AMCA
THE AMERICAN MOSQUITO CONTROL ASSOCIATION

Individuals enhancing the health and quality of life through the suppression of mosquitoes, other vectors and pests of public health importance.

A Partner in the EPA's Pesticide Environmental Stewardship Program

AMERICAN MOSQUITO CONTROL ASSOCIATION FOUNDED 1935

September 6, 2013

Coos County Board of Commissioners:

The American Mosquito Control Association wishes to voice its strongest opposition to testimony delivered before the Coos County Commissioners on 3 September, 2013 regarding plans to address the mosquito problems arising within the Bandon Marsh. A number of gross inaccuracies stated in this testimony require clarification if the interests of public health in general and those of the affected citizens are to be properly served.

Bti is a better product than methoprene. While in many instances the use of Bti would be the optimal larvicide choice, a blanket statement indicating its inherent superiority over methoprene does not reflect informed opinion or demonstrable fact. Methoprene is a key component of mosquito control programs nationwide because of its exceptionally low toxicity profile, rapid biodegradation in the environment, and demonstrated efficacy in marshland habitats, where intermittent wet/dry cycles might compromise the efficacy of other products.

That being said, Bti is a superb frontline larvicidal product in widespread use in vector control programs throughout the United States – and so is methoprene. Bti has a few disadvantages that might argue against its use in the case of Bandon Marsh. Bti must be consumed by the mosquito larvae in order for its toxic proteins to be expressed in the midgut of the mosquito larvae. Thus, factors affecting larval feeding such as water temperature and organic load may profoundly impact efficacy. Larval stage present with relation to Bti particle size may also affect feeding and resultant larvicidal properties. This is not to say that Bti is not worthy of consideration, but merely to express several characteristics of the product that must be taken into account before its employment in a specific operation.

Methoprene kills lobsters, crabs, etc as evidenced in Maine. Laboratory findings cited in testimony in state legislatures in both Connecticut and Rhode Island only demonstrate deleterious effects on crustaceans from methoprene dosages several orders of magnitude in excess of those actually found after applications (Zulkosky et al 2005) and should not form the basis of policy decisions on its use. Furthermore, other studies (Gibson 2008, Dove et al. 2005 and Butler 2005) have evaluated the field data to date and found that the 0.05 parts per billion (ppb) of methoprene found at storm drain outfalls in Long Island Sound poses no risk to lobster larvae in terms of molting or survivability. In addition, dilution well below detectability thresholds occurs within short

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distances from the outfalls. Miller et al. (2005) studied lobster mortality in western Long Island Sound in 1999 and concluded that: "Model results show that even with an overly conservative model input assumption (i.e., that the entire mass of pesticide applied in the watershed reached the open waters of LIS without any attenuation or decay in either the watershed or the Sound) the calculated 24-hr average ambient levels of methoprene in the Sound were less than 0.0005 ug/L and well below the lowest reported ecologic endpoint of lobster stress (i.e., 2.8 ug/L stage 2 larvae LC50)."

The fact remains that the USEPA, during its initial registration process, determined that methoprene did not adversely impact crustacean populations when used according to label directives. EPA further concluded in 1996 that data support margins of safety of greater than 200X for non-target organisms tested either after acute or chronic exposure. For this reason, EPA mandated that the product labels be changed to remove the label restriction "do not use in fish-bearing waters" from all formulations.

Very few (mosquito control districts) use naled. Testimony incorrectly stated that few mosquito control organizations utilize naled. In fact, naled has been commonly used for mosquito control in the Pacific Northwest, with 239,429 pounds utilized between the years of 2004 - 2010. In Oregon alone during that time period, 28,774 pounds of naled were used in mosquito control applications. Nationwide, it is a frontline choice for wide-area aerial mosquito control. For instance, of the 8,300,000 acres aerially adulticided in Florida in FY 2007-2008, over 8,000,000 acres were treated with naled.

Naled is the product of choice for aerial applications based upon its demonstrable performance in controlling mosquitoes. This results in the need for fewer applications needed to effect desired control, thus potentially lessening environmental load when compared to products requiring more frequent applications. Thus, blanket recommendations for use of the "least toxic" pesticide oversimplify the process and may actually result in significantly higher amounts of pesticides in the environment over the long term. In addition, naled's rapid degradation reduces the potential for its exposure to other aquatic and terrestrial organisms. Naled and its degradates are transformed by abiotic hydrolysis, indirect photolysis in water and biodegradation. Volatilization from soils and/or water is the major mode of transport for naled and its bioactive degradate, dichlorvos. Under terrestrial, aquatic, and forestry field conditions naled dissipates rapidly with half-lives of less than 2 days. This rapid hydrolysis and even faster biodegradation helps decrease the concentration of naled and its degradates available for runoff.

Furthermore, advances in aerial applications spray technologies now produce more uniform droplet spectra. Coupled with far more predictive spray drift modeling and in-flight meteorological tools, these advances have made aerial applications much more precise.

Corrosive properties of naled. Testimony grossly overstated the corrosiveness of naled. While it requires care in handling and usage, statements regarding "bumpers falling off cars" are both inaccurate and intentionally misleading.

Naled wouldn't work. Although testimony stated that naled wouldn't work, reasons for this vis-à-vis the pyrethrins suggested as the alternative were not given – and do not exist. Both naled and the pyrethroids testimony promoted for use have label advisories for use in the vicinity of aquatic habitats. In fact, pyrethroids are particularly harmful to fish when exposure occurs. This is why special precautions are mandated on the label for both naled and pyrethroids. Nonetheless, EPA has determined minimal environmental impact for both pesticides when used according to these label dictates – as is federal law. Contrary to the suppositions basing the testimony, however, pyrethroid synergists may remain in the environment far longer than naled degradates.

Aerial applications are more expensive than ground applications. Aerial mosquito control procedures are designed to treat large areas in minimal time. An aerial treatment of the 300 acres in question would require mere minutes of flight time utilizing 1000-foot effective swaths, particularly in light of the fact that a total of 10,260 acres inclusive of the 300 acres in question are planned. Ground applications produce 300-foot swaths and would require significantly more time and labor. Costs for both would be similar, but aerial treatment would effect control far more rapidly than ground applications in this instance. Furthermore, the use of trucks in the marsh would produce more environmental impact due to tire tracks from trucks, with their reduced effective swaths, requiring access to remote areas of the marsh. Interestingly, the risks to medium and large-bodied insects such as bees and dragonflies after aerial applications are generally lower than truck-mounted ULV applications (Schleier III et al. 2008)

Aerial adulticide effects on bees and dragonflies. Effects of aerially-applied mosquitocides on dragonflies is minimal. Dragonflies are active only during daylight hours. Ultra low volume mosquito control sprays are applied in the evening, when dragonflies are inactive. Thus, exposure of dragonflies to the insecticide is minimal. Testimony incorrectly stated that dragonflies constitute an important source of predation on mosquitoes. (A dragonfly biology webpage, http://www.naturenorth.com/dragonfly/DOM/Page07_Food.html, states the following "Most dragonflies hunt during the daytime, when it is sunny and warm. Most mosquitoes remain hidden in the daytime, so they're not a major food item for most dragonflies. Nymphs will eat mosquito larvae, but most nymphs live in permanent water bodies, while mosquitoes breed mainly in temporary waters. Mosquitoes can have several generations in one summer, so their populations can rise dramatically in a short time. Dragonflies have only one generation each year, so their numbers cannot increase to match mosquito populations. Dragonflies are an important part of wetland ecosystems, but they can't control mosquito numbers. In nature, the availability of prey usually limits predator populations, not the other way around."

Dragonfly nymphs, which are bottom feeders, will feed upon mosquito larvae when the larvae at the water surface are startled and head for the bottom. Unfortunately, they also feed on water striders, guppies and other mosquito larvae predators, compromising natural larval control. Furthermore, controlled studies have not shown significant reduction in mosquito density by introduction of dragonfly nymphs. Second, there are compelling theoretical arguments for supposing it to be unfounded. As stated above the role of adult dragonflies in mosquito predation is often grossly overstated. They certainly pick off the odd mosquito here and there, but they are daylight predators, using their superb eyesight for locating prey. Mosquitoes are not normally highly active during the peak feeding hours of dragonflies.

If bees are in the path of the treatment and unprotected, they could be affected. However, honeybees are typically in the hive when treatments occur and therefore are mostly unaffected. Although it is likely that collateral mortality occurs for small flying insects that are active at the same time as mosquitoes, data suggest that measurable and persistent biological effects on nontarget arthropods exposed to larvicides or adulticides applied via ULV sprayer would be minimal (Davis et al. 2008).

It is extremely important for the public to have access to vector control information that is based upon sound science so that they can make informed decisions on their preferred means of protection from mosquito-borne disease. The American Mosquito Control Association remains fully supportive of mosquito control measures endorsed by both the CDC and EPA, which include the judicious use of mosquitocides when deemed necessary by competent authority. We are public health professionals and our first concern is the health and welfare of the citizenry we serve. The mosquito control profession enjoys a long and proud legacy of community service in its pursuit of an improved quality of life and a society free from the ravages of mosquito-borne diseases that have afflicted our country in times past. This goal remains our primary focus and is fully consistent with the very finest traditions of public health.

It appears that the Commissioners and U.S. Fish and Wildlife Service are making the proper decision to apply EPA-registered mosquitocides according to their label specifications to abate this problem. AMCA fully endorses this decision. Let's work together to continue to search for answers to this important problem, for the sake of the environment and your community's quality-of-life and public health. However, in doing so, let's make certain that policy decisions continue to be based on valid, reproducible science, rather than uninformed opinion and innuendo that fly in the face of scientific fact.

Sincerely,

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