

July 3, 2005

This Report will be submitted to the BCPUD Board in July
2005

REPORT AND RECOMMENDATIONS TO THE
BOLINAS COMMUNITY PUBLIC UTILITIES DISTRICT (BCPUD)
FOR MOSQUITO MANAGEMENT IN WEST MARIN
BY
THE BCPUD WEST MARIN MOSQUITO CONTROL COMMITTEE

Committee's Recommended Basic Protocol

This protocol defines the committee's recommendations for the specific methods to be used to control mosquitoes in West Marin.

1. EDUCATE WEST MARIN COMMUNITIES ON MOSQUITO PREVENTION AND CONTROL,
2. PROVIDE INFORMATION ON AND SUPPORT FOR PHYSICAL PREVENTION METHODS, and
3. TREATMENT AS A LAST RESORT WITH TWO (2) BIOLOGICAL TREATMENTS (BT's) - VECTOBAC (Bti) AND VECTOLEX (Bs).

COMMITTEE REPORT

The Committee report is a compilation of the committee's research, analysis and the recommended community-based approach that supports the Protocol. This Report is intended as a contextual background document.

I. Basic Principles

These recommendations are based on the following principles:

- * **Protect Human Health:** Humans should be protected from West Nile Virus and other diseases transmitted by mosquitoes.
- * **Protect Wildlife:** Birds, horses and other animals should be protected from diseases transmitted by mosquitoes.
- * **Protect the Environment:** Measures to control mosquito breeding should be compatible with and not harm the environment. Measures should follow the 'precautionary principle.'
- * **Local Involvement:** The local communities in West Marin should be involved in decision-making about mosquito control measures. Individual and community responsibility is as important as the actions taken by the Marin Sonoma Mosquito Vector Control District (hereafter referred to as "The District").
- * **Hierarchy of Control Methods:** Educate first, then prevent, then, as last resort, treat with two (2) biological treatments - Vectobac (Bti) and Vectolex (Bs).

II. Education

A community well educated about the mosquito and its disease-carrying potential will be better able to take preventive action and participate in the control of mosquitoes.

- * **Distribute Flyers:** The District should work with the local community to provide and circulate flyers about mosquito prevention as part of its ongoing public education program. The flyers should focus on how to reduce mosquitoes by removing standing water, being sure that septic systems are secured and properly screened and vented, tarps are not gathering water, old tires are not gathering water, etc., as well as information on West Nile Virus, other diseases transmitted by mosquitoes. **Most**

importantly, the flyer should provide guidance on what individual residents can do to control mosquitoes.

* **Use Local Media:** The District as well as local West Marin organizations and agencies should be encouraged to use local media to disseminate information on mosquito prevention to the public, including the BPCUD newsletter, Bolinas Hearsay News, Point Reyes Light, Coastal Post, Independent Journal and KWMR radio station (The District could perhaps have a weekly announcement about mosquito control.)

* **Disseminate Information from an Outside Review:** Sometime in the near future, Beyond Pesticides, a respected, national organization will conduct an audit of the District's operations. The District, which has requested this outside review, should make this report publicly available to increase the District's transparency and increase the public's confidence in District operations.

III. Prevention

Source reduction of mosquitoes is the most effective way to control mosquito production. The idea is to prevent the mosquito from reaching adulthood. A number of measures should be undertaken.

* **Avoid Standing Water:** Mosquitoes need still water to lay their eggs, which develop in 7 to 10 days. BCPUD, other local agencies and organizations should encourage all West Marin residents to maintain their properties to avoid standing water to keep mosquitoes from breeding in the first place. Common problem areas are faulty septic systems, clogged rain gutters, old tires, upright wheelbarrows, upturned boats, tree holes, open containers, birdbaths, etc. Residents should call the District for help with standing water in low-lying areas, waterways or ditches/drainage issues.

* **Support a Septic Inspection and Sealing Program:** Septic tanks are the primary source of mosquito breeding in West Marin - perhaps greater than 75% of the total. The mosquito enters the septic tank riser (or roof vents) and deposits its eggs inside the tank. The hatched mosquitoes then travel back out through the riser or through the septic pipe that connects to the house. The mosquitoes then exit through the vents on the house roof. Given the rural nature of West Marin, the number of septic systems in use is much higher than in other areas of Marin County.

The District will inspect septic systems generated from tenant/owner requests, providing information regarding sealing and screening for all West Marin residents. The committee encourages residents to use this service.

All septic tank risers or manholes and house roof vents should be secured/sealed and properly screened. The committee is aware that there are several materials that can be used for proper septic screening and sealing, some lasting significantly longer than others. We encourage residents to use materials that are durable and weather-resistant.

All repairs are the responsibility of the property owners. The committee will develop a list of licensed and bonded individuals/ services that are able to provide sealing and screening service for all West Marin residents. ***These services would be for mosquito control only, not for septic tank operations.***

*** Work with property owners:** A process must be developed to address property owners who are not taking measures to control mosquito-breeding sources. In these situations, the District will work with the Advisory Committee (see Implementation) to resolve community issues. The District will give property owners written notice with a timeline re: sealing and venting their septic systems or correcting drainage problems. Members of the Advisory Committee will also offer their assistance to the owner in resolving the problem. A detailed procedure needs to be worked out with the District re: treatments, citations and as a very last resort, a property can be declared a public nuisance and a daily fine of \$1,000 would begin to accrue.

*** Improve Drainage:** Open, stagnant water is a major breeding ground for mosquitoes. It is important to distinguish between wetlands, seasonal wetlands, and areas that need drainage work. There are no problems with mosquitoes if wetlands are functioning properly. If they are not functioning properly, then the wetlands will need to be remedied, not drained.

The District will work with the US Army Corps of Engineers, Bay Area Conservation and Development District, Coastal Conservancy, National Park Service, US Fish and Wildlife Service, California Department of Fish and Game, and other local, state and federal agencies to implement proper drainage in West Marin.

Example: Perhaps the biggest challenge in Bolinas is the natural swale on the Big Mesa along Alder Road from Overlook Road to the ocean. District staff, BCPUD staff and local community volunteers should work together to improve the drainage there.

BCPUD should develop a Drainage Plan that relies on manual and mechanical methods to increase water circulation and maintain dirt roads to avoid ponding. BCPUD should then work in partnership with the District to implement the project, determine what role each plays and establish respective financial commitments. Because of the environmental sensitivity of the swale, special care should be taken to "do no harm" and follow any appropriate environmental regulations. A time frame should be established for completion.

Several other areas in West Marin also have significant drainage issues as well.

* **Do Not Use Mosquito Fish:** The committee recommends not using mosquitofish. After extensive research, the committee has become aware that mosquitofish are not appropriate for West Marin. Our ecosystem is too vulnerable. Mosquitofish are non-native predator fish and will likely harm small or young native fish (including our endangered Coho salmon that are now just beginning to return), young frogs and salamanders, as well as beneficial aquatic insects. The fish also often out-compete native species for available food and habitat. Therefore, we recommend that mosquitofish are not used in West Marin. It is too easy for these fish to escape into our waterways. In West Marin, horse troughs, ponds, etc., are often close to waterways. When there is overflow, the mosquitofish can then invade our creeks, ponds that drain into our waterways, etc. Therefore, the committee has concluded that mosquitofish are inappropriate for use in West Marin. Instead, drain your ponds, horse troughs, etc. or use Bti.

* **Promote the Effectiveness of Natural Predators**

Common local swallows (Barn, Cliff, Violet-green and Tree) and dragonflies are voracious eaters of mosquitoes, especially at dawn and dusk when biting mosquitoes are most active. The committee will provide educational material on the value (and risks) of mosquito predators and will provide information on how to attract mosquito predators onto one's property.

IV. Treatment

The BCPUD MCC recommends the following treatment, if needed:

After education and extensive prevention methods (as previously described) have been used, mosquito eggs may still hatch into larvae and pupa before hatching into adults. **As a last resort**, if mosquito larvae are still present in large numbers, treatment methods may be needed.

*** Use Biological Treatments:** The District currently uses the following biological larvicides:

Vectobac (Bti: *Bacillus thuringiensis israelensis*) - Bti, a naturally occurring bacterium sold commercially as Vectobac, is a subspecies of BT, the most widely used microbial pesticide in the world. Isolated from a stagnant riverbed pool in Israel (thus its name), this bacterium is highly lethal to mosquito larvae. Once ingested by the larvae, a crystalline endotoxin is released disrupting the midgut lining which leads to death before pupation within 48 hours. It can be applied by power equipment or hand sprayers. The District occasionally uses helicopters for spraying Bti.

Bti is very target specific, causing no identified harm to aquatic life other than to mosquitoes and black fly larvae. Persistence of Bti in the environment is about 3-7 days. It may be applied to any mosquito-breeding source except drinking water reservoirs and receptacles. It is sold commercially with inert ingredients whose contents by law do not have to be disclosed by the manufacturer.

Vectolex (Bs: *Bacillus sphaericus*), is a bacterium that works similarly to Bti, but is more effective in water with higher organic content.

Both of these products - **Vectolex and Vectobac are biological controls and are not chemical pesticides.** Furthermore, they are on the Organic Materials Research Institute (OMRI) list of allowed substances. The OMRI provides an independent review of products intended for use in certified organic production, handling, processing and guidance on the suitability of material inputs under the USDA National Organic Program standards

*** Eliminate or Rapidly Phase Out the Use of Chemical Pesticides:** A pesticide is defined as an agent that through its chemical action is used to destroy pests. Though some scientific studies of federally approved pesticides indicate their safety, many other studies provide strong evidence that pesticides can harm human health and the health of our environment. Cancer is very high in Marin County. Scientific research indicates a 1/1 correlation between the increased use of chemicals/pesticides in the USA and the increase in cancer rates. Thus, the committee strongly believes that we should not increase the use of chemicals/pesticides in our communities. Furthermore, spraying chemical pesticides can cause drift, a significant issue of concern to organic gardeners, beekeepers and organic farmers as it could cause them loss of their organic certification.

The District should not use chemical pesticides or biological agents other than the two recommended in this document for the control of mosquitoes in West Marin, with the following possible exceptions:

*New products that are developed with significantly reduced toxicity than current biologic products (named above) and do not harm human health or the environment.

*The State of California declares a state of emergency where their authority, under the Mosquito Abatement Act of 2003, would supercede that of the District and any of its agreements with local jurisdictions.

No chemical pesticides would be used by the District without prior notification and review by BCPUD or an Advisory Committee (See Implementation) formed to represent West Marin on this issue.

Number 5 - Implementation

*** Adoption by Other Jurisdictions:** The Committee suggests that members of the BCPUD MCC and/or the BCPUD Board meet with and request other jurisdictions in West Marin to adopt these recommendations. BCPUD, the Stinson Beach Water District and the Inverness PUD have the authority to adopt these recommendations for their districts. Other parts of West Marin - Point Reyes Station, Marshall, Tomales and Olema - would need to create an appropriate forum to adopt the recommendations. Other entities should be approached to participate in the adoption of these recommendations, including the National Park Service, Marin County (the County), the Environmental Action Committee (EAC) and Marin Organic.

*** Jointly Adopt a Plan:** The District, BCPUD and any other interested West Marin parties should jointly adopt a plan for mosquito control in West Marin.

*** Form a West Marin Advisory Committee:** Such a committee would have representation from each of the districts, agencies and organizations listed above along with some individuals representing Pt. Reyes, Marshall, Olema and Tomales Bay (which do not have government agencies yet), to advise and work with the District in an ongoing relationship. This committee would meet regularly with the District to discuss issues, make recommendations, review data and be available to their communities as a resource. This committee would also participate in a

countywide discussion in the event there is an increase of WNV in human beings in Marin Country and possible action (other than the recommended protocol) is being considered.

*** Establish a communication Link with District Trustees and the community:** The District board has one member who represents the West Marin Community. The newly developed West Marin Advisory Committee will create ongoing communication with the West Marin District board member. In addition, West Marin residents are welcome to attend the monthly District Board meetings.

*** Prepare a Monthly Report:** The District should prepare a monthly report on service calls from West Marin by zip code, the types and quantities of BTI and BS used in West Marin. This report will be submitted to designated BCPUD and other district representatives.

*** Focus on Education:** We believe that the most effective means to control mosquitoes in West Marin will involve communication and education, as well as timely access to information and assistance with septic systems and drainage issues.

*** Continue Cooperation:** The District has been very cooperative in working with this committee and we strongly urge that this positive relationship with West Marin continue. We should make every effort to cooperate with the District by seeking local volunteer labor for mosquito control projects, identifying problem areas that need attention and implementing the letter and spirit of the agreement.

*** Emergency Response:** In the event that the District and County are considering declaring West Marin an emergency due to the presence of WNV, representatives from the BCPUD board and/or the Advisory Committee must be included in such discussions before action is taken.

In summary, the BCPUD MCC recommends that the emphasis be on education, physical methods and only the two specific BT's described above. The committee recommends that no chemical pesticides are used in West Marin and that the BCPUD Board adopt the above-recommended protocol.

Respectfully Submitted:

BCPUD West Marin Mosquito Control Committee

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Alternates:

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Additional Information: The Committee will create a list of licensed and bonded contractors who are available to check and repair, if necessary, roof vents and septic systems (**for mosquito prevention only**). We will provide a range of how much an individual would be charged to assure the West Marin community that the costs are reasonable and appropriate. The Committee recognizes that individual property owners have the right to employ methods they choose on their own private property. The recommendations in this report are in regards to the protocols and methods of education, prevention and treatment to be followed by the District in West Marin.