

## VIII. SUMMARY AND RECOMMENDATIONS

### A. Legal, Organizational and Fiscal Aspects of Massachusetts Mosquito Control

The organizational structure and funding for Massachusetts mosquito control programs, be they regional or town based, rests predominately at the level of town government, although the state legislative bodies have a direct influences over eight of the nine MCPs' annual budgets (only East Middlesex is not so affected). In contrast, the overseer of mosquito-control activity in Massachusetts is the State Reclamation and Mosquito Control Board. This is a loose arrangement for delivering a public service that is best applied at a regional level. Lack of control effort in one town can greatly effect the efficiency of control efforts in neighboring towns.

Enabling legislation has been written in a patchwork manner so that there is currently little consistency from project to project. For example, towns in Barnstable County (and formerly in Berkshire) are all members of their respective regional MC project and no individual community may withdraw from the program without changing the legislation as did Chap. 119 of the Acts of 1982 in the case of Berkshire County. This provides an assurance of fiscal and organizational stability that is lacking in other programs. For example, the Essex County and Central Massachusetts projects both went through considerable upheavals in membership between 1988 and 1993. Fortunately, the other projects have remained remarkably stable over the past decade. Maintaining and improving stability, both in membership and funding, is a desirable goal.

This uncertain fiscal picture is further compounded by the fact that all MC projects in Massachusetts are seriously under-funded. In other states, with progressive MC programs, the per capita expenditure varies from \$2 upward. In Massachusetts, it averages about \$0.50 (based on \$2 per household of 4 people). In addition, many other states provide supplemental state funds to encourage non-chemical control efforts and for supportive research and educational activities. No such state support exists in Massachusetts. When supplemental state support has come, it has been for chemical adulticiding in the wake of EEE threats.

To a large extent, funding dictates the control approaches that can be pursued. IPM, source reduction, larval control, and adult control represent the four major options in their order of decreasing cost and efficiency. Thus, poorly funded programs are forced into more reliance on less efficient and more controversial techniques. Larger, better-funded, and stable regional projects can invest in better paid and trained employees, better surveillance and public education programs, and expensive equipment such as helicopters which can broaden the

options for safer and more efficient larval control (e.g., granular larviciding with Bti and methoprene).

Given the fact that several different state agencies are concerned with mosquito control activities, the current system of interagency responsibility for overseeing MC activities (i.e., State Reclamation and Mosquito Control Board representing 3 different state agencies) is perhaps the best compromise arrangement. On the other hand, the level of general support services that projects and towns receive from this Board seems to be inadequate.

#### Recommendations

That new and comprehensive enabling legislation be drafted, reviewed, appropriately revised, and passed into law, which will bring all MC control activity in Massachusetts under the same organizational, fiscal and operational guidelines. This legislation should provide for the following:

1. The State Reclamation and Mosquito Control should have the following personnel:
  - a. An Executive Director @ approximately \$45,000 per year
  - b. An Engineer @ approximately \$35,000 per year
  - c. An Entomologist @ approximately \$35,000 per year

Not only would this staffing permit the state to conduct research into mosquito control, it would provide a team for rapid response to EEE threats in communities that are not members of established MCPs. This staff would also provide services such as incorporating DEP stormwater management guidelines into Massachusetts MCP Upland Water management operational procedures.
2. An operations budget, above and beyond the normal needs of the SRCMB, for research and development. A minimum of \$50,000 per year is suggested.
3. A competitive grant fund (funded by the state, administered by the Executive Director of SRMCB and advised by an ad hoc panel of outside experts) to support IPM related research and delivery programs within the state mosquito control enterprise. This should provide support for studies such as: cost/benefit analysis of mosquito-control programs; development of human annoyance thresholds (HAT); improved methods for monitoring and predicting mosquito population levels; development, evaluation, and implementation of new, non-chemical mosquito management techniques (e.g., open marsh management and biological control); management of pesticide resistance, drift and other use exposures; impact of MC activities on surface and ground water,

and on non-target organisms; and the biology and role of selected species in disease transmission.

4. The SRMCB should establish a committee to work with their staff to develop best management practices (BMPs) for all aspects of mosquito control, the results of their work being used to update the GEIR on a regular basis. The committee should include four mosquito-control superintendents, four representatives of environmental agencies (federal, state or private) and one at-large member to serve as chairperson. Their first order of business should be to develop a set of BMPs for freshwater drainage maintenance for mosquito control. These BMPs should establish strict definitions for projects in which the mosquito control exemption from the Wetlands Protection Act may be applied.
5. MCPs must have the authority to deny requests for maintenance work that does not have a mosquito-control component. Because these requests are often made by the same persons or municipalities which provide funding to the MCPs, the SRMCB must be willing to act as an appeals board, to which a request for work may be sent by an applicant in the event the mosquito control program denies the request.
6. Limit mosquito control activity to regionally based regional mosquito control programs which can be organized by the appropriate public vote. The SRMCB should organize the regional based mosquito control programs and appoint project or district commissioners. The SRMCB should select Commissioners from candidates proposed by authorized Boards/individuals from the cities and towns of the mosquito control projects or districts.
7. A flexible and appropriate system of tax assessment which allows for budgets that are adequate to provide for the implementation of the most contemporary and least risky strategies for controlling mosquitoes.
8. A legal system whereby all major zoning and construction plans in the Commonwealth are reviewed by the executive director of SRMCB and the appropriate county MC director for their potential impact on mosquito populations and human health.

B. Operational Aspects of Massachusetts Mosquito Control

Operational programs in Massachusetts could legally be using chemicals (approved by EPA and the Massachusetts Pesticide Board) that are significantly more hazardous than those used in current practice. This

suggests that knowledge and sensitivity for the environment and human safety are generally being considered by the existing control programs. As already indicated, funding levels seldom allow projects to follow the optimum operational course. Despite these fiscal constraints, projects have significantly changed their operational methods in recent years toward more source reduction work such as the Open Marsh Water Management projects in Essex, Norfolk and Plymouth Counties. Most projects also use more selective and environmentally compatible larvicides such as Bti and methoprene.

The operational recommendations that follow are predicated on additional and adequate funding being available for implementation.

#### Recommendations

1. All MC Projects should build their programs around the IPM strategy of keeping human annoyance below threshold levels as given in the Standards of this GEIR.
2. Control methodology should be source reduction whenever possible and larvicidal control when it is not. Projects should work closely with the DEP water quality certification program and the Natural Heritage Endangered Species Program to minimize negative impacts of source reduction to wetland habitat and/or rare or endangered species. The most target-selective and environmentally compatible larvicides (e.g., Bti, methoprene) should be used whenever possible regardless of cost considerations.
3. Saltmarsh mosquito control efforts should emphasize OMWM. All OMWM proposals should include plans for filling many of the old grid ditches in Massachusetts salt marshes which do not function in a productive way and which must regularly be cleaned in order to prevent breeding in the ditches themselves. This will gradually eliminate the controversy over the continuing need to clean these ditches and the problem of what to do with the resulting spoil that is created.
4. Document location, length, and cross-section(s) of all drainage systems maintained by the project and have that information available in an easily understood format for public inspection. Exemption from the permitting process extends only to those drainage systems for which adequate historical records of maintenance work exist.
5. The SRMCB should create a list of pesticides approved for mosquito control in Massachusetts. Adulticides should be from Categories III and IV and larvicides should be from Category IV.

6. Adulticiding should only be carried out in emergency situations involving disease threats or pest densities which consistently exceed the human annoyance threshold.
7. For large-scale adulticiding, only ULV-cold fogging should be used. For spot treatment around recreation areas or other areas where public events are to be held, portable mistblowers using permethrin as a residual pesticide can be used.
8. Aerial applications should be restricted to granular formulations in areas where drift could be a significant problem. Sometimes some drift is desirable so as to reduce the chance of gaps between application swathes. In such cases a liquid formulation may be a better choice. At this time liquid formulations are also significantly cheaper, making larger applications, and more effective control, easier. Increased use of helicopters for aerial larviciding in coordination with the use of drift-suppression agents and technologies should be encouraged (particularly for enhanced larval control in inaccessible habitats such as salt marshes, wooded swamps, vernal pools, etc.).
9. Projects should file a post-treatment report for aerial applications with the Pesticide Bureau which gives location and acreage actually treated. The pre-application forms do not always accurately represent what actually happened.
10. Chemical-use reporting needs to be monitored to ensure uniformity and accuracy in reporting. Previous reports contained such problems as no units are given on the 1993 through 1995 Cape Cod report for Bactimos (BTI), two different EPA registration numbers for Bactimos are given in the 1993 Cape Cod and Central Massachusetts MCPs reports, and briquets are variously reported in terms of number of briquets, pounds of briquets or pounds of active ingredient. The Pesticide Bureau should insist that yearly chemical-use reports be filled out according to standardized procedures. Reports should be checked as they come in to ensure that standardized reporting procedures are followed.
11. All pesticide storage areas should be equipped with smoke, fire and security systems. A standard procedure should be developed for the disposal of all insecticidal materials used in Massachusetts for mosquito control. The State Pesticide Board should encourage manufacturers of such products to market reusable containers. A standard procedure should be developed for the clean-up of

accidental spills of insecticides. Proper use of absorbent materials and the disposal of such materials are necessary. Proper attire during formulation and application of insecticides should be made mandatory for all individuals involved in these processes.

#### C. Research Needs

There is a need in the mosquito control process in Massachusetts for a strong, operationally focused, research effort in freshwater wetlands, exclusive of chemical application techniques. This is not to condemn current research efforts, for we know more about EEE mosquitoes than ever before, have improved saltmarsh mosquito control dramatically, and have made improvements in both chemicals used and methods of chemical use over the past decade. But there is a need for research to assess the environmental impacts and efficacy of the current MCP programs relative to the freshwater environment.

Additional research on topics such as long-term effects of OMWM, economically viable control of *Cq. perturbans*, and mosquito control in endangered species habitats also require attention.

#### Recommendations

1. For water management practices, monitor impacts on animals on a case-by-case basis, depending on the site and establish vegetation transects to document changes in wetland vegetation.
2. Develop a unified data base that documents mosquito populations on an ongoing basis from regular monitoring sites. Establish state standards for monitoring mosquitoes and provide training to mosquito control project staff in data collection and management.
3. Conduct comparative studies with different management approaches (e.g. pesticide applications vs. water management).
4. Develop a Geographic Information System (GIS) with known breeding sites and areas of historical water management activities.
5. Qualify sites on the basis of need for control, based on breeding (potential or actual), mosquito species, proximity to human activity, level and type of human activity, and type of wetland habitat affected.
6. Create an ongoing research partnership with NHESP to document wetland types, etc.. Mosquito Control Projects have knowledge and expertise about wetlands that could be invaluable to NHESP.