

A Proposed Mosquito Control Program for the  
Moncton Mosquito Control Committee  
and the  
Greater Moncton Mosquito Control Authority

By

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## INTRODUCTION

This report presents recommendations to the City of Moncton, the Moncton Mosquito Control Committee, the Greater Moncton Mosquito Control Authority, and the Department of Municipal Affairs, Fredericton for the expansion and improvement of the mosquito control program at present in effect in the Moncton area. At the request of the City of Moncton, the author spent the 29th and 30th of June, 1970, discussing the problems of mosquito control and surveying the area under control with the Director of the Mosquito Control Committee. The analysis of the present scheme, and recommendations are based on experience which the author has gained while working on mosquito and black fly control programs in Africa, Canada and Grand Cayman, British West Indies.

## ANALYSIS OF THE MOSQUITO CONTROL PROGRAM

The mosquito control program for Moncton was set up following a survey of the area carried out by D.G. Peterson of the Canada Department of Agriculture in which the mosquitoes were identified and their breeding sites mapped. The control program was then set up to give protection based on this knowledge. The mosquito problem can be divided into two problem areas according to the habitat of the mosquitoes: (a) salt marsh mosquitoes breeding on the tidal flats and producing several generations per year, and (b) mosquitoes breeding in naturally occurring bodies of water (woodland pools and ditches, pot holes, etc.) or artificial containers (discarded tires, empty cans, improperly sealed septic tanks, etc.) and generally producing only one generation per year. At present, control of the salt marsh mosquitoes is by

burning the grass on the tidal flats and oiling the exposed water. Other control methods are by filling or removal of breeding sites and by spot treatment of breeding sites. The fogging program will not provide control of the mosquitoes since the larvae are not affected. To get a noticeable effect from fogging, the area treated must be large and the fogging should be carried out on a nightly schedule.

Biological control by the encouragement of purple martin colonies will provide limited control. One must remember that the purple martins do not feed only on mosquitoes and neither do they affect the larval sites. Thus adult mosquitoes will be produced which will cause some annoyance even when there are large numbers of insectivorous birds. Also, when dealing with salt marsh mosquitoes, with the very large numbers emerging over a short period of time, effective control of the adults requires the use of chemicals.

#### RECOMMENDATIONS

The Moncton area suffers from two major sources of mosquito breeding. With this mosquito problem, two separate plans of attack must be considered to give effective control. The salt marsh mosquitoes, by their nature of development, and by the nature of their breeding site can be controlled most effectively and economically by physical means. The female salt marsh mosquito lays her eggs on the damp ground; when there is flooding, either by tide, rain, or spring run-off, the eggs hatch and development commences. The emerged females will then migrate (up to several miles) in search of a blood



meal. With the recurrent flooding of the tidal marsh, there will be several broods or generations produced each year. The most effective method of controlling this mosquito is to prevent the recurrent flooding of the tidal grassland. This can be done by land fill or drainage, or by prevention of recurrent flooding. These methods will be discussed in a separate section. The mosquitoes breeding in woodland pools, swamps, etc., are more difficult to control. Control of these mosquitoes requires a lot of work on the part of the mosquito control agency and cooperation by all members of the Community. To enable the mosquito control agency to carry out a proper control program, there must be a law passed to give the agency authority to carry out the necessary work. The following recommendations are therefore made:

A. Legal Recommendations

1. A law must be passed to create a mosquito control district with a director and terms of reference for the agency to cover the following points:
  - a) The mosquito control agency must have authority to enter on private land to search for mosquitoes and to carry out the necessary control measures.
  - b) The mosquito control agency must have authority to enforce laws pertaining to mosquito control; the property owners must take the necessary steps to remove potential breeding sites, ie. clean up property, remove tires and water containers,

seal septic tanks and provide the necessary screening on tank vents, fill ditches, provide drainage to prevent gathering of water.

- c) The law must provide legal protection for the employees of the mosquito control agency when carrying out their duty.
  - d) The law must provide protection to the public in case of accidents caused by the mosquito control agency or its employees in the course of their work (ie. accidentally trampling flowers). Accidents due to machinery, people, or insecticidal damage (this will include any compound being used for mosquito control) occasionally do occur.
  - e) The mosquito control agency should consider insurance to protect the agency and members working for the agency. This is especially important if volunteer workers are being used.
  - f) Other legal aspects must be considered.
2. The work of the Mosquito Control Agency, the City Engineer, and the Town Planner, must be coordinated. When work in any area is planned all persons concerned must be notified. This is important in the development of swamp areas. If land fill is being brought in to fill a swamp, care must be taken to plan the dumping of the fill to prevent the formation of mosquito breeding sites while filling is in progress.

With the formation of a mosquito control agency with legal power to act, it will then be possible to plan a long term control plan which will incorporate development by the City of Moncton and any Public Works program.

B. Mosquito Control Recommendations

1. Control of the salt marsh mosquitoes.

As mentioned, these mosquitoes are most effectively and economically controlled by a physical control scheme. When such a scheme is completed two objectives will have been attained, (a) the area will not be a mosquito breeding area and (b) the existence of dikes will permit the more economical employment of hydraulically pumped fill, or even trucked fill, to be used for development of the area. For the Moncton area, along the river front the physical scheme can also be linked to development leading to road construction in that area.

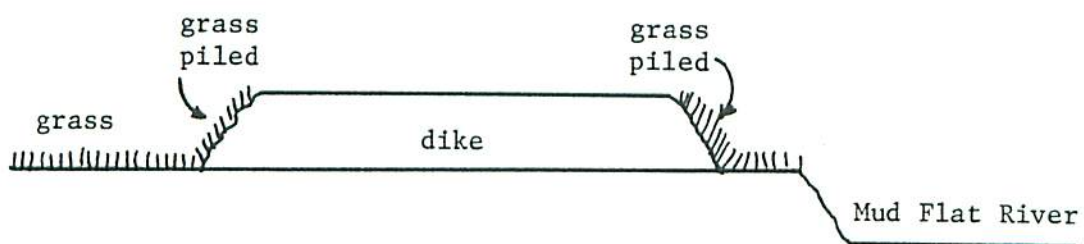
It is suggested that a dike be constructed along the boundary of the tidal flats and the river bed, using the limit of grass as the boundary. The actual engineering and planning of this work can best be done by the City Engineer since the weight-loading of the drag-line will have to be determined in order that it can operate on the soft marsh land.

The accompanying map shows three areas which should be diked. They are numbered 1, 2, and 3 should probably be completed in that order. It is recommended that the width of the dike is such that it can be used as an access route, the height will be that to prevent flooding at peak tide. This technique of dike construction is employed by the Mosquito Research Unit in the West Indies; the author spent two years working on that particular project and



one of the observations was that at no matter how flat the terrain, in very boggy ground a drainage ditch will cause drainage and drying of ground for more than 100 feet on either side of the ditch. Thus, after the dike is constructed, if it is desired to increase the rate of drying on the tidal marsh, ditches could be made leading to tide gates to permit drainage and drying.

The sketch illustrates how the dike might be constructed.



The operator of the drag-line should remove the grass sod from the strip on which the dike will rest, this sod should be piled along either side of the area where the dike will be formed to serve as a retaining wall for the mud that will be taken from the tidal flat. It may be advisable to have the dike set back a few feet from the edge of the grass-covered flat to prevent it from slipping onto the mud flat. If rubble is available, it may be advisable to reinforce the dike wall on the river side to prevent erosion.

The construction of dikes must be considered a long-term project. Presumably the weather in the Moncton area is such that this work can be done in the winter as well as during the summer

months. An advantage of this type of a program is that the year-round schedule will enable the operator to become sufficiently proficient and he will be able to work with minimum supervision.

The tidal marsh numbered 6 on the map (above the causeway) may require more detailed surveying since it is on a non-tidal stretch of water and since there are cottages bordering the marsh. Land-fill should be considered for the inland areas numbered 4 and 5. There is at present a project of land fill in progress, if other sources of fill are available these areas should be filled. The author saw the extensive mud flats on the river front. If it is possible to obtain a hydraulic dredge, this could be used to back fill the diked marsh areas numbered 1, 2, and 3. Again, the City Engineer would be able to give assistance in determining the amount of silt fill which could be used and what should be placed on top of the fill if the area is to be considered for future development.

2. Control of other mosquitoes.

The control scheme at present in progress is basically good and only requires more support in the form of equipment and funds. A definite budget should be set to permit the director of the mosquito control agency to plan his work. During the visit, I was shown the breeding sites in the pot holes and depressions along the hydro line right of way. If a vehicle such as a bulldozer were available, it could be used to level the ground in this and other such areas.

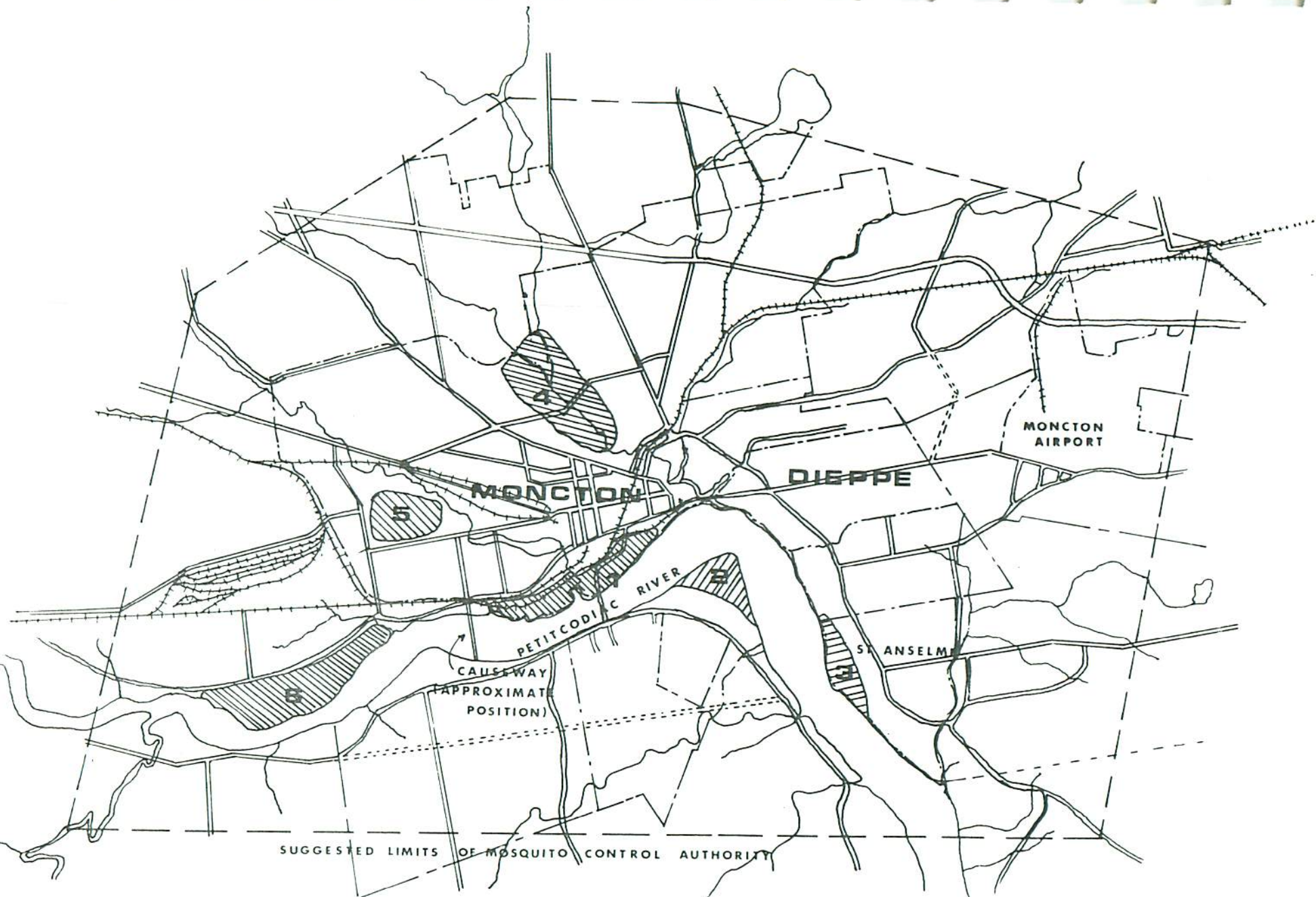


It is for this type of work that the law to permit the mosquito control agency to enter private property to do work is essential. The mosquito control director must have the authority to act quickly if a successful scheme is to be carried out.

On the map are shown suggested boundaries for the mosquito control authority; these have only been put in to show the necessity of treating a large area if successful control for the City of Moncton is to be achieved. In the annual reports, the director has stated that mosquitoes do invade from outside areas, and the people desiring mosquito control must be prepared to pay for treatment outside their area. Again the Mosquito Control authority must be set up so that the whole area is being treated and it must be stressed to the residents of Moncton that if they want relief from mosquitoes, they may have to pay the major portion of the bill to do work outside the City of Moncton.

### C. Planning of the Scheme

If the suggested scheme involving dike construction and physical control is agreed upon, it is suggested that another visit be made to the Mosquito Control Authority to give assistance in the planning of dike construction. This recommendation is based on experience gained while working on the physical control of salt marsh mosquitoes.



**MONCTON AND VICINITY**

