

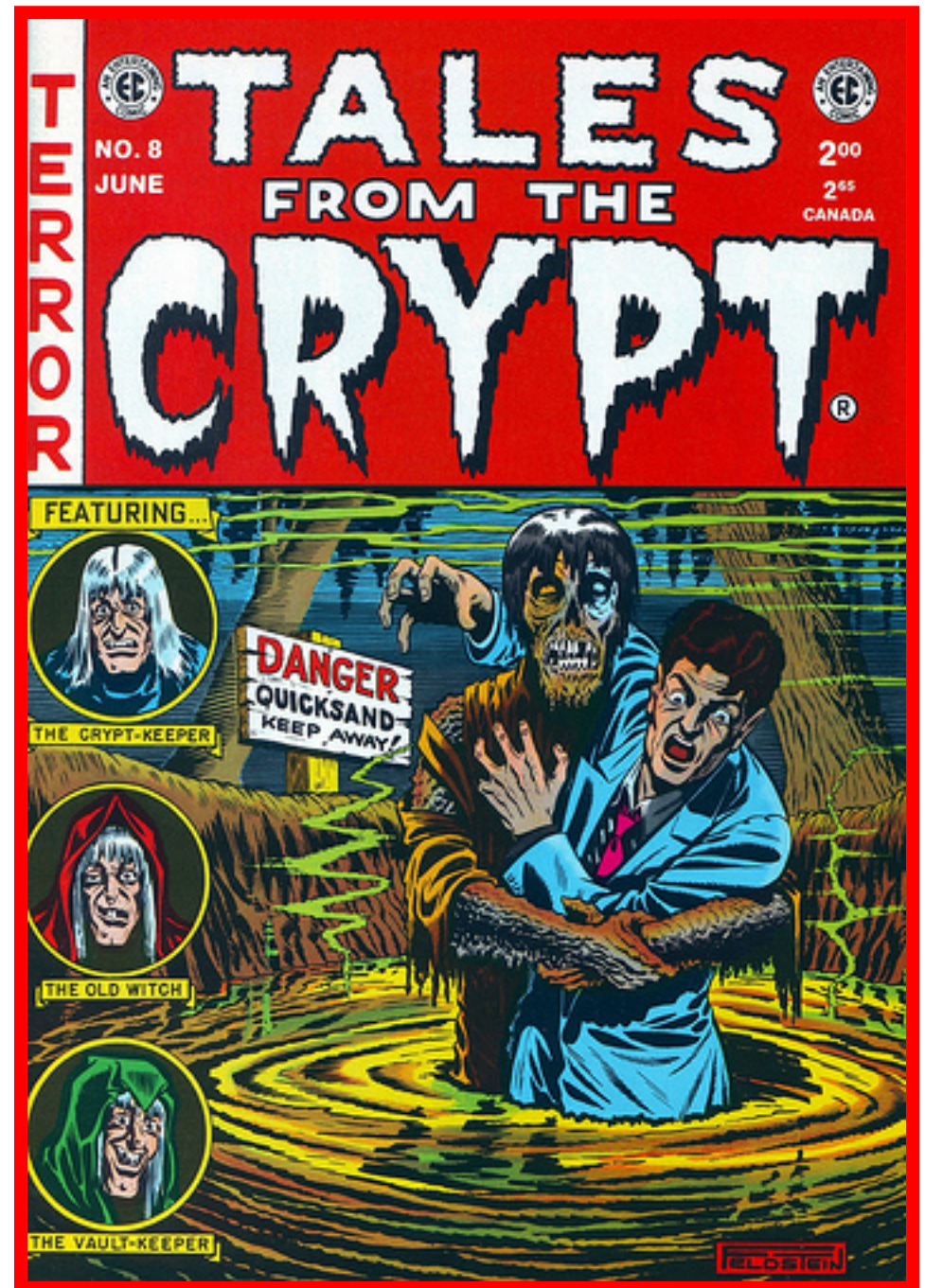
Atlantic White Cedar Symposium

Greenville, NC

9 June 2009

Richard Pollack, Ph.D.
Laboratory of Public Health Entomology
Harvard School of Public Health
Boston, MA

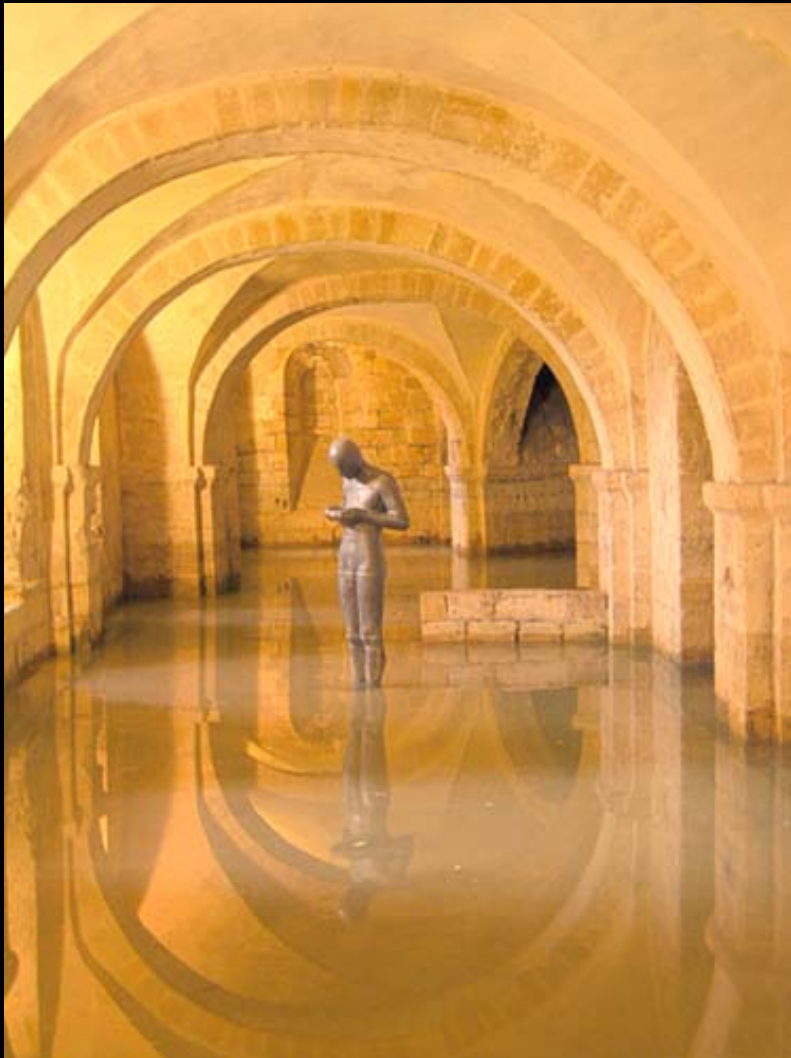
Note: Images protected by copyright



<http://www.merriam-webster.com/dictionary/crypt>

Crypt Latin crypta, from Greek kryptē, from feminine of kryptos hidden, from kryptein to hide;

1 a: a chamber (as a vault) wholly or partly underground















http://moldychum.typepad.com/moldy_chum/images/firefoxscreensnapz009_2.jpg



<http://aquatic-photography.com/gallery//showimage.php?i=6650&c=3&userid=6199>

Chaoborus
Lake Victoria, Uganda

Chaoborus spp.
Diptera: Chaoboridae

Phantom midges

predaceous larvae



http://www.jjphoto.dk/animal_archive/chaoborus_spp.htm

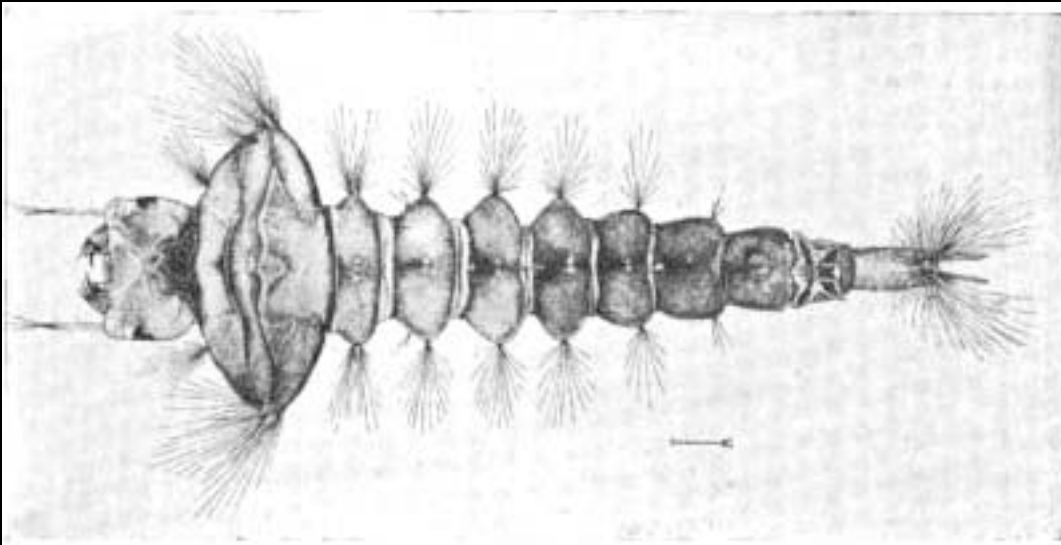


FIG. 12. LARVA *Eucorethra underwoodi*. DORSAL VIEW.

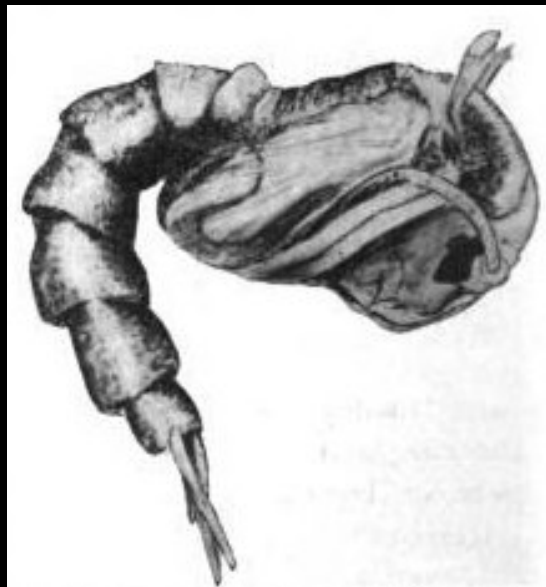


FIG. 14. PUPA *Eucorethra underwoodi*. ORIGINAL DRAWING.

Larvae with
prehensile antennae



FIG. 15. *Eucorethra underwoodi*. COQUILLET MS. ORIGINAL DRAWING.

Eucorethra underwoodi
Diptera: Chaoboridae
(Phantom midges)

Corethrella appendiculata (Diptera: Corethrellidae)

Photo: Univ. Illinois



Voracious predator
- kills more than it eats

Tungara frog♂ (*Physalaemus pustulus*)



Corethrella sp. (Diptera: Corethrellidae)

A.T. Baugh, Gamboa 2006

http://www.stri.org/english/site_tools/photo_of_the_week/index.php?id=87



(c) Sturgis McKeever

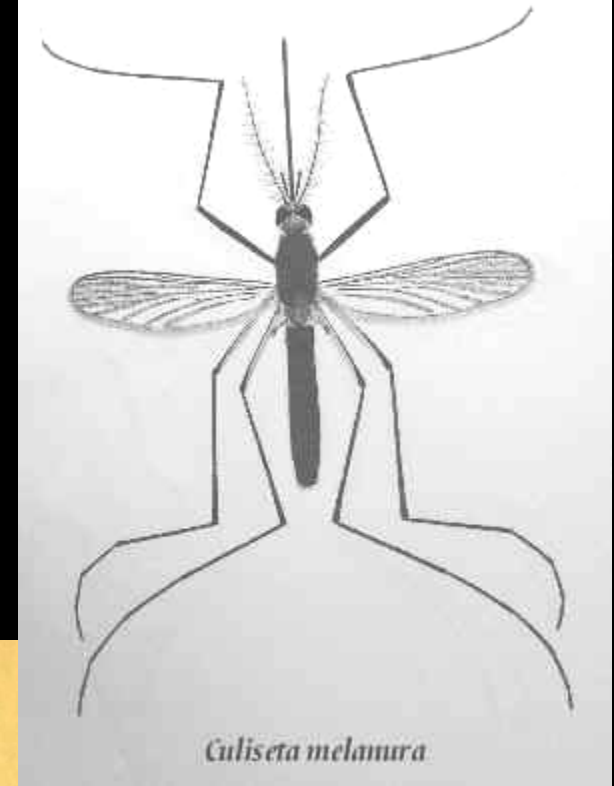
Acoustic detection
♂ calls (real and recorded)

Corethrella wirthi ♀
feeding on
Hyla versicolor ♂

Vector of anuran
trypanosomes



(c) Sturgis McKeever



Culiseta melanura
Diptera: Culicidae

The most
dangerous
mosquito?

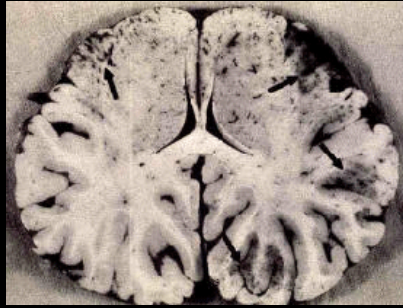


Minor annoyance

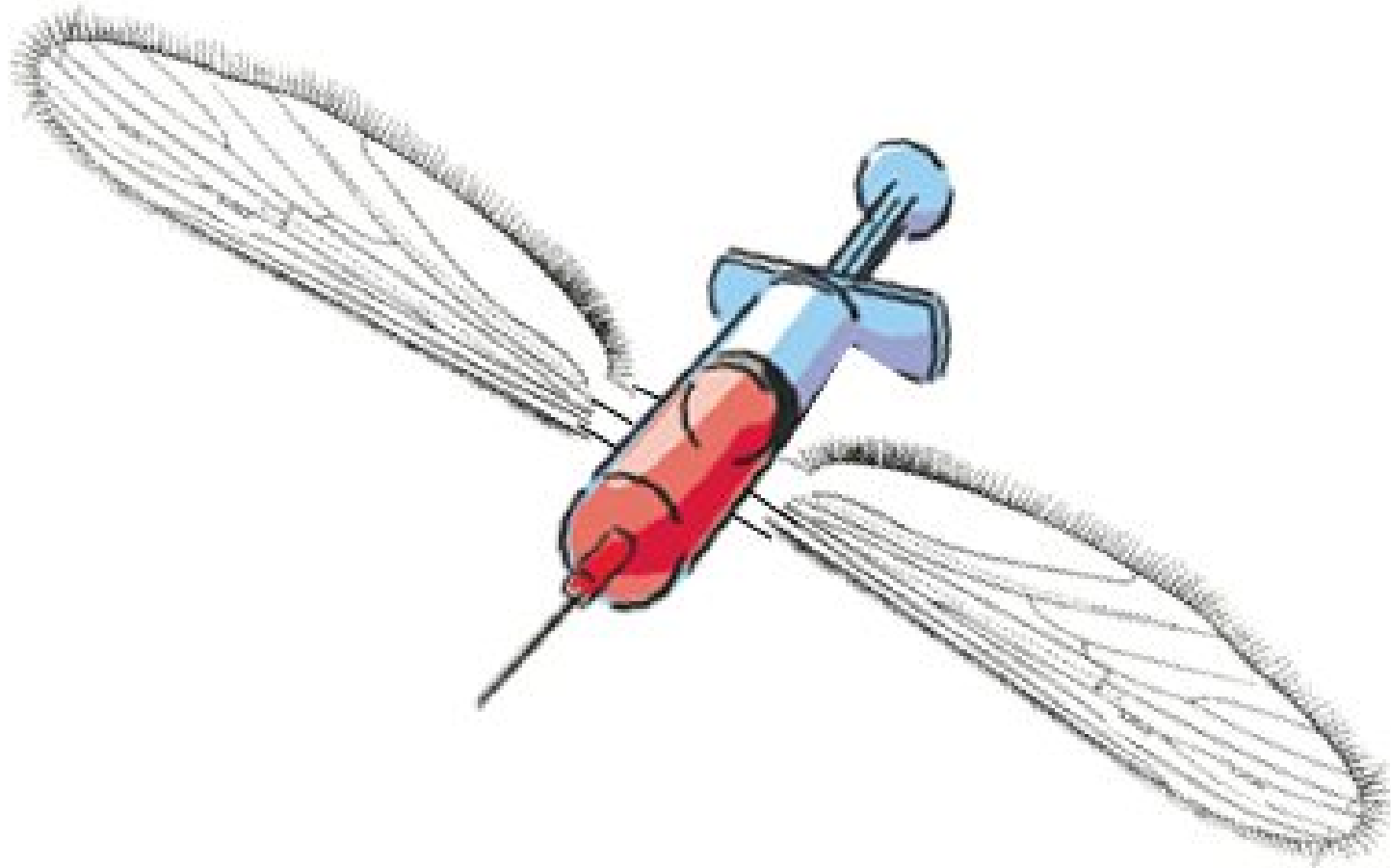
Quality of life

Illness

Death



A 'flying syringe'? NOT !











Arboviruses

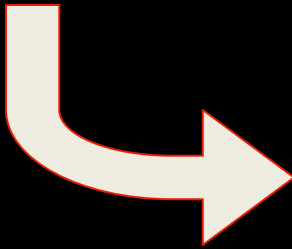
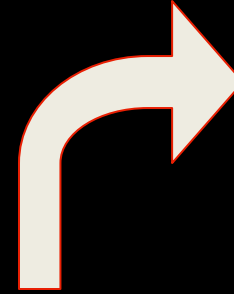
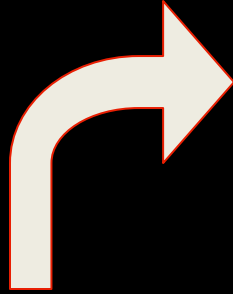
Arthropod-borne viruses

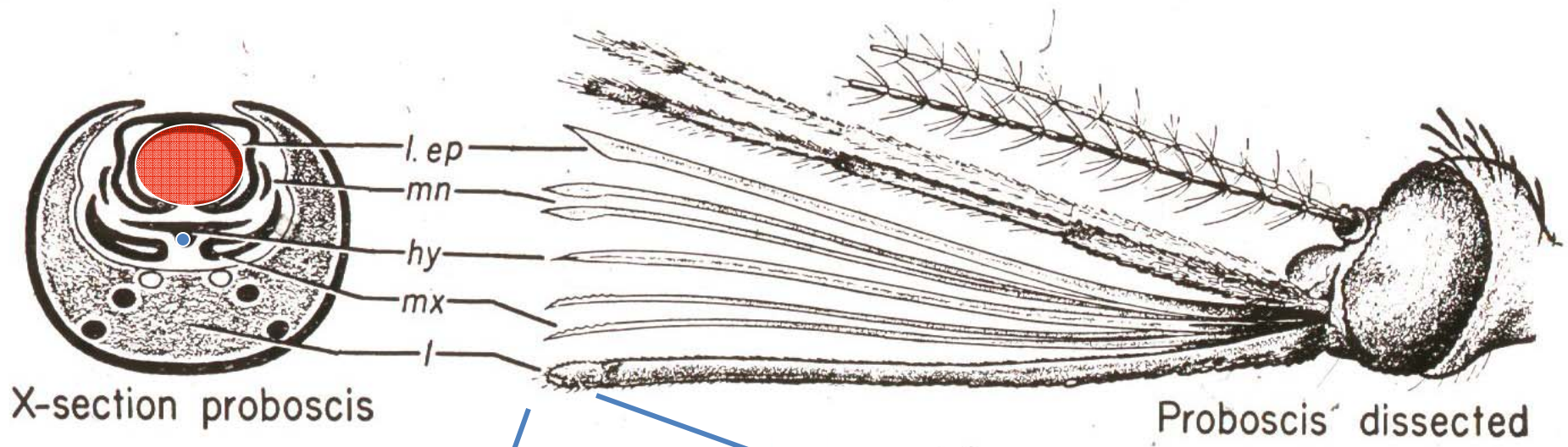
Vertebrate--> arthropod--> vertebrate

Disease manifestations:

- systemic febrile illnesses
- encephalitis
- hemorrhagic fever

EEE Eastern Equine Encephalomyelitis

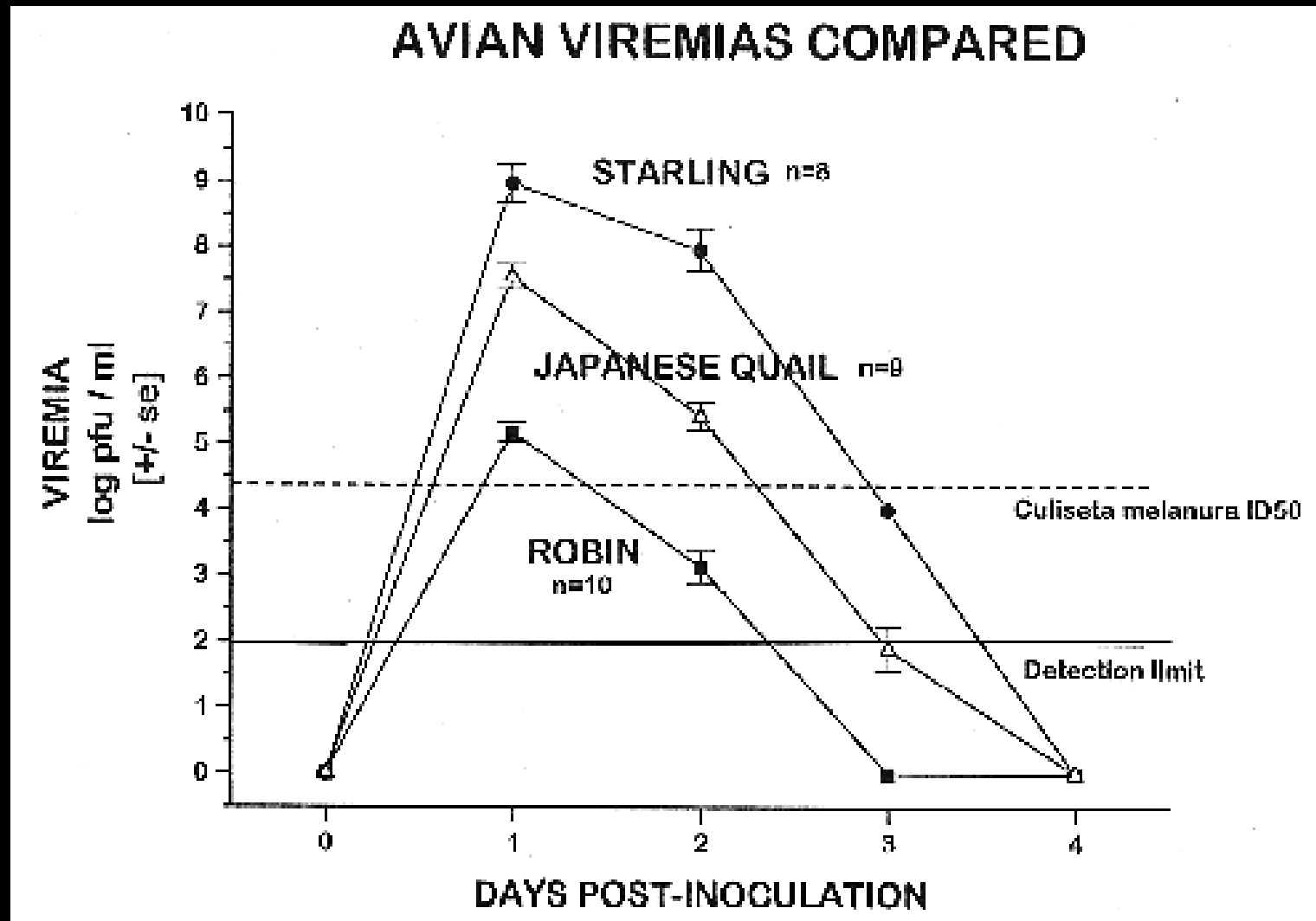








Reservoir competence



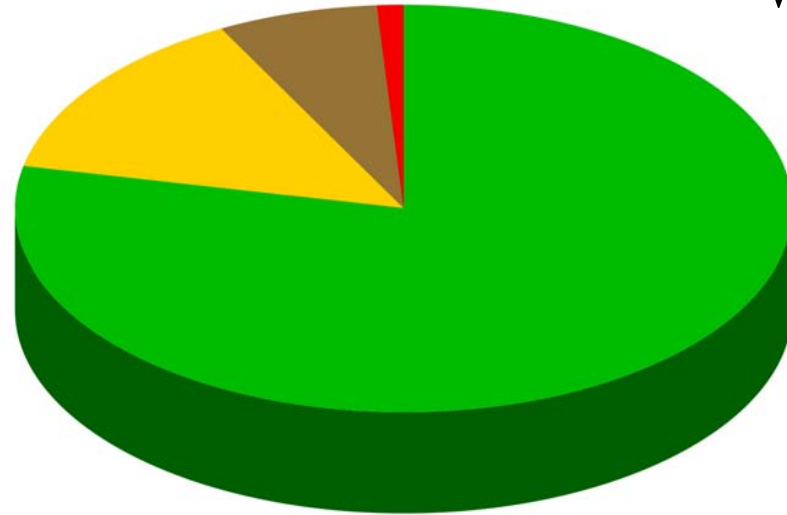






Spectrum of human illness from infection

WN_v



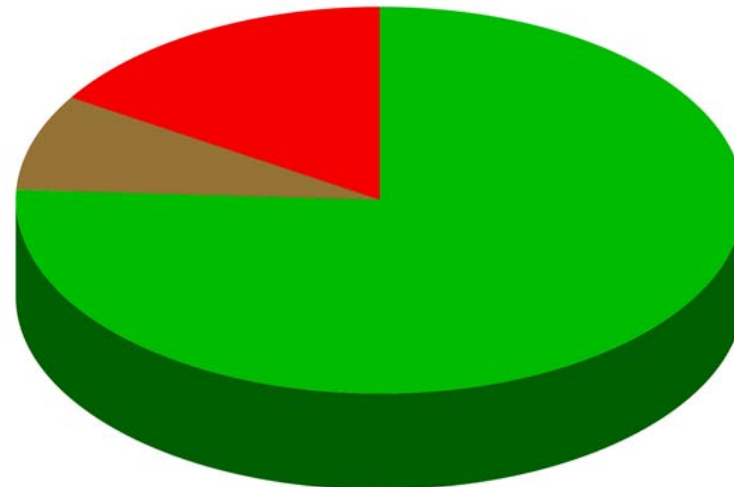
Death

Fever & Neurological illness

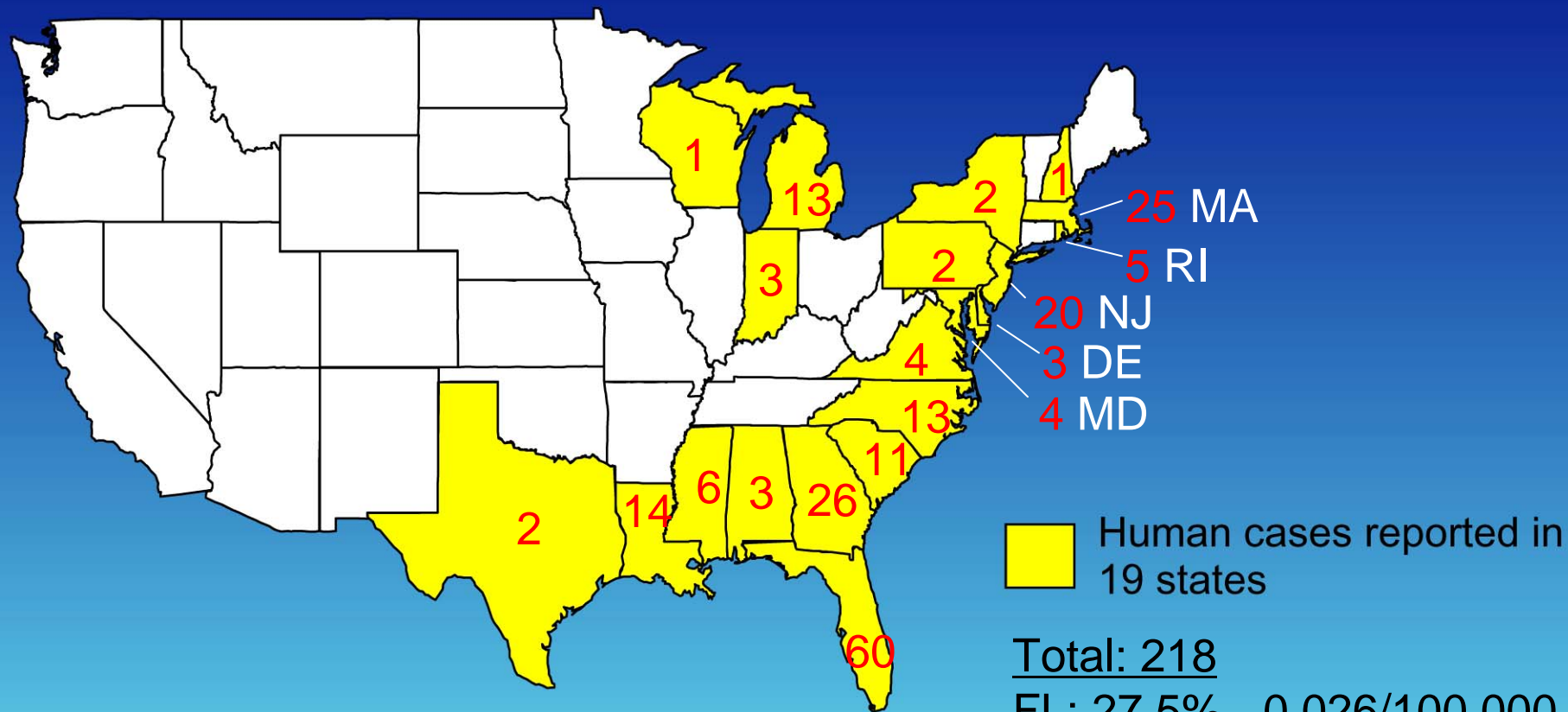
Fever

OK (without illness)

EEE_v



Survivors: Full recovery in some to lifetime institutional care.



Number of Eastern Equine Encephalitis Human Cases, 1964-2004, by State

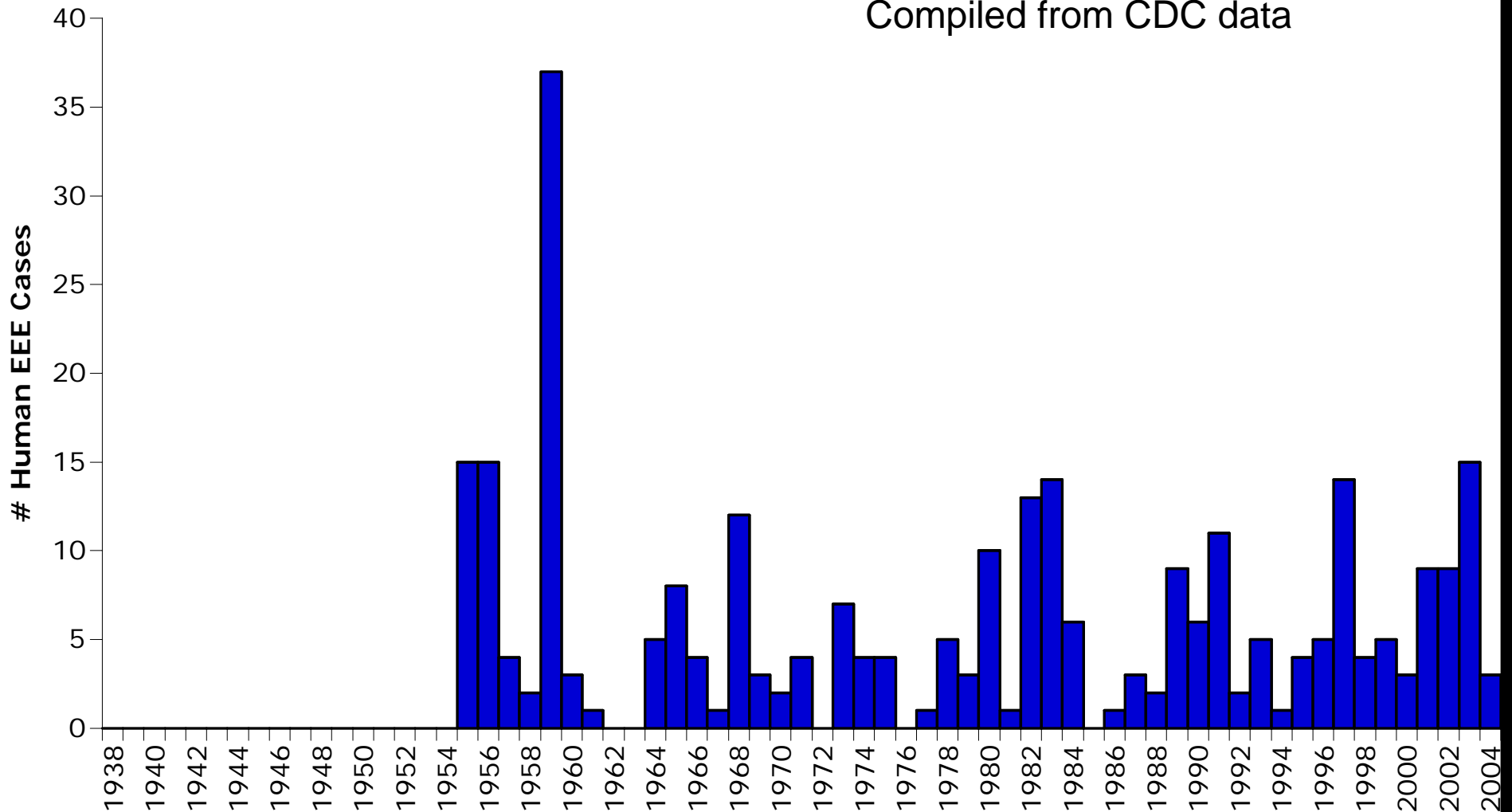
Average: 5 cases/year

Human cases reported in 19 states

Total: 218
 FL: 27.5% - 0.026/100,000
 GA: 11.9%
 MA: 11.5%

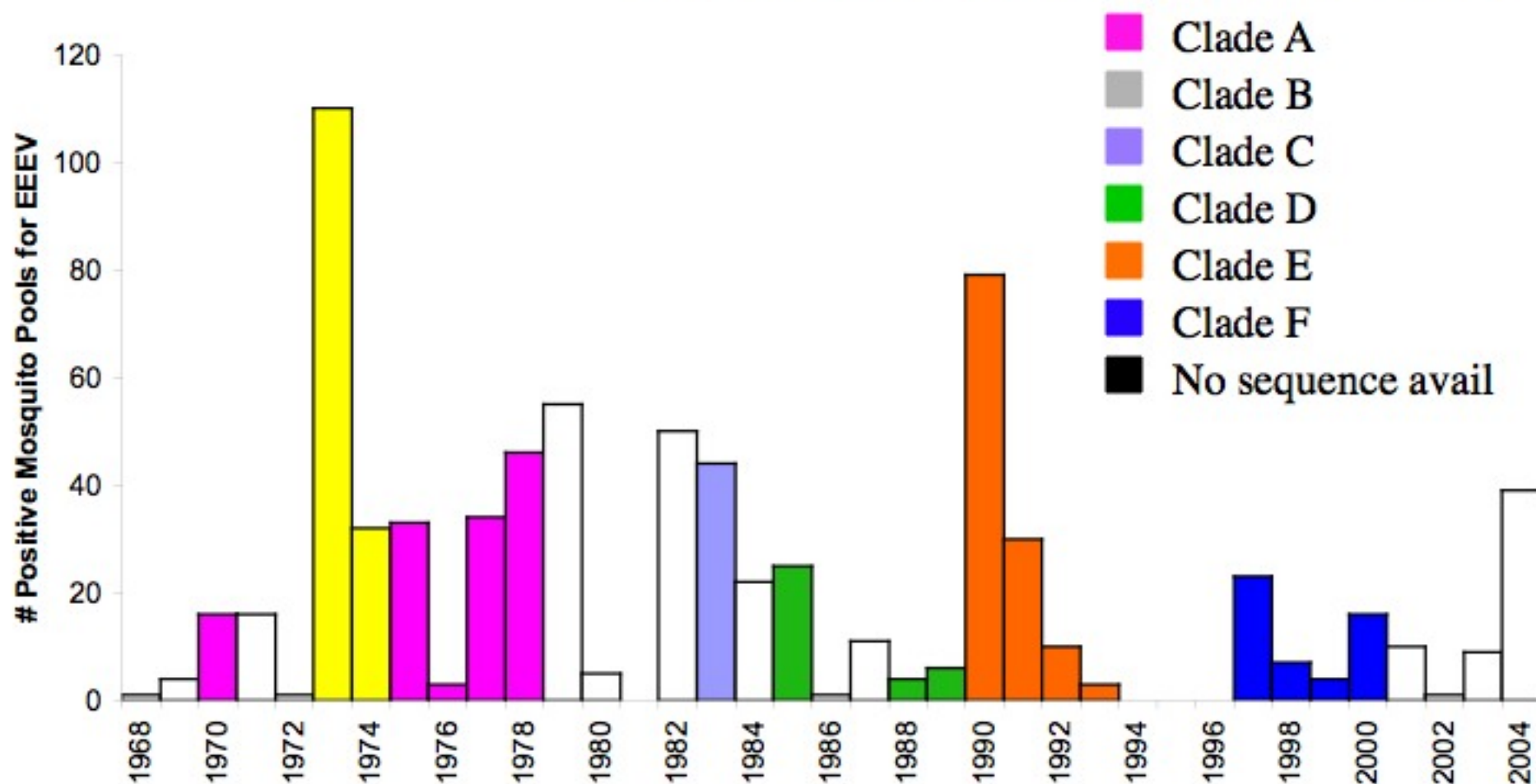
Human EEE Cases in the United States 1955-2004

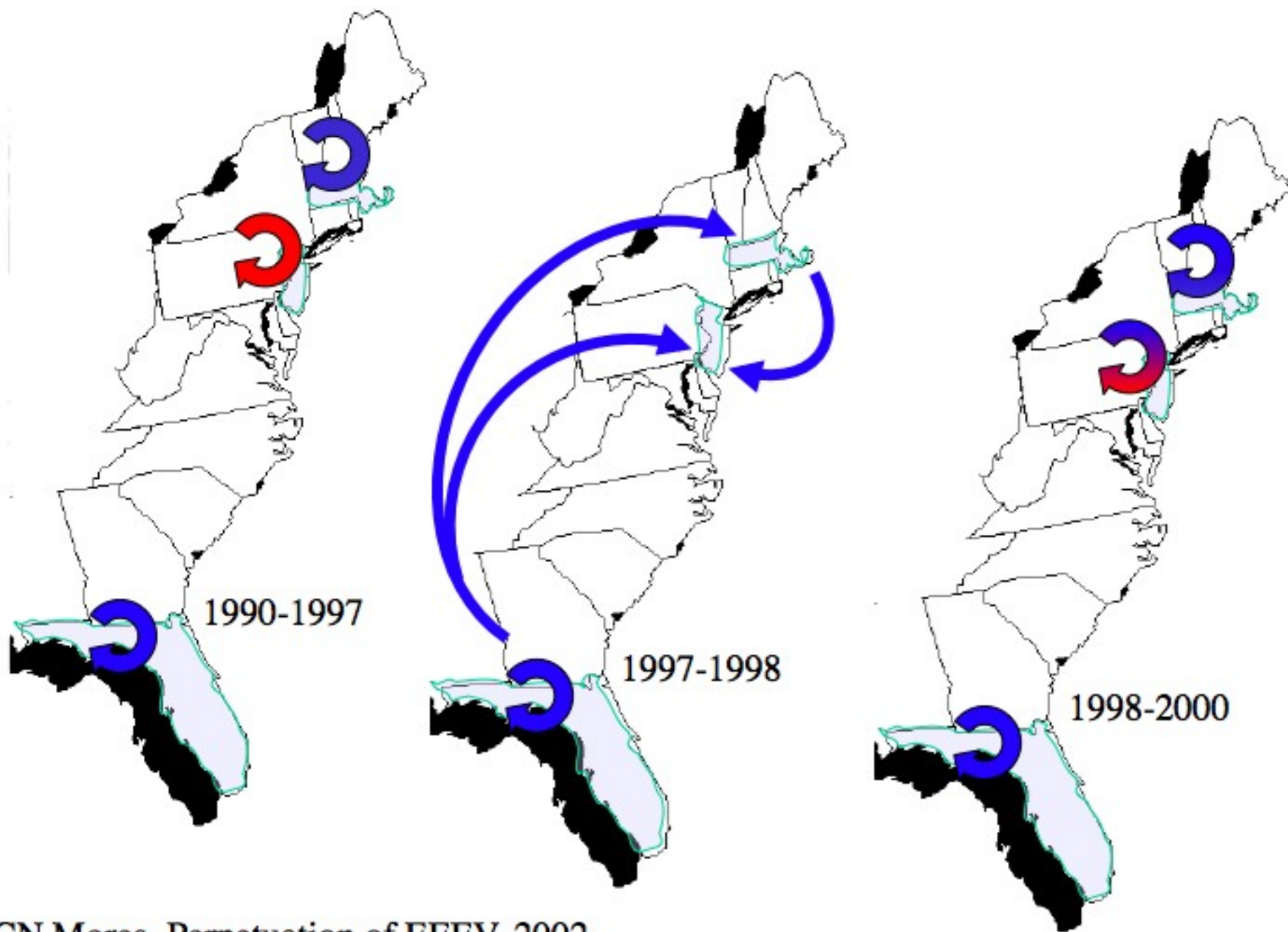
Compiled from CDC data



EEEV isolates in mosquitoes MA 1970-2000 with classification by clade

CN Mores 2002, Harvard School of Public Health

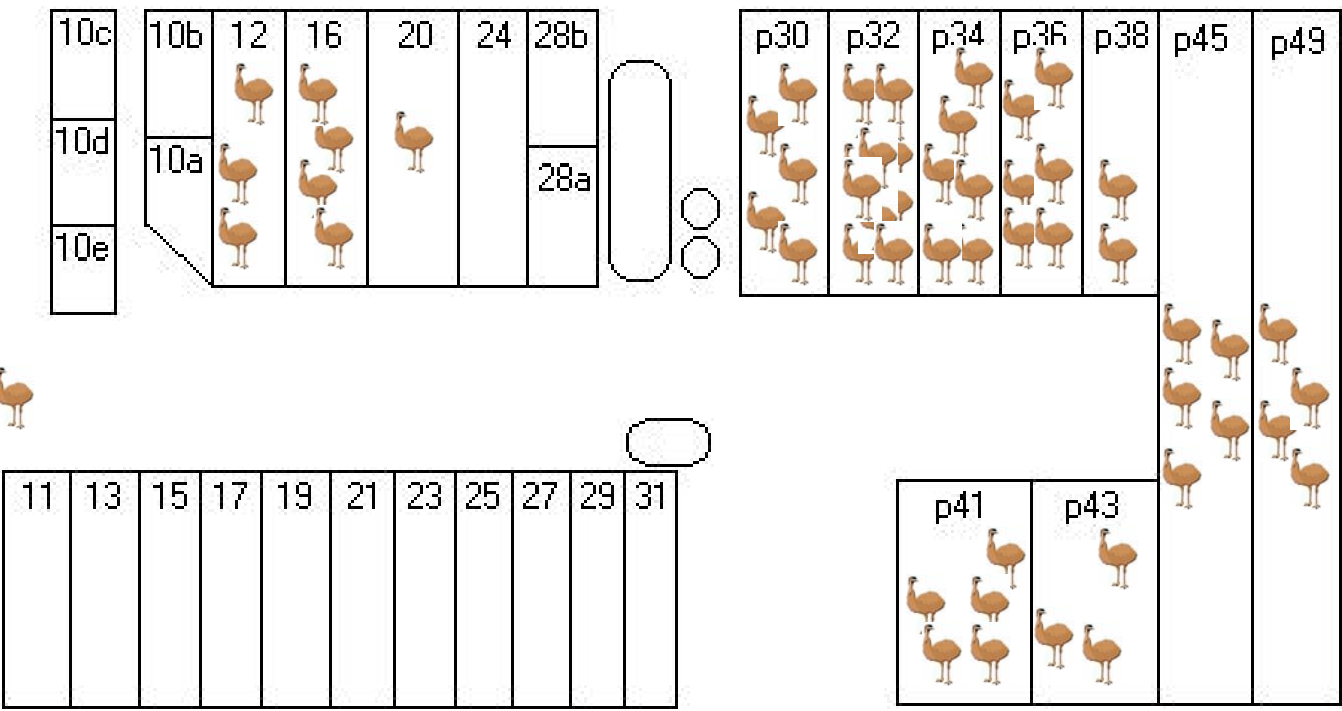




CN Mores, Perpetuation of EEEV, 2002



Pen Layout



Outbreak summary

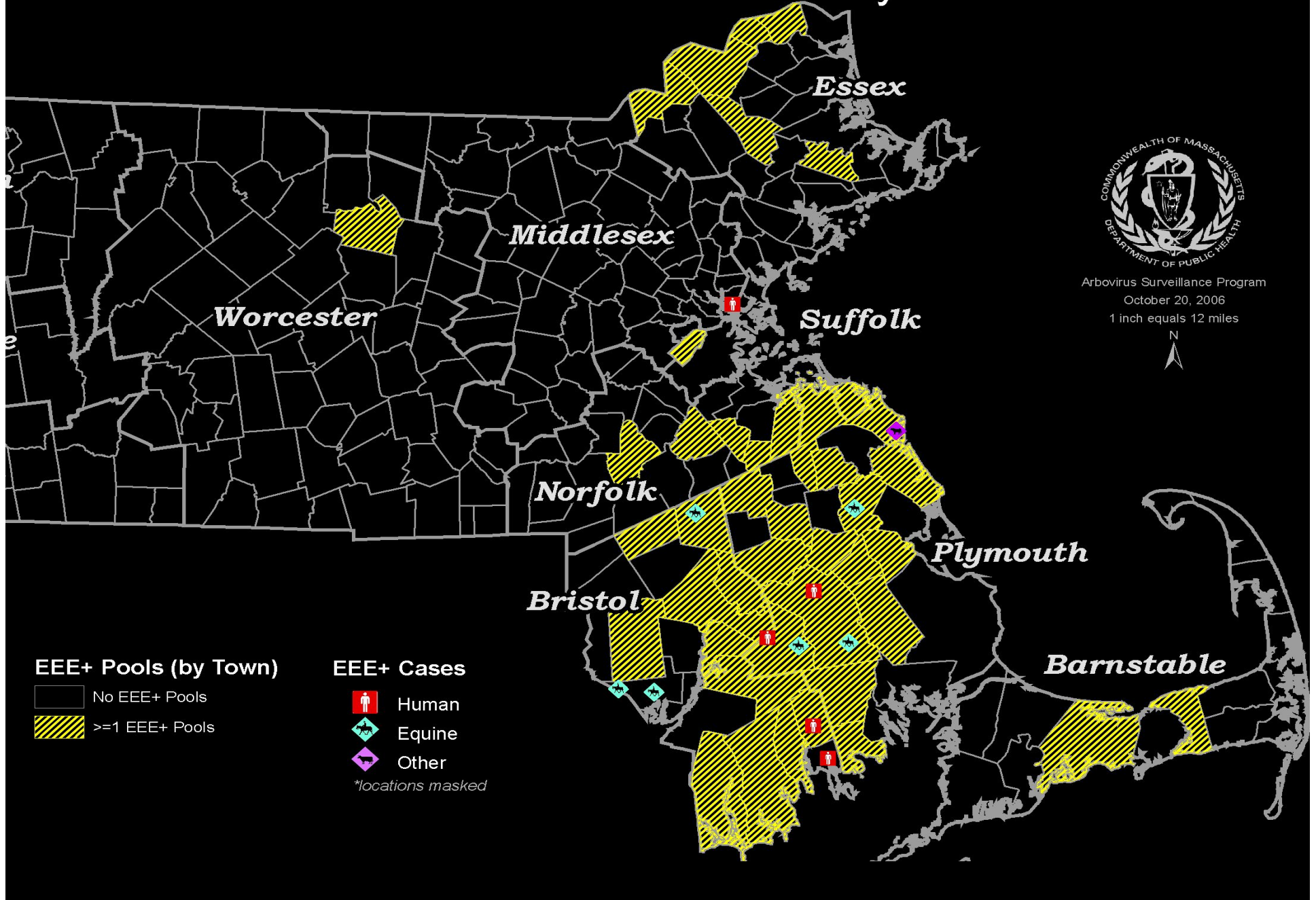
- 58 out of 501 emus died (11.6%)
- Outbreak ended after 54 days
- 13 out of 40 pens affected (32.5%)
- Cases appear clustered within pens and between adjacent pens

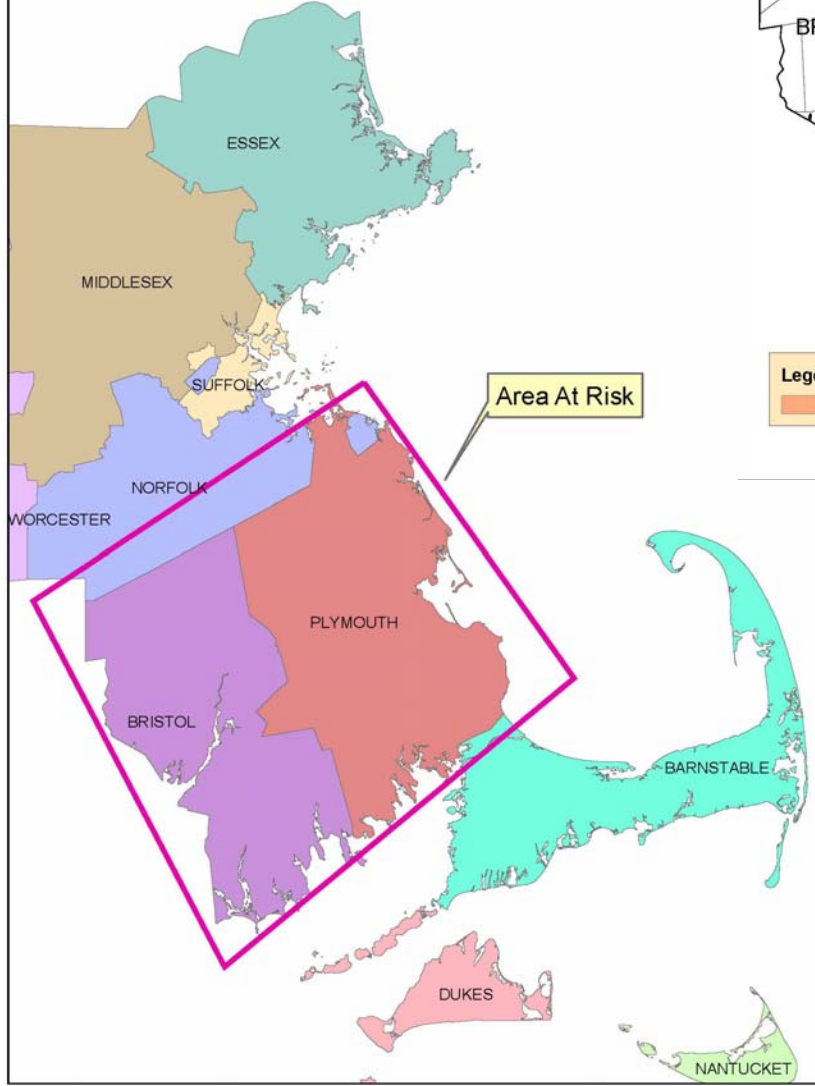
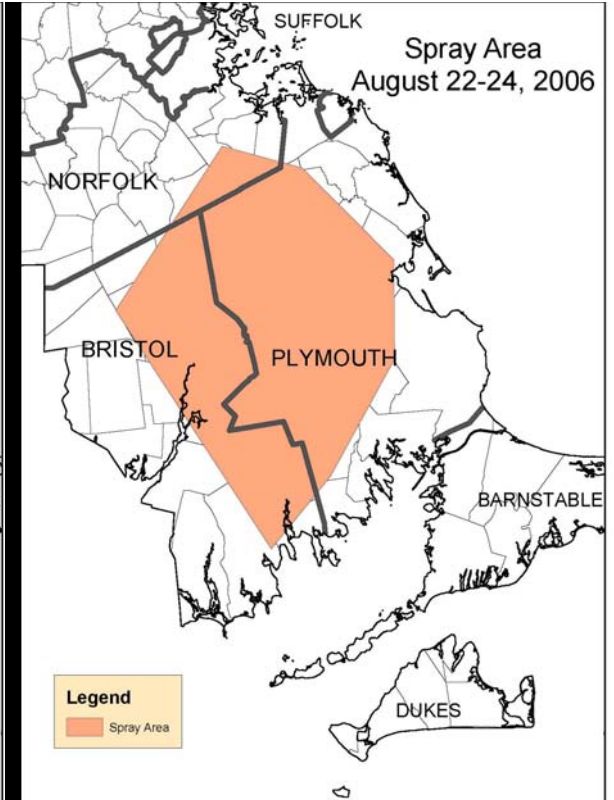
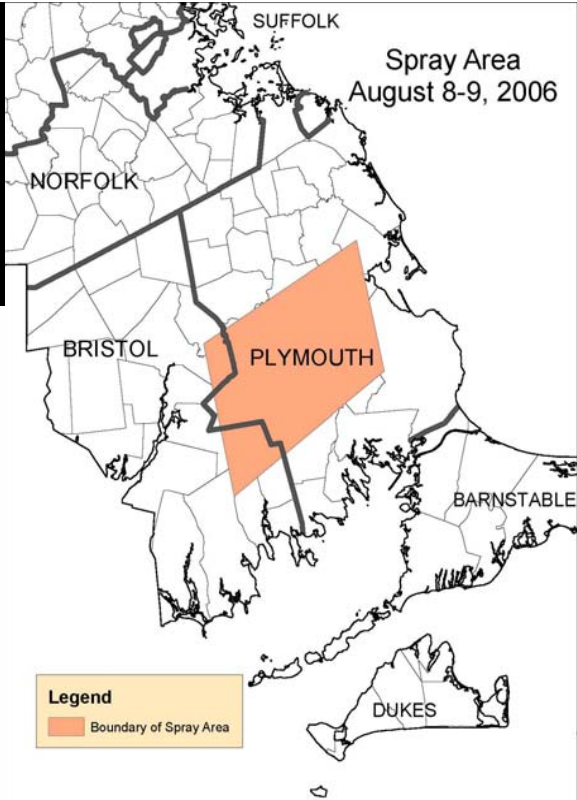
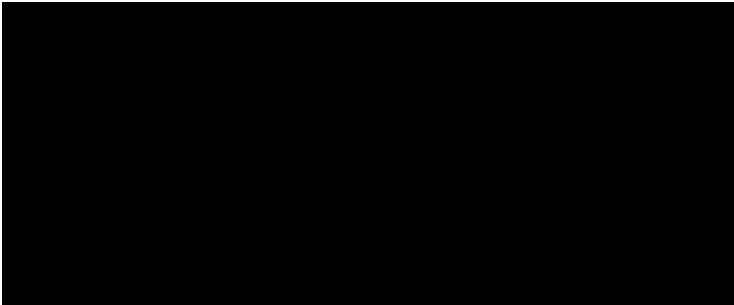






Massachusetts EEE Activity 2006

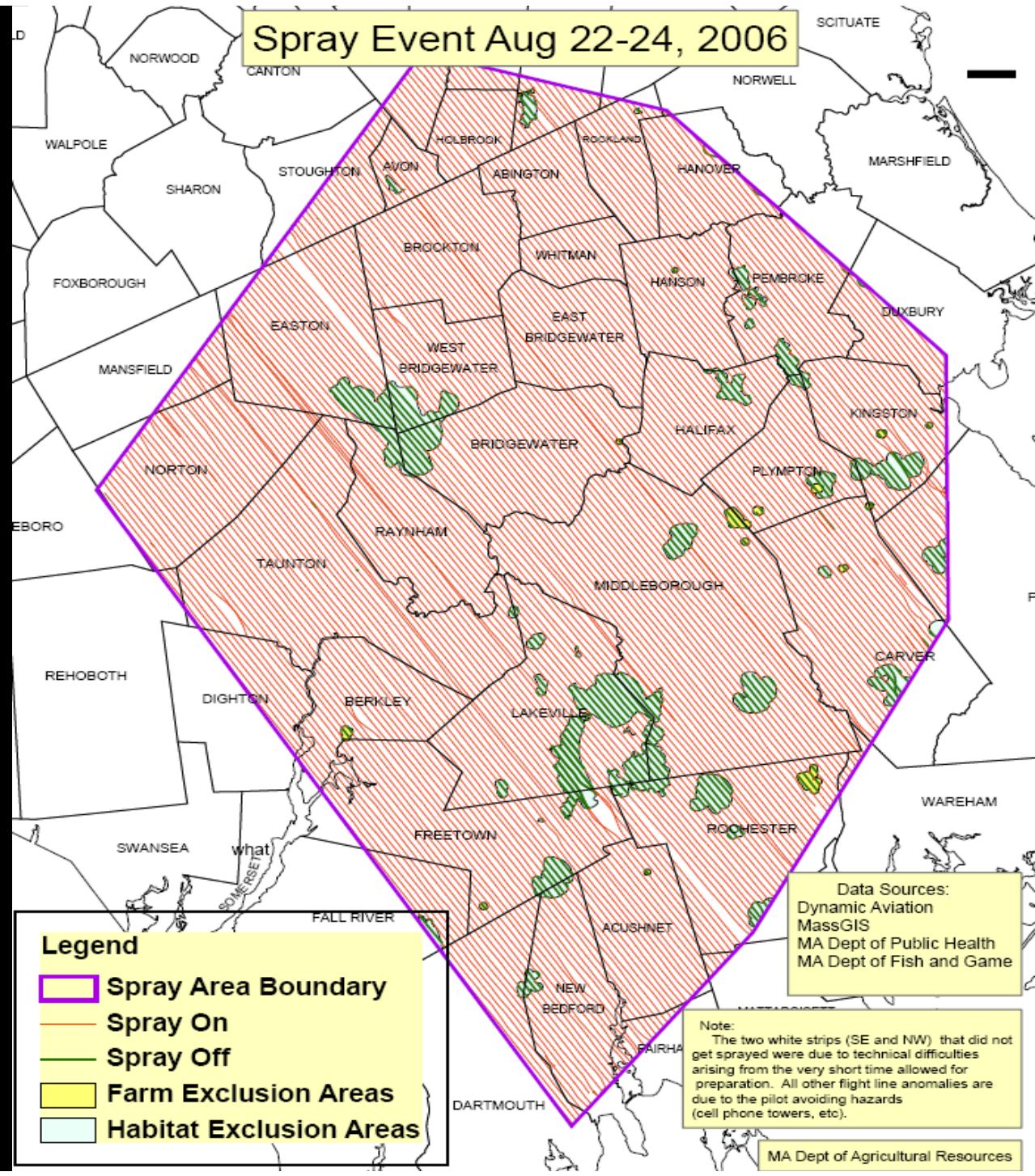


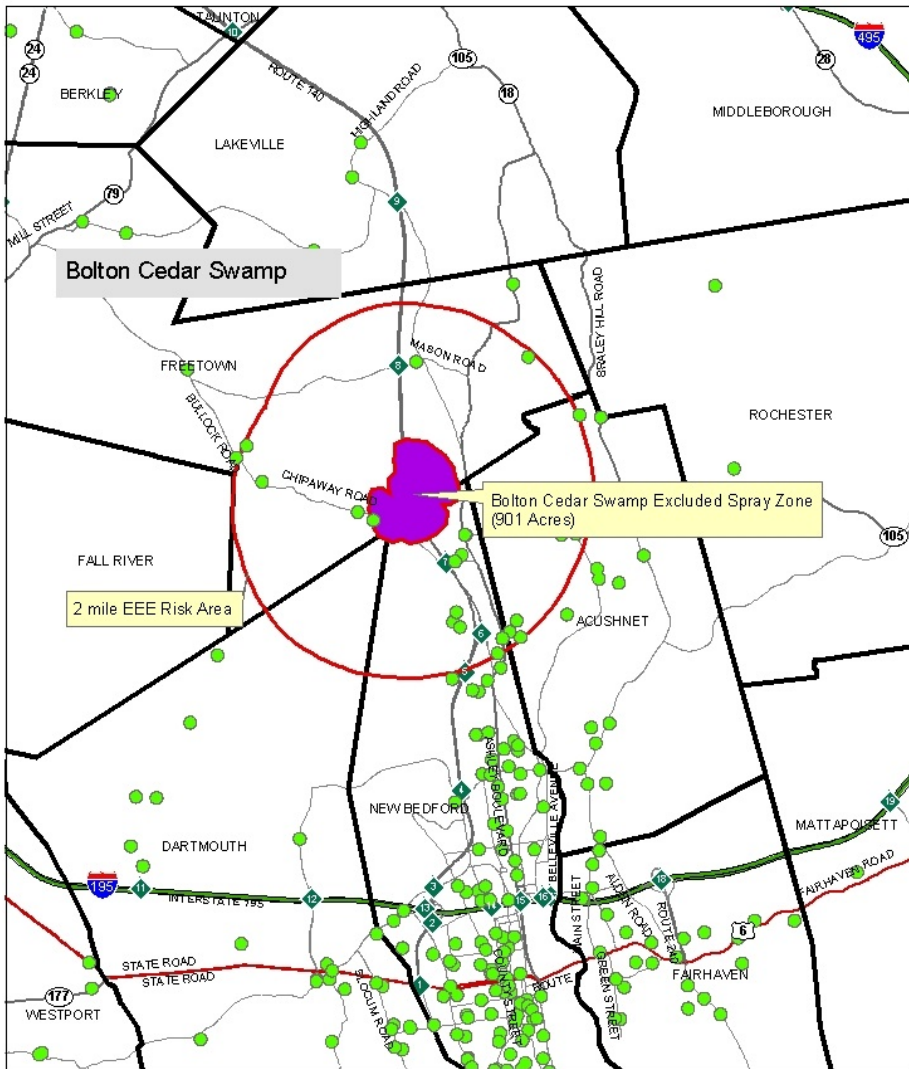


Aerial Application of Pesticide - 2006

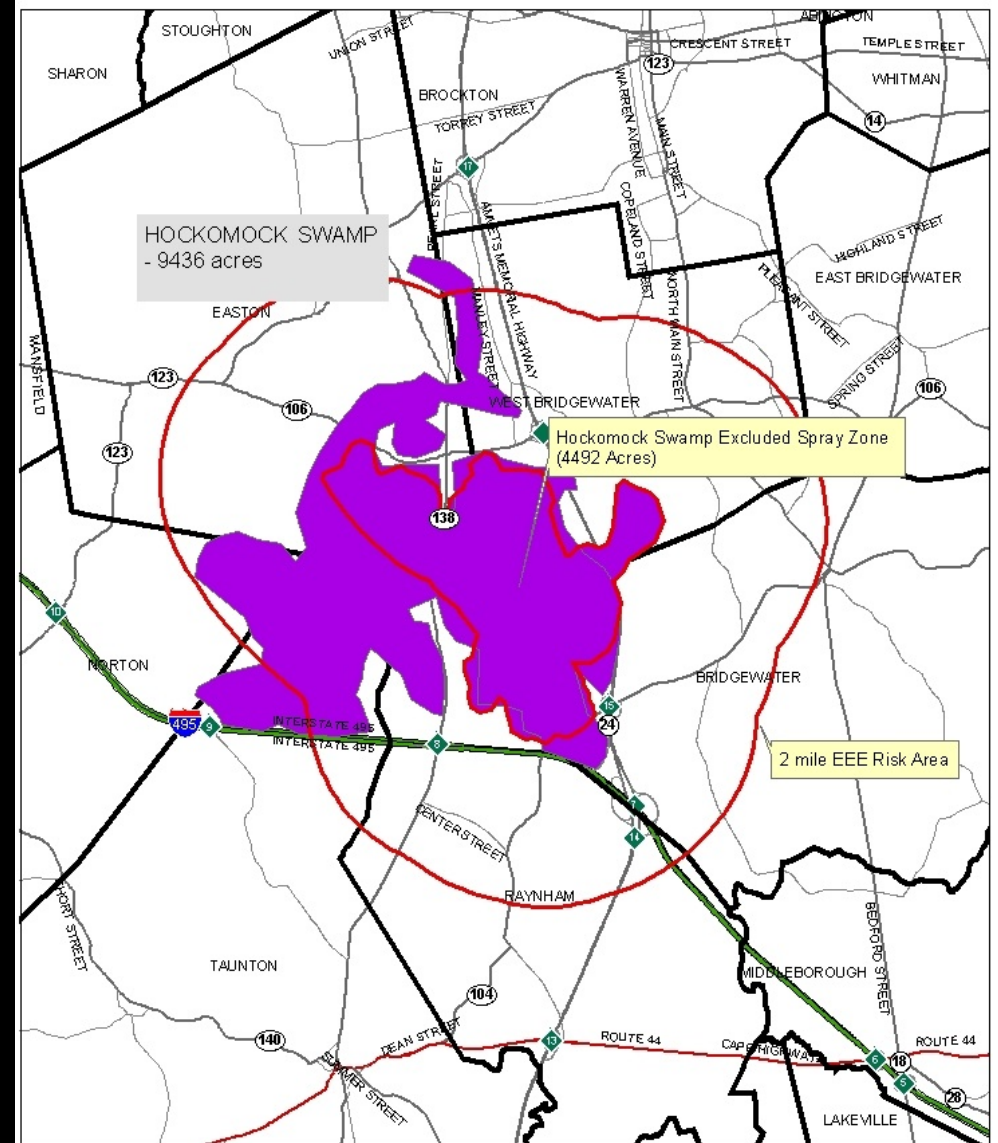
- Fixed wing aircraft
 - Small planes
 - GPS controlled applicator
 - Fly in dark – after sunset
- Sumithrin – pyrethroid
 - Least toxic available insecticide
 - 0.6 oz. product per acre
 - Rapid breakdown
 - Product with 10% piperonyl butoxide
- Ultra low volume application
- Wide experience

Spray Event Aug 22-24, 2006





Green Circles Represents Schools and Day Cares
Prepared on August 23, 2006



Following information was presented at the Post-Audit Hearing
Prepared on September 20, 2006

Preliminary Assessment of Aerial Spray

- Mosquito abundance: 57-88.6% reduction pre to post
- c/w 25-61% overall increase outside spray zone)
- *C. melanura*: 80-90% reduction
- Mammal-biters: generally reduced, but variable

- No overt effects on wildlife (limited surveillance)
- Adverse health effects: 18 reports, 1/3 unrelated
- No emergency department or physician reports
- No residual sumithrin measured on cranberries
- PBO residue at typical levels



Which is the lesser evil, the risk of:

mosquito-borne disease

- or -

human and /or environmental
damage from interventions ?



THANK YOU

Particularly:

Aimlee Laderman
Eric Hinesley

US FWS