Protocol for Field and Laboratory Evaluating Acute Toxicity of Aerial Naled on *Danaus plexippus* and *Aedes taeniorhynchus*

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Recognitions

Florida Dept. of Agriculture and Consumer Services

Beach Mosquito Control District

Manatee Co. Mosquito Control District

USDA/ARS Center for Medical, Agricultural and Veterinary Entomology

U.S. Fish & Wildlife Service

St. Marks National Wildlife Refuge

Objective

Determine naled impact on monarch butterflies

Danaus plexippus

Aedes taeniorhyncus

Aim: Collect replicated field mortality data

Why the Monarch?

- Migratory populations have plummeted 90% from historical 20-year average
- 2014: U.S. Fish & Wildlife Service was petitioned under Endangered Species Act (ESA) to protect monarch as an endangered or threatened species
- 2017: Monarch designated as a new national priority species by U.S. Dept. of Agriculture Natural Resources Conservation & U.S. Fish & Wildlife Service
- 2019: ESA review to be completed and decision rendered on whether or not to classify as a threatened or endangered species

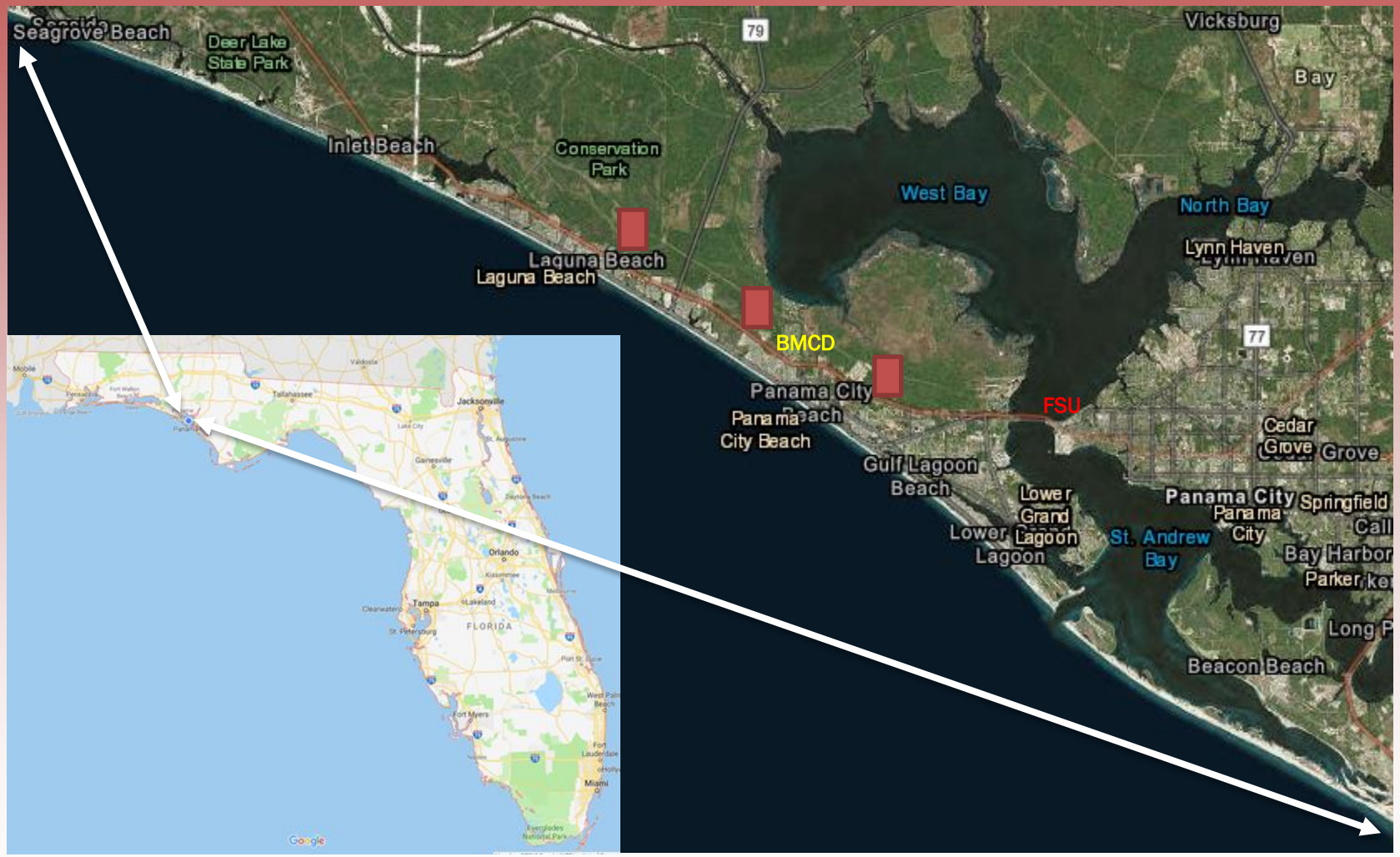
Importance to Mosquito Control

- If classified as endangered or threatened, the U.S. Fish & Wildlife Service could propose regulations deemed necessary and advisable to provide for species conservation (i.e. 4(d) rule)

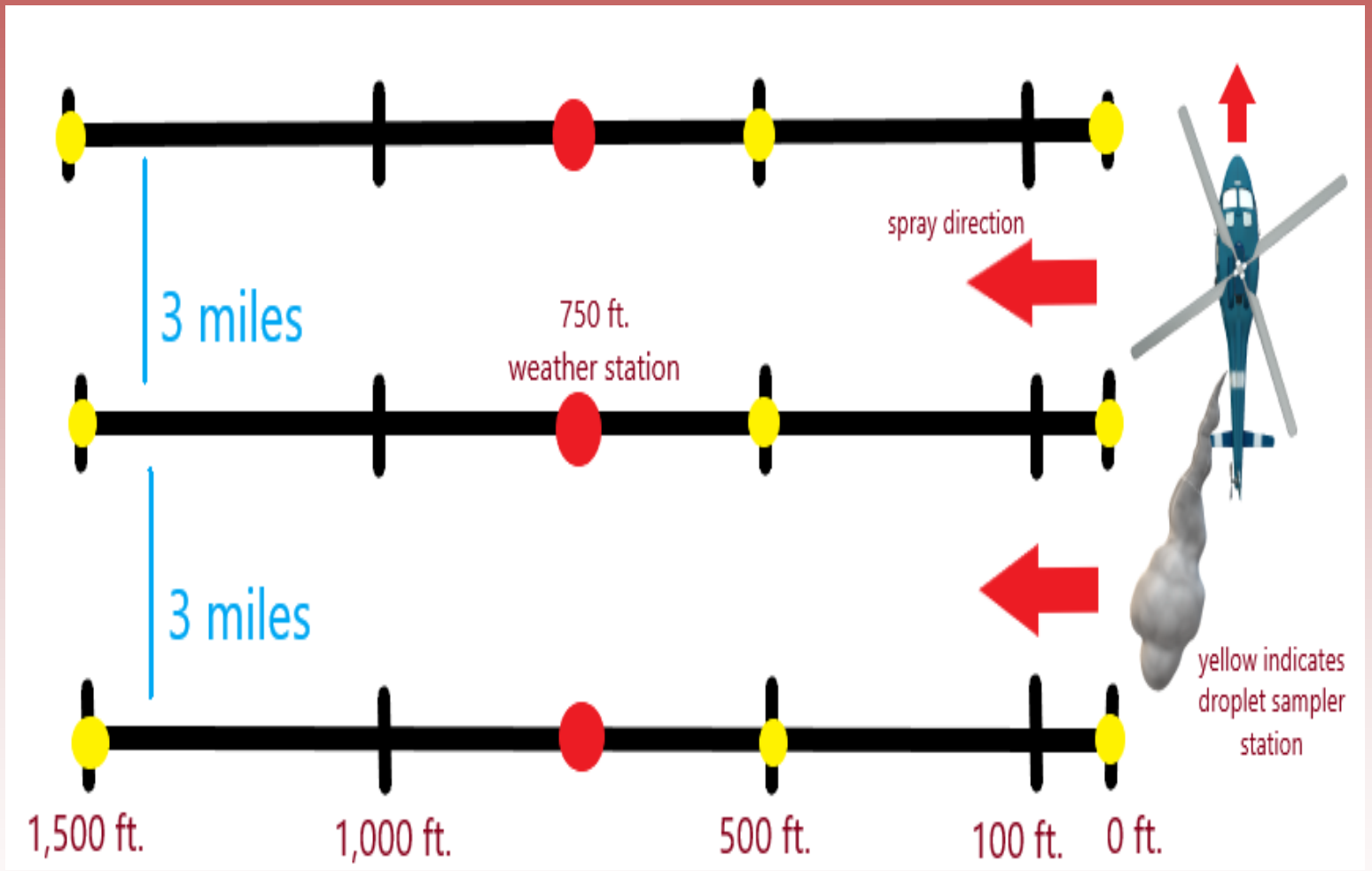
- These regulations could severely limit pesticide applications in and near monarch habitats

- Field data on naled impact should be useful for mosquito control and regulators

Experimental Site



Transect Set Up



Three controls upwind

Goal: Three “good” spray trials

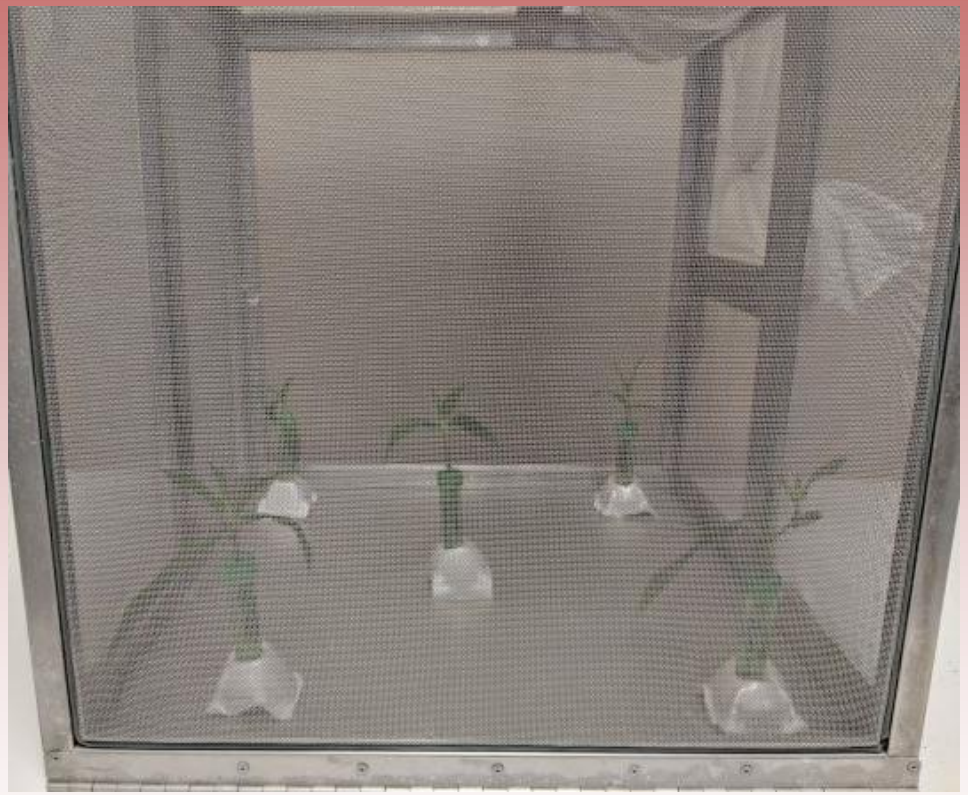
Field Bioassays

Rearing

Asclepias incarnata
Swamp milkweed

Greenhouses

Lab Bioassays



Naled Application and Droplet Sampling

- OH-58 Bell Ranger
- Micronair 5000 rotary nozzles
- AgNav and AIMMS 20 systems
- Dibrom (naled) at 0.66 oz/ac at 150 ft and 86 mph
- Leading Edge DropVision program

Atmospheric Data

Kestrel 5500AG Weather Meters
positioned on towers

Data Analysis

- 24 and 48 hr control-adjusted mortality on adult butterflies and mosquitoes
- Daily caterpillar mortality in leaf feeding bioassays
- Statistical comparisons of mortality means by dates, treatment, transect, distance from application, and replication

Conclusions

1. Results are pending outcome of experimental trials this spring and summer

2. Looking for suggestions on improvements to our experimental plan

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