



The Heron

SPRING-SUMMER 2013

ISSUE NO. 28

The Newsletter of the Mattapoissett Land Trust, Inc. • www.mattlandtrust.org • E-mail: info@mattlandtrust.org

Land preservation and Global Warming

by Martin Hudis

Introduction

Everyone in today's world is aware of Global Warming. A growing number of scientists have begun forecasting a large increase in the US coastal sea level over the next two decades¹ due to global warming. US government studies are predicting a large increase in the impact from global warming on agriculture loss, human health issues and disaster cost² over the next 20 years. Not so commonly discussed is the positive impact of land conservation on global warming. This short article will estimate the impact of land conservation on reducing the Mattapoissett Carbon Footprint.

Fundamental Concepts

Earth's Average Temperature

The earth's average temperature results from a balance between the heating of the earth including its atmosphere from the sun and cooling of the earth by losing energy to outer space. The heat energy from the Sun is partially trapped between the surface of the earth and the atmosphere. A small change in the composition of the atmosphere leads to an increase in the trapped energy, which results in an increasing average temperature³. This slow change in the average temperature of the earth is referred to as global warming. Localized temperatures vary considerably over the surface of the earth due to many local factors. When these local temperatures are

averaged over time, an increasing temperature pattern has been detected in recent times. The increasing temperature results in melting of the polar ice fields and increases in the level of the oceans. Increasing temperature also has a big impact on weather and storm patterns.

The average temperature of the earth along with the level of the oceans has undergone large cycles over the long history of the earth. Historically natural processes have driven these cycles. Today these temperature changes are being driven by a combination of natural processes and man-induced processes. The impact is acceleration in the time scale for these temperature changes which in turn is having a big impact on ocean levels and weather patterns.

Composition of the Earth's Atmosphere

The composition of the earth's atmosphere is made up of a number of gases and small particulates (silicate dust, sea salt, sulfates, etc.)⁴. Of all the materials in the earth's atmosphere, Carbon Dioxide has one of the biggest impacts on trapping the Sun's energy. Small increases in the concentration of Carbon Dioxide have a large impact on the magnitude of the trapped energy and therefore the magnitude of global warming. Greenhouse gases are the atmospheric gases, which impact the trapping of energy between the atmosphere and the earth. Greenhouse gases normally refer to five compounds of which Carbon Dioxide has one of the largest impacts⁵.

Source of Carbon Dioxide

Greenhouse gases are generated both by natural processes such as thermal decomposition of dying trees and vegetation and Man-induced processes such as burning fossil fuel for heat, electricity and transportation. Natural processes still dominate the generation of Carbon Dioxide but Man-induced processes over the past 50 years are now making a significant contribution. Overlaying the natural processes with the Man-induced processes has led to a rapid increase in the time scale for global warming.

¹ *How High Could the Tide Go?*, Justin Gillis, *NY Times*, January 21, 2013

² *Blog by Justin Gillis summary some key points from a draft of a federal report on current and anticipated impacts from greenhouse gases-driven global warming on the United States.* *NY Times*, January 14, 2013

³ *Discussed in more detail on the Mattapoissett Land Trust web site (www.mattlandtrust.org)*

⁴ *ibid* 3

⁵ *ibid* 3

Carbon Footprint

Carbon Footprint is the amount of Greenhouse gas generated by man-induced processes per unit of time. [C02]e is the common symbol for the quantity of Carbon Dioxide equivalent⁶ generated over a period of time.

The Carbon Footprint is used as a yard-stick to measure the impact of various Man-induced Carbon Dioxide forming processes. This yard-stick will be used to estimate the impact of land conservation, on global warming. A [C02]e quantity of forty-eight tons (96,000 pounds) per year for the average US house household is a current common value being used in US for the house hold carbon footprint. Not included in this article is a comparison of the world number (around 13 tons/year).

To put this number in prospective, 48 tons of Carbon Dioxide would fill approximately 1.5 million Helium balloons and lined up one after another they would stretch twice across the state of Massachusetts.

This number is large and hard to imagine its origin. Its origin along with some background information is discussed in detail on the MLT web site.

Population and land area information for Mattapoisett⁷ along with the 48-tons/year number have been used to define the Carbon Footprint for Mattapoisett. The calculated Carbon Footprint is show below:

- 25 tons of [C02]e/year per person (Mattapoisett)
- 13.6 tons of [C02]e/year per acre of land (Mattapoisett)^{8, 9}.

Trees, Humans, Oxygen and Carbon Dioxide

In very simple terms, humans consume Oxygen and generate Carbon Dioxide. Vegetation, including trees, consumes Carbon Dioxide and generates Oxygen In summary, the average adult consumes around 675 pounds/year of Oxygen and generates about 700 pounds/year of Carbon Dioxide. A single acre of average forested land generates 6.2 tons/year of Oxygen and consumes 11.1 tons/year of Carbon Dioxide¹⁰

Land Conservation

A map of Mattapoisett showing protected land is posted on the MLT web site. The restricted land is held by local, state and federal organizations. A list of these organizations is also shown on the Mattapoisett map posted on the MLT web site.

As of 2004, the restricted Mattapoisett land is 18% (1,973 protected acres to 11,173 total acres). The 11,173-acre number is defined as non-water area. This is not the same as wetland and upland. Water area is the land containing rivers and ponds, etc.

Impact of Land Conservation on the Mattapoisett Carbon

6 *ibid 3*

7 *3,172 housing units, 6,268 permanent full time residence, Buzzards Bay National Estuary Program*

8 *Buzzards Bay National Estuary Program number for dry land not water area, 17.4 square miles or 11,173 acres*

9 *The map of Mattapoisett showing the protected land owned by various organizations is shown on the MLT web site.*

10 *Oxygen Production by Urban Trees in the United States, David J. Nowak, Robert Hoehn and Daniel E. Crane, Arboriculture & Urban Forestry, 2007, 33(3), Pg 220-236.*

Footprint

A few assumptions¹¹ have been made in order to calculate the impact of land conservations on the Carbon Footprint for Mattapoisett.

The major results of these calculations are presented below:

- Up to 263 new homes could be built if the existing land restrictions were removed. This does not remove state and federal restrictions such as wetland restrictions and building on land near municipal water wells.
- 1.12 tons/year/acre of additional {[C02]e} would be generated by the 263 new homes.
- 175-forested acres will be lost from building 263 new homes.
- The Carbon Footprint for Mattapoisett as a per acre number increases by 9.5 % if 263 new homes were built and 175 forested acres were lost¹².

If the restricted land would be developed, the Carbon Footprint in Mattapoisett would increase by about 10%. This estimate is based on a very simple model, which is open to a number of refinements but the impact is still real and significant.

Summary

There are many good reasons to promote land conservation. The Mattapoisett Land Trust (MLT) supports the preservation of land to develop open spaces for all the town residents to enjoy for all generations to come. The MLT specifically focuses on the protection of land, which has a big impact on the local environmental. Examples are land which buffers the pollution run off into Buzzards Bay; land surrounding the aquifer, which feeds the local water wells for Mattapoisett and the surrounding towns; land which contains important environmental benefit to the community and surrounding water ways and finally land which can be used for non-destructive recreation like nature hikes. In addition, reducing the Mattapoisett Carbon Footprint is also an important benefit of land conservation and the MLT.

¹¹ *Ibid 3.*

¹² *This calculation is described in some detail on the MLT web site.*

More on Global Warming

Additional references on the subject of this article are available in PDF format on mattlandtrust.org. Follow the links on the lower right of the home page.

The Mattapoisett Free Public Library has set up a reference area as well with related publications. Ask at the front desk.

Kayaking in Nasketucket Bay

by Paul Osenkowski

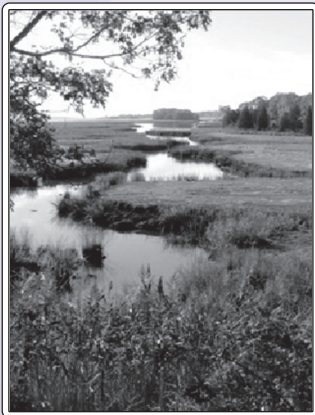
Being a resident of Mattapoisett affords us the accessibility to the wonderful waterway known as Buzzards Bay. We are attracted to this lifestyle because of related water sports and activities. Fishing, sailing, shellfishing, swimming and a myriad of saltwater activities are there for the taking.

About 10 years ago, my wife took up kayaking as a result of a neighbor talking to her about it. Seeing how much she enjoyed it caught my attention and we've become avid kayakers ever since. It's a great way to get out and enjoy the outdoors and a fantastic way to exercise at the same time. We live at Brandt Beach and can easily launch



from the end of the road but we also launch from many places throughout the area.

The Nasketucket Bay area affords the people of Mattapoisett many locations in which to explore and appreciate what Mother Nature has provided for us. The Brandt Island Cove has become our most frequently visited playground where we spend many hours observing the water fowl and other creatures that abound in the cove. Striped bass and bluefish feed throughout the area especially in the spring and can be seen swimming under our boats in the estuaries and canals at the northernmost end of the cove. These canals were created by the Army Corps of Engineers many years ago in an attempt to drain the "swamps" and thereby eliminate the mosquito problem. The canals are now a great place for the development of the tiny fish which grow up to produce the "catch" of the anglers today. Fiddler crabs, willets, egrets and herons all call this place home as do hundreds of other organisms. Great "prairies" of marsh grasses exist and were used by farmers to feed sheep and cattle in the agrarian times of old. It creates what I like to think of as the Tom Sawyer and Huckleberry



Finn playground in our backyard. At high tide you can go halfway up the length of the marsh and see Molly's Cove in Mattapoisett Harbor. I've even gone all the way across and around Mattapoisett Neck at moon high tide.



We love to monitor the numerous osprey nests which abound in Brandt Island Cove. There were three nests that produced offspring last year and a natural nest in a tree at the end of the Walega-Livingston trail. The large number of osprey and harbor seals that are present in the bay give you an idea of the number of fish that are available in this cove which according to an article produced by the Buzzards Bay Coalition is some of the cleanest water on the south east coast of the state. The remnants of ancient Native American fishing weirs on Mattapoisett Neck are a further testament to the health of the waters here. Many arrowheads and Clovis points can be found on the Neck following storm activity.

Launching from the town landing gives you access to the mouth of the Mattapoisett River and one of the most picturesque areas of all. It's a great place to visit early in the morning and then go out and explore the harbor. Pine Island Cove can be explored at high tide by launching at Ned's Point. Be careful though around Strawberry point since it can get really rough

out there. Shaw's Cove and Little Bay can be accessed by putting in at the ramp near the Fairhaven water tower on Sconticut Neck. There are many sandbar islands that can be investigated and the estuary can be navigated all the way up to the bike path. There are many rock islands that can be explored and West Island is a fascinating place to visit from a kayak.



Our granddaughter gets a kick out of riding in the kayak and seeing the seals and shore birds. Of course she also likes splashing me whenever she gets a chance but that's what creates a great excursion. Family outings on the bay can be just as enjoyable as sailing and for a lot less money. Be sure to bring drinking water and lots of sun screen but most of all bring a camera. The views could even awe Ansel Adams.



Salty's Eye Shines Once Again

By Martin Hudis

Salty's eye once lit up at night for about ten years. It was originally installed in June of 2000 and stopped working in the summer of 2010. Salty with its glass eye is shown below.

The light is an LED (light emitting diode) lamp, which is powered by a passive solar battery system. The LED lamp, some of the electronics, and the battery reached their end of life after about ten years of use and the light system stopped operating in mid-2010.

Salty with his eye lit has become an icon in Mattapoissett. When the eye stopped working, the MLT received a number of comments about the unlit eye at the 2011 and 2012 Harbor Days booth.

The sea horse was originally installed in 1955. In 2000 it was named Salty in a local children's contest and its eye was electrified. The electrical system which energizes the eye does not use utility power and as such has a "zero carbon" footprint. At the time Salty was named, a maintenance fund was donated to the MLT and the funds were restricted to Salty's maintenance. This funding source was used to give Salty an eyelift.

The passive solar electrical system was totally redesigned and rebuilt during November 2012 and the new system was installed on Saturday December 8, 2012. The eye stands about 26 feet off the ground and the installation of the new system required the use of an electric lift. The electric lift and the work being done on the eye are shown on the right. The original system had the battery, electronics, lamp and solar panel all installed in Salty's head which



prevented easy and quick maintenance. The new system moved the electronics and battery to a tamper resistance electrical enclosure, which was installed on the pole five feet off the ground. This will provide for much easier maintenance moving forward.

The size of the new system was increased by a factor of 4, which allowed the installation of a small DC to AC inverter on the inside of the enclosure. The small inverter will be used to provide a low power AC circuit on the property for special events like the Soiree, which is held every fall around Halloween. Lights for these special events have been powered in the past by using a small motor generator. The inverter was added so the motor generator could be eliminated for future special events on the Dunseith Property. The motor generator produces both noise and carbon emission so the elimination of the motor generator continues with the Land Trust's sensitivity to environmental issues.



Careful! Nesting Osprey



The spring is nesting and breeding time for our costal birds. For example you may be familiar with the signs urging caution around Piping Plover nesting areas.

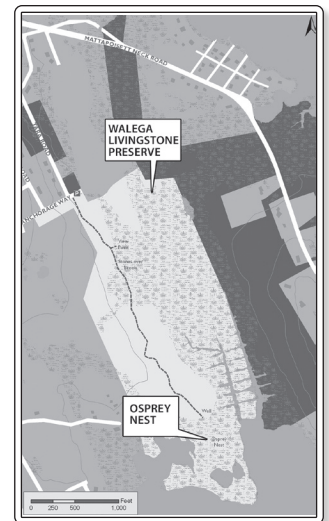
The MLT normally encourages you to enjoy the properties with your pets as long as you keep them under control and pick up after them,

Now we are asking a favor when you visit the Walega-Livingstone Preserve.

A natural Osprey nest (actually in a tree!) was discovered last year on this property. Your romping barking companion may disturb the Osprey as they breed and watch over their eggs and hatchlings.

Please keep your pet out of this area during the nesting season from April through May. A sign will be placed at the entrance to the preserve.

Thanks for respecting the wildlife on your MLT's properties.



Did you miss the party?

Special event held (we're pretty sure) for volunteers

In case you had not heard, seen it on our website, checked our Facebook page or received an actual invitation, the MLT held a special event to honor the lifeblood of our entirely volunteer organization. We depend on volunteers for everything from maintaining the properties you visit to making decisions on acquisition of new properties.

Originally the event was scheduled for Saturday, February 9 in Reynard Hall at the Mattapoisett Congregational Church. However the arrival of the Great Blizzard of 2013 forced a change to March 9.

Since publication and mailing of this issue fell before the rescheduled event, the following semi-fictional account is being substituted for an actual review.

Entertainment was provided by the Mike Bliss Quartet from Old Rochester Regional High School.

A light meal was provided followed by fabulous blueberry desserts prepared by your Board of Directors.

A little ceremony thanking our volunteers was held and specially designed tee shirts were presented to the volunteers in attendance. If you see somebody wearing one, please give them a hearty thank you for keeping open space available in Mattapoisett! Also, ask them how you can get involved and maybe get this spiffy apparel for yourself.



Special Talk at Mattapoisett Library

Jennifer Francis, PhD, will be speaking at the Mattapoisett Free Public Library, Wednesday, March 27 at 6:30, on her research about extreme weather and the melting Arctic ice cap.

Dr. Francis is a faculty member at Rutgers University in the Institute of Marine and Coastal Sciences and the Departments of Environmental Sciences and Meteorology.

She lives in Marion and is on the Board of Directors of the Sippican Lands Trust.

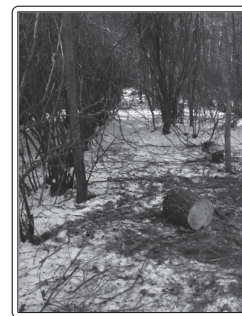
Join us for what promises to be a fascinating and educational session.

Blueberry progress report



Before

Work on the blueberry patch within the Brownell preserve is in full swing. Many trees and underbrush surrounding the bushes have been removed. Soil samples will determine the need for fertilization and a hard cutback of the bushes will allow new growth on viable plants to begin. The project was partially paid for by a Community Grant from the Eastern Bank Charitable Foundation but still needs funding to proceed, so contact the MLT through the website or leave a message at 774-371-9191 to make a donation.



After

Honor Your Loved Ones

The following individuals or groups have chosen in the last six months to honor their loved ones through donations to the Mattapoisett Land Trust.

In memory of Barbara K. & E. Mason Welling;

Janis H. Dyer

Concord, MA

In memory of Barbara Welling, their neighbor:

Georgia and Tom Glick

Lexington, MA

Thank you for your generous contributions which will be used to further our mission of protecting the land and environment of Mattapoisett for generations to come.

THE HERON is published bi-annually by the Mattapoisett Land Trust.

The MLT, formed in 1974, is a non-profit, tax-exempt charitable organization incorporated under the laws of the Commonwealth of Massachusetts. Its purpose is to preserve open space for the enjoyment of current and future residents of Mattapoisett, as well as to educate the public about the sound use of natural resources, and to work with other organizations having the same goals.

Our membership consists of annual contributors — our primary source of revenue — and a volunteer Board of Directors: Kathy Bohan, Ray Cebula, Don Cuddy, Sandra Dawson, Ellen Flynn, Sandra Hering, Luana Josvold, Elizabeth Liedhold, Lou Martin, Jenny Mello, Paul Osenkowski, Charles Radville, Don Short and Gary P. Johnson, President.

The MLT is a non-profit 501 (c) (3) organization. All contributions are fully tax deductible.

Mattapoisett Land Trust, Inc.

P.O. Box 31

Mattapoisett, MA 02739

E-mail: Info@MATTLANDTRUST.ORG

Layout and Design by Charles Radville

2013 MLT Scholarship

Blanche B. Perry Scholarship offered for fourth consecutive year by Ellen Flynn

Since the Pell Grant Award has been eliminated and as student loan debt increases, the new generation of America's college bound students is even more dependent on private foundations and financial aid to cover their college costs.

For the fourth year in a row, the Mattapoisett Land Trust will select a qualifying candidate for the \$1000.00 Blanche B. Perry Scholarship Award. This award is available to a Mattapoisett resident senior graduating by June 2013, from secondary school and pursuing an education in the sciences and/or environmental studies or other related field.

The scholarship is made available through the Edith Glick Shoolman fund, a bequest left to provide support for children in the community. The scholarship is consistent with the Mattapoisett Land Trust mission of preserving land in order to enrich the quality of life for present and future generations of Mattapoisett residents and visitors and of furthering environmental education in the community.

Along with the application, the following additional information is required:

1. A Personal Statement about career goals as they relate to the mission of the MLT, past and present.
2. A signed Community Service Form documenting a minimum of 20 hours of community service.
3. A professional letter of reference (teacher or guidance counselor)
4. A character letter of reference from an employer, scout or community leader and or neighbor is required.
5. Official school transcript including credits and class rank.

The application forms will be found in the guidance offices at the local public and private schools or at the Mattapoisett Land Trust website, <http://www.mattlandtrust.org/education/>

Schools participating are:

1. ORRHS, Marion Road, Mattapoisett, MA 02739
2. Bishop Stang High School, 500 Slocum Rd., N. Dartmouth, MA 02747
3. OCRVT High School, 476 North Avenue, Rochester MA 02770
4. Tabor Academy, Front St. Marion, MA 02738

The deadline for submitting the forms is April 23, 2013

Applicants will be assessed according to academic achievement, pursuit of education in the sciences, and or environmental studies or a related field, personal statement, professional and personal references, community service, and financial need. Preference will be given to individuals who are members of the Mattapoisett Land Trust or whose parents or grandparents are members of the MLT.

The recipient will be selected by May 16, 2013 and will be notified by mail. The recipient will be recognized at his or her school's awards ceremony. The award will be disbursed after the student submits an official college transcript documenting successful completion of his or her first semester in college to the President of the Mattapoisett Land Trust

For more information contact the MLT at:

Mattapoisett Land Trust

ATTN.: Education Committee

P.O. Box 31

Mattapoisett, MA 02739

or by email at: info@mattlandtrust.org

Vernal pools

by Elizabeth Leidhold

A vernal pool is a contained basin depression lacking a permanent above ground outlet. In the Northeast, it fills with water with the rising water table of fall and winter or with the meltwater and runoff of winter and spring snow and rain. Many vernal pools in the Northeast are covered with ice in the winter months making them easy to spot through the trees during this time of the year.

All vernal pools contain water for at least a few months in the spring and early summer but by late summer it is not unusual for the pool to be dry. Because these pools dry up on occasion they do not support breeding populations of fish, which is essential to the reproductive success of many amphibian and invertebrate species. These pools provide a safe environment for those animals that cannot breed effectively anywhere else due to excessive predation.

The organisms that use a vernal pool exclusively for breeding or maturing are called the "obligate" vernal pool species, so called because they must use a vernal pool for various parts of their life cycle. By collecting evidence of breeding or juvenile obligate vernal pool animals, such as the mole salamanders and the wood frog, or any evidence of fairy shrimp, a pool may be certified for protection as a valuable wildlife habitat.

If you'd like to find out more about these special ecosystems please join the Mattapoisett Land Trust at www.mattlandtrust.org

**See calendar on back cover
for special vernal pool events**

Kids' Corner

A very odd resident of Mattapoissett

You may have seen a very oddly shaped animal called a horseshoe crab (*Limulus Polyphemus*) on a sandy beach sometime. While the Bay has lots of odd residents, the horseshoe crab really is in a class by itself.

Did you know...

...horseshoe crabs belong to the phylum of Arthropods with classes of insects, arachnids (spiders, etc.) and crustaceans (lobsters, etc) which have thousands of species, the class of Merostomata contains only 4 species of horseshoe crabs, one on the east coast of North America and the other three in Asia.

...the horseshoe crab has ten eyes and can see ultraviolet light that is not visible to humans.

...horseshoe crabs mate at high tide in late spring. They crawl onto a sandy beach and lay approximately 80,000 eggs in about 20 clusters. The eggs make an important food source for shore birds.

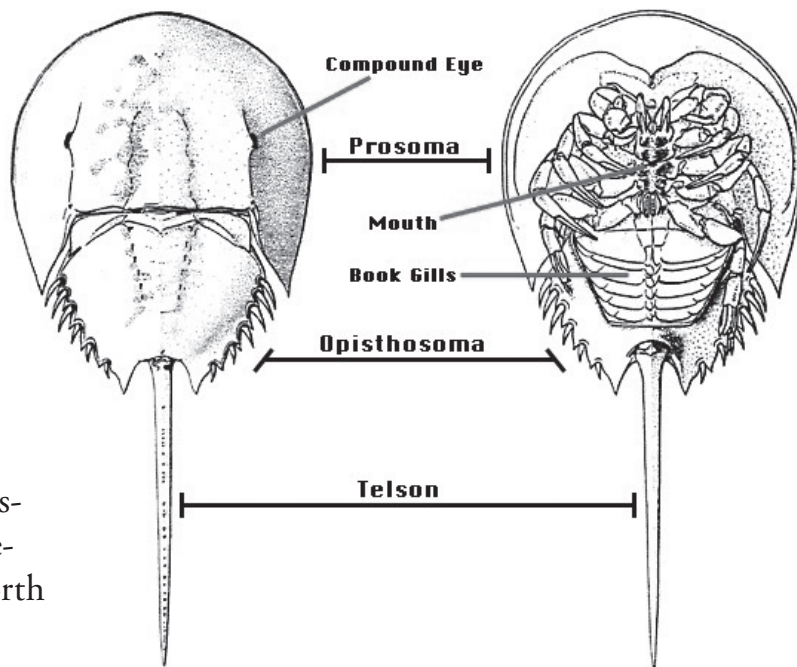
...the "blood" of horseshoe crabs is blue instead of red. It is used in creating a test for contamination of drug products that are injected into people.

...horseshoe crabs are one of the oldest animal species on earth- they are even older than dinosaurs.

...in 1588 British naturalist Thomas Hariot called the species "horsefoot crab" because of the shape of the shell.

If you want to learn more about this odd resident of our shore, please join us on May 11 when Vin Malkoski, Senior marine fisheries biologist from the Massachusetts Division of Marine Fisheries, will tell us more. And if you ever spot a horseshoe crab of the beach, you can help science by reporting it on the website: www.horseshoecrab.org/sightings/ , or just visit the website to learn more.

Adult Male Horseshoe Crab from Delaware Bay



Copyright © 1997 Great Blue Productions and Carl N. Shuster, Jr. Ph.D.



Mattapoisett Land Trust, Inc.
Post Office Box 31 ~ Mattapoisett, MA 02739

Presorted Standard
U.S. Postage Paid
Fairhaven, MA
Permit No. 39

The Heron

Calendar — 2013 Spring and Summer Activities

All Mattapoisett Land Trust events are free and open to the public

Check www.mattlandtrust.org for up-to-date information

Wednesday, March 27	6:30 PM	Environmental Lecture	Jennifer Francis, PhD, of Rutgers U. will speak on her research about extreme weather and the melting Arctic icecap.	Mattapoisett Free Public Library
Wednesday, April 3	6:00 PM	Vernal Pool Lecture	Wetland Scientist Elizabeth Leidhold will give a slide presentation on vernal pools at the Mattapoisett Library in preparation for certification field trip on April 6	Mattapoisett Free Public Library
Saturday, April 6	9:00 AM	Vernal Pool Certification	Join wetland scientist Elizabeth Leidhold for a fascinating hands on experience in the field. Learn about the springtime breeding place of wood frogs, salamanders and more!	MLT Woodcock Preserve
Saturday May 11	1:00 PM	MLT Annual Meeting	Join us beforehand starting at 11:00 for walks, activities and a potluck lunch	Friends Meeting House
Saturday, May 11	1:15 PM	Horseshoe Crabs	Presentation by Vin Malkoski, senior marine fisheries biologist from the Massachusetts Division of Marine Fisheries.	Friends Meeting House, following the Annual Meeting
July 20 & 21	10:00-4:00	Harbor Days	Visit our booth for current information on membership, acquisitions and trails. Purchase MLT tee shirts and more	Shipyard Park by the parking lot, under the tree