STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
PLANT HEALTH PROGRAM
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

To: Board of Pesticides Control
From: Hillary Peterson, Integrated Pest Management Specialist
Re: Request for Funding
Date: February 18, 2022

The Department of Agriculture, Conservation and Forestry (DACF) based in Augusta, Maine and the Maine Medical Center Research Institute (MMCRI) based in Portland, Maine are two of the major mosquito surveillance agencies in Maine. Adult and larval mosquito surveillance data from all over the state has been collected for almost twenty years. Mosquito surveillance is important for early detection of vector borne diseases such as Eastern equine encephalitis, West Nile virus, Jamestown Canyon virus, and more. The DACF IPM Program monitors mosquitos at approximately six sites per summer (early July through the end of September) in Kennebec and Waldo counties, including in Farmingdale, Augusta, Palermo, and Unity Twp. Mosquitoes are collected, sorted, identified and submitted for disease testing at State of Maine Health and Environmental Testing Laboratory (HETL) weekly, and data is entered into a secure database online for further analysis. In 2015, a mapping project was initiated by the Department of Agriculture, Conservation and Forestry to optimize the efficiency and effectiveness of surveillance of *Culiseta melanura*, the primary vector of Eastern equine encephalitis (EEE). In 2019, the habitat map was revised to include new site coordinates and updated geospatial data.

The Integrated Pest Management Program is requesting funds to assist with ongoing efforts for mosquito surveillance and identification, and continued outreach around vector-borne diseases. Assistant will be available to perform additional tasks for BPC if mosquito activity is low due to weather or other unforeseen factors. The temporary hire will also be involved with a funded grant for biological control of Swallowwort, providing early-season funds towards the position.

The IPM program is requesting a total budget of $11,182.00 for the 2022 program. Please see the following page for a breakdown of costs.

GARY FISH, STATE HORTICULTURIST
90 BLOSSOM LANE, DEERING BUILDING

PHONE: (207) 287-7545
WEB: WWW.MAINE.GOV/HORT

Budget Request:

Item	Rate / hr	Salary plus temp staffing fee	Hours / Week	# Weeks	Total Hours	Total $
Summer field and lab assistant	$15.00	$18.57	40	14	560	$ 10,399.20
Item	**Cost / mile**	**Distance (miles)**	**# Trips**	**Total Miles**		
Mileage	$0.45	145	12	1740		$ 783.00
					Total	**$ 11,182.20**

Breakdown of Summer Temp Position:

Project Responsibility	Hours / Week	Start Date	End Date	# Weeks	Pay / Hr	Temp Fee / Hr	Total Pay / Hr	Total Budget for Position	State of Funding
Swallowwort	40	5/9/2022	6/19/2022	6	$15.00	$3.57	$18.57	$4,456.80	Available from Grant
Mosquito (occasional Swallowwort)	20	6/20/2022	9/23/2022	14	$15.00	$3.57	$18.57	$5,199.60	Need to request from BPC
BPC Staffing Work	20	6/20/2022	9/23/2022	14	$15.00	$3.57	$18.57	$5,199.60	Need to request from BPC

Sincerely,

Hillary Peterson,
IPM Entomologist
Maine Department of Agriculture, Conservation and Forestry

2021 Mosquito Monitoring Report

Results of Mosquito Trapping Conducted in the Field Season of 2021

State of Maine
Department of Agriculture, Conservation, and Forestry
Division of Animal and Plant Health IPM Program

Results of Mosquito Monitoring Conducted by Maine Department of Agriculture, Conservation and Forestry IPM Program - 2021

Two types of traps were used. At each site, 10 resting boxes (RB) and/or one CO2-baited CDC mini light trap (LT) were deployed. Traps were deployed at 6 sites:

Site Name	Town	County	State	Trap Type
Jamie's Pond	Farmingdale	Kennebec	Maine	RB
Viles Arboretum	Augusta	Kennebec	Maine	RB + LT
Garcelon WMA	Augusta	Kennebec	Maine	RB + LT
Iron Ore Point	Palermo	Waldo	Maine	RB
Beech Pond	Palermo	Waldo	Maine	RB
Unity Plantation	Unity Twp	Waldo	Maine	RB

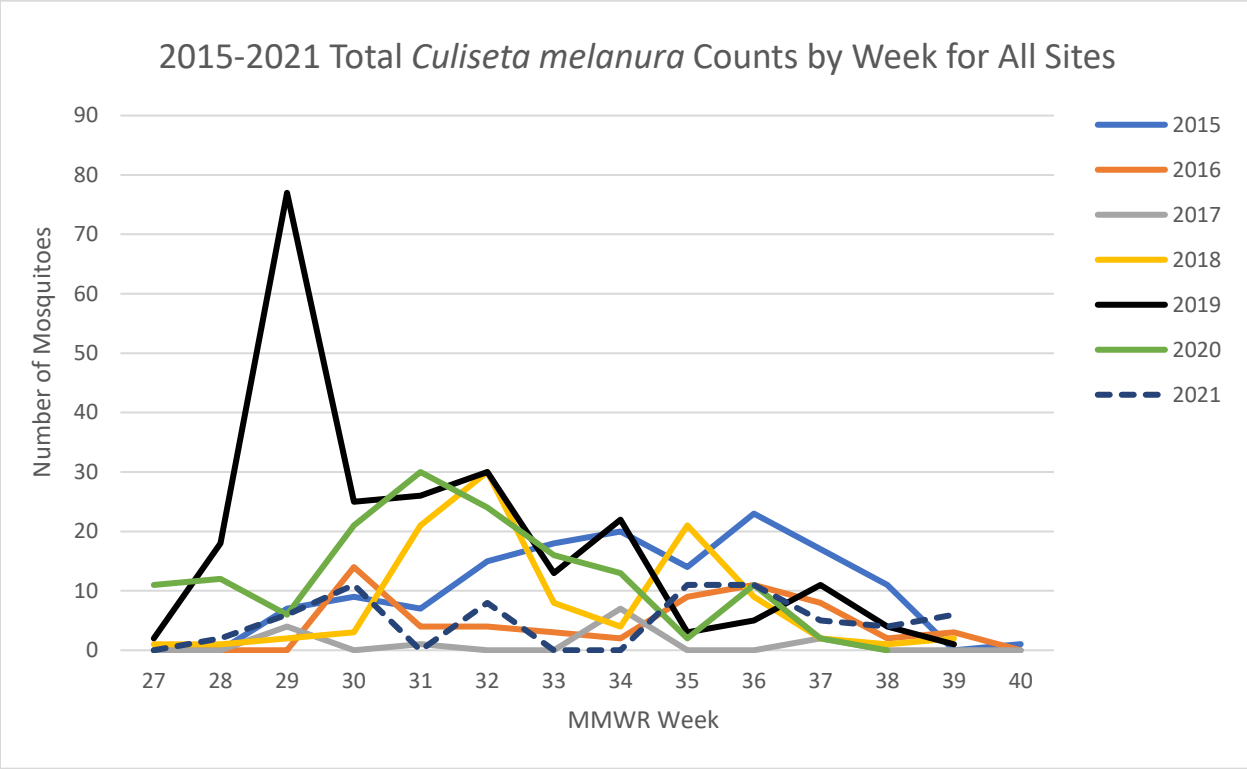
- Mosquitoes were collected, sorted, identified and submitted for disease testing at State of Maine Health and Environmental Testing Laboratory (HETL) weekly from 7/06/21 through 9/30/21. None of the samples were found to be positive for West Nile Virus, Eastern equine encephalitis (EEE) virus or Zika virus in 2021.

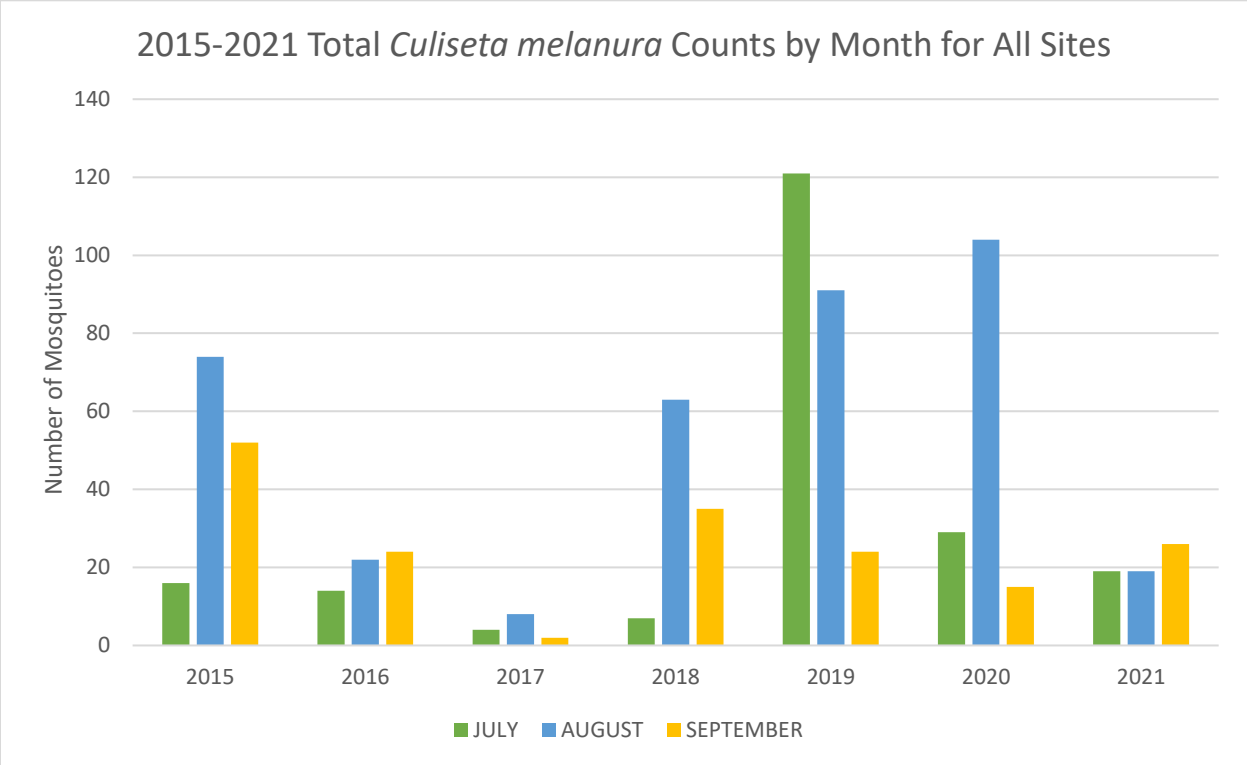
- Labor: summer temporary staff member (Autumn St.Pierre): 15 weeks (@ $15.00/hr) to deploy traps and service sites weekly for the entire season.

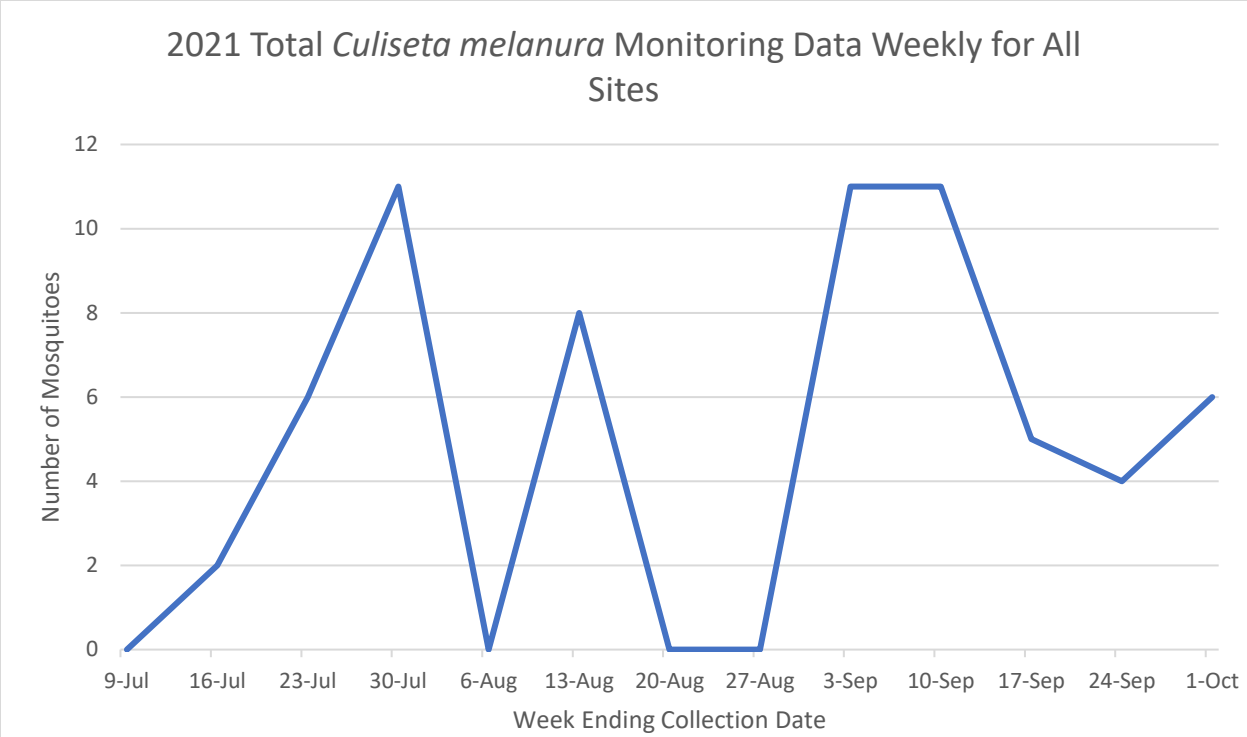
- Resting boxes are used to collect primarily *Culiseta spp*. mosquitoes, which are important vectors of EEE. The *Culiseta spp*. were found at five of the six sites we monitored with the highest numbers at two of the six sites. The numbers of *Culiseta spp*. collected at each weekly visit from July 1st through Sept 30th, 2021, from the 10 resting boxes deployed at each of these sites are shown below.

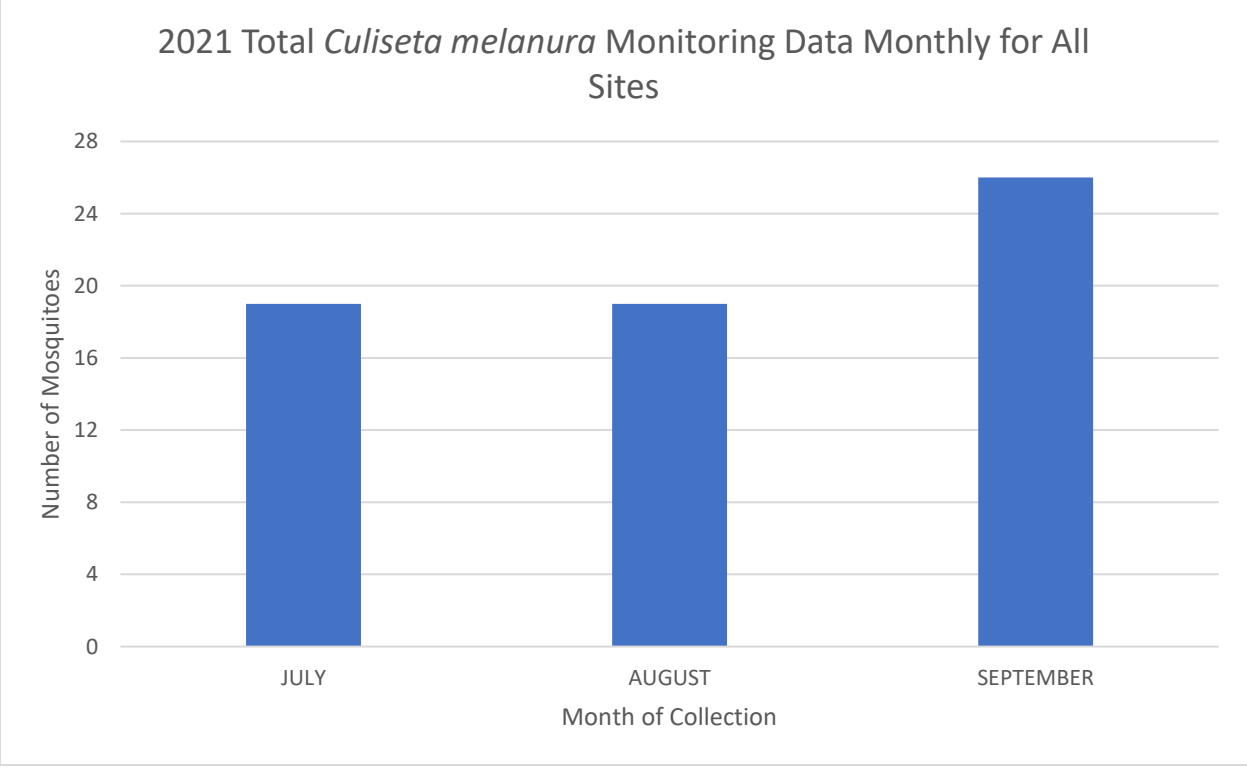
- The total number of mosquito species per site collected at each weekly visit from July 1st through Sept 30th, 2021, from the 10 resting boxes deployed at each of these sites, and the 2 light traps at two of the sites, are shown below. The light traps were deployed at two of the sites from Aug 10th to Sep 30th.

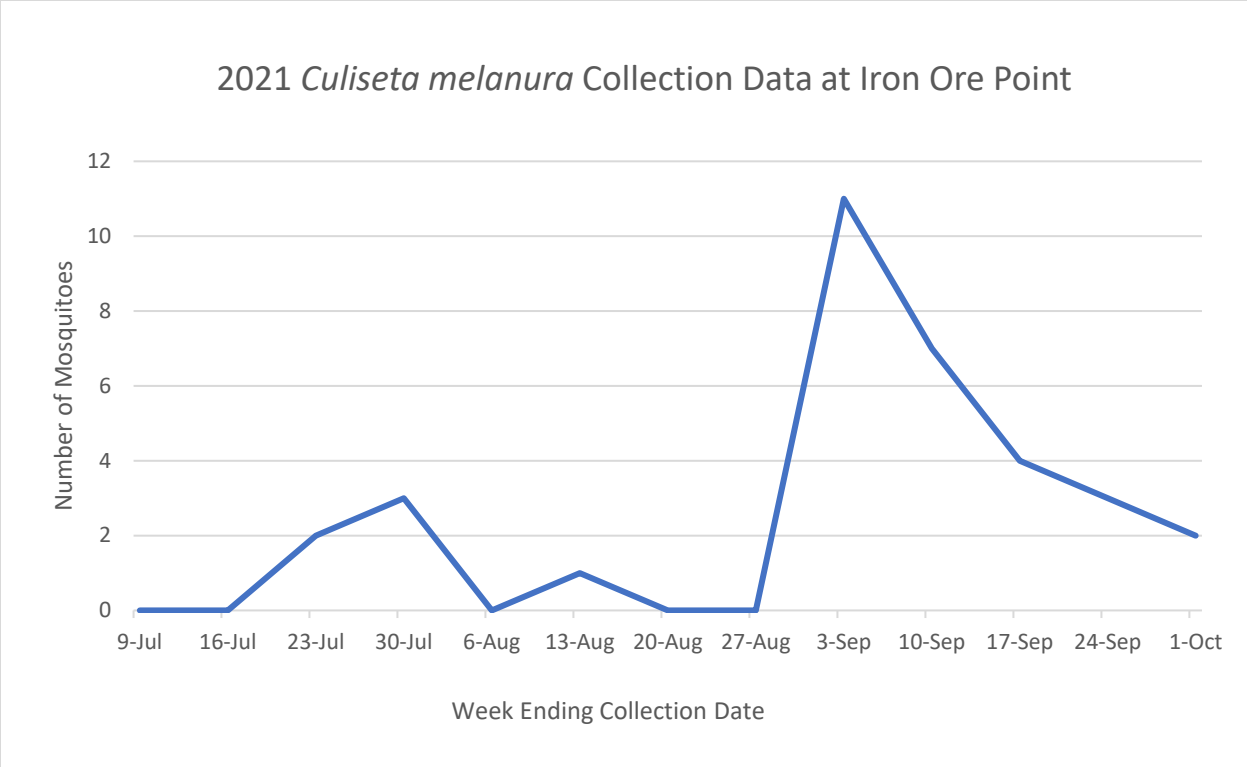
- Please note the absence of data for MMWR weeks 32, 34, and 35. There were unforeseen circumstances where no one was available, and the data was not able to be collected from sites those weeks.

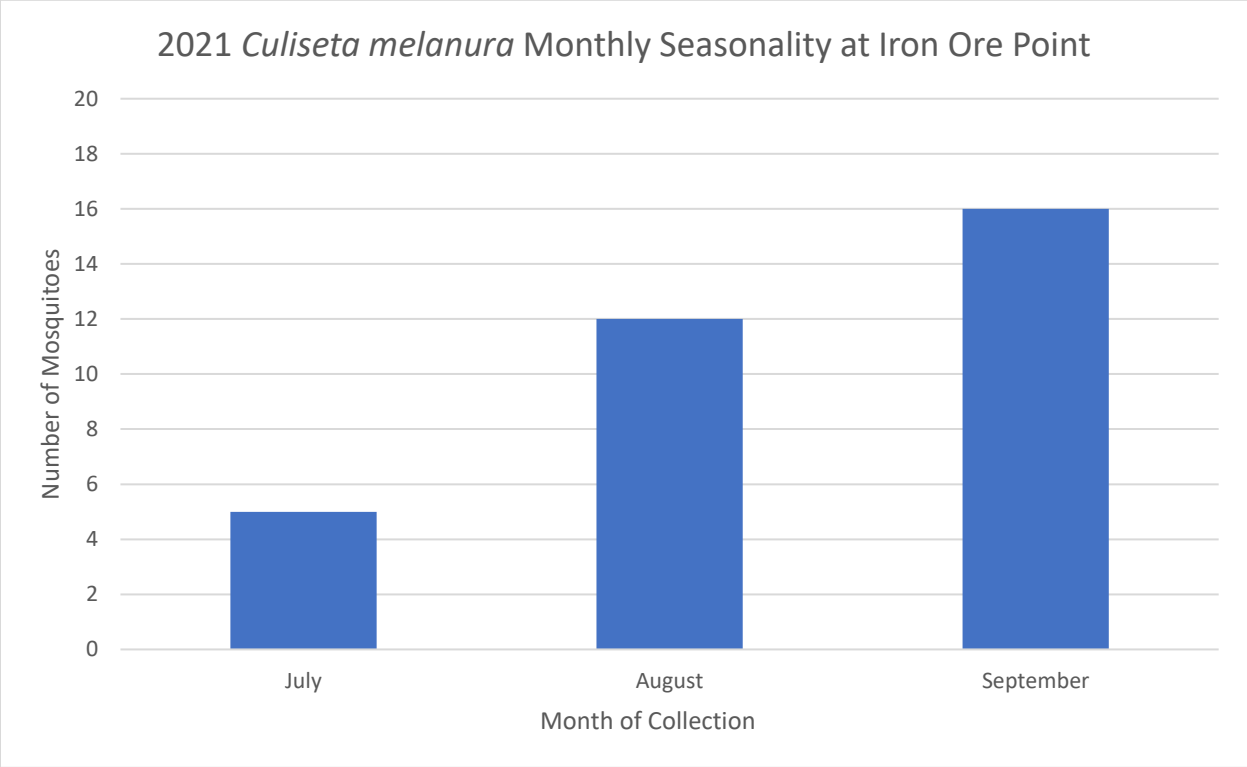

2015-2021 Total Culiseta melanura Counts by Week for All Sites
Number of Mosquitoes
MMWR Week
2015
2016
2017
2018
2019
2020
2021

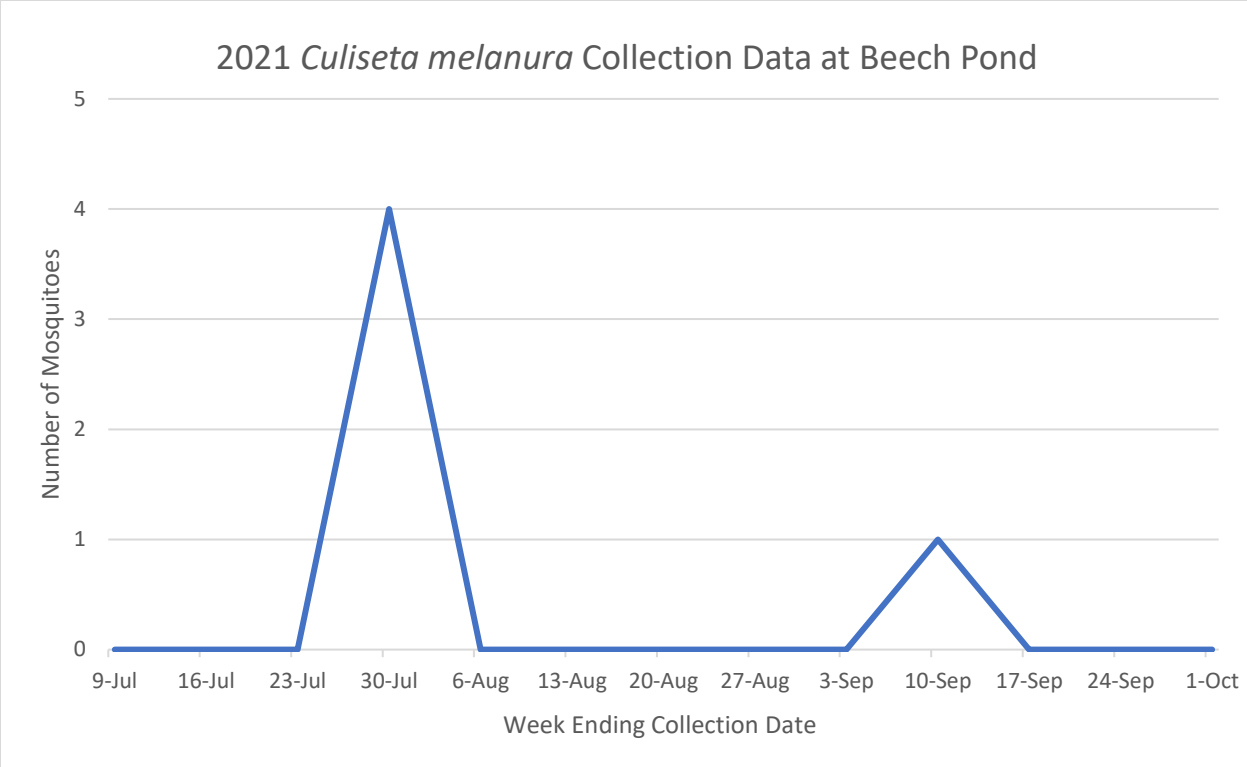

2015-2021 Total Culiseta melanura Counts by Month for All Sites
Number of Mosquitoes
JULY
AUGUST
SEPTEMBER

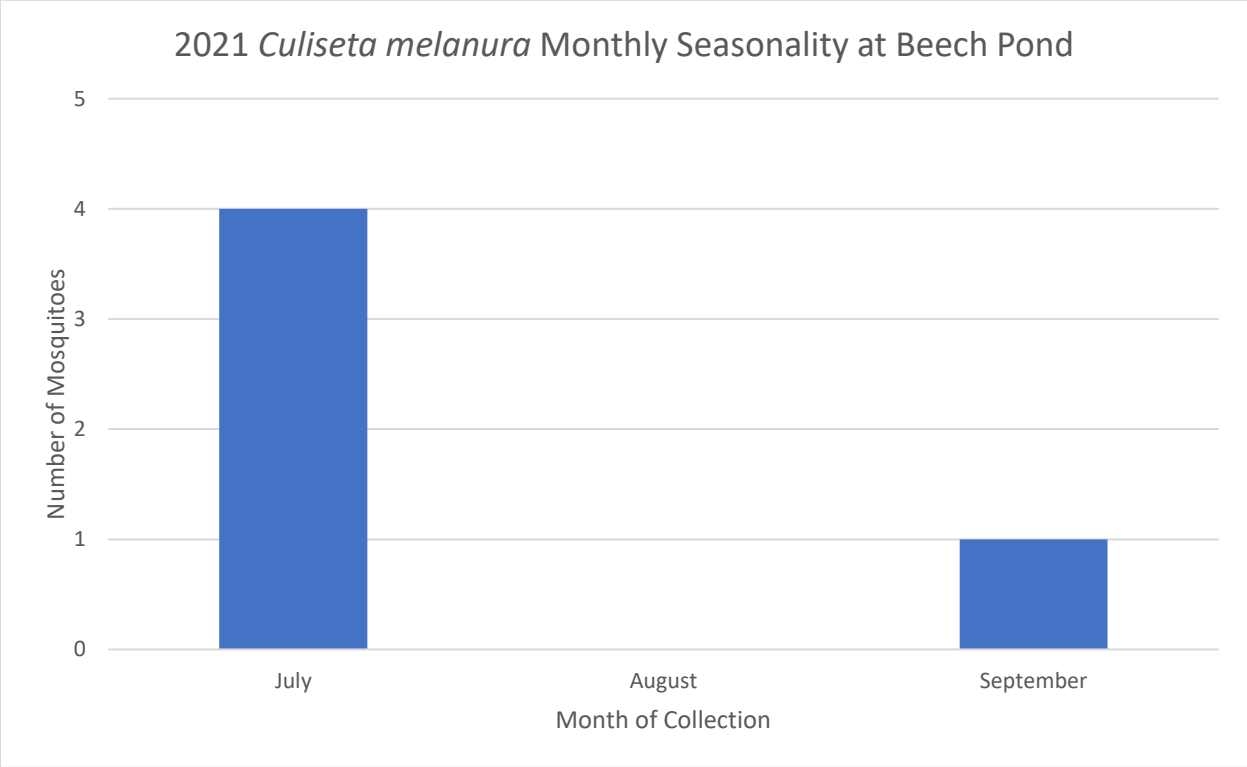

2021 Total *Culiseta melanura* Monitoring Data Weekly for All Sites
Number of Mosquitoes
0
2
4
6
8
10
12
9-Jul
16-Jul
23-Jul
30-Jul
6-Aug
13-Aug
20-Aug
27-Aug
3-Sep
10-Sep
17-Sep
24-Sep
1-Oct
Week Ending Collection Date

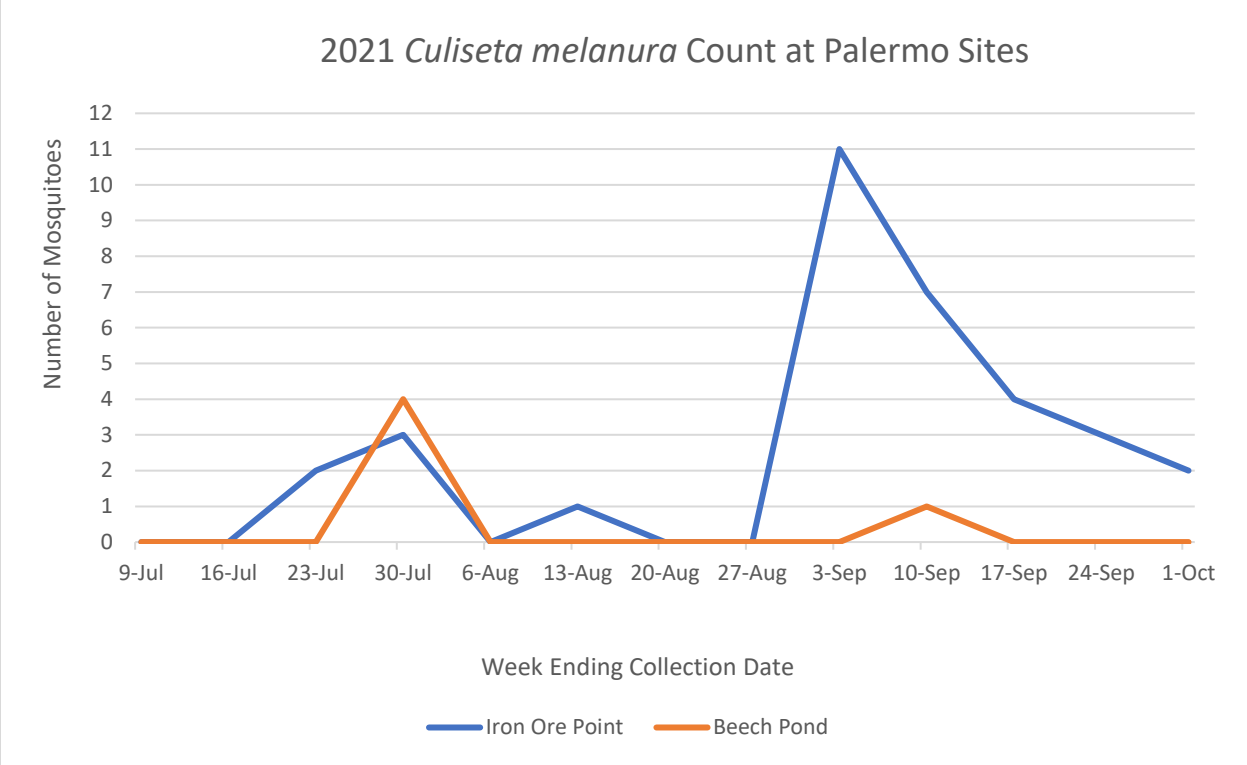

2021 Total *Culiseta melanura* Monitoring Data Monthly for All Sites
Number of Mosquitoes
0
4
8
12
16
20
24
28
JULY
AUGUST
SEPTEMBER
Month of Collection

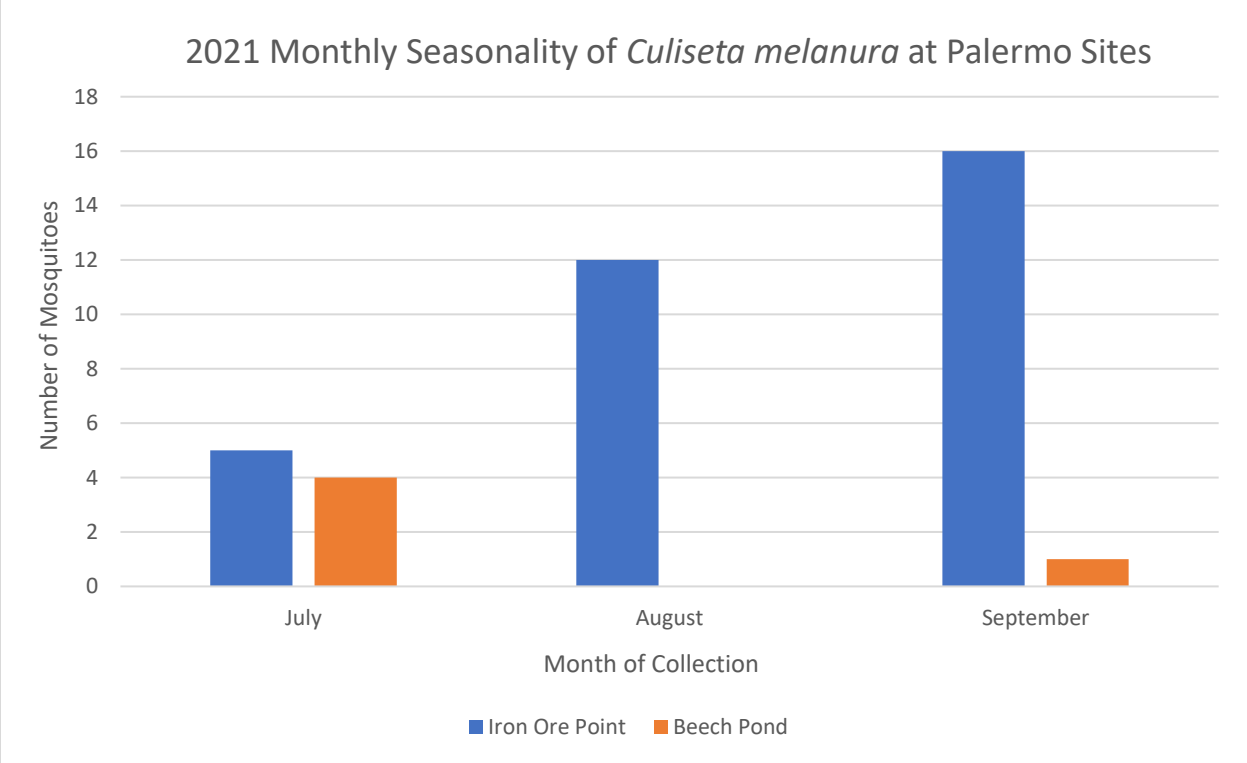

2021 *Culiseta melanura* Collection Data at Iron Ore Point
Number of Mosquitoes
0
2
4
6
8
10
12
9-Jul
16-Jul
23-Jul
30-Jul
6-Aug
13-Aug
20-Aug
27-Aug
3-Sep
10-Sep
17-Sep
24-Sep
1-Oct
Week Ending Collection Date

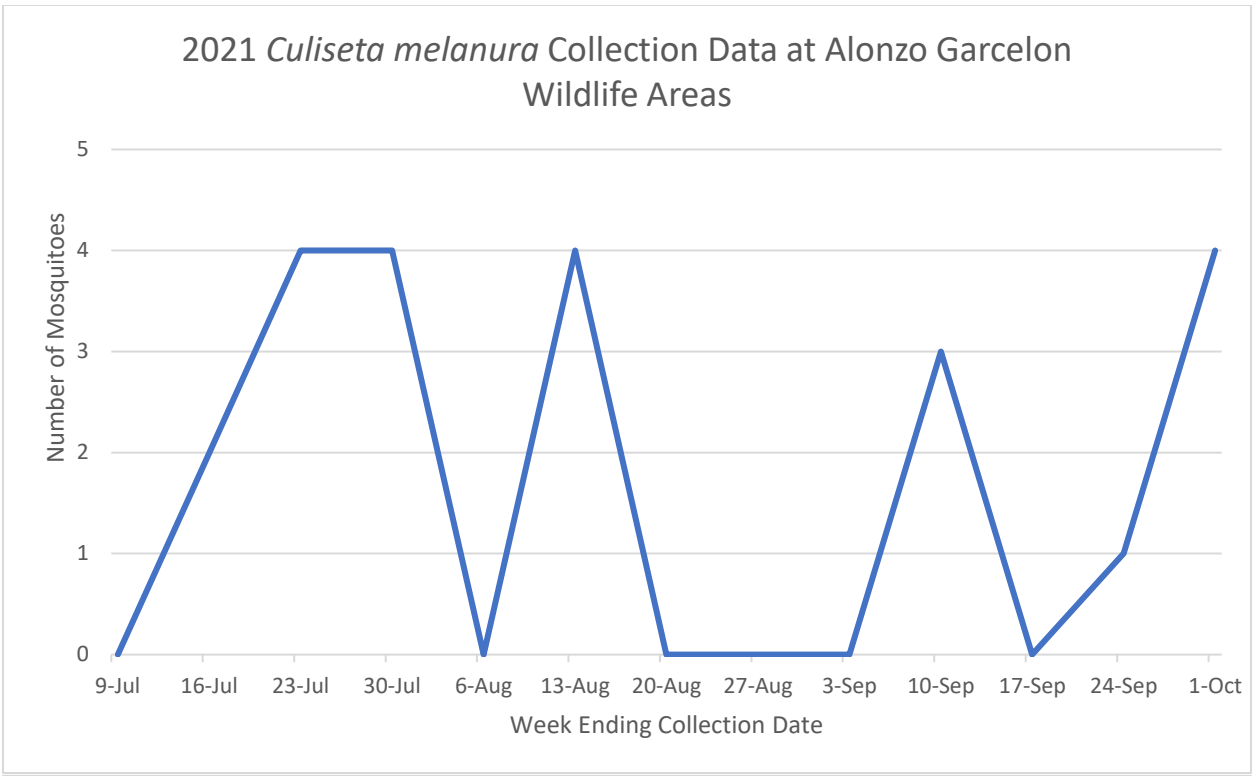

2021 *Culiseta melanura* Monthly Seasonality at Iron Ore Point
Number of Mosquitoes
0
2
4
6
8
10
12
14
16
18
20
July
August
September
Month of Collection

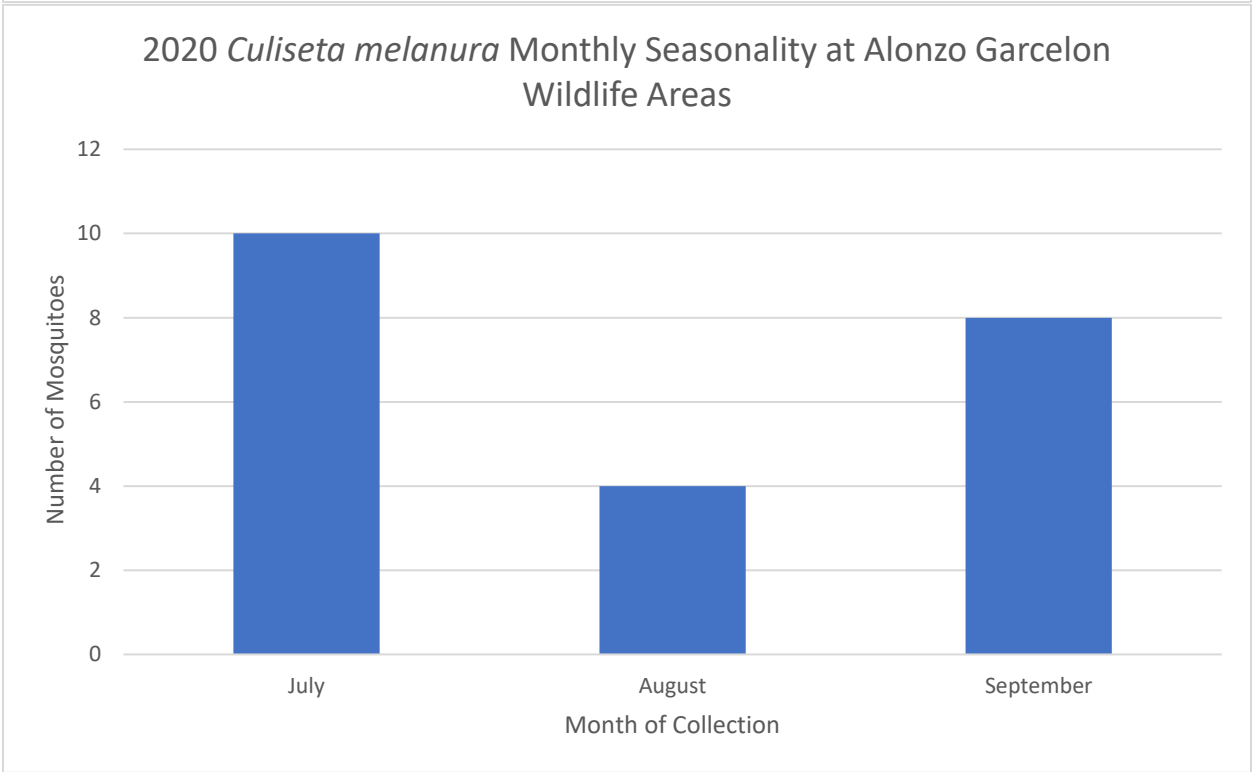

2021 *Culiseta melanura* Collection Data at Beech Pond
Number of Mosquitoes
0
1
2
3
4
5
9-Jul
16-Jul
23-Jul
30-Jul
6-Aug
13-Aug
20-Aug
27-Aug
3-Sep
10-Sep
17-Sep
24-Sep
1-Oct
Week Ending Collection Date

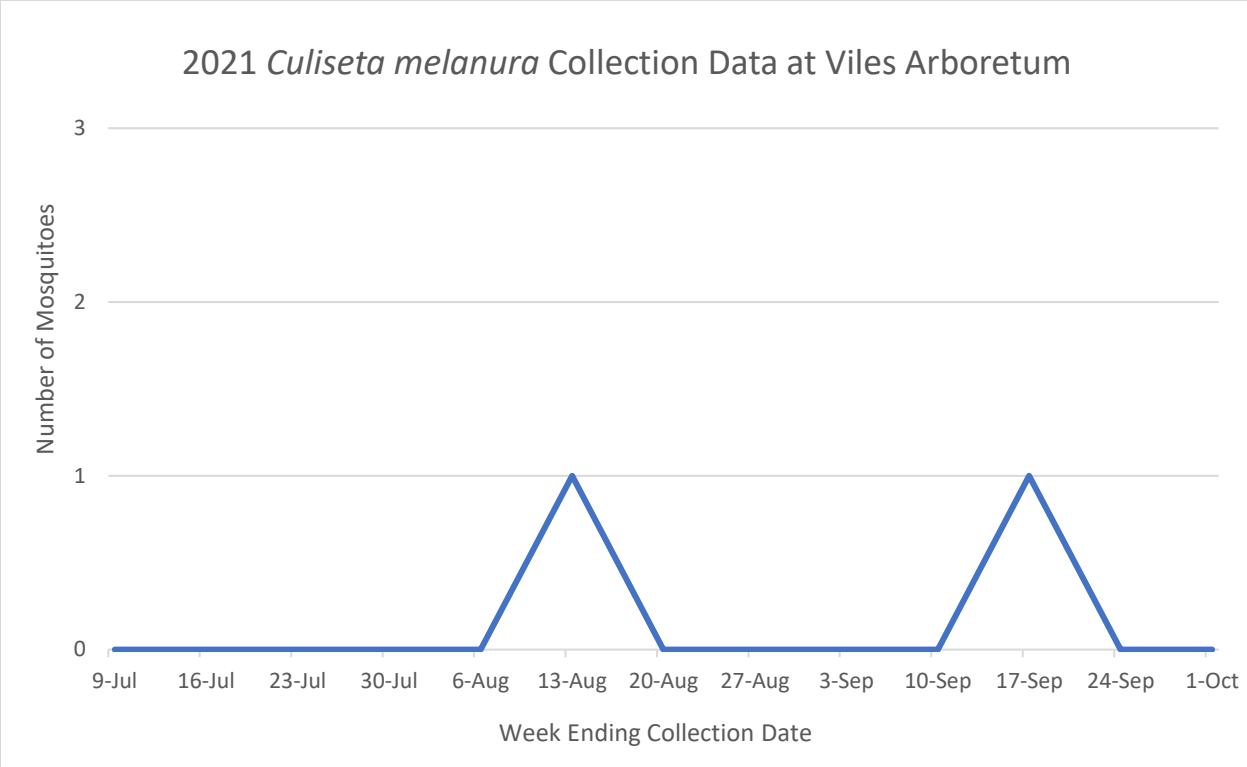

2021 *Culiseta melanura* Monthly Seasonality at Beech Pond
Number of Mosquitoes
0
1
2
3
4
5
July
August
September
Month of Collection

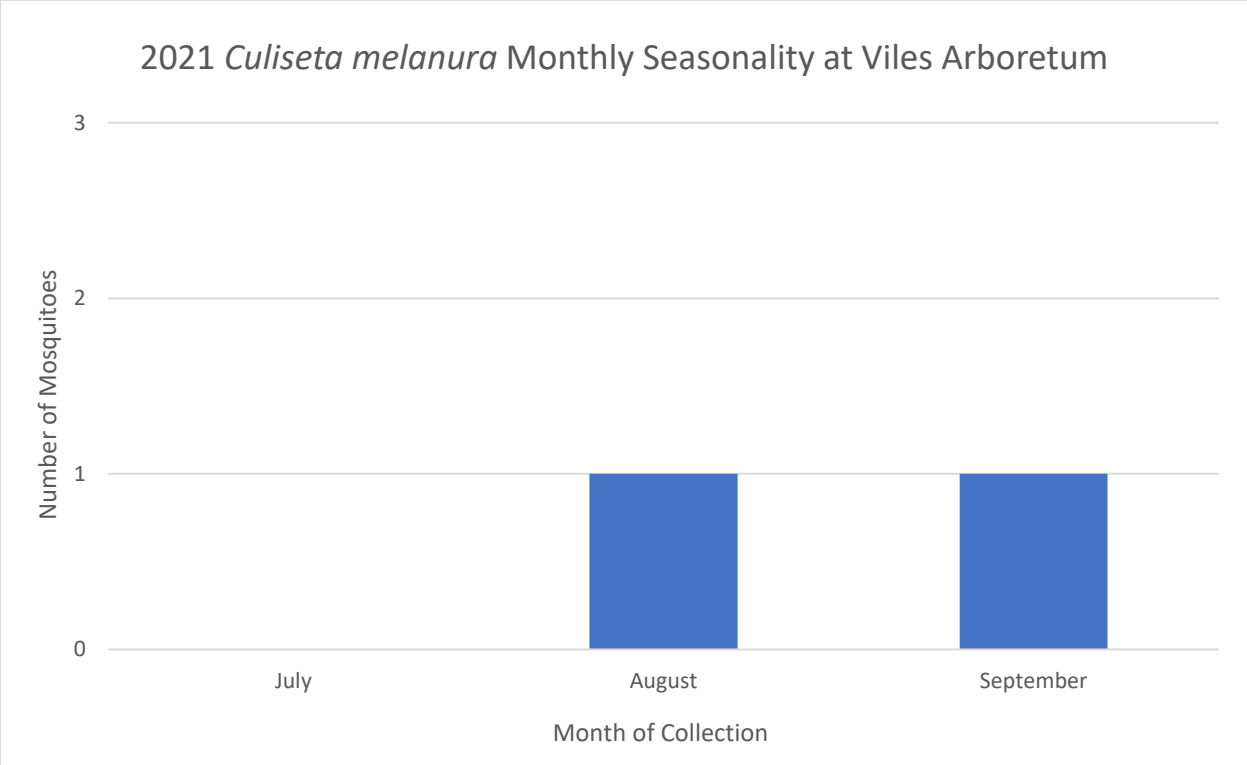

2021 *Culiseta melanura* Count at Palermo Sites
Number of Mosquitoes
12
11
10
9
8
7
6
5
4
3
2
1
0
9-Jul
16-Jul
23-Jul
30-Jul
6-Aug
13-Aug
20-Aug
27-Aug
3-Sep
10-Sep
17-Sep
24-Sep
1-Oct
Week Ending Collection Date
Iron Ore Point
Beech Pond

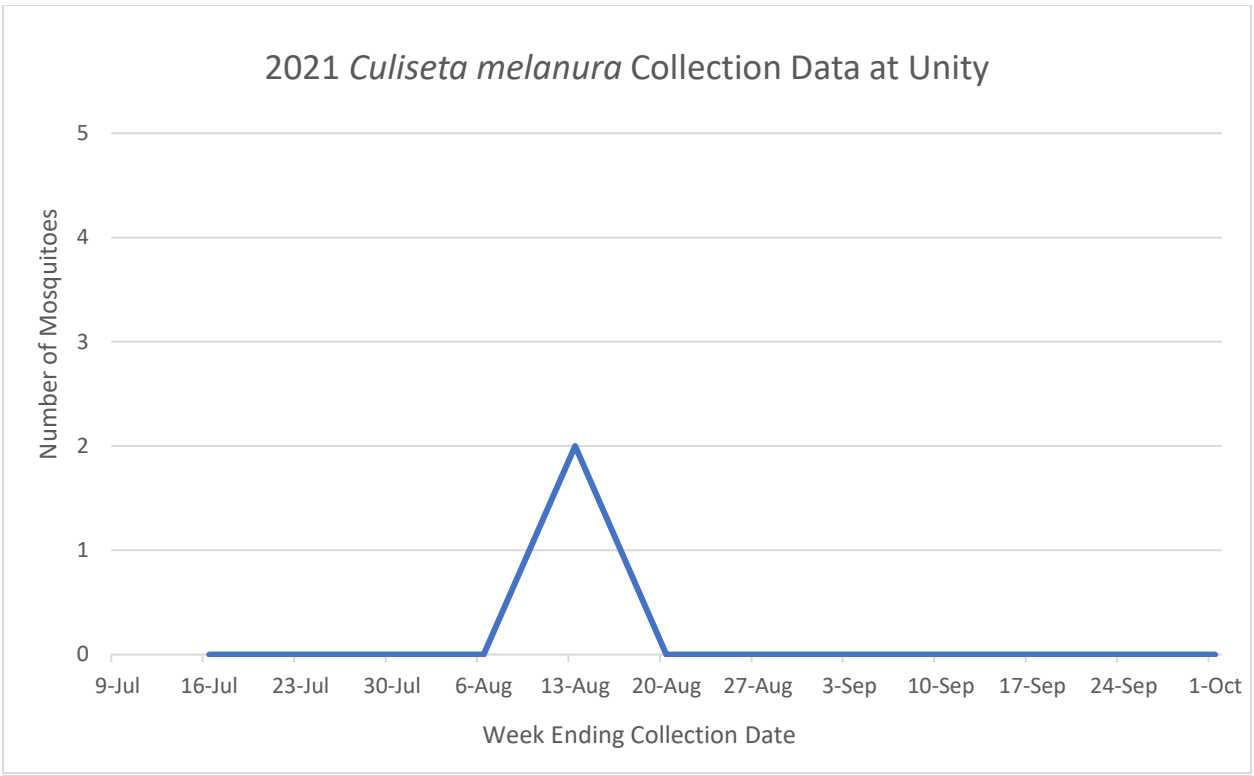

2021 Monthly Seasonality of *Culiseta melanura* at Palermo Sites
Number of Mosquitoes
18
16
14
12
10
8
6
4
2
0
July
August
September
Month of Collection
Iron Ore Point
Beech Pond

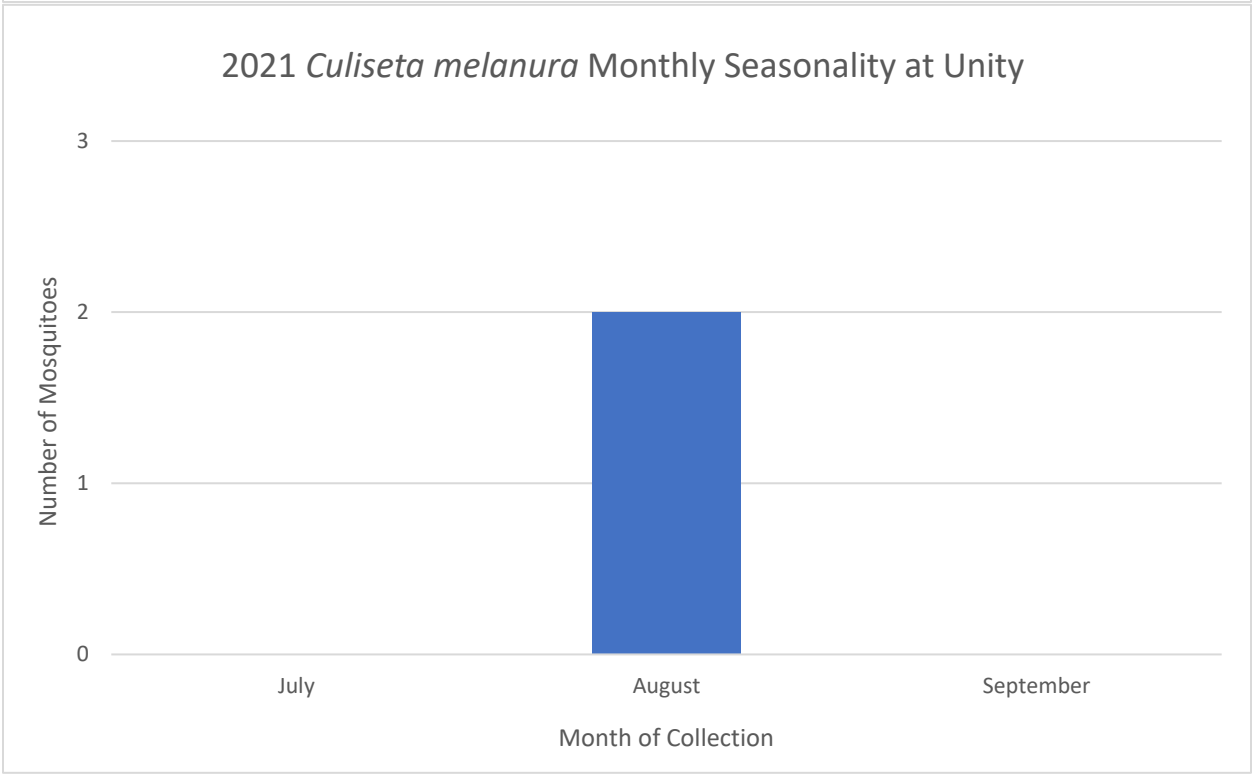

2021 *Culiseta melanura* Collection Data at Alonzo Garcelon Wildlife Areas
Number of Mosquitoes
0
1
2
3
4
5
9-Jul
16-Jul
23-Jul
30-Jul
6-Aug
13-Aug
20-Aug
27-Aug
3-Sep
10-Sep
17-Sep
24-Sep
1-Oct
Week Ending Collection Date

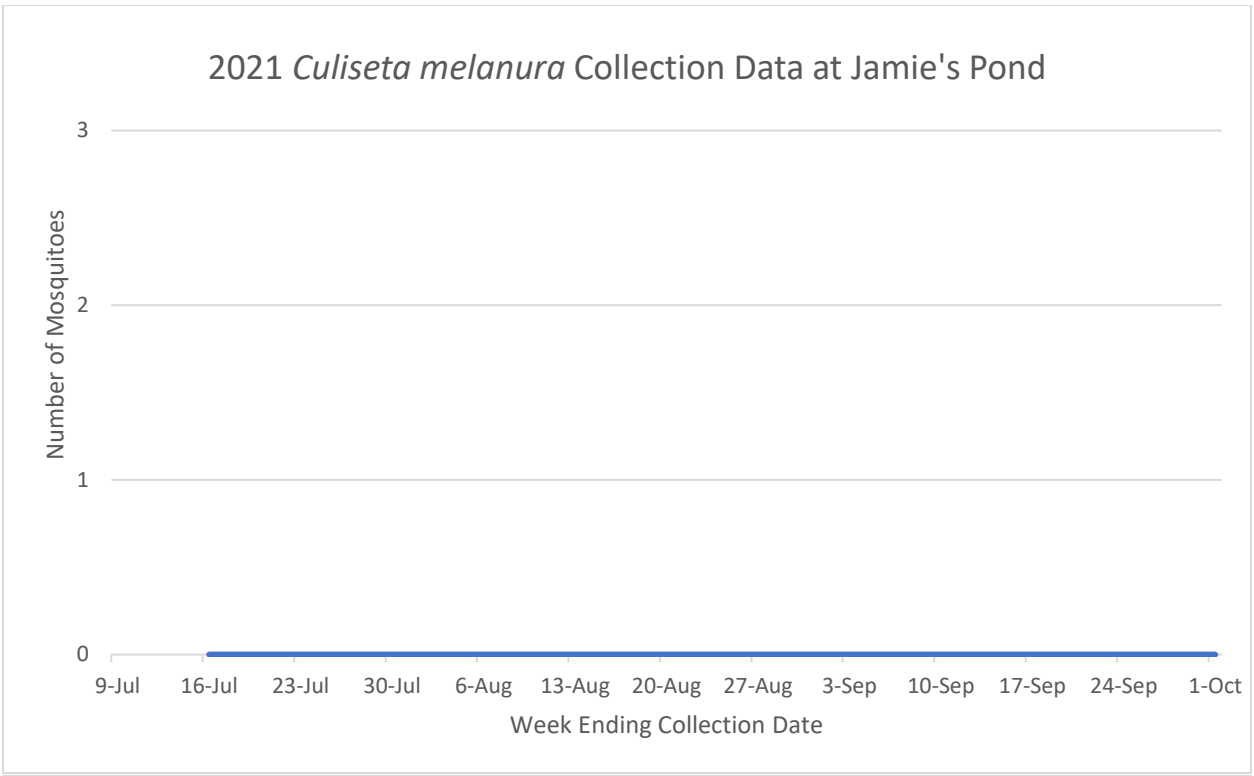

2020 *Culiseta melanura* Monthly Seasonality at Alonzo Garcelon Wildlife Areas
Number of Mosquitoes
0
2
4
6
8
10
12
July
August
September
Month of Collection

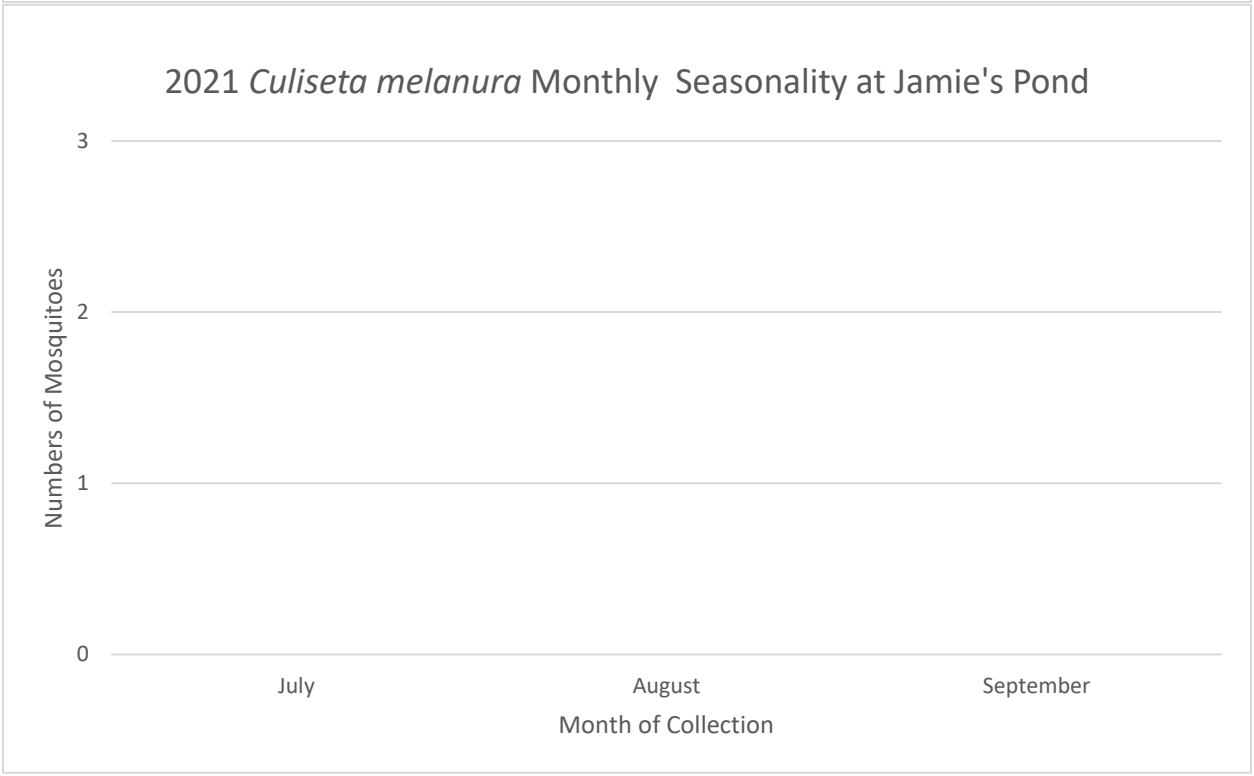

2021 *Culiseta melanura* Collection Data at Viles Arboretum
Number of Mosquitoes
3
2
1
0
9-Jul
16-Jul
23-Jul
30-Jul
6-Aug
13-Aug
20-Aug
27-Aug
3-Sep
10-Sep
17-Sep
24-Sep
1-Oct
Week Ending Collection Date

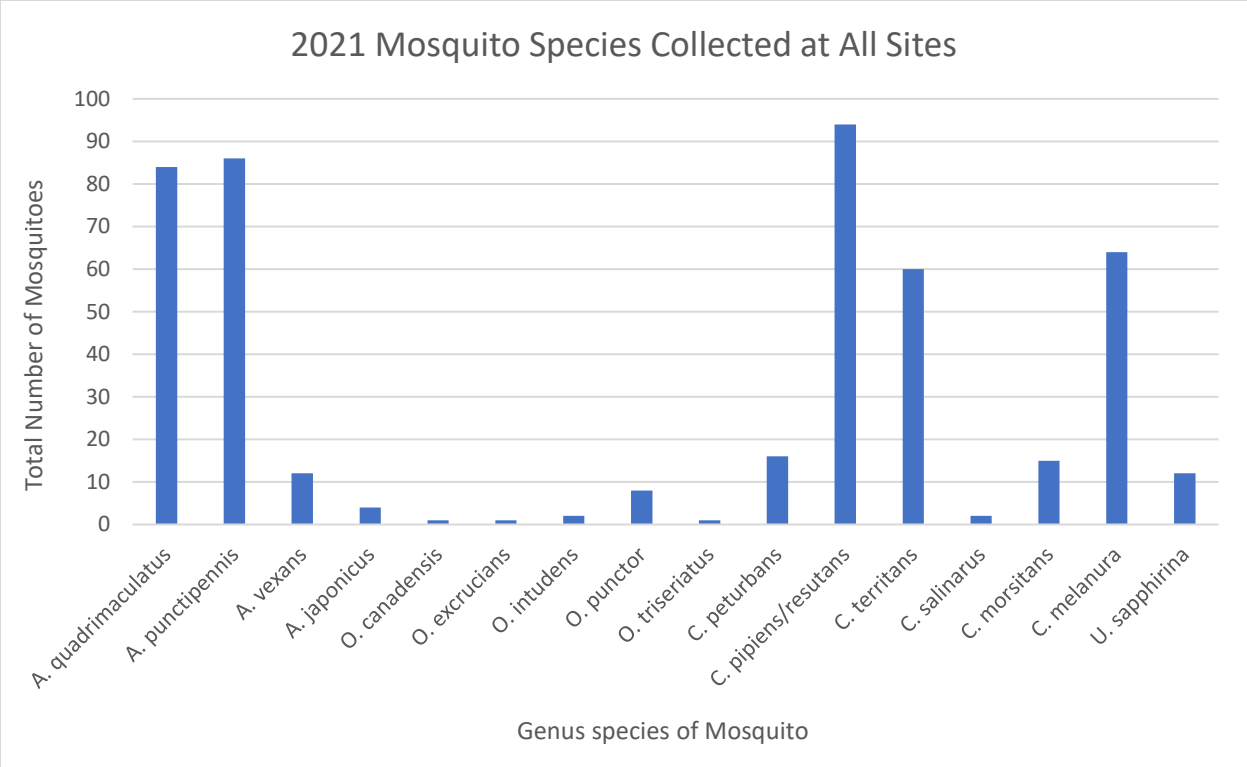

2021 *Culiseta melanura* Monthly Seasonality at Viles Arboretum
Number of Mosquitoes
3
2
1
0
July
August
September
Month of Collection

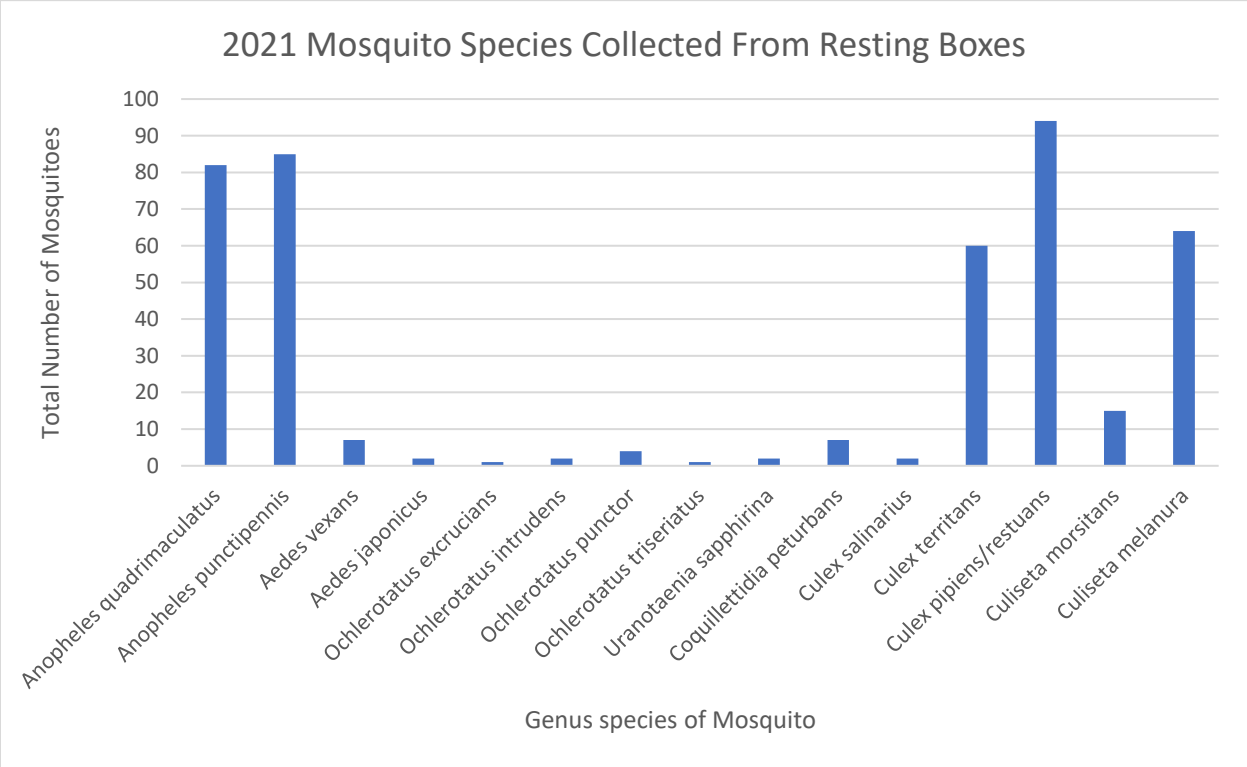

2021 *Culiseta melanura* Collection Data at Unity
Number of Mosquitoes
5
4
3
2
1
0
9-Jul
16-Jul
23-Jul
30-Jul
6-Aug
13-Aug
20-Aug
27-Aug
3-Sep
10-Sep
17-Sep
24-Sep
1-Oct
Week Ending Collection Date

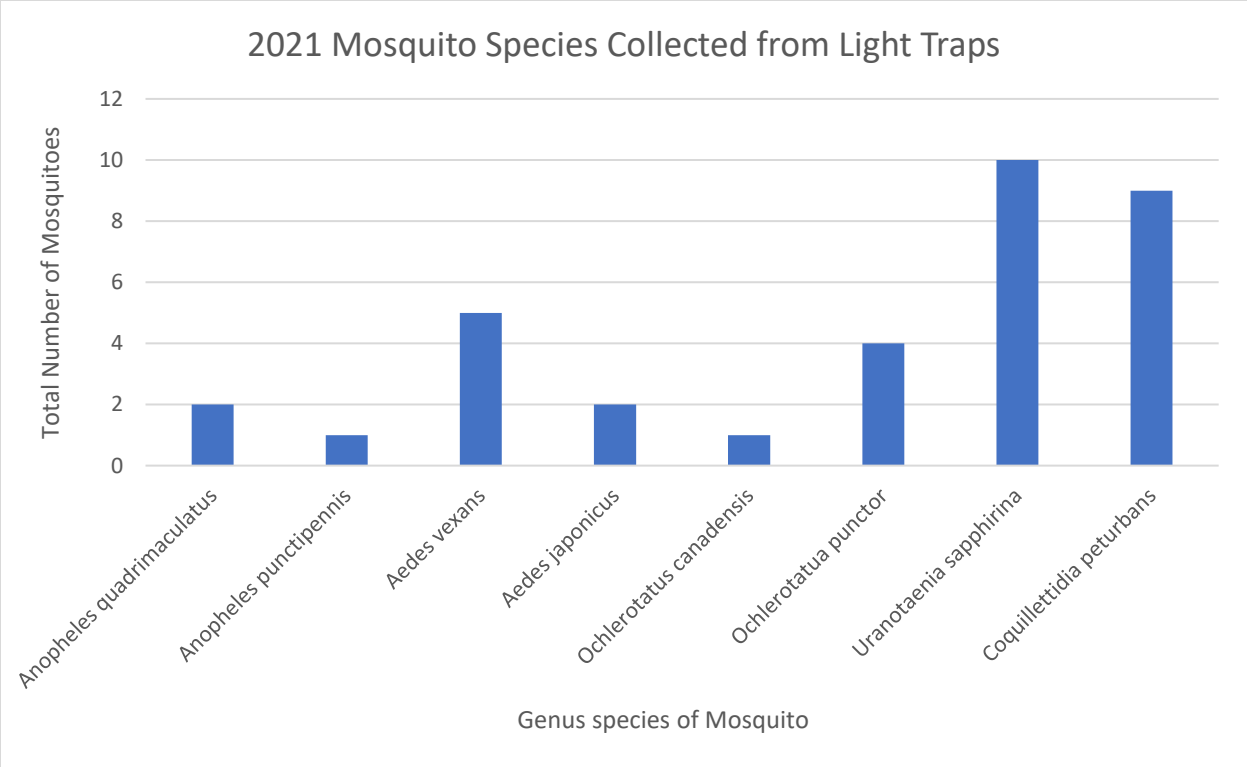

2021 *Culiseta melanura* Monthly Seasonality at Unity
Number of Mosquitoes
3
2
1
0
July
August
September
Month of Collection

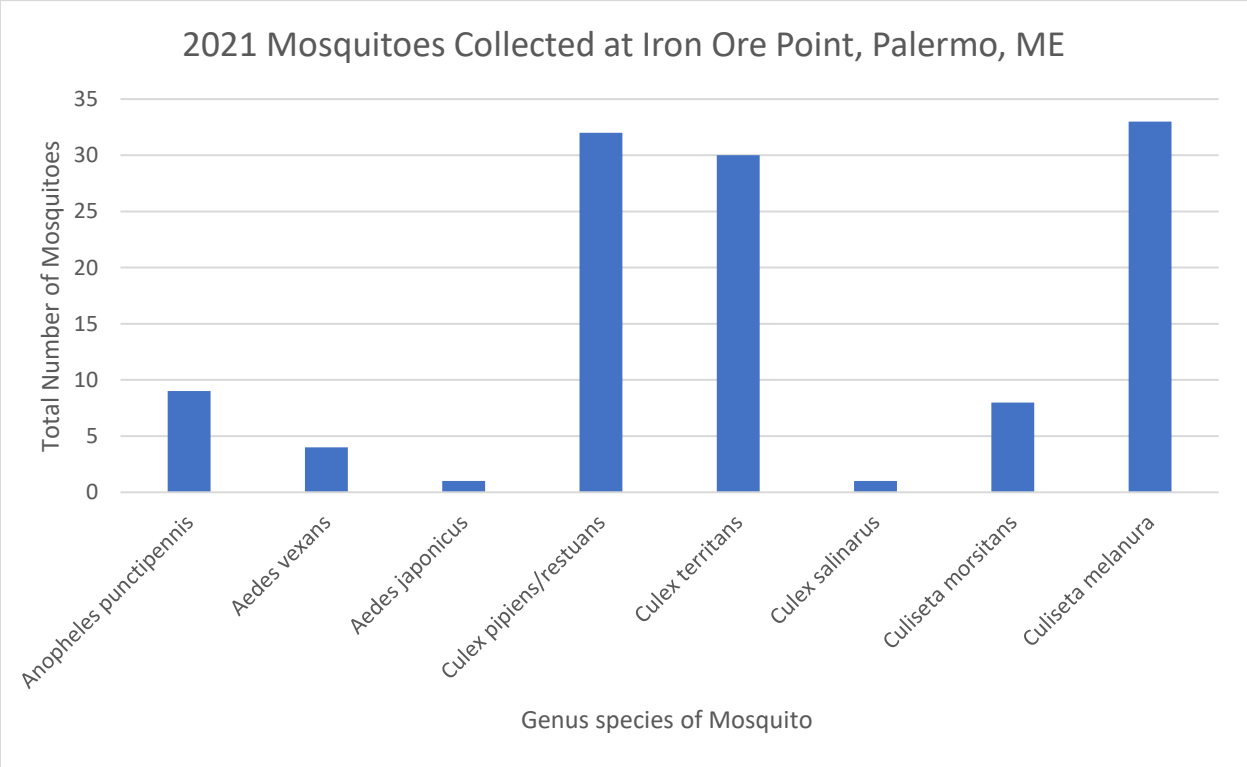

2021 *Culiseta melanura* Collection Data at Jamie's Pond
Number of Mosquitoes
3
2
1
0
9-Jul
16-Jul
23-Jul
30-Jul
6-Aug
13-Aug
20-Aug
27-Aug
3-Sep
10-Sep
17-Sep
24-Sep
1-Oct
Week Ending Collection Date

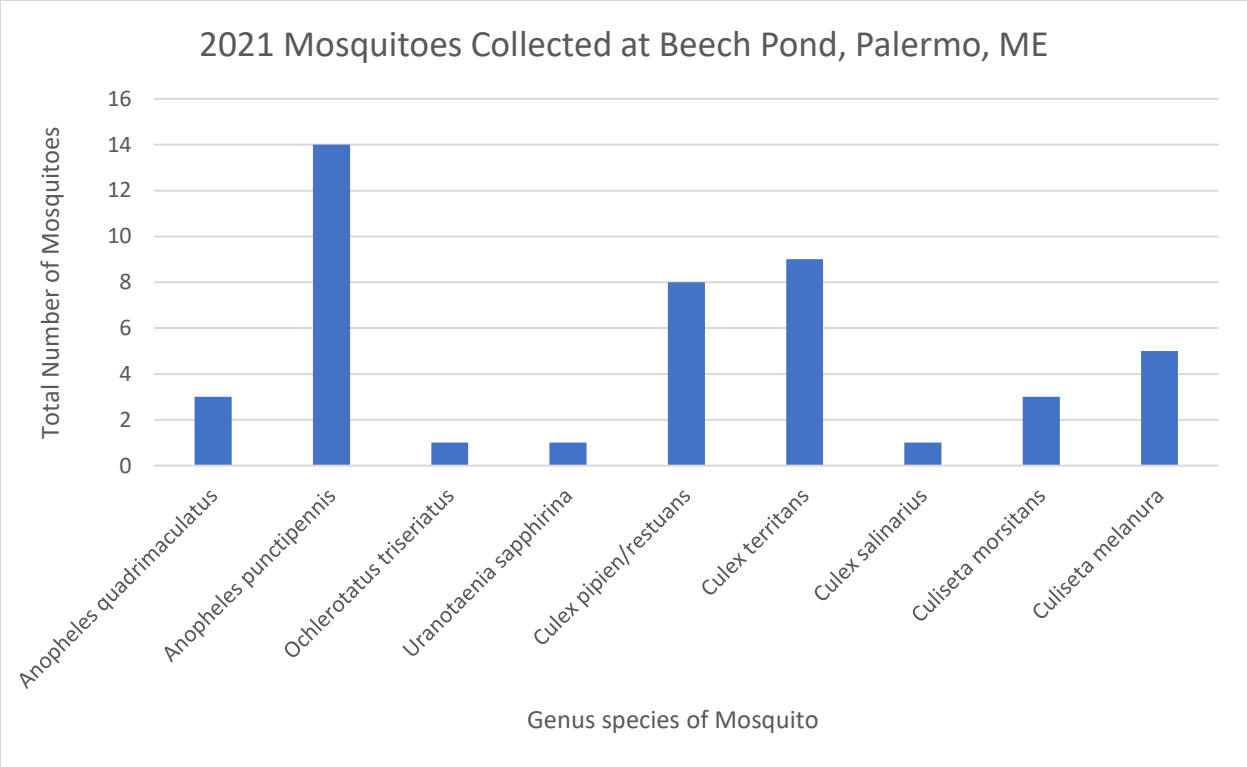

2021 *Culiseta melanura* Monthly Seasonality at Jamie's Pond
Numbers of Mosquitoes
3
2
1
0
July
August
September
Month of Collection

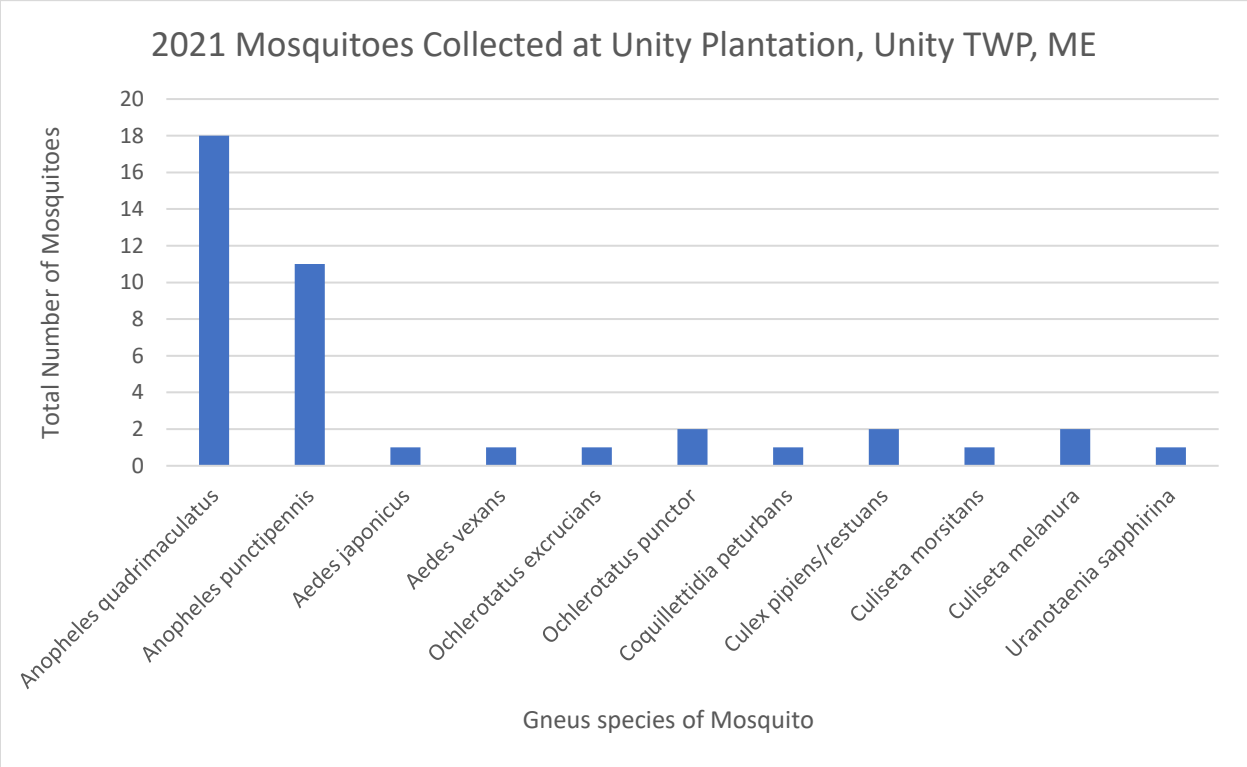

2021 Mosquito Species Collected at All Sites
Total Number of Mosquitoes
100
90
80
70
60
50
40
30
20
10
0
A. quadrimaculatus
A. punctipennis
A. vexans
A. japonicus
O. canadensis
O. excrucians
O. intudens
O. punctor
O. triseriatus
C. peturbans
C. pipiens/resutans
C. territans
C. salinarus
C. morsitans
C. melanura
U. sapphirina
Genus species of Mosquito

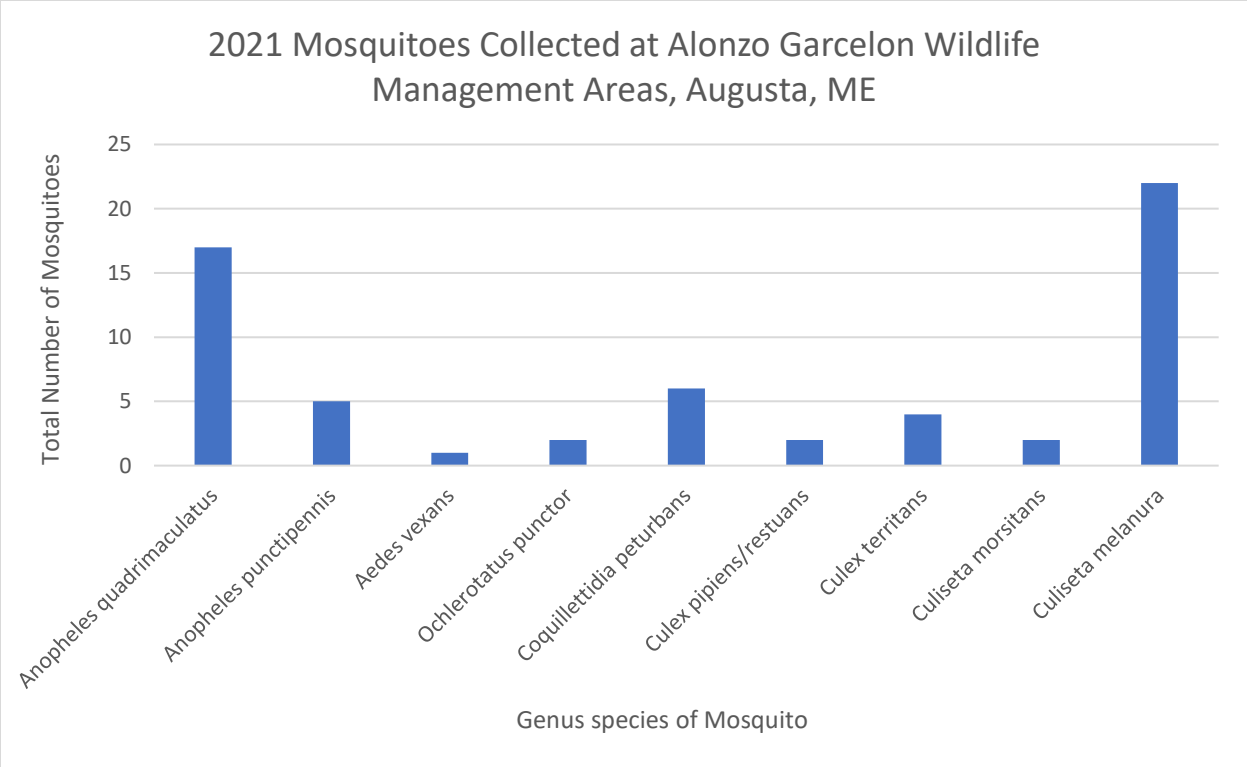

2021 Mosquito Species Collected From Resting Boxes
Total Number of Mosquitoes
100
90
80
70
60
50
40
30
20
10
0
Anopheles quadrimaculatus
Anopheles punctipennis
Aedes vexans
Aedes japonicus
Ochlerotatus excrucians
Ochlerotatus intrudens
Ochlerotatus punctor
Ochlerotatus triseriatus
Uranotaenia sapphirina
Coquillettidia peturbans
Culex salinarius
Culex territans
Culex pipiens/restuans
Culiseta morsitans
Culiseta melanura
Genus species of Mosquito

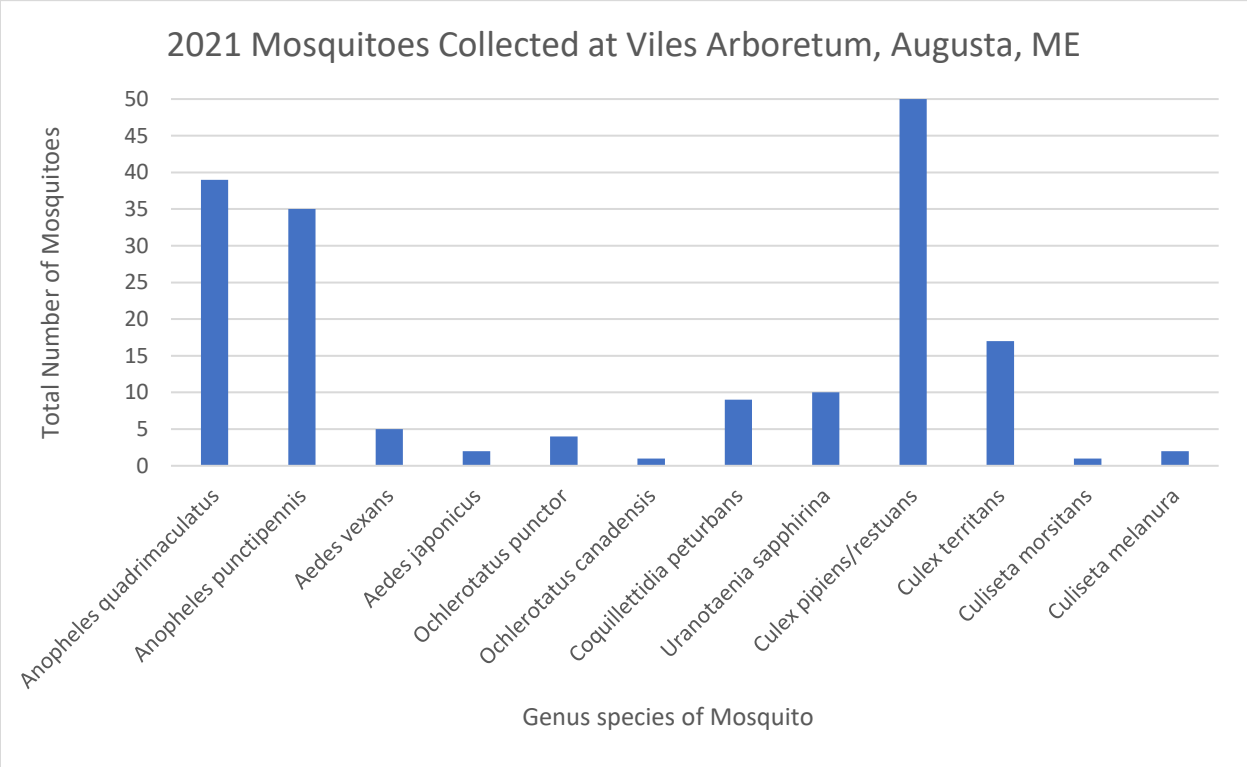

2021 Mosquito Species Collected from Light Traps
Total Number of Mosquitoes
12
10
8
6
4
2
0
Anopheles quadrimaculatus
Anopheles punctipennis
Aedes vexans
Aedes japonicus
Ochlerotatus canadensis
Ochlerotatua punctor
Uranotaenia sapphirina
Coquillettidia peturbans
Genus species of Mosquito

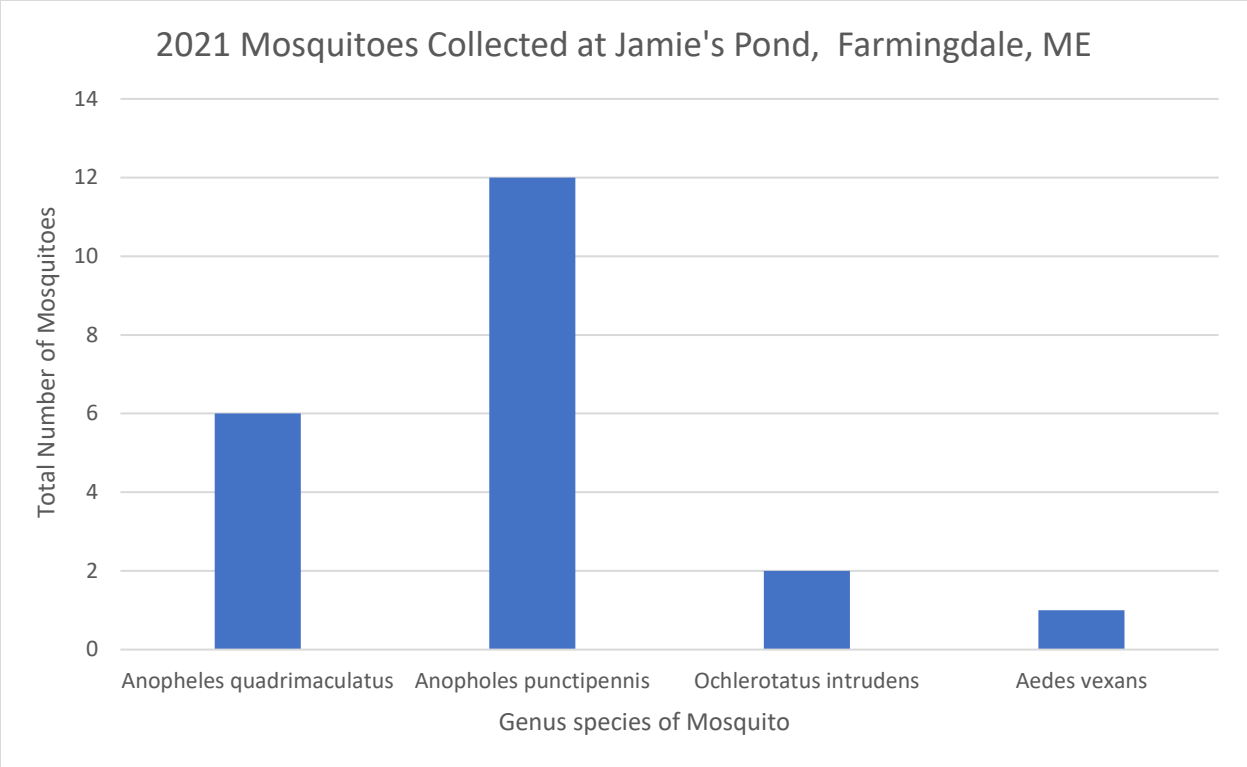

2021 Mosquitoes Collected at Iron Ore Point, Palermo, ME
Total Number of Mosquitoes
35
30
25
20
15
10
5
0
Anopheles punctipennis
Aedes vexans
Aedes japonicus
Culex pipiens/restuans
Culex territans
Culex salinarus
Culiseta morsitans
Culiseta melanura
Genus species of Mosquito

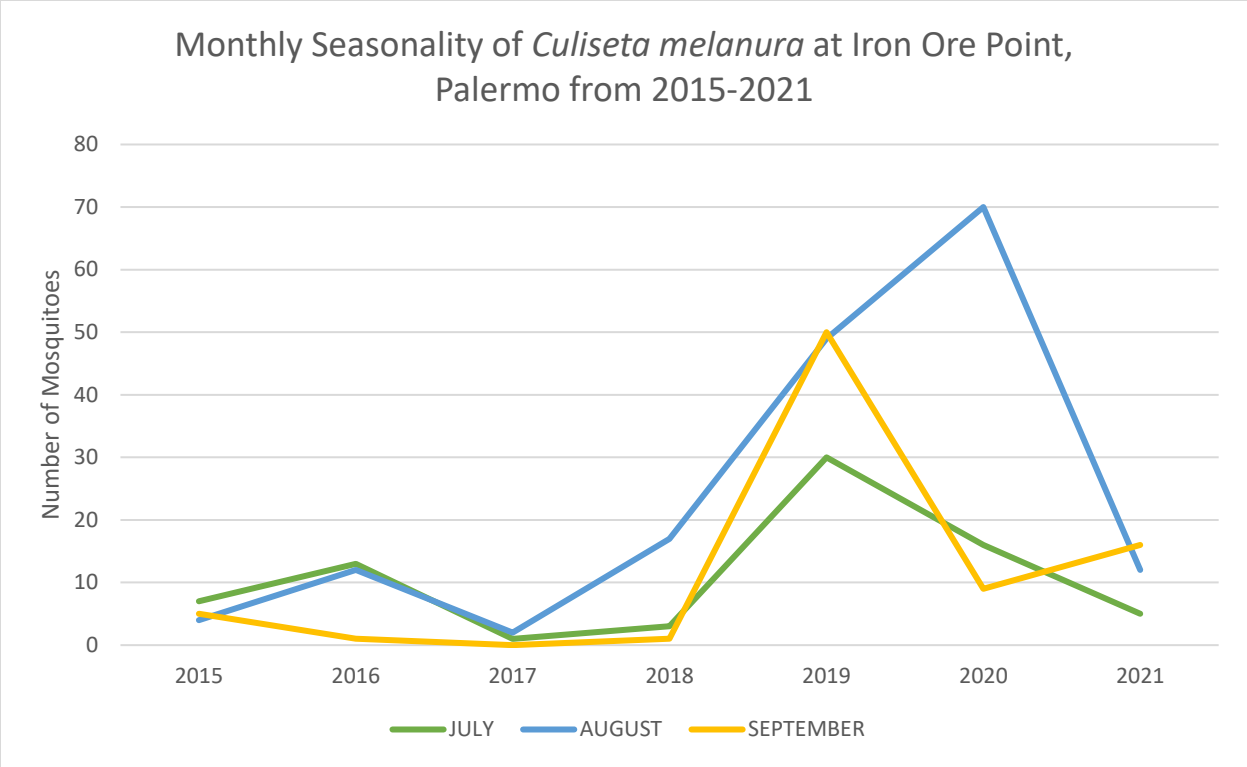

2021 Mosquitoes Collected at Beech Pond, Palermo, ME
Total Number of Mosquitoes
16
14
12
10
8
6
4
2
0
Anopheles quadrimaculatus
Anopheles punctipennis
Ochlerotatus triseriatus
Uranotaenia sapphirina
Culex pipien/restuans
Culex territans
Culex salinarius
Culiseta morsitans
Culiseta melanura
Genus species of Mosquito

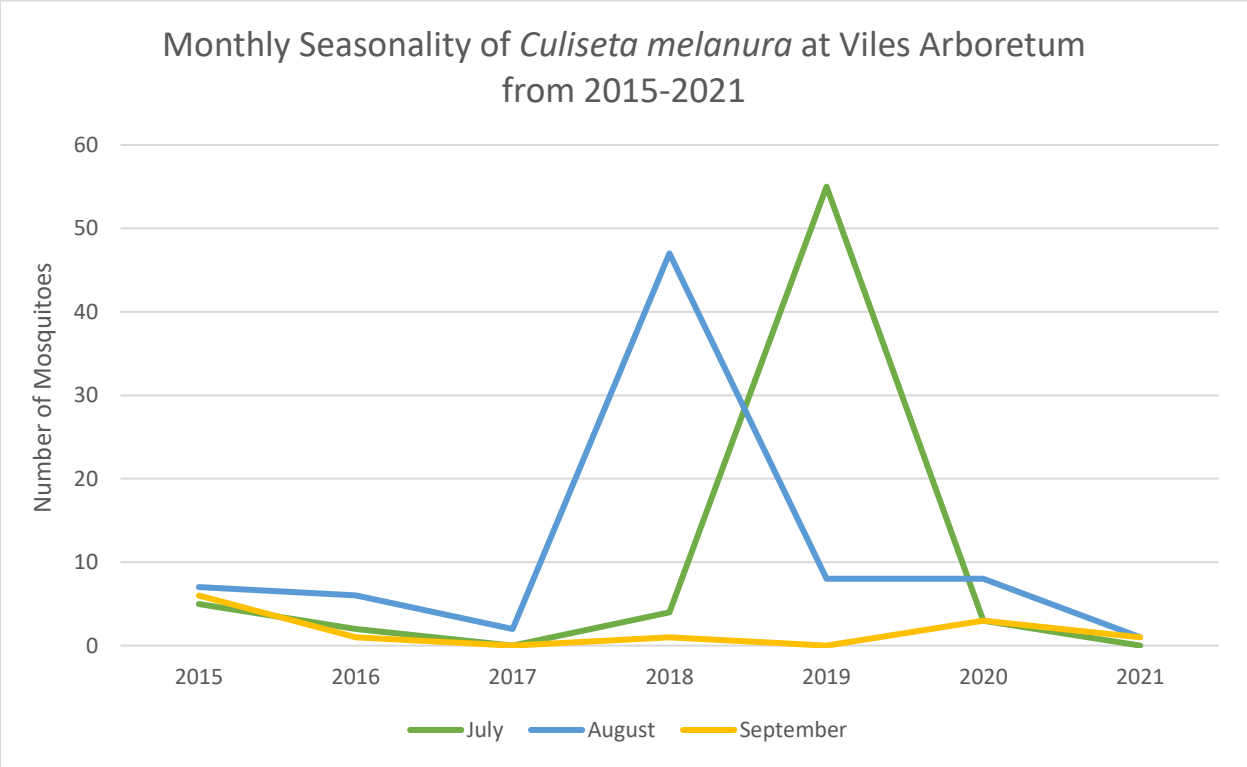

2021 Mosquitoes Collected at Unity Plantation, Unity TWP, ME
Total Number of Mosquitoes
20
18
16
14
12
10
8
6
4
2
0
Anopheles quadrimaculatus
Anopheles punctipennis
Aedes japonicus
Aedes vexans
Ochlerotatus excrucians
Ochlerotatus punctor
Coquillettidia peturbans
Culex pipiens/restuans
Culiseta morsitans
Culiseta melanura
Uranotaenia sapphirina
Gneus species of Mosquito

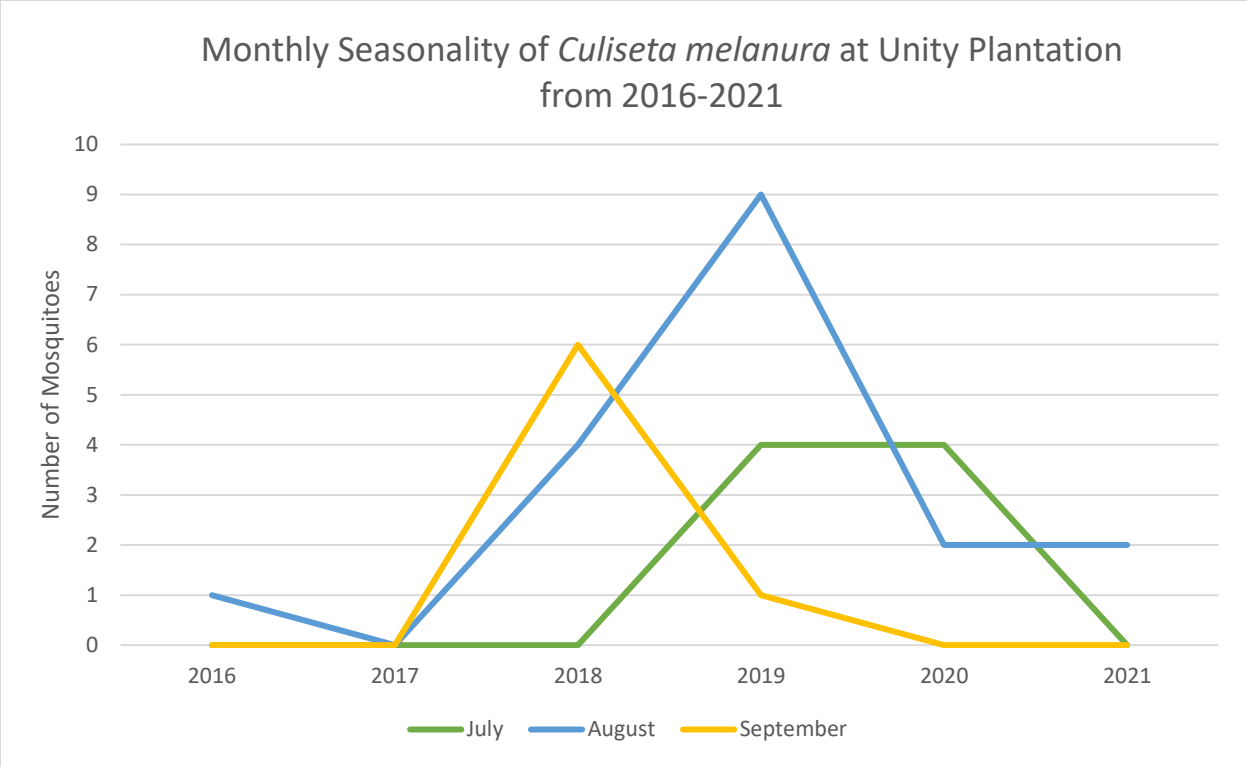

2021 Mosquitoes Collected at Alonzo Garcelon Wildlife Management Areas, Augusta, ME
Total Number of Mosquitoes
25
20
15
10
5
0
Anopheles quadrimaculatus
Anopheles punctipennis
Aedes vexans
Ochlerotatus punctor
Coquillettidia peturbans
Culex pipiens/restuans
Culex territans
Culiseta morsitans
Culiseta melanura
Genus species of Mosquito

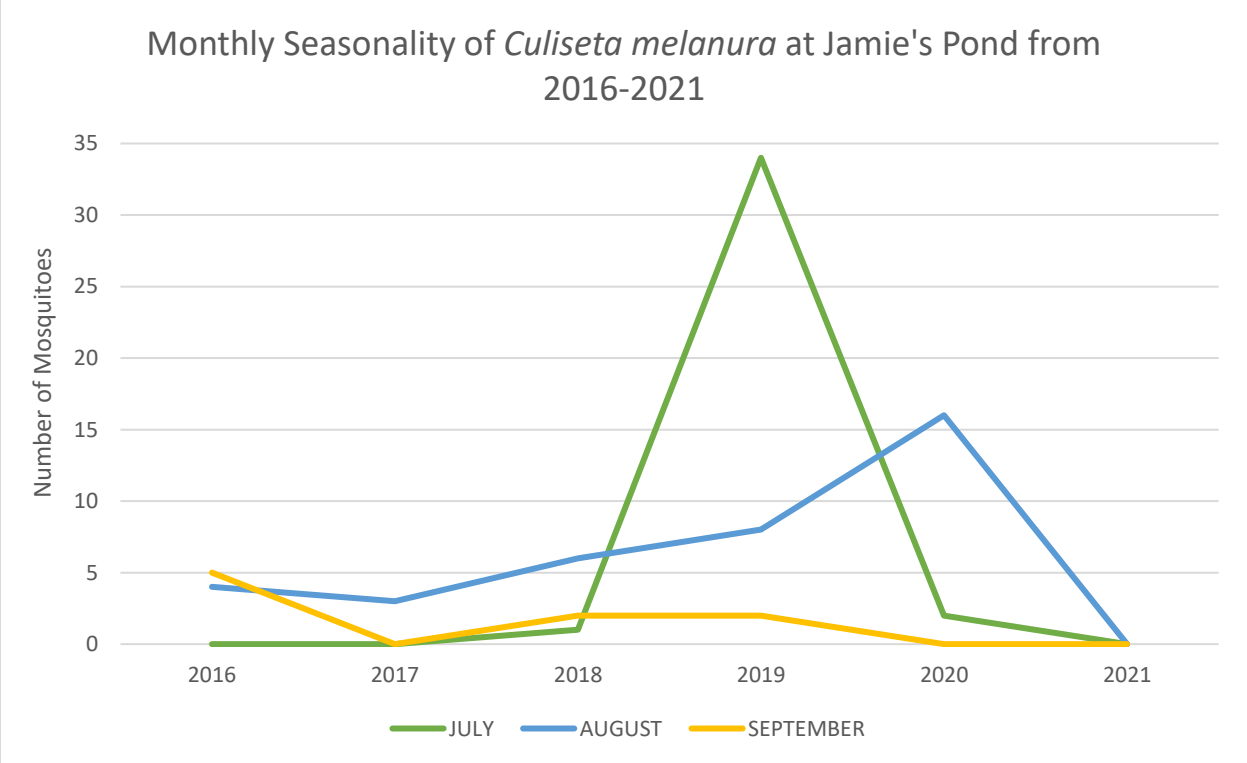

2021 Mosquitoes Collected at Viles Arboretum, Augusta, ME
Total Number of Mosquitoes
50
45
40
35
30
25
20
15
10
5
0
Anopheles quadrimaculatus
Anopheles punctipennis
Aedes vexans
Aedes japonicus
Ochlerotatus punctor
Ochlerotatus canadensis
Coquillettidia peturbans
Uranotaenia sapphirina
Culex pipiens/restuans
Culex territans
Culiseta morsitans
Culiseta melanura
Genus species of Mosquito

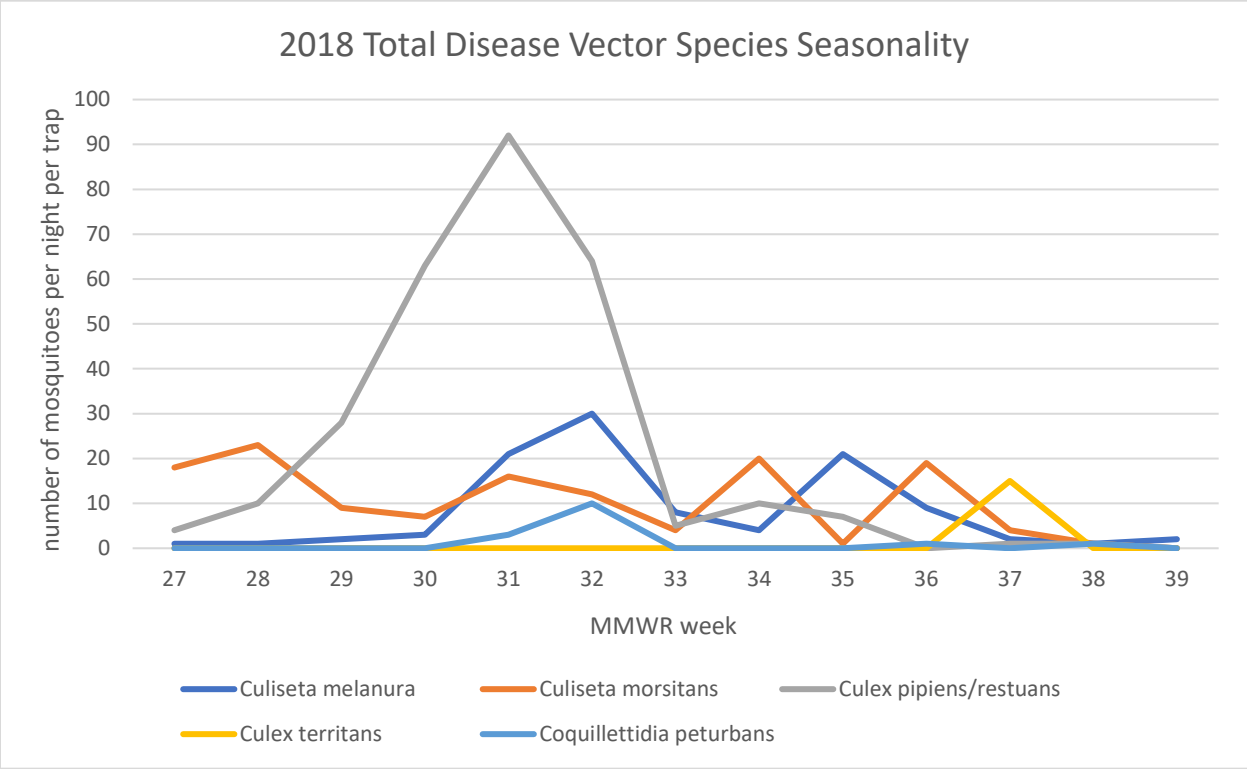

2021 Mosquitoes Collected at Jamie's Pond, Farmingdale, ME
Total Number of Mosquitoes
14
12
10
8
6
4
2
0
Anopheles quadrimaculatus
Anopholes punctipennis
Ochlerotatus intrudens
Aedes vexans
Genus species of Mosquito

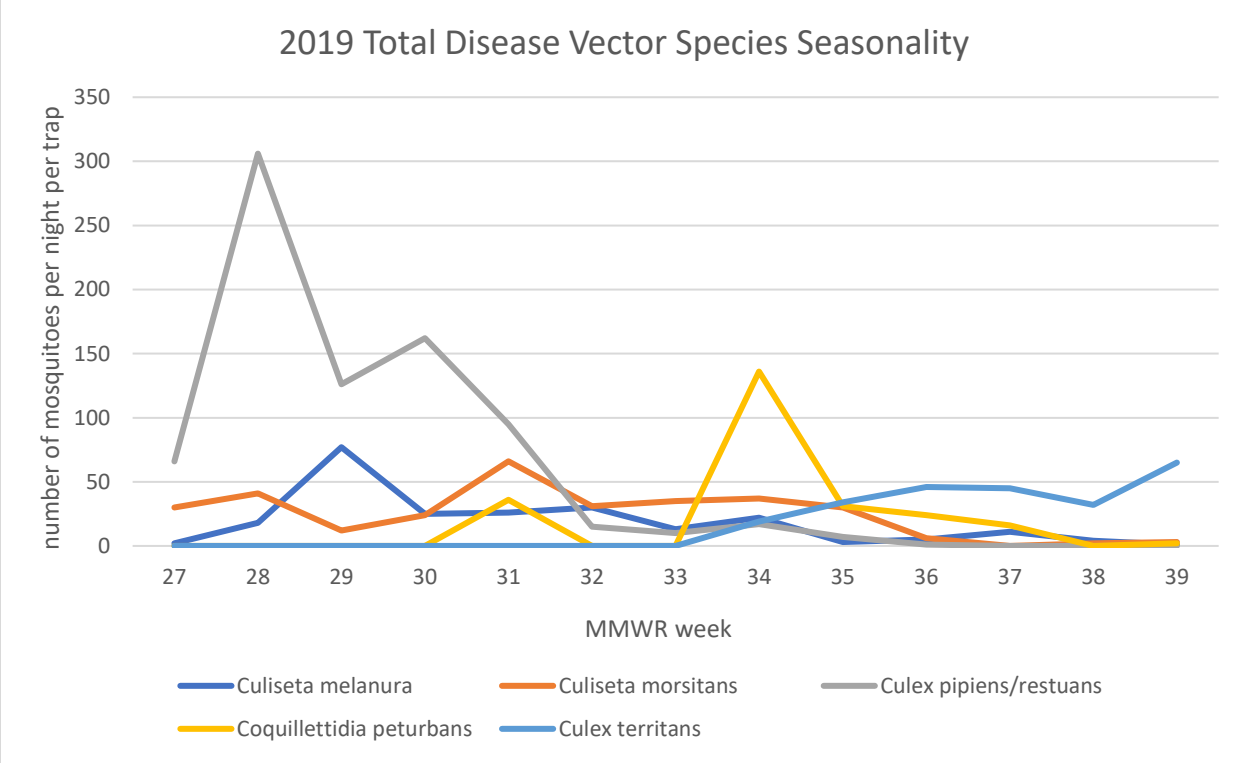

Monthly Seasonality of *Culiseta melanura* at Iron Ore Point, Palermo from 2015-2021
Number of Mosquitoes
80
70
60
50
40
30
20
10
0
2015
2016
2017
2018
2019
2020
2021
JULY
AUGUST
SEPTEMBER

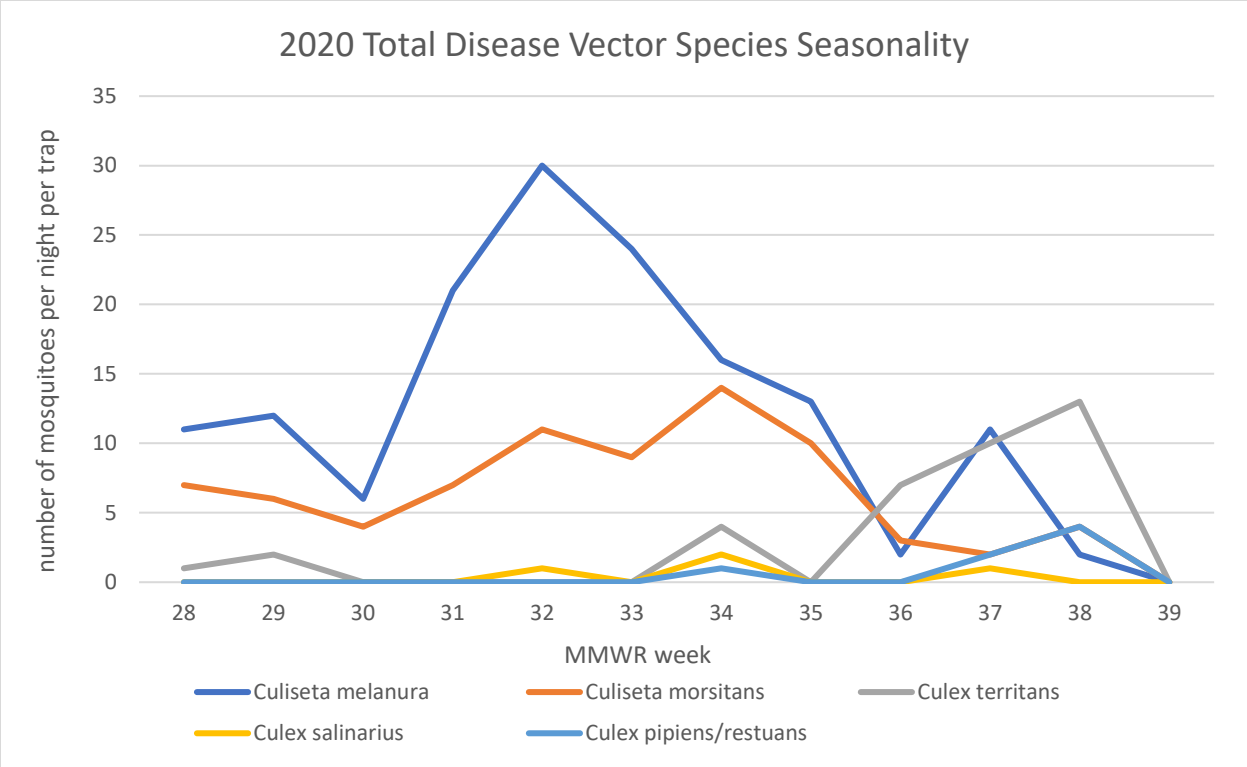

Monthly Seasonality of *Culiseta melanura* at Viles Arboretum from 2015-2021
Number of Mosquitoes
60
50
40
30
20
10
0
2015
2016
2017
2018
2019
2020
2021
July
August
September

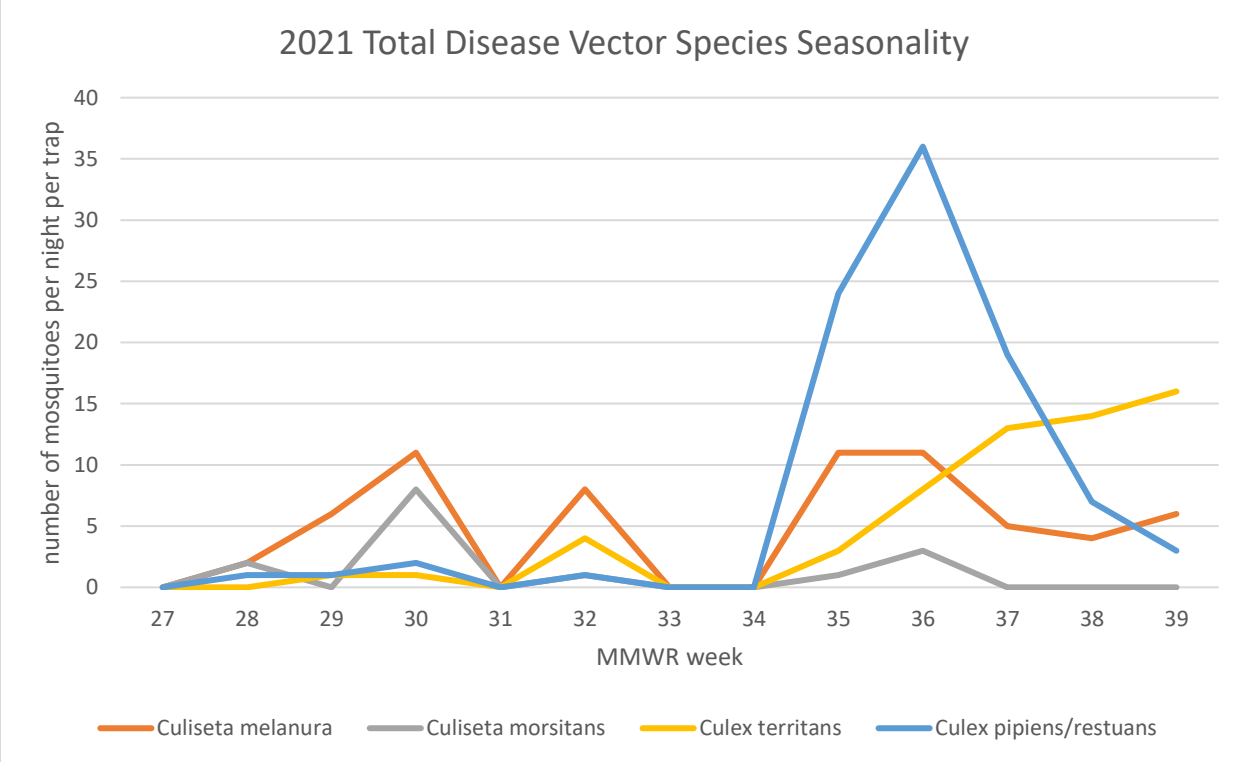

Monthly Seasonality of *Culiseta melanura* at Unity Plantation from 2016-2021
Number of Mosquitoes
10
9
8
7
6
5
4
3
2
1
0
2016
2017
2018
2019
2020
2021
July
August
September


Monthly Seasonality of *Culiseta melanura* at Jamie's Pond from 2016-2021
Number of Mosquitoes
35
30
25
20
15
10
5
0
2016
2017
2018
2019
2020
2021
JULY
AUGUST
SEPTEMBER


2018 Total Disease Vector Species Seasonality
number of mosquitoes per night per trap
100
90
80
70
60
50
40
30
20
10
0
27
28
29
30
31
32
33
34
35
36
37
38
39
MMWR week
Culiseta melanura
Culiseta morsitans
Culex pipiens/restuans
Culex territans
Coquillettidia peturbans


2019 Total Disease Vector Species Seasonality
number of mosquitoes per night per trap
350
300
250
200
150
100
50
0
27
28
29
30
31
32
33
34
35
36
37
38
39
MMWR week
Culiseta melanura
Culiseta morsitans
Culex pipiens/restuans
Coquillettidia peturbans
Culex territans

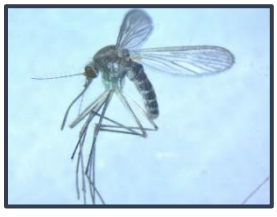

2020 Total Disease Vector Species Seasonality
number of mosquitoes per night per trap
35
30
25
20
15
10
5
0
28
29
30
31
32
33
34
35
36
37
38
39
MMWR week
Culiseta melanura
Culiseta morsitans
Culex territans
Culex salinarius
Culex pipiens/restuans


2021 Total Disease Vector Species Seasonality
number of mosquitoes per night per trap
40
35
30
25
20
15
10
5
0
27
28
29
30
31
32
33
34
35
36
37
38
39
MMWR week
Culiseta melanura
Culiseta morsitans
Culex territans
Culex pipiens/restuans

25	6/26/2021
26	7/3/2021
27	7/10/2021
28	7/17/2021
29	7/24/2021
30	7/31/2021
31	8/7/2021
32	8/14/2021
33	8/21/2021
34	8/28/2021
35	9/4/2021
36	9/11/2021
37	9/18/2021
38	9/25/2021
39	10/2/2021
40	10/9/2021

MMWR Weeks for 2021 Field Season

Report prepared by Autumn St.Pierre, DACF, October 2021



Draft Job Description

2022 Field Technician for Mosquito and Swallowwort Biocontrol Project

BRIEF JOB DESCRIPTION: The Maine Department of Agriculture, Conservation and Forestry (DACF) has a temporary need for a seasonal laboratory and field assistant to assist with two projects on a 40 hour per week basis. The first project involves assisting in a project working to successfully introduce and establish *Hypena opulenta* as a classical biological control agent for managing the severely invasive black swallowwort (*Cynanchum louiseae*) in Maine. The second project involves mosquito trapping and testing activities for the Maine statewide mosquito monitoring program as described in DACF's "Plan for the Protection of the Public Health from Mosquito-borne Diseases". Additionally, there will be opportunities to assist the staff of the Maine Board of Pesticides Control with various tasks. The successful candidate will assist in selecting sites and servicing mosquito traps weekly, assist in mosquito identification, properly handle and label specimens using cold-chain protocol, keep records and manage data. Field sites for both projects extend from Ogunquit to Unity, Maine, and will involve driving up to 1.5 hours at a time. Work will be based in Augusta, Maine.

KNOWLEDGE/SKILLS/ABILITIES: Education and experience in biology, with priority given to experience and training in insect identification and/or plant identification; Project management & implementation, including record-keeping, time management, and ability to communicate with superiors and collaborating laboratories with routine sample drop off dates and times; Ability to use Microsoft Office applications including Word, Excel, and Outlook, with priority given if able to conduct simple data analyses within spreadsheets (simple formulas, creating graphs, copying graphs and tables from Excel to Word) and comfort writing technical reports; Comfort with field and laboratory conditions, including handling live insects (specifically mosquitos and caterpillars), ability to conduct good recordkeeping while in the field (data sheets will be provided), ability to traverse uneven ground while carrying approximately 15-20lbs of equipment (field sites are within the woods), ability to drive to coordinate locations and follow instructions to find remote field sites, comfort with handling dry ice, and experience with use of a dissection microscope. Assistant will be trained in identification and field skills where lacking.

MINIMUM QUALIFICATIONS: Candidates must have a valid driver's license and be at least 18 years of age.