The following is excerpted from the Tick-borne Disease Prevention Committee's report, which is still in draft. 2/14/11

SECTION 4

GENERAL INFORMATION ABOUT TICK-BORNE DISEASE PREVENTION[1]

The key to reducing the incidence of tick-borne disease is based upon the ability to reduce the exposure and probability of human contact with infected ticks. In recent years, numerous medical organizations, townships, civic groups and individuals have researched a variety of ways to protect people from becoming bitten and infected. Some of these approaches have proven to be effective beyond a doubt. Others have uncertain results, are prohibitively costly or are harmful to the environment.

MEASURES THAT HAVE PROVEN TO BE EFFECTIVE

- Personal Care. Attention to protective clothing and personal care is the first line of defense against tick-borne disease. Measures include:
    - wearing of appropriate clothing,
    - use of tick repellents
    - daily bathing
    - prompt removal of ticks

- Landscape Modification. Landscapes can be modified so as to be less hospitable to small animals, deer and deer ticks.
    - Studies have shown that open-grass/sparse-shrub habitats contain fewer immature blacklegged ticks that high shrub areas. Tick densities are greatest on mice trapped from areas with more shrub cover and woody stem densities.
    - The "edge" effects of shrub patches provide large areas for deer browsing.
    - Excessive watering of grass will increase the humidity and promote a more favorable habitat for ticks.

- Deer Control. Blacklegged tick numbers and distribution are directly linked to deer density. Deer are the primary host for the adult blacklegged tick; deer feed most adult ticks and are key to the reproductive success of the tick. Other potential hosts are not as important as deer. It has been proven that islands that lack deer do not sustain deer tick populations even with alternative hosts available.

[1] Information about tick-borne disease prevention methods has been taken from a number of sources including the Nantucket Report, pp. 15-29 and the Dover, MA Report.

There is a direct correlation between the rise in the density of deer in the eastern U. S. and the epidemic curve for Lyme disease. Information generated from scientific studies and successful reduction programs indicates that if deer herd density is reduced to or below 8-10 deer/sq. mile, tick numbers can be lowered to levels that decrease risk of human disease.

MEASURES THAT HAVE NOT PROVEN TO BE EFFECTIVE OR THAT ARE UNTESTED, COSTLY OR ENVIRONMENTALLY HARMFUL

- Acaricide Usage. Acaricides are pesticides for ticks. The most common is permethrin, a member of the pyrethroid class of pesticides. The devices using permethrin include:

    - Permethrin spray. Applied in May or early June to target nymphal ticks, the stage most likely to transmit tick-borne disease. Adults may be targeted by spraying in the fall (or in the spring if no fall application was made). Highly toxic to fish and other aquatic organisms, but generally less so to mammals, birds and other wildlife.

    - The Four Poster device to apply acaricides to deer consists of a central bin containing whole kernel corn as bait. When deer feed on the bait, the device forces them to rub their heads, necks and ears against permthrin-impregnated applicator rollers.

      Some studies have shown the device to be effective in reducing tick density. A study conducted by the U. S. Department of Agriculture in five eastern states showed a 71% reduction in nymphal ticks after 5 years. Another study in Connecticut failed; sufficient ticks remained to reproduce and cause disease. Further experiments are currently being conducted and studied on Cape Cod and Shelter Island. The technique is labor-intensive and costly. The coast to set up the system on Shelter Island was $182,000 in the first year and $118,767 in the second year.[2]

    - Damminix Tick-tubes® are cardboard tubes filled with cotton balls treated with permethrin that mice collect to build their nests. Ticks that feed on nesting mice in the spring and fall are exposed to permethrin.

      The effectiveness of Damminix tubes is uncertain. Two studies in Connecticut and New York State failed to show any reduction in the number of infected, host-seeking nymphs when this product was used for a three-year period in woodland and residential areas; a Massachusetts study reported reductions.

    - "Bait box" systems, which attract mice and apply an acaricide to their bodies when they enter, have not been extensively tested. One of these products, Maxforce®, has been removed from the market because of low sales.

[2] Shelter Island Task Force, Executive Summary, www.shelter-island.org/deerandtick/report.html

- Immuno-contraception. Contraceptive drugs can be administered with corn that has been treated or with under-the-skin implants or injections. Best used for single herds of deer that are manageable. The Maine Department of Inland Fisheries & Wildllife does not consider fertility control to be a safe and effective means of controlling wild populations of deer.[3]

- Biological Control. The use of predators, parasites and pathogens has been examined for tick control, including chalcid wasps, fungi and nematodes. Such biological controls have not been extensively tested and may interfere with typical predator-prey dynamics.

- Small Animal Control. Small animals and rodents are key intermediate hosts for tick-borne disease. The control of small animals is best accomplished by reducing the dense vegetation and ground cover that provide cover for them as they forage for food. A widespread, organized program directed at artificially reducing the small animal population has no supporting data indicating a reduction in tick-borne disease and may in fact alter the ecological balance of the environment.

[3] Maine Department of Island Fisheries and Wildlife, *Deer Reduction Protocol*, June 2001