

BENTON COUNTY MOSQUITO CONTROL DISTRICT

KNOW THE RISKS



INSIDE: Problems mosquitoes bring — Safe use of pesticides — What you can do to help!

A special advertising supplement

MOSQUITOES

101

MOSQUITO SEASON IS UPON US — LEARN THE FACTS TO PROTECT YOURSELF AND YOUR FAMILY

- **MOSQUITOES ARE SMALL BUT RESILIENT!**
They have been around for 400 million years and most are the approximate size of a dime.
- Mosquitoes can breed in mine shafts **5,000 FEET UNDERGROUND** and in mountainous regions with altitudes up to 14,000 feet.
- Mosquito-borne diseases are among **THE WORLD'S LEADING CAUSES** of illness and death.
- **THEIR STRENGTH IS IN NUMBERS.** At the height of the season, mosquito traps in the Everglades gather up to **ONE POUND OF MOSQUITOES** in one location in one night.
- The average mosquito drinks **5 MILLIONTHS OF A LITER OF BLOOD** during a feeding, which is smaller than a raindrop.
- **ONLY FEMALE MOSQUITOES DRINK BLOOD**, which is required for egg development. Male mosquitoes do not bite. Both males and females feed on nectar and other suitable sugar sources for energy.
- Mosquitoes track victims at a distance, like a shark, following movement and scent. Mosquitoes **TRAVEL SEVERAL MILES IN ONE NIGHT** for a meal, making it difficult for homeowners to keep a mosquito-free yard.
- Mosquitoes are **ATTRACTED TO THE CARBON DIOXIDE** we exhale and lactic acid.
- Mosquitoes have a **GOOD SENSE OF SMELL.** Unique body scent, including fragrances and other factors, can either make you more or less attractive to mosquitoes.
- The **RISK OF CONTRACTING WEST NILE VIRUS** outweighs the risks associated with mosquito control.
- Mosquito control sprays contain **LESS THAN ONE TENTH OF ONE OUNCE OF ACTIVE INGREDIENT PER ACRE.**
- Degradation of the droplets found in the sprays is rapid, **LEAVING LITTLE OR NO RESIDUE.**
- The bump left behind after a mosquito bite is an allergic reaction to the **MOSQUITO'S SALIVA.**



WATCH OUT FOR THESE **MOSQUITOES**

While there are 22 species of mosquitoes in Benton County, there are two species of mosquitoes you need to be on the lookout for because they can carry disease.

ENCEPHALITIS MOSQUITO

(Culex tarsalis)

This mosquito is the primary vector of West Nile virus, western equine encephalomyelitis virus and St. Louis encephalitis virus. This mosquito prefers to feed on birds, but will readily settle for humans, horses and cattle. *Culex tarsalis* breeds in a variety of clean and polluted water sources like flooded agricultural lands, ditches, man-made containers, ponds and more.



NORTHERN HOUSE MOSQUITO

(Culex pipiens)

Much like *Culex tarsalis*, the Northern House Mosquito is a major vector of West Nile virus, western equine encephalomyelitis virus and St. Louis encephalitis virus. Larvae prefer polluted, foul water high in organic content — water in artificial containers, storm drains, wastewater ponds, stumps, septic tanks, fountains, birdbaths and unmaintained swimming pools. Birds are their primary target, but they will attack humans and invade homes.



KNOWING THE **SIGNS**

AFTER MONTHS OF MEDICAL TESTING, WOMAN IS DIAGNOSED WITH WEST NILE

BY **MIKE BLOUNT**

In 2009, Lisa Zelinski rode her bicycle to work every day from her home in Prosser, Wash., a total of 26 miles round trip. She describes herself as the “picture of health” at that time in her life. So when she started feeling ill, her friends and family expected a quick recovery. No one suspected her condition would dramatically take a turn for the worse in such a short amount of time.

“I just woke up one morning and I wasn’t feeling good,” Zelinski says. “I had to really push myself to do things. I was taking extra amounts of caffeine just to get through the day, and I thought I was making up some of the symptoms I was feeling in my head. I thought I was being crazy.”

But she wasn’t. Zelinski had a panic attack a few days later when she became separated from her friends at a park. She couldn’t focus enough to find them and says she felt like she was having an out-of-body experience — one where she was unable to perform simple tasks that once were easy. After four days of feeling like this, Zelinski gave in and made a doctor’s appointment.

She was initially diagnosed with the flu and told to go home and rest. But after a week, she went back to the doctor with a rash on her arm. She casually mentioned to him that she had tripped and fell while taking out the trash, which compelled him to refer her to a neurologist. Unfortunately, the earliest she could make an appointment was still two months away.

Meanwhile, things continued to get worse. Zelinski’s mother and sister convinced her to go back to the hospital and not leave until doctors found out what was wrong with her.

“They did a bunch of tests, but they still couldn’t determine what was wrong,” Zelinski says. “They were about to release me because I had been there so long,

but at that point there was a changing of doctors and the second doctor wanted to do a spinal tap. My spinal fluid wasn’t the right color so they admitted me.”

Zelinski’s boss and wife, who are both veterinarians, came to visit her in the hospital and suggested that it might be West Nile virus. After all, they saw it a lot in horses they had treated and the symptoms seemed to match up. Even Zelinski herself had joked early on that she had it. After urging her doctors to test for it, they sent Zelinski’s blood and spinal fluid to a laboratory.

It came back positive for West Nile virus.

“DOCTORS NEED TO REALIZE THIS IS A SERIOUS DISEASE AND IT CAN HAPPEN TO ANYONE.”

Lisa Zelinski, 46, West Nile virus victim

For the first time in months, things began to make sense. Most people who are infected with West Nile virus feel no symptoms at all. But Zelinski was part of the less than 1 percent that develop a serious neurologic illness, including symptoms such as headache, high fever, neck stiffness, disorientation, coma, tremors, seizures, or even paralysis.

She was relieved to know what she was up against, but would never be able to fully recover. Today, she is feeling better and more focused. She says she will probably never feel completely healthy again, but she’s thankful for the support of her friends and family.

“Doctors need to realize this is a serious disease and it can happen to anyone.”



Lisa Zelinski was diagnosed with West Nile virus in 2009.

A GROWING *THREAT*

NUMBERS ACROSS THE U.S. FOR WEST NILE VIRUS

- The number of West Nile virus cases in the U.S. has fluctuated dramatically since it was **FIRST DOCUMENTED IN NEW YORK IN 1999**, according to the Centers for Disease Control and Prevention.
- Because the symptoms are associated with the flu and often mild, many cases go unreported. However, roughly **1 IN 5 PEOPLE** infected with West Nile virus will experience headache, body aches, joint pains, vomiting, diarrhea or rash.
- **LESS THAN 1 PERCENT** of infected people will develop a serious neuroinvasive illness from West Nile virus. Symptoms include disorientation, convulsions, paralysis, coma and even death.
- In 2012, there were **5,674 CASES OF WEST NILE VIRUS** reported and 286 deaths were attributed to it.
- The highest number of cases reported in the U.S. in one year was **9,862** in 2003.
- West Nile virus is **ENDEMIC IN BENTON AND YAKIMA COUNTIES**. Activity has been detected each year since 2008.
- There were **2,873 NEUROINVASIVE DISEASE CASES** reported in the U.S. in 2012. If less than 1 percent of total cases are neuroinvasive, it can be estimated that there were over 400,000 possible cases last year. **MB**

ASSESSING THE *RISK*

THE SCIENCE OF MOSQUITO PESTICIDES

BY **MIKE BLOUNT**

How safe are pesticides?

The answer to that question can be found in the research of Robert K.D. Peterson, who's been conducting biological and agricultural risk assessments through his program at Montana State University for the last eight years. By studying the introduction of new pesticides and biological control methods, Peterson is able to determine the best management strategy that has the least impact on humans and the environment.

When it comes to mosquitoes, there is no one-size-fits-all answer to controlling their populations and the potentially deadly West Nile virus they can spread to humans. But the most common control method, modern pesticides, are for the most part completely safe, according to Peterson.

EXPOSURE IS SO LOW IT WOULD TAKE 1,000 TIMES THE AVERAGE AMOUNT OF MODERN PESTICIDES USED BEFORE THE ENVIRONMENTAL PROTECTION AGENCY'S THRESHOLD FOR SAFE USAGE IS REACHED.

"Pesticides are a very prominent tool in U.S. and global agricultural, so people like me have a vested interest in the technology and industry," Peterson says. "What we've been doing is comparing risks from West Nile virus and other mosquito-borne diseases and looking at the risks from managing those populations."

Peterson says they look at several factors including human health, public health, wildlife

health, changes in the environment and the risk to the food supply when characterizing the risks associated with each control method.

Peterson says that scientists in the U.S. didn't consider West Nile virus a major threat until recently, but the consensus has changed in recent years.

"West Nile virus is an infrequent, but very serious, human disease with lots of consequences," Peterson says. "Most people do not become infected, but we still don't know that much about it either. We've only had it in the U.S. since about 1999 and it's a particularly severe strain."

By contrast, much is known about the methods used to control mosquito populations, keeping them from spreading disease, Peterson says. With modern pesticides, it only takes a very low concentration in an area to be effective. In other words, exposure is so low it would take 1,000 times the average amount of modern pesticides used before the Environmental Protection Agency's threshold for safe usage is reached.

Through a process of spraying called "ultra-low volume," pesticide is sprayed into the air from an airplane or vehicle. As the tiny particles fall, they land on the adult mosquito, which knocks it down and kills the insect. Surveys are then conducted in the area to determine if further treatment is needed and to verify the mosquito's life cycle has been disrupted.

Despite these reassurances, Peterson says many people will continue to be concerned with pesticide usage. He stresses that even with low amounts being used, pesticides are a tool that need to be used judiciously.

"People are involuntarily exposed so they perceive more risk, and people are always going to be leery of that even in the face of disease," Peterson says. "I don't think those concerns will ever go away. It is a natural human phenomenon that people are concerned about things they can't directly control, but weighted evidence shows pesticides are not harmful."



PHOTO COURTESY OF MONTANA STATE UNIVERSITY

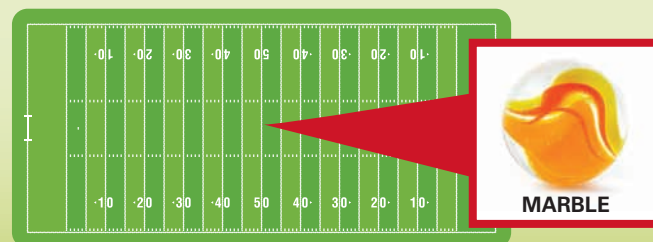
Robert K.D. Peterson is a professor of entomology at Montana State University.

HOW MUCH IS TOO MUCH?

In terms of modern pesticides, very low amounts are used to control mosquito populations, according to Montana State University Professor of Entomology Robert K.D. Peterson.

"The maximum amount of estimated pesticide used is just over one tenth of one ounce [per] acre," Peterson says. "To reach the seven pounds for the Environmental Protection Agency threshold, you would have to use about a ton of material [per] acre before you would cause human harm."

In agriculture, there are typically higher rates of pesticide use, but Peterson says those rates also fall well below EPA guidelines for safe usage. "In terms of the food supply and dietary risk assessments, residues found in food are very low, which means exposure is low," he says. **MB**



THE TYPICAL AMOUNT OF PESTICIDE USED OVER THE AREA OF A FOOTBALL FIELD WOULD FIT INSIDE A MARBLE.

STAY SAFE: *DRAIN IT!*

BY AMANDA CARAWAY

KEEP YOUR YARD FROM BECOMING A BREEDING GROUND FOR MOSQUITOES

Mosquitoes can lay eggs in any location that contains standing water. This graphic illustrates likely breeding grounds that can be found in your own backyard. Be sure to inspect your yard and property once every week and drain any standing water.

AND DON'T FORGET TO CHECK:

- Plant saucers
- Uncovered boats
- Water bowls for pets
- Leaky hoses and faucets
- Rot holes in trees

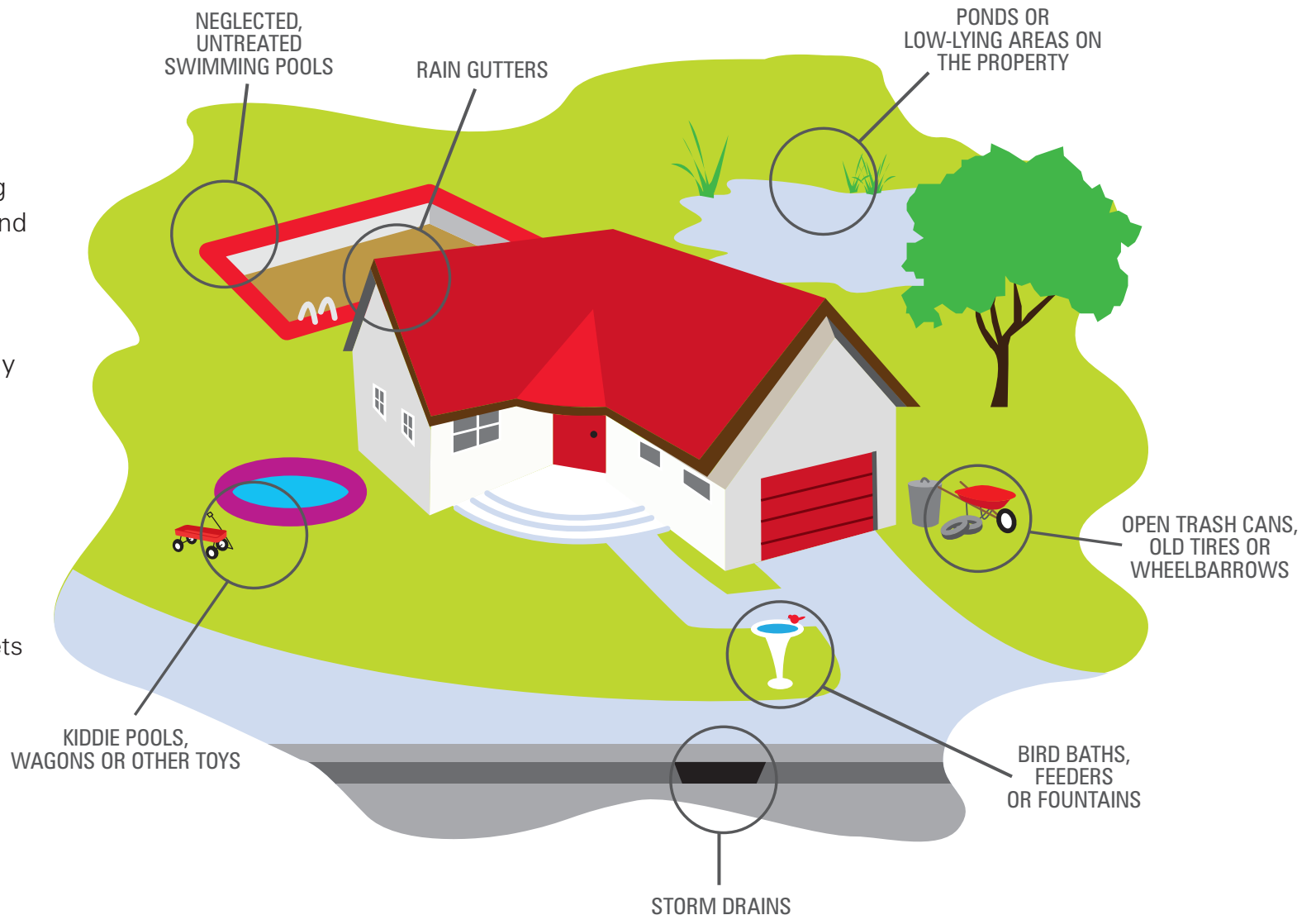


ILLUSTRATION BY MELISSA ARENDT

MOSQUITO DISTRICT ANNUAL TIRE DRIVE

HELPS ELIMINATE A COMMON BREEDING GROUND FOR MOSQUITOES

Each year the Benton County Mosquito Control District (BCMCD) holds a tire drive to keep down the local mosquito population. Tires are a common breeding ground for mosquitoes because they easily retain standing water. They also are difficult to check and treat. One female mosquito can lay about 200-250 eggs in a single raft and the mosquitoes that commonly breed in tires are good carriers of disease. Tires tend to gather in yards and properties due to fees charged for tire disposal at landfills. BCMCD will accept up to 20 tires per property during the drive. More than 25,000 tires have been collected since the drive began in 2005. Collected tires are recycled, paid for in part by a grant from the Washington State Department of Ecology. Tires are collected each April around Earth Day at locations in West Richland & Prosser. **AC**

Visit www.mosquitocontrol.org for more information.





PROTECT YOURSELF WITH **REPELLENTS**

THE BEST WAY TO DEFEND AGAINST
MOSQUITO BITES WHILE OUTSIDE

BY **AMANDA CARAWAY**

Using repellent is one of the most effective ways to protect yourself against mosquito bites and the potential diseases mosquitoes carry. Repellents come in many forms including sprays, creams, liquids and solids.

Avoid products that are sunscreen/repellent combinations. Sunscreens should be reapplied more often than repellent and it is best not to use excessive amounts of either product.

"Although recommended repellents have been thoroughly tested and deemed safe, as with any product, it is best to avoid unnecessary use," says Kevin Shoemaker, Information Officer for the Benton County Mosquito Control District.

The effectiveness of the repellent depends on the ingredients. Look for DEET, picaridin, IR3535, oil of lemon eucalyptus and para-menthane-diol. Some repellents contain permethrin and are meant only for use on clothing, shoes and camping gear. Read the label carefully and use as directed. Repellents can last between 90 minutes and 10

hours depending on the percentage of active ingredients.

Experts recommend wearing long sleeves and long pants outdoors during peak mosquito hours and covering exposed skin thoroughly with repellent. Mosquitoes can feed on an exposed area as small as a dime. Saturation is not necessary and will not improve effectiveness.

"Products that contain DEET have an odor that deters mosquitoes," Shoemaker says. "Therefore it is important to use on the outer layer of clothing and exposed skin. Repellent should be used on clothing if the material is thin or tight fitting."

When applying repellents, avoid getting the product in the mouth, eyes and ears. When using spray repellents, spray the product into your hands and then apply to the face. Avoid putting repellent on the hands of small children since it is likely they will touch their mouth and eyes. Don't use repellents on irritated skin, cuts and wounds. After returning indoors, wash treated skin with soap and water.

R.E.P.E.L. MOSQUITOES AND STAY SAFE

In an effort to help people stay protected from mosquitoes, the Benton County Mosquito Control District has developed an acronym for five tips that everyone should remember during mosquito season. Take the proper steps to R.E.P.E.L. mosquitoes every time you step outside. **AC**

Repellent. Your best defense against bites, always use repellent on exposed skin if you go outside during the hours when mosquitoes are active.

Evening. Mosquitoes are the most active during dusk and dawn.

Pour. Something everyone should do weekly with items that hold standing water, such as tires and plastic pools. These are common breeding grounds for mosquitoes.

Everyone. That's you! Successful mosquito control is a group effort.

Long-sleeved. Always wear long-sleeved shirts and long pants when you are outdoors during peak hours.

Q&A WITH ANGELA BEEHLER

DISTRICT MANAGER OF BENTON COUNTY MOSQUITO CONTROL ANSWERS YOUR QUESTIONS

BY MIKE BLOUNT

WHAT CAN I DO TO PREVENT MOSQUITOES AROUND MY PROPERTY?

The number one thing you can do to prevent mosquitoes is to not give them a place to lay their eggs and develop. Mosquitoes will generally take about 10 days (it can be as little as four) to complete the life cycle of egg to adult, and they need water for this to happen. So, if homeowners make sure they change out or discard standing water at least once a week, then the mosquitoes will not have a chance to develop.

Examples of places to look would be a low spot in the yard that gathers water from the sprinklers, the bottom of the flower pot, children's pools and toys, or discarded tires. Keep the water in ornamental ponds and fountains moving with a pump.

"THE NUMBER ONE THING YOU CAN DO TO PREVENT MOSQUITOES IS TO NOT GIVE THEM A PLACE TO LAY THEIR EGGS AND DEVELOP."

Angela Beehler, District Manager for Benton County Mosquito Control District

If you can't remove the water, there are other options. The District can provide small fish that eat mosquito larvae. Consent forms for fish drop-off are available on our website. You can also purchase products that kill mosquito larvae at most lawn and garden stores. These products will not harm birds or other animals that might drink the water.

Also, keep your lawn short so the mosquitoes don't use it as a resting place during the day. There are sprays that you can use on hedges or areas of heavy vegetation to kill mosquitoes as they are hiding out. Even after taking these steps we still recommend that you wear mosquito repellent to protect yourself.

WHAT DO I DO IF I FIND WATER WHERE MOSQUITOES ARE BREEDING?

If you have questions about water on your property or see other areas of concern, such as poor drainage

or abandoned pools, you can report them to mosquito control. We will check the area and treat it if necessary. The products we use have many of the same ingredients as those sold in stores, and are safe for you and your pets.

WHAT CAN I DO TO REDUCE MY RISK OF BECOMING INFECTED WITH WEST NILE VIRUS?

Wear repellent when outdoors. That is your best defense. West Nile virus is active in our area and should be taken seriously. I have a hard time asking people to stay indoors during periods of peak mosquito activity (dusk and dawn) because it is a great time for recreation in our area, but if you are in the high risk category, meaning you have a weakened immune system, you will want to minimize your exposure as much as possible.

WHERE CAN I GET TESTED FOR WEST NILE VIRUS?

Testing would be done by your regular doctor if you were showing symptoms of West Nile Neuroinvasive Disease. Since there is no treatment or cure for West Nile fever, those cases often go undiagnosed. If you have symptoms of West Nile fever that are getting worse, a doctor may test you after they have ruled out a more likely clinical explanation.

Most cases of West Nile virus are asymptomatic — 20 percent of people exposed will experience flu-like symptoms caused by West Nile fever, and less than 1 percent of cases will result in serious illness. Based on what we know about the disease, for each case of West Nile Neuroinvasive Disease reported, we assume there were around 150 exposures.

WHAT DOES BENTON COUNTY MOSQUITO CONTROL DO TO CONTROL MOSQUITO POPULATIONS AND HOW DO YOU DETERMINE THE PLACES THAT NEED SERVICE?

Most of what we do is checking and treating standing water to control mosquitoes in their larval form before they become flying, biting adults. We have identified 2,637 mosquito development sites throughout the district that are routinely checked by our 20 seasonal employees. We also manage water, where possible, to keep it from standing long enough for mosquitoes to develop.



PHOTO COURTESY OF BENTON COUNTY MOSQUITO CONTROL

Angela Beehler is the district manager for Benton County Mosquito Control District.

We set around 50 traps per week to determine the abundance of adult mosquito populations. This tells us where we need to implement additional control measures, and if there is a threat of mosquito-transmitted diseases.

We use several resources to determine when and where mosquito control will be conducted including traps, employee feedback and public complaints.

WHEN DID BENTON COUNTY MOSQUITO CONTROL FORM?

Our District was formed in 1957 due to a concern for repeated epidemics of encephalitis. It is important to have a comprehensive control program in place between epidemics so we can react quickly when new diseases threaten the health of our community. The risk of West Nile virus is high in our area, but because we have the right tools to combat the mosquitoes we have not seen the high numbers of cases experienced in other states.

The emergence and spread of West Nile virus may be the first in a series of exotic diseases imported due to the worldwide increase in tourism and international air travel. Malaria, Rift Valley Fever, Chikungunya Virus and dengue fever are but a plane flight away. Organized mosquito control programs will be increasingly important for public health in the future.

We are grateful for the support that the residents have shown for our mosquito control program, and in return we are dedicated to providing a safe and healthy environment for their families.

CONTROLLING MOSQUITOES

IN BENTON AND YAKIMA COUNTIES

For mosquito abatement, Benton County Mosquito Control District uses an Integrated Pest Management (IPM) approach. An innovative approach, IPM means the District uses multiple control measures to moderate mosquito levels in the county. The District uses five methods as part of its IPM program: Education, Source Reduction, Biological Controls, Larviciding and Adulticiding. Benton County Mosquito Control District aims to use physical and biological controls before using chemical methods to promote a healthier environment.

EDUCATION is achieved by informing the public through media, advertising, governmental affairs, community events, school programs and presentations to increase awareness about mosquito control, West Nile virus and prevention methods.

SOURCE REDUCTION is removing breeding sites or making them inhospitable for mosquitoes. This can be as simple as clearing culverts of debris or can entail extensive drainage practices to reduce the amount of stagnant water.

BIOLOGICAL CONTROLS are the implementation of natural predators of mosquitoes to help reduce overall populations. For example, the mosquitofish (*Gambusia affinis*) eats mosquito larvae before they grow to adulthood and can be very effective in reducing the number of mosquitoes in water sites.

LARVICIDING is the process of controlling mosquitoes when they are in the larval or pupal form. Controlling mosquitoes when they are in the water is an effective approach because the mosquito is somewhat isolated and known breeding sites can be recorded and routinely monitored. There are many different abatement practices for larviciding, including insect growth regulators and larviciding oils.

ADULTICIDING is the process of controlling mosquitoes using chemicals when they are mature, flying mosquitoes. Adult female mosquitoes are the ones that bite, so ultimately they provide the largest threat to the public welfare. Adulticiding is necessary because larviciding rarely kills 100 percent of the larvae, not every water site is known and mosquitoes can fly in from outside the District's boundaries. Adulticiding can provide temporary control of mosquitoes in a given area, but is not practical as the only method of control.

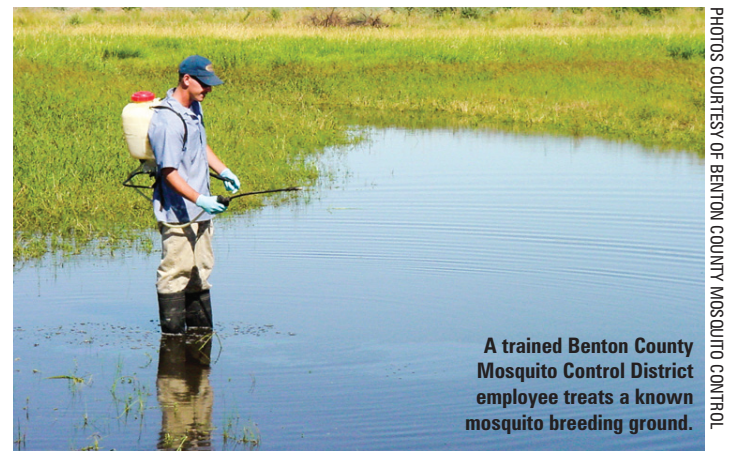
REPORT DEAD BIRDS:

If you find a dead bird, report it to ensure proper testing and action is taken to prevent the spread of diseases like West Nile virus. For more information and instructions, go to the Benton-Franklin Health Department website at www.bfhd.wa.gov/eh/birds.php.

- If you find a dead crow, raven, magpie, jay, or raptor and the bird is fresh and undamaged, please report it for possible West Nile virus testing by calling the Benton-Franklin Health District at (509) 460-HAWK [4295].
- Dead chickens and other domestic poultry should be reported to the Washington State Department of Agriculture (1-800-606-3056).

Only some crows, ravens, magpies, jays or raptors will be selected for West Nile virus testing. If the bird is not eligible for testing, you may dispose of it in your outside garbage.

Do not handle dead birds with your bare hands. Instead, use gloves, a shovel, or a plastic bag placed over your hand to pick up the bird. Double-wrap the bird in two plastic bags before placing in your garbage. Be sure to wash your hands, even if you were careful to not touch the bird.



A trained Benton County Mosquito Control District employee treats a known mosquito breeding ground.

PHOTOS COURTESY OF BENTON COUNTY MOSQUITO CONTROL



Yum! A mosquitofish helps control the mosquito population by eating mosquito larvae.



Benton County Mosquito Control District collects and tests mosquitoes to see if they carry diseases.



The Benton County Mosquito Control District's service area covers parts of Yakima and Benton counties, including the cities of Mabton, Grandview, West Richland, Richland, Kennewick, Benton City and Prosser.

BENTON COUNTY MOSQUITO CONTROL DISTRICT

4951 W. Van Giesen St., West Richland, WA 99353
(509) 967-2414 • www.mosquitocontrol.org

AREA MOSQUITO CONTROL DISTRICTS:

Yakima Mosquito Control District • (509) 452-1890
Columbia Mosquito Control District • (509) 547-4994
Franklin County Mosquito Control District • (509) 545-4083

OTHER CONTACTS:

Benton County Extension • (509) 735-3551
(general pest and plant questions)