Annual Report
Bureau of Insect Pest Control
FY 1977

The words "Environmental Management" denote a vast range of endeavor. The Division of Forests and Parks bears the responsibility for that part of the environment concerned with trees. The two categories of trees receiving attention from the Division are those designated forest and those designated shade. Of major concern in the management of trees are the periodic attacks by certain insects and diseases. Responsibility for the survey and detection of these tree pests rests in the Bureau of Insect Pest Control. It is also the responsibility of the Bureau to determine the extent and severity of an outbreak and to predict the short and long term effect on the trees. Upon reaching this determination it is then the responsibility of the Bureau to use or to recommend the most efficaceous means of suppressing the pest.

Over the years, due to the nature of insect and disease control, the Bureau has taken on other closely related programs. Rats had always been a minor problem on Forest and Park areas until the acquisition of the Boston Harbor Islands. Suddenly we were confronted with a major problem. On the other hand, mosquitoes have always been a problem on our park and recreation areas and have for years been controlled by Bureau personnel and equipment. Our bodies of water, due to natural eutrophication and that aggravated by the addition of nutrients, need periodic control measures to cut down on the aquatic weeds and algae which interfere with swimming and boating. Control of the Dutch Elm Disease is most efficient with the prompt removal and destruction of diseased elms which if left standing are focal points for further spread of the disease. To help combat the disease, the Bureau has four crews trained in the removal of the diseased trees. Due to their skills in tree work, they have been found to be very useful in the maintenance of trees on the recreation areas.

An unusual program outside normal Bureau functions was culminated during this fiscal year. As had been reported in previous years, the Department had collected and put in storage in bunkers at Wompatuck State Park 260 tons of unwanted pesticides. This year saw the complete removal of these pesticides not only from the Park but from the State.

The start of each fiscal year coincides with the program time to conduct the annual aerial survey for the purpose of determining current defoliation, particularly that of the gypsy moth. In July of 1976 the survey required 25.5 hours of flying time to cover the State.

Results of the aerial survey indicated an almost twofold increase in visible gypsy moth defoliation in 1976 over that noted in 1975. The total 1976 gypsy moth defoliation was 31,720 acres as compared to the 1975 defoliation of 17,895 acres. Most of the increase took place in Bristol and Norfolk Counties although some increase in the town of Sturbridge was noted.

Of particular interest in the 1976 aerial survey was an area in the vicinity of the Erving and Wendell State Forests. Insect activity had been noted earlier and some adults of a small moth were collected and sent to the National Museum of Natural History for identification. They were identified as Croesia semipurpurana, common name, oak leaf tier. The aerial survey indicated approximately

30,000 acres as visibly defoliated by this insect.

As this insect is an early feeder, its larval stage being completed by the end of May, a second aerial survey was conducted during this fiscal year. On June 13, 1977 five hours of flying indicated a total of 100,665 acres of defoliation which could be attributed to this insect. It extended from the towns of Northfield and Warwick south to Belchertown. To the west of this area and running from Charlemont down to Westfield appeared a line of individual defoliated areas. Random checking on the ground confirmed the presence of the oak leaf tier.

Fall webworm was again prevalent throughout the State confirming its feeding primarily to wild cherry along the roadsides. Many inquiries were made both to the Boston office and to personnel in the field by citizens alarmed by the numbers of nests and the appearance they created. Most of their fears were alleviated when it was explained that little or no permanent damage would be sustained by the trees.

The gypsy moth continues to be troublesome, particularly in Bristol and Norfolk Counties where the communities of Mansfield, Sharon, Easton, Norton, North Attleboro, and Attleboro were sprayed aerially to give relief to residents. The current outbreak in this area is the first since the early 1950's. Considerable spraying with ground equipment was also conducted in Rehoboth, Sharon and Wrentham.

Dutch Elm Disease

During the course of the year Bureau personnel assisted 93 communities in the removal of 1,656 Dutch Elm diseased trees. They assisted 106 communities in the sampling of elm trees suspected of having the disease reaching a total of 1,925 trees sampled.

Bureau activity in this program is extremely important when viewed on a statewide basis. Those trees removed can no longer act as focal points for further spread of the disease as the beetles which spread the disease are no longer afforded a breeding area. More important, however, is the incentive this city and town assistance program gives the communities in encouraging their further participation on the local level.

Another Bureau function in the total Dutch Elm Disease control effort is that of coordinating the efforts of certain counties in the monetary assistance to communities having demonstrated a sincere concern for the problem. During the past fiscal year three counties Bristol, Worcester, and Berkshire participated in this program for a total of $35,000.00. This money was allocated to those cities and towns having conducted Dutch Elm Disease programs satisfactory to the Bureau and according to the amount of expenditure incurred by each. Here again the incentive was as important as the money.

Gypsy Moth

We are in a period of rising gypsy moth populations. From a low of 17,000 acres in 1975 we are faced with a total of approximately 150,000 acres as indicated by the 1977 aerial survey. A total of 26 communities, with the major portion of these in Bristol and Norfolk Counties, showed visible defoliation from the air. Spot checks on the ground indicate that perhaps double the amount of acreage shown to be defoliated also has rising gypsy moth populations.

In an effort to enhance the present parasite predator complex the Bureau has been cooperating with the U. S. Department of Agriculture in the release of

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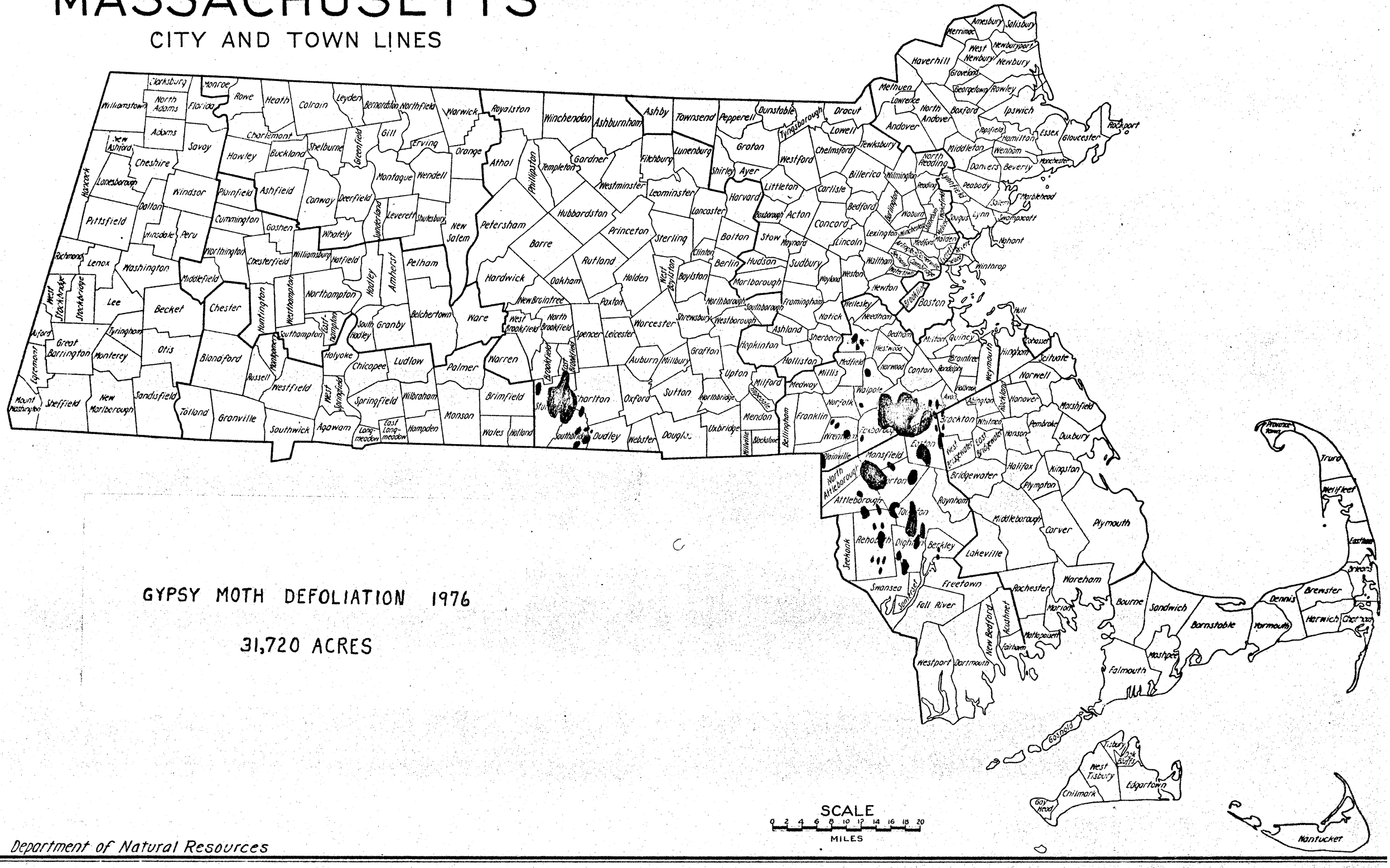
CITY AND TOWN LINES



GYPSY MOTH DEFOLIATION 1976

31,720 ACRES

SCALE

0 2 4 6 8 10 12 14 16 18 20

MILES

Department of Natural Resources

parasite species not now present in Massachusetts. Approximately 5,000 individuals comprised of three different species of parasites, Exorista lavarum, Palexorista inconspicua, and Apanteles liparidis, were released in selected areas during FY 77. The parasites released were all parasitic on the larval form of the gypsy moth. Each of the above named parasites are polyphagous, having the ability to survive on alternate hosts when gypsy moth populations are low. The release sites will be checked yearly for evidence that one or all of the species has become established.

Oak Leaf Tier

This is a native insect which periodically breaks out into epidemic proportions in areas heavily populated with red oak. Oak of the white oak varieties growing in the same areas are not attacked. Past histories of outbreaks, the last major one being in Pennsylvania, indicate that severe mortality to the red oak can result.

At the present time a severe outbreak is in progress in Massachusetts. The first indications were noted in 1975 when light defoliation was seen in the area of the Erving - Wendell State Forests. Examination of captured moths indicated that the defoliator was Croesia semipurpurana, the oak leaf tier.

The general aerial survey conducted in July, 1976 for the purpose of detecting gypsy moth defoliation detected an area of approximately 30,000 acres in the northeast portion of Franklin County. A later ground check revealed small, flat, circular eggs on the two year old branches. These were eggs of the oak leaf tier. Concerned that large numbers of eggs were present and aware of this insect's potential killing power, Bureau personnel contacted the U. S. Forest Service. Plans were made to monitor the outbreak with the intention of collecting data for the purpose of preparing an environmental inpact statement.

Plots were established in known areas of infestation with accompanying check plots outside the generally infested area in an attempt to determine the impact of this insect on the red oak. Recently the U. S. Forest Service has developed a somewhat simple, visual method of determining the starch content in the roots of deciduous trees, particularly oak. Normally starch is stored in the roots to be changed to sugars in the spring to aid in the growth. A tree under stress from such things as drought, insect defoliation, etc. cannot store the proper amount of starch. A low starch content is a good indication that the tree is in trouble and more stress will kill it. Hopefully the tests will give us an insight into the possible danger of continued defoliation.

In June of 1977, following extended and heavy larval feeding, a special aerial survey was conducted to determine the extent and severity of the feeding. At this time it was determined that 100,665 acres of red oak were moderately to heavily defoliated by the oak leaf tier.

Fall Webworm

FY 76 again saw this insect in outbreak condition throughout the State. Although its favorite food plant is wild cherry, it could be classed as a general feeder on deciduous trees and shrubs. Aesthetically it creates a problem. The nests are unsightly and cause a great deal of concern. The insect does not, however, permanently damage the trees. The feeding takes place at that time of year when the tree has made most of its growth and has stored most of its food for the following spring. As it has in the past the population will eventually subside.

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Elm Phloem Necrosis

Of particular interest to those of us concerned with the plight of the American Elm and the problem it is facing with the Dutch Elm Disease is the first confirmation of the presence in Massachusetts of another devastating disease, Elm Phloem Necrosis. Similar in some respects to the Dutch Elm Disease, it tends to clog the vessels of the tree and the major vector of the disease is an insect. The culprit in this case is a leaf hopper rather than a bark beetle. Leaf hoppers feed by sucking the juices from various plants. In doing so disease spores are transmitted from diseased to healthy trees.

This first confirmation was made by Dr. Francis Holmes, Director of the Shade Tree Laboratories at the University of Massachusetts in Amherst. The suspected tree was discovered in Lincoln. Dr. Holmes sampled the tree, cultured the sample in the laboratory and examined it under an electron microscope.

Storm Damage

The past winter and spring were particularly hard on trees due to severe ice and wind storms. Many branches and even whole trees were felled by these storms. Bureau personnel spent many man days assisting in the massive cleanup job. The major storm came late in the spring when preparations were underway to get the recreation areas ready for the season. The skills of the men, the chain saws, and the heavy equipment were used to good advantage.

Pesticide Disposal

As noted in previous annual reports, the Department collected and stored at Wompatuck State Park a large quantity of unwanted pesticides. The collection took place between 1970 and 1975 and the pesticides received were in containers ranging from 55 gallon drums to 1/2 pint bottles and from 50 pound bags to one pound bags. Three and one half bunkers were filled.

In 1975 the Legislature appropriated $125,000.00 to implement the disposal of these pesticides. Shortly thereafter the Environmental Protection Agency granted $10,000.00 to assist in the disposal. With the money in hand a plan was formulated to complete the project. With assistance from personnel in the Environmental Protection Agency the decision was made to complete the job in two phases.

As it was not known exactly what pesticides would be involved and what the weight and volume might be, the first phase would be the inventorying and repackaging of the materials. Requests for proposals were sent to ten concerns felt having had the expertise to accomplish the work. Chem - Trol Pollution Services from Model City, NY was awarded the contract. Phase I was completed in February, 1976. All of the chemicals were segregated according to the chemical families. All of the pesticide containers had been examined and where necessary were placed in new 55 gallon drums or palleted to prepare them for transporting when a final destination had been determined.

In April of 1976 a request for submission of a proposal for the loading, transporting and final destruction of the pesticides was sent to firms deemed qualified to complete the project. Again the contract was awarded to Chem - Trol Pollution Services of Model City, NY.

On August 13, 1976 a certificate of completion was issued to Chem - Trol covering all but the final disposition. Final payment on the contract was delayed until January of 1977 when all of the 260 tons of pesticides had been destroyed and rendered harmless.

The total cost for the inventorying, repackaging, loading, transporting, and final destruction of the unwanted pesticides was $132,006.13 including $122,006.13 as the Commonwealth's share and $10,000.00 granted by the Federal Government.

Related Programs

Mosquito control is conducted annually on the major recreation areas by means of the Bureau mist blowers. To accomplish the most good in a limited amount of time the periods of the year when mosquito populations are the highest and park attendees are the highest is when spraying takes place. The first spray period is just prior to Memorial Day and the second is just prior to the Fourth of July.

A total of 132 man hours were spent spraying for mosquito control.

Poison ivy control is another related problem undertaken by the Bureau in an effort to assist in the maintenance of the recreation areas. A total of 51 man days were devoted to this endeavor.

Aquatic weeds and algae pose another problem in the proper maintenance of recreation areas. A total of 16 man days were spent surveying those bodies of water considered as problem areas. Only two areas were treated during FY77. A bloom of algae in Watson Pond in Taunton made it necessary to apply copper sulphate on an emergency basis to allow the continued use of this swimming area. An over abundance of the aquatic weed, milfoil, was creating a problem at the sailboat launching area at Regatta Point on Lake Quinsigamond. This was treated and the problem overcome.

One of the major problems on the Boston Harbor Islands is the presence of the Norway rat. Without the influence of humans these rodents are able to survive on shell fish dead fish which float up onto the shore. When humans are present in any great numbers their resultant garbage and refuse allows the rats to increase their populations, therefore compounding the problem. During the past fiscal year two of the most rat populated islands, Grape and Slate, were treated. Excellent control was attained but not complete elimination. Complete erradication of the species from the islands would be desirable but it would be unrealistic to believe it possible. As long as the public is invited to use the islands, rats will continue to flourish there.

Summation

Fiscal year 1977 saw a significant increase in two major forest insect problems - the gypsy moth and the oak leaf tier. It should also be noted that this year saw the first laboratory confirmation in Massachusetts of the presence of elm phloem necrosis, a disease almost as deadly as the Dutch Elm Disease. The year saw the removal and complete disposal of the 260 tons of unwanted pesticides which had been stored in bunkers at Wompatuck State Park.

The year also saw the continued efforts of the Bureau to slow down the incidence of the Dutch Elm Disease and to keep the various cities and towns abreast of the gypsy moth situation by providing technical advice as to the degree and extent of the pest population. Bureau personnel were also available to advise and recommend concerning the various insect and disease problems facing the various communities - a major Bureau responsibility.