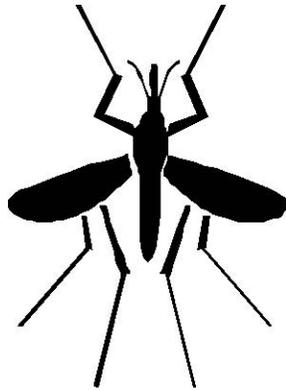


Arbovirus Surveillance and Mosquito Control in Idaho



Guidance for Counties

Version 10.3

Print Date: 3/14/2003

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Mosquito Abatement

- A.** Mosquito facts and mosquito control myths
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A. Mosquito facts and mosquito control myths

I. Mosquito facts

- **Mosquito abatement programs are necessary because mosquito bites:**

may cause —

Mosquito-borne diseases

Allergic reactions

Annoyance

reduce —

Human productivity due to health issues

Outdoor enjoyment and recreation

Real estate and tourism revenues

Weight gain in livestock

Milk production in dairy cattle

Livestock reproduction and survival

Wildlife populations

There are approximately 3,000 different species of mosquitoes throughout the world, of which 170 to 200 species occur in the United States. Approximately 25-30 species are found in Idaho.

Mosquitoes need a standing water source to develop. Any standing water source such as a marsh, pond, creek, or lake, ditch, canal, storm water retention pond, flooded field, uncovered boat, discarded tire, swimming pool, or birdbath will allow mosquitoes to breed.

Female mosquitoes bite because a blood meal is required for egg production. Only female mosquitoes bite.

Female mosquitoes can take multiple blood meals and produce multiple generations during a single mosquito season. Under optimal conditions, a female *Culex* mosquito will lay 200 to 400 eggs every three days.

Most eggs hatch into mosquito larvae within 24 - 48 hours.

Only one male is required to fertilize a lifetime of egg production in the female.

Mosquitoes generally live one to two months. *Culex* species may over winter and survive for up to a year.

Mosquitoes often fly fifteen or more miles in a single night.

II. Mosquito control myths (control options that don't seem effective)

Sound and electric devices — these have no repellency effects and units are sold with no documented test results.

Citronella (plants and candles) — there is no data to support the claim that citronella is a good mosquito repellent; its pleasant odor does not guarantee results.

Skin moisturizing oil — field tests do not support claims that certain skin oils will repel mosquitoes. Mosquitoes are 30 times more sensitive to DEET than to skin moisturizers.

Bug zappers — mosquitoes actually comprise less than 5% of the total bug zapper catch. The zappers kill many beneficial insects and tend to attract more insects than they kill.

Birds — ornithologists state that purple martins and other swallow-like birds do not prefer mosquitoes and that mosquitoes make up less than 3% of their diets.

Bats — insectivorous bat diets consist mainly of beetles, wasps, ants, flies, stoneflies, mayflies, moths and grasshoppers. Mosquitoes make up less than 1% of their diet. Location of bat houses should also take into consideration that bats sometimes carry rabies. Separation of bat houses from human populations is a good practice.

B. Idaho Mosquito Abatement Districts (9/17/2002)

Bear River Mosquito Abatement District
Ron Peterson, Manager
327 Jefferson Street Montpelier, Idaho 83254
Phone: 208-847-0545
E-mail: ctp@dcdi.net

Canyon County Mosquito Abatement District
Brian Benner, Director 721 E. Roosevelt Avenue
Nampa, Idaho, 83686
Phone: 208-461-8633 or 208-871-1860
E-mail: ccmad@att.net

Custer County Mosquito Abatement District
Scott Johnson, Secretary - Treasurer
Star Route
Mackay, Idaho 83251
Phone 208-588-3072

Fairfield Mosquito Abatement District
Cathy Miller, Manager
P.O. Box 1
Fairfield, Idaho 83327
Phone: 208-764-3202
E-mail: cmiller06@fs.fed.us

Fremont County Mosquito Abatement District
Woody Andersen, Supt. of Public Works
110 West Main
St. Anthony, Idaho 83445
Phone: 208-624-3494
E-mail: stacity@fretel.com

Gem County Mosquito Abatement District
Terri Quenzer, Secretary
Quinn Nuffer, Manager

526 West 3rd Street
Emmett, Idaho 83617
Phone: 208-365-5628
E-mail: gcmad@earthlink.net

Emmett County Golf Association, Inc.
Dave Watkins, Manager
6846 West Highway 52
Emmett, Idaho 83617
Phone: 208-365-2675

Jefferson County Mosquito Abatement District.
Reed Williams, Manager
167 South Third West
Rigby, Idaho 83442
Phone: 208-538-7778(day), 208-745-8424
E-mail: rwilliams@mascot.sd252.k12.id.us

Mackay Mosquito District - Custer County
Jack Anderson, Secretary
410 E. Custer Street
Mackay, Idaho 83251
Phone: 208-588-2438 (h)
E-mail: jckandrsn7@aol.com

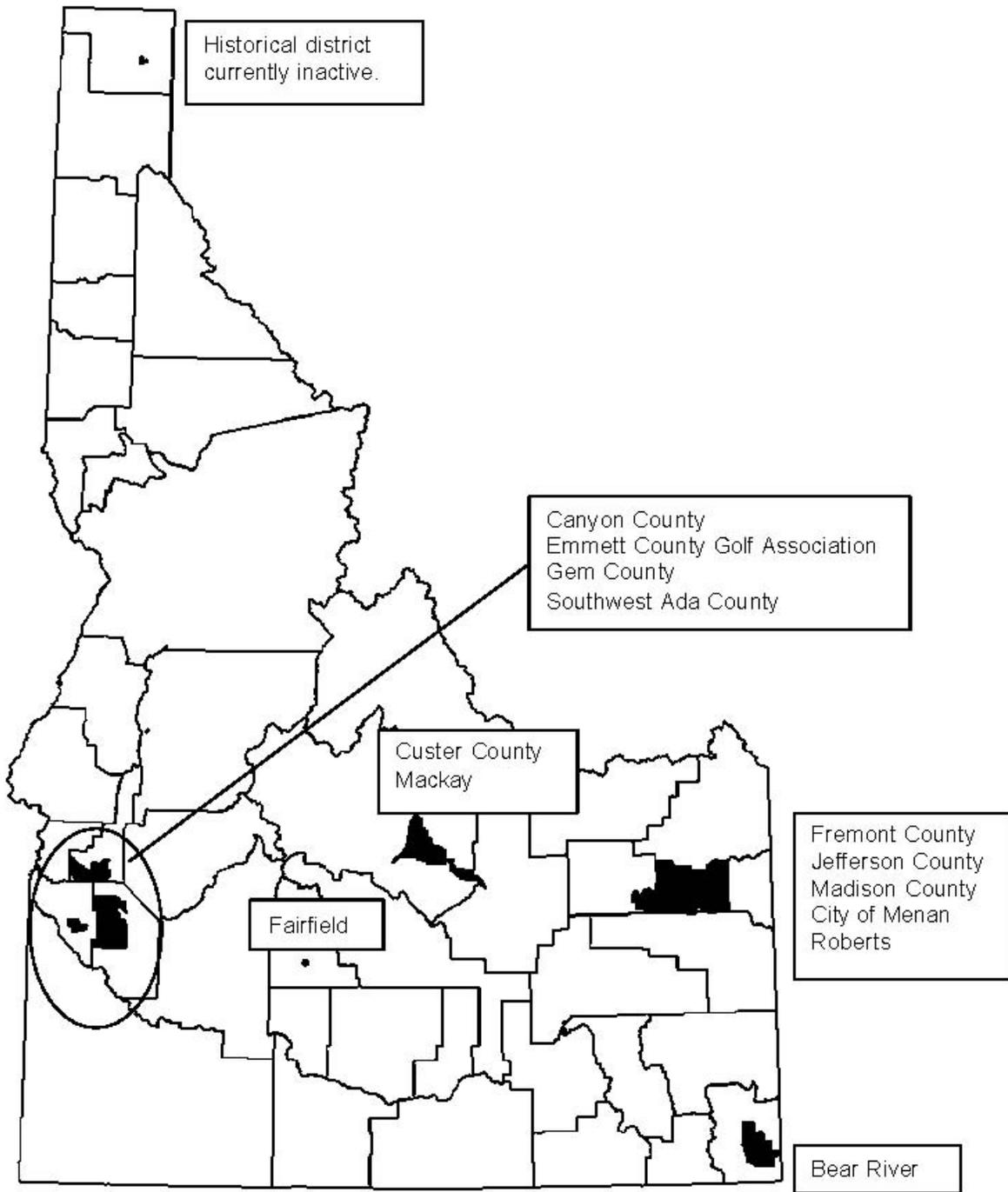
Madison County Mosquito Abatement District
Wendell Roth, Manager
750 North 1500 West
Rexberg, Idaho 83440
Phone: 208-356-3102 (cell) 208-390-3102
E-mail: tinker51@fretel.com

The City of Menan
Lyn Jacobson, Maintenance Supt.
Menan, Idaho 83434
Phone: 754-0438 (h) or 520-4369 (cell)

Roberts Mosquito Abatement District
Tom Buxton, Chairman
2898 East 800 North
Roberts, Idaho 83444
Phone 208-228-6851
E-mail: tbuxton@ida.net

Ada County Mosquito Abatement
Jack Bennett, Field Operations Manager
975 East Pine
Meridian, Idaho 83642
Phone 208-577-4646 or (cell) 208-869-7482
E-mail: jbennett@adaweb.net

Map of Idaho Mosquito Abatement Districts (2/22/03)



**C. Idaho statutes regarding formation and operation
of a mosquito abatement district.**

Title 39, Chapter 28-01-11 (see following pages for text)

- 39-2801. AUTHORIZATION TO FORM ABATEMENT DISTRICTS
- 39-2802. PROCEDURES FOR FORMATION OF ABATEMENT DISTRICTS
- 39-2803. SELECTION OF OFFICIALS OF ABATEMENT DISTRICTS
- 39-2804. POWERS AND DUTIES OF ABATEMENT DISTRICTS
- 39-2805. METHOD OF FINANCING ABATEMENT DISTRICTS
- 39-2806. ANNEXATION TO ABATEMENT DISTRICTS
- 39-2807. CONSOLIDATION OF ABATEMENT DISTRICTS
- 39-2808. EXISTING RIGHTS PRESERVED
- 39-2809. SHORT TITLE
- 39-2810. WITHDRAWAL
- 39-2811. HEARING OF PETITION FOR WITHDRAWAL

Title 39, Chapter 28-01-11

TITLE 39
HEALTH AND SAFETY
CHAPTER 28

MOSQUITO ABATEMENT DISTRICTS

39-2801. AUTHORIZATION TO FORM ABATEMENT DISTRICTS. There may be formed, under the provisions of this act, districts for the abatement of mosquitoes and/or other vermin of public health importance, in any area of the state from territory of one or more counties, one or more cities or towns, or any combination or portion thereof.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28

MOSQUITO ABATEMENT DISTRICTS

39-2802. PROCEDURES FOR FORMATION OF ABATEMENT DISTRICTS. Upon presentation to the board of county commissioners of a petition requesting the formation of an abatement district, which is signed by qualified resident property owners of the territory of the proposed abatement district, equal to not less than ten percent (10%) of the resident property owners that voted in the last general election, the commissioners shall publish such petition when the following conditions are met: the petition must define the boundaries of the proposed district and assessed tax valuation of the property therein. When the above conditions have been met the county commissioners shall publish the petition, and if after thirty (30) days no protests are received, an election must be held at the next date specified in section 34-106, Idaho Code. The petitioners shall bear the expense of holding the election. If there are written protests, the county commissioners must hold a public hearing within thirty (30) days after receipt of the written protests and after the hearing hold an election. Notice of the time and place of such election shall be published at least once not less than twelve (12) days prior to the election and a second time not less than five (5) days prior to the election in at least one (1) newspaper having general circulation in the proposed abatement district. Only qualified electors who own land within the district, or the proposed district, and are residents of the county in which the district, or a portion thereof, is located, or are spouses of such landowners residing in such county, may vote on the formation of the district. A majority of the votes cast will establish the district.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28

MOSQUITO ABATEMENT DISTRICTS

39-2803. SELECTION OF OFFICIALS OF ABATEMENT DISTRICTS. A five (5) member board of trustees shall be appointed from within the area of the proposed abatement district to govern the abatement district. The trustees appointed shall at the first meeting of each year elect a president, secretary and treasurer to serve during the ensuing year. The officers of the board shall be bonded to the extent of five hundred dollars (\$500) to five thousand dollars (\$5,000) each as set by the county commissioners. The members of the board shall be appointed by the county commissioners of the county which they are to represent. When two (2) or more counties or portions thereof comprise an abatement district, the selection of trustees will be made by mutual agreement of the county commissioners concerned. Each trustee shall be a resident property owner and a registered voter. Trustees shall be appointed for four (4) years on staggered appointments. To initiate the board two (2) members are appointed for two (2) years, one (1) for three (3) years and two (2) for four (4) years. Subsequent appointments shall be for four (4) years. Trustees shall serve without compensation but will be reimbursed for necessary expenses involved with the performance of their official duties. The county health officer and the county agent shall be ex officio members of the board. Whenever two (2) or more counties or

portions thereof are included in the district, the health officer and county agent for each county shall be ex officio members of the board. The [directors or] heads of the following state departments or their designated representatives shall be considered ex officio members of the board and may be called upon for their advice and assistance in the handling of abatement problems affecting their direct interests: agriculture, fish and game, lands, transportation, water resources and health and welfare.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28 MOSQUITO ABATEMENT
DISTRICTS

39-2804. POWERS AND DUTIES OF ABATEMENT DISTRICTS.

The abatement district board of trustees is authorized:

a. To appoint a director to direct the activities of the district, in accordance with training and experience necessary to fulfill the duties of the position.

b. To appoint such other persons as necessary, determine their duties and compensation, and make rules and regulations respecting them.

c. To take all necessary and proper steps for the control of mosquitoes and other vermin of public health importance in the district and for these purposes shall have the right to enter upon any and all lands.

d. To sue and be sued.

e. Contract to purchase, hold, dispose of, and acquire by gift real and personal property in the name of the district. To exercise the right of eminent domain and for these purposes to condemn any necessary land and/or rights of way in accordance with general law.

f. To abate as nuisance breeding places of mosquitoes and/or other vermin of public health importance within the district or within migrating distance of the district by use of chemicals and/or permanent control measures and in this connection have the right to enter upon any and all lands.

g. To work with the lateral ditch water users associations, irrigation, drainage and flood control districts and other cooperating organizations. The board of trustees of the abatement district may supplement funds of cooperating organizations for improvement, repair, maintenance and cleaning of ditches which will temporarily or permanently eliminate mosquito breeding or for other activities which will benefit the district.

h. To file annually with the board of county commissioners for their approval an estimate of funds required for the next year, a plan of the work to be done, and methods to be employed. No procedure, work or contract for any year of operation shall be done or entered upon until plans and budget have been jointly approved by the board of county commissioners.

i. To file, annually or by February 1 of the succeeding year, with the board of county commissioners a report setting forth the moneys expended during the previous year, methods employed, and work accomplishments.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28

MOSQUITO ABATEMENT DISTRICTS

39-2805. METHOD OF FINANCING ABATEMENT DISTRICTS. The board of county commissioners must levy upon taxable property within the district a tax at a rate not greater than sufficient to raise the amount determined by the board of trustees as approved by the board of county commissioners, as necessary for the operation of the district for the ensuing year. In no event shall such tax exceed one tenth percent (.1%) of the market value for assessment purposes on all taxable property within the district. All taxes thus levied shall be collected in the same manner as other taxes and deposited to the credit of the abatement district and

shall be used for no other purposes. Such funds may be withdrawn from the county treasury and upon warrant of the board of trustees of the abatement district, signed by the president of the board and countersigned by its secretary, for the activities of the abatement district.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28

MOSQUITO ABATEMENT DISTRICTS

39-2806. ANNEXATION TO ABATEMENT DISTRICTS. Contiguous territories may be annexed to organized mosquito abatement districts upon petition of a majority of the legal voters in the territory seeking annexation and of the owners of more than half, by assessed value, of the taxable property in such territory, or by written request for annexation of a designated area, submitted to the trustees of the existing mosquito abatement district and signed by all members of the board of county commissioners in which county the territory seeking annexation is located. Upon receiving this petition or written request, the trustees of the existing mosquito abatement district must submit the question of annexation to the legal voters of the district at an election held subject to the provisions of section 34-106, Idaho Code.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28

MOSQUITO ABATEMENT DISTRICTS

39-2807. CONSOLIDATION OF ABATEMENT DISTRICTS. Two (2) or more contiguous districts may be consolidated. Any district board of trustees may seek consolidation by adoption of a resolution by a majority vote of its members. Consolidation is accomplished by a majority vote of the members of each of the boards of trustees involved in the consolidation. The consolidated districts may enter into arrangements for pooling funds and joint use of personnel, equipment, and supplies. The activities conducted under joint arrangement shall be considered as if conducted directly by the board having jurisdiction over the area concerned. The board of county commissioners must be given written notice of consolidation.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28

MOSQUITO ABATEMENT DISTRICTS

39-2808. EXISTING RIGHTS PRESERVED. It is the purpose of this act to provide additional and cumulative remedies to prevent, abate and control the spread of mosquitoes and/or other vermin affecting the public health, safety and welfare of the people of the state of Idaho. Nothing herein contained shall be construed to abridge or alter rights of action or remedies in equity or under the common law or statutory law, criminal or civil, nor shall any provision of this act, or an act done by virtue thereof, be construed as stopping the state or any municipality or person in the exercise of their rights of equity or under the common law or statutory law to suppress or abate nuisances.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28

MOSQUITO ABATEMENT DISTRICTS

39-2809. SHORT TITLE. This act may be cited as the Idaho Mosquito Abatement Act.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28
MOSQUITO ABATEMENT DISTRICTS

39-2810. WITHDRAWAL. Any portion of a mosquito abatement district which will not be reasonably benefited by remaining within such district may be withdrawn as in this section provided. Upon receiving a petition signed by fifty (50) or more landowners within the portion desired to be withdrawn from any mosquito abatement district, or by a majority of such landowners, if there are less than one hundred (100) landowners within the portion sought to be withdrawn, requesting the withdrawal of such portion from the district on the ground that such portion will not be reasonably benefited by remaining in said district, the board of county commissioners shall fix a time for hearing on such petition and for hearing protests to the continuance of the remaining territory as a mosquito abatement district. The hearing shall not be less than ten (10) days nor more than thirty (30) days after the receipt thereof. The board shall, at least one (1) week prior to the time so fixed, publish notice of such hearing by one (1) publication in a newspaper of general circulation in the district, which the board deems most likely to give notice to the inhabitants thereof, of the proposed withdrawal.

TITLE 39
HEALTH AND SAFETY
CHAPTER 28

MOSQUITO ABATEMENT DISTRICTS

39-2811. HEARING OF PETITION FOR WITHDRAWAL. Any person interested may appear at the hearing and object to the withdrawal of the portion from the district, or may object to the continuance of the remaining territory as a mosquito abatement district. The board of county commissioners shall consider all objections and shall pass upon the same, and if it finds that portion of the district sought to be withdrawn will not be reasonably benefited by remaining within the district, and the territory not sought to be withdrawn will be reasonably benefited by continuing as a mosquito abatement district, it shall grant the petition and enter an order thereon upon its records. In the event the board finds the district will not be reasonably benefited by continuing as a mosquito abatement district, it shall enter an order upon its records completely dissolving and terminating the previously existing mosquito abatement district. Upon the withdrawal of any territory from a mosquito abatement district, as in this section provided, all property acquired for the district shall remain vested in the county and be used for the purposes of the district. Upon complete dissolution of a mosquito abatement district as herein provided, all property acquired for the district shall remain vested in the county and be used for any general purpose of the county.

Other related statutes: Agricultural Pest Statutes (Title 25, Chapters 2601-2613): The Animal Pest statutes appear to control animals and insects that would be more appropriately categorized as predatory. The mosquito abatement statutes listed above directly address the issue of mosquito abatement. Mosquito abatement and the means used to carry those activities out should remain governed by abatement statutes. The formation of abatement districts following the mosquito abatement statutes should be encouraged.

TITLE 25
ANIMALS
CHAPTER 26
EXTERMINATION OF WILD ANIMALS
AND PESTS IN COUNTIES

25-2601. CONTROL OF PESTS -- POWERS OF COUNTY COMMISSIONERS. The board of county commissioners of each and every county of this state are all hereby granted full power and authority to declare any predatory animal, including coyote, that feeds upon, preys upon or destroys any poultry or livestock of any kind upon any public or private lands within their respective counties, or any rodent, jack-

rabbit, gopher, ground squirrel, cricket, locust, grasshopper and other insect pests or plant disease causing organisms/agents or any other invertebrate organism that feeds, preys upon, or destroys any livestock, natural grasses, or cultivated crops of any kind upon any public or private lands within their respective counties, to be agricultural pests, and to take all steps that they may deem necessary to control such pests.

D. General legal principles of mosquito abatement in Idaho

Letter from the State of Idaho Office of the Attorney General addressing questions from Senator Brad Little (11/6/02). Please [click here](#).

E. Model standard operating procedures for mosquito abatement districts in Idaho. (See the following pages.)

MODEL

STANDARD OPERATING PROCEDURES*

FOR MOSQUITO

ABATEMENT DISTRICTS

IN IDAHO



*All mosquito abatement districts in Idaho are required by law (Idaho Statue Title 39, Chapter 28-04) to develop an annual plan for standard operations.

This document outlines the basic activities carried out by abatement districts according to the nationally recognized integrated pest management model.

This is not meant to be a complete text on mosquito abatement activities. For more information, visit the following websites:

American Mosquito Control Association (AMCA)

<http://www.mosquito.org/>

Northwest Mosquito and Vector Control Association

<http://www.nwmvca.org/>

Contents

I. Function and scope of mosquito districts

II. Surveillance and Monitoring

Identify adult mosquito species Survey and map mosquito breeding habitat (source) Evaluate mosquito larvae density in breeding sites Determine level of adult mosquito activity Test adult mosquitoes for the presence of virus.

III. Prevention

Source reduction, modification and elimination Larvicide application in mosquito breeding habitats

IV. Intervention

Adult mosquito reduction

V. Threshold determinations for abatement activities

Model Standard Operating Procedures

I. Function and Scope of Mosquito Abatement Districts (MADs)

Mosquitoes have both positive and negative impacts on the environment. Mosquitoes provide a food source for fish and other aquatic organisms. They are also food for bats, birds, spiders, and dragonflies. However, they transmit pathogens that cause many harmful mosquito-borne diseases worldwide, including malaria, encephalitis, yellow fever, dengue fever and the latest mosquito-borne virus to reach the USA, West Nile virus.

Each MADs primary function is to protect the public's health and safety from mosquito-borne diseases. Additionally, as public health protection is fulfilled MAD programs reduce pest mosquito populations. Successful abatement programs improve the quality of life, promote economic development, and facilitate enjoyment of natural and man-made attractions. In order for a MAD to be effective in its functions, it must implement necessary integrated control measures over a large area.

MADs may consider different levels of activity to perform these functions. The level considered may change with local conditions and vector activity. Activity levels can be passive, proactive, or active, as outlined below.

a. Passive

- Control areas proposed
- Staff identified and equipment available to respond to known outbreak

b. Proactive

- Control areas defined
- Adequate staff and equipment to implement control plan
- Educational elements in place
- Surveillance and species identification activities ongoing
- Good reporting and planning functions operational
- Establish mutual aid or cooperative agreements with other agencies or jurisdictions.

c. Active

- Control areas defined
- Adequate staff and equipment to implement control plan
- Good reporting and planning functions operational

In addition, MADs may consider no or minimal action when mosquitoes do not represent a vector-borne disease threat in the district.

II. Surveillance / Monitoring

a. Mosquito Trapping and Identification

In order to determine where specific mosquito species exist in a particular area of Idaho, it is necessary to trap and identify them. Once

they are identified, the level of risk for disease can be better understood. Some mosquitoes are only pests not capable of transmitting disease, while others are both pests and disease vectors.

As of this printing, CO₂-baited traps are the preferred method for collecting biting female mosquitoes. These traps are typically set one or two separate nights per week for a 12-14 hour period during the calendar months of April through October. This time frame may vary depending on the occurrence of winter frosts (when mosquito activity diminishes). The trap collections are picked up the next day. Mosquitoes are then sent to the state public health laboratory for evaluation (unless the abatement district has a trained entomologist). Mosquitoes are identified under the microscope by genus and species. Mosquitoes are pooled into vials by similar species, date and collection location. The resulting data will be maintained in a master database at the state public health laboratory and a copy will also be returned to the submitting agency for recording and evaluation. This data will help determine what control measures are warranted (mosquito abatement, source reduction, etc.)

b. Surveillance for mosquito breeding habitats

The most effective method of mosquito control is the reduction, modification, or elimination of mosquito breeding source habitats. This form of control cannot be accomplished in many cases due to legal, fiscal and environmental constraints. Mapping mosquito breeding habitat locations can help with source reduction activities and strategically pinpoint target areas for community education efforts and/or insecticide application. Breeding habitats should be identified, described, mapped (ideally by GPS coordinates) and cataloged.

c. Monitoring for larvae

Timely inspections and evaluations of mosquito larvae populations in aquatic habitats by dip-collection is a key tool to determine the mosquito growth phase and numbers. As mosquito larvae threshold densities approach threshold values, mosquito management activities are applied to the breeding habitats to prevent the larvae from becoming biting adults (see prevention and threshold determinations below).

d. Mosquito landing rates

Surveillance of the adult mosquito landing rates permits excellent evaluation of the prevalence of mosquitoes within residential areas. Mosquito landing rates are determined best during crepuscular periods (two hours after sunset or two hours prior to sunrise). The surveyor should wear dark colored clothing and sit or stand quietly for a few minutes, collecting mosquitoes with an aspirator as they land on his or her clothing. The required equipment for this type of surveillance is a battery-operated or simple mouth-suction aspirator. The collected mosquitoes are taken back to the district work area for identification and control measures are determined. A modification of the landing

rate is the mosquito-biting (or "light and bite") rate, in which the mosquito is not aspirated until it bites the surveyor. This method is not recommended in areas where mosquito-borne virus occurs.

e. Monitoring for virus

Typically mosquitoes are collected in traps (as described above) from April through October and pooled by species, date, and location. Mosquito pools are tested for the presence of arboviruses at the Idaho State Bureau of Laboratories in Boise, Idaho. Test results are maintained by the state Office of Epidemiology in the Idaho Department of Health and Welfare. Copies are furnished to the submitting agency and the corresponding district health department.

III. Prevention

Mosquito control is important because it reduces the number of flying adult mosquitoes, thereby reducing the risk of mosquito-borne virus transmission to humans and animals.

a. Eliminating or modifying mosquito breeding habitats

The elimination or modification of mosquito breeding habitat, when feasible and within regulations, is a critical component and the best long-term solution for mosquito control. These activities include avoiding over watering in public and private areas, draining and/or filling of areas of shallow stagnant water, increasing flow rates in irrigation and drainage canals, eliminating water holding containers and reducing and/or eliminating vegetation in slack or stagnant water which supports mosquito breeding. Most of these activities can be achieved through cooperative agreements with other agencies and political subdivisions, and by the use of public education campaigns.

b. Abatement of mosquito larvae in their aquatic habitats

Mosquito larvicide applications selectively target mosquito larvae and are effective in reducing mosquito populations. This type of mosquito control measure requires considerable personnel, equipment, materials, planning, mosquito survey work and expense. These types of applications offer the most selective chemical control of mosquitoes. *Bacillus thuringiensis israelensis* (Bti) and *Bacillus sphaericus* (Bs) are applied to mosquito breeding habitats when mosquito larvae are found in the 1st to 3rd instar stage of life. Aquatic sites can fall under one of many different jurisdictions, each of which may have limitations to insecticide usage. Please refer to the "Special considerations for pesticide applications and other control methods" section of this plan prior to the use of any insecticide.

IV. Adult mosquito intervention This method should be considered when rapid reduction in adult mosquito populations is warranted.

The ultra low volume (ULV) adulticide spray method is typically used where mosquito trapping, landing or biting rate counts, and verifiable complaints from MAD constituents indicate the presence of flying

adult mosquitoes.

The current mosquito insecticide (mosquitocide or adulticide) used by most MADs is a malathion-based ULV concentrate. This product is a non-residual insecticide with excellent efficacy against flying mosquitoes. In Idaho much cropland is present and malathion is used because it generally does not have cropland restrictions on its label directions. Pyrethrin-based products may be used in residential areas-avoiding cropland and sensitive aquatic areas according to label restrictions.

ULV spray treatments for flying adult mosquitoes are routinely announced publicly at the beginning of the mosquito season. Some abatement districts have established a "Call Before Spraying List" for those residents who wish to be called prior to ULV spraying in the areas in which they live. All ULV treatments are restricted to property within the mosquito abatement district's jurisdiction, taking into consideration special situations. All treatments must be applied according to the insecticide's label directions and the state requirements related to licensure. All treatment equipment is calibrated as per the insecticide label directions and certified to be correctly operational by the Idaho Department of Agriculture or other recognized authority.

Exceptions to the approved operational plan are reviewed on a case-by-case basis with priority given to emergency health related issues. The board of trustees and the county commissioners must approve any substantial changes to these operational plans.

During heightened arbovirus detection, ULV spraying treatments will likely increase to reducing the adult mosquito population.

V. Threshold determinations for abatement activities The intent of the mosquito abatement districts is to ensure that applications of insecticides are made only when necessary. The threshold factors are:

Results of mosquito monitoring (using recognized surveillance methods such as larva surveys, traps or landing rates) indicate that a threshold is reached (for example, when five or more adult mosquitoes per trap or landing period, or three or more larvae in a dip are present)

When public complaints and service requests are validated by one or more recognized surveillance methods

When potential of mosquito-borne disease is imminent in the District area

When mosquito-borne disease is present

Please refer to the Model Arbovirus Surveillance and Response Guide in the next section.

F. Idaho model arbovirus surveillance and response guide.
(See the following pages.)

IDAHO MODEL ARBOVIRUS SURVEILLANCE AND RESPONSE GUIDE



A Phased Response to Arbovirus Detection

This document provides guidance for modifying standard operating procedures in response to a suspected or detected arbovirus. Please note that this is an addendum to the model standard operating procedures may need to be reviewed and approved by your County Board of Commissioners as directed by Idaho Code.

Guidelines for the Phased Response to Arbovirus Detection

The primary mission of the model plan is to protect the public health and safety of people in Idaho. The following arbovirus protection provisions for mosquito abatement districts are proposed as ideal responses to various indicators of virus in the environment. These responses are presented in a phased manner with the level of response categorized by perceived risk to human health. This response plan itself was modeled after plans adopted by many states in the continental United States, and as such, is considered consistent with acceptable national practices.

I. Arbovirus Detection

Testing of mosquito pools, dead birds, and human samples will be conducted at the Idaho State Department of Health and Welfare, Bureau of Laboratories. Horse samples will be tested at the Idaho State Department of Agriculture, Animal Industries Laboratory.

II. Phased Response (Risk) Categories

- 0:** Probability of outbreak in humans — none
- 1a:** Probability of outbreak in humans — remote
- 1b:** Probability of outbreak in humans — remote but suspected due to previous activity
- 2:** Probability of outbreak in humans — low
- 3:** Probability of outbreak in humans — moderate
- 4:** Probability of outbreak in humans — high
- 5:** Probability of outbreak in humans — outbreak in progress

0 – Risk Category

Probability of outbreak in humans – None

Definition – Off-season; adult vectors inactive, climate unsuitable for breeding.

Recommended Response — Acquire surveillance and control resources necessary to enable emergency response. Initiate community outreach and public education programs along with the local health district.

1a – Risk Category

Probability of outbreak in humans – Remote

Definition – Spring, summer or fall; areas unlikely to have arbovirus epizootic during the year based on lack of previous or current arbovirus activity in the region.

Recommended Response – Same as Risk Category 0, plus the following: Conduct entomologic survey (inventory and map mosquito breeding areas). Conduct community outreach and public education. Monitor avian mortality, human encephalitis/meningitis and equine surveillance.

1b – Risk Category

Probability of outbreak in humans – Remote

Definition – Spring, summer or fall; areas anticipating arbovirus epizootic during the year based on previous arbovirus activity in the region; no current surveillance findings indicating arbovirus epizootic activity in the area.

Recommended Response – Same as Risk Category 1a, plus the following: Do source reduction. Use larvicides at specific sources identified by entomologic survey, targeted at amplifying and vector species. Maintain avian mortality, vector, and virus surveillance. Conduct public education emphasizing source reduction.

NOTE: ABATEMENT DISTRICTS DO NOT ROUTINELY MAKE PESTICIDE APPLICATIONS OUTSIDE THEIR DESIGNATED DISTRICT BOUNDARIES.

2 – Risk Category

Probability of outbreak in humans – Low

Definition – Spring, summer or fall; areas with initial, sporadic, or limited arbovirus activity in birds and/or mosquitoes.

Recommended Response – Response as in Risk Category 1b, plus the following: Increase insecticide-based larval control and source reduction efforts. Enhance public education emphasizing personal protection measures and equine vaccination. Enhance adult mosquito surveillance activities such as mosquito trapping and testing for virus to further quantify epizootic activity. Target adult control efforts to particular locations, when surveillance indicates potential for increased human risk. Follow-up to evaluate the efficacy of mosquito control activities.

3 – Risk Category

Probability of outbreak in humans – Moderate

Definition – Spring, summer or fall; areas with initial confirmation of

arbovirus in a human and/or horse, or moderate arbovirus activity in birds and/or mosquitoes.

Recommended Response – Same as Risk Category 2, plus the following: Increase frequency of surveillance and control activities as long as there continues to be the potential for human risk to persist or increase.

4- Risk Category

Probability of outbreak in humans – High

Definition – Spring, summer or fall; quantitative measures indicating arbovirus epizootic activity at a level suggesting high risk of human infection (for example, high dead bird densities, high mosquito infection rates, multiple positive species, horse or mammal cases indicating escalating epizootic transmission, or human case and high levels of epizootic activity) and abundant adult vectors.

Recommended Response – Same as Risk Category 3, plus the following: Expand public information program to promote personal protective measures on television, radio and newspaper. Continue source reduction, risk communication about adult mosquito control; initiate or continue active surveillance for human cases. Continue escalating adult mosquito control and monitoring (efficacy) in target areas of potential human risk.

5- Risk Category

Probability of outbreak in humans – Outbreak in progress:

Definition – Multiple confirmed cases in humans; conditions favoring continued transmission to humans.

Recommended Response - Same as Risk Category 4, plus the following: Increase risk communication about adult mosquito control. Escalate adult mosquito control and monitoring of control efficacy in target areas of human risk.

If outbreak is widespread and covers multiple jurisdictions, activate mutual aid and cooperative agreements.

II. Arbovirus Alerts

a. Positive test results in mosquitoes or dead birds

Mosquito and dead bird test results will be reported from the state health department to the submitting agency and the affected district

health department. The general public will be alerted through timely press releases. Press releases will encourage individuals to take personal protective measures against mosquito bites and to assure that horses have been properly vaccinated.

b. Positive test results in humans or horses

Each positive laboratory test on a human or a horse will be investigated to determine if the individual had traveled to a state already experiencing WNV infections or if that infection was acquired in Idaho. Formal mosquito abatement districts and local district health officials will be provided generalized case information to assist in the initiation of increased surveillance and control measures. Due to confidentiality issues, press releases will be generated but the identity of the person or horse and the exact location will be withheld. Information will be relayed in terms of county or district affected. The general public will be alerted through timely press releases. Press releases will encourage individuals to take personal protective measures against mosquito bites and to assure that horses have been properly vaccinated.

G. Estimated start-up and operational costs for mosquito abatement districts.

The following estimates are provided for planning purposes only. Some of the items may already exist in one of the other county operations (such as office or shop space in the weed control or road departments) and need not be duplicated.

The following budget list is not meant to be all-inclusive because different areas have different needs or challenges. The list will provide planners with the basic elements for the establishment of a mosquito abatement program. Please do not total the columns because alternative items have been placed in the list to increase the likelihood that all factors will be considered, e.g. facility mortgage payment and monthly office rent. Pick the items that need to be considered for your operation, expand on that list to cover items particular to your planning area, then apply local cost and budget factors to provide an estimate for planning purposes. See footnotes for details of some estimates.

Budget Estimates 1st /Annual Capital Purchase & Replacement

Capitol Equipment	\$107,800	\$ 12,000	Non-Capitol
Equip.	\$ 6,600	\$ 3,000	Facilities \$174,500 \$ 24,000
			(\$2,000 per
month) Materials and Supplies	\$ 10,500	\$ 10,500	Manpower
	\$124,400	\$124,400+	Operations \$ 33,106 \$ 33,106+

Equipment – Based on District of 22 Square Miles

Capitol Equipment Pickup trucks 3 @ \$16,000 = \$48,000 ULV Spray Unit
3 @ \$10,000 = \$30,000

Larvacide Granule Spreader 3-4 each @ \$700 = \$ 2,800
Computer 2 @ \$2,000 = \$ 4,000
4-Wheeler 1 @ \$10,000 = \$10,000
Trailer 1 @ \$3,000 = \$ 3,000
Microscope and Lights 1 @ \$2,000 = \$ 2,000
Forklift 1 @ \$8,000 = \$ 8,000

\$12,000-16,000 per year est. replace fund **\$107,800**

General Use Equipment Traps 10 @ \$100 = \$ 1,000
GPS Units 4-5 @ \$200 = \$ 1,000
Spill Kit 4 @ \$100 = \$ 400
Secure chemical and equipment storage area. = \$120,000 (minimum)

Wind speed, temperature and related weather devices. \$ 400
Night operations, warning light, flashlights, signs, misc. hand tools, etc. Office \$ 800
Equipment (Desks, Chairs, FAX machine, file cabinet, etc) **\$ 3,000**
\$ 6,600

Facilities

Administrative Office, Laboratory and Record Storage, Run-on, Run-off surface water addressed.

Water Supply cross connection protection \$ 3,500
Land \$ 40,000 (approx. two acres based on 18-20,000 per acre)
Wash Rack/Pad \$ 6,000
Rinsate Recovery System \$ 2,000
Chemical Containment \$ 3,000
\$174,500

Materials and Supplies (annual estimates based on 22 square mile operation, ground application only)

Larvacide \$2,500
Adulticide² \$3,100
Office Supplies \$ 600
Vehicle (Gas, Oil) \$2,500
PPE – Gloves, coveralls, aprons, respirators, boots, goggles, etc. \$1,000
\$9,700

Manpower \$124,400 +

Director \$40,000 + Benefits
Supervisor \$28,000 + Benefits
Office (P/T) \$ 9,400
Seasonal Personnel \$47,000
5 individuals X \$10.00 (per hour w/tax and ins.) x 4,700 hours/year
Manpower estimates based on 2002 wages, estimate 3.5% increase each year thereafter.

Operations Routine Services – Annual Basis

Telephone/Cell Phone Communication \$ 3,000
Power \$ 1,200
Internet Service \$ 300
Education - PSA / \$ 1,000
Community Outreach / Promotion
Licenses/Training^{3,4} \$ 3,120
Surveillance / Monitoring^{5,6} \$ 8,400
Calibration of Sprayers \$ 200
Container Recycling \$ n/c
Medical Monitoring/Respirator Fit Test \$ 400 (Dibrom)
Accounting / Audit \$ 1,500
Legal / Counsel \$ 1,000
Vehicle and general liability Insurance (ex:) \$ 6,086
Water (drinking and irrigation) \$ 300
Sewer/ Trash \$ 600
Survey Service – (Slope and Grade) \$ 1,000
Drainage Work – Project Based \$ 5,000
\$33,106

Based on 2002 data from Canyon County, annual increases anticipated.

Contracted Services

Drainage Contractor – Project Based \$ 5,000 (+ or -)
Ground application \$70 - 200 per hour
Air application \$1-6 per acre

Contracted application rates are estimates based on historical values and may not be applicable at current date or in your given situation. \$5,000 was placed into plan to cover drainage activities on an "on-call" basis.)

Details of estimates

- 1 Larvacide — \$2,500 on a 22 square mile district (100 gal @ \$25/gallon)
- 2 Adulticide— \$3,080 on a 22 square mile district (110 gal @ \$28 per gallon)
- 3 Licensure — Driving and Pesticide Applicator, \$120
- 4 Training — Examples of training that may be required (Mosquito University, PPE, Hazardous Materials, Fork Lift and Mixer-Loader). Estimated training cost is \$3,000.
- 5 Surveillance/ Monitoring estimates are based on 6 traps and average summer counts. One trap should service approximately 4 square miles (more or less). Mosquito identification and separation for virus estimates are based on 0.6 hours per trap night X 2 times per week = 1.2 hours per week x 26 weeks = 31 hours @ \$15 per hour = \$465 per trap (rounded up), per year. Another \$935 is estimated to manage (mileage, materials and manpower @ \$18 per trap night) the trap and collect samples during one season. This estimate averages \$1,400 per trap site, and \$8,400 for the six traps in the example.
- 6 Mosquito identification and separation of trapped mosquitoes for

virus testing (if activity contracted separately from surveillance and monitoring) — 4 hours per trap night X 2 times per week = 8 hours per week x 26 weeks = 208 hours @ \$15 per hour = \$3,120 per year (example based on 6 traps and average summer counts).

H. Special considerations for pesticide application and other control methods

Aerial applications

All proposed aerial applications of pesticides must be reviewed by the FAA and performed by a licensed professional applicator.

Aquatic applications

Proposed application of pesticides to surface water used for drinking purposes must be accompanied by a short-term activity exemption from the Idaho Department of Environmental Quality. This exemption must be obtained prior to initiating pesticide application.

Bee colony locations

ISDA requires beekeepers within Idaho to be registered; however, some beekeepers do not register their hives or may move them to new locations every year. Check with ISDA for registered beekeepers on a county-by-county basis, prior to spraying. Insecticides used for mosquito control will kill pollinating bees if improperly applied. Follow pesticide label instructions and ISDA rule IDAPA 02.03.03.400 for restrictions related to the protection of pollinators. In general application of pesticides toxic to bees shall be made during the time frame starting three hours prior to sunset and ending three hours after sunrise.

Biologically-controlled areas

An example includes the use of organisms to consume the noxious weeds purple loosestrife and yellow star thistle. Adulticide applications should be avoided in these areas. Check with the local county agriculture extension agent for information in your area.

Chemically sensitive individuals

Idaho does not have a registry for individuals with chemical sensitivities. In practice, most mosquito abatement districts have created lists of citizens who wish to be notified prior to application in their area. Notification allows the person to leave the immediate area or take other actions during pesticide application. Publicizing spraying activities and MAD contact information prior to pesticide application may provide an opportunity for such individuals to identify themselves.

Endangered or threatened species

For information related to Endangered Species Act (ESA) specific issues in your area, contact the Idaho Conservation Data Center at the Idaho Department of Fish and Game, and ask for George Stephans

208-334-3402

Organic farms

Certified organic farms are registered with the Idaho State Department of Agriculture (ISDA). Please check with ISDA for organic operations in your area prior to pesticide application. It is important to avoid pesticide application that would result in pesticide residues on organic products.

Restricted pesticide application areas

These areas are established according to ISDA laws and rules. Locations of restricted areas may be obtained by contacting ISDA

Water irrigation districts, canal companies, and drainage districts

These operations, if working properly, should not promote mosquito breeding because the water should be flowing fast enough to inhibit mosquito breeding site development. These operations also have the ability to evaluate and initiate drainage of breeding sites on property controlled by them.

Wetlands

All drainage projects should be evaluated in terms of the requirements put forth in the Clean Water Act and enforced by the U.S. Army Corps of Engineers.

Private and commercial recreation areas

For private or commercial recreational areas (e.g., Idaho Power Co. parks and campsites) please contact the owner or managing agency for any restrictions on that property.

City, county, state, and federal lands

Please contact the managing agency for any restrictions on that property.



I. Frequently asked questions from areas lacking abatement districts

Q. Why should we form an abatement district and what are the advantages?

A. Mosquito abatement districts (MADs), are formed for many reasons. One is to protect the public's health by reducing disease-carrying mosquitoes. Arboviruses (arthropod borne viruses) may be life threatening to some individuals and cause life-long debilitating disease in others. MADs also provide a community service by eliminating pest mosquitoes which annoy residents, worry livestock (an economic issue), and inhibit recreational opportunities. MAD formation can be an effective method of pooling financial, labor and capital equipment costs.

Q. Can we ask nearby abatement districts to abate mosquitoes in our area even though we don't have an abatement district of our own?

A. No. MADs function as described in Statute (Title 39, Chapter 28-04) to abate mosquitoes within a described district. Besides lack of authority, barriers to MADs abating mosquitoes outside of an MAD include a lack of funding for such activities, liability issues, a lack of known mosquito breeding site locations, and a lack of mapping of areas of special consideration.

Q. How long does it take to establish an abatement district?

A. The mosquito abatement act was designed to allow for local residents to vote for, fund, implement and manage the mosquito abatement activities in their immediate area. The election process and the setting of the levy to collect operational funds as a tax assessment take the most time. The whole process has been known to take an average of two years to complete.

Q. Why aren't abatement districts countywide?

A. Ideally abatement districts should be countywide. Abatement districts already in existence are finding it difficult to annex adjacent or non-adjacent regions in their counties when the need arises. In fact, the process of annexation is just as difficult as establishing a new

abatement district. Abatement districts may include property in two or more counties and operate under one management plan as long as the district area is contiguous.

Q. Who should make abatement decisions?

A. Abatement districts are headed by county commissioner-appointed trustees who prioritize abatement efforts (Title 39, Chapter 28-03). A MAD shall employ a director to make the day-to-day management / operational decisions. These decisions are based on an approved annual work plan.

Q. How can we get some start-up funds to begin abatement activities prior to the influx of revenue through taxation?

A. Tax anticipation loans may be obtained from lending institutions for districts that have formed but are not receiving revenues yet. Legislation may clear the way for other methods of funding such as deficiency warrants or a grant program but at this time those options have not been authorized.

Q. Can the District Health Departments help with mosquito abatement?

A. The district health departments are not licensed pesticide applicators. District health departments are ex-official members of the board of trustees for each existing MAD and therefore are active in the administration of the MAD by offering guidance related to public health. Several of the health districts have personnel that have vector control experience and or knowledge and may be of assistance but as of this time there are no formal vector control specialists available either at the local or state health department level.

Q. What should we do if surveillance efforts in our area detect WNV (positive mosquito pool, positive dead bird, positive horse or human) and we are not in an abatement district?

A. Public education about personal protection and the reduction of breeding sites near homes is the first option. The district health department is a strong ally with the ability to provide education on these topics. Other options include the identification of mosquito breeding sites and working with landowners to eliminate standing water and the formation of an abatement district.

Q. Can existing abatement districts make requests directly to FEMA for assistance if they are unable to financially maintain adequate abatement when arboviruses are detected?

A. No. The MADs should contact the county emergency coordinator to facilitate discussion with the county commissioners about declaring an emergency. The county commissioners have the authority to declare a state of emergency for the county. When emergency needs exceed the

county's ability to respond, the county can send a request for assistance to the State to the Bureau of Disaster Services. The Bureau of Disaster Services handles the request with the Governor. If the emergency needs exceed the state's ability to respond, the Governor can request federal assistance through FEMA.

Section 4



Appendices

- A.** Glossary of terms
- B.** Agency contact list
- C.** DEQ aquatic pesticide application rule
- D.** Larviciding pesticides and safety issues
- E.** Adulticiding pesticides and safety issues
- F.** Training required prior to pesticide usage
- G.** Example Mosquito Operations plan: Canyon County Mosquito Abatement District emergency plan

Appendix A:
Glossary of Terms Related to Mosquito Control and Public Health

adulticide	a type of pesticide used to kill adult mosquitoes
arthropod	a group of animals that do not have a backbone such as insects, spiders, and crustaceans
assay	a laboratory test
avian surveillance	monitoring of the bird population for presence of a disease
<i>Bacillus sphaericus</i>	a bacterium; type of biological pesticide used to eradicate mosquito larvae in water (mosquito larvae die after ingesting this bacteria)

catch basins grates seen at street corners for water runoff

communicable diseases illnesses due to specific infectious agents or their toxic products that can be transmitted from an infected person or animal to a susceptible host; either directly or indirectly through an intermediate host

Culex pipiens species of mosquito, a major vector for West Nile virus, commonly found in urban areas; breeds in fresh but stagnant water such as backyard containers and storm drains

DEET DEET (chemical name, N,N-diethyl-meta-toluamide) is the active ingredient in many insect repellent products

encephalitis inflammation of the brain

etiologic agents biologic organism or chemical material that cause disease

gravid traps type of mosquito traps designed to attract pregnant female mosquitoes

IgM-capture enzyme immunoassay (EIA) testing a laboratory analysis for the presence of immunoglobulin M antibodies (antibodies that rise during the acute phase of an illness and are a sign of recent infection)

indirect IgG enzyme immunoassay (EIA) testing a laboratory analysis for the presence of Immunoglobulin G antibodies (longlasting antibodies; their presence are a sign of past infection)

larvae immature mosquitoes; stage which hatches from the egg, prior to adult stage

larvicide a type of pesticide used to eradicate immature mosquitoes (larvae)

meningitis inflammation of the lining of the brain and spinal cord which

can be caused by a virus or a bacteria

methoprene a type of larvicide; chemical that is used to prevent mosquito larvae from emerging and developing into adult mosquitoes

migratory birds birds that fly south for the winter and return north in the spring

mosquito breeding site where mosquitoes lay eggs, typically stagnant water with organic material

mosquito pool a group of mosquitoes collected in one area and combined for laboratory testing

N,N-diethyl-metatoluamide

DEET (chemical name, N,N-diethyl-meta-toluamide) is the active ingredient in many insect repellent products

necropsy	autopsy on an animal
outbreak	an unexpected increase in frequency or distribution of a disease
overwintering	a period of rest or hibernation by which insects survive the winter
pesticide	substance used to kill pests such as insects, mice and rats; insecticide is a form of pesticide
pyrethrins	naturally-occurring plant compounds having insecticidal properties
pyrethroid	a synthetic organic compound with insecticidal properties similar to pyrethrins
resmethrin	a synthetic pyrethroid pesticide used to eradicate adult mosquitoes in the home, lawn, garden and at industrial sites; active ingredient in the product Scourge®
serologic	of, or relating to serum
serum	liquid portion of the blood containing proteins, including antibodies
vector	an organism (an insect in most cases) capable of carrying and transmitting a disease-causing agent from one host to another
vector control	mechanism instituted to control and reduce the vector population
vector surveillance	monitoring of the vector population for presence of a disease
viral	of or relating to a virus
viral encephalitis	inflammation of the brain caused by a virus

Appendix B: Agency Duties and Contact List

Bureau of Land Management

Jan Peterson, Safety/Occupational Health Manager
Idaho State Office
1387 S. Vinnell Way
Boise, Idaho 83709
PH: 208-373-4030; FAX: 208-373-3805
Jan_Peterson@blm.gov

Idaho Department of Environmental Quality

The Idaho Department of Environmental Quality (IDEQ) is responsible for protecting Idaho's drinking water quality, preserving Idaho's air quality, ensuring proper disposal of solid wastes, and remediation of releases of hazardous materials. The general number for IDEQ is 208-373-0502. See their website <http://www.deq.state.id.us/> for additional contact information.

Idaho Department of Fish and Game:

To discuss issues regarding mosquito abatement and IDFG lands, or West Nile virus in wildlife, contact Jeff Gould 334-2920.

Wildlife Diseases Laboratory

16569 S. 10th Ave
Caldwell IE 83605
208-454-7646

Idaho Conservation Data Center

For information regarding endangered species, please contact George Stephans, 208-334-3402

Idaho State Department of Health and Welfare

Office of Epidemiology

450 W. State St., 4th Floor
Boise, ID 83720
208-334-5939

The Office of Epidemiology is responsible for tracking reportable diseases in Idaho. Disease due to West Nile virus and other arboviruses is reportable under these categories: aseptic or viral meningitis or encephalitis, and extraordinary occurrence of disease (e.g., flaccid paralysis due to WNV.) A reported or suspected case of WNV disease will be investigated to determine the source of infection (when possible), to confirm laboratory findings, and to promote public health practices designed to reduce the opportunity for human illness. This may include the generation of educational press releases encouraging individuals to reduce mosquito habitats and mosquito

biting opportunities around the home. The Office of Epidemiology will work closely with district health departments. Additional activities include maintaining an educational website on WNV and working with other agencies involved with WNV, namely the ISDA and the IDFG.

Bureau of Laboratories

Virology Section
2220 Old Penitentiary Rd.
Boise, ID 83712

The state Bureau of Laboratories is capable of testing for the presence of WNV or antibodies against the virus in humans, horses, birds, and mosquitoes. Testing for this virus is a priority with rapid turn-around times and rapid reporting back to the submitting agency or physician.

District Health Departments:

District health departments provide public health services to all 44 counties in Idaho.

District 1: Panhandle Health District
Coeur d'Alene, ID
208-677-3481

District 2: North Central Health District
Lewiston, ID
208-799-3100

District 3: Southwest District Health Department
Caldwell, ID
208-455-5300

District 4: Central District Health Department
Boise, ID
208-375-5211

District 5: South Central Health District
Twin Falls, ID
208-737-5900

District 6: Southeastern Health District
Pocatello, ID

208-233-9080

District 7: District Seven Health Department
Idaho Falls, ID
208-522-0310

Idaho State Department of Agriculture (ISDA) The roles of the Idaho State Department of Agriculture as related to animal disease tracking, the control of mosquitoes, and pesticide use include:

Division of Animal Industries
State Veterinarian, 208-332-8560

ISDA Animal Industries has the responsibility to address emerging animal diseases (such as West Nile virus). ISDA will continue to advise veterinarians and citizens statewide on the actions needed to address the WNV situation in domestic animals. Within the Division of Animal Industries, the Bureau of Animal Health and Livestock will track information related to reported horse cases and investigate suspicious cases in other animal species.

Urban Pesticide Program
Robert S. Hays, Coordinator; 208-442-2803

1 The authority to regulate pesticide usage in Idaho. That authority includes the licensure of pesticide applicators, the registration of pesticide products used in Idaho, routine inspections related to pesticide use, and the investigation of pesticide related complaints. ISDA's Division of Agricultural Resources (DAR) conducts these activities as well as providing training for pesticide applicators.

2 Integrated pest management training and information. DAR staff provides Idaho mosquito abatement districts and personnel with information and training related to integrated pest management techniques, pest monitoring/surveillance, pest management plan development, technical pesticide issues and pesticide regulation compliance.

3 ULV spray equipment calibration. In an effort to maintain compliance with the pesticide label directions related to ultra low volume (ULV) droplet size, ISDA's Division of Animal Industries provides equipment and personnel for the calibration of ULV spray equipment used for adult mosquito control applications. This is a service based on request only and a fee is charged.

Organic Program
ISDA certifies organic producers. According to IDAPA 02.06.33.004,

section

205.202 Land Requirements:

Any field or farm parcel from which harvested crops are intended to be sold, labeled, or represented as “organic,” must: (b) Have no prohibited substances, as listed in 205.105 (i.e. synthetic substances, unless on allowed list, pesticides, fertilizers, prohibited non-synthetic substances, sewage sludge) applied to it for a period of 3 years immediately preceding harvest of the crop.

A current list of certified organic growers for a given area may be obtained by contacting the ISDA at 208-332-8620.

Apiary Program

The ISDA's Apiary Program registers bee keepers operating in Idaho on a county-by-county basis. Please contact Mike Cooper, Acting Administrator, Division of Plant Industries, Idaho State Department of Agriculture at phone number 208-332-8620 for bee keeper contact information.

Idaho Department of Water Resources

The Idaho Department of Water Resources is responsible for water resource protection (e.g., ground water protection, stream channel protection, flood plain management), water allocation (e.g., water rights and distribution), and water planning (e.g., minimum stream flows), among other duties. For issues involving mosquito abatement and WNV, contact Dick Larson, 208-327-7933

Idaho Water Users Association

The Idaho Water Users Association is organized to ‘promote, aid and assist the development, control, conservation, preservation and utilization of the water resources of the State of Idaho and to cooperate with similar organizations in other states...’ For issues regarding irrigation water, contact: Norm Semanko, Executive Director 410 S. Orchard Boise, Idaho 83705 208-344-6690 208-344-2744 iwua@iwua.org

Mountain Home Air Force Base

Conducts surveillance and coordinates control measures on the base. Public Health Flight Commander Mountain Home AFB, Idaho
Tel: 208-828-7385

National Park Service

To discuss pest management coordination with respect to National Parks, contact one of the following individuals:

Gerald McCrea
Regional Pest Management Coordinator
National Park Service, Intermountain Region

gerald_mccrea@nps.gov

PH: 505 988-6204 FAX: 505 988-6876

Erv Gasser
Regional Pest Management Coordinator
National Park Service, Pacific Region
erv_gasser@nps.gov

U.S. Army Corps of Engineers

For issues related to West Nile virus, contact:
Brayton P. Willis, Jr.
Boise Office, Walla Walla District

U.S. Army Corps of Engineers
P.O. Box 2780
Boise, Idaho 83701
PH: 208-345-2064 FAX: 208-345-2263
brayton.p.willis@usace.army.mil

For issues related to enforcement of wetlands protection under the
Clean Water Act, contact Greg Martinez, 208-345-2155

U.S. Fish and Wildlife Service

To discuss mosquito abatement issues with respect to U.S. Fish and
Wildlife Service lands, contact:

Sam Johnson, Region 1 Integrated Pest Management Coordinator
U.S. Fish and Wildlife Service
NWRS/OPR/Biology
9317 Highway 99, Suite D
Vancouver, WA 98665
PH: 360 696-7621; FAX 360-696-7968
E-mail: sam_johnson@fws.gov

U.S. Forest Service

To discuss mosquito abatement issues with respect to U.S. Forest
Service lands, contact
Janet A. Valle, 801-625-5258, jvalle@fs.fed.us

Appendix C. DEQ aquatic pesticide application rule

Idaho Administrative Code, Department of Environmental Quality
IDAPA 58.01.02 – Water Quality Standards and Wastewater Treatment
Regulations follows. Please refer to section 080.

Appendix D. Larvicidal pesticides

Because of the nature of pesticide development and the annual registration of pesticides for distribution within Idaho, the following list of mosquito control products may or may not be current. When purchasing pesticide products, inquire if they are registered for sale in Idaho. You may also contact the Idaho State Department of Agriculture at 208-332-8610 to check the registration status of a pesticide.

Larvicides

1 ***Bacillus thuringiensis israelensis (BTI)*** (e.g. Vectobac®, Teknar®, Mosquito Dunks®, Bti Tossits®) Use: Approved for most permanent and temporary bodies of water. Limitations: Only works on actively feeding stages (larval instar stages one, two and three). Does not persist well in the water column.

2 ***Bacillus sphaericus*** (e.g. Vectolex®) Use: Approved for most permanent and temporary bodies of water. Limitations: Only works on actively feeding stages. Does not work well on all species. May persist and have residual activity in some sites.

3 **IGRs (Insect Growth Regulators) Methoprene** (e.g. Altosid®) Use: Approved for most permanent and temporary bodies of water.

Limitations: Works best on older instars. Some populations of mosquitoes may show some resistance. Diflurobenzamide (e.g. Dimilin®)

Use: Impounded tailwater, sewage effluent, urban drains and catch basins. Limitations: Cannot be applied to wetlands, crops, or near estuaries.

1 **Larvaciding oils** (e.g. Golden Bear 1111®, BVA Chrysalin®) Use: Ditches, dairy lagoons, floodwater. Effective against all stages, including pupae. Limitations: Use of these products should be limited to areas that will not have run off or over flow out of treated area. Some plant damage has been observed from the use of larvacide oils (rice crops in California).5.

2 **Monomolecular Films** (e.g. Agnique MMF®) Use: Most standing water including certain crops. Limitations: Does not work well in areas with winds in excess of ten mph.

3 **Organo-phosphate based larvacides** (e.g. Abate®) Use: Breeding sites as specified on label directions. Limitations: Must be applied to areas with not run off or outflow, not selective, will kill other species besides mosquito larva.

4 **Pyrethrins** (e.g. Pyrenone Tossits®) Use: Breeding sites as specified on label, usually paired with piperonal butoxide as a synergist.

Limitations: Must be applied to areas with not run off or outflow, not selective, will kill other species besides mosquito larva.

Always read the label for safety considerations and follow the label directions for use.

Appendix E. Adulticidal pesticides

Because of the nature of pesticide development and the annual registration of pesticides for distribution within Idaho, the following list of mosquito control products may or may not be current. When purchasing pesticide products, inquire if they are registered for sale in Idaho. You may also contact the Idaho State Department of Agriculture at 208-332-8610 to check the registration status of a pesticide.

Adulticides

1. Organophosphate compounds

Note: Some mosquito populations may become resistant to label OP application rates if applications have been routine over several years. Recommend alternating or cycling adulticide products to avoid resistance development.

Malathion (e.g. Fyfanon®)

Use: May be applied by air or ground equipment over urban areas, and most crops, and wetlands when applied at labeled rates for public health applications.

Limitations: May damage automobile paint if large droplets are produced; toxic to fish, wildlife and bees; crop residue limitations may result in preharvest interval for some crops.

Naled (e.g. Dibrom®, Trumpet EC®)

Use: Air or ground application on fodder crops, swamps, floodwater, residential areas.

Limitations: Same as malathion, and some cosmetic spotting of fruit may occur in dry hot climates.

1 **Pyrethrins** (natural pyrethrin products) (e.g. Pyrenone Mosquito Spray®, Pyroicide®) Use: Wetlands, floodwater, residential areas, some crops. Limitations: Do not apply to drinking water, milking areas; may be toxic to bees, fish, and some wildlife. Shellfish, such as crawdads, display little or no tolerance to these products. Some formulations with synergists have greater limitations.

2 **Pyrethroids** (synthetic pyrethrin products containing resmethrin, sumethrin, or permethrin) (e.g. Scourge®, Anvil®) Use: All non-crop areas including wetlands and floodwater. Limitations: May be toxic to bees, fish, and some wildlife; avoid treating food crops, drinking water or milk production.

**Always read the label for safety considerations
and
follow label directions for use.**

Appendix F. Special training required prior to pesticide application

Depending on the type of business and the type of pesticide applied, two categories of pesticide applicator license are required.

To commercially apply pesticides for mosquito control or to apply a restricted use pesticide for adult mosquito control, one must be licensed in the "public health" and "law and safety" categories of the Idaho State Department of Agriculture pesticide applicator licensing program.

Currently there is no requirement for applicator licensing if the applications are of general use pesticides on land owned or controlled by the applicator or the applicator's employer. Some mosquito abatement districts require the manager to be a licensed professional pesticide applicator to demonstrate competency and as a condition of employment.

A public applicator license category is currently being considered by the ISDA to require licensure of all individuals that apply any pesticide to public property (schools, parks, public buildings), or private property (stores, restaurants, private institutions), open to public access.

Public Health Pesticide Applicator Certification Training Idaho State Department of Agriculture, Sherman Takatori 208-332-8609 Certification and licensing is required for individuals wishing to apply restricted-use pesticides or apply pesticides commercially in the control of public health vectors. This training is three hours in length.

General use pesticide application

Information is available through the Idaho State Department of Agriculture Urban Pesticide Program, Robert Hays, 208-442-2803, related to the use of general use pesticides for mosquito control in situation not requiring pesticide applicator licensure.

For more general information on pesticides:

American Mosquito Control Association

<http://www.mosquito.org/>

Northwest Mosquito and Vector Control Association

<http://www.nwmvca.org/>

Environmental Protection Agency

<http://www.epa.gov/pesticides/>

Appendix G. Example of a mosquito abatement district arbovirus emergency plan

Please [click here](#) for the Canyon County Mosquito Abatement District (CCMAD) Standard Operating Procedures for CCMAD Arbovirus

Emergencies.