

Preventing West Nile Virus

MOSQUITO CONTROL ON PRIVATE PROPERTY

What are the methods for mosquito control on private property?

There are several methods of controlling mosquitoes on private property and often a combination of methods will produce the best results. Natural methods are preferable prior to considering the use of pesticides. Control of mosquito larvae is generally more effective than trying to control adult mosquitoes.

- **Source reduction:** Effective prevention and reduction of adult mosquito populations begins by surveying the property and getting rid of standing water where mosquitoes breed. This includes containers that hold water such as buckets and tires and water pooling on roofs, tarps, and in boat hulls. Wetlands and natural ponds, however, should not be drained.
- **Natural predators:** In nature, there are many predators that eat adult mosquitoes or mosquito larvae. These include fish, frogs and other aquatic animals and wildlife around ponds and wetlands such as swallows and bats. In confined ponds, animal water troughs, and abandoned swimming pools adding goldfish or koi can also be effective for controlling mosquito larvae.
- **Larviciding:** Larviciding includes the use of biological, biochemical, and chemical pesticide control products applied to water sources to kill the immature larvae before they hatch into adult flying mosquitoes. Many larvicides (such as *Bacillus thuringiensis israelensis*, *Bti*) come in the form of pellets or donut-shaped "dunks". Larviciding can be effective if done correctly but it is important to **READ THE LABEL** before using products and to follow state and federal laws.
- **Spraying for adult mosquitoes:** Spraying adult mosquitoes with a pesticide product is generally less effective than the methods to *control* larvae, as described above. Spraying may be considered when there is a severe nuisance problem to provide relief from heavy swarms of biting mosquitoes or when public health officials have determined the risk of mosquito borne diseases outweigh potential risks.

What can I do to reduce mosquito breeding on my property?

Many of the types of mosquitoes that carry West Nile virus prefer to lay their eggs in containers of water such as buckets and bird baths common to many backyards.

By reducing these sources of water, you'll go a long way towards reducing mosquitoes hatching near your windows and in your yard. While we will never get rid of all mosquitoes, it does make sense to reduce sources of mosquito breeding around your home.



Tips for reducing mosquito breeding habitat:

- Tip water out of barrels, buckets and wheelbarrows and turn them over so water cannot collect
- Tip out containers that could hold water such as toys, cans or plant saucers weekly
- Empty children's wading pools weekly
- Change water in birdbaths, pet watering dishes and animal troughs at least once a week
- Discard, properly store or drill holes in used tires
- Clean debris from ornamental ponds and keep fountains running during the summer
- Stock ornamental ponds with fish
- Maintain swimming pools and hot tubs
- Recycle old bottles, buckets, and cans
- Clean leaf-clogged gutters and drain flat roofs
- Dump water off of tarps and plastic sheeting
- Drain water from covers on pools, boats and hot tubs
- Repair leaky outdoor faucets
- Cover rain barrels with mosquito screens
- Cover garbage cans with an appropriate lid
- Repair ripped window and door screens and make sure they fit tight; use a screen door on doors that often are left open

Help your elderly or frail neighbors and relatives with these activities (older people are more vulnerable to severe West Nile virus disease).

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What can I do to control mosquitoes in ornamental fountains, ponds and birdbaths?

There are several options to control mosquitoes in fountains, birdbaths, small ornamental ponds or other landscape "water features". The first is to keep water moving by using a pump to create a waterfall, spray, or otherwise circulate the water. This does not need to run continuously; just a couple hours a day will prevent mosquitoes from successfully hatching.

Another way is to add goldfish or koi to the pond; these fish love to eat mosquito larvae and are a very effective control method. Goldfish or koi can be purchased inexpensively at most pet stores. For birdbaths and small fountains, you could also empty the water each week and refill with fresh water--this is effective because it takes more than a week for mosquito eggs to hatch into adults.

Do not add gold fish or koi to non-ornamental waters such as natural ponds, lakes or wetlands.

What can I do to control mosquitoes in a swimming pool or hot tub?

Neglected swimming pools and hot tubs may serve as sources for mosquitoes that could carry West Nile Virus. Swimming pools and hot tubs should be maintained in a manner that does not create a nuisance. There are several ways to keep mosquitoes from multiplying in your pool or hot tub while it is not being used:

- Maintain effective disinfection of swimming pools and hot tub water at all times (even when they are not being used)
- Assure standing water on pool cover is removed at least once a week
- Maintain water circulation in swimming pools and hot tubs
- Fill abandoned swimming pools with appropriate backfill
- Keep covered or drained if not in use



What can I do to control mosquitoes in natural ponds and wetlands?

A healthy pond or wetland is home for many mosquito predators such as dragon fly larvae, mosquito eating birds and bats. Generally it is not necessary to treat these bodies of water and the presence of mosquito larvae must be verified by a professional pesticide applicator before chemicals may be applied to these areas.



Permits are required to apply larvicides to water bodies that are not completely contained, such as an artificial or natural pond where the water from the pond can flow to a natural water body or constructed drainage system. The property owner or a licensed commercial pesticide applicator must obtain the required permit. To apply for a National Pollutant Discharge Elimination System (NPDES) Permit for Aquatic Mosquito Control on-line, go to http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/mosquito/mosquito_index.html

Also, contact your local drainage or surface water management office to verify if local regulations have additional requirements other than just a NPDES permit. In the phone book government pages or on-line, look for your city's Public Works or utilities section, and under the subheading "drainage" or "storm water".

For more information about controlling mosquitoes on private drainage systems visit our website at <http://www.kingcounty.gov/healthservices/health/ehs/westnile/MosquitoControl.aspx>

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Can I add fish to the natural pond or wetland on my property?

This is not allowed unless the property owner has first obtained a permit from the State Department of Fish and Wildlife. This permit is required before any fish is introduced to natural bodies of water, including natural ponds and wetlands, on private property. This is to prevent establishment of non-native species that may harm native animals and plants. For more information and permit procedures, visit WSDA on the web at http://wdfw.wa.gov/licensing/fish_transport/stocking_app.html

Remember that wetlands, ponds and swamps are likely to have natural predators such as fish, birds, amphibians, dragonflies and other insects that help keep mosquitoes under control.

Is it okay to use bleach, vegetable oil, motor oil or soap in ponds to control mosquitoes?

No, these should never be used!

Bleach, vegetable oil, motor oil and soap are not registered for use as pesticides and cannot be used for control of mosquito larvae or eggs. Mosquito control must comply with federal and state requirements. It would be illegal to put these substances into waters of the state that are not completely contained without a permit, **even if** they are on private property. Many substances, such as petroleum products, should not be used in a manner that will allow them to get into natural water systems, groundwater, or drainage systems.



Pacific Tree Frog

Photo courtesy of USGS

Bleach, oils, soap, and many other chemicals can be toxic to organisms such as fish, amphibians, and insects, and killing these mosquito predators will do more harm than good. Even products labeled as "biodegradable" or "non-toxic" may be harmful to aquatic organisms.



How do I choose a commercial pesticide applicator to provide mosquito control on my property?

Commercial pesticide applicators must be licensed through the Washington State Department of Agriculture. When choosing an applicator ask to see their current pesticide license to ensure that it is up-to-date. The pest control business should have a Commercial Pesticide Applicator license; their employees should have Commercial Operator licenses. Make sure the applicator has an aquatic, public health or statewide endorsement on their license. One of these endorsements is required for the applicator to apply larvicides to water.

Other endorsements are required to apply sprays for adult mosquitoes. Most common are the PCO General or Ornamental Insect & Disease Control; the Public Health endorsement can also be used.

For more information visit WSDA on the web at <http://agr.wa.gov/PestFert/Pesticides/ComplianceActivities.aspx>

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Are there any laws and regulations to require mosquito control in King County?

The responsibility of mosquito control ultimately lies with the property owner (city, county or private ownership). If there is a potential mosquito problem on private property, you may file a complaint with Public Health's Environmental Health Division by calling 206-263-9566. Public Health does not have regulatory authority to require property owners to remove mosquito habitat except if the habitat is in violation of solid waste law. We can send educational materials that provide guidance on reducing habitat. If the habitat is on public property, we will inform and advise the appropriate property owner.

What is King County doing about stormwater ponds?



If you believe that the stormwater pond is a source of mosquitoes, look for a sign posted near the pond or call your local public utilities office to determine who is responsible. If you are not sure who owns the stormwater pond, call your city or county government for more information.

King County's Department of Natural Resources and Parks (DNRP) is continually evaluating its stormwater facilities, in unincorporated King County and some contracted cities. Call 206-296-1900 if you have concerns about a DNRP stormwater pond. More information can also be found at:

<http://www.kingcounty.gov/environment/waterandland/stormwater/problem-investigation-line.aspx>

For mosquito control information regarding ponds and catch basins located on private property ponds, see <http://www.kingcounty.gov/healthservices/health/ehs/westnile/MosquitoControl.aspx>

What can I do to kill adult mosquitoes in my yard?

First of all, remember that not all flying insects are mosquitoes. There are other bugs such as crane flies, certain midges and gnats that may look like mosquitoes but which don't generally bite and don't spread West Nile virus.

Killing adult mosquitoes is rarely the best way to protect yourself from mosquito bites. Instead, avoid being bitten by staying inside during the feeding time of adult mosquitoes. Wear protective clothing when mosquitoes are biting, and consider applying insect repellent to exposed skin. Since the adult mosquitoes you see now are capable of laying eggs, find and eliminate sources of stagnant water on your property to prevent new generations of mosquitoes.

Spraying pesticides to kill adult mosquitoes is not normally recommended by Public Health. While some products can be legally used, this is not the most effective solution to mosquito problems. Before considering spraying for mosquitoes, we recommend contacting a licensed commercial pesticide applicator that is knowledgeable about adult mosquito control, the rules regarding use of pesticides, the conditions under which they may be applied, and the least toxic products.

What about bug zappers and other mosquito deterring devices?



There are a variety of devices advertised that are designed to attract mosquitoes and then kill them by electrical shock or other means. Effectiveness of these devices can vary, and there is little scientific data available to help guide the consumer in purchasing such devices, many of which are fairly expensive. In general, it is advisable to concentrate your mosquito control efforts on eliminating mosquito breeding habitat, preparing your home to keep mosquitoes out, and taking personal precautions against being bitten by mosquitoes.

Where can I get more information about West Nile virus?

See the following websites:

- Public Health-Seattle & King County
www.kingcounty.gov/health/westnile
- Washington State Department of Health
<http://www.doh.wa.gov/YouandYourFamily/IllnessandDisease/WestNileVirus.aspx>
- National Centers for Disease Control
<http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>