Appendix M-7
Buck Moth Study

Hugh McGuinness, PhD.

Assessment of Coastal Buck Moth (*Hemileuca maia*) Populations at the Spinney Road Site, East Quogue, New York

By Hugh McGuinness, Ph.D.*

The Coastal Buck Moth (*Hemileuca maia*) is a charismatic, day-flying member of the Giant Silk Moth family (Saturniidae). It belongs to a complex of sibling species that feed on oaks (*Quercus* spp.) and range throughout the eastern United States. On Long Island, the Buck Moth is restricted to stands of Scrub Oak (*Quercus ilicifolia*), a shrubby oak species that occurs within pine-barrens habitats. The Buck Moth appears to favor stands that have not been overtopped by the canopy of pines (mainly *Pinus rigida*) and other oak species.

The Coastal Buck Moth is listed by the New York State Department of Environmental Conservation (NYS DEC) as a rare species of "special concern." Its state ranking of S1 means that it is "critically imperiled because of rarity…or factors making it especially vulnerable to extinction…in New York State." The primary reason for its rarity is that the host plant is uncommon and patchy in distribution because it is dependent on disturbance (typically fire) to maintain the open, sandy habitats in which it thrives. In the last 50-100 years the host plant range in New York has decreased due to fire suppression and to the development of barrens habitats. As a result Buck Moth populations have also decreased. Buck Moths appear to readily respond to newly opened patches of Scrub Oak created by fire.

During May, June and October of 2009 I surveyed a large parcel of land in East Quogue, New York, on three occasions to look for Buck Moths. The first survey was conducted to look for egg masses and young larvae. The second survey searched for larvae. The final survey searched for adults using live, pheromone-emitting females.

Methods

The property in question comprises nearly 400 acres east and north of Spinney Road, and north of Lewis Road, in East Quogue, New York, and is hereafter referred to as the Spinney Road property. It lies within 5 miles of a very large population of Buck Moths in the Dwarf Pine Plains of Westhampton (see Figure 1), and thus has the potential to host this species.

Before the surveys, I was provided with a map of Scrub Oak stands on the Spinney Road property compiled by Nelson, Pope & Voorhis (NPV). On both visits I concentrated on the mapped areas, although on the first survey I ventured into other areas to look for Scrub Oak that might have been missed by NPV personnel. Although I found several Scrub Oak plants not indicated on the map, these were

mostly small, scraggly individual plants that were not part of a larger aggregation. Thus all subsequent work was concentrated in two Scrub Oak patches identified by NPV: one at the northern end and the other in the central portion of the property.

The Buck Moth's biology makes sampling fairly straightforward. Females lay eggs during the late Fall near the terminus of Scrub Oak branches, so that the young larvae, which hatch during May, have easy access to tender, young, nutritious foliage. Egg masses, which have an easily identified appearance, can be found by looking near the tips of branches that are low to the ground. The young larvae are gregarious for the first three instars, and therefore their feeding damage is concentrated and localized. Damaged leaves are readily apparent by visual inspection and groups of larvae can typically be found by turning over leaves near the damage.

The first survey was conducted on 9 May 2009. During this survey I sampled 250 Scrub Oak branches in both the northern and southern Scrub Oak patches (n = 500). I sampled 5 randomly chosen branches on small trees and 10 such branches on large trees. About 40 trees were examined in each patch. The terminal 70 cm of each branch was examined for egg-masses and for leaf damage. Damaged leaves were turned over to look for groups of feeding larvae

The second survey was conducted in June 2009. I repeated the sampling procedure from the first survey, except that I concentrated on feeding damage and did not look for eggs masses. On June 7, I visited a Westhampton site known to contain a large population of Buck Moths (hereafter referred to as the DPP trail site, see Figure 1) and surveyed the site for 1 hour to make sure that I was able to find Buck Moth larvae in a place where it is known to occur. On June 8, I visited the Spinney Road site during which time I examined about 250 branches in each of the previously identified Scrub Oak patches (n = 500).

On October 30, I re-visited the DPP trail site where I had found Buck Moth larvae in June and also a nearby site within the Dwarf Pine Plains (hereafter referred to as the DPP burn site, see Figure 1) known to hold a high concentration of Buck Moths. I did this in order to demonstrate that adults were flying at this time. It was a warm day with temperatures reaching 60 F, and I arrived in the afternoon, which prior experience suggests is a good time to find flying adults. I brought with me two newly enclosed, unmated female Buck Moths obtained from Connecticut. These moths emit a pheromone that "calls in" nearby males. I spent 30 minutes at each site.

The following day, 31 October 2009, I returned to the DPP burn site where I spent 60 minutes to determine if Buck Moth adults were flying that day. Temperatures were in the mid-50s, which experience has shown is warm enough for adult Buck Moths to fly. After this I proceeded directly to the Spinney Road site and spent over 30 minutes within each of the two previously indentified Scrub Oak stands on the property.

Results

In both the May and June survey I was unable to find any evidence of Buck Moth occurrence at the Spinney Road site. Despite looking at over 1000 branches over two days I found neither egg masses nor larvae. In contrast my June visit to the DPP trail site produced 4 larval groups and 2 egg masses in an hour of work, during which I looked at perhaps 75 branches.

No adults were found on the Spinney Road site during the visit on 31 October 2009. In contrast, on 30 October the calling females attracted 1 male in 30 minutes at the DPP trail site where I had found larvae in June, and 5 males in 30 minutes at the DPP burn site. On October 31, I revisited the DPP burn site prior to sampling at Spinney Hills. I called in 2 males in 30 minutes, and also observed two additional flying Buck Moths, including a female.

Discussion

My surveys found no evidence of Buck Moths at the Spinney Road site despite the presence of the host plant and the proximity of this site to a known high-density population in the Dwarf Pine Plains of Westhampton, NY. It is, of course, possible that I missed larvae at the site, but the encounter rate I had in Westhampton suggests that in 7 hours of observing trees at Spinney Road I should have encountered larvae even if they occur in low density. It seems less likely that I could have missed adults since my search was aided by calling females. The lack of Buck Moths at the Spinney Road site seems to be due to the poor quality of the Scrub Oak stands, which are reduced to understory trees in a canopy of pine and oak. Thus the current habitat seems unlikely to support a viable Buck Moth population, and it seems reasonable to conclude that Buck Moths are not currently using this site.

*--Hugh McGuinness
12 Round Pond Lane
Sag Harbor, NY 11963
631 697 2099
hmcguinness@ross.org

Map showing the DPP trail site and the DPP burn site in proximity to the Spinney Road property