

Mosquito Landscapes 2

Presentation to the California Mosquito and Vector Control Association

By Joshua N. Collins, PhD

21 January 2001
Silverado Country Club
Napa California

Information Technology, including especially GIS, is facilitating more studies of natural resources at the regional scale, where a region is defined by climate, geology, and shared definitions of political problems and solutions.

The San Francisco Bay Area is a region that is recognized all over the world. Within this region, natural resource planning and protection is focusing on landscapes as operational units of geography. The three major landscapes in the Bay Area are the bays, the baylands around the bays, and the local watersheds.

Mosquito Abatement interests will need to operate at the landscape scale to collaborate with other resource managers.

What might we mean by a mosquito landscape?

Let's look at the question from the mosquito perspective. The effective habitat for Anopheline mosquitoes has been termed the intersection line: the place where positive menisci that form around wettable objects pull the still water surface into the air.

These edges are part of plant communities that are parts of wetlands.

There are naturally many kinds of wetlands in the Bay Area owing to the variation in climate, topography, and the influence of the tides. Land uses that operate on the natural template for wetlands create additional kinds and increase the variability of wetlands in space and over time.

The region of bays, baylands, and watersheds consists of complex mosaics of mosquito habitats. **We might argue that mosquito larvae provide the most resolute or fine-scale definition of wetlands in the region.**

Most if not all of the natural resource managers are scaling up to landscapes for the implementation of their policies and practices. We hear about Regional Recover Plans for endangered species, Natural Community Conservation Plans, Watershed Management Initiatives, Regional Dredging Solutions, North Bay Watershed Protection Plans, the Bay Area Wetlands Restoration Program, the Bay Area Habitat Joint Venture, the Ecosystem Restoration Program of CALFED, etc.

I suggest that the Mosquito Abatement Districts of the region are doing this also. For example, the MAD's have gone from hand ditching of tidal marshes at the turn of the last century, to aerial application of pesticides, to large-scale mechanized ditching, and now management of the baylands landscape through tidal marsh restoration is one of the approaches used to control baylands mosquitoes.

The MAD's are poised to play major technical roles in the planning of large-scale wetlands restoration in the region. In fact, they are already playing this role, as evidenced by their involvement in the Bay Area Habitat Goals Project and the Wetlands Regional Monitoring Program.

How might that roll evolve? I don't know. But I suggest that the role will be technical. In the past I have suggested that the common denominator among all wetlands interests including mosquito control is the management of surface water: in short, drainage. Most of the desired ecological services as well as mosquito control can be achieved by careful management of the distribution, depth, and timing of flooding and drainage.

But I would also suggest that drainage becomes a concern for mosquito control mostly at the boundaries between land uses, habitats, and landscapes. It is the conflict between drainage patterns and practices at the boundary between natural or unnatural landforms that produce poor drainage and mosquito control problems.

We can consider the boundary between watersheds and baylands, where creeks back up behind bridges and culverts that are too small to convey their sediment loads. We can consider urban development that crosses the

boundary, resulting in roads and yards and parking lots that flood and cannot drain. We can consider the dairy cows that trample the edge of tidal marsh, where tidal water fills hoof prints. We can consider the land fill or unofficial dump where containers of rainwater accumulate.

I believe the MADs and other resource manager groups will need to focus on physical control through careful management of drainage patterns at the boundaries between major habitats, land uses, and landscapes. We might regard this as an extension of the intersection line concept to the landscape scale.

Thank you.