

SANITARY MAYFLY DISPOSAL THROUGH COMPOSTING

LEPF 97-01

NOVEMBER, 2000

FINAL REPORT

LAKE ERIE PROTECTION FUND PROJECT LEPF 97-01

SANITARY DISPOSAL OF MAYFLIES THROUGH COMPOSTING

Daniel A. Bryan, Safety Service Director, Current Project Director
City of Port Clinton, 1868 E. Perry St., Port Clinton, Ohio 43452

November 2000

Summary

Long time residents of the City of Port Clinton can remember seeing or being told about the yearly "invasion" of mayflies or as they were commonly called June bugs or Canadian soldiers. They would talk of the streets being covered with mayflies a foot deep and being hauled away by the truckload. As the pollution of Lake Erie became more evident and the water quality deteriorated, the mayfly invasions dwindled. With the improved condition of Lake Erie in the 1990's, there was a marked increase in the mayfly hatch that occurs yearly primarily during the months of June and July. It was in June of 1996 that the City once again experienced the "invasion". The citizens awoke to find the pests hanging from poles, lights posts, their homes and businesses and piled in the streets as if it had snowed. The City crews indeed did use front-end loaders to scoop up the mayflies so that they could be disposed of. They collected and disposed of 35 streetsweeper loads of mayflies. The residents and business owners would wash down their homes and businesses so that they could easily sweep up the remains. It quickly became evident that to mix them with water was a grave mistake as they then emitted an odor similar to rotting fish. Besides the sanitary issue, there was also a safety issue. When the mayflies would be squashed, they would leave an oily residue that was very slippery. On the main state route that follows the shoreline, we had to post signs "Reduce Speed-Slippery Roads Due to Mayfly Hatch". On a lighter side, media from across the country would call City Hall to get daily update reports on the mayfly hatch from our local "Mayfly Madam". Because numerous lakeshore communities were also experiencing these problems, it quickly became evident that an improved method of disposing and controlling them was required. Mayor Thomas Brown obtained the Lake Erie Protection Fund Grant to determine if the mayflies could be composted and develop the method and procedures to do it.

Project Review

The major scope of the project was to develop and implement composting of the mayflies. The initial requirement was to obtain a special sanitary landfill license. Because the City always had an abundance of brush that was collected from property owners, it was determined that after this brush was ground, that it would be mixed with the mayflies and placed in windrows so that they could easily be continually turned to

promote the composting process. It became evident during the first collection of mayflies that another problem existed. How to separate the trash (paper, glass, and cans) from the mayflies as these materials could not be mixed in with the composting materials. Public education became very important at this stage as the City needed their help to keep the mayflies trash free and also in the area of control. One of the major findings was that if we could eliminate lights along the shoreline at night, the mayflies did not move into shore in such mass quantities. The residents and business owners were asked to turn off as many outside lights as possible. The City also contacted First Energy to assist by turning off the streets lights along the shoreline and back three city blocks. In 1996, 1997 and 1998, First Energy turned these lights off at their convenience so that the City would not have to be charged an additional fee. This meant that sometimes they were off for close to four months. In 1999, Mayor Brown obtained permission from the Lake Erie Protection Fund to use some of the grant monies to have First Energy install eighty-six switches which would control 115 lights. The installation was completed in 2000. It is now a very simple process for our City crews to turn the lights off and on. This has greatly reduced the number of mayflies entering the City.

The initial composting process entailed a lot of trial and error implementation. The City crews now have the entire cleanup and composting process simplified and it is very quick and efficient. Initially, mulch from existing brush was screened to separate the larger pieces. A bed of the larger mulch was laid down into a windrow. A 5x1 ratio of small mulch to mayfly was mixed and added on top of the base. Another 8" to 10" of small mulch was added, another mulch and mayfly mixture was added and so on until the windrow height is achieved. The windrow was allowed to set undisturbed for an initial thirty days. It was then turned every ten days to two weeks for an additional two months. It was then ready for use and only turned occasionally. Through experimentation, it was found that the screening process could be eliminated as it did not make any difference in the end result if you used large or small mulch in the process. The end product has little or no smell and is nice organic humus. The City uses the completed mulch in and around their plantings throughout the City and residents can obtain it free of charge for their own use.

The City has worked very closely with Mr. Fred Snyder of Sea Grant and Dr. Ken Krieger of Heidelberg College in Tiffin. Mr. Snyder gave a presentation on "Composting Nuisance Mayflies for Sanitary Disposal" at the International Conference on Great Lakes Research at Cornwall, Ontario in May 2000. Dr. Krieger is conducting his own mayfly research with LEPF grants to study and track the increase of mayfly populations. Being the first pilot project in the United States in handling this problem, the City has set a standard that other communities with the same problem can benefit from. We intend to continue to monitor the yearly hatch and its affect on the City of Port Clinton. This ecology program has certainly proven what it takes to control mayfly infestation and Lake Erie shoreline communities now realize that a problem can become an ecological solution with some creative thinking.

Letter to shoreline businesses

City of Port Clinton
Department of Safety and Service
City Hall - 1868 E. Perry Street
Port Clinton, Ohio 43452
(419) 734-5522



Ronald D. Bivens
Director

June 17, 1997

As you may or may not be aware, the "lights out" policy downtown, on Perry Street and on Buckeye Boulevard in the City has begun. The mayflies have started their decent and street lights, building lights, and windows with lighted displays attract them and they pile up to great depths in those areas.

The Entomologist researching the insects indicate the reproduction rate of the insect is increasing dramatically. It is possible that the infestation this year could be 2 to 3 times as bad as last year.

We would like to request your cooperation to keep lights out or kept at a minimum without jeopardizing the security and safety of your business.

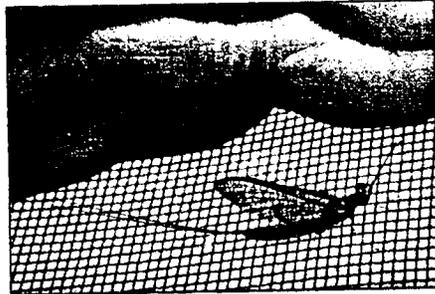
One other suggestion is as the mayflies do accumulate, please do not attempt to hose them off. Combined with water, the smell is quite unpleasant. Although this may not be an option for everyone, some residents and business owners have found it useful to use leaf blowers to get the mayflies away from the buildings and into the curb area for pick up.

We are continuing to be in a learning process and one of the new things we are trying this year is composting of the mayflies through grant monies obtained through SeaGrant. If you have any questions, please contact City Hall at 734-5522.

Thank you,

Ronald D. Bivens
Safety-Service Director

This time around, mayfly attack will be met



BLADE PHOTO BY HENRAL LONG

Mayfly assays Moose Hall screen in Port Clinton.

BY KIM BATES
BLADE STAFF WRITER

PORT CLINTON — Mayflies unexpectedly hit this small Ottawa County city with a vengeance last year.

When they descended in late June, they attached themselves to lights and windows, created slippery roads, and forced city workers to sweep up piles of smelly dead bodies daily.

This year, city officials are preparing to wage an all-out battle with the pesky bugs — before the masses arrive.

"We're trying to be proactive," said Laurie Eberle, Port Clinton's clerk of council. "We've been trying to stay ahead of it."

When the first of the mayflies was

spotted here on June 17, Safety Service Director Ron Bivens sent out letters to area business owners asking them to consider keeping their lights out, or at a minimum, in upcoming weeks.

Since then, crews with Ohio Edison Co. have been shutting off some downtown street lights in connection with another "lights out" policy in town.

Yesterday, Port Clinton Mayor Tom Brown filed a three-year, \$38,000 grant application with the Ohio Lake Erie office in Toledo. If approved, the money would be used to create an innovative compost pile where the dead bugs could be placed.

Fred Snyder, the district's Ohio Sea

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Mayfly

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Grant specialist who orchestrated the unusual proposal, said they hope to place the dead mayflies into a pile of seasoned compost and sawdust, similar to the process that's used with fish waste.

"What we're trying to do in Port Clinton is a demonstration project," Mr. Snyder said. "They swept the streets diligently (last year) but there were so many flies they couldn't get. One thing that really struck me was this place really stunk. The problems we are trying to avert [with composting] are nuisance problems and health problems both."

Mayflies, which once roamed the lakeshore every summer, vanished in the 1960s when Lake Erie's pollution reached catastrophic lev-

els. But as the lake cleared, the mayflies re-emerged, but only in the lake's western basin. The eastern edge of Maumee Bay is a particularly fertile site.

Dr. Kenneth Krieger, one of the state's leading mayfly researchers, said that he has volunteers stationed throughout the state to document the bugs' arrival this year.

The species begins its life cycle with females laying eggs on the water. The eggs sink to the bottom and hatch millimeter-long nymphs that nestle in the bottom of the sediment.

The nymphs rise to the surface in late June or early July when they shed their skin. Huge numbers are gobbled up by yellow perch and other fish.

The insects live as flying, mating adults for only a day or two. The mayflies don't bite — or even eat — during their flying stages.

Although the water was un-

usually cold this season and restricted some of their growth, Dr. Krieger said the mayflies struck in mass during the middle of the week in North Toledo near Lake Erie.

He said the bugs could be seen swarming along Point Place's downtown strip and around a McDonald's restaurant there Wednesday night.

Dr. Krieger said the mayflies were documented by volunteers, who watch over insect boards with lights every night. For two hours after sundown, they check to see how many bugs are attracted to that light. He said about 150 of the insects attached to the board in Point Place during just one night.

Similar insect boards have been set up at Gibraltar Island near Put-in-Bay and in Catawba Island Township, northeast of Port Clinton. Dr. Krieger said mayflies have been found at Gibraltar Island but

they have not been sited in Catawba Island Township. He said 25 volunteers are tracking the bugs from Huron, O., to the Pennsylvania line. No bugs have been reported in those areas.

Toledo Edison Co. officials likewise are preparing for another attack of the mayflies.

A huge swarm descended upon the main substation at the utility's Bayshore power plant in Oregon last year, causing an unexpected "short" in the system. Lights dimmed across northwest Ohio.

Jim Proctor, an Edison spokesman, said that officials implemented a nighttime black-out schedule June 16 for certain areas of the Bayshore plant as well as the Davis-Besse Nuclear Power Station in Oak Harbor.

"This is the easy way to deal with it," Mr. Proctor said. "No lights. They don't come."

City gets grant to compost mayflies

BY TOM HENRY
BLADE STAFF WRITER

PORT CLINTON — City officials here want to do something useful with dead mayflies they scrape off streets next summer.

So, they're going to compost them and use the decayed material as organic fertilizer for use in local parks.

The city was awarded a \$25,592 grant from the Ohio Lake Erie Commission recently to set up a mayfly composting program that could be used as a model for other waterfront communities.

The grant is one of seven awarded by the commission, the largest of which was \$191,855 to Toledo for improvements along the Ottawa River to help pave the way for the new Chrysler Jeep plant.

Port Clinton is looking for a site to do its mayfly composting, Mayor Thomas Brown said.

He said the swarm of 1996 convinced him the city should seek a grant, especially because Ohio's leading mayfly expert, Dr. Kenneth Krieger of Heidelberg College in Tiffin, predicted greater swarms for future years.

Pound for pound, Port Clinton is one of the communities hit hardest. It scraped 35 to 40 truckloads of mayflies off city streets in 1996, prompting officials to temporarily post signs warning drivers about roads being unusually slick.

The bugs didn't come in such great numbers anywhere in north-west Ohio this year, but some people theorize it was just an off year.

The numbers might have been down because of cool lake temperatures, as well as the timing of a two-year cycle in which mayflies are embedded in the lake bottom as nymphs, researchers have said.

Even so, Port Clinton took steps to lessen the impact by turning off unnecessary street lights at night, as well as getting people to use more innovative ways to clear bugs from their property.

Mr. Brown said composting is an "environmentally friendly technology" that could cut down on the odors in the community during the annual swarms.

"We're a tourism community here. We can't afford to let this affect our economy," he said.

The Ohio Lake Erie Commission is a panel of state officials from six agencies. Its grant money is from the Lake Erie Protection Fund, established in 1992 with money from Lake Erie license plates sales and Ohio's portion of the Great Lakes Protection Fund.

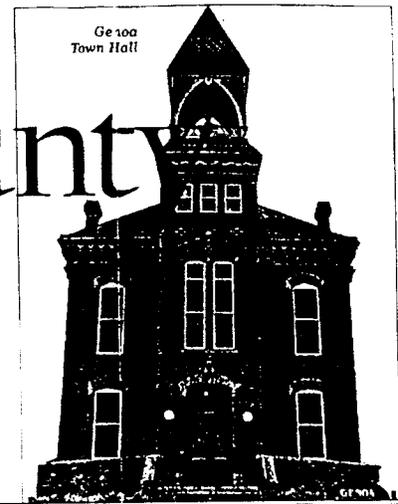
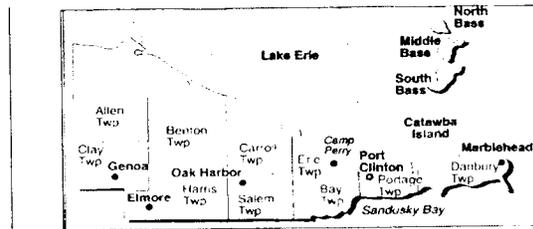
Other projects funded in this area include:

- \$100,000 to the Toledo Metropolitan Area Council of Governments for a Swan Creek watershed-improvement plan.
- \$42,000 to the Ohio Department of Natural Resources for wetlands restoration at Maumee Bay State Park.
- \$13,000 to the local chapter of Pheasants Forever for reducing erosion with native grass.

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November 27, 1999

Ottawa County



Port Clinton

Mayor wants switches on city street lights

By KEVIN G. BROSIEN
Staff writer

PORT CLINTON — The city wants to use the last portion of a state grant to install switches on street lights turned on and off during the summer mayfly invasion.

Port Clinton turns off downtown street lights when mayflies emerge from Lake Erie in masse and cover area streets and buildings. The invasion became a problem in the mid-1990s when a cleaner lake resulted in a

deluge of the inch-long insects along the Northcoast.

The insects, while harmless, are attracted to light and hover over mainland by the millions.

Living for about 24 hours after they emerge from the lake, their carcasses cover the city creating a smelly mess and hazardous road conditions similar to driving on ice.

Port Clinton received a grant from the Lake Erie Protection Fund to create a composting program which

began last year at a city cemetery.

There is \$5,000 left in that fund, and Mayor Tom Brown wants to use the money for the light switch program.

"When we turn the lights out in the city, we create a safety concern," Brown said. "It was almost two months before we could get the lights turned back on this year."

Under arrangements with Ohio Edison, the current policy is for the company to turn the lights off and on

when their schedule allows — at no cost to the city.

Brown said that because of the arrangement, there was an extended lag before the lights were turned back on this year. A power company officials said damage caused summer storms but crews behind schedule.

The switches would be concealed behind a locking plate so only city workers would have access to the switches.

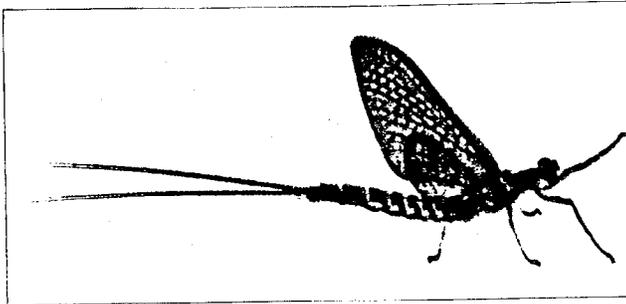
But this way, Brown said, street lights could be turned

on and off at the city's convenience.

Under the original grant arrangements, the money had to be used by the end of 1999.

Brown said he will ask for an extension to the grant to allow the city to use the money for the installation of the switches which cost \$175 each.

The idea came from a city resident who used to work for Ohio Edison, Brown said.



Mayflies, a favorite food of fish and birds, are an indicator of Lake Erie's water quality. BLADE PHOTO

Lights, changing winds lessen mayfly invasion

BY TOM HENRY
and KIM BATES
BLADE STAFF WRITERS

SANDUSKY — Contrary to popular belief, there might be a safe and effective way to shoo away annual mayfly swarms: Cross your fingers and hope the skinny, winged insects get blown over to Canada.

Dr. Kenneth Krieger, a senior research scientist at Heidelberg College's nationally recognized water quality laboratory in Tiffin, said strong, shifting winds were

likely the reason why Port Clinton — a lakefront community in Ottawa County known for getting hammered by mayflies each summer — didn't have many of the insects this year.

"The mayfly problem this year was not as bad as it was in the past," Port Clinton Mayor Tom Brown said. "The weather played a major role. We are better equipped to handle any problem than we were in 1996 when they were at their worst."

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Mayfly

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That's when the city had 35 truckloads of mayflies scraped from the streets, compared with less than one truckload this year.

Officials in other area lakefront communities, such as Put-in-Bay and Washington Township, adjacent to the Point Place area, said they noticed a decrease in the insects this season.

"We're used to a mess," Ken Kay, a Washington Township trustee, said. "But I didn't think it was that bad this year."

"It wasn't horrible," Put-in-Bay Mayor John Blatt said. "We had some off and on for a month. Last year, it was everyday for two months."

So where did the bulk of this year's mayflies end up?

They converged on a tiny rural lakefront community formerly known as Colchester, which was a pair of townships near the southern Ontario shoreline. About 30 miles southeast of downtown

Detroit, the townships were incorporated Jan. 1, 1999, with the inland cities of Harrow, Ont. and Essex, Ont., to form a new city called Essex.

Cheryl Bondy, Essex deputy clerk, said the swarm was the largest she had ever seen and prompted a research project by the University of Windsor.

"This was the first year I can remember our public works crews were power-washing sidewalks."

Dr. Krieger said the historic Colchester area was plastered because the bugs are so light they get carried off by wind.

"They're really not strong fliers," he said.

If anyone should know, it's Dr. Krieger. He is rather fond of mayflies and arguably surpasses all Ohioans in terms of looking forward to each summer's crop.

The bugs have been the focus of his research since 1992. For three years, he led a research project from Toledo to Conneaut, O., in which volunteers formed a "Mayfly Watch" and did just that — watched for mayflies.

During a presentation last week at the Ohio Lake Erie Commis-

sion's annual conference, Dr. Krieger said mayfly numbers have held steady after a peak in 1997 and appear to be headed toward equilibrium.

One new development could be their distribution.

Lake Erie's fertile western basin between Toledo and Sandusky remains their preferred locale. The western basin's warm, shallow water makes it a productive place for fish to spawn.

Mr. Brown credited the decrease in mayflies to the weather and to Port Clinton's new weapon: controlling the lights. City officials can turn off the lights themselves, preventing the mayfly attraction.

"We are able to cut them on and off when we know they are coming," the mayor said. The city paid about \$15,000 for the light switches using a grant from the Ohio Lake Erie Commission.

Mayflies are now being spotted as far east as Erie, Pa., and Buffalo, which was unheard of.

Dr. Krieger said he isn't sure whether it's a new development, or whether the flies were so scarce east of Cleveland that nobody took notice until told to look for them.

Mayfly nymphs have been found in lake sediment as far east as Conneaut, Dr. Krieger said. Nymphs are the bug equivalent of children, except they burrow in lake sediment for two years.

Research into nymphs in Erie and Buffalo is incomplete, he said.

Mayflies are a favorite food of fish and birds. The flies provided up to 5 per cent of the diet of one type of perch in a 1998 study, but came packed with more nutrition than one would expect from a source of food that small, Dr. Krieger said.

Mayflies are an indicator of the lake's water quality. Sensitive to environmental stresses, they were virtually wiped out after excessive sewage discharges and farm runoff in the 1960s and 1970s allowed algae to proliferate and rob the lake of oxygen.

A study from 1997 through 1999 showed 377 mayfly nymphs per square meter in Lake Erie's western basin. Between 200 and 250 nymphs per square meter is excellent, Dr. Krieger said.

Blade staff writer Jason Williams contributed to this report.