Modern Mosquito Control Challenges and Opportunities

An Independent Special District
Protecting Public Health since 1930

City of Newark: 1/10/19

Hello Newark.

- Our District
- Mosquitoes
- Health Threats
- Control
- Innovations
- Partners
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<td>CITY SEWER SERVICE</td>
<td>800-676-7516</td>
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<td>MOSQUITO ABATEMENT</td>
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<td>CSA PARAMEDIC</td>
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<td>* EBRP PARK SAFETY/IM</td>
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<td>URBAN RUNOFF</td>
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Financials
Our Staff: 17 FT & 5 Seasonal Staff

Mosquito Control
9 FT Staff in 8 Zones
2 Seasonal Staff

Monitoring
3 FT Staff
2 Seasonal Staff

Administrative
5 FT Staff
1 Seasonal Staff

Aquatic Lifecycle

- Urban mosquitoes spend 1 - 2 weeks as larvae or pupae
- Breathe air at the surface of water
Mosquito Pathogens

- West Nile virus
- Western equine encephalitis virus
- Saint Louis encephalitis virus
- Dog heartworm
- Malaria
- Zika virus
- Dengue virus
- Chikungunya virus
- Yellow fever virus

Mosquitoes in Alameda County that transmit West Nile virus

*Culex pipiens*: common house mosquito

*Culex tarsalis*: western encephalitis mosquito
Mosquitoes that spread Zika, Dengue, Chikungunya, Yellow Fever viruses

Aedes aegypti
lyre-shaped pattern on thorax

Aedes albopictus
bright lateral line on thorax

Controlling Mosquitoes
Our Service Area and Monitoring Sites

- County boundary
- Outside of service area
- Light traps (n = 22)
- Native mosquito traps (n = 180)
- Invasive Aedes traps (n = 710)

Monitoring Approach

Looking for larvae & eggs

Adult monitoring with traps
Testing for disease and insecticide resistance

we test more than 90% of disease-spreading mosquitoes caught in our traps

virus test results in 3 hours

sensitivity to insecticides

insecticide detoxification

genetic resistance

Controlling mosquitoes in storm drain systems
Controlling mosquitoes in marshes

Controlling mosquitoes with fish
Controlling mosquitoes through source reduction

Channels for community outreach

- Legislative
- Interagency
- Public
Quality Control & Automation

Threats
- Financial pressures
- Invasive mosquitoes
- Climate change

Opportunities
- Financial planning
- Emerging technologies
- Interagency collaboration
2. Innovative Control Methods

- Irradiate reproductive cells
- Wolbachia-infect
- Modify genome using Gene Drives (CRISPR)
3. Interagency collaboration: trash capture devices/ BMPs

4. Healthy Wetlands
5. Emerging technologies: drone imagery of marshes where mosquitoes can breed

Partnerships

San Francisco Bay Restoration Authority

East Bay Regional Park District

CHANCE ZUCKERBERG BIOHUB

Berkeley, University of California

SAN MATEO COUNTY MOSQUITO & VECTOR CONTROL DISTRICT
Mosquito Sources in the City of Newark

- Unmaintained swimming pools, catch basins, flood control channels
- Don Edwards San Francisco Bay National Wildlife Refuge

Thank you-

- Ryan Clausnitzer, MPA
  General Manager
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  ryan@mosquitoes.org
  510-925-1756