nematodes effectively. Sixty team members from 21 states.

Consultant (e.g. Biosys, Integrated BioControl Systems, Ecogen, Great Lakes Chemical, Hyponex, Johnson & Johnson, Environmental Factor, ThermoTrilogy, etc.) in technology transfer.

Gaugler R. 1997. Nematodes. *In* "Biological Control: A Guide to Natural Enemies in North America" (Weeden et al., eds). http://www.nysaes.cornell.edu/ent/biocontrol/pathogens/nematodes.html.

Wilson M & R Gaugler. 1997. *Phasmarhabditis hermaphrodita*. *In* Biological Control: A Guide to Natural Enemies in North America (Weeden et al., eds). http://www.nysaes.cornell.edu/ent/biocontrol/pathogens/phasmarhabditis_h.html.

Gaugler R. 1997. Know your nematodes. *Golf Course Management.* December, pp. 64-68.

Graphics contributed and consultant for permanent nematode exhibit in Biodiversity Hall, American Museum of Natural History, 1998.

Leader, Nematode Poster Design Team. 1998. Developed educational wall poster on nematodes.

Executive Producer, "Nematodes as Pest Management Tools", 30 min training video, 1998.

Smith-Fiola D & R Gaugler. 1999. Everything you always wanted to know about beneficial nematodes. *The County Agent* 59:5-13.

Gaugler R. 1999. Matching nematodes to target hosts. Feature Article in *Midwest Biological Control News* 6(11):1-6. Reprinted as lead article in *The IPM Practitioner,* 2000.

Miles C, C Blethen & R Gaugler. 2000. Using beneficial nematodes for crop insect pest control. *Pacific NW Extension Publ* 544. 12 pp.

Gaugler R. 2000. Matching nematodes to target hosts. *The IPM Practitioner* 22(2):1-6.

Smith-Fiola D & R Gaugler. 2000. The nematode advantage. *Amer Nurseryman* 191:90-102.

Miles C, C Blethen & R Gaugler. 2001. Using beneficial nematodes for crop insect pest control. *Agrichemical & Environmental News,* Vol. No. 180, April.

Directed New Jersey state-wide arbovirus and adult mosquito surveillance programs, 2006-11.

Nelder M & R Gaugler. 2008. New Jersey black flies. NJAES Coop Extension Fact Sheet FS1090.

Miles C, C Blethen, R Gaugler, D Shapiro-Ilan & T Murray. 2012. Using entomopathogenic nematodes for crop insect pest control. *Pacific NW Extension Publ* 544. 11 pp.

Gaugler R & A Faraji. 2016. What New Jersey residents need to know about Zika virus. http://vectorbio.rutgers.edu/Zika.htm. New Jersey Agricultural Experiment Station.

TEACHING EXPERIENCE

Full member of Graduate Programs in 1) Ecology & Evolution 2) Entomology, and 3) Plant Biology

- General Biology
- Turfgrass Pest Science
- Biological Control
- Principles of Ecology
- Insect Ecology
- Short Course in Biological Control of Vectors (Chiapas, Mexico), 1983.
- Short Course in Entomopathogenic Nematology (Sao Paulo University, Brazil), 2005.
- Short Course in Entomopathogenic Nematology (Chinese Academy of Science, Harbin), 2006.
- Short Course in Insect Nematology (Cairo University), 2007.
- Contributor to: Advanced Insect Pathology (Cornell University), Host Recognition Short Course (University of Neuchatel, Switzerland), Advanced Training in Entomological Theory & Practice (Chinese Academy of Sciences, Beijing) and various courses at Cairo University (Egypt).

*Teaching effectiveness rated **4.72 / 5.0** at http://www.ratemyprofessors.com*

HONORS & AWARDS

- Outstanding College Athletes of America, 1970.
- National Science Foundation Graduate Traineeship, 1972-1974.
- Commencement Speaker, North Dakota State University at Bottineau, 1988.
- USDA Certificate of Appreciation for Outstanding Service, 1989.
- Athletic Hall of Fame, North Dakota State University at Bottineau, 1990.
- Research Excellence Award. Rutgers University, 1993.
- Fellow of the Japanese Society for the Promotion of Science, 1994.
- Team Research Excellence Award. Rutgers University, 1995.
- Sustained Research Excellence Award. Rutgers University, 1996.
- Fellow of the Society of Nematologists, elected 1997.
- Board of Trustees Award for Excellence in Research, Rutgers University, 1998.
- Communicator Award of Distinction (1999), Educational Award from the Board Certified Entomologists of Mid-America (2000), and Award of Excellence from The Videographer Awards (2000) as Executive Producer of *'Nematodes as Pest Management Tools'* video.
- Excellence in Integrated Pest Management Award, Entomological Society of America, 1999.
- Fellow of the American Association for the Advancement of Science (AAAS), elected 1999.
- Education Award, '*Insect Nematodes'* website, Certified Entomologists of Mid-America, 2000.
- Outstanding BARD Research Project (top 15%) (w/ I. Glazer), BARD 20-year review, 2001.
- Recognition Award in Entomology, Entomological Society of America, 2004.
- New species named *Mononchoides gaugleri*, 2005.
- Fellow of the Entomological Society of America, elected 2005.
- Fulbright Senior Scholar, Egypt, 2005-06.
- Development of "molecular methods for genetic improvement" one of top ten New Jersey Agricultural Experiment Station Research Milestones - 1862 to 2005.
- Listed among 'Prominent Nematologists' by Nematode-Plant Expert Information System, 2005.
- Listed among 'Pioneers in Insect Nematology,' *Journal of Invertebrate Pathology* 89:57, 2005.
- Adjunct Member, Chinese Academy of Sciences, 2006-present.

- Albert Einstein Professor, Chinese Academy of Sciences, 2006. Recipients include 6 Nobel laureates.
- Distinguished Lecturer (inaugural), School of Environmental & Biological Sciences, Rutgers U., 2007.
- Henry L. Bolley Alumni Achievement Award (inaugural), North Dakota State University, 2007.
- Hall of Fame, West Fargo High School, 2010.
- Professorship for Senior International Scientists, Chinese Academy of Sciences, 2012.
- Golden Service Award, Dakota College, 2012.
- Invited Foreign Expert, China International Economic & Trade Exposition, 2012.
- International Excellence Award, School of Environmental & Biological Sciences, Rutgers, 2012.
- Fulbright Senior Scholar, Egypt, 2012-13.
- L.O. Howard Distinguished Achievement Award, Entomological Society of America (EB), 2012.
- Memorial Lecturer, American Mosquito Control Association, 2013.
- Team Excellence Award, School for Biological & Environmental Sciences, Rutgers University, 2014.
- Team Award, Entomological Society of America, 2014.
- Medal of Honor, American Mosquito Control Association, 2017.
- Distinguished Fulbright Chair, 2017-18.
- Legend Speaker, EPN Centennial, Logrono, Spain, 2024.

CITATION INDICES **Google Scholar Citations: 25.116 h-index: 87 i10 index: 253**

SAMPLE PLAN DOCUMENT
SECTION 125
FLEXIBLE BENEFIT PLAN

The attached plan document and adoption agreement are being provided for illustrative purposes only. Because of differences in facts, circumstances, and the laws of the various states, interested parties should consult their own attorneys. This document is intended as a guide only, for use by local counsel.

SECTION 125 FLEXIBLE BENEFIT PLAN
ADOPTION AGREEMENT

The undersigned Employer hereby adopts the Section 125 Flexible Benefit Plan for those Employees who shall qualify as Participants hereunder. The Employer hereby selects the following Plan specifications:

A. EMPLOYER INFORMATION

Name of Employer:	INDIAN RIVER MOSQUITO CONTROL DISTRICT
Address:	5655 41ST ST VERO BEACH, FL 32967
Employer Identification Number:	59-6001309
Nature of Business:	MUNICIPALITY
Name of Plan:	INDIAN RIVER MOSQUITO CONTROL DISTRICT Flexible Benefit Plan
Plan Number:	501
Plan Description:	125/Flex

B. EFFECTIVE DATE

Original effective date of the Plan:	October 1, 2012
If Amendment to existing plan, effective date of amendment:	October 1, 2026

C. ELIGIBILITY REQUIREMENTS FOR PARTICIPATION

Eligibility requirements for each component plan under this Section 125 document will be applicable and, if different, will be listed in Item F.

Length of Service:	First of the month following 30 days.
Retiree Wording:	N/A
Minimum Hours:	All employees with 30 hours of service or more each week. An hour of service is each hour for which an employee receives, or is entitled to receive, payment for performance of duties for the Employer.
Age:	Minimum age of 0 years.

D. PLAN YEAR

The current plan year will begin on October 1, 2026 and end on September 30, 2027. Each subsequent plan year will begin on October 1 and end on September 30.

E. EMPLOYER CONTRIBUTIONS

Non-Elective Contributions:

The maximum amount available to each Participant for the purchase of elected benefits with non-elective contributions will be:

Plan 1:

Employee Only $1,078.01; Employee + Spouse $2,069.82; Employee + Children $1,811.10; Family $2,802.88

Plan 3:

Employee Only $1,078.01; Employee + Spouse $2,069.82; Employee + Children $1,811.10; Family $2,802.88

Elective Contributions (Salary Reduction):

The Employer may at its sole discretion provide a non-elective contribution to provide benefits for each Participant under the Plan. This amount will be set by the Employer each Plan Year in a uniform and non-discriminatory manner. If this non-elective contribution amount exceeds the cost of benefits elected by the Participant, excess amounts will not be paid to the Participant as taxable cash.

The maximum amount available to each Participant for the purchase of elected benefits through salary reduction will be:

$20000.00 per plan year.

Each Participant may authorize the Employer to reduce his or her compensation by the amount needed for the purchase of benefits elected, less the amount of non-elective contributions. An election for salary reduction will be made on the benefit election form.

F. AVAILABLE BENEFITS: Each of the following components should be considered a plan that comprises this Plan.

1. **Group Medical Insurance** -- The terms, conditions, and limitations for the Group Medical Insurance will be as set forth in the insurance policy or policies described below: (See Section V of the Plan Document)

   American Fidelity Assurance Company : Accident Only Plan, Hospital GAP & Group Hospital Indemnity | Florida Municipal Insurance Trust/ United Healthcare

   Eligibility Requirements for Participation, if different than Item C.

   |

2. **Disability Income Insurance** -- The terms, conditions, and limitations for the Disability Income Insurance will be as set forth in the insurance policy or policies described below: (See Section VI of the Plan Document)

   N/A

   Eligibility Requirements for Participation, if different than Item C.

3. **Cancer Coverage** -- The terms, conditions, and limitations for the Cancer Coverage will be as set forth in the insurance policy or policies described below: (See Section V of the Plan Document)

   American Fidelity Assurance Company : C-11 and subsequent policies

   Eligibility Requirements for Participation, if different than Item C.

4. **Dental/Vision Insurance** -- The terms, conditions, and limitations for the Dental/Vision Insurance will be as set forth in the insurance policy or policies described below: (See Section V of the Plan Document)

   Delta : Dental DPPO - Employee pays 100% | Spectra : Employee pays 100%

   Eligibility Requirements for Participation, if different than Item C.

   |

5. **Group Life Insurance** which will be comprised of Group term life insurance and Individual term life insurance under Section 79 of the Code.

   The terms, conditions, and limitations for the Group Life Insurance will be as set forth in the insurance policy or policies described below: (See Section VII of the Plan Document)

   Principal

   Individual life coverage under Section 79 is available as a benefit, and the face amount when combined with the group-term life, if any, may not exceed $50,000.

   Eligibility Requirements for Participation, if different than Item C.

6. **Dependent Care Assistance Plan** -- The terms, conditions, and limitations for the Dependent Care Assistance Plan will be as set forth in Section IX of the Plan Document and described below:

Minimum Contribution - $**200.00** per Plan Year

Maximum Contribution - $**7500.00** per Plan Year

Recordkeeper: American Fidelity Assurance Company

Eligibility Requirements for Participation, if different than Item C.

N/A

7. **Medical Expense Reimbursement Plan** (a.k.a. Healthcare Flexible Spending Account) -- The terms, conditions, and limitations for the Medical Expense Reimbursement Plan will be as set forth in Section VIII of the Plan Document and described below:

Minimum Coverage - $**200.00** per Plan Year

Maximum Coverage - $**3400.00** per Plan Year or a Prorated Amount for a Short Plan Year. In no event can the maximum exceed the limit as indicated by the IRS in accordance with the law.

Recordkeeper: American Fidelity Assurance Company

Restrictions: As outlined in Policy G-905/R1.

Grace Period: The Provisions in Section 8.06 of the Plan to permit a Grace Period with respect to the Medical Expense Reimbursement Plan **are not** elected.

Carryover: The Provisions in Section 8.07 of the Plan to permit a Carryover with respect to the Medical Expense Reimbursement Plan **are** elected.

Carryover Maximum: $**680.00** per Plan Year.

HEART Act: The provisions in Section 8.08 of the Plan to permit the Qualified Reservist Distribution of the Heroes Earnings Assistance and Relief Tax Act (HEART) **are not** elected.

Eligibility Requirements for Participation, if different than Item C.

8. **Health Savings Accounts** – The Plan permits contributions to be made to a Health Savings Account on a pretax basis in accordance with Section X of the Plan and the following provisions:

HSA Trustee – **N/A**

Maximum Contribution – **N/A**

Limitation on Eligible Medical Expenses – For purposes of the Medical Reimbursement Plan, Eligible Medical Expenses of a Participant that is eligible for and elects to participate in a Health Savings Account shall be limited to expenses for:

Eligibility Requirements for Participation, if different than Item C.

a. An Employee must complete a Certification of Health Savings Account Eligibility which confirms that the Participant is an eligible individual who is entitled to establish a Health Savings Account in accordance with Code Section 223(c)(1).
b. Eligibility for the Health Savings Account shall begin on the later of (i) first day of the month coinciding with or next following the Employee's commencement of coverage under the High Deductible Health Plan, or (ii) the first day following the end of a Grace Period available to the Employee with respect to the Medical Reimbursement Accounts that are not limited to vision and dental expenses (unless the participant has a $0.00 balance on the last day of the plan year).
c. An Employee's eligibility for the Health Savings Account shall be determined monthly.

The Plan shall be construed, enforced, administered, and the validity determined in accordance with the applicable provisions of the Employee Retirement Income Security Act of 1974, (as amended) if applicable, the Internal Revenue Code of 1986 (as amended), and the laws of the State of Florida. Should any provision be determined to be void, invalid, or unenforceable by any court of competent jurisdiction, the Plan will continue to operate, and for purposes of the jurisdiction of the court only, will be deemed not to include the provision determined to be void.

This Plan is hereby adopted _____.

INDIAN RIVER MOSQUITO CONTROL DISTRICT -
(Name of Employer)

Signed By:_____

Title:_____

APPENDIX A

Related Employers that have adopted this Plan

Name(s):
N/A

THIS DOCUMENT IS NOT COMPLETE WITHOUT SECTIONS I THROUGH XIII

SECTION 125 FLEXIBLE BENEFIT PLAN

SECTION I

PURPOSE

The Employer is establishing this Flexible Benefit Plan in order to make a broader range of benefits available to its Employees and their Beneficiaries. This Plan allows Employees to choose among different types of benefits and select the combination best suited to their individual goals, desires, and needs. These choices include an option to receive certain benefits in lieu of taxable compensation.

In establishing this Plan, the Employer desires to attract, reward, and retain highly qualified, competent Employees, and believes this Plan will help achieve that goal.

It is the intent of the Employer to establish this Plan in conformity with Section 125 of the Internal Revenue Code of 1986, as amended, and in compliance with applicable rules and regulations issued by the Internal Revenue Service. This Plan will grant to eligible Employees an opportunity to purchase qualified benefits which, when purchased alone by the Employer, would not be taxable.

SECTION II

DEFINITIONS

The following words and phrases appear in this Plan and will have the meaning indicated below unless a different meaning is plainly required by the context:

2.01 **Administrator** The Employer unless another has been designated in writing by the Employer as Administrator within the meaning of Section 3(16) of ERISA (if applicable).

2.02 **Beneficiary** Any person or persons designated by a participating Employee to receive any benefit payable under the Plan on account of the Employee's death.

2.02a **Carryover** The amount equal to the lesser of (a) any unused amounts from the immediately preceding Plan Year or (b) an amount up to $680, as indexed for inflation, paralleling the indexing applicable to the limit on salary reduction contributions under Code Section 125(i) of the Code, except that in no event may the Carryover be less than five dollars ($5).

2.03 **Code** Internal Revenue Code of 1986, as amended.

2.04 **Dependent** Any of the following:

(a) Tax Dependent: A Dependent includes a Participant's spouse and any other person who is a Participant's dependent within the meaning of Code Section 152, provided that, with respect to any plan that provides benefits that are excluded from an Employee's income under Code Section 105, a Participant's dependent (i) is any person within the meaning of Code Section 152, determined without regard to Subsections (b)(1), (b)(2), and

(d)(1)(B) thereof, and (ii) includes any child of the Participant to whom Code Section 152(e) applies (such child will be treated as a dependent of both divorced parents).

(b) Student on a Medically Necessary Leave of Absence: With respect to any plan that is considered a group health plan under Michelle's Law (and not a HIPAA excepted benefit under Code Sections 9831(b), (c) and 9832(c)) and to the extent the Employer is required by Michelle's Law to provide continuation coverage, a Dependent includes a child who qualifies as a Tax Dependent (defined in Section 2.04(a)) because of his or her full-time student status, is enrolled in a group health plan, and is on a medically necessary leave of absence from school. The child will continue to be a Dependent if the medically necessary leave of absence commences while the child is suffering from a serious illness or injury, is medically necessary, and causes the child to lose student status for purposes of the group health plan's benefits coverage. Written physician certification that the child is suffering from a serious illness or injury and that the leave of absence is medically necessary is required at the Administrator's request. The child will no longer be considered a Dependent as of the earliest date that the child is no longer on a medically necessary leave of absence, the date that is one year after the first day of the medically necessary leave of absence, or the date benefits would otherwise terminate under either the group health plan or this Plan. Terms related to Michelle's Law, and not otherwise defined, will have the meaning provided under the Michelle's Law provisions of Code Section 9813.

(c) Adult Children: With respect to any plan that provides benefits that are excluded from an Employee's income under Code Section 105, a Dependent includes a child of a Participant who as of the end of the calendar year has not attained age 27. A 'child' for purpose of this Section 2.04(c) means an individual who is a son, daughter, stepson, or stepdaughter of the Participant, a legally adopted individual of the Participant, an individual who is lawfully placed with the Participant for legal adoption by the Participant, or an eligible foster child who is placed with the Participant by an authorized placement agency or by judgment, decree, or other order of any court of competent jurisdiction. An adult child described in this Section 2.04(c) is only a Dependent with respect to benefits provided after March 30, 2010 (subject to any other limitations of the Plan).

Dependent for purposes of the Dependent Care Reimbursement Plan is defined in Section 9.04(a).

2.05 **Effective Date** The effective date of this Plan as shown in Item B of the Adoption Agreement.

2.06 **Elective Contribution** The amount the Participant authorizes the Employer to reduce compensation for the purchase of benefits elected.

2.07 **Eligible Employee** Employee meeting the eligibility requirements for participation as shown in Item C of the Adoption Agreement.

2.08 **Employee** Any person employed by the Employer on or after the Effective Date.

2.09 **Employer** The entity shown in Item A of the Adoption Agreement, and any Related Employers authorized to participate in the Plan with the approval of the Employer. Related Employers who participate in this Plan are listed in Appendix A to the Adoption Agreement. For the purposes of Section 11.01 and 11.02, only the Employer as shown in Item A of the Adoption Agreement may amend or terminate the Plan.

2.10 **Employer Contributions** Amounts that have not been actually received by the Participant and are available to the Participant for the purpose of selecting benefits under the Plan. This term includes Non-Elective Contributions and Elective Contributions through salary reduction.

2.11 **Entry Date** The date that an Employee is eligible to participate in the Plan.

2.12 **ERISA** The Employee Retirement Income Security Act of 1974, Public Law 93-406 and all regulations and rulings issued thereunder, as amended (if applicable).

2.13 **Fiduciary** The named fiduciary shall mean the Employer, the Administrator and other parties designated as such, but only with respect to any specific duties of each for the Plan as may be set forth in a written agreement.

2.14 **Health Savings Account** A “health savings account” as defined in Section 223(d) of the Internal Revenue Code of 1986, as amended established by the Participant with the HSA Trustee.

2.15 **HSA Trustee** The Trustee of the Health Savings Account which is designated in Section F.8 of the Adoption Agreement.

2.16 **Highly Compensated** Any Employee who at any time during the Plan Year is a "highly compensated employee" as defined in Section 414(q) of the Code.

2.17 **High Deductible Health Plan** A health plan that meets the statutory requirements for annual deductibles and out-of-pocket expenses set forth in Code section 223(c)(2).

2.18 **HIPAA** The Health Insurance Portability and Accountability Act of 1996, as amended.

2.19 **Insurer** Any insurance company that has issued a policy pursuant to the terms of this Plan.

2.20 **Key Employee** Any Participant who is a "key employee" as defined in Section 416(i) of the Code.

2.21 **Non-Elective Contribution** A contribution amount made available by the Employer for the purchase of benefits elected by the Participant.

2.22 **Participant** An Employee who has qualified for Plan participation as provided in Item C of the Adoption Agreement.

2.23 **Plan** The Plan referred to in Item A of the Adoption Agreement as may be amended from time to time.

2.24 **Plan Year** The Plan Year as specified in Item D of the Adoption Agreement.

2.25 **Policy** An insurance policy issued as a part of this Plan.

2.26 **Preventative Care** Medical expenses which meet the safe harbor definition of "preventative care" set forth in IRS Notice 2004-23, which includes, but is not limited to, the following: (i) periodic health evaluations, such as annual physicals (and the tests and diagnostic procedures ordered in conjunction with such evaluations); (ii) well-baby and/or well-child care; (iii) immunizations for adults and children; (iv) tobacco cessation and obesity weight-loss programs; and (v) screening devices. However, preventative care does not generally include any service or benefit intended to treat an existing illness, injury or condition.

2.27 **Recordkeeper** The person designated by the Employer to perform recordkeeping and other ministerial duties with respect to the Medical Expense Reimbursement Plan and/or the Dependent Care Reimbursement Plan.

2.28 **Related Employer** Any employer that is a member of a related group of organizations with the Employer shown in Item A of the Adoption Agreement, and as specified under Code Section 414(b), (c) or (m).

SECTION III

ELIGIBILITY, ENROLLMENT, AND PARTICIPATION

3.01 ELIGIBILITY: Each Employee of the Employer who has met the eligibility requirements of Item C of the Adoption Agreement will be eligible to participate in the Plan on the Entry Date specified or the Effective Date of the Plan, whichever is later. Dependent eligibility to receive benefits under any of the plans listed in Item F of the Adoption Agreement will be described in the documents governing those benefit plans. To the extent a Dependent is eligible to receive benefits under a plan listed in Item F, an

Eligible Employee may elect coverage under this Plan with respect to such Dependent. Notwithstanding the foregoing, life insurance coverage on the life of a Dependent may not be elected under this Plan.

3.02 ENROLLMENT: An eligible Employee may enroll (or re-enroll) in the Plan by submitting to the Employer, during an enrollment period, an Election Form which specifies his or her benefit elections for the Plan Year and which meets such standards for completeness and accuracy as the Employer may establish. A Participant's Election Form shall be completed prior to the beginning of the Plan Year, and shall not be effective prior to the date such form is submitted to the Employer. Any Election Form submitted by a Participant in accordance with this Section shall remain in effect until the earlier of the following dates: the date the Participant terminates participation in the Plan; or, the effective date of a subsequently filed Election Form.

A Participant's right to elect certain benefit coverage shall be limited hereunder to the extent such rights are limited in the Policy. Furthermore, a Participant will not be entitled to revoke an election after a period of coverage has commenced and to make a new election with respect to the remainder of the period of coverage unless both the revocation and the new election are on account of and consistent with a change in status, or other allowable events, as determined by Section 125 of the Internal Revenue Code and the regulations thereunder.

3.03 TERMINATION OF PARTICIPATION: A Participant shall continue to participate in the Plan until the earlier of the following dates:

a. The date the Participant terminates employment by death, disability, retirement or other separation from service; or
b. The date the Participant ceases to work for the Employer as an eligible Employee; or
c. The date of termination of the Plan; or
d. The first date a Participant fails to pay required contributions while on a leave of absence.

3.04 SEPARATION FROM SERVICE: The existing elections of an Employee who separates from the employment service of the Employer shall be deemed to be automatically terminated and the Employee will not receive benefits for the remaining portion of the Plan Year.

3.05 QUALIFYING LEAVE UNDER FAMILY LEAVE ACT: Notwithstanding any provision to the contrary in this Plan, if a Participant goes on a qualifying unpaid leave under the Family and Medical Leave Act of 1993 (FMLA), to the extent required by the FMLA, the Employer will continue to maintain the Participant's existing coverage under the Plan with respect to benefits under Section V and Section VIII of the Plan on the same terms and conditions as though he were still an active Employee. If the Employee opts to continue his coverage, the Employee may pay his Elective Contribution with after-tax dollars while on leave (or pre-tax dollars to the extent he receives compensation during the leave), or the Employee may be given the option to pre-pay all or a portion of his Elective Contribution for the expected duration of the leave on a pre-tax salary reduction basis out of his pre-leave compensation (including unused sick days or vacation) by making a special election to that effect prior to the date such compensation would normally be made available to him (provided, however, that pre-tax dollars may not be utilized to fund coverage during the next plan year), or via other arrangements agreed upon between the Employee and the Administrator (e.g., the Administrator may fund coverage during the leave and withhold amounts upon the Employee's return). Upon return from such leave, the Employee will be permitted to reenter the Plan on the same basis the Employee was participating in the Plan prior to his leave, or as otherwise required by the FMLA.

SECTION IV

CONTRIBUTIONS

4.01 EMPLOYER CONTRIBUTIONS: The Employer may pay the costs of the benefits elected under the Plan with funds from the sources indicated in Item E of the Adoption Agreement. The Employer Contribution may be made up of Non-Elective Contributions and/or Elective Contributions authorized by each Participant on a salary reduction basis.

4.02 IRREVOCABILITY OF ELECTIONS: A Participant may file a written election form with the Administrator before the end of the current Plan Year revising the rate of his contributions or discontinuing such contributions effective as of the first day of the next following Plan Year. The Participant's Elective Contributions will automatically terminate as of the date his employment terminates. Except as provided in this Section 4.02 and Section 4.03, a Participant's election under the Plan is irrevocable for the duration of the plan year to which it relates. The exceptions to the irrevocability requirement which would permit a mid-year election change in benefits and the salary reduction amount elected are set out in the Treasury regulations promulgated under Code Section 125, which include the following:

(a) Change in Status. A Participant may change or revoke his election under the Plan upon the occurrence of a valid change in status, but only if such change or termination is made on account of, and is consistent with, the change in status in accordance with the Treasury regulations promulgated under Section 125. The Employer, in its sole discretion as Administrator, shall determine whether a requested change is on account of and consistent with a change in status, as follows:

(1) Change in Employee's legal marital status, including marriage, divorce, death of spouse, legal separation, and annulment;
(2) Change in number of Dependents, including birth, adoption, placement for adoption, and death;
(3) Change in employment status, including any employment status change affecting benefit eligibility of the Employee, spouse or Dependent, such as termination or commencement of employment, change in hours, strike or lockout, a commencement or return from an unpaid leave of absence, and a change in work site. If the eligibility for either the cafeteria Plan or any underlying benefit plans of the Employer of the Employee, spouse or Dependent relies on the employment status of that individual, and there is a change in that individual's employment status resulting in gaining or losing eligibility under the Plan, this constitutes a valid change in status. This category only applies if benefit eligibility is lost or gained as a result of the event. If an Employee terminates and is rehired within 30 days, the Employee is required to step back into his previous election. If the Employee terminates and is rehired after 30 days, the Employee may either step back into the previous election or make a new election;
(4) Dependent satisfies, or ceases to satisfy, Dependent eligibility requirements due to attainment of age, gain or loss of student status, marriage or any similar circumstances; and
(5) Residence change of Employee, spouse or Dependent, affecting the Employee's eligibility for coverage.

(b) Special Enrollment Rights. If a Participant or his or her spouse or Dependent is entitled to special enrollment rights under a group health plan (other than an excepted benefit), as required by HIPAA under Code Section 9801(f), then a Participant may revoke a prior election for group health plan coverage and make a new election, provided that the election change corresponds with such HIPAA special enrollment right. As required by HIPAA, a special enrollment right will arise in the following circumstances: (i) a Participant or his or her spouse or Dependent declined to enroll in group health plan coverage because he or she had coverage, and eligibility for such coverage is subsequently lost because the coverage was provided under COBRA and the COBRA coverage was exhausted, or the

coverage was non-COBRA coverage and the coverage terminated due to loss of eligibility for coverage or the employer contributions for the coverage were terminated; (ii) a new Dependent is acquired as a result of marriage, birth, adoption, or placement for adoption; (iii) the Participant's or his or her spouse's or Dependent's coverage under a Medicaid plan or under a children's health insurance program (CHIP) is terminated as a result of loss of eligibility for such coverage and the Participant requests coverage under the group health plan not later than 60 days after the date of termination of such coverage; or (iv) the Participant, his or her spouse or Dependent becomes eligible for a state premium assistance subsidy from a Medicaid plan or through a state children's insurance program with respect to coverage under the group health plan and the Participant requests coverage under the group health plan not later than 60 days after the date the Participant, his or her spouse or Dependent is determined to be eligible for such assistance. An election change under (iii) or (iv) of this provision must be requested within 60 days after the termination of Medicaid or state health plan coverage or the determination of eligibility for a state premium assistance subsidy, as applicable. Special enrollment rights under the health insurance plan will be determined by the terms of the health insurance plan.

(c) Certain Judgments, Decrees or Orders. If a judgment, decree or order resulting from a divorce, legal separation, annulment or change in legal custody (including a qualified medical child support order [QMCSO]) requires accident or health coverage for a Participant's child or for a foster child who is a dependent of the Participant, the Participant may have a mid-year election change to add or drop coverage consistent with the Order.

(d) Entitlement to Medicare or Medicaid. If a Participant, Participant's spouse or Participant's Dependent who is enrolled in an accident or health plan of the Employer becomes entitled to Medicare or Medicaid (other than coverage consisting solely of benefits under Section 1928 of the Social Security Act providing for pediatric vaccines), the Participant may cancel or reduce health coverage under the Employer's Plan. Loss of Medicare or Medicaid entitlement would allow the Participant to add health coverage under the Employer's Plan.

(e) Family Medical Leave Act. If an Employee is taking leave under the rules of the Family Medical Leave Act, the Employee may revoke previous elections and re-elect benefits upon return to work.

(f) COBRA Qualifying Event. If an Employee has a COBRA qualifying event (a reduction in hours of the Employee, or a Dependent ceases eligibility), the Employee may increase his pre-tax contributions for coverage under the Employer's Plan if a COBRA event occurs with respect to the Employee, the Employee's spouse or Dependent. The COBRA rule does not apply to COBRA coverage under another Employer's Plan.

(g) Changes in Eligibility for Adult Children. To the extent the Employer amends a plan listed in Item F of the Adoption Agreement that provides benefits that are excluded from an Employee's income under Code Section 105 to provide that Adult Children (as defined in Section 2.04(c)) are eligible to receive benefits under the plan, an Eligible Employee may make or change an election under this Plan to add coverage for the Adult Child and to make any corresponding change to the Eligible Employee's coverage that is consistent with adding coverage for the Adult Child.

(h) Cancellation due to reduction in hours of service. A Participant may cancel group health plan (as that term is defined in Code Section 9832(a)) coverage, except Health FSA coverage, under the Employer's Plan if both of the following conditions are met:

(i) The Participant has been in an employment status under which the Participant was reasonably expected to average at least 30 hours of service per week and there is a change

in that Participant's status so that the Participant will reasonably be expected to average less than 30 hours of service per week after the change, even if that reduction does not result in the Participant ceasing to be eligible under the group health plan; and

(ii) The cancellation of the election of coverage under the Employer's group health plan coverage corresponds to the intended enrollment of the Participant, and any related individuals who cease coverage due to the cancellation, in another plan that provides minimum essential coverage with the new coverage effective no later than the first day of the second month following the month that includes the date the original coverage is cancelled.

(i) Cancellation due to enrollment in a Qualified Health Plan. A participant may cancel group health plan (as that term is defined in Code Section 9832(a)) coverage, except Health FSA coverage, under the Employer's Plan if both of the following conditions are met:

(i) The Participant is eligible for a Special Enrollment Period (as defined in Code Section 9801(f)) to enroll in a Qualified Health Plan (as described in section 1311 of the Patient Protection and Affordable Care Act (PPACA)) through a competitive marketplace established under section 1311(c) of PPACA (Marketplace), pursuant to guidance issued by the Department of Health and Human Services and any other applicable guidance, or the Participant seeks to enroll in a Qualified Health Plan through a Marketplace during the Marketplace's annual open enrollment period; and

(ii) The cancellation of the election of coverage under the Employer's group health plan coverage corresponds to the intended enrollment of the Participant and any related individuals who cease coverage due to the cancellation in a Qualified Health Plan through a Marketplace for new coverage that is effective beginning no later than the day immediately following the last day of the original coverage that is cancelled.

(j) Cancellation due to related individuals' enrollment in a Qualified Health Plan. For elections effective on or after January 1, 2023, a participant may cancel an election of family coverage under a group health plan (as that term is defined in Code Section 9832(a)), except Health FSA coverage, under the Employer's Plan if both of the following conditions are met:

(i) One or more related individuals are eligible for a Special Enrollment Period (as defined in Code Section 9801(f)) to enroll in a Qualified Health Plan (as described in section 1311 of the Patient Protection and Affordable Care Act (PPACA)) through a competitive marketplace established under section 1311(c) of PPACA (Marketplace), pursuant to guidance issued by the Department of Health and Human Services and any other applicable guidance, or one or more already-covered related individuals seeks to enroll in a Qualified Health Plan through a Marketplace during the Marketplace's annual open enrollment period; and

(ii) The cancellation of the election of coverage under the Employer's group health plan coverage corresponds to the intended enrollment of the related individual or related individuals who cease coverage due to the cancellation in a Qualified Health Plan through a Marketplace for new coverage that is effective beginning no later than the day

immediately following the last day of the original coverage that is cancelled. If the employee does not enroll in a Qualified Health Plan through an Exchange as set forth in Notice 2014-55, the employee must elect self-only coverage (or family coverage including one or more already-covered related individuals) under the group health plan.

Notwithstanding anything to the contrary in this Section 4.02, the change in election rules in this Section 4.02 do not apply to the Medical Expense Reimbursement Plan, or may not be modified with respect to the Medical Expense Reimbursement Plan if the Plan is being administered by a Recordkeeper other than the Employer, unless the Employer and the Recordkeeper otherwise agree in writing.

4.03 OTHER EXCEPTIONS TO IRREVOCABILITY OF ELECTIONS. Other exceptions to the irrevocability of election requirement permit mid-year election changes and apply to all qualified benefits except for Medical Expense Reimbursement Plans, as follows:

(a) Change in Cost. If the cost of a benefit package option under the Plan significantly increases during the plan year, Participants may (i) make a corresponding increase in their salary reduction amount, (ii) revoke their elections and make a prospective election under another benefit option offering similar coverage, or (iii) revoke election completely if no similar coverage is available, including in spouse or dependent's plan. If the cost significantly decreases, employees may elect coverage even if they had not previously participated and may drop their previous election for a similar coverage option in order to elect the benefit package option that has decreased in cost during the year. If the increased or decreased cost of a benefit package option under the Plan is insignificant, the participant's salary reduction amount shall be automatically adjusted.

(b) Significant curtailment of coverage.

(i) With no loss of coverage. If the coverage under a benefit package option is significantly curtailed or ceases during the Plan Year, affected Participants may revoke their elections for the curtailed coverage and make a new prospective election for coverage under another benefit package option providing similar coverage.

(ii) With loss of coverage. If there is a significant curtailment of coverage with loss of coverage, affected Participants may revoke election for curtailed coverage and make a new prospective election for coverage under another benefit package option providing similar coverage, or drop coverage if no similar benefit package option is available.

(c) Addition or Significant Improvement of Benefit Package Option. If during the Plan Year a new benefit package option is added or significantly improved, eligible employees, whether currently participating or not, may revoke their existing election and elect the newly added or newly improved option.

(d) Change in Coverage of a Spouse or Dependent Under Another Employer's Plan. If there is a change in coverage of a spouse, former spouse, or Dependent under another employer's plan, a Participant may make a prospective election change that is on account of and corresponds with a change made under the plan of the spouse or Dependent. This rule applies if (1) mandatory changes in coverage are initiated by either the insurer of spouse's plan or by the spouse's employer, or (2) optional changes are initiated by the spouse's employer or by the spouse through open enrollment.

(e) Loss of coverage under other group health coverage. If during the Plan Year coverage is lost under any group health coverage sponsored by a governmental or educational institution, a Participant may

prospectively change his or her election to add group health coverage for the affected Participant or his or her spouse or dependent.

4.04 CASH BENEFIT: Available amounts not used for the purchase of benefits under this Plan may be considered a cash benefit under the Plan payable to the Participant as taxable income to the extent indicated in Item E of the Adoption Agreement.

4.05 PAYMENT FROM EMPLOYER'S GENERAL ASSETS: Payment of benefits under this Plan shall be made by the Employer from Elective Contributions which shall be held as a part of its general assets.

4.06 EMPLOYER MAY HOLD ELECTIVE CONTRIBUTIONS: Pending payment of benefits in accordance with the terms of this Plan, Elective Contributions may be retained by the Employer in a separate account or, if elected by the Employer and as permitted or required by regulations of the Internal Revenue Service, Department of Labor or other governmental agency, such amounts of Elective Contributions may be held in a trust pending payment.

4.07 MAXIMUM EMPLOYER CONTRIBUTIONS: With respect to each Participant, the maximum amount made available to pay benefits for any Plan Year shall not exceed the Employer's Contribution specified in the Adoption Agreement and as provided in this Plan.

SECTION V

GROUP MEDICAL INSURANCE BENEFIT PLAN

5.01 PURPOSE: These benefits provide the group medical insurance benefits to Participants.

5.02 ELIGIBILITY: Eligibility will be as required in Items F(1), F(3), and F(4) of the Adoption Agreement.

5.03 DESCRIPTION OF BENEFITS: The benefits available under this Plan will be as defined in Items F(1), F(3), and F(4) of the Adoption Agreement.

5.04 TERMS, CONDITIONS AND LIMITATIONS: The terms, conditions and limitations of the benefits offered shall be as specifically described in the Policy identified in the Adoption Agreement.

5.05 COBRA: To the extent required by Section 4980B of the Code and Sections 601 through 607 of ERISA, Participants and Dependents shall be entitled to continued participation in this Group Medical Insurance Benefit Plan by contributing monthly (from their personal assets previously subject to taxation) 102% of the amount of the premium for the desired benefit during the period that such individual is entitled to elect continuation coverage, provided, however, in the event the continuation period is extended to 29 months due to disability, the premium to be paid for continuation coverage for the 11 month extension period shall be 150% of the applicable premium.

5.06 SECTION 105 AND 106 PLAN: It is the intention of the Employer that these benefits shall be eligible for exclusion from the gross income of the Participants covered by this benefit plan, as provided in Code Sections 105 and 106, and all provisions of this benefit plan shall be construed in a manner consistent with that intention. It is also the intention of the Employer to comply with the provisions of the Consolidated Omnibus Budget Reconciliation Act of 1985 as outlined in the policies identified in the Adoption Agreement.

5.07 CONTRIBUTIONS: Contributions for these benefits will be provided by the Employer on behalf of a Participant as provided for in Item E of the Adoption Agreement.

5.08 UNIFORMED SERVICES EMPLOYMENT AND REEMPLOYMENT RIGHTS ACT: Notwithstanding anything to the contrary herein, the Group Medical Insurance Benefit Plan shall comply with the applicable provisions of the Uniformed Services Employment and Reemployment Rights Act of 1994 (Public Law 103-353).

SECTION VI

DISABILITY INCOME BENEFIT PLAN

6.01 PURPOSE: This benefit provides disability insurance designated to provide income to Participants during periods of absence from employment because of disability.

6.02 ELIGIBILITY: Eligibility will be as required in Item F(2) of the Adoption Agreement.

6.03 DESCRIPTION OF BENEFITS: The benefits available under this Plan will be as defined in Item F(2) of the Adoption Agreement.

6.04 TERMS, CONDITIONS AND LIMITATIONS: The terms, conditions and limitations of the Disability Income Benefits offered shall be as specifically described in the Policy identified in the Adoption Agreement.

6.05 SECTION 104 AND 106 PLAN: It is the intention of the Employer that the premiums paid for these benefits shall be eligible for exclusion from the gross income of the Participants covered by this benefit plan, as provided in Code Sections 104 and 106, and all provisions of this benefit plan shall be construed in a manner consistent with that intention.

6.06 CONTRIBUTIONS: Contributions for this benefit will be provided by the Employer on behalf of a Participant as provided for in Item E of the Adoption Agreement.

SECTION VII

GROUP AND INDIVIDUAL LIFE INSURANCE PLAN

7.01 PURPOSE: This benefit provides group life insurance benefits to Participants and may provide certain individual policies as provided for in Item F(5) of the Adoption Agreement.

7.02 ELIGIBILITY: Eligibility will be as required in Item F(5) of the Adoption Agreement.

7.03 DESCRIPTION OF BENEFITS: The benefits available under this Plan will be as defined in Item F(5) of the Adoption Agreement.

7.04 TERMS, CONDITIONS, AND LIMITATIONS: The terms, conditions, and limitations of the group life insurance are specifically described in the Policy identified in the Adoption Agreement.

7.05 SECTION 79 PLAN: It is the intention of the Employer that the premiums paid for the benefits described in Item F(5) of the Adoption Agreement shall be eligible for exclusion from the gross income of the Participants covered by this benefit plan to the extent provided in Code Section 79, and all provisions of this benefit plan shall be construed in a manner consistent with that intention.

7.06 CONTRIBUTIONS: Contributions for this benefit will be provided by the Employer on behalf of a Participant as provided for in Item E of the Adoption Agreement. Any individual policies purchased by the Employer for the Participant will be owned by the Participant.

SECTION VIII

MEDICAL EXPENSE REIMBURSEMENT PLAN

8.01 PURPOSE: The Medical Expense Reimbursement Plan is designed to provide for reimbursement of Eligible Medical Expenses (as defined in Section 8.04) that are not reimbursed under an insurance plan, through damages, or from any other source. It is the intention of the Employer that amounts allocated for this benefit shall be eligible for exclusion from gross income, as provided in Code Sections 105 and 106, for Participants who elect this benefit and all provisions of this Section VIII shall be construed in a manner consistent with that intention.

8.02 ELIGIBILITY: The eligibility provisions are set forth in Item F(7) of the Adoption Agreement.

8.03 TERMS, CONDITIONS, AND LIMITATIONS:

a. Accounts. The Reimbursement Recordkeeper shall establish a recordkeeping account for each Participant. The Reimbursement Recordkeeper shall maintain a record of each account on an on-going basis, increasing the balances as contributions are credited during the year and decreasing the balances as Eligible Medical Expenses are reimbursed. No interest shall be payable on amounts recorded in any Participant's account.

b. Maximum benefit. The maximum amount of reimbursement for each Participant shall be limited to the amount of the Participant's Elective Contribution allocated to the program during the Plan Year, not to exceed the maximum amount set forth in Item F(7) of the Adoption Agreement.

c. Claim Procedure. In order to be reimbursed for any medical expenses incurred during the Plan Year, the Participant shall complete the form(s) provided for such purpose by the Reimbursement Recordkeeper. The Participant shall submit the completed form to the Reimbursement Recordkeeper with an original bill or other proof of the expense acceptable to the Reimbursement Recordkeeper. No reimbursement shall be made on the basis of an incomplete form or inadequate evidence of expense as determined by the Reimbursement Recordkeeper. Forms for reimbursement of Eligible Medical Expenses must be submitted no later than the last day of the third month following the last day of the Plan Year during which the Eligible Medical Expenses were incurred. Reimbursement payments shall only be made to the Participant, or the Participant's legal representative in the event of incapacity or death of the Participant. Forms for reimbursement shall be reviewed in accordance with the claims procedure set forth in Section XII.

d. Funding. The funding of the Medical Reimbursement Plan shall be through contributions by the Employer from its general assets to the extent of Elective Contributions directed by Participants. Such contributions shall be made by the Employer when benefit payments and account administrative expenses become due and payable under this Medical Expense Reimbursement Plan.

e. Forfeiture. Subject to Section 8.06 and 8.07, any amounts remaining to the credit of the Participant at the end of the Plan Year and not used for Eligible Medical Expenses incurred during the Participant's participation during the Plan Year shall be forfeited and shall remain assets of the Plan. With respect to a Participant who terminates employment with the Employer and who has not elected to continue coverage under this Plan pursuant to COBRA rights referenced under Section 8.03(f) herein, such Participant shall not be entitled to reimbursement for Eligible Medical Expenses incurred after his termination date regardless if such Participant has any amounts of Employer Contributions remaining to his credit. Upon the death of any Participant who has any amounts of Employer Contributions remaining to his credit, a dependent of the Participant may elect to continue to claim reimbursement for Eligible Medical Expenses in the same manner as the Participant could have for the balance of the Plan Year.

f. COBRA. To the extent required by Section 4980B of the Code and Sections 601 through 607 of ERISA ('COBRA"), a Participant and a Participant's Dependents shall be entitled to elect continued participation in this Medical Expense Reimbursement Plan only through the end of the plan year in which the qualifying event occurs, by contributing monthly (from their personal assets previously subject to taxation) to the Employer/Administrator, 102% of the amount of desired reimbursement through the end of the Plan Year in which the qualifying event occurs. Specifically, such individuals will be eligible for COBRA continuation coverage only if they have a positive Medical Expense Reimbursement Account balance on the date of the qualifying event. Participants who have a deficit balance in their Medical Expense Reimbursement Account on the

date of their qualifying event shall not be entitled to elect COBRA coverage. In lieu of COBRA, Participants may continue their coverage through the end of the current Plan Year by paying those premiums out of their last paycheck on a pre-tax basis.

g. Nondiscrimination. Benefits provided under this Medical Expense Reimbursement Plan shall not be provided in a manner that discriminates in favor of Employees or Dependents who are highly compensated individuals, as provided under Section 105(h) of the Code and regulations promulgated thereunder.

h. Uniform Coverage Rule. Notwithstanding that a Participant has not had withheld and credited to his account all of his contributions elected with respect to a particular Plan Year, the entire aggregate annual amount elected with respect to this Medical Expense Reimbursement Plan (increased by any Carryover to the Plan Year), shall be available at all times during such Plan Year to reimburse the participant for Eligible Medical Expenses with respect to this Medical Expense Reimbursement Plan. To the extent contributions with respect to this Medical Expense Reimbursement Plan are insufficient to pay such Eligible Medical Expenses, it shall be the Employer's obligation to provide adequate funds to cover any short fall for such Eligible Medical Expenses for a Participant; provided subsequent contributions with respect to this Medical Expense Reimbursement Plan by the Participant shall be available to reimburse the Employer for funds advanced to cover a previous short fall.

i. Uniformed Services Employment and Reemployment Rights Act. Notwithstanding anything to the contrary herein, this Medical Expense Reimbursement Plan shall comply with the applicable provisions of the Uniformed Services Employment and Reemployment Rights Act of 1994 (Public Law 103-353).

j. Proration of Limit. In the event that the Employer has purchased a uniform coverage risk policy from the Recordkeeper, then the Maximum Coverage amount specified in Section F.7 of the Adoption Agreement shall be pro rated with respect to (i) an Employee who becomes a Participant and enters the Plan during the Plan Year, and (ii) short plan years initiated by the Employer. Such Maximum Coverage amount will be pro rated by dividing the annual Maximum Coverage amount by 12, and multiplying the quotient by the number of remaining months in the Plan Year for the new Participant or the number of months in the short Plan Year, as applicable.

k. Continuation Coverage for Certain Dependent Children. In the event that benefits under the Medical Expense Reimbursement Plan does not qualify for the exception from the portability rules of HIPAA, then, effective for Plan Years beginning on or after October 9, 2009, notwithstanding the foregoing provisions, coverage for a Dependent child who is enrolled in the Medical Expense Reimbursement Plan as a student at a post-secondary educational institution will not terminate due to a medically necessary leave of absence before a date that is the earlier of:

- the date that is one year after the first day of the medically necessary leave of absence; or
- the date on which such coverage would otherwise terminate under the terms of the Plan.

For purposes of this paragraph, “medically necessary leave of absence” means a leave of absence of the child from a post-secondary educational institution, or any other change in enrollment of the child at the institution, that: (i) commences while the child is suffering from a serious illness or injury; (ii) is medically necessary; and (iii) causes the child to lose student status for purposes of coverage under the terms of the Plan. A written certification must be provided by a treating physician of the dependent child to the Plan in order for the continuation coverage requirement to

apply. The physician's certification must state that the child is suffering from a serious illness or injury and that the leave of absence (or other change in enrollment) is medically necessary.

8.04 ELIGIBLE MEDICAL EXPENSES:

a. Eligible Medical Expense in General. The phrase 'Eligible Medical Expense' means any expense incurred by a Participant or any of his Dependents (subject to the restrictions in Sections 8.04(b) and (c)) during a Plan Year that (i) qualifies as an expense incurred by the Participant or Dependents for medical care as defined in Code Section 213(d) and meets the requirements outlined in Code Section 125, (ii) is excluded from gross income of the Participant under Code Section 105(b), and (iii) has not been and will not be paid or reimbursed by any other insurance plan, through damages, or from any other source. Notwithstanding the above, capital expenditures are not Eligible Medical Expenses under this Plan.

b. Expenses Incurred After Commencement of Participation. Only medical care expenses incurred by a Participant or the Participant's Dependent(s) on or after the date such Participant commenced participation in the Medical Expense Reimbursement Plan shall constitute an Eligible Medical Expense.

c. Eligible Expenses Incurred by Dependents. For purposes of this Section, Eligible Medical Expenses incurred by Dependents defined in Section 2.04(c) are eligible for reimbursement if incurred after March 30, 2010; Eligible Medical Expenses incurred by Dependents defined in Sections 2.04(a) and (b) are eligible for reimbursement if incurred either before or after March 30, 2010 (subject to the restrictions of Section 8.04(b)).

d. Health Savings Accounts. If the Employer has elected in Item F.8 of the Adoption Agreement to allow Eligible Employees to contribute to Health Savings Accounts under the Plan, then for a Participant who is eligible for and elects to contribute to a Health Savings Accounts, Eligible Medical Expenses shall be limited as set forth in Item F.8 of the Adoption Agreement.

8.05 USE OF DEBIT CARD: In the event that the Employer elects to allow the use of debit cards ("Debit Cards") for reimbursement of Eligible Medical Expenses under the Medical Expense Reimbursement Plan, the provisions described in this Section shall apply.

a. Substantiation. The following procedures shall be applied for purposes of substantiating claimed Eligible Medical Expenses after the use of a Debit Card to pay the claimed Eligible Medical Expense:

(i) If the dollar amount of the transaction at a health care provider equals the dollar amount of the co-payment for that service under the Employer's major medical plan of the specific employee-cardholder, the charge is fully substantiated without the need for submission of a receipt or further review.

(ii) If the merchant, service provider, or other independent third-party (e.g., pharmacy benefit manager), at the time and point of sale, provides information to verify to the Recordkeeper (including electronically by e-mail, the internet, intranet, or telephone) that the charge is for a medical expense, the charge is fully substantiated without the need for submission of a receipt or further review.

b. Status of Charges. All charges to a Debit Card, other than co-payments and real-time substantiation as described in Subsection (a) above, are treated as conditional pending confirmation of the charge, and additional third-party information, such as merchant or service provider receipts, describing the service or product, the date of the service or sale, and the amount, must be submitted for review and substantiation.

c. Correction Procedures for Improper Payments. In the event that a claim has been reimbursed and is subsequently identified as not qualifying for reimbursement, one or all of the following procedures shall apply:

(i) First, upon the Recordkeeper's identification of the improper payment, the Eligible Employee will be required to pay back to the Plan an amount equal to the improper payment.

(ii) Second, where the Eligible Employee does not pay back to the Plan the amount of the improper payment, the Employer will have the amount of the improper payment withheld from the Eligible Employee's wages or other compensation to the extent consistent with applicable law.

(iii) Third, if the improper payment still remains outstanding, the Plan may utilize a claim substitution or offset approach to resolve improper claims payments.

(iv) If the above correction efforts prove unsuccessful, or are otherwise unavailable, the Eligible Employee will remain indebted to the Employer for the amount of the improper payment. In that event and consistent with its business practices, the Employer may treat the payment as it would any other business indebtedness.

(v) In addition to the above, the Employer and the Plan may take other actions they may deem necessary, in their sole discretion, to ensure that further violations of the terms of the Debit Card do not occur, including, but not limited to, denial of access to the Debit Card until the indebtedness is repaid by the Eligible Employee.

d. Intent to Comply with Rev. Rul. 2003-43. It is the Employer's intent that any use of Debit Cards to pay Eligible Medical Expenses shall comply with the guidelines for use of such cards set forth in Rev. Rul. 2003-43, and this Section 8.05 shall be construed and interpreted in a manner necessary to comply with such guidelines.

8.06 GRACE PERIOD: If the Employer elects in Section F.7 of the Adoption Agreement to permit a Grace Period with respect to the Medical Reimbursement Plan, the provisions of this Section 8.06 shall apply. Notwithstanding anything to the contrary herein and in accordance with Internal Revenue Service Notice 2005-42, a Participant who has unused contributions relating to the Medical Reimbursement Plan from the immediately preceding Plan Year, and who incurs Eligible Medical Expenses for such qualified benefit during the Grace Period, may be paid or reimbursed for those Eligible Medical Expenses from the unused contributions as if the expenses had been incurred in the immediately preceding Plan Year. For purposes of this Section, 'Grace Period' shall mean the period extending to the 15th day of the third calendar month after the end of the immediately preceding Plan Year to which it relates. Eligible Medical Expenses incurred during the Grace Period shall be reimbursed first from unused contributions allocated to the Medical Reimbursement Plan for the prior Plan Year, and then from unused contributions for the current Plan Year, if participant is enrolled in current Plan Year.

8.07 CARRYOVER: If the Employer elects in Section F.7 of the Adoption Agreement to permit a Carryover with respect to the Medical Reimbursement Plan, the provisions of this Section 8.07 shall apply.

Notwithstanding anything to the contrary herein and in accordance with Internal Revenue Service Notice 2013-71, the Carryover for a Participant who has an amount remaining unused as of the end of the run-off period for the Plan Year, may be used to pay or reimburse Eligible Medical Expenses during the following entire Plan Year. The Carryover does not count against or otherwise affect the Maximum benefit set forth in Section 8.03 (b). Eligible Medical Expenses incurred during a Plan Year shall be reimbursed first from unused contributions for the current Plan Year, and then from any Carryover carried over from the preceding Plan Year. Any unused amounts from the prior Plan Year that are used to reimburse a current Plan Year expense (a) reduce the amounts available to pay prior Plan Year expenses during the run-off period, (b) must be counted against any Carryover amount from the prior Plan Year, and (c) cannot exceed the maximum Carryover from the prior Plan Year. If the Employer elects to apply Section 8.06 in Section F.7 of the Adoption Agreement, this Section 8.07 shall not apply.

8.08 QUALIFIED RESERVIST DISTRIBUTIONS: Notwithstanding anything in the Plan to the contrary, an individual who, by reason of being a member of a reserve component (as defined in 37 U.S.C. § 101), is ordered or called to active duty for a period in excess of 179 days or for an indefinite period may elect to receive a distribution of all or a portion of the unused Elective Contributions in his or her Account relating to the Medical Expense Reimbursement Plan if the distribution is made during the period beginning on the date of such order or call and ending on the last date that reimbursements could otherwise be made under the Plan for the Plan Year that includes the date of such order or call. If the distribution is for the entire amount of unused Elective Contributions available in the Medical Expense Reimbursement Plan, then no additional reimbursement requests will be processed for the remainder of the Plan Year.

SECTION IX

DEPENDENT CARE REIMBURSEMENT PLAN

9.01 PURPOSE: The Dependent Care Reimbursement Plan is designed to provide for reimbursement of certain employment-related dependent care expenses of the Participant. It is the intention of the Employer that amounts allocated for this benefit shall be eligible for exclusion from gross income, as provided in Code Section 129, for Participants who elect this benefit, and all provisions of this Section IX shall be construed in a manner consistent with that intention.

9.02 ELIGIBILITY: The eligibility provisions are set forth in Item F(6) of the Adoption Agreement.

9.03 TERMS, CONDITIONS, AND LIMITATIONS:

a. Accounts. The Reimbursement Recordkeeper shall establish a recordkeeping account for each Participant. The Reimbursement Recordkeeper shall maintain a record of each account on an on-going basis, increasing the balances as contributions are credited during the year and decreasing the balances as Eligible Dependent Care Expenses are reimbursed. No interest shall be payable on amounts recorded in any Participant's account.

b. Maximum Benefit. The maximum amount of reimbursement for each Participant shall be limited to the amount of the Participant's allocation to the program during the Plan Year not to exceed the maximum amount set forth in Item F(6) of the adoption agreement.

For purpose of this Section IX, the phrase "earned income" shall mean wages, salaries, tips and other employee compensation, but only if such amounts are includible in gross income for the taxable year. A Participant's spouse who is physically or mentally incapable of self-care as described in Section 9.04(a)(ii) or a spouse who is a full-time student within the meaning of Code Section 21(e)(7) shall be deemed to have earned income for each month in which such spouse is so disabled (or a full-time student). The amount of such deemed earned income shall be $250 per month in the case of one Dependent and $500 per month in the case of two or more Dependents.

c. Claim Procedure. In order to be reimbursed for any dependent care expenses incurred during the Plan Year, the Participant shall complete the form(s) provided for such purpose by the Reimbursement Recordkeeper. The Participant shall submit the completed form to the Reimbursement Recordkeeper with an original bill or other proof of the expense from an independent third party acceptable to the Reimbursement Recordkeeper. No reimbursement shall be made on the basis of an incomplete form or inadequate evidence of the expense as determined by the Reimbursement Recordkeeper. Claims for reimbursement of Eligible Dependent Care Expenses must be submitted no later than the last day of the third month following the last day of the Plan Year during which the Eligible Dependent Care Expenses were incurred. Reimbursement payments shall only be made to the Participant, or the Participant's legal representative in the event of the incapacity or death of the Participant. Forms for reimbursement shall be reviewed in accordance with the claims procedure set forth in Section XII.

d. Funding. The funding of the Dependent Care Reimbursement Plan shall be through contributions by the Employer from its general assets to the extent of Elective Contributions directed by Participants. Such contributions shall be made by the Employer when benefit payments and account administration expenses become due and payable under this Dependent Care Expense Reimbursement Plan.

e. Forfeiture. Any amounts remaining to the credit of the Participant at the end of the Plan Year and not used for Eligible Dependent Care Expenses incurred during the Plan Year shall be forfeited and remain assets of the Plan.

f. Nondiscrimination. Benefits provided under this Dependent Care Reimbursement Plan shall not be provided in a manner that discriminates in favor of Highly Compensated Employees (as defined in Code Section 414(q)) or their dependents, as provided in Code Section 129. In addition, no more than 25 percent of the aggregate Eligible Dependent Care Expenses shall be reimbursed during a Plan Year to five percent owners, as provided in Code Section 129.

9.04 DEFINITIONS:

a. "Dependent" (for purposes of this Section IX) means any individual who is:

(i) a Participant's qualifying child (as defined in Code Section 152 (c)) who has not attained the age of 13; or

(ii) a dependent (qualifying child or qualifying relative, as defined in Code Section 152 (c) and (d), respectively) or the spouse of a Participant who is physically or mentally incapable of self-care, and who has the same principal place of abode as the taxpayer for more than half of the taxable year. For purposes of this Dependent Care Reimbursement Plan, an individual shall be considered physically or mentally incapable of self-care if, as a result of a physical or mental defect, the individual is incapable of caring for his or her hygienic or nutritional needs, or requires full-time attention of another person for his or her own safety or the safety of others.

b. "Dependent Care Center" (for purposes of this Section IX) shall be a facility which:

(i) provides care for more than six individuals (other than individuals who reside at the facility);
(ii) receives a fee, payment, or grant for providing services for any of the individuals (regardless of whether such facility is operated for profit); and
(iii) satisfies all applicable laws and regulations of a state or unit of local government.

c. "Eligible Dependent Care Expenses" (for purposes of this Section IX) shall mean expenses incurred by a Participant which are:

(i) incurred for the care of a Dependent of the Participant or for related household services;
(ii) paid or payable to a Dependent Care Service Provider; and
(iii) incurred to enable the Participant to be gainfully employed for any period for which there are one or more Dependents with respect to the Participant.

"Eligible Dependent Care Expenses" shall not include expenses incurred for services outside the Participant's household for the care of a Dependent unless such Dependent is (i) a qualifying child (as defined in Code Section 152 (c)) under the age of 13, or (ii) a dependent (qualifying child or qualifying relative, as defined in Code Section 152 (c) and (d), respectively)), who is physically or mentally incapable of self-care, and who has the same principal place of abode as the Participant for more than half of the taxable year, or (iii) the spouse of a Participant who is physically or mentally incapable of self-care, and who has the same principal place of abode as the Participant for more than half of the taxable year. Eligible Dependent Care Expenses shall be deemed to be incurred at the time the services to which the expenses relate are rendered.

d. "Dependent Care Service Provider" (for purposes of this Section IX) means:

(i) a Dependent Care Center, or
(ii) a person who provides care or other services described in Section 9.04(b) and who is not a related individual described in Section 129(c) of the Code.

SECTION X

HEALTH SAVINGS ACCOUNTS

10.01 PURPOSE: If elected by the Employer in Section F.8 of the Adoption Agreement, the Plan will permit pre-tax contributions to the Health Savings Account, and the provisions of this Article X shall apply.

10.02 BENEFITS: A Participant can elect benefits under the Health Savings Accounts portion of this Plan by electing to pay his or her Health Savings Account contributions on a pre-tax salary reduction basis. In addition, the Employer may make contributions to the Health Savings Account for the benefit of the Participant.

10.03 TERMS, CONDITIONS AND LIMITATION:

a. Maximum Benefit. The maximum annual contributions that may be made to a Participant's Health Savings Account under this Plan is set forth in Section F.8 of the Adoption Agreement.

b. Mid-Year Election Changes. Notwithstanding any to the contrary herein, a Participant election with respect to contributions for the Health Savings Account shall be revocable during the duration of the Plan Year to which the election relates. Consequently, a Participant may change his or her election with respect to contributions for the Health Savings Account at any time.

10.04 RESTRICTIONS ON MEDICAL REIMBURSEMENT PLAN: If the Employer has elected in Section F.8 of the Adoption Agreement both Health Savings Accounts under this Plan and the Medical Expense Reimbursement Plan, then the Eligible Medical Expenses that may be reimbursed under the Medical Reimbursement Plan for Participants who are eligible for and elect to participate in Health Savings Accounts shall be limited as set forth in Section F.8 of the Adoption Agreement.

10.05 NO ESTABLISHMENT OF ERISA PLAN: It is the intent of the Employer that the establishment of Health Savings Accounts are completely voluntary on the part of Participants, and that, in accordance with Department of Labor Field Assistance Bulletin 2004-1, the Health Savings Accounts are not "employee welfare benefit plans" for purposes of Title I of ERISA.

SECTION XI

AMENDMENT AND TERMINATION

11.01 AMENDMENT: The Employer shall have the right at any time, and from time to time, to amend, in whole or in part, any or all of the provisions of this Plan, provided that no such amendment shall change the terms and conditions of payment of any benefits to which Participants and covered dependents otherwise have become entitled to under the provisions of the Plan, unless such amendment is made to comply with federal or local laws or regulations. The Employer also shall have the right to make any amendment retroactively which is necessary to bring the Plan into conformity with the Code. In addition, the Employer may amend any provisions or any supplements to the Plan and may merge or combine supplements or add additional supplements to the Plan, or separate existing supplements into an additional number of supplements.

11.02 TERMINATION: The Employer shall have the right at any time to terminate this Plan, provided that such termination shall not eliminate any obligations of the Employer which therefore have arisen under the Plan.

SECTION XII

ADMINISTRATION

12.01 NAMED FIDUCIARIES: The Administrator shall be the fiduciary of the Plan.

12.02 APPOINTMENT OF RECORDKEEPER: The Employer may appoint a Reimbursement Recordkeeper which shall have the power and responsibility of performing recordkeeping and other ministerial duties arising under the Medical Expense Reimbursement Plan and the Dependent Care Reimbursement Plan provisions of this Plan. The Reimbursement Recordkeeper shall serve at the pleasure of, and may be removed by, the Employer without cause. The Recordkeeper shall receive reasonable compensation for its services as shall be agreed upon from time to time between the Administrator and the Recordkeeper.

12.03 POWERS AND RESPONSIBILITIES OF ADMINISTRATOR:

a. General. The Administrator shall be vested with all powers and authority necessary in order to amend and administer the Plan, and is authorized to make such rules and regulations as it may deem necessary to carry out the provisions of the Plan. The Administrator shall determine any questions arising in the administration (including all questions of eligibility and determination of amount, time and manner of payments of benefits), construction, interpretation and application of the Plan, and the decision of the Administrator shall be final and binding on all persons.

b. Recordkeeping. The Administrator shall keep full and complete records of the administration of the Plan. The Administrator shall prepare such reports and such information concerning the Plan and the administration thereof by the Administrator as may be required under the Code or ERISA and the regulations promulgated thereunder.

c. Inspection of Records. The Administrator shall, during normal business hours, make available to each Participant for examination by the Participant at the principal office of the Administrator a copy of the Plan and such records of the Administrator as may pertain to such Participant. No Participant shall have the right to inquire as to or inspect the accounts or records with respect to other Participants.

12.04 COMPENSATION AND EXPENSES OF ADMINISTRATOR: The Administrator shall serve without compensation for services as such. All expenses of the Administrator shall be paid by the Employer. Such expenses shall include any expense incident to the functioning of the Plan, including, but not limited to, attorneys' fees, accounting and clerical charges, actuary fees and other costs of administering the Plan.

12.05 LIABILITY OF ADMINISTRATOR: Except as prohibited by law, the Administrator shall not be liable personally for any loss or damage or depreciation which may result in connection with the exercise of duties or of discretion hereunder or upon any other act or omission hereunder except when due to willful misconduct. In the event the Administrator is not covered by fiduciary liability insurance or similar insurance arrangements, the Employer shall indemnify and hold harmless the Administrator from any and all claims, losses, damages, expenses (including reasonable counsel fees approved by the Administrator) and liability (including any reasonable amounts paid in settlement with the Employer's approval) arising from any act or omission of the Administrator, except when the same is determined to be due to the willful misconduct of the Administrator by a court of competent jurisdiction.

12.06 DELEGATIONS OF RESPONSIBILITY: The Administrator shall have the authority to delegate, from time to time, all or any part of its responsibilities under the Plan to such person or persons as it may deem advisable and in the same manner to revoke any such delegation of responsibilities which shall have the same force and effect for all purposes hereunder as if such action had been taken by the Administrator. The Administrator shall not be liable for any acts or omissions of any such delegate. The delegate shall report periodically to the Administrator concerning the discharge of the delegated responsibilities.

12.07 RIGHT TO RECEIVE AND RELEASE NECESSARY INFORMATION: The Administrator may release or obtain any information necessary for the application, implementation and determination of this Plan or other Plans without consent or notice to any person. This information may be released to or obtained from any insurance company, organization, or person subject to applicable law. Any individual claiming benefits under this Plan shall furnish to the Administrator such information as may be necessary to implement this provision.

12.08 CLAIM FOR BENEFITS: To obtain payment of any benefits under the Plan a Participant must comply with the rules and procedures of the particular benefit program elected pursuant to this Plan under which the Participant claims a benefit.

12.09 GENERAL CLAIMS REVIEW PROCEDURE: This provision shall apply only to the extent that a claim for benefits is not governed by a similar provision of a benefit program available under this Plan or is not governed by Section 12.10.

a. Initial Claim for Benefits. Each Participant may submit a claim for benefits to the Administrator as provided in Section 12.08. A Participant shall have no right to seek review of a denial of benefits, or to bring any action in any court to enforce a claim for benefits prior to his filing a claim for benefits and exhausting his rights to review under this section.

When a claim for benefits has been filed properly, such claim for benefits shall be evaluated and the claimant shall be notified of the approval or the denial within (90) days after the receipt of such claim unless special circumstances require an extension of time for processing the claim. If such an extension of time for processing is required, written notice of the extension shall be furnished to the claimant prior to the termination of the initial ninety (90) day period which shall specify the special circumstances requiring an extension and the date by which a final decision will be reached (which date shall not be later than one hundred and eighty (180) days after the date on which the claim was filed.) A claimant shall be given a written notice in which the claimant shall be advised as to whether the claim is granted or denied, in whole or in part. If a claim is denied, in whole or in part, the claimant shall be given written notice which shall contain (a) the specific reasons for the denial, (b) references to pertinent plan provisions upon which the denial is based, (c) a description of any additional material or information necessary to perfect the claim and an explanation of why such material or information is necessary, and (d) the claimant's rights to seek review of the denial.

b. Review of Claim Denial. If a claim is denied, in whole or in part, the claimant shall have the right to request that the Administrator review the denial, provided that the claimant files a written request for review with the Administrator within sixty (60) days after the date on which the claimant received written notification of the denial. A claimant (or his duly authorized representative) may review pertinent documents and submit issues and comments in writing to the Administrator. Within sixty (60) days after a request is received, the review shall be made and the claimant shall be advised in writing of the decision on review , unless special circumstances require an extension of time for processing the review, in which case the claimant shall be given a written notification within such initial sixty (60) day period specifying the reasons for the extension and when such review shall be completed (provided that such review shall be completed within one hundred and twenty (120) days after the date on which the request for review was filed.) The decision on review shall be forwarded to the claimant in writing and shall include specific reasons for the decision and references to plan provisions upon which the decision is based. A decision on review shall be final and binding on all persons.

c. Exhaustion of Remedies. If a claimant fails to file a request for review in accordance with the procedures herein outlined, such claimant shall have no rights to review and shall have no right to bring action in any court and the denial of the claim shall become final and binding on all persons for all purposes.

12.10 SPECIAL CLAIMS REVIEW PROCEDURE: The provisions of this Section 12.10 shall be applicable to claims under the Medical Expense Reimbursement Plan and the Group Medical Insurance Plan, effective on the first day of the first Plan Year beginning on or after July 1, 2002, but in no event later than January 1, 2003, provided such plans are subject to ERISA.

a. Benefit Denials: The Administrator is responsible for evaluating all claims for reimbursement under the Medical Expense Reimbursement Plan and the Group Medical Insurance Plan.

The Administrator will decide a Participant's claim within a reasonable time not longer than 30 days after it is received. This time period may be extended for an additional 15 days for matters beyond the control of the Administrator, including in cases where a claim is incomplete. The Participant will receive written notice of any extension, including the reasons for the extension and information on the date by which a decision by the Administrator is expected to be made. The Participant will be given 45 days in which to complete an incomplete claim. The Administrator may secure independent medical or other advice and require such other evidence as it deems necessary to decide the claim.

If the Administrator denies the claim, in whole or in part, the Participant will be furnished with a written notice of adverse benefit determination setting forth:

1. the specific reason or reasons for the denial;

2. reference to the specific Plan provision on which the denial is issued;

3. a description of any additional material or information necessary for the Participant to complete his claim and an explanation of why such material or information is necessary, and

4. appropriate information as to the steps to be taken if the Participant wishes to appeal the Administrator's determination, including the participant's right to submit written comments and have them considered, his right to review (on request and at no charge) relevant documents and other information, and his right to file suit under ERISA with respect to any adverse determination after appeal of his claim.

b. Appealing Denied Claims: If the Participant's claim is denied in whole or in part, he may appeal to the Administrator for a review of the denied claim. The appeal must be made in writing within 180 days of the Administrator's initial notice of adverse benefit determination, or else the participant will lose the right to appeal the denial. If the Participant does not appeal on time, he will also lose his right to file suit in court, as he will have failed to exhaust his internal administrative appeal rights, which is generally a prerequisite to bringing suit.

A Participant's written appeal should state the reasons that he feels his claim should not have been denied. It should include any additional facts and/or documents that the Participant feels support his claim. The Participant may also ask additional questions and make written comments, and may review (on request and at no charge) documents and other information relevant to his appeal. The Administrator will review all written comment the Participant submits with his appeal.

c. Review of Appeal: The Administrator will review and decide the Participant's appeal within a reasonable time not longer than 60 days after it is submitted and will notify the Participant of its decision in writing. The individual who decides the appeal will not be the same individual who decided the initial claim denial and will not be that individual's subordinate. The Administrator may secure independent medical or other advice and require such other evidence as it deems necessary to decide the appeal, except that any medical expert consulted in connection with the appeal will be different from any expert consulted in connection with the initial claim. (The identity of a medical expert consulted in connection with the Participant's appeal will be provided.) If the decision on appeal affirms the initial denial of the Participant's claim, the Participant will be furnished with a notice of adverse benefit determination on review setting forth:

1. The specific reason(s) for the denial,

2. The specific Plan provision(s) on which the decision is based,

3. A statement of the Participant's right to review (on request and at no charge) relevant documents and other information,

4. If the Administrator relied on an "internal rule, guideline, protocol, or other similar criterion" in making the decision, a description of the specific rule, guideline, protocol, or other similar criterion or a statement that such a rule, guideline, protocol, or other similar criterion was relied on and that a copy of such rule, guideline, protocol, or other criterion will be provided free of charge to the Participant upon request," and

5. A statement of the Participant's right to bring suit under ERISA § 502(a).

12.11 PAYMENT TO REPRESENTATIVE: In the event that a guardian, conservator or other legal representative has been duly appointed for a Participant entitled to any payment under the Plan, any such payment due may be made to the legal representative making claim therefor, and such payment so made shall be in complete discharge of the liabilities of the Plan therefor and the obligations of the Administrator and the Employer.

12.12 PROTECTED HEALTH INFORMATION. The provisions of this Section will apply only to those portions of the Plan that are considered a group health plan for purposes of 45 CFR Parts 160 and 164. The Plan may disclose PHI to employees of the Employer, or to other persons, only to the extent such disclosure is required or permitted pursuant to 45 CFR Parts 160 and 164. The Plan has implemented administrative, physical, and technical safeguards to reasonably and appropriately protect, and restrict access to and use of, electronic PHI, in accordance with Subpart C of 45 CFR Part 164. The applicable claims procedures under the Plan shall be used to resolve any issues of non-compliance by such individuals. The Employer will:

- not use or disclose PHI other than as permitted or required by the plan documents and permitted or required by law;
- reasonably and appropriately safeguard electronic PHI created, received, maintained, or transmitted to or by the it on behalf of the Plan, in accordance with Subpart C of 45 CFR Part 164;
- implement administrative, physical, and technical safeguards that reasonably and appropriately protect the confidentiality, integrity, and availability of the electronic PHI that it creates, receives, maintains, or transmits on behalf of the Plan;
- ensure that any agents including a subcontractor~~s~~ to whom it provides PHI received from the Plan agree to the same restrictions and conditions that apply to the Employer with respect to such information;
- not use or disclose PHI for employment-related actions and decisions or in connection with any other employee benefit plan of the Employer;
- report to the Plan any use or disclosure of the information that is inconsistent with the permitted uses or disclosures provided for of which it becomes aware;
- make available PHI in accordance with 45 CFR Section 164.524;
- make available PHI for amendment and incorporate any amendments to PHI in accordance with 45 CFR Section 164.526;

- make available the information required to provide an accounting of disclosures in accordance with 45 CFR Section 164.528;
- make its internal practices, books, and records relating to the use and disclosure of PHI received from the Plan available to the Secretary of Health and Human Services or his designee upon request for purposes of determining compliance with 45 CFR Section 164.504(f);
- if feasible, return or destroy all PHI received from the Plan that the Employer still maintains in any form and retain no copies of such information when no longer needed for the purposes for which disclosure was made, except that, if such return or destruction is not feasible, limit further uses and disclosures to those purposes that make the return or destruction of the information infeasible; and,
- ensure that the adequate separation required in paragraph (f)(2)(iii) of 45 CFR Section 164.504 is established.

For purposes of this Section, "PHI" is "Protected Health Information" as defined in 45 CFR Section 160.103, which means individually identifiable health information, except as provided in paragraph (2) of the definition of "Protected Health Information" in 45 CFR Section 160.103, that is transmitted by electronic media; maintained in electronic media; or transmitted or maintained in any other form or medium by a covered entity, as defined in 45 CFR Section 164.104.

SECTION XIII

MISCELLANEOUS PROVISIONS

13.01 INABILITY TO LOCATE PAYEE: If the Plan Administrator is unable to make payment to any Participant or other person to whom a payment is due under the Plan because it cannot ascertain the identity or whereabouts of such Participant or other person after reasonable efforts have been made to identify or locate such person, then such payment and all subsequent payments otherwise due to such Participant or other person shall be forfeited following a reasonable time after the date any such payment first became due.

13.02 FORMS AND PROOFS: Each Participant or Participant's Beneficiary eligible to receive any benefit hereunder shall complete such forms and furnish such proofs, receipts, and releases as shall be required by the Administrator.

13.03 NO GUARANTEE OF TAX CONSEQUENCES: Neither the Administrator nor the Employer makes any commitment or guarantee that any amounts paid to or for the benefit of a Participant or a Dependent under the Plan will be excludable from the Participant's or Dependent's gross income for federal or state income tax purposes, or that any other federal or state tax treatment will apply to or be available to any Participant or Dependent.

13.04 PLAN NOT CONTRACT OF EMPLOYMENT: The Plan will not be deemed to constitute a contract of employment between the Employer and any Participant nor will the Plan be considered an inducement for the employment of any Participant or employee. Nothing contained in the Plan will be deemed to give any Participant or employee the right to be retained in the service of the Employer nor to interfere with the right of the Employer to discharge any Participant or employee at any time regardless of the effect such discharge may have upon that individual as a Participant in the Plan.

13.05 NON-ASSIGNABILITY: No benefit under the Plan shall be liable for any debt, liability, contract, engagement or tort of any Participant or his Beneficiary, nor be subject to charge, anticipation, sale, assignment, transfer, encumbrance, pledge, attachment, garnishment, execution or other voluntary or involuntary alienation or other legal or equitable process, nor transferability by operation of law.

13.06 SEVERABILITY: If any provision of the Plan will be held by a court of competent jurisdiction to be invalid or unenforceable, the remaining provisions hereof will continue to be fully effective.

13.07 CONSTRUCTION:

a. Words used herein in the masculine or feminine gender shall be construed as the feminine or masculine gender, respectively where appropriate.

b. Words used herein in the singular or plural shall be construed as the plural or singular, respectively, where appropriate.

13.08 NONDISCRIMINATION: In accordance with Code Section 125(b)(1), (2), and (3), this Plan is intended not to discriminate in favor of Highly Compensated Participants (as defined in Code Section 125(e)(1)) as to contributions and benefits nor to provide more than 25% of all qualified benefits to Key Employees. If, in the judgment of the Administrator, more than 25% of the total nontaxable benefits are provided to Key Employees, or the Plan discriminates in any other manner (or is at risk of possible discrimination), then, notwithstanding any other provision contained herein to the contrary, and, in accordance with the applicable provisions of the Code, the Administrator shall, after written notification to affected Participants, reduce or adjust such contributions and benefits under the Plan as shall be necessary to insure that, in the judgment of the Administrator, the Plan shall not be discriminatory.

13.09 ERISA. The Plan shall be construed, enforced, and administered and the validity determined in accordance with the applicable provisions of the Employee Retirement Income Security Act of 1974 (as amended), the Internal Revenue Code of 1986 (as amended), and the laws of the State indicated in the Adoption Agreement. Notwithstanding anything to the contrary herein, the provisions of ERISA will not apply to this Plan if the Plan is exempt from coverage under ERISA. Should any provisions be determined to be void, invalid, or unenforceable by any court of competent jurisdiction, the Plan will continue to operate, and for purposes of the jurisdiction of the court only will be deemed not to include the provision determined to be void.

RENEWAL QUOTE FOR 2026-2027

Indian River Mosquito Control District

FMIT 0273

Coverage		Deductible	Limit	Premium
General/Professional Liability		$0	$1,000,000	$13,230
Cyber Liability		$0	$1,000,000	$1,003
Automobile Liability		$0	$1,000,000	$26,746
Automobile Physical Damage		Per Schedule		$6,667
Property		$1,000	$6,983,688	$58,989
Named Storm Deductible		5%		
Workers' Compensation		$0	Total Payroll	
Experience Modification	1.01	10/1/26	$2,691,474	$59,717
TOTAL NET PREMIUM				**$166,352**

*Includes: Drug Free Credit: Yes
Safety Credit: Yes

Please Note: All descriptions of coverage provided herein are intended for illustration and general discussion purposes. Do not rely upon this communication for coverage. Refer to the FMIT Coverage Agreement(s) for applicable coverage terms, conditions, limits and obligations.

The premiums quoted above are priced according to the coverage lines presented. Any change or deletion of coverages may result in re-pricing of remaining coverage lines.

***Please see next page for options if applicable.**

Insurance Premiums FY 2026-2027

CURRENT	FY 2025-2026	
GL	$	12,228
Cyber		1,036
Auto Liability		20,638
Auto Damage		5,340
Property		61,816
WC		48,354
Total	**$**	**149,412**

RENEWAL	%		$
GL	8.19%	$	13,230
Cyber	-3.19%		1,003
Auto Liability	29.60%		26,746
Auto Damage	24.85%		6,667
Property	-4.57%		58,989
WC	23.50%		59,717
Total	**11.34%**	**$**	**166,352**

SYNERGIZED HR

HR FOR STARTUPS, BUSINESS & GOVERNMENT

INDIAN RIVER MOSQUITO CONTROL DISTRICT

Classification & Compensation Study

FINAL REPORT

Prepared for the Indian River Mosquito Control District

Report Date	August 2026
Study Organization	Indian River Mosquito Control District
Current Classifications Analyzed	35
Employees Reviewed	38
Comparator Organizations Identified	31
Approved Market Observations	241

PREPARED BY

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Strategic Human Resource Consulting | Classification & Compensation | Workforce Solutions

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Transmittal & Final Report Status

Synergized HR LLC was retained by the Indian River Mosquito Control District to conduct a comprehensive compensation and classification analysis, including market benchmarking, internal equity and pay compression review, classification review, development of a revised salary structure, and implementation guidance. This final report presents the completed analysis and recommendations for District leadership and the Board of Commissioners.

The analysis reflects a market-data snapshot as of August 2026. Market observations were compiled from a structured survey, public-records responses, official salary schedules and pay plans, classification specifications, personnel policies, collective bargaining agreements, benefits materials, and other governmental source documents. Volusia County was the only organization to complete the direct survey; the study therefore relied heavily on verified public-sector source materials to achieve adequate market coverage.

FINAL REPORT STATUS

The compensation, classification, internal-equity, pay-structure, job-description, and implementation analyses are complete. A limited number of classification-record and organizational maintenance items identified during the study are documented for District follow-up and do not prevent use of the study findings or recommendations.

The recommendations in this report are advisory and remain subject to District fiscal evaluation and Board direction. No employee pay reduction is recommended as part of the recommended structure.

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Executive Summary

Study Purpose and Background

The Indian River Mosquito Control District engaged Synergized HR LLC to evaluate the competitiveness, internal alignment, and long-term sustainability of its compensation and classification framework. The study was designed to provide District leadership and the Board of Commissioners with a transparent, evidence-based foundation for decisions affecting salary structure, recruitment, retention, internal equity, and future compensation administration.

The District operates in a specialized public-service environment that combines mosquito-control operations, scientific programs, field inspection, environmental management, aviation and unmanned aerial systems, public outreach, finance, human resources, information technology, fleet, and facilities functions. Many positions therefore require comparison to a mix of mosquito-control districts, county programs, regional public employers, and specialty classifications rather than relying solely on exact job-title matches.

Executive Study Snapshot

35	34	76%	241
CLASSIFICATIONS	**MARKET COMPARISONS**	**>5% ABOVE MARKET**	**APPROVED OBSERVATIONS**
current classifications analyzed	with calculable variance	26 of 34 calculable classifications	retained after match review

Metric	Result	Interpretation
Current classifications analyzed	35	Current study set used in market analysis
Employees reviewed	38	34 full-time, 3 part-time, 1 full-time seasonal
Comparator organizations identified	31	Tiered group of mosquito-control and regional public employers
Organizations with usable compensation data	15	Official ranges or other usable current compensation data
Approved market observations	241	Position-level observations retained after match review
Market support	25 Robust / 9 Adequate / 1 Limited	Most classifications supported by 3+ distinct comparator organizations

Summary of Findings

Across the 34 classifications with both a documented current midpoint and a usable market median, the District's current salary-range midpoints average 15.4% above the market median; the median position-level variance is 16.3% above market. This overall result indicates that the District does not have a systemic below-market salary-range problem. Instead, the study identifies targeted market pressure in a small number of classifications and specific internal-equity relationships that warrant review.

- 1 classification is more than 10% below the market median: Aerial Supervisor (-13.3%). Project Manager is now 5.5% below market after alignment to the current Grade 9 job description.
- 3 additional classifications are 5% to 10% below market: Chief Finance Officer (-5.8%), Project Manager (-5.5%), and Lab Assistant (-5.1%).

- 4 classifications fall within the competitive +/-5% market range; 26 are more than 5% above the market median.
- 0 employees fall below the recommended salary-range minimum; 1 employee is above the recommended maximum; 1 confirmed supervisor/subordinate pay inversion requires targeted review.
- The recommended structure retains the District's 14-grade, 20-step framework and approximately 75.4% range spread, with the existing 3% step progression preserved. The market results do not support broad range compression or across-the-board range movement. Grade 12, which currently has no active assignment, is recalibrated between Grades 11 and 13 to remove the existing structural inversion.
- Retaining and recalibrating the existing range architecture creates no structural minimum-placement cost. Optional illustrations show approximately $11,049 for a tenure-informed placement model and $22,224 for a broader compression-oriented model; both require District policy direction and are not recommended commitments.

Decision Lens: External Market vs. Internal Placement

Decision Signal	Validated Evidence	What It Means	Leadership Response
External Range Position	26 above market / 4 at market / 4 below market	The District does not have a systemic below-market range problem.	Avoid broad across-the-board range increases.
Employee Placement	0 below recommended minimum / 1 above recommended maximum	One employee's current pay exceeds the established maximum and may require red-circle treatment rather than a pay reduction.	Preserve current pay and establish how above-maximum employees will be treated under the District's salary-administration policy.
Targeted Market Pressure	4 classifications below market; 1 is more than 10% below	External pressure is concentrated, not organization-wide.	Prioritize targeted review of Aerial Supervisor; monitor Project Manager, Chief Finance Officer, and Lab Assistant.
Internal Equity	1 confirmed supervisor/subordinate pay inversion	A verified subordinate currently earns more than the documented supervisor.	Review the confirmed relationship before implementation.

EXECUTIVE CONCLUSION

The District's salary ranges are broadly competitive and, for most classifications, positioned above the collected market median. The primary need is not a broad across-the-board range increase or range compression; it is targeted review of specific market gaps, the single above-maximum employee placement, the confirmed supervisor pay inversion, and limited classification-record issues.

1. Study Scope and Project Approach

The Professional Services Agreement establishes five core workstreams: project initiation and data review; market compensation benchmarking; internal equity and pay compression analysis; classification review and salary structure development; and preparation of a comprehensive written report, supporting tables/charts, Excel models, and presentation materials. Synergized HR organized the work into six connected phases so that each analytical step could inform the next.

Phase	Workstream	Primary Activities
Phase 1	Project Initiation & Data Review	Kickoff; salary schedule, roster, organization chart, policies, and job-description review
Phase 2	Market Compensation Benchmarking	Comparator selection; source collection; job matching; market statistics
Phase 3	Internal Equity & Pay Compression	Employee placement, compa-ratios, range penetration, supervisor/subordinate relationships
Phase 4	Classification & Job Description Review	Current titles, grades, FLSA and structural consistency; reconciliation of legacy/current classifications
Phase 5	Compensation Structure Development	Retain/recalibrate 14-grade salary schedule, classification alignment, and targeted implementation modeling
Phase 6	Draft/Final Report & Presentation	Findings, recommendations, implementation guidance, Excel model, Board presentation

Benchmark Match Quality & Evidence Interpretation

Evidence Designation	What It Means	How Leadership Should Interpret It
Strong Match	High functional similarity across duties, scope, authority, supervision, qualifications, complexity, and organizational context.	Appropriate as direct market evidence when source data is current and complete.
Moderate Match	Functionally comparable, but one or more meaningful differences require professional interpretation.	Included where differences do not invalidate comparison; results should be read with scope context.
Limited Market Support	Fewer than three distinct comparator organizations for the District classification.	Use cautiously; match quality may still be strong, but the market sample is narrow.

1.1 Data Collection and Source Strategy

The study identified and contacted 31 comparator organizations and organized them across three analytical tiers. The comparator framework emphasizes mosquito-control-specific organizations first, then county mosquito-control departments and specialized programs, followed by regional public employers that compete for administrative, finance, HR, IT, fleet, maintenance, supervisory, and management talent. Of the 31 organizations identified, 15 contributed usable compensation information from one or more validated sources, 11 contributed benefits or pay-practice information, 9 contributed job-description/class-specification information, and 13 documented public-records responses were received.

A structured compensation and benefits survey was used as a supplemental follow-up method for comparator organizations that had not provided sufficient information through public-records outreach or official published source materials. Volusia County completed the direct survey. To maximize market coverage, Synergized HR combined survey data with public-records responses and independently located official compensation materials, retaining only current, traceable, and sufficiently comparable information in the final market model.

1.2 Job Matching and Inclusion Standards

Job matching was based on functional similarity rather than title alone. Each potential observation was reviewed for duties, level of responsibility, reporting relationship, supervisory scope, technical requirements, and organizational context. Candidate matches were categorized as Strong or Moderate

before inclusion. The current analytical dataset contains 241 approved market observations across 35 classifications. Each observation represents one retained comparator job/pay data point that met the study's job-matching and source-quality standards. Multiple observations may support a single District classification, allowing the market result to reflect a broader set of comparable employers rather than a single external match.

The primary market statistic is the median salary-range midpoint. The median was selected because it is less sensitive than an arithmetic mean to unusually high or low observations, particularly when comparator groups vary in size or organizational design. Market variance is calculated as: (District Midpoint / Market Median Midpoint) - 1.0. Classifications within +/-5% are treated as broadly competitive with market.

METHODOLOGY NOTE
Market data is a decision input, not an automatic grade-placement formula. Internal hierarchy, supervisory relationships, scope, recruitment realities, job design, and classification equity are considered together with external market results.

2. Comparator Market Framework

2.1 Comparator Tiers

The comparator group was intentionally broader than a single list of mosquito-control districts. Specialized field and scientific classifications require mosquito-control-specific peers, while finance, HR, IT, communications, maintenance, and executive positions also compete in the wider regional public-sector labor market.

Comparator Tier	Organizations Identified	Primary Analytical Role
Tier 1	13	Primary mosquito-control and special-district benchmarking
Tier 2	8	Supplemental mosquito-control/specialty benchmarking
Tier 3	10	Regional public-sector labor-market benchmarking

Coverage Measure	Count	Comment
Direct survey responses	1	Volusia County completed the supplemental survey
Public-records responses received	13	Organizations that responded to formal records requests
Comparators with usable compensation data	15	Total organizations contributing usable compensation data from survey, public-records, and/or official published sources
Comparators with benefits/pay-practice data	11	Used for supplemental compensation-practice context
Comparators with job-description/class-spec data	9	Used to strengthen functional job matching

2.2 Data Coverage

This source strategy is important to interpretation of the study. Survey response rate alone is not a measure of market-data quality. The final model relies primarily on current official public-sector records and published compensation materials, with the survey serving as one additional source rather than the sole basis of analysis.

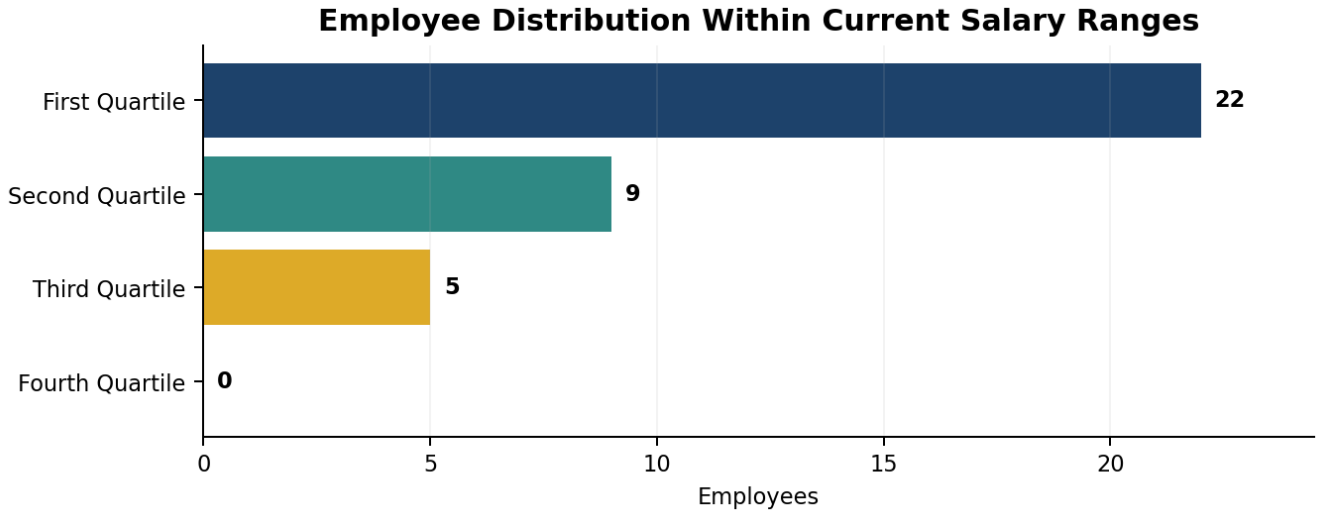
These coverage measures are not additive. Some organizations provided information through more than one source, while additional usable compensation information was obtained from official published materials without a direct survey or public-records response.

3. Assessment of Current Compensation Conditions

3.1 Workforce and Current Range Placement

The employee dataset includes 38 employees: 34 full-time, 3 part-time, and 1 full-time seasonal. Current employee salaries are generally concentrated in the lower half of the District's established salary ranges. This is an internal range-placement finding and should not be confused with the external market-position finding discussed later in the report. Although most District range midpoints are above the external market median, many employees are positioned below the midpoint of their assigned District range. The median current compa-ratio is approximately 79.4%, meaning the typical employee is paid at roughly 79.4% of the current District range midpoint.

Service and progression context. The current distribution is concentrated in the lower half of the salary structure: 22 employees are in the first quartile, 9 in the second quartile, 5 in the third quartile, and none in the fourth quartile. This pattern supports continued attention to employee placement and progression practices, but it does not by itself establish that employees are underpaid. Time in position should be considered together with relevant experience, qualifications, performance, job growth, and internal equity rather than treated as an automatic progression entitlement.



31 of the 36 employees with resolved in-range placement are in the first or second quartile of their assigned salary range. This reflects internal range placement, not external market competitiveness. One additional employee is above the current maximum and one has an unresolved current range, bringing the total employee records reviewed to 38.

Current Range Position	Employees	Interpretation
First Quartile	22	0% to 25% of range
Second Quartile	9	25% to 50%
Third Quartile	5	50% to 75%
Fourth Quartile	0	75% to 100%
Above Maximum	1	Above established current maximum
Unresolved Range	1	Current grade/range requires confirmation

No employee is recorded below an established current minimum. 1 employee is above the established current maximum. The *Coastal Inspector* classification has an unresolved current grade/range and is treated separately rather than forced into the current-range distribution.

3.2 Current Structure Observations

The District currently uses a 14-grade, 20-step salary structure with approximately 3% progression between steps and an overall range spread of approximately 75.4%. Classification relationships generally progress from entry and technical support levels through skilled, professional, supervisory, director, and executive classifications. The market analysis indicates that this architecture is broadly workable and that most current range midpoints are already competitive or above market. The recommended approach therefore preserves the existing range architecture rather than replacing it with narrower ranges that would create artificial employee-placement issues.

Current pay-plan health. The existing framework is serviceable and market-competitive overall. The principal structural issue is not range width; it is the sequencing of certain grades, most notably the current Grade 12/13 inversion. Because Grade 12 has no active classification assignment, the recommended schedule recalibrates Grade 12 between Grades 11 and 13 while retaining the established ranges for occupied grades. Targeted classification review remains more appropriate than broad structural movement.

Historical structure context. The District's current 14-grade, 20-step framework was established through the 2023 compensation study completed by Rehmann. That study documented a 75% grade spread, a 20-step structure, and an average 3% step escalator. It also documented the District's then-stated pay philosophy as positioning pay 10% above market. The current study independently benchmarks 2026 market conditions and does not use 2023 compensation rates as current market data; the prior study is referenced only to explain the origin and design intent of the existing structure.

Three-year market continuity. Rehmann concluded in 2023 that most positions were paid close to or above the market 50th percentile and generally nearer the 75th percentile, with targeted exceptions. The independent 2026 analysis similarly finds that most current salary-range midpoints remain above the collected market median. Taken together, the two studies indicate that the structure has generally maintained a competitive market position over the three-year period, while specific classifications, internal-equity relationships, and classification records now warrant targeted attention.

3.3 Classification and Job Description Review Findings

The District provided 43 job-description and position-specification files for review. Those files do not correspond one-for-one to the 35 current classifications used in the market analysis. The review was used to support classification reconciliation, market matching, internal hierarchy analysis, and identification of records requiring clarification. Review factors included essential duties and functional

scope, minimum qualifications, reporting and supervisory relationships, title and grade consistency, and FLSA designation where documented in the source materials.

Scope clarification. The District's baseline salary schedule contained 53 classification records, and all 53 were reviewed through the classification-reconciliation process to determine current status, title relationships, and continued applicability. The market analysis benchmarks 35 current classifications for which current employee or classification evidence was sufficient for the market model. Vacant status alone is not treated as a reason to exclude a classification. The reconciliation also preserves unoccupied classifications, combined-title series, and title relationships that require District confirmation so the final classification inventory remains traceable to the baseline schedule.

Classification-universe reconciliation. Appendix F provides the full 53-record baseline reconciliation. Of the 53 classifications listed in the baseline salary schedule, 29 are represented in the current 35-classification market model through the same title or a reconciled current title. The other baseline records remain documented as combined-title series, unoccupied/current records, legacy items, or classifications requiring District confirmation. The current market model also includes six classifications that are not discrete records in the baseline 53: Coastal Inspector, Field Efficacy Entomologist II, Impoundment Supervisor, Larvicide Inspector, UAS Pilot / Vector Ecologist, and GIS Specialist. Accordingly, 29 baseline-represented classifications plus 6 current classifications outside discrete baseline records produce the 35-classification market model.

A file-by-file audit of the current job-description source set identified several record-management, role-clarity, and documentation issues rather than evidence that the District's overall classification system requires replacement. Among the 35 current study classifications, 30 have direct, combined-title, related-title, or otherwise usable JD source support and 5 do not have a separate current JD. Four grade conflicts remain for District confirmation. The current Communications & Payroll Specialist, Project Manager, UAS Pilot / Vector Ecologist, Chief Financial Officer, Director of Administration, and GIS Specialist descriptions also identify targeted drafting, FLSA, licensure, title, or role-boundary items described below rather than broad structural concerns.

Finding	Count	What It Means
Direct or combined-title JD support	30	Current JD evidence directly or through a documented title/series relationship supports the classification.
Targeted JD review items	6	Current JDs are available but contain drafting, FLSA/licensure, role-boundary, or template issues that should be corrected or confirmed.
No separate current JD	5	Current classification is supported by other records, but a standalone current JD was not provided.
Active grade conflicts	4	Salary schedule/model and supplied JD show different grade information; District confirmation is required.

Table 3.1 - Job Description Review — Key Findings. Counts reflect the 35 current study classifications reviewed against the current JD source set.

Reporting-relationship audit. The original PDFs show several nomenclature and accountability inconsistencies in Operations. The *Coastal Inspector I/II* and *Marine Inspector I/II* JDs state "Reports To: *Larvicide Supervisor*," and the *Larvicide Foreman* JD does the same, while the current employee roster places corresponding active employees under *Inspection Supervisor*. A December 18, 2025 *Coastal Supervisor* JD states that the *Coastal Supervisor* supervises the Foreman and inspectors of both the Coastal and Inland departments. Separately, the *Inland Supervisor* JD states that it supervises the Inland Inspection Program and reports to the *Assistant Director*, while the *Assistant Director* JD

states that the *Assistant Director* directly supervises the *Coastal Supervisor*, *Inland Supervisor*, *Ecologist*, and *Aerial Supervisor*. The *Director of Operations* JD also describes direct supervision of the Larvicide, Impoundment, Inland, Aerial, and *Project Manager* functions. These records should be reconciled into one approved operating hierarchy; the report does not assume that *Larvicide Supervisor*, *Coastal Supervisor*, and *Inspection Supervisor* are interchangeable titles or that overlapping supervisory statements reflect current intended authority.

Affected Area	JD / Source Record	Current Roster / Other Record	Status
Coastal Inspector I/II	Reports to Larvicide Supervisor	Roster uses Inspection Supervisor	**District confirmation required**
Marine Inspector I/II	Reports to Larvicide Supervisor	Roster uses Inspection Supervisor	**District confirmation required**
Foreman / supervisor titles	Larvicide Foreman JD reports to Larvicide Supervisor; Coastal Supervisor JD supervises Foreman and Coastal/Inland inspectors	Roster uses Coastal Foreman and Inspection Supervisor	**Confirm whether Larvicide Supervisor, Coastal Supervisor, and Inspection Supervisor reflect renamed/reorganized roles**

Table 3.2 - Reporting Relationship & Title Alignment Findings. Titles are not assumed equivalent unless confirmed by the District.

Where a current job description was available, the description was used as the primary source for functional job matching and classification-scope review rather than relying on title alone. Where a current description was unavailable or inconsistent with another District record, the analysis flags the issue rather than assuming duties, grade, or status. FLSA designation was considered where documented; any position whose duties or authority materially change should be re-evaluated before a revised exemption designation is adopted.

Recommended maintenance approach. Maintain one current, approved job description for each active classification and update it whenever essential duties, reporting relationships, supervisory authority, minimum qualifications, or organizational placement materially change. Reconcile the salary schedule, roster, organization chart, and job-description inventory at the same time so classification records remain internally consistent.

3.4 Classification Architecture and Job Description Recommendations

The job-description review identified a broader design issue beyond isolated title and grade conflicts: several positions contain overlapping ownership, reporting, or functional language. In a small operational organization, cross-training and shared support are appropriate and often necessary. The concern is not that employees assist outside their core function; it is that some current descriptions do not consistently distinguish primary accountability from cross-functional support. That can make it difficult to determine who owns a program, who supervises whom, how classifications differ, and why one role is placed at a different grade.

Synergized HR recommends clarifying role architecture before undertaking wholesale job-description rewrites. Each classification should state what the role owns, what it supports, what it supervises, what decisions it may make independently, and which responsibilities belong primarily to another classification. The recommendations below are based on the current source documents and are advisory; final organizational design remains with the District.

Role Family / Issue	Verified Overlap or Ambiguity	Recommended Direction	Action
Operations supervision & titles	Coastal Supervisor states it supervises the Foreman and Coastal/Inland inspectors; Inland Supervisor separately supervises the Inland program; Assistant Director directly supervises Coastal Supervisor and Inland Supervisor; Director of Operations also describes direct supervision of multiple operational functions.	Adopt one official Operations hierarchy and use the same titles/reporting lines in the organization chart, roster, salary schedule, and JDs. If one supervisor owns both coastal and inland inspection, consider Inspection Supervisor as the clearer functional title; if the programs remain separate, define each supervisor's boundaries explicitly.	**District design decision**
Impoundment leadership	Ecologist states that it supervises the Impoundment Program and Impoundment Operators. Impoundment Supervisor also states that it supervises the Impoundment Program and staff.	Assign one role primary people/operational ownership. Recommended model: Impoundment Supervisor owns day-to-day staff, equipment, maintenance, and operating execution; Ecologist owns environmental science, permitting, RIM strategy, conservation, research, and regulatory coordination, unless the District intentionally chooses another structure.	**Clarify ownership**
Aerial / UAS	Aerial Supervisor coordinates and supervises UAS treatments; the part-time UAS Pilot supports flight operations; the UAS Pilot / Vector Ecologist adds independent UAS operations, aerial application, vector ecology, surveillance, GIS, and research functions while reporting to the Executive Director.	Define Aerial Supervisor mission/safety authority and clearly distinguish the part-time Grade 8 UAS Pilot from the Grade 11 UAS Pilot / Vector Ecologist. Maintain the roles as separate classifications and verify FAA credential requirements and the documented FLSA exemption basis for the hybrid role.	**Targeted clarification**
Administration / communications / education	Director of Administration, Communications & Payroll Specialist, and Education Specialist include intersecting public outreach, communications, Board/public information, administrative support, and event responsibilities. The Director of Administration also owns daily administrative operations, policies/procedures, vendor/contract administration, and direct supervision.	Define Director of Administration as the administrative/public-relations leader; Communications & Payroll Specialist as payroll/records administration plus defined communication channels; Education Specialist as curricula/training/classroom programming. Use the Director of Administration title consistently across the organization chart, roster, salary schedule, and JDs.	**Recommended role architecture**
HR / payroll / administrative support	The Communications & Payroll Specialist now holds primary payroll ownership together with records, retirement coordination, Board support, and communications. HR classifications retain benefits/employee-relations support functions.	Document payroll ownership clearly and distinguish payroll administration from HR generalist/employee-relations responsibilities. Strengthen minimum payroll-experience language and confirm whether Public Health Pest Control licensure is necessary for this administrative classification.	**Targeted review**

Science / surveillance support	Surveillance Coordinator, Surveillance Specialist references, ULV Coordinator/Specialist, Laboratory roles, Field Assistant, and Part-Time Surveillance Aide contain intersecting trapping, data, field-surveillance, and technical-support duties.	Establish a clear science/surveillance job family showing entry support, field surveillance, laboratory support, specialist/coordinator ownership, and supervisory escalation. Confirm whether Surveillance Coordinator replaces or differs from Surveillance Specialist and whether Surveillance Assistant corresponds to Part-Time Surveillance Aide.	**District confirmation**
Combined-title progression series	Several source documents combine levels or titles, including Coastal Inspector I/II, Marine Inspector I/II, Impoundment Operator I/II, Payroll Coordinator/Specialist, and ULV Coordinator/Specialist. In some cases a single grade notation conflicts with the salary schedule.	Either maintain separate JDs by level or add an explicit level matrix within each combined JD showing grade, distinguishing duties, minimum experience/certifications, decision authority, and progression criteria for each level.	**Systemwide recommendation**
“Other job descriptions” catch-all language	Many JDs state that the employee may “perform tasks of other job descriptions as deemed necessary,” which can blur classification boundaries when used broadly.	Replace with narrower language such as: “Performs other related duties consistent with the purpose, level, and responsibilities of the classification, as assigned.” Preserve cross-training but distinguish temporary support from permanent primary accountability.	**Systemwide recommendation**
Project Manager JD quality / role boundaries	Current Grade 9 JD validates infrastructure/capital project coordination, impoundment work, surveying, contractor liaison responsibilities, and UAS support, but contains legacy template text and ambiguous aviation wording.	Remove legacy “Human Resource Generalist”/repeated-page artifacts; correct “VRM” to CRM if Crew Resource Management is intended; clarify the statement that the position “Participates as an Aerial Supervisor” so it does not conflict with the Aerial Supervisor role.	**Document cleanup / clarification**
Finance / administration boundaries	Chief Financial Officer, Director of Administration, and Communications & Payroll Specialist each contain some Board support, public-records, administrative, compliance, or HR-adjacent responsibilities.	Document primary ownership: CFO = finance, budget, audit, banking, fiscal compliance; Director of Administration = administrative operations, policies, contracts/vendors, public relations, and supervised admin staff; Communications & Payroll Specialist = payroll, records, retirement coordination, and assigned communications support.	**Targeted clarification**
GIS / spatial-data support	GIS Specialist owns enterprise GIS datasets, mapping, geoprocessing, spatial analysis, and GIS workflow support. UAS Pilot / Vector Ecologist also uses GIS/spatial data and is instructed to assist the GIS Specialist.	Establish GIS Specialist as primary GIS data/workflow owner and document the UAS/vector role as a scientific/UAS user and contributor. Recommend Non-Exempt for GIS Specialist under the current duties; revisit only if decision authority is materially broadened.	**Recommended clarification**

Table 3.3 - Classification Architecture & Job Description Recommendations. Recommendations distinguish primary accountability from appropriate cross-functional support.

JD DESIGN PRINCIPLE: Cross-training is appropriate; unclear ownership is not. Each JD should identify primary ownership, support responsibilities, supervision, decision authority, and escalation boundaries. Temporary assistance outside a classification should not become an undocumented permanent transfer of core duties.

4. Market Compensation Analysis

4.1 Overall Market Position

The market analysis includes 35 current classifications and 241 approved position-level observations. Of the 35 classifications analyzed, 34 have both a documented current midpoint and a usable market median. One classification - Coastal Inspector - has a market benchmark but lacks a confirmed current range, so a current-to-market percentage is not reported. Among the 34 classifications with a calculable variance, 4 are more than 5% below the market median, 4 are within +/-5%, and 26 are more than 5% above market. The average position-level variance is 15.4% above market and the median variance is 16.3% above market.

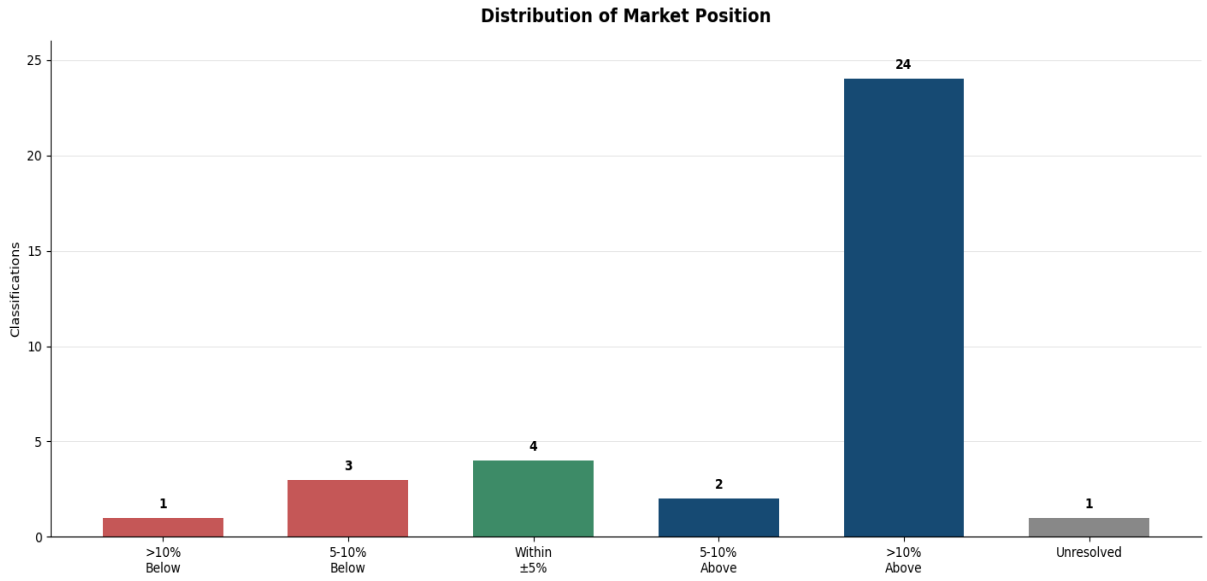


Figure 4.1 - Distribution of Market Position. Source: Synergized HR market analysis workbook, August 2026.

4.2 Classifications Below Market

Classification	Grade	District Midpoint	Market Median	Variance	Comparators	Support
Aerial Supervisor	10	$87,395	$100,781	-13.3%	4	Adequate
Project Manager	9	$80,316	$85,013	-5.5%	6	Robust
Chief Finance Officer	13	$116,183	$123,322	-5.8%	5	Adequate
Lab Assistant	1	$50,629	$53,347	-5.1%	8	Robust

Aerial Supervisor represents the most significant current market gap at approximately 13.3% below the market median and is supported by four distinct comparator organizations. Chief Finance Officer, Project Manager, and Lab Assistant are more moderate gaps at approximately 5.8%, 5.5%, and 5.1% below market, respectively. Project Manager's current Grade 9 job description confirms that the Grade 9 midpoint is substantially closer to the validated market reference than the prior Grade 7 modeling.

KEY FINDING
The external market does not support a broad across-the-board upward adjustment to all classifications. The clearest market pressure is concentrated in Aerial Supervisor, with more moderate pressure in Chief Finance Officer, Project Manager, and Lab Assistant.

4.3 Classifications At and Above Market

4 classifications fall within the competitive +/-5% range. 26 classifications are more than 5% above the market median. Above-market positioning of a salary range does not mean individual employees are overpaid; it means the established midpoint is higher than the collected comparator median. Under the recalibrated structure, no employee falls below a recommended minimum; one employee is above the recommended maximum.

Highest Above-Market Classifications	District Midpoint	Market Median	Variance	Support
Marine Inspector II	$74,063	$52,624	40.7%	Robust
Education Specialist	$87,395	$64,052	36.4%	Robust
Inland Inspector II	$70,288	$52,832	33.0%	Robust
Coastal Inspector II	$70,288	$53,040	32.5%	Robust
Administrative Assistant	$70,288	$54,517	28.9%	Robust
ULV Specialist	$72,766	$56,887	27.9%	Robust
Inland Inspector III	$74,063	$58,032	27.6%	Adequate
Executive Director	$155,353	$122,633	26.7%	Adequate
Director of Administration	$116,183	$94,119	23.4%	Adequate
Coastal Foreman	$75,597	$61,593	22.7%	Robust

4.4 Market Support and Analytical Confidence

How to read the support levels. Support level reflects the breadth of the external market sample for each District classification—in other words, how many distinct comparator organizations contributed usable data. Robust means the result is supported by six or more comparators, Adequate means three to five comparators, and Limited means fewer than three. Support level does not measure how closely an individual comparator job matches the District role; that is evaluated separately through the Strong/Moderate match-quality review.

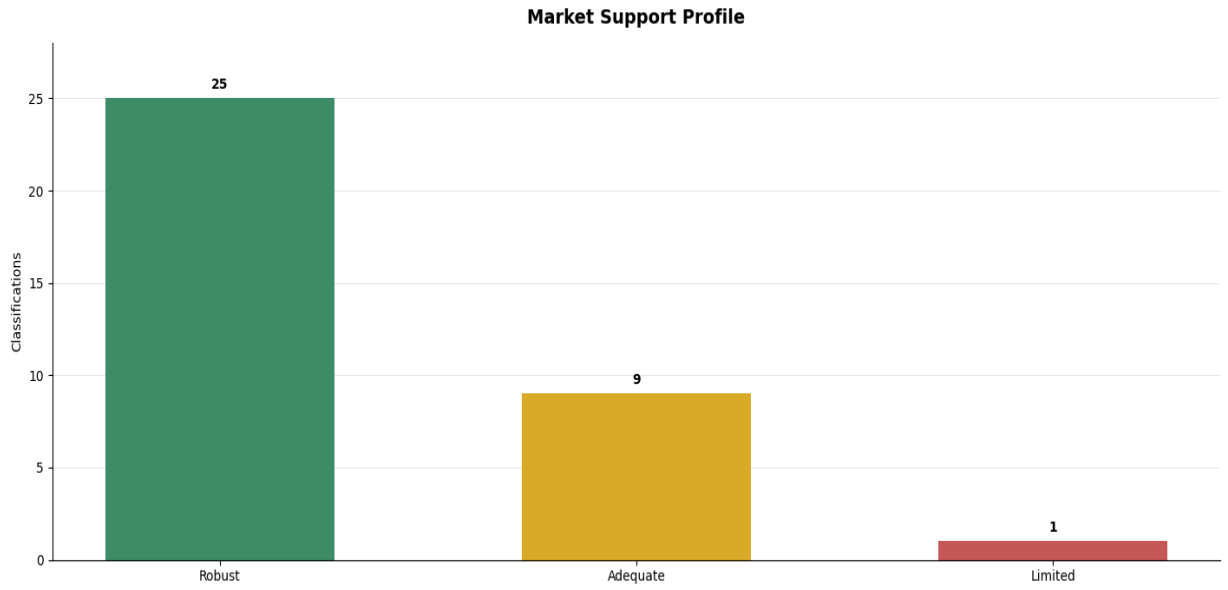


Figure 4.2 - Market Support Profile. Robust = 6+ distinct comparators; Adequate = 3-5; Limited = fewer than 3.

The support profile is strong overall: 25 classifications have Robust support, 9 have Adequate support, and 1 has Limited support. The separate part-time UAS Pilot is the only Limited classification, with two direct Strong UAS/drone pilot matches. The Grade 11 UAS Pilot / Vector Ecologist and GIS Specialist are evaluated separately and both have at least Adequate market support.

Director of Administration and Director of IT & Maintenance have adequate observation counts, but several retained matches are Moderate because the District roles combine broader functional scope than typical comparator classifications. Director of Administration now includes daily administrative operations, policies/procedures, vendor and contract administration, executive support, public relations, and direct supervision. Its grade placement is therefore supported by both organizational scope and market context rather than a stand-alone title match.

Evidence Behind the Findings

VALIDATED MARKET EVIDENCE			
241	**113**	**128**	**34 of 35**
APPROVED OBSERVATIONS	**STRONG MATCHES**	**MODERATE MATCHES**	**ROBUST / ADEQUATE SUPPORT**
retained after match review	high functional similarity	included with scope context	only part-time UAS Pilot is Limited

4.5 Selected Benchmark Confidence Review

Classification	Distinct Comparators	Match Profile	Support	Consultant Interpretation
Aerial Supervisor	4	2 Strong / 2 Moderate	Adequate	Meaningful market gap; retain scope and supervisory context in final placement.
Project Manager	6	2 Strong / 4 Moderate	Robust	Current Grade 9 JD validates scope; market result is a moderate gap that supports monitoring rather than automatic regrade.
UAS Pilot	2	2 Strong / 0 Moderate	Limited	Direct matches are strong; narrow sample warrants caution, not weaker matching.
Director of Administration	4	1 Strong / 3 Moderate	Adequate	Updated JD broadens administrative leadership scope; use market evidence with internal director-level context.
Director of IT & Maintenance	5	0 Strong / 5 Moderate	Adequate	Combined IT/fleet/facilities scope requires internal director-level context.
GIS Specialist	4	0 Strong / 4 Moderate	Adequate	Four public-sector GIS observations support the Grade 11 market review; current duties support Non-Exempt treatment despite technical complexity.

Decision note: support level reflects sample breadth; Strong/Moderate reflects individual match quality. These are separate concepts.

5. Supplemental Pay Practices and Benefits Context

The RFP requires analysis of compensation practices beyond base salary ranges, including longevity, certification or education incentives, acting assignments, cost-of-living adjustments, promotional opportunities, and recognizable compensation growth. Available comparator documentation varies considerably; therefore, this section presents documented practices as context rather than as a comprehensive benefit-value study.

Comparator	Benefits / Medical Context	Education / Certification	Other Pay Practices
East Flagler Mosquito Control District	Full employee medical premium; 75% spouse/child; HSA contribution	Tuition reimbursement	Deferred comp match up to $200/pay period
Citrus County Mosquito Control District	100% employee health/life premium	5% increases for certain licenses/certifications	4% promotion or new-position starting rate; on-call/call-out provisions
Pasco County Mosquito Control District	Full employee medical premium	Required certification $0.50/hour; approved education reimbursement	Combined PTO; retiree medical provision

Comparator	Benefits / Medical Context	Education / Certification	Other Pay Practices
Collier Mosquito Control District	Medical base plan premiums paid 100% across tiers	No specific certification incentive identified	Tenure awards; 457 match up to $4,800 annually
Florida Keys Mosquito District	Current personnel/pay structure documented	—	3% COLA effective 10/1/2025
Hernando County Mosquito Control	County benefit structure; FRS	—	Promotion 5% (1-2 grades) / 10% (3 grades); 5% step-up/out-of-class
Beach Mosquito Control District	Current medical and leave programs documented	Hourly incentives for licenses/education	15-step progression; step increases generally every two years; 4-hour call-back minimum
Indian River County Sheriff's Office	Medical/dental/vision and FRS	Civilian education pay $50-$200/month	6% non-sworn promotion or new minimum; on-call/call-out/shift differentials

Table 5.1 - Selected documented supplemental practices. This is an illustrative summary of available source material, not a prevalence estimate across all 31 identified comparator organizations.

The collected materials demonstrate that Florida public-sector employers use a variety of mechanisms to create compensation growth beyond base-range movement. Documented examples include formal step plans, promotional increases, certification incentives, education pay, call-back guarantees, acting/out-of-class premiums, deferred compensation matching, and COLA adjustments. The diversity of these practices supports maintaining flexibility in the District's salary administration policy rather than relying on a single automatic progression rule.

Historical benefits context. The 2023 Rehmann study concluded that the District's benefits were generally consistent with or slightly above the market, with medical cost-sharing, deductibles and copays, and employer-paid basic life/AD&D identified as relative strengths. It identified voluntary dependent life/AD&D as a relative gap and noted emerging practices such as paid parental leave and Tricare supplemental coverage. Those findings are historical and are not treated as current 2026 benchmark results; the current report uses 2026 comparator materials only for present-day supplemental-pay and benefits context.

6. Internal Equity and Pay Compression Analysis

6.1 Employee Placement in the Recommended Structure

Employee placement was evaluated against the recommended 14-grade salary structure. No employee falls below a recommended range minimum. One employee—*Maintenance Technician II*—is above the recommended Grade 4 maximum and should be reviewed for red-circle treatment and classification scope rather than receiving a pay reduction. All other employees fall within the recommended ranges, including *Coastal Inspector* when modeled at Grade 2 pending District confirmation.

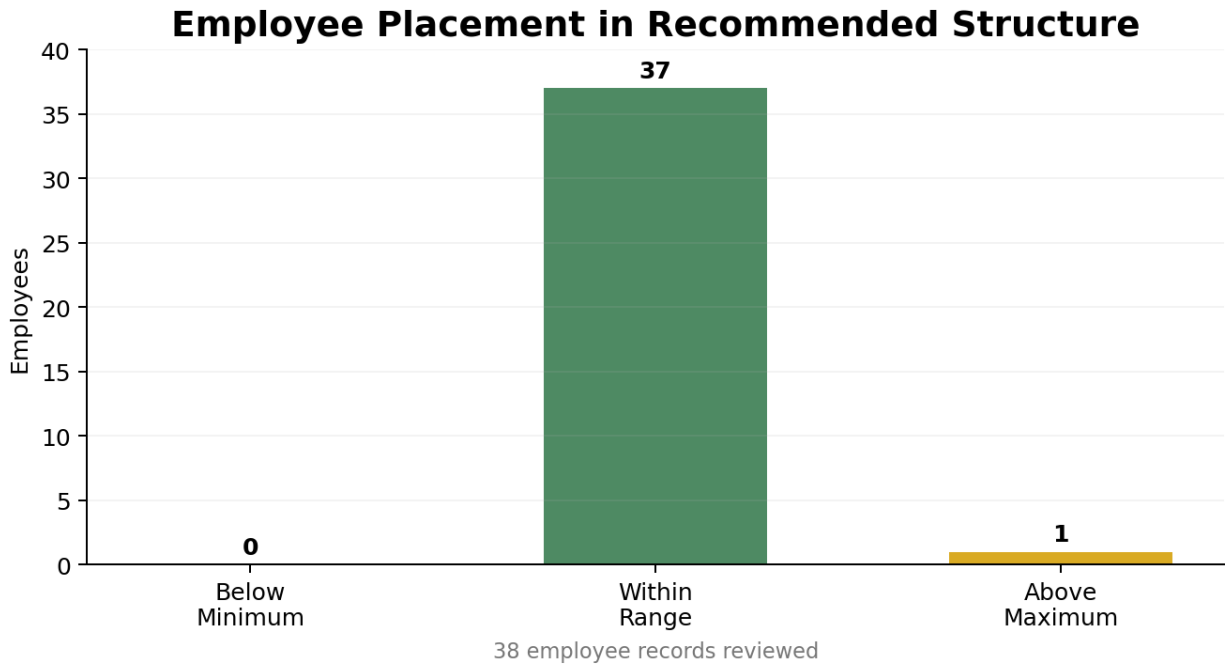


Figure 6.1 - Employee Placement in Recommended Structure.

Classification	Placement Status	Current Pay	Review Note
Maintenance Technician II	Above Recommended Maximum	$90,875	Approximately $1,353 above the retained Grade 4 maximum; preserve pay and review red-circle treatment / classification scope.

Table 6.1 - Employee Placement Exception in the Recommended Structure.

WHAT "RED-CIRCLE" MEANS
When an employee's current salary exceeds the maximum of the assigned pay range, the employee may be managed as "red-circled." This does not mean reducing the employee's salary. Current base pay is typically preserved while the organization defines how future increases will be handled until the range catches up or the classification is reevaluated. For the District, any red-circle practice should be formally defined in salary-administration policy and applied consistently.

6.2 Supervisor/Subordinate Relationships

How to read these findings. A pay inversion occurs when an employee earns more than the person who directly supervises them. Pay compression is broader and occurs when the pay difference between employees or classifications becomes too small relative to differences in responsibility, experience, or supervisory authority. An inversion is one specific form of compression.

The employee-level review identified 1 confirmed supervisor pay inversion based on a reporting relationship supported by the District job descriptions. This is a priority internal-equity review item because the subordinate currently earns more than the identified supervisor.

Subordinate Classification	Recorded Supervisor	Subordinate Pay	Review Note
Education Specialist	Director of Administration	$98,926	Current pay exceeds the Director of Administration supervisor by $12,009 (13.8%). The reporting relationship is confirmed by the Education Specialist job description; review role scope and pay history before any equity adjustment is finalized.

Compression findings should be resolved through targeted review and documented adjustments, not by reducing subordinate pay. Only source-verified reporting relationships are treated as confirmed compression findings in this study.

6.3 Downstream Equity Considerations

Current Relationship	Observed Signal	Potential Downstream Impact	Leadership Consideration
Education Specialist / Director of Administration	Subordinate pay exceeds supervisor by $12,009 (13.8%).	Adjustment to either role affects supervisory differential and director-level internal equity.	Reporting relationship is confirmed; review role scope and pay history before setting any targeted adjustment.

Downstream review does not presume an adjustment amount. It identifies relationships that should be checked before a compensation action is implemented.

6.4 Compression Findings and Future Prevention

The quantified compression finding in the current employee data is the Education Specialist/Director of Administration pay inversion identified in Section 6.2. The implementation model also tests same-class and verified supervisory relationships so that broader placement decisions do not unintentionally create new internal-equity problems. The study does not infer additional compression findings where a validated relationship or supporting employee data is not available.

Compression should be treated as a relationship issue rather than as a stand-alone percentage adjustment. A pay action that is reasonable for one employee or classification can narrow the pay difference to a supervisor, adjacent classification, or similarly situated employee. For that reason, targeted market adjustments, promotional increases, new-hire placement above minimum, and range-minimum changes should be reviewed for downstream effects before implementation.

- Review supervisor/subordinate differentials whenever either classification receives a market, promotional, or equity adjustment.
- Review similarly situated employees within the same classification when an adjustment is based on experience, service, qualifications, or individual placement.
- Check adjacent classifications and career-progression relationships before moving a classification to a different grade or materially changing its range.
- Re-run compression and inversion checks after general salary-structure movement, targeted market corrections, or significant hiring-above-minimum decisions.
- Correct confirmed compression through targeted, documented adjustments rather than reducing subordinate pay or automatically increasing every related classification.

Same-class placement signal. The two *Marine Inspector II* incumbents currently receive the same annualized pay despite approximately 1.5 years of difference in time in position. This does not by itself establish a pay inequity because the District has not adopted an automatic tenure-based progression

requirement. It does, however, illustrate why future progression decisions should consistently consider relevant experience, service, qualifications, performance, and internal equity rather than tenure in isolation.

7. Recommended Compensation Structure

7.1 Structure Design

Synergized HR recommends retaining the District's 14-grade, 20-step framework. The existing ranges are broadly market-competitive and should not be narrowed solely for structural uniformity. The recommended schedule preserves the approximately 75.4% range spread and 3% step progression used in the current plan, while recalibrating the unoccupied Grade 12 between Grades 11 and 13 to remove the current grade inversion.

- Grades 1–14: retain approximately 75.4% range spread generated by the existing 20-step, 3% progression schedule.
- Preserve existing occupied-grade midpoints/ranges because most are already at or above the collected market median.
- Recalibrate only unoccupied Grade 12 to restore logical sequencing between Grades 11 and 13.
- Use market median as the primary external reference, with internal hierarchy, job scope, and confirmed reporting relationships controlling targeted classification decisions.
- No employee pay reduction recommended.

How to read the recommended salary structure. Each grade represents a salary range with a minimum, midpoint, and maximum. The minimum is the normal entry reference for an employee who meets the basic requirements of the role; the midpoint is the center of the range and the primary reference used in the District's market comparison; and the maximum is the upper boundary of the grade. Range spread shows the distance from minimum to maximum, while the final column shows how much the midpoint increases from the prior grade. The recommended structure largely preserves the District's existing architecture because the current ranges remain broadly competitive, with only Grade 12 recalibrated to restore logical sequencing.

Grade	Minimum	Midpoint	Maximum	Range Spread	Increase from Prior Grade Midpoint
1	$36,774	$50,629	$64,483	75.4%	—
2	$42,591	$58,637	$74,684	75.4%	15.8%
3	$44,776	$61,646	$78,515	75.4%	5.1%
4	$51,053	$70,288	$89,522	75.4%	14.0%
5	$52,853	$72,766	$92,678	75.4%	3.5%
6	$53,796	$74,063	$94,332	75.4%	1.8%
7	$54,910	$75,597	$96,285	75.4%	2.1%
8	$56,324	$77,544	$98,764	75.4%	2.6%
9	$58,338	$80,316	$102,296	75.4%	3.6%
10	$63,479	$87,395	$111,311	75.4%	8.8%
11	$66,243	$91,200	$116,158	75.4%	4.4%

Grade	Minimum	Midpoint	Maximum	Range Spread	Increase from Prior Grade Midpoint
12	$74,768	$102,936	$131,106	75.4%	12.9%
13	$84,389	$116,183	$147,977	75.4%	12.9%
14	$112,840	$155,353	$197,866	75.4%	33.7%

Table 7.1 - Recommended 14-Grade Salary Structure. Subject to Board approval.

7.2 Classification Placement and Pay Differential Methodology

Classification placement methodology. Final grade placement is based on a combined review of external market position and internal classification relationships rather than a single market percentage. The placement decision considers essential duties and functional scope, level of authority and decision-making, supervisory responsibility, minimum qualifications and technical complexity, organizational context, current internal hierarchy, and relationships to adjacent or career-progression classifications. Market median results inform placement, but do not automatically determine grade assignment when internal scope or hierarchy supports a different conclusion.

Pay differential and grade relationships. Justifiable pay differentials are maintained through grade separation, midpoint progression, supervisory hierarchy, career-path relationships, and differences in scope, complexity, authority, and accountability. A classification may therefore remain above or below the collected market median when its placement is needed to preserve internal hierarchy or an appropriate relationship with related classifications. Proposed market or grade adjustments should be evaluated for their effect on supervisors, subordinates, adjacent classifications, promotional opportunity, and internal equity before implementation.

7.3 Classification Assignments

Of the 35 current classifications, 34 have a documented current grade and one - Coastal Inspector - remains unresolved. The current Communications & Payroll Specialist and Project Manager JDs establish Grade 9 for those classifications. The UAS Pilot / Vector Ecologist and GIS Specialist JDs establish Grade 11 for distinct specialized classifications. Director of Administration and Chief Financial Officer remain at Grade 13. Coastal Inspector remains modeled at Grade 2 only until the District confirms the intended level.

Classification	Current Grade	Recommended Grade	Status	Rationale
Aerial Supervisor	10	10	Targeted Market / Grade Confirmation	Retain modeled Grade 10 only pending District confirmation. Current Aerial Supervisor JD states Grade 8 while the salary schedule/model reflects Grade 10; market gap supports targeted review but does not resolve the source conflict.
Coastal Inspector	0	2	District Confirmation Required	The supplied Coastal Inspector file is a combined Coastal Inspector I/II JD with Grades 2/4. The roster also contains a separate Coastal Inspector title without a confirmed level/grade. Grade 2 is used for modeling only until the District confirms whether the roster title corresponds to Inspector I, Inspector II, or another classification level.

Classification	Current Grade	Recommended Grade	Status	Rationale
Director of Administration	13	13	Recommended	Current 08/28/2026 JD confirms Grade 13, Exempt status, Executive Director reporting, direct supervision, administrative operations, policy/vendor/contract responsibilities, and public-relations leadership. Retain Grade 13 and standardize the new title.
Project Manager	9	9	Recommended	Current 08/18/2026 JD confirms Grade 9, Non-Exempt status, reporting to Impoundment Supervisor, and infrastructure/project/UAS scope. Market midpoint is modestly above the Grade 9 midpoint; retain and monitor.
UAS Pilot	8	8	Recommended - Limited Market Support	Retain the separate part-time Grade 8 UAS Pilot based on the current JD and roster evidence; the Grade 11 UAS Pilot / Vector Ecologist is treated as a distinct classification with broader scientific and operational scope.
UAS Pilot / Vector Ecologist	11	11	Recommended	Current 08/18/2026 JD supports a distinct Grade 11 hybrid UAS/vector-ecology classification. Retain Grade 11 and clarify FAA credential requirements, Aerial Supervisor mission/safety authority, and the documented FLSA exemption basis.
GIS Specialist	11	11	Recommended - Non-Exempt	Current 08/28/2026 JD supports Grade 11 based on technical GIS complexity and internal professional alignment. Four comparator observations indicate the current Grade 11 midpoint is above market; retain grade. Recommend Non-Exempt under the duties as written.

STRUCTURE RECOMMENDATION

Retain the 14-grade, 20-step framework and existing occupied-grade range architecture; recalibrate unoccupied Grade 12 to restore logical sequencing. Avoid broad range compression or across-the-board movement. Address market gaps and internal-equity issues through targeted classification decisions.

7.4 Salary Administration, Employee Progression, and Annual Maintenance

A sustainable salary structure requires consistent rules for how employees enter, move through, and exit salary ranges. The study therefore recommends that the District pair the recommended structure with a written compensation and salary-administration philosophy.

Market-position philosophy. The 2023 study documented a then-stated District philosophy of positioning pay 10% above market. The District should confirm whether that remains the desired policy. A written philosophy should define whether salary-range midpoints are intended to target the market median, maintain a modest market premium, or use differentiated targets for hard-to-fill, specialized, or mission-critical classifications. Defining that target will make future range movement, hiring decisions, and annual market reviews more consistent and easier to explain.

2026 position relative to the historical philosophy. The 2023 study documented a District pay philosophy of positioning pay approximately 10% above market. In the 2026 analysis, the 34 classifications with calculable current-to-market variance average 15.4% above the market median, and the median classification-level variance is 16.3% above market. These results indicate that the current

structure has generally maintained an above-market orientation, although individual classifications vary materially. The District should confirm whether a 10% premium above the market median remains the intended policy before using that target for future range maintenance or salary-setting decisions.

Why the 2026 study uses the market median. The underlying market model calculates the market minimum, 25th percentile, median, average, 75th percentile, and maximum where the available observations support those statistics. The report uses the market median as the primary external decision reference rather than applying a fixed 25th, 50th, or 75th percentile target to every classification. The number of defensible comparator observations varies by classification, and emphasizing quartiles for very small samples can imply greater precision than the underlying evidence supports. Median-based benchmarking, together with disclosed comparator counts, Strong/Moderate match quality, and internal hierarchy review, provides a consistent reference while preserving appropriate judgment for specialized or limited-sample roles.

New-hire placement. Use the assigned range minimum as the normal entry reference. Placement above minimum should be supported by documented directly relevant experience, qualifications, certifications, labor-market conditions, and internal equity with similarly situated employees. Higher starting pay should trigger a compression review when it approaches experienced incumbents or supervisors.

Promotional placement. Place the employee at no less than the minimum of the new range and evaluate whether an additional increase is needed to preserve a meaningful advancement opportunity and appropriate supervisory or classification relationships. The District may adopt a standard promotional practice, but the final rate should still be checked for internal equity and compression.

Progression within range. Do not assume that tenure alone requires automatic movement through an open range unless the District formally adopts that policy. Progression may consider documented performance, growth in proficiency or responsibility, directly relevant experience, market conditions, compression, and internal equity. Decisions should use the same factors consistently and be documented.

Employees above maximum. Do not reduce base pay solely because a revised range maximum falls below an employee's current salary. Manage the employee as red-circle pay and determine future base-pay treatment under the District's adopted salary-administration policy until the range or classification relationship changes.

Annual maintenance cycle. At least annually, review general market movement and any District COLA decision, hard-to-fill or specialized classifications, employees below minimum or above maximum, supervisor/subordinate relationships, significant new-hire or promotional placements, and changes in duties or organizational structure. Update individual classifications when evidence supports targeted action; move the full structure only when broader market or policy conditions support doing so. Conduct a comprehensive compensation and classification review approximately every three to five years.

8. Implementation Strategy and Cost Modeling

8.1 Planning Scenarios

How to read the implementation scenarios. The recommended salary structure does not create a broad implementation cost because no employee falls below the recommended range minimum. The

scenarios below therefore separate the District's baseline structural decision from optional compensation-policy choices. The first scenario reflects the recommended structure as designed. The second and third scenarios illustrate what additional annualized cost could result if the District elects to adopt a tenure-informed progression approach or broader compression/equity adjustments. These optional scenarios are planning tools, not recommended commitments.

Scenario	Employees Adjusted	Annualized FTE-Equivalent Cost	Known Payroll Cost	Pending FTE Cost	Primary Purpose
Recommended Structural Approach	0	$0	$0	$0	Recommended baseline; retains current range architecture with no employee below minimum
Optional Tenure-Informed Policy	10	$11,049	$10,739	$310	Optional service-based placement philosophy; requires District policy approval
Optional Compression/Equity Policy	10	$22,224	$21,914	$310	Optional compression/equity modeling; requires validation and District policy approval

Leadership Tradeoff View

Implementation Approach	What It Addresses	What Remains	Practical / Fiscal Tradeoff
Recommended Structural Approach	Preserves competitive current ranges and eliminates artificial minimum-placement effects.	Targeted market gaps and compression relationships still require separate review.	No baseline minimum-placement cost; lowest disruption.
Optional Tenure-Informed Policy	Models a service-based progression philosophy.	Requires adoption of a new progression policy and employee-specific validation.	Approx. $11.0K annualized illustration; not a recommendation.
Optional Compression/Equity Policy	Models a 5% differential for the confirmed supervisor relationship plus the 2% same-class illustration.	Requires District policy approval of the modeling thresholds.	Approx. $22.2K annualized illustration; not a recommendation.

KEY TAKEAWAY

The study does not identify a required across-the-board implementation expense. Any cost above $0 would result from additional policy choices the District elects to make regarding employee progression or internal-equity adjustments.

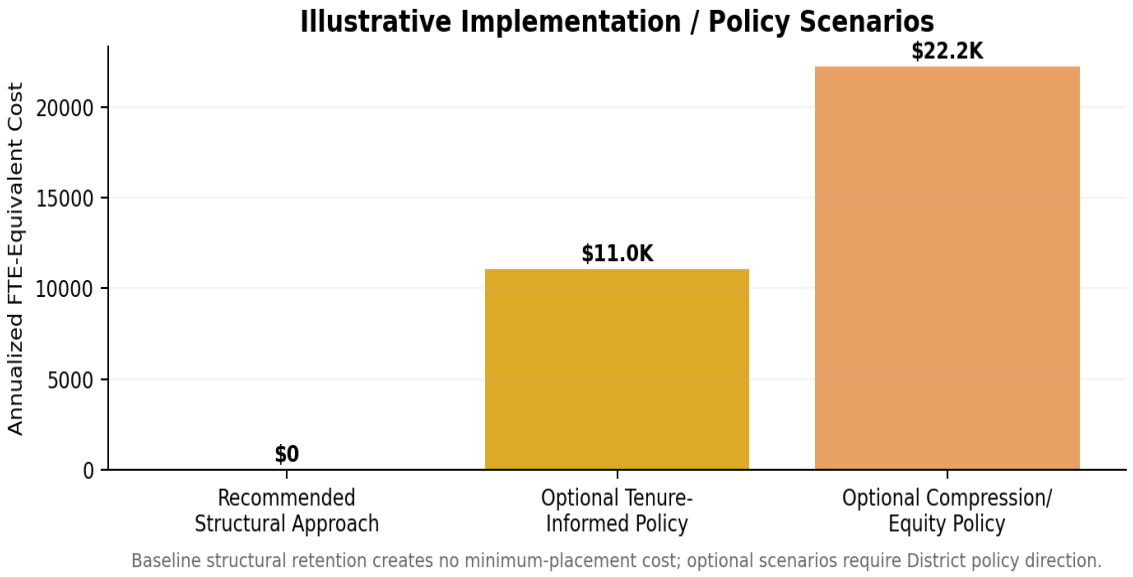


Figure 8.1 - Illustrative Implementation / Policy Scenarios.

8.2 Recommended Sequencing

Synergized HR recommends retaining the existing range architecture as the baseline structural approach. No employee requires a minimum-placement increase solely as a result of the recommended structure. Targeted market and internal-equity decisions should be addressed separately after the remaining grade, scope, and reporting-relationship confirmations are resolved.

- Baseline structural retention: $0 minimum-placement cost; no employee falls below a recommended range minimum.
- Optional broader equity/compression illustration: approximately $22,224 annualized FTE-equivalent cost if the District elects the modeled assumptions; this is not a recommended commitment.
- Scheduled-hours/FTE confirmation is not required for the baseline structural recommendation; it would only be needed to refine optional employee-level policy scenarios.

No employee pay reduction is recommended. Employees above a proposed maximum should generally retain current pay and be managed through future salary administration practices until the range catches up, unless the District makes a separate classification decision.

9. Key Findings and Recommendations

9.1 Key Findings

- The District's salary ranges are broadly competitive. Most current range midpoints are above the collected market median, so systemic upward range movement is not supported by the data.
- The current 14-grade, 20-step architecture was established in 2023 with an intentional above-market orientation; the independent 2026 results indicate that the structure has generally retained that competitive position, although the District should now confirm its desired market-position philosophy going forward.

- Market pressure is concentrated in four classifications, with the strongest gap in Aerial Supervisor and more moderate gaps in Chief Finance Officer, Project Manager, and Lab Assistant.
- The employee-placement review does not identify a systemic minimum-placement problem under the recalibrated structure: 0 employees fall below minimum, 1 employee is above maximum, and 1 confirmed supervisor/subordinate pay inversion requires targeted review.
- The 14-grade structure remains viable and can be modernized without replacing the entire compensation architecture.
- Market-support quality is strong for nearly all classifications; the separate part-time UAS Pilot is the only classification with fewer than three comparator organizations and is supported by two direct Strong matches. UAS Pilot / Vector Ecologist is evaluated separately through blended UAS/scientific evidence.
- Survey participation was limited to Volusia County, but public-records and official published data produced a substantial, traceable market dataset with 241 approved observations.

Workforce and operational considerations. The study does not include a validated turnover, time-to-fill, applicant-volume, or succession-risk dataset, so it does not assign recruitment or retention risk ratings to individual classifications. The findings do, however, support continued monitoring of specialized aviation/UAS and scientific roles, supervisor/subordinate differentials, employees positioned below adopted range minimums, and other classifications where a narrow external labor pool or compensation relationship could affect future staffing continuity. The District should track turnover, time-to-fill, qualified applicant volume, exit reasons, and hard-to-fill classifications alongside annual compensation monitoring so that future adjustments are based on both market evidence and actual workforce experience.

9.2 Recommendations

1. Retain the District's 14-grade, 20-step salary structure as the working framework. Preserve the existing range architecture and 3% step progression, recalibrate the unoccupied Grade 12 to remove the Grade 12/13 inversion, and avoid broad range compression or across-the-board structural movement.
2. Do not implement a broad minimum-placement adjustment. The recalibrated structure places all employees at or above the recommended minimum. Review the single above-maximum *Maintenance Technician II* case for red-circle treatment and classification scope; do not reduce pay.
3. Address targeted market pressure rather than applying broad range increases. Prioritize Aerial Supervisor for focused review and monitor Chief Finance Officer, Project Manager, and Lab Assistant as moderate market gaps.
4. Resolve the confirmed supervisor pay inversion through targeted equity review. Address the Education Specialist/Director of Administration relationship without reducing subordinate pay. The current Project Manager JD identifies the Impoundment Supervisor as the direct supervisor; current pay does not create an inversion in that relationship.
5. Retain Project Manager at Grade 9. The current 08/18/2026 JD validates the classification's duties, Grade 9 placement, Non-Exempt status, and reporting to the Impoundment Supervisor. The market midpoint remains modestly higher than the Grade 9 midpoint, supporting continued monitoring rather than an automatic regrade.
6. Establish a written compensation and salary-administration philosophy. Confirm the District's desired market position, including whether it intends to target the market median, maintain a modest premium, or use differentiated targets for hard-to-fill or specialized classifications. Define

hiring placement, promotional increases, treatment of employees above maximum, and progression within ranges. Avoid automatic tenure-only movement unless specifically adopted by the District.

7. Maintain current job descriptions and classification records. Resolve legacy/current title discrepancies and update job descriptions when significant duties or reporting relationships change. For classifications maintained outside the current benchmark set, the District should keep current job descriptions on file and conduct targeted market review when duties or organizational needs materially change.
8. Conduct targeted annual monitoring and a comprehensive review every three to five years. Use focused market reviews for hard-to-fill or retention-sensitive classifications between full studies.

9.3 Leadership Decision Considerations

Decision Area	Evidence in This Study	Leadership Choice	Downstream Check
Salary Structure	Current 14-grade / 20-step architecture is broadly competitive; Grade 12 is structurally inverted with Grade 13.	Retain occupied-grade ranges and recalibrate Grade 12.	Confirm limited classification-history exceptions before final adoption.
Employee Placement	0 employees below recommended minimum; 1 above recommended maximum.	No broad minimum-placement action; review the single above-maximum case.	Preserve pay and review classification scope / red-circle treatment.
Targeted Market Action	Aerial Supervisor shows the largest below-market gap; Chief Finance Officer, Project Manager, and Lab Assistant show more moderate gaps.	Determine whether targeted range/grade action is warranted.	Review adjacent classifications and supervisory relationships before action.
Internal Equity	1 confirmed supervisor pay inversion identified.	Address through targeted review; do not reduce subordinate pay.	Use only source-verified reporting relationships in final action.
Ongoing Administration	Comparator practices show varied promotion, certification, step, and special-pay approaches.	Adopt written salary-administration rules and periodic review cycle.	Monitor hard-to-fill or specialized classifications between full studies.

This decision framework summarizes validated study findings; it is not a risk score or proprietary rating model.

10. Study Limitations and Administrative Follow-Up

10.1 Market Benchmarking Limitations

Compensation benchmarking is necessarily a snapshot in time. Public-sector organizations use different classification architectures, salary-administration practices, budget cycles, and benefit structures. Job titles are not always equivalent, and even strong functional matches can differ in organizational scope. For this reason, the study uses match-quality review, median statistics, source documentation, and internal-equity analysis rather than treating any single comparator salary as determinative.

Results based on limited comparator counts require additional judgment. The separate part-time UAS Pilot is the only classification with fewer than three distinct comparator organizations. The UAS Pilot / Vector Ecologist is a hybrid classification for which no exact external peer was identified; its market result therefore uses a blended UAS/scientific comparator set and should be interpreted together with internal scope and hierarchy. GIS Specialist has Adequate support from four public-sector GIS

observations. Director of Administration and Director of IT & Maintenance have adequate counts but rely partly on Moderate matches due to their broad combined scope.

10.2 Classification Record Maintenance Items

The items below reflect classification-record, title, reporting-relationship, job-description, or organizational maintenance issues identified during the study. They do not prevent implementation of the study's compensation findings and recommendations. The District should address these items through its ongoing classification and job-description maintenance process as organizational decisions are finalized.

Item	Status	District Follow-Up / Maintenance Item
Coastal Inspector grade/range	DISTRICT FOLLOW-UP	The supplied Coastal Inspector file is a combined Coastal Inspector I/II JD with Grades 2/4. The employee roster also contains a separate Coastal Inspector title without a documented level/grade. Confirm whether that roster title corresponds to Inspector I, Inspector II, or another classification level; Grade 2 is used for modeling only.
Ecologist current grade	SOURCE CONFLICT	October 2025 salary schedule shows Grade 10; April 24, 2026 job description shows Grade 8. Current official grade should be confirmed.
Aerial Supervisor grade	SOURCE CONFLICT	Current salary schedule/model reflects Grade 10; the 09/17/2025 Aerial Supervisor job description states Pay Grade 8. Confirm the official current grade before any targeted market or regrade action.
Legacy/vacant classifications	DISTRICT FOLLOW-UP	Twelve reconciliation records remain flagged for confirmation regarding current validity, renaming, combination, or supersession. These do not invalidate the 35-classification current market analysis but affect the final classification inventory.
Project Manager JD cleanup	JD MAINTENANCE	Current JD received and incorporated. Remove legacy template/repeated-page text, confirm CRM acronym, and clarify the statement that the position "Participates as an Aerial Supervisor." Grade 9, Non-Exempt status, and Impoundment Supervisor reporting are documented.
Active classifications without separate current JDs	RECORD MAINTENANCE	No separate current JD is currently documented for Entomologist II, Executive Director, Inland Inspector II, Inland Inspector III, or Surveillance Specialist. Retain current grades absent other evidence supporting change; confirm/update JDs before material reclassification decisions.
Related-title JD reconciliation	DISTRICT FOLLOW-UP	Confirm whether Coastal Foreman corresponds to Larvicide Foreman and whether Inspection Supervisor corresponds to Coastal Supervisor. Confirm whether Surveillance Assistant corresponds to the Part-Time Surveillance Aide source record. Coastal Inspector level/grade is addressed separately against the combined Coastal Inspector I/II JD.

Item	Status	District Follow-Up / Maintenance Item
Impoundment Operator I grade	SOURCE CONFLICT	The October 2025 salary schedule and the 2023 Rehmann structure both place Impoundment Operator I at Grade 1, while the 04/30/2026 combined Impoundment Operator I/II JD lists Pay Grade 3. Confirm whether Grade 3 applies only to Operator II or reflects a combined-description notation.
Marine Inspector II grade / reporting	SOURCE CONFLICT	The October 2025 salary schedule and the 2023 Rehmann structure both place Marine Inspector II at Grade 6. The 04/25/2025 combined Marine Inspector I/II JD lists Pay Grade 3 and Reports To Larvicide Supervisor, while the current roster uses Inspection Supervisor. Confirm the intended current grade and reporting structure.
Operations supervisor-title alignment	DISTRICT FOLLOW-UP	Confirm whether Inspection Supervisor corresponds to the Coastal Supervisor and/or Larvicide Supervisor titles used in current JDs. Coastal Inspector I/II and Marine Inspector I/II JDs report to Larvicide Supervisor, while current roster records use Inspection Supervisor; the Coastal Supervisor JD states it supervises the Foreman and Coastal/Inland inspectors.
Unoccupied current classifications	DISTRICT FOLLOW-UP	Maintain the District's authorized classification inventory, including unoccupied classifications and combined-title series, as part of ongoing classification administration. Vacant status alone should not be treated as a reason for exclusion. If a classification is later activated or materially revised, the District should maintain a current job description and conduct targeted market review as appropriate.
Impoundment program accountability	DISTRICT FOLLOW-UP	Ecologist and Impoundment Supervisor both state responsibility for supervising the Impoundment Program/staff. Confirm the intended primary people-management and operational owner. The report recommends separating day-to-day impoundment operations from Ecologist environmental/scientific and regulatory responsibilities unless the District intentionally maintains a different model.
Operations leadership hierarchy	DISTRICT FOLLOW-UP	Assistant Director, Director of Operations, Coastal Supervisor, Inland Supervisor, and related Larvicide/Inspection titles contain overlapping or inconsistent supervisory statements. Confirm the intended current hierarchy and official titles so all JDs, the roster, organization chart, and salary schedule can be reconciled.
Surveillance title / series alignment	DISTRICT FOLLOW-UP	Confirm the relationship among Surveillance Coordinator, Surveillance Specialist, Surveillance Assistant, and Part-Time Surveillance Aide. Current source files do not establish that these titles are interchangeable or represent the same progression level.
Communications & Payroll Specialist JD	JD MAINTENANCE	Current Grade 9 JD is incorporated. Clarify minimum payroll-experience expectations, confirm whether Public Health Pest Control licensure is necessary for this administrative

Item	Status	District Follow-Up / Maintenance Item
		classification, and align the Director of Administration reporting title with the approved organization structure.
UAS Pilot / Vector Ecologist JD	JD / FLSA / LICENSURE MAINTENANCE	Current Grade 11 Exempt JD is incorporated as a distinct classification from the part-time Grade 8 UAS Pilot. Clarify Aerial Supervisor mission authority, verify the intended FLSA exemption basis, add/confirm FAA Part 107 or other required pilot credentials, and complete the truncated out-of-town meeting sentence.
GIS Specialist FLSA / document cleanup	CONSULTANT RECOMMENDATION	Recommend Non-Exempt based on the current duties. The JD describes an intermediate-level GIS support/analysis role emphasizing data maintenance, mapping, geoprocessing, scripting familiarity, field validation, and support to senior analysts. Remove the "CD GIS SPECIALIST" artifact and repair the incomplete General Scope sentence; revisit exemption only if the actual role exercises materially broader independent decision authority.
Director of Administration title / role boundaries	JD CLEANUP	The 08/28/2026 JD uses Director of Administration as the position title but retains residual Community Relations Director labeling. Standardize the title and confirm primary ownership boundaries among the Director of Administration, CFO, Executive Director, and Communications & Payroll Specialist.
Chief Financial Officer title / role boundaries	JD CLEANUP	The 08/27/2026 JD supports Grade 13 and Exempt treatment. Standardize Chief Financial Officer/Chief Finance Officer naming and clarify overlap in public records, Board support, HR backup, and administrative duties with the Director of Administration and Communications & Payroll Specialist.

PROFESSIONAL NOTE
The District's current classification and compensation framework has been reviewed using the available salary schedules, employee data, job descriptions, organizational records, and market evidence. The findings and recommendations in this report reflect the fully integrated study analysis and are intended to support consistent classification, compensation, and salary-administration decisions going forward.

11. Conclusion

The Indian River Mosquito Control District enters this review from a comparatively strong structural position. The market analysis does not indicate widespread salary-range underpricing; rather, most current range midpoints are above the collected market median. The study therefore supports a targeted strategy: preserve the strengths of the existing framework, modernize and smooth the salary structure, correct specific market gaps, place employees within appropriate range boundaries, and address the limited internal-equity relationships that warrant attention.

The recommended 14-grade structure provides a practical foundation for long-term administration because it preserves the District's established step-based architecture while correcting the unoccupied

Grade 12 sequencing issue. This approach avoids creating artificial below-minimum placements and directs attention to the classifications and internal-equity relationships that actually warrant review.

This report constitutes Synergized HR's completed classification and compensation study, including the recommended salary structure, implementation guidance, and supporting classification analysis. The District may address the administrative maintenance items identified in Section 10.2 as part of its ongoing classification and job-description management.

CLOSING PERSPECTIVE

The study supports targeted, evidence-based action rather than broad compensation expansion. That approach gives the District a defensible path to maintain competitiveness, strengthen internal equity, and preserve fiscal flexibility.

Appendix A - Detailed Market Comparison

Classification	Grade	Current Min	Current Mid	Current Max	Market Median	Dollar Diff.	Variance	Market Position	Comps	Strong	Moderate	Support
Administrative Assistant	4	$51,053	$70,288	$89,522	$54,517	$15,771	28.9%	>10% Above	10	5	5	Robust
Aerial Supervisor	10	$63,479	$87,395	$111,311	$100,781	-$13,386	-13.3%	>10% Below	4	2	2	Adequate
Chief Finance Officer	13	$84,389	$116,183	$147,977	$123,322	-$7,139	-5.8%	5-10% Below	5	3	2	Adequate
Coastal Foreman	7	$54,910	$75,597	$96,285	$61,593	$14,004	22.7%	>10% Above	7	3	4	Robust
Coastal Inspector	0	$0	$0	$0	$51,237	—	—	Unresolved	9	4	5	Robust
Coastal Inspector I	2	$42,591	$58,637	$74,683	$50,908	$7,729	15.2%	>10% Above	9	7	2	Robust
Coastal Inspector II	4	$51,053	$70,288	$89,522	$53,040	$17,248	32.5%	>10% Above	9	7	2	Robust
Communications & Payroll Specialist	9	$58,338	$80,316	$102,296	$64,784	$15,533	24.0%	>10% Above	10	0	10	Robust
Director of Administration	13	$84,389	$116,183	$147,977	$94,119	$22,064	23.4%	>10% Above	4	0	4	Adequate
Director of IT & Maintenance	13	$84,389	$116,183	$147,977	$107,500	$8,683	8.1%	5-10% Above	5	0	5	Adequate
Director of Scientific Programs	13	$84,389	$116,183	$147,977	$104,811	$11,372	10.8%	>10% Above	6	3	3	Robust
Ecologist	10	$63,479	$87,395	$111,311	$77,887	$9,508	12.2%	>10% Above	8	5	3	Robust
Education Specialist	10	$63,479	$87,395	$111,311	$64,052	$23,343	36.4%	>10% Above	8	6	2	Robust
Entomologist II	8	$56,324	$77,544	$98,764	$77,887	-$343	-0.4%	Within ±5%	8	4	4	Robust
Executive Director	14	$112,840	$155,353	$197,866	$122,633	$32,720	26.7%	>10% Above	4	3	1	Adequate
Field Efficacy Entomologist II	8	$56,324	$77,544	$98,764	$72,140	$5,404	7.5%	5-10% Above	6	1	5	Robust
Human Resources Assistant	4	$51,053	$70,288	$89,522	$57,724	$12,564	21.8%	>10% Above	5	1	4	Adequate
Human Resources Director	13	$84,389	$116,183	$147,977	$115,027	$1,156	1.0%	Within ±5%	5	2	3	Adequate
Impoundment Operator I	1	$36,774	$50,629	$64,484	$51,073	-$444	-0.9%	Within ±5%	8	1	7	Robust
Impoundment Supervisor	10	$63,479	$87,395	$111,311	$71,456	$15,939	22.3%	>10% Above	8	4	4	Robust
Inland Inspector II	4	$51,053	$70,288	$89,522	$52,832	$17,456	33.0%	>10% Above	9	7	2	Robust
Inland Inspector III	6	$53,796	$74,063	$94,331	$58,032	$16,031	27.6%	>10% Above	5	3	2	Adequate
Inspection Supervisor	10	$63,479	$87,395	$111,311	$72,987	$14,408	19.7%	>10% Above	8	5	3	Robust
Lab Assistant	1	$36,774	$50,629	$64,484	$53,347	-$2,718	-5.1%	5-10% Below	8	3	5	Robust
Larvicide Inspector	2	$42,591	$58,637	$74,683	$50,908	$7,729	15.2%	>10% Above	9	7	2	Robust
Maintenance Technician II	4	$51,053	$70,288	$89,522	$59,904	$10,384	17.3%	>10% Above	9	4	5	Robust
Marine Inspector II	6	$53,796	$74,063	$94,331	$52,624	$21,439	40.7%	>10% Above	8	3	5	Robust
Project Manager	9	$58,338	$80,316	$102,296	$85,013	-$4,697	-5.5%	5-10% Below	6	2	4	Robust
Research Entomologist	11	$66,243	$91,200	$116,158	$79,560	$11,640	14.6%	>10% Above	7	2	5	Robust
Surveillance Assistant	1	$36,774	$50,629	$64,484	$52,998	-$2,369	-4.5%	Within ±5%	8	6	2	Robust
Surveillance Specialist	5	$52,853	$72,766	$92,678	$65,645	$7,121	10.8%	>10% Above	7	4	3	Robust
UAS Pilot	8	$56,324	$77,544	$98,764	$68,538	$9,006	13.1%	>10% Above	2	2	0	Limited
ULV Specialist	5	$52,853	$72,766	$92,678	$56,887	$15,879	27.9%	>10% Above	7	3	4	Robust
UAS Pilot / Vector Ecologist	11	$66,243	$91,200	$116,158	$73,665	$17,536	23.8%	>10% Above	6	0	6	Robust
GIS Specialist	11	$66,243	$91,200	$116,158	$74,484	$16,716	22.4%	>10% Above	4	0	4	Adequate

The table above provides a quick-reference view of the full classification-level market comparison used in the final analysis. Color coding highlights each classification's market-position category, while the support column shows the breadth of comparator evidence. Market position reflects the current midpoint relative to the market median; Coastal Inspector is shown as unresolved because the current range is not confirmed.

EMPLOYEE PLACEMENT EXCEPTION

Maintenance Technician II is the sole employee above the recommended range maximum. Current pay: $90,875 | Recommended Grade 4 maximum: $89,522 | Amount above maximum: approximately $1,353 (1.5%). Recommended treatment: preserve current pay, review red-circle treatment and classification scope, and do not reduce pay. Employee-level placement exceptions are shown separately because Appendix A compares classification salary ranges to the external market, not individual employee pay.

Appendix B - Classification-to-Grade Assignments

How to read this appendix. This appendix summarizes the recommended grade treatment for each current classification. A recommendation to retain the current grade does not necessarily mean that every supporting classification document is complete or current. Where documentation is missing, conflicting, or available only through a related job-description series, the status identifies the item requiring District confirmation or future documentation. Market results alone were not used to resolve source-document conflicts or infer current job scope.

Status	Meaning
Recommended	Current evidence supports the recommended placement.
Provisional Retention — Current JD Needed	No current standalone JD was provided; current grade is retained provisionally from other records, but job-scope/FLSA or material reclassification conclusions require current duty documentation.
District Confirmation Required	A source conflict, related-title issue, or current-status question must be reconciled.
Targeted Review Required	Market and/or scope evidence warrants additional review before final placement.

Classification	Current Grade	Recommended Grade	Recommendation Status	Assignment Rationale
Administrative Assistant	4	4	Recommended	Retain current grade; market midpoint is below the current midpoint and administrative hierarchy supports placement.
Aerial Supervisor	10	10	Targeted Review Required	Retain modeled Grade 10 only pending District confirmation. Current Aerial Supervisor JD states Grade 8 while the salary schedule/model reflects Grade 10; market gap supports targeted review but does not resolve the source conflict.
Chief Finance Officer	13	13	Recommended	Retain executive leadership grade; current midpoint is within 5% of the market median.
Coastal Foreman	7	7	District Confirmation Required	Retain current modeled Grade 7 for analysis only. No Coastal Foreman JD was supplied; a Grade 7 Larvicide Foreman JD may reflect a related/reorganized function, but equivalency requires District confirmation.
Coastal Inspector	0	2	District Confirmation Required	The supplied source is a combined Coastal Inspector I/II JD with Grades 2/4. The roster also contains a separate Coastal Inspector title without a confirmed level/grade. Grade 2 is used for modeling only pending District confirmation of whether the roster title corresponds to Inspector I, Inspector II, or another level.
Coastal Inspector I	2	2	Recommended	Retain entry inspector grade; current range is above the market median.
Coastal Inspector II	4	4	Recommended	Retain advanced inspector grade above Inspector I and below foreman/supervisor levels.
Communications & Payroll Specialist	9	9	Recommended	Current Grade 9 JD validates the combined payroll, records, Board-support, and communications scope. Retain Grade 9; address JD drafting/role-boundary items through maintenance.

Classification	Current Grade	Recommended Grade	Recommendation Status	Assignment Rationale
Director of Administration	13	13	Recommended	Retain director grade based on the current Director of Administration JD, documented organizational scope, and peer-director internal equity. External market matches are Moderate, so the market result is contextual rather than determinative.
Director of IT & Maintenance	13	13	Recommended	Retain director grade based on enterprise IT, maintenance scope, and peer-director equity.
Director of Scientific Programs	13	13	Recommended	Retain director grade based on scientific-program leadership and peer-director equity.
Ecologist	10	10	District Confirmation Required	Do not finalize grade until the source conflict is resolved. Current Ecologist JD states Grade 8 while the salary schedule/model reflects Grade 10; market result alone does not resolve the official grade.
Education Specialist	10	10	Recommended	Retain professional grade based on role scope and current hierarchy; current midpoint is above market.
Entomologist II	8	8	Provisional Retention — Current JD Needed	Retain current Grade 8 absent evidence supporting change. No separate current Entomologist II JD was supplied; market result is near median and scope should be confirmed before any material reclassification. Update/confirm the current JD before any future material reclassification.
Executive Director	14	14	Provisional Retention — Current JD Needed	Retain current Grade 14 absent evidence supporting change. No separate current Executive Director JD was supplied; recommendation relies on existing schedule, organizational placement, and market evidence. Update/confirm the current JD before any future material reclassification.
Field Efficacy Entomologist II	8	8	Recommended	Retain professional scientific grade; current midpoint is within 5% of market median.
Human Resources Assistant	4	4	Recommended	Retain HR support grade; current midpoint is above market and role reports to HR Director.
Human Resources Director	13	13	Recommended	Retain director grade; current midpoint is within 5% of market median and peer-director equity supports placement.
Impoundment Operator I	1	1	District Confirmation Required	Do not finalize the grade until the source conflict is resolved. The salary schedule places Operator I at Grade 1, while the 04/30/2026 combined Impoundment Operator I/II JD lists Pay Grade 3. Market position is near median but does not resolve the official grade.
Impoundment Supervisor	10	10	Recommended	Retain supervisor grade above operators and aligned with other operational supervisors.
Inland Inspector II	4	4	Provisional Retention — Current JD Needed	Retain current Grade 4 absent evidence supporting change. No separate current Inland Inspector II JD was supplied; title/pay-plan and organizational evidence support the current relationship. Update/confirm the current JD before any future material reclassification.
Inland Inspector III	6	6	Provisional Retention — Current JD Needed	Retain current Grade 6 absent evidence supporting change. No separate current Inland Inspector III JD was supplied; title/pay-plan and organizational evidence support the current relationship. Update/confirm the current JD before any future material reclassification.
Inspection Supervisor	10	10	District Confirmation Required	Retain current modeled Grade 10 for analysis only. No Inspection Supervisor JD was supplied; a Grade 10 Coastal Supervisor JD may reflect the current function, but equivalency requires District confirmation.
Lab Assistant	1	1	Recommended	Retain entry laboratory grade; modest market gap can be addressed through range update and employee placement rather than reclassification.

Classification	Current Grade	Recommended Grade	Recommendation Status	Assignment Rationale
Larvicide Inspector	2	2	Recommended	Retain entry inspector grade and alignment with Coastal Inspector I.
Maintenance Technician II	4	4	Recommended	Retain skilled technician grade; current range is above the market median.
Marine Inspector II	6	6	District Confirmation Required	Do not finalize the classification relationship until sources are reconciled. The salary schedule places Marine Inspector II at Grade 6, while the 04/25/2025 combined Marine Inspector I/II JD lists Grade 3 and Larvicide Supervisor as Reports To; the roster uses Inspection Supervisor.
Project Manager	9	9	Recommended	Current 08/18/2026 JD confirms Grade 9, Non-Exempt status, Impoundment Supervisor reporting, and expanded infrastructure/project/UAS responsibilities. Market result supports monitoring, not automatic regrade.
Research Entomologist	11	11	Recommended	Retain senior scientific professional grade above Entomologist II and below scientific director.
Surveillance Assistant	1	1	District Confirmation Required	A Part-Time Surveillance Aide JD was supplied, but the source does not establish that Surveillance Aide and Surveillance Assistant are the same classification. Retain modeled Grade 1 for analysis pending title/series confirmation.
Surveillance Specialist	5	5	Provisional Retention — Current JD Needed	Retain current Grade 5 absent evidence supporting change. No separate current Surveillance Specialist JD was supplied; title/pay-plan and organizational evidence support the current relationship. Update/confirm the current JD before any future material reclassification.
UAS Pilot	8	8	Recommended	Retain specialized technical grade and subordinate relationship to Aerial Supervisor.
ULV Specialist	5	5	Recommended	Retain specialist grade and internal alignment with Surveillance Specialist.
UAS Pilot / Vector Ecologist	11	11	Recommended	Current Grade 11 JD supports hybrid UAS/vector-ecology scope. Confirm relationship to the separate part-time UAS Pilot and clarify FAA/FLSA documentation.
GIS Specialist	11	11	Recommended - Non-Exempt	Retain Grade 11 based on technical GIS complexity, enterprise geodatabase/spatial-analysis responsibilities, and internal professional alignment. Market evidence from four public-sector GIS observations places the current midpoint above market. Recommend Non-Exempt under the duties as written.

Appendix C - Comparator Organizations and Source Status

Comparator Organization	Tier	Organization Type	Comp Data	Benefits Data	JD Data	Source Status
St. Lucie County Mosquito Control District	Tier 1	County Mosq. Program	No	No	No	No Response
Brevard County Mosquito Control Department	Tier 1	County Dept.	No	No	No	No Response
Martin County Mosquito Control	Tier 1	County Dept.	Yes	No	Yes	Received
East Flagler Mosquito Control District	Tier 1	Special District	Yes	Yes	No	Received
Anastasia Mosquito Control District	Tier 1	Special District	Yes	Yes	Yes	Received
Citrus County Mosquito Control District	Tier 1	Special District	Yes	Yes	Yes	Received
Pasco County Mosquito Control District	Tier 1	Special District	Yes	Yes	No	Received
Manatee County Mosquito Control District	Tier 1	Special District	No	No	No	No Response
Collier Mosquito Control District	Tier 1	Special District	Yes	Yes	Yes	Received
Lee County Mosquito Control District	Tier 1	Special District	No	No	No	No Response
Volusia County Mosquito Control / East Volusia Mosquito Control District	Tier 1	Special District / County	Yes	Yes	No	Received
Amelia Island Mosquito Control District	Tier 1	Special District	No	No	No	No Response
Florida Keys Mosquito District	Tier 1	Special District	Yes	Yes	Yes	Received
Palm Beach County Mosquito Control	Tier 2	County Dept.	Yes	No	No	Received
Pinellas County Mosquito Control	Tier 2	County Dept.	Yes	No	Yes	Received
Sarasota County Mosquito Management Services	Tier 2	County Dept.	Yes	Yes	Yes	Received
Hillsborough County Mosquito Management Services	Tier 2	County Dept.	No	No	No	No Response
Lake County Mosquito & Aquatic Plant Management	Tier 2	County Dept.	No	No	No	No Response
Hernando County Mosquito Control	Tier 2	County Dept.	Yes	Yes	No	Received
Beach Mosquito Control District	Tier 2	Special District	Yes	Yes	Yes	Received
South Walton County Mosquito Control District	Tier 2	Special District	No	No	No	No Response
Indian River County	Tier 3	County Govt.	No	No	No	No Response
City of Vero Beach	Tier 3	Municipal Govt.	No	No	No	No Response
City of Sebastian	Tier 3	Municipal Govt.	No	No	No	No Response
St. Lucie County	Tier 3	County Govt.	No	No	No	No Response
City of Fort Pierce	Tier 3	Municipal Govt.	No	No	No	No Response
City of Port St. Lucie	Tier 3	Municipal Govt.	No	No	No	No Response

Comparator Organization	Tier	Organization Type	Comp Data	Benefits Data	JD Data	Source Status
Martin County	Tier 3	County Govt.	Yes	No	Yes	Received
Brevard County	Tier 3	County Govt.	No	No	No	No Response
Okeechobee County	Tier 3	County Govt.	No	No	No	No Response
Indian River County Sheriff's Office	Tier 3	Law Enforcement	Yes	Yes	No	Received

Appendix D - Glossary of Terms

Above Market: A salary-range midpoint that is higher than the selected external market reference. Above market does not mean an individual employee is overpaid.

Adequate Market Support: A market result supported by salary data from three to five distinct comparator organizations. This reflects sample breadth, not individual match quality.

At-Market Range (±5%): The competitive zone within which a District salary-range midpoint is considered broadly aligned with the market median.

Below Market: A salary-range midpoint that is lower than the selected external market reference.

Benchmark Position: A District classification for which one or more sufficiently comparable external positions are used to establish a market reference.

Classification: A defined job or group of substantially similar jobs with common duties, responsibilities, qualifications, and an assigned pay grade.

COLA (Cost-of-Living Adjustment): A general pay or salary-structure adjustment intended to respond to broad changes in prices or labor-market conditions. A COLA is different from a merit, market, or promotional increase.

Compa-Ratio: An employee's salary divided by the salary-range midpoint. A compa-ratio of 1.00 means pay is exactly at midpoint; a ratio below 1.00 means pay is below midpoint.

Comparator Organization: A public organization selected because of service similarity, labor-market relevance, geography, workforce characteristics, or availability of comparable positions.

District Confirmation Required: A report status indicating that a source conflict, title relationship, grade, reporting relationship, or other record issue requires confirmation from IRMCD before the item is finalized.

Exempt / Non-Exempt: FLSA classifications that determine overtime eligibility. Non-exempt employees are generally eligible for overtime; exempt status depends on both salary-basis and duties tests.

External Equity: The relationship between District compensation and pay for comparable work in the external labor market.

FLSA (Fair Labor Standards Act): The federal law governing minimum wage, overtime, recordkeeping, and related wage-and-hour requirements. FLSA status in this study is considered where documented in District source materials.

Grade: A level in the salary structure that groups classifications with reasonably comparable scope, responsibility, complexity, and internal value.

Internal Equity: The fairness and consistency of pay relationships among District employees and classifications, considering responsibility, scope, supervision, experience, qualifications, and organizational hierarchy.

Limited Market Support: A market result supported by fewer than three distinct comparator organizations. The underlying individual matches may still be strong, but the market sample is narrow.

Market Adjustment: A targeted compensation change made when current pay or a salary range is materially out of alignment with the external labor market.

Market Median: The middle value of the ranked comparator midpoint observations retained for a classification. Half of the observations fall above it and half below it.

Market Observation: One retained comparator job/pay data point that met the study's source-quality and job-matching standards. Multiple observations may support one District classification.

Market Position: The relationship between the District's salary-range midpoint and the external market median for a classification.

Market Variance: The percentage difference between the District midpoint and the market median midpoint: (District Midpoint ÷ Market Median) − 1.

Moderate Match: A comparator position that is sufficiently similar for inclusion but has one or more meaningful differences in scope, level, authority, supervision, or organizational context that require professional interpretation.

Pay Inversion: A situation in which an employee earns more than the person who directly supervises them. A pay inversion is one specific form of pay compression.

Promotional Placement: The pay-setting decision made when an employee moves into a higher-level classification or grade. Placement should consider the new range minimum, advancement opportunity, experience, and internal equity.

Quartile: One of four equal segments of a salary range. The first quartile is the lowest 25% of the range; the fourth quartile is the highest 25%.

Range Maximum: The upper boundary of a salary range. Pay above maximum is an exception that requires defined salary-administration treatment.

Range Midpoint: The center of a salary range and the primary external benchmarking reference used in this study.

Range Minimum: The lower boundary of a salary range and the normal entry reference for an employee who meets the basic requirements of the classification.

Range Penetration: An employee's position within a salary range, measured from the minimum toward the maximum.

Range Spread: The percentage difference between the minimum and maximum of a salary range. A wider spread provides more room for pay progression within the same grade.

Reclassification: A change to a job's classification or grade based on a material change in duties, scope, authority, responsibility, or other job factors—not simply because of individual performance or tenure.

Red-Circle Pay: Pay that exceeds the established maximum of an assigned salary range. Base pay is typically preserved rather than reduced, while future increases are managed under the organization's salary-administration policy.

Robust Market Support: A market result supported by salary data from six or more distinct comparator organizations. This reflects sample breadth, not individual match quality.

Salary Administration: The policies and practices used to place employees in ranges and manage hiring pay, promotions, progression, market adjustments, above-maximum pay, and other compensation decisions.

Salary Compression: Insufficient pay differentiation between employees or classifications with meaningfully different responsibility, experience, tenure, or supervisory authority.

Step: A defined pay point within a salary grade. IRMCD's current structure contains 20 steps within each grade.

Step Progression: The percentage increase from one salary step to the next within a grade. IRMCD's current structure generally uses approximately 3% between steps.

Strong Match: A comparator position with high functional similarity in duties, scope, responsibility, authority, supervision, qualifications, complexity, and organizational context.

Targeted Review Required: A report status indicating that market pressure, job scope, or another substantive factor warrants focused review before final grade or pay action.

Total Compensation: The combined value of base salary and employer-provided benefits and supplemental compensation elements. This study uses base salary ranges as the primary market benchmark and supplemental practices as contextual analysis.

Primary Accountability: The duties, decisions, outcomes, staff, or program responsibilities for which a classification is principally responsible. Primary accountability should be distinguished from cross-training or temporary support.

Role Architecture: The organized relationship among job titles, levels, reporting lines, decision authority, and career progression within a function or job family.

Cross-Functional Support: Work performed to assist another function or classification without transferring permanent primary ownership of that work. Cross-functional support should not replace clear accountability in the job description.

Appendix E - Visual Market & Implementation Summary

This visual appendix consolidates the principal market-position, market-support, employee-placement, and implementation findings used throughout the report. The market findings are unchanged; the employee-placement and implementation visuals reflect the recalibrated salary structure.

35	34	76%	241
CLASSIFICATIONS	**MARKET COMPARISONS**	**>5% ABOVE MARKET**	**APPROVED OBSERVATIONS**
current classifications analyzed	with calculable variance	26 of 34 calculable classifications	retained after match review

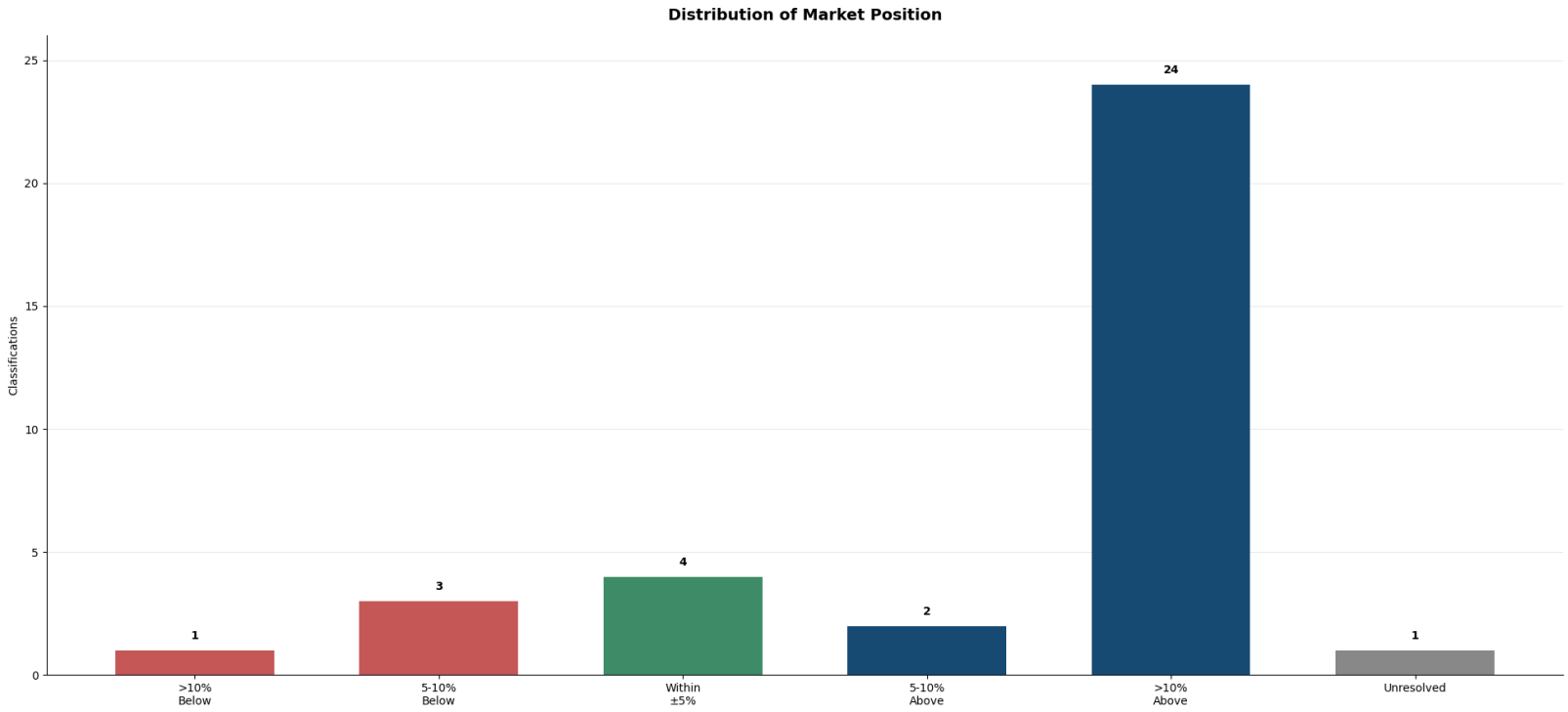


Figure E.1 - Market position distribution. Source: Synergized HR market analysis workbook, August 2026.

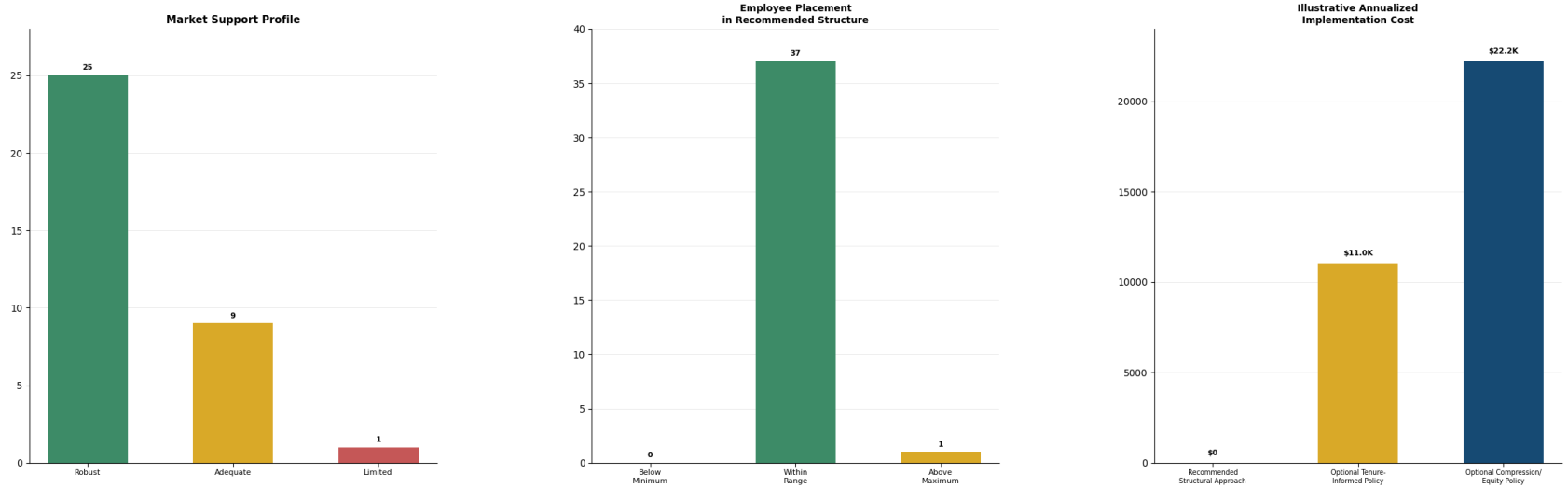


Figure E.2 - Market support, employee placement in the recommended structure, and illustrative optional policy scenarios. Source: Synergized HR compensation study workbook, August 2026.

External Range Position	Most current salary-range midpoints are above the collected market median; broad upward range movement is not supported.
Internal Placement	No employee falls below a recommended range minimum; one employee is above the recommended maximum.
Evidence Quality	34 of 35 classifications have Robust or Adequate market support; the separate part-time UAS Pilot is the only Limited-support classification.
Implementation Choice	Structural retention creates no minimum-placement cost. Tenure and compression scenarios are optional policy illustrations, not commitments.

Appendix F - Baseline Classification Reconciliation

This appendix reconciles all 53 classifications listed in the District's baseline salary schedule to the current 2026 roster, available job descriptions, and the 35-classification market model. A baseline title does not disappear from the study simply because it is not separately benchmarked: combined-title series, unoccupied classifications, title changes, and unresolved current-status items remain documented below.

Reconciliation Measure	Count	Meaning
Baseline salary-schedule records	**53**	Full classification universe reviewed through reconciliation.
Baseline records represented in market model	**29**	Represented under the same title or a reconciled current title.
Baseline records not separately benchmarked	**24**	Remain documented below; status may be combined, unoccupied/current, or confirmation-needed.
Current classifications outside discrete baseline records	**6**	Coastal Inspector, Field Efficacy Entomologist II, Impoundment Supervisor, Larvicide Inspector, UAS Pilot / Vector Ecologist, and GIS Specialist.
Current market model	**35**	29 baseline-represented classifications + 6 current classifications outside discrete baseline records.

Current classifications represented outside discrete baseline records

Current Addition 1	Current Addition 2	Current Addition 3	Current Addition 4
Coastal Inspector	**Field Efficacy Entomologist II**	**Impoundment Supervisor**	**Larvicide Inspector**
Current Addition 5	**UAS Pilot / Vector Ecologist**		
Current Addition 6	**GIS Specialist**		

Full 53-record baseline reconciliation

Grade	Baseline Salary-Schedule Title	Current / Reconciled Title	2026 Study Disposition
1	Maintenance Assistant I	—	Not separately benchmarked in the current market model. Confirm whether the baseline classification remains current, vacant, renamed, or superseded.
1	Impoundment Operator I	Impoundment Operator I/II	Represented in 35-classification market model as Impoundment Operator I. District confirmation remains required.
1	Lab Assistant I	Laboratory Assistant	Represented in 35-classification market model as Lab Assistant. Current title/reconciliation noted.
1	Surveillance Assistant	Part-Time Surveillance Aide	Represented in 35-classification market model as Surveillance Assistant. Current title/reconciliation noted.
2	Maintenance Assistant II	—	Not separately benchmarked in the current market model. Confirm whether the baseline classification remains current, vacant, renamed, or superseded.
2	Lab Tech I	Laboratory Technician I	Not separately benchmarked in the current 35-classification model; current/updated title remains documented for classification inventory review.
2	Surveillence Coordinator	Surveillance Coordinator	Not separately benchmarked in the current 35-classification model; current/updated title remains documented for classification inventory review.

Grade	Baseline Salary-Schedule Title	Current / Reconciled Title	2026 Study Disposition
2	Coastal Inspector I	Coastal Inspector I/II	Represented in 35-classification market model as Coastal Inspector I. Supported through combined-title series.
2	Inspector I (Inland)	—	Not separately benchmarked in the current market model. Confirm whether the baseline classification remains current, vacant, renamed, or superseded.
2	Maintenance Technician I	Maintenance Technician I	Not separately benchmarked in the current 35-classification model; current classification remains documented for inventory/current-status review.
3	Payroll Coordinator	Communications & Payroll Specialist	Reconciled to the current Grade 9 Communications & Payroll Specialist, which now carries primary payroll ownership along with records/administrative and communications responsibilities.
3	Marine Inspector I	Marine Inspector I/II	Not separately benchmarked as its own current title. Reconciled through the combined-title series shown at left.
3	Admin Clerk	Administrative Clerk/Assistant	Not separately benchmarked as its own current title. Reconciled through the combined-title series shown at left.
3	Aerial Coordinator	Aerial Coordinator/Specialist	Not separately benchmarked as its own current title. Reconciled through the combined-title series shown at left.
3	Impoundment Operator II	Impoundment Operator I/II	Not separately benchmarked as its own current title. Reconciled through the combined-title series shown at left.
3	Lab Assistant II	—	Not separately benchmarked in the current market model. Confirm whether the baseline classification remains current, vacant, renamed, or superseded.
4	Coastal Inspector II	Coastal Inspector I/II	Represented in 35-classification market model as Coastal Inspector II. Supported through combined-title series.
4	HR Assistant	Human Resources Assistant	Represented in 35-classification market model as Human Resources Assistant. Current title/reconciliation noted.
4	Admin Assistant	Administrative Clerk/Assistant	Represented in 35-classification market model as Administrative Assistant. Supported through combined-title series.
4	ULV Coordinator	ULV Coordinator/Specialist	Not separately benchmarked as its own current title. Reconciled through the combined-title series shown at left.
4	Inspector II (Inland)	Inland Inspector II	Represented in 35-classification market model as Inland Inspector II. Current title/reconciliation noted.
4	Maintenance Technician II	Maintenance Technician II	Represented in 35-classification market model as Maintenance Technician II. Current benchmark treatment.
4	Operations Technician	Operations Technician	Not separately benchmarked in the current 35-classification model; current classification remains documented for inventory/current-status review.
5	Lab Tech II	Laboratory Technician II	Not separately benchmarked in the current market model. Unoccupied classification remains supported as current/valid and should be confirmed for final inventory treatment.
5	Surveillence Specialist	Surveillance Specialist	Represented in 35-classification market model as Surveillance Specialist. Current title/reconciliation noted.
5	ULV Specialist	ULV Coordinator/Specialist	Represented in 35-classification market model as ULV Specialist. Supported through combined-title series.

Grade	Baseline Salary-Schedule Title	Current / Reconciled Title	2026 Study Disposition
6	Marine Inspector II	Marine Inspector I/II	Represented in 35-classification market model as Marine Inspector II. District confirmation remains required.
6	Inspector III (Inland)	Inland Inspector III	Represented in 35-classification market model as Inland Inspector III. Current title/reconciliation noted.
7	Larvicide Foreman	Larvicide Foreman	Represented in 35-classification market model as Coastal Foreman (pending title confirmation). Title equivalency remains pending District confirmation.
7	Entomologist I	—	Not separately benchmarked in the current market model. Confirm whether the baseline classification remains current, vacant, renamed, or superseded.
7	Aerial Specialist	Aerial Coordinator/Specialist	Not separately benchmarked as its own current title. Reconciled through the combined-title series shown at left.
7	Project Manager	Project Manager	Represented in the 35-classification market model as Project Manager at current Grade 9; current JD reviewed and incorporated.
8	Human Resource Manager	—	Not separately benchmarked in the current market model. Confirm whether the baseline classification remains current, vacant, renamed, or superseded.
8	Entomologist II	Entomologist II	Represented in 35-classification market model as Entomologist II. Current benchmark treatment.
8	Communications Coordinator	Communications & Payroll Specialist	Represented in the 35-classification market model as Communications & Payroll Specialist at current Grade 9; title/scope updated through current JD.
8	UAS Pilot	Unmanned Aerial Systems Pilot	Represented in the 35-classification market model as the separate part-time UAS Pilot at Grade 8. The Grade 11 UAS Pilot / Vector Ecologist is treated as a distinct current classification with broader scientific and operational scope.
9	Senior Entomologist	—	Not separately benchmarked in the current market model. Confirm whether the baseline classification remains current, vacant, renamed, or superseded.
10	IT Specialist	—	Not separately benchmarked in the current market model. Confirm whether the baseline classification remains current, vacant, renamed, or superseded.
10	Coastal Supervisor	Coastal Supervisor	Represented in 35-classification market model as Inspection Supervisor (pending title confirmation). Title equivalency remains pending District confirmation.
10	Maintenance Supervisor	Maintenance Supervisor	Not separately benchmarked in the current market model. Unoccupied classification remains supported as current/valid and should be confirmed for final inventory treatment.
10	Inland Supervisor	Inland Supervisor	Not separately benchmarked in the current 35-classification model; current classification remains documented for inventory/current-status review.
10	Ecologist	Ecologist	Represented in 35-classification market model as Ecologist. Current benchmark treatment.
10	Aerial Supervisor	Aerial Supervisor	Represented in 35-classification market model as Aerial Supervisor. Current benchmark treatment.

Grade	Baseline Salary-Schedule Title	Current / Reconciled Title	2026 Study Disposition
10	Education Specialist	Education Specialist	Represented in 35-classification market model as Education Specialist. Current benchmark treatment.
11	Research Entomologist	Research Entomologist	Represented in 35-classification market model as Research Entomologist. Current benchmark treatment.
12	IT Manager	—	Not separately benchmarked in the current market model. Confirm whether the baseline classification remains current, vacant, renamed, or superseded.
13	Chief Financial Officer	Chief Financial Officer	Represented in the 35-classification market model as Chief Financial Officer at Grade 13; current 08/27/2026 JD reviewed and incorporated.
13	Director of IT and Maintenance Services	Director of IT, Fleet & Facilities Maintenance	Represented in 35-classification market model as Director of IT & Maintenance. Current title/reconciliation noted.
13	Director of Scientific Programs	Director of Scientific Programs	Represented in 35-classification market model as Director of Scientific Programs. Current benchmark treatment.
13	Human Resource Director	Director of Human Resources	Represented in 35-classification market model as Human Resources Director. Current title/reconciliation noted.
13	Director of Administration	Director of Administration	Represented in 35-classification market model as Director of Administration. Current benchmark treatment.
13	Assistant Director	Assistant Director	Not separately benchmarked in the current 35-classification model; current classification remains documented for inventory/current-status review.
14	Executive Director	Executive Director	Represented in 35-classification market model as Executive Director. Current benchmark treatment.
11	—	GIS Specialist	Current Grade 11 GIS Specialist classification supported by 08/28/2026 JD and included in the 35-classification market model. No incumbent documented; Non-Exempt recommended based on duties as written.

Interpretation note. The 35-classification market model is a current analytical set, not a claim that the District has only 34 classification records. Appendix F preserves the full 53-record baseline history and identifies the records that remain combined, unoccupied, title-updated, or pending District confirmation.

For classifications maintained outside the current benchmark set, the District should keep current job descriptions on file and conduct targeted market review when a classification is activated, materially revised, or organizational needs change.

JANICE BRODA, COMMISSIONER
ANNA KIRKLAND, COMMISSIONER
THOMAS LOWTHER, COMMISSIONER
ISIK UNLU, EXECUTIVE DIRECTOR

MEMORANDUM

Date: September 8, 2026

To: Board of Commissioners

From: Isik Unlu, Executive Director

Subject: FY 2026-2027 Budget Consideration

At the July 14th meeting, the Board voted to set the millage at 0.2848. This is 22.49% greater than the current fiscal year and 29.57% greater than the rolled back rate. Final property valuations were received, and staff rebalanced the budget accordingly to reflect the updated figures.

Attached are summaries of three budget options for consideration. These options will be presented to Board members at the September 17th Tentative Budget TRIM Hearing. All budget options presented in September contain the following changes from the July Preliminary Budget.

Changes to budget position:

- Cash balance forward has been adjusted to $4,955.913.
- Employee health insurance values were adjusted to 20.4% or increased by $112K
- Operating Expense increased by $152k
- Repair & Maintenance $79k
- Other Charges decreased by $10K, since the FEMA overpayment was returned
- Office supplies decreased overall by $36k, reclassified new software implementation cost $70K, added IT solutions $34k.
- Chemicals decreased by $14K
- Misc. supplies increased by $5K
- Capital Outlay increased to support the following: software implementation cost $70k, surveyor equipment $18k, BG Lures $ 14K and science greenhouse/fishery $20k.
- Contingency decreased by $2k

<u>Budget Options:</u>

Option 1: Millage rate = 0.2611; Operating Budget = $10,688,192
Millage is 12.30% greater than FY2025-2026, 17.51% greater than rolled back rate; advertised as a tax increase.

Option includes:

- Employee salary increase of 2.8% COLA and 3% Merit (one step in the pay plan)
- $2.8M Reserve Fund Balance, comprised of $1.6M Future Capital Outlay, $1.1M Cash Forward Reserve (1.25 months), and $84K Sick and Annual Leave Reserve

Option 2: Millage rate = 0.2425; Operating Budget = $10,688,192
Millage is 4.3% greater than FY2025-2026, 9.14% greater than rolled back rate; advertised as a tax increase.

Option includes:

- Employee salary increase of 2.8% COLA and 3% Merit (one step in the pay plan)
- $2.2M Reserve Fund Balance, comprised of $1.3M Future Capital Outlay, $848K Cash Forward Reserve (1 month), and $84K Sick and Annual Leave Reserve

Option 3: Millage rate = 0.2325; Operating Budget = $10,580,664

Millage is the same as FY2025-2026, 4.64% greater than rolled back rate; advertised as a tax increase.

Option includes:

- Employee salary increase of 3% COLA
- $1.9M Reserve Fund Balance, comprised of $1.2M Future Capital Outlay, $630K Cash Forward Reserve (3/4 month), and $84K Sick and Annual Leave Reserve

Indian River Mosquito Control District

September Budget Comparison

Fiscal Year 2026-2027

Gross Taxable Value: 6.06% up from FY 2025-2026

Taxing authorities may levy a millage up to 110 percent of the majority vote maximum millage rate.

Option	Millage Rate	FY 2026-2027 Total Budget	% Total Budget Change vs. FY 25-26	Operating Budget	% Operating Budget Change vs. FY 25-26	Budget Highlights	Tax Bill on Average IRC Home valued at $324,000, with homestead exemption	Dollar amount increase/decrease comapared to FY 2025-2026
Current Budget FY 25-26	0.2325	$11,617,620		$9,360,517		• 2% COLA, 3% Merit • Contingency $444,255 • Current Reserve Funding $2.3M: ▪ $1.2M Future Capital Outlay ▪ $926K Cash Bal FWD ▪ $104K Sick/Annual Leave • (2) Emergency Aerial Adulticide Missions	$75.33	
1	**0.2611** (17.51% greater than rolled-back rate)	$13,721,245	15.7%	$10,709,711	14.2%	• 2.8% COLA, 3% Merit • Contingency $507,267 • Reserve Funding $3M: ▪ $1.7M Future Capital Outlay ▪ $1.2M Cash Bal FWD ▪ $84K Sick/Annual Leave • (2) Emergency Aerial Adulticide Missions	$84.60	$9.27
2	**0.2425** (9.14% greater than rolled-back rate)	$13,125,484	10.6%	$10,709,711	14.2%	• 2.8% COLA, 3% Merit, • Contingency $507,267 • Current Reserve Funding $2.4M: ▪ $1.3M Future Capital Outlay ▪ $1M Cash Bal FWD ▪ $84K Sick/Annual Leave • (2) Emergency Aerial Adulticide Missions	$78.57	$3.24
3	**0.2325** (4.64% greater than rolled-back rate)	$12,799,141	7.90%	$10,602,183	13.0%	• 3% COLA • Contingency $506,998 • Current Reserve Funding $2.2M: ▪ $1.2M Future Capital Outlay ▪ $845K Cash Bal FWD ▪ $84K Sick/Annual Leave • (2) Emergency Aerial Adulticide Missions	$75.33	$0.00

Fiscal Year 2026-2027 Draft Budget

Taxable Value

Gross Taxable Value For 2025-2026	$31,782,335,481		
Gross Taxable Value For 2026-2027	$33,832,060,133	**6.06%**	**Difference**

SOURCE OF REVENUE 2026-2027

AD VALOREM	**0.2611**	**Proposed Millage**
Local Tax Request	$ 8,833,550.90	
Less Uncollectible of 5%	$ 441,677.55	
Net Local Tax Request	**$ 8,391,873.36**	

Option 1:
- ☐ COLA@ 2.8%, Merit@ 3%
- ☐ $2.8 M Reserve Fund Balance

Proposed millage rate of	0.2611	12.30%	greater than last year's rate of	0.2325
Proposed millage rate of	0.2611	17.51%	greater than Rolled Back rate of	0.2222

LINE-ITEM BUDGET SUMMARY

	TOTAL FUNDS 2025-2026 Budget	% of budget	TOTAL FUNDS 2026-2027 Budget	% of budget	$ increase	% increase	GENERAL FUND 2026-2027 Budget	STATE FUND 2026-2027 Budget	OPEB FUND 2026-2027 Budget
ESTIMATED INCOME									
311.000 Ad Valorem Taxes	$ 7,075,804.67	59.6%	$ 8,391,873.36	61.2%	$ 1,316,068.69	18.6%	$ 8,391,873.36		
334.100 State Grant	-	0.0%	-	0.0%	-				
337.000 Grants and Donations	10,400.00	0.1%	30,477.03	0.2%	20,077.03	193.0%	29,127.03		1,350.00
361.000 Interest	48,391.66	0.4%	69,749.52	0.5%	21,357.86	44.1%	62,749.52	-	7,000.00
364.00 Eqpt and Other Sales	-	0.0%	42,500.00	0.3%	42,500.00		42,500.00		
369.000 Misc./Refunds (prior yr expenditures)	-	0.0%	2,000.00	0.0%	2,000.00	#DIV/0!	2,000.00		
380.000 Other Sources		0.0%	-	0.0%	-				
TOTAL SOURCES	7,134,596.33	60.1%	8,536,599.91	62.2%	1,402,003.58	19.7%	8,528,249.91	-	8,350.00
Fund Balances/Reserves/Net Assets	4,729,563.26	39.9%	5,184,645.52	37.8%	455,082.26	9.6%	4,955,913.52	-	228,732.00
Total Revenues, Transfers & Balances	**$ 11,864,159.59**	100.0%	**$13,721,245.43**	100.0%	$ 1,857,085.84	15.7%	**$13,484,163.43**	**$ -**	**$ 237,082.00**
EXPENDITURES									
10-15 PERSONNEL EXPENDITURES	2,794,311.37	23.6%	2,766,637.51	20.2%	(27,673.86)	-1.0%	2,766,637.51		
21-25 PERSONNEL BENEFITS	1,443,948.66	12.2%	1,581,784.25	11.5%	137,835.59	9.5%	1,562,380.25		19,404.00
30-34 PROF SERVICES	1,674,565.13	14.1%	1,972,883.65	14.4%	298,318.52	17.8%	1,971,383.65		1,500.00
40-49 RPR/SRVC/TRVL	528,304.36	4.5%	617,037.42	4.5%	88,733.06	16.8%	616,822.42		215.00
51-55 SUPPLY/MTRL/TRNG	312,779.23	2.6%	410,062.46	3.0%	97,283.23	31.1%	410,062.46		
52.1 GAS/OIL/LUBE	74,000.00	0.6%	87,500.00	0.6%	13,500.00	18.2%	87,500.00		
52.2 CHEM/SUPPLY	1,377,441.56	11.6%	1,524,637.51	11.1%	147,195.95	10.7%	1,524,637.51		
62-64 CAPITAL OUTLAY	730,881.82	6.2%	1,241,900.95	9.1%	511,019.13	69.9%	1,241,900.95		
89 CONTINGENCY	444,654.46	3.7%	507,266.81	3.7%	62,612.35	14.1%	506,866.81	-	400.00
TOTAL EXPENDITURES	9,380,886.59	79.1%	10,709,710.56	78.1%	1,328,823.97	14.2%	10,688,191.56	-	21,519.00
Fund Balances/Net Assets					-				
.001 FUTURE CAPITAL OUTLAY	1,226,250.00	10.3%	1,650,954.00	12.0%	424,704.00	34.6%	1,650,954.00		
.003 CASH CARRYOVER	1,152,594.83	9.7%	1,276,117.66	9.3%	123,522.83	10.7%	1,060,554.66		215,563.00
.004 SICK and ANNUAL LEAVE	104,428.17	0.9%	84,463.21	0.6%	(19,964.96)	-19.1%	84,463.21		
Fund Balances/Reserves/Net Assets	2,483,273.00	20.9%	3,011,534.87	21.9%	528,261.87	21.3%	2,795,971.87	-	215,563.00
Total Appropriated Expenditures Transfers, Reserves & Balances	**$ 11,864,159.59**	100.0%	**$13,721,245.43**	100.0%	1,857,085.84	15.7%	**$13,484,163.43**	**$ -**	**$ 237,082.00**

Fiscal Year 2026-2027 Draft Budget

Taxable Value

Gross Taxable Value For 2025-2026	$31,782,335,481		
Gross Taxable Value For 2026-2027	$33,832,060,133	**6.06%**	**Difference**

SOURCE OF REVENUE 2026-2027

AD VALOREM	**0.2425**	**Proposed Millage**
Local Tax Request	$ 8,204,274.58	
Less Uncollectible of 5%	$ 410,213.73	
Net Local Tax Request	**$ 7,794,060.85**	

Option 2:
☐ COLA @ 2.8%, Merit @ 3%
☐ $2.2M Reserve Fund Balance

Proposed millage rate of	0.2425	4.30%	greater than last year's rate of	0.2325
Proposed millage rate of	0.2425	9.14%	greater than Rolled Back rate of	0.2222

LINE-ITEM BUDGET SUMMARY

	TOTAL FUNDS 2025-2026 Budget	% of budget	TOTAL FUNDS 2026-2027 Budget	% of budget	$ increase	% increase	GENERAL FUND 2026-2027 Budget	STATE FUND 2026-2027 Budget	OPEB FUND 2026-2027 Budget
ESTIMATED INCOME									
311.000 Ad Valorem Taxes	$ 7,075,804.67	59.6%	$ 7,794,060.85	59.4%	$ 718,256.18	10.2%	$ 7,794,060.85		
334.100 State Grant	-	0.0%	-	0.0%	-				
337.000 Grants and Donations	10,400.00	0.1%	30,477.03	0.2%	20,077.03	193.0%	29,127.03		1,350.00
361.000 Interest	48,391.66	0.4%	71,800.10	0.5%	23,408.44	48.4%	64,800.10	-	7,000.00
364.00 Eqpt and Other Sales	-	0.0%	42,500.00	0.3%	42,500.00		42,500.00		
369.000 Misc./Refunds (prior yr expenditures)	-	0.0%	2,000.00	0.0%	2,000.00	#DIV/0!	2,000.00		
380.000 Other Sources		0.0%	-	0.0%	-				
TOTAL SOURCES	7,134,596.33	60.1%	7,940,837.98	60.5%	806,241.65	11.3%	7,932,487.98	-	8,350.00
Fund Balances/Reserves/Net Assets	4,729,563.26	39.9%	5,184,645.52	39.5%	455,082.26	9.6%	4,955,913.52	-	228,732.00
Total Revenues, Transfers & Balances	**$11,864,159.59**	100.0%	**$13,125,483.50**	100.0%	$ 1,261,323.91	10.6%	**$ 12,888,401.50**	**$ -**	**$ 237,082.00**
EXPENDITURES									
10-15 PERSONNEL EXPENDITURES	2,794,311.37	23.6%	2,766,637.51	21.1%	(27,673.86)	-1.0%	2,766,637.51		
21-25 PERSONNEL BENEFITS	1,443,948.66	12.2%	1,581,784.25	12.1%	137,835.59	9.5%	1,562,380.25		19,404.00
30-34 PROF SERVICES	1,674,565.13	14.1%	1,972,883.65	15.0%	298,318.52	17.8%	1,971,383.65		1,500.00
40-49 RPR/SRVC/TRVL	528,304.36	4.5%	617,037.42	4.7%	88,733.06	16.8%	616,822.42		215.00
51-55 SUPPLY/MTRL/TRNG	312,779.23	2.6%	410,062.46	3.1%	97,283.23	31.1%	410,062.46		
52.1 GAS/OIL/LUBE	74,000.00	0.6%	87,500.00	0.7%	13,500.00	18.2%	87,500.00		
52.2 CHEM/SUPPLY	1,377,441.56	11.6%	1,524,637.51	11.6%	147,195.95	10.7%	1,524,637.51		
62-64 CAPITAL OUTLAY	730,881.82	6.2%	1,241,900.95	9.5%	511,019.13	69.9%	1,241,900.95		
89 CONTINGENCY	444,654.46	3.7%	507,266.81	3.9%	62,612.35	14.1%	506,866.81	-	400.00
TOTAL EXPENDITURES	9,380,886.59	79.1%	10,709,710.56	81.6%	1,328,823.97	14.2%	10,688,191.56	-	21,519.00
Fund Balances/Net Assets					-				
.001 FUTURE CAPITAL OUTLAY	1,226,250.00	10.3%	1,267,303.00	9.7%	41,053.00	3.3%	1,267,303.00		
.003 CASH CARRYOVER	1,152,594.83	9.7%	1,064,006.73	8.1%	(88,588.10)	-7.7%	848,443.73		215,563.00
.004 SICK and ANNUAL LEAVE	104,428.17	0.9%	84,463.21	0.6%	(19,964.96)	-19.1%	84,463.21		
Fund Balances/Reserves/Net Assets	2,483,273.00	20.9%	2,415,772.94	18.4%	(67,500.06)	-2.7%	2,200,209.94	-	215,563.00
Total Appropriated Expenditures Transfers, Reserves & Balances	**$11,864,159.59**	100.0%	**$13,125,483.50**	100.0%	1,261,323.91	10.6%	**$ 12,888,401.50**	**$ -**	**$ 237,082.00**

Fiscal Year 2026-2027 Draft Budget

Taxable Value

Gross Taxable Value For 2025-2026	$31,782,335,481		
Gross Taxable Value For 2026-2027	$33,832,060,133	**6.06%**	**Difference**

SOURCE OF REVENUE 2026-2027

AD VALOREM	**0.2325**	**Proposed Millage**
Local Tax Request	$ 7,865,953.98	
Less Uncollectible of 5%	$ 393,297.70	
Net Local Tax Request	**$ 7,472,656.28**	

Option 3:
☐ COLA @ 3%
☐ $1.9 M Reserve Fund Balance

Proposed millage rate of	0.2325	0.00%	greater than last year's rate of	0.2325
Proposed millage rate of	0.2325	4.64%	greater than Rolled Back rate of	0.2222

LINE-ITEM BUDGET SUMMARY

	TOTAL FUNDS 2025-2026 Budget	% of budget	TOTAL FUNDS 2026-2027 Budget	% of budget	$ increase	% increase	GENERAL FUND 2026-2027 Budget	STATE FUND 2026-2027 Budget	OPEB FUND 2026-2027 Budget
ESTIMATED INCOME									
311.000 Ad Valorem Taxes	$ 7,075,804.67	59.6%	$ 7,472,656.28	58.4%	$ 396,851.61	5.6%	$ 7,472,656.28		
334.100 State Grant	-	0.0%	-	0.0%	-				
337.000 Grants and Donations	10,400.00	0.1%	30,477.03	0.2%	20,077.03	193.0%	29,127.03		1,350.00
361.000 Interest	48,391.66	0.4%	66,862.47	0.5%	18,470.81	38.2%	59,862.47	-	7,000.00
364.00 Eqpt and Other Sales	-	0.0%	42,500.00	0.3%	42,500.00		42,500.00		
369.000 Misc./Refunds (prior yr expenditures)	-	0.0%	2,000.00	0.0%	2,000.00	#DIV/0!	2,000.00		
380.000 Other Sources		0.0%	-	0.0%	-				
TOTAL SOURCES	7,134,596.33	60.1%	7,614,495.78	59.5%	479,899.45	6.7%	7,606,145.78	-	8,350.00
Fund Balances/Reserves/Net Assets	4,729,563.26	39.9%	5,184,645.52	40.5%	455,082.26	9.6%	4,955,913.52	-	228,732.00
Total Revenues, Transfers & Balances	**$11,864,159.59**	100.0%	**$12,799,141.30**	100.0%	$ 934,981.71	7.9%	**$ 12,562,059.30**	**$ -**	**$ 237,082.00**
EXPENDITURES									
10-15 PERSONNEL EXPENDITURES	2,794,311.37	23.6%	2,710,989.49	21.2%	(83,321.88)	-3.0%	2,710,989.49		
21-25 PERSONNEL BENEFITS	1,443,948.66	12.2%	1,568,173.06	12.3%	124,224.40	8.6%	1,548,769.06		19,404.00
30-34 PROF SERVICES	1,674,565.13	14.1%	1,972,883.65	15.4%	298,318.52	17.8%	1,971,383.65		1,500.00
40-49 RPR/SRVC/TRVL	528,304.36	4.5%	617,037.41	4.8%	88,733.05	16.8%	616,822.41		215.00
51-55 SUPPLY/MTRL/TRNG	312,779.23	2.6%	410,062.46	3.2%	97,283.23	31.1%	410,062.46		
52.1 GAS/OIL/LUBE	74,000.00	0.6%	87,500.00	0.7%	13,500.00	18.2%	87,500.00		
52.2 CHEM/SUPPLY	1,377,441.56	11.6%	1,524,637.51	11.9%	147,195.95	10.7%	1,524,637.51		
62-64 CAPITAL OUTLAY	730,881.82	6.2%	1,203,900.95	9.4%	473,019.13	64.7%	1,203,900.95		
89 CONTINGENCY	444,654.46	3.7%	506,998.46	4.0%	62,344.00	14.0%	506,598.46	-	400.00
TOTAL EXPENDITURES	9,380,886.59	79.1%	10,602,182.99	82.8%	1,221,296.40	13.0%	10,580,663.99	-	21,519.00
Fund Balances/Net Assets					-				
.001 FUTURE CAPITAL OUTLAY	1,226,250.00	10.3%	1,267,303.00	9.9%	41,053.00	3.3%	1,267,303.00		
.003 CASH CARRYOVER	1,152,594.83	9.7%	845,192.10	6.6%	(307,402.73)	-26.7%	629,629.10		215,563.00
.004 SICK and ANNUAL LEAVE	104,428.17	0.9%	84,463.21	0.7%	(19,964.96)	-19.1%	84,463.21		
Fund Balances/Reserves/Net Assets	2,483,273.00	20.9%	2,196,958.31	17.2%	(286,314.69)	-11.5%	1,981,395.31	-	215,563.00
Total Appropriated Expenditures Transfers, Reserves & Balances	**$11,864,159.59**	100.0%	**$12,799,141.30**	100.0%	934,981.71	7.9%	**$ 12,562,059.30**	**$ -**	**$ 237,082.00**

District Report – August 2026

BOARD of COMMISSINERS
Janice Broda
Anna Kirkland
Tom Lowther

Executive Director
Dr. Isik Unlu

IRMCD Report Date: 08/31/2026

OPERATIONS

Table 1. Weather and tire report

	Max Daliy Rain (location)	Monthly Rain IRMCD	Monthly Rain Airport	Max Tide	Max Winds (mph)	# of Tires Collected
May	4" at W Jungle Swale	7.2" at Joe Michaels	2.53"	33.5" at St.Chris	28	1
June	4.5" at Pine Island	9.5" at Joe Michaels	6.76	31.5" at St. Chris	29	2
July	5” at Timinski Field	11” at Vista Royal	9.68”	26”at St. Chris	26	1
August	4” at Earman Island	12.5” at Dog Park	6.68”	24.5” at St. Chris	30	0
September						
October						
November						
December						

Table 2. Landing rates from critical areas

Location	May	June	July	August	September	October	November	December
Island 42	100	60	7	1				
Island 43	80	5	2	0				
Mangrove Slough	80	60	50	8				
Island 39	40-50	50	9	5				
Moorings	40-50	30	10	3				
Oyster Bar	40-50	20	10	0				
County Line	40-50	20	5	1				
Vero Shores	40-50	10	4	4				
Island 41	40-50	10	3	0				
Island 6	40-50	5	12	1				
Earing Point Palm	40-50	50	11	3				
Island 23C	40-50	15	2	0				
Inlet Uplands	40-50	30	50	2				
Joe Michaels	20-30	10	5	0				
Hole in the Wall	20-30	20	9	1				
Sandpoint	20-30	20	10	1				
Fritz Island	20-30	5	7	1				
Island 38	20-30	5	3	5				
Little Round Island	20-30	5	10	0				

- Stable (0-10%)
- Slight decline 10- 25%
- Moderate decline 25-50%
- Large decline >50
- Increase

Coastal

An aerial treatment was conducted on 7/31 and completed on 8/1. During the inspection on Monday, 8/3/26, live *Ae. taeniorhynchus* larvae were found at the following locations: Paul's Island, 8 dips with 6 larvae; Fretwell Island, 40 dips with 20 larvae; 95th Woods, 5 dips with 5 larvae; and Vickers Marsh, 10 dips with 10 larvae.

On 8/7/26, inspectors reported up to 1.5 inches of rainfall and observed late first- and early second-instar larvae. A total of 330 acres required treatment. Post-aerial inspection on 8/10 indicated that treatment was effective at the treated locations.

Report – August 2026

We received rainfall early on Saturday, 8/8/26, with areas receiving up to 3 inches of rain, as reported at Earman. During the 8/10 inspection, inspectors found late third-instar *taeniorhynchus* larvae in several areas. USA Island, Fretwell Island, Earman Island, Duck Head Island, Ski Island, South Knights, and Medical Center Field were all treated by ground.

On 8/25, inspectors reported up to 2 inches of rainfall in the central coastal area and observed first- and second-instar *Ae. taeniorhynchus* larvae. An aerial mission covering 410 acres was conducted on 8/26. During the aerial larviciding treatment, the coastal and aerial supervisors conducted a bucket catch at S. Knights; the results are included in the aerial report. On 8/27, a post-aerial assessment indicated excellent results, with no live larvae found.

From 8/26 through 8/28, we continued to receive rainfalls, with heavy rain affecting different parts of the county on different days. Inspectors remained busy identifying areas requiring aerial larviciding, and the highest reported rainfall over that period was 4.8 inches at Medical Center Field. On 8/28, the plane treated the reported areas, and later that day inspectors identified another brood emergence, requiring additional acreage to be treated on 8/29. Inspection results on 8/31 were generally good; however, live larvae were reported in the following areas: Birds Imp., 2 live *taeniorhynchus*; 6th Ave Woods, 1 live *taeniorhynchus*; and Garden Grove, 1 live *taeniorhynchus*.

Over the weekend of 8/31, significant rainfall was received, with 3.5 inches reported at both Luther's Woods and 6th Ave Woods. Inspectors found a new brood of second-instar *taeniorhynchus*, requiring another aerial mission scheduled for 9/1 and possibly continuing into 9/2.

Inland

Due to a staffing shortage, the inland crew assisted with operations in the coastal zones. Despite this reassignment, the inland crew treated a total of 85.5 acres during the month. Landing rates remained moderate at 5 per minute at both the N. County Pool and Imagine School. At the end of the month, we received heavy daily rainfall, flooding much of the county's more rural areas. As a result, we expect broods to emerge in early September, and ULV trucks will be deployed when adult numbers reach threshold levels in traps and/or landing rates.

Report – August 2026

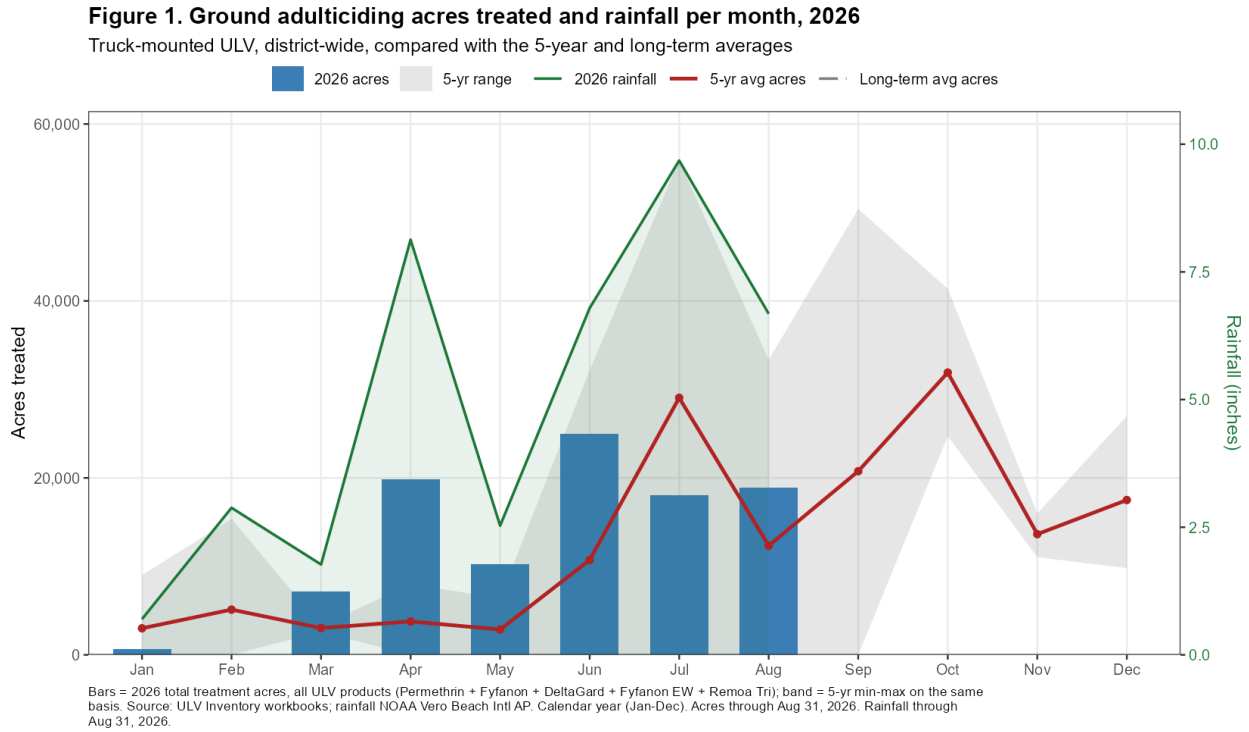


Figure 1. Summary of truck-mounted adulticiding treatment took place at IRC.

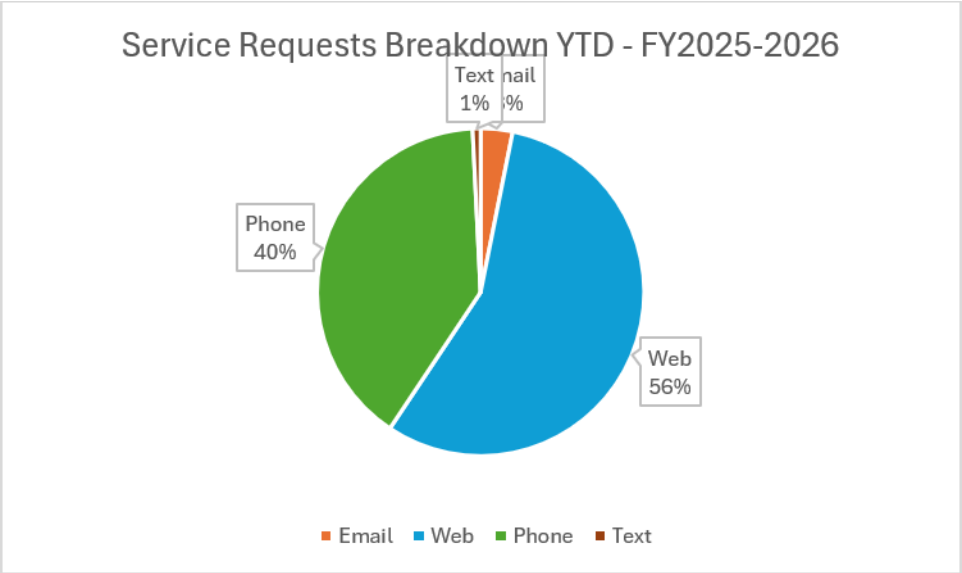


Figure 2. Number of service requests received per month for FY2025-26, as compared to the 5-year and long-term averages.

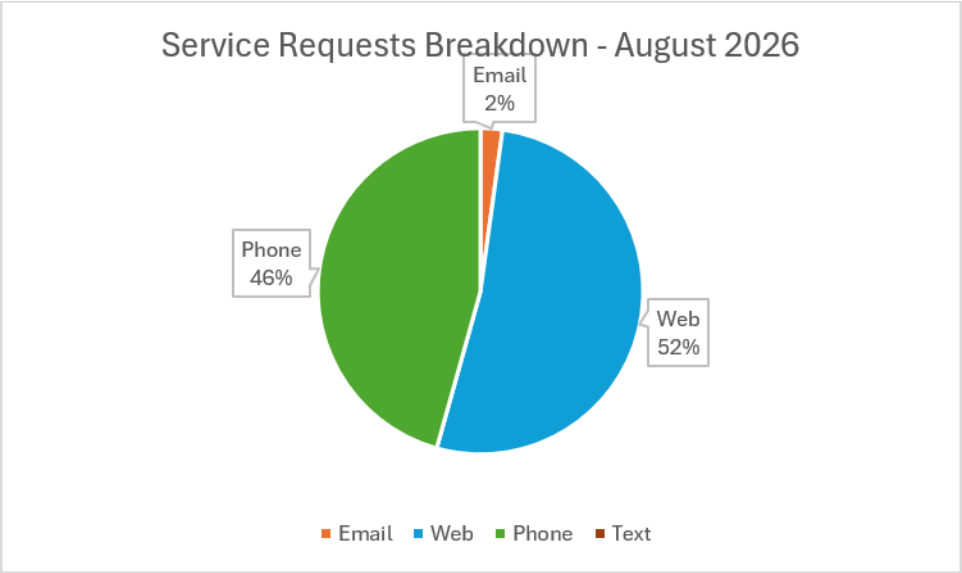
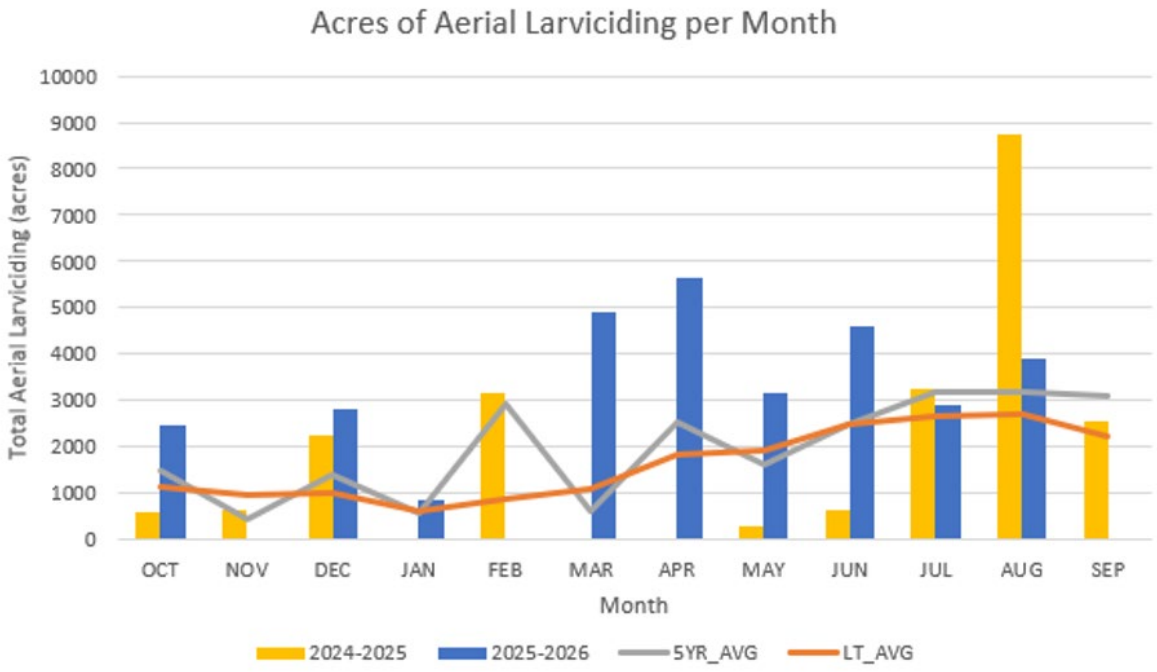


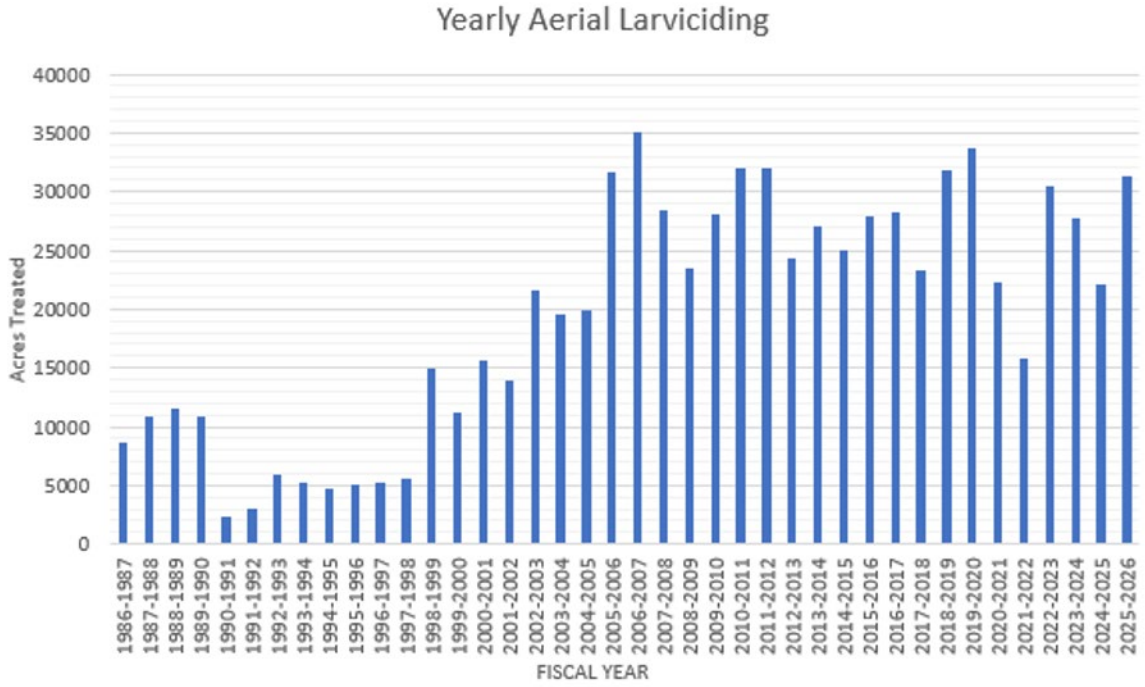
Figure 3. Service request breakdown by method of contact.

Aerial Program

Five aerial missions were conducted, totaling 3,929 acres, using 47,200 lbs. of material throughout the coastal areas. 2,175 acres of Vectobac GS using 26,120 lbs. 1,754 acres of Summit Bti using 21,080 lbs. We were below the 2024-2025 August total, but we are already above the five-year average and currently above the five-year high. Our total aerial treatment acres for the 2025-2026 season are 31,288. The district's largest aerial treatment year ever was 2006-2007, with a total of 35,137 acres treated. With the five-year average for September at 3,100 acres and current weather conditions, we are likely to be very close to or surpass the all-time high for aerial treatments. IRMCD's UAS program performed 1 mission consisting of 62 acres and utilizing 450 lbs. of Altosid XRG Ultra. The UAS system continued to have minor issues, and the rep for Frontier Precision, Peter Brake, assisted the aerial team with solutions for those issues. While conducting test flights afterwards and sending flight logs to Hylio to ensure the UAS issues had been solved they discovered one of the two GPS systems is not communicating correctly. At that time while working with Hylio the aerial team ordered a new GPS unit which should be delivered Friday 9-4-26. The aerial team will continue to schedule time with Peter Brake to ensure the system is back in working order.

Report – August 2026





Report – August 2026

Ecology & Permanent Control

Permanent control staff have successfully conducted regular pump runs for the month of August. Bruce has finished mowing the Golf Course and S. Knights impoundments and will continue to mow next month. Frank and Faron are continuing to conduct pump runs to make sure that appropriate water levels are met.

The bridge construction has finished at the North Deerfield impoundment breach. Pictures are available upon request.

The Sebastian Inlet pump started making noise on August 21, 2026. Inlet pump was removed August 26, 2026, and brought in for repairs. A portable pump was stationed at the Inlet to make sure that desired water levels continue to be maintained.

The second water exchange project was performed on August 18-20, 2026, at the Orca 19 impoundment. During the following week, August 2026 water quality testing event 34 was conducted and marked the fifth wet season testing. There was a noticeable change in the DO (Dissolved Oxygen) after the exchanges were conducted. Now that we have conducted two exchanges throughout this season, we had hopes that the DO would be positively affected. Over the first four months, the positive trend for the sites DO was overwhelmingly positive, unfortunately this last testing has shown the DO has returned to a number below 1mg/L. The table below shows the change in the different parameters throughout the wet season testing at the Orca 19 impoundment. More details can be found in the water quality report package event 34. More details can be found in the water quality report package event 34.

Orca 19 impoundment

Site #									
1	North Orca								
Year-Round	Date	Time	Temperature (°C)	Specific Conductance (uS/cm)	Salinity (PSU)	pH (SU)	Turbidity (FNU)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)
	Apr. 2026	3:02	24.4	24157.1	14.65	6.87	77.7	0.78	10.1
	May 2026	1:23	27.59	19829.9	11.77	6.7	41.8	0.96	13.1
	June 2026	1:13	28.23	15193.5	8.81	6.79	22.62	1.15	15.5
	July 2026	1:09	27.55	26617.3	16.24	7.13	36.62	1.58	22
	Aug. 2026	1:33	28.21	29817.3	18.39	6.93	222.57	0.39	5.5

Community Relations

Calendar of Events

- **5 August:** ELC Camp
- **5 August:** Dodgertown Back to School
- **20 August**: Chamber of Commerce Meet and Greet
- **22 August:** ELC Aerial Presentation

Upcoming Events

- **2 September:** Small & Beginning Farmers Mini Conference

Social Media

- Facebook has 543 followers, up from the previous 30 days, and YouTube has 24 subscribers, the same as the previous 30 days.
- The top post for views was the ULV spray truck notification on August 20th, views are up by 158%, and Interactions increased by 156% from the previous 30 days.
- Top audience areas in the county:

  Vero Beach 35.2%, Florida Ridge 17.4%, Sebastian 14.3%, Gifford 10.5%, Winter Beach 5.5% and Other 17.2%

Website

- This month, the website had 74,759 page views, which is a decrease from the prior month, and 94 subscribers, an increase from the prior month.

Education

- Before the new school year was fully in swing, the Educational Specialist and Community Relations Director met with the Assistant Principal at Pelican Island Classical Magnet School to discuss the Indian River Mosquito Control District Educational Program. Following the success of last year's pilot program, the district has been invited to return and continue educating students. This year, the district will teach two third-grade science classes in the fall and two second-grade classes in the spring. The Educational Specialist will visit the school once a month to teach students about mosquitoes and incorporate Sunshine Standards that will be reinforced throughout their academic careers.
- The Educational Specialist has also been assisting the district in educating community partners, stakeholders and staff on the importance of impoundments, their locations and their functions.

Human Resources

- The Impoundment Operator position has been filled.
- The UAS/Vector Ecologist position has been posted on the district's website, FMCA, AMCA, and Gulf Coast Training Center.
- The compensation survey is progressing. According to the draft report a few items were still needed. Staff has presented them and are waiting on a final draft.
- The HR company we selected has provided a contract, it has been signed and staff is awaiting a kickoff meeting.

SCIENCE

Arbovirus Summary

State: Statewide WNV activity increased through July, with 15 sentinel chickens seroconverting in Bay, Brevard, Hillsborough, Leon, Palm Beach, Pasco, Pinellas, and Walton counties, and one asymptomatic blood donor identified in Leon County, bringing the 2026 statewide total to 25 sentinel chickens from 11 counties. EEEV activity remained lower than in June, with 8 sentinel chickens and one horse (Osceola) reported in July, for a 2026 total of 30 sentinel chickens and three horses from 11 counties. One SLEV-positive sentinel chicken was reported in Brevard County, the first of 2026. Locally acquired dengue emerged for the first time this year, with four cases reported in Hillsborough (2), Miami-Dade, and Palm Beach counties, all with July onset. Travel-associated dengue (18 cases) and chikungunya (6 cases) continued. Alachua, Leon, Palm Beach, and Pasco counties are currently under a mosquito-borne illness advisory; Hillsborough and Miami-Dade are under an alert. Indian River County remains under neither.

District: The state laboratory reported no confirmed arbovirus-positive samples from the District in July. The single EEEV-positive sentinel chicken from the Ryall coop, reported 6/26 from a sample collected 6/12, remains the only confirmed District detection year-to-date. In-house WNV screening flagged reactive sentinel samples during the first half of the month, concentrated at the Ryall coop (see below); these are preliminary results and none were confirmed by the state laboratory.

Table 1. District & Statewide for WNV, SLEV, and EEEV (as of August 1, 2026)

VIRUS	DISTRICT		STATEWIDE							
	Sentinels		Sentinels		Humans		Horses		Mosquito Pools	
	JUL	YTD	JUL	YTD	JUL	YTD	JUL	YTD	JUL	YTD
WNV	0	0	15	25	1	2	0	0	0	0
SLEV	0	0	1	1	0	0	0	0	0	0
EEEV	0	1	8	30	0	0	1	3		

Table 2. District & Statewide for DENV, CHIKV, ZIKAV, and OROV (as of August 1, 2026)

VIRUS	DISTRICT		STATEWIDE			
	Imported Case		Imported Case		Local Case	
	JUL	YTD	JUL	YTD	JUL	YTD
DENV	0	0	18	51	4	4
CHIKV	0	0	6	44	0	0
ZIKAV	0	0	0	0	0	0
OROV	0	0	0	0		

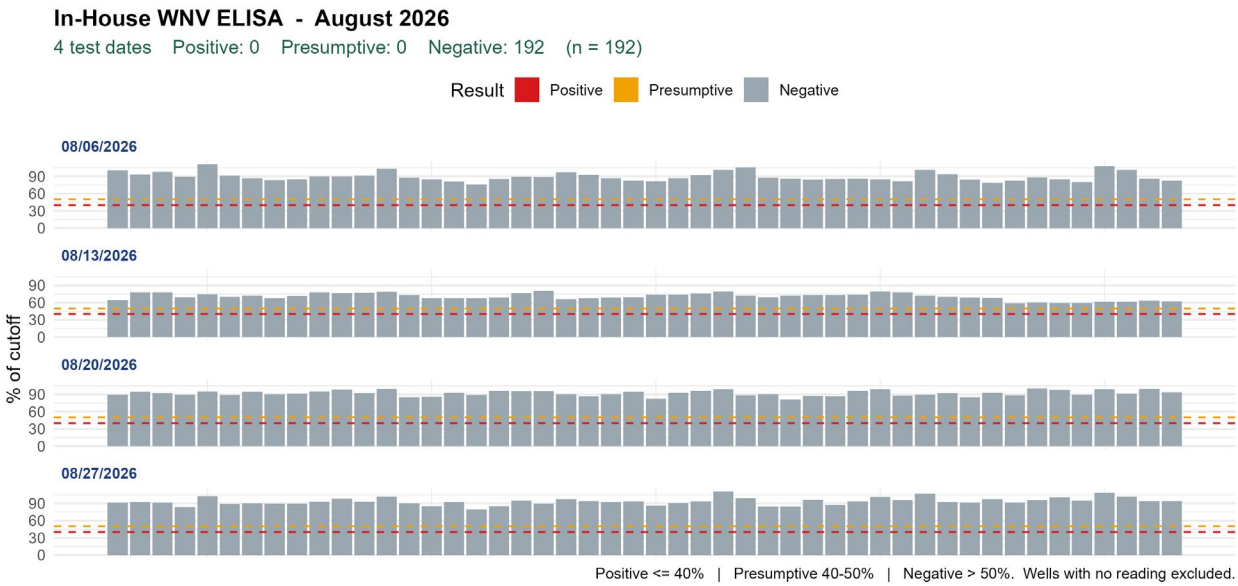
Counties Under Mosquito-borne Illness Advisory:
Alachua, Leon, Palm Beach, and Pasco

Counties Under Mosquito-borne Illness Alert:
Hillsborough and Miami-Dade

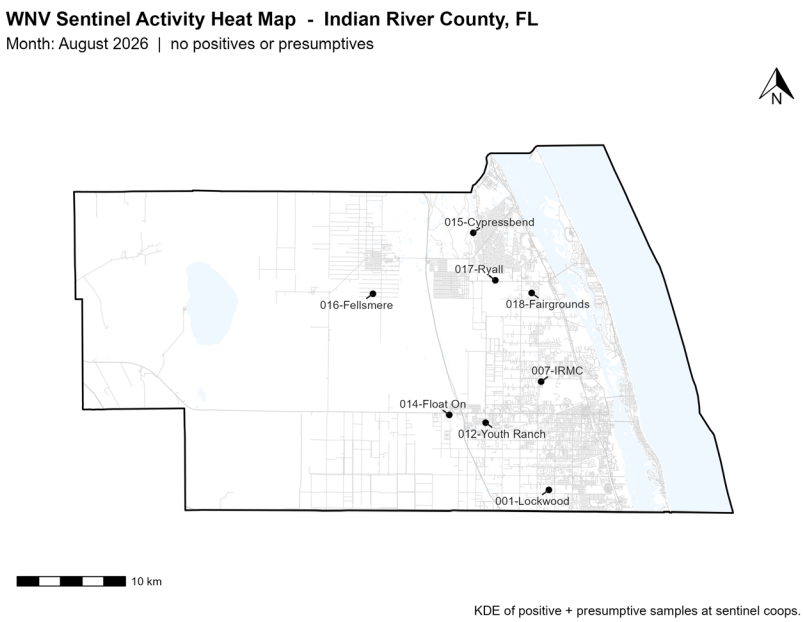
WNV – West Nile virus; SLEV – St. Louis encephalitis virus; EEEV – Eastern equine encephalitis virus; DENV – dengue virus; CHIKV – chikungunya virus; ZIKAV – Zika virus; OROV – Oropouche virus. Flavivirus – tested positive for flavivirus antibodies, pending additional testing to confirm SLEV or WNV. Imported case: infected while traveling outside the County. Local case: infected individual with no travel history outside the County during the infection period. Shaded cells are not reported by the state.

Sentinel Chicken WNV Screening

Report – August 2026



In-house positive, 0 presumptive, and 192 negative. No reactive samples were recorded on any August test date; the most recent reactive sample was 7/16. Season to date, 604 wells have been screened across 13 test dates, yielding 8 positive and 3 presumptive results, all confined to 6/19 through 7/16. These are preliminary in-house tests; none were confirmed by the state laboratory. WNV ELISA screening was conducted for all 2026 test dates, with results reported as a percentage of the assay cutoff (≤40% positive, red; 40–50% presumptive, orange; >50% negative). August comprised four test dates (8/06, 8/13, 8/20, 8/27), totaling 192 wells: 0



Heat map of positive and presumptive WNV sentinel chicken samples across the IRC for August 2026. No positive or presumptive samples were detected during the month, so no activity is plotted; all sentinel coops were quiet.

Report – August 2026

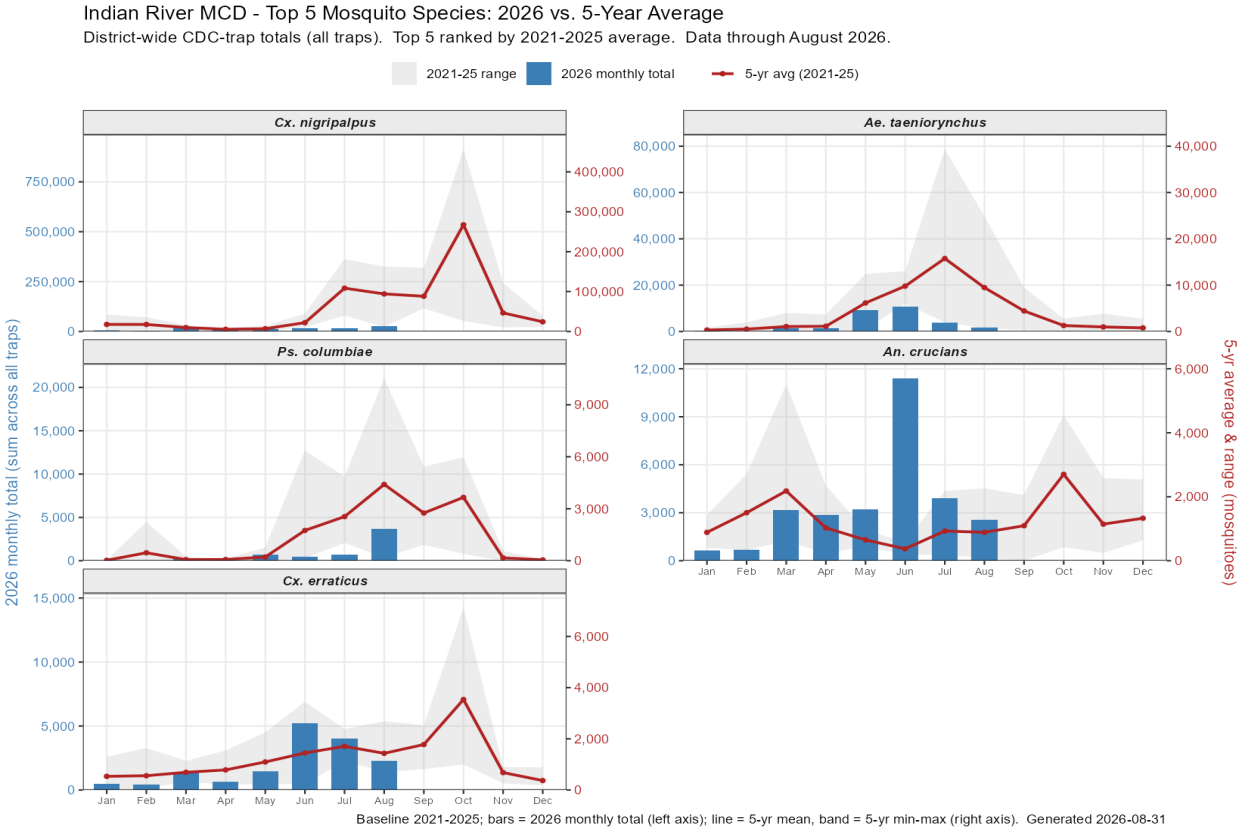
Mosquito Surveillance

Inland

No inland trap exceeded its August average. 53rd Street was highest relative to baseline at 0.80x (1,730 versus 2,176), followed by Sebastian at 0.67x and Graves at 0.55x. 65th Street rose from 0.19x in July to 0.52x, while Friendship, the highest inland trap in July at 0.37x, fell to 0.17x. The 17 inland traps with a baseline collected 25,913 mosquitoes against an average of 101,677, roughly 26% of normal, up from 14% in July. Graves recorded the group's largest total at 4,846, followed by Cypress Bend at 3,156. At the low end, 4th Street collected 15 mosquitoes against an average of 1,371. Outlet Mall, SyAqua North, and SyAqua South have no baseline yet; together they collected 5,515, bringing the inland group to 31,428.

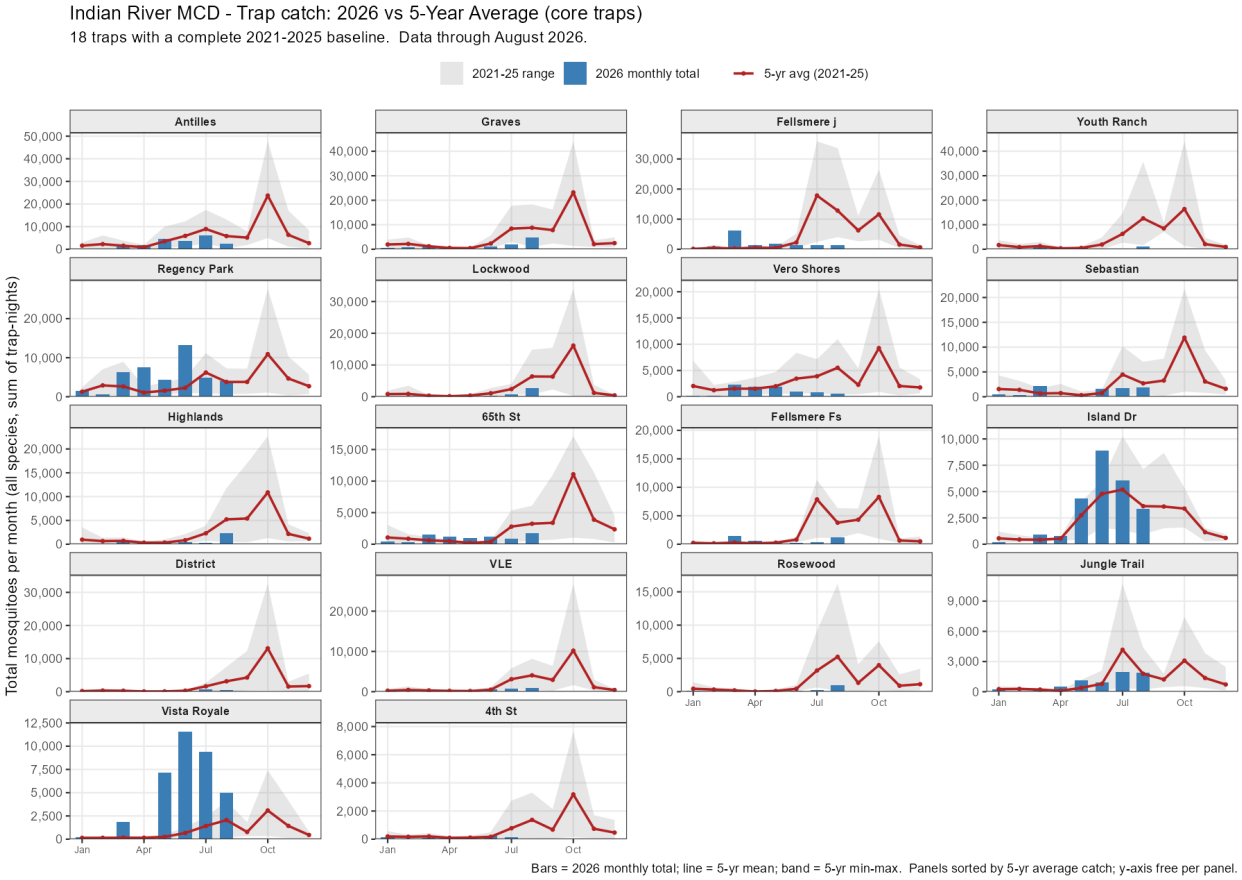
Coastal

Vista Royale was again the highest trap in the district relative to baseline, at 2.43x (4,994 versus 2,054), down from 4.49x in July. This trap was relocated earlier this year to a site closer to the impoundment, so the higher counts are likely due to the new location rather than a true increase. Jungle Trail (1.06x) and Regency Park (1.04x) were the only other traps in the district at or above average, with Regency Park up from 0.57x in July. Island Drive rose slightly to 0.93x. The eight coastal traps collected 17,480 mosquitoes against an average of 26,599, about 66% of normal — essentially unchanged from July's 67%.



Report – August 2026

District-wide CDC-trap totals for the five species with the highest 2021–2025 average. Bars show 2026 monthly totals (left axis); the red line and gray band show the 5-year mean and min–max range (right axis). *An. crucians* remained elevated at 2,545, roughly 2.9 times its August average of 888, and *Cx. erraticus* ran at 2,285 against an average of 1,434 (1.6x). Both eased from their July peaks of 3,922 and 4,010 but stayed above normal, consistent with the *Anopheles influx* noted earlier in the season. C*x. nigripalpus* climbed to 25,826 from 17,600 in July, though this remains 27% of its August average of 94,085. *Ae. taeniorhynchus* fell further to 1,658 against an average of 9,471 (18%), while *Ps. columbiae* rose to near normal at 3,716 versus 4,404 (84%), up sharply from 735 in July.



Total catch remained well below average across the district in August. District-wide, 28 traps collected 48,908 mosquitoes, essentially unchanged from July's 48,645 (+0.5%), with the top five species accounting for 73.7% of that total, up from 61.7% in July. The 25 traps with an established baseline collected 43,393 against an average of 128,276, about 34% of normal. Only three traps met or exceeded their August average, all coastal: Vista Royale, Jungle Trail, and Regency Park. Vista Royale recorded the highest single-trap total in the district at 4,994, followed by Graves (4,846) and Regency Park (3,945). Inland traps rose from 14% of normal in July to 26% in August, while the coastal group held steady at about two-thirds.

WILTON SIMPSON
COMMISSIONER

Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

MOSQUITO CONTROL MONTHLY REPORT - PESTICIDE ACTIVITY

Section 388.341, F.S. and Rule 5E-13.027, F.A.C.
Telephone: (850) 617-7911; Fax: (850) 617-7939

Submit to:
MosquitoControlReport@FDACS.gov
or
Mosquito Control Reports
3125 Conner Blvd, Suite E
Tallahassee, FL 32399-1650

I. General Information

Program:	Indian River Mosquito Control District
Completed by:	Daniel Long

Month:	August
Fiscal Year:	2025-2026

II. Adulticides

Product Name	Active Ingredient(s) and Percentage	EPA Registration Number	GRND	AIR	Mix Ratio (see Calculation Tab)	RTU	Total Output Monthly in Gallons	Acres Treated Monthly	Total Undiluted Yearly in Gallons	Acres Treated Yearly
Aqua Zenivex E20	Etofenprox 20%	89459-81	x		1.00					
Aqua-Reslin	Permethrin 20% Piperonyl Butoxide 20%	432-796	x		1.00					
DeltAGard	Deltamethrin 2%	432-1534	x		1.00				**0.112**	**2.361**
Dibrom Concentrate	Naled 87.4%	5481-480		x	1.00					
Evoluer 30-30	Permethrin 30% Piperonyl Butoxide 30%	769-983	x		1.00					
Fyfanon EW	Malathion 40.9%	279-3622	x		1.00					
Permanone 30-30	Permethrin 30% Piperonyl Butoxide 30%	432-1235	x		1.00				**0.132**	**6.338**
PermaSease 4-4	Permethrin 4.6% Piperonyl Butoxide 4.6%	86291-3-96263	x		1.00		0.026	8.758	**0.594**	**218.232**
Pyronyl Crop Spray	Pyrethrins 6% Piperonyl Butoxide 60%	89459-26	x		1.00					
Pyronyl 525 Oil Concentrate	Pyrethrins 5% Piperonyl Butoxide 25%	89459-24	x		1.00					
Zenivex E4 RTU	Etofenprox 4%	2724-807	x		1.00					
Kontrol 30-30	Permethrin 30% Piperonyl Butoxide 30%	73748-5	x		1.00		25.726	11760.457	**186.535**	**85273.222**
Fyfanon ULV	Malathion 96.5%	279-3539	x		1.00		30.500	7098.182	**126.300**	**29293.455**
Merus 3.0	Pyrethrins, a botanical insecticide 5%	8329-108	x		1.00					
					1.00					
					1.00					
					1.00					
					1.00					

III. Larvicides: Liquids

Product Name	Active Ingredient(s) and Percentage	EPA Registration Number	GRND	AIR	Mix Ratio (see Calculation Tab)	RTU	Total Output Monthly in Gallons	Acres Treated Monthly	Total Undiluted Yearly in Gallons	Acres Treated Yearly
Altosid SR20	(S)-Methoprene 20%	2724-446	x		1.00					
Natular SC	Spinosad 22.5%	62719-748-8329	x		1.00		3.383	216.499	**12.578**	**805.005**
Vectobac 12AS	Bti 11.61%	73049-38	x		1.00				**78.125**	**1176.733**
Agnique MMF	Poly (oxy-1,2-ethanediyl), α-(C16-20 branched and linear alkyl	53263-25	x		1.00					
					1.00					
					1.00					
					1.00					
					1.00					
					1.00					
					1.00					
					1.00					
					1.00					
					1.00					
					1.00					
					1.00					
					1.00					
					1.00					

Program:	Indian River Mosquito Control District	Month:	August	Fiscal Year:	2025-2026

IV. Larvicides: Units

Product Name	Active Ingredient(s) and Percentage	EPA Registration Number	GRND	AIR	Unit Weight (see Calculation Tab)	Total Output Monthly in Units	Acres Treated Monthly	Total Yearly in Pounds	Acres Treated Yearly
Natular DT	Spinosad 7.48%	8329-602	x		0.003			**0.030**	**0.002**
Natular T30	Spinosad 8.33%	8329-85	x		0.013			**0.013**	**0.002**

V. Larvicides: Solids

Product Name	Active Ingredient(s) and Percentage	EPA Registration Number	GRND	AIR	Mix Ratio	Total Output Monthly in Pounds	Acres Treated Monthly	Total Yearly in Pounds	Acres Treated Yearly
Altosid P35	(S)-Methoprene 4.25%	89459-95		X	1.00			**916.000**	**130.857**
Altosid XRG	(S)-Methoprene 1.5%	2724-451		x	1.00				
Altosid XRG Ultra	(S)-Methoprene 1.6%	89459-104		x	1.00	450.000	62.000	**1339.500**	**189.000**
Censor	Spinosad 0.5%	8329-83		x	1.00			**82088.000**	**6842.000**
Metalarv S-PT	(S)-Methoprene 4.25%	73049-475	x		1.00				
Natular G30	Spinosad 2.5%	8329-83		x	1.00			**124.000**	**880.000**
Sumilarv 0.5G	2-[1-Methyl-2-(4-phenoxyphenoxy) ethoxy] pyridine 0.50%	1021-2819	x		1.00				
Summit	Bti 2.86%	6218-86		x	1.00	21080.000	1754.000	**59080.000**	**4983.000**
VectoBac GS	Bti 2.80%	73049-10		x	1.00	26120.000	2175.000	**200164.000**	**16622.000**
VectoMax FG	Bti 7.2%	73049-429		x	1.00				
Altosid P35	(S)-Methoprene 4.25%	89459-95	x		1.00	3.455	0.493	**37.629**	**5.203**
Altosid XRG	(S)-Methoprene 1.5%	2724-451	x		1.00				
Altosid XRG Ultra	(S)-Methoprene 1.6%	89459-104	x		1.00			**1.069**	**0.153**
Censor	Spinosad 0.5%	8329-83	x		1.00				
Natular G30	Spinosad 2.5%	8329-83	x		1.00				
VectoBac GS	Bti 2.80%	73049-10	x		1.00				
VectoMax FG	Bti 7.2%	73049-429	x		1.00				
Fourstar Bti CRG	Bti 10%	85685-4		x	1.00			**10.000**	**1.500**
Fourstar Bti CRG	Bti 10%	85685-4	x		1.00			**10.000**	**1.500**

Director's Signature

09/03/2026
Date