

PMI 214 Notes - “Surveillance and control of vectors in California”

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1 Key concepts

- What makes CA unique
- funding..
- others

2 CDPH

- Rodent-Borne - Hantavirus
- Flea - Typhus and Plague
- Tick - Lyme among others
- Mosquito -
- Cooperative agreement with local agencies
- Sac-Yolo mostly works with ticks and mosquitos

3 Cooperative Agreement

- Calibration of equipment and record keeping
- reports about pesticides and adverse effects
- technician certification
 - many requirements

4 Sac-Yolo Mosquito and Vector Control District

- one of the three biggest in CA along with LA and OC
- funding?
 - bi-county - funded from property taxes in both counties
 - other agencies (ie SD) funded from public health dept
 - some agencies are forced to ask the public to charge them more if there is a big outbreak
- governed by board of trustees
 - make decisions for what’s best for cities and counties
 - 1915 - Mosquito Abatement Act
 - operate under CA health and safety code
 - * they have authority to enter a premises if there is a reason to believe there is a health concern

5 Integrated Mosquito Management

- Surveillance
- Control
 - Physical
 - * Easier to empty a pool than to continue to implement pesticides. Unattended pools could produce 100,000s of mosquitos
 - Biological
 - Chemical
 - * Larvicide - killing mosquito in water
 - * Adulticide
- Education
 - \$500,000/yr

6 Surveillance

- Traps
 - Light Trap - attracts many other attractor - not effective in urban areas, bc light competition
 - Magnet Trap - requires propane - gets stolen ALOT - better if your neighbor has it, not you - no longer on the market
 - Gravid Trap - stinky - alfalfa yeast water... attracting females ready to lay eggs
 - Ovitrap
 - EVS trap (Encephalitic)
 - BG-Sentinel trap - stolen alot - white elephant - very obvious... cost \$200
 - AGO (autocidal gravid ovitrap)
 - Resting trap - after blood feeding..
 - Aspirator
 - Field samples
 - 200-300 traps/wk in Sac-Yolo
- Encephalitis Virus Surveillance
 - Dead bird collections
 - * Most successful indicator
 - * they take birds even if they died years ago
 - * West Nile is very stable
 - Sentinel chickens
 - * worthless
 - * usually viruses are found 8 weeks after they show up in a dead bird
 - * more useful in a remote location with few humans
 - EVS
 - * Co2 dry ice and gravitrap
 - * test live mosquitos the next day
 - Test for West Nile, Western and St. Louis Equine Encephalitis

7 West Nile Virus

- 2 people died this year and this will grow...
- a study found that infection risk is 3-20 %. From those, 20% get ill. From those, only .7% show encephalitis. From those, 4-18% die. low mortality.
- hospitalized patients:
 - 37% recover fully
 - neurological deficits are long-held
 - 8 months later, still fatigue, myalgias, headaches, persistent cognitive deficits

8 Testing for other pathogens

- vectors
 - mosquitos
 - * Malaria
 - * dengue
 - * chikungunya
 - * zika
 - sexual transission is important
 - some people in Sac-Yolo have it from travelling
 - * This dept checks the residence of victim for mosquitos
 - ticks and others
 - * lyme
 - * tularemia
- Some mosquitos lay eggs on the edge of plants so that when it floods the eggs can hatch
- mosquitos are very easily introduced in any area
- mosquitos that transmit some diseases (zika) most likely eat bird blood - they would have to bite a human twice in order to transmit in Sac-Yolo
- Tick Surveillance
 - flags used to colect ticks
 - ticks chill at the top of a plant and put their legs up, hoping to snag a dog or your leg.. lyme disease - big problem in CA, not just East Coast
 - if a tick bites a lizard, lyme is cleared
 - ticks are by cache creek and by the american river
 - * Tick nymphs chill on logs.. as many 20% carry
- Yellowjacket Surveillance
 - No disease transmission, but a nuisance
 - chemical lure traps
 - queen trapping
- Africanized Honeybee (killer)
 - From Brazil
 - Swarm trap
 - chemical lure
 - story goes the researcher quarentined the bee, but it escaped and eventually got all the way to USA - mostly in So Cal - temperature-limited factor?

- Dog Heartworm Surveillance
 - dept works with vets because medication is expensive and certain vectors are not in certain places
- Pesticide resistance management
 - Test for resistance to pesticides.. constantly

9 Control

- kiddie pools are a problem
- emptied pools are a problem when it rains
- collection basins..
- clogged gutters..
- in so cal they poke holes and/or take stuff from peoples backyards!
- Rice fields - huge mosquito producer
- Davis and Woodland are surrounded by rice
- Winters is a big problem since it is surrounded by mountains so planes can't effectively drop pesticides
- Gambusia
 - treat fish with antibiotics

10 Education

- Anyone who will share the message is welcome..
- Largest education budget - \$500,000
- Ops budget - \$150,000
- Do your part
 - Drain standing water
 - Avoid being outdoors at dawn and dusk
 - dress appropriately
 - defend yourself
 - door/window screens
 - FightTheBite.net
 - 800-429-1022

11 Key concepts

- CA is unique
 - the BEST in terms of mosquito control..
 - very organized
- funded through tax dollars, but operator independently

12 Contact

- pmacedo@fightthebite.net
- 916-405-2066

13 Use of mathematical models? Stats?

- Vector index
- infection rates
- research budget - Dr. Barker (giving a talk in this class)