

# Managed Wetland Mosquito Control Strategies

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Sac-yolo Mosquito and Vector Control



Sacramento-Yolo  
MOSQUITO & VECTOR  
CONTROL DISTRICT

Ca Delta



# Wetland Ownership

## Wetland Ownership:

- United States (Federal)
  - United States Fish and Wildlife Service
  - Bureau of Land Management
  - Bureau of Reclamation
- State of California
  - Department of Fish and Wildlife
  - Department of Water Resources
  - Dept. of Parks and Recreation
- Local (County, City)
- Non-Agency
  - Conservancies, wildlife organizations
  - Private (hunted)



# District Wetlands

## Wetland Types:

- Natural / Floodplain or Permanent, Fresh water tidal – 1600 Acres
- Stormwater – Drainages / Riparian
- Managed – 21,000 Acres
  - Requires human intervention
  - Brood, habitat and hunted
- Re-flood harvested rice – 42,000 Acres
- Combinations of types



# Managed Wetlands

- Drain water mid Spring (March –May)
  - Promote vegetation growth
- Irrigate 30-90 days after wetland drains
  - Drowns weeds
  - Germinate desirable plants
- Summer mosaic disking
  - Mow perimeter edges
- Late September flash flood to moisten soil
  - Flood for early water
- September to November flood for season
- Conflict with Mosquito Control



# BMP Manual

## Design and Maintenance:

- Steep slopes
- Deep and clean swales
- Clear access
- Properly sized inlets and outlets
- Pump capacity
- Control seepage

## Vegetation Management:

- Disking of vegetation
- Mowing edges

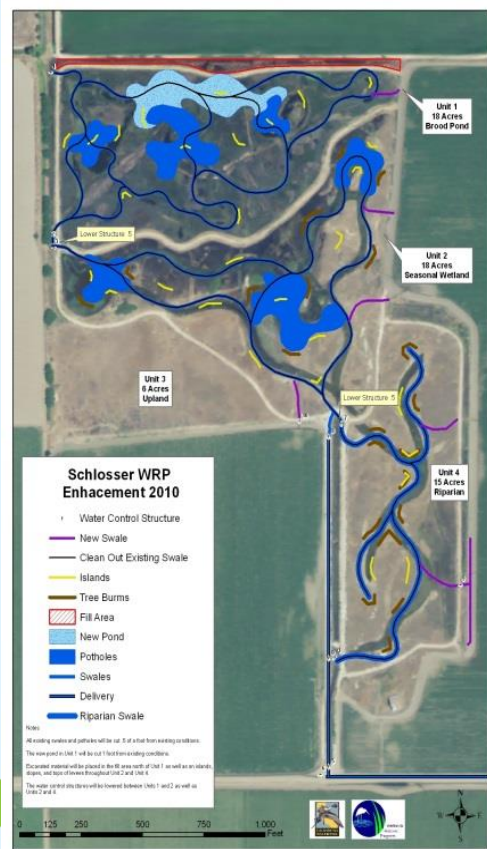
## Timing of Flooding:

- Time of year and duration
- Delay fall flooding



# Planning and Design

- Wetland purpose and ownership
- Water conveyance
  - How fast can it flood or drain
  - Inlets and discharges
  - Water availability
  - Support biological predators
- Sizing and access
  - Smaller cells inside large wetland
  - Drive around all sides
- Management Plan
  - Duration of water, irrigations, etc.
  - Limitations to Mosquito Control



# Focus on IPM

## Annual Wetland Planning:

- Discuss annual goals
- Discuss irrigations
- Timing of maintenance
- Fall flooding
- Mosquito treatment options and costs
- Suggest BMPs to reduce treatment costs
- District provided onsite services (cost shared)
  - Imaging
  - Access road mowing
  - Backhoe services
  - Heavy equipment rentals





# Annual Program

- Annual pre-season meetings
- Use of technology
- BMP incentives
  - District provided maintenance
  - Encourage vegetation reductions
  - Encourage delay in Fall flooding
  - Fall Flooding Cost Share



# Fall Flooding Cost Share

Flooding started on or after date	Percent of material costs to be paid by landowner
Summer -September 17	100%
Sept 17	50%
Sept 24	25%
Oct 1	none



District charges a portion of the larvicide costs based upon start of flood date includes re-flood of harvested rice fields

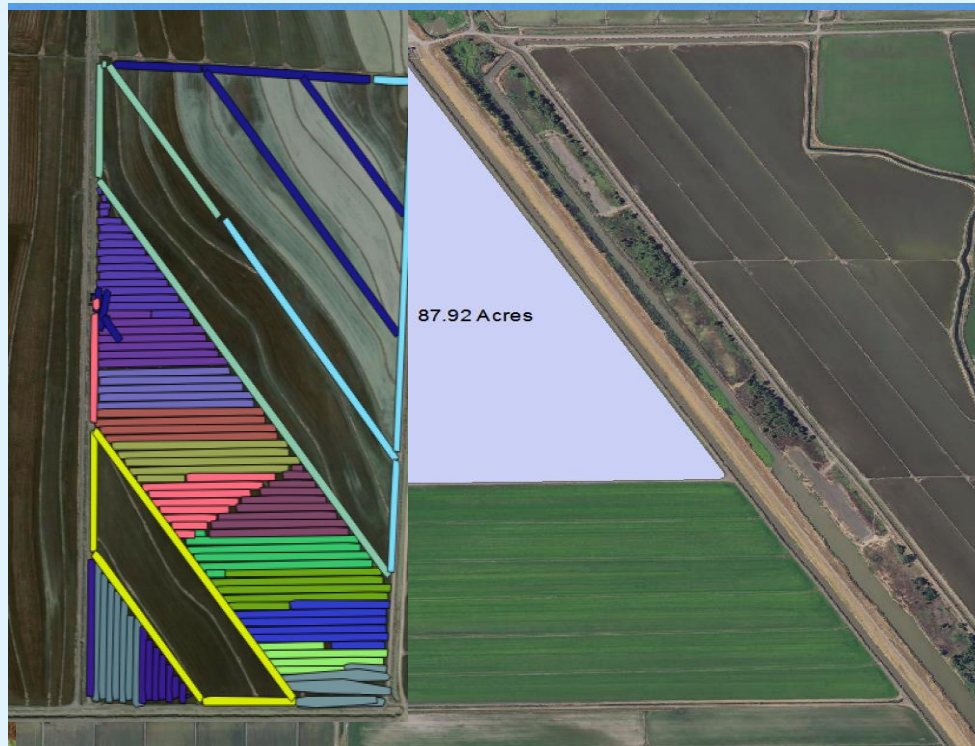
# UAS Imagery Tools

- Google
- Aircraft
- Unmanned
  
- Where to look
- Product selection
- Size of treatment
- Maintenance plan
- Use as historical imagery
- Document Fall Flooding



# Applications

- Ground
  - Argo
  - Quad
- Aircraft
  - Agricultural Ag Cats
    - Large acreages
  - UAS
    - Small to medium acreages
    - Edge treatments
    - Partial treatments
    - 2<sup>nd</sup> treatments
    - Wildlife concerns



# Seasonal Pesticide Types

## Spring / Summer:

- Single brood
  - Irrigations, flash flood
- Residual
  - Weed control
  - Slow draining, etc

## Fall:

- Single brood
  - Deep or open water
  - Veg-free
- Residual
  - Early season
  - Slow flood
- mosquitofish



# Summary

- Work with individual wetland manager
- Implement BMPs
- Inspect every water event
- Treat when necessary with single brood and residual products
- Utilize drone technologies
- Cost share with landowners for early flood-ups





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