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CONSERVATION OF TWO THREATENED SOUTH FLORIDA BUTTERFLIES AND THEIR HOST PLANTS (LEPIDOPTERA: LYCAENIDAE, NYMPHALIDAE)

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ABSTRACT.- Anaea troglodyta floridalis and Stymon acis bartrami have been found in reduced numbers in recent years due to environmental causes and factors introduced by humans. Protection of the butterflies and proper management of their habitat will be essential for their preservation in the Florida Keys and on the South Florida mainland.

KEY WORDS: Anaea, butterfly conservation, Euphorbiaceae, Florida Keys, habitat conservation, Lycaenidae, Nymphalidae, Papilio, Papilionidae, Strymon.



Fig. 1-2. 1. Anaea troglodyta floridalis at rest. 2. Strymon acis bartrami feeding on Croton linearis.

In addition to the well-known federally listed endangered Schaus Swallowtail butterfly (*Papilio aristodemus ponceanus* Schaus) in south Florida, there has been concern about the status of two other butterfly species that are found in the Florida Keys and south Florida mainland. Both the Florida Leafwing (*Anaea troglodyta floridalis* Johnson and Comstock) (Fig. 1) and Bartram's Hairstreak (*Strymon acis bartrami* (Comstock and Huntington)) (Fig. 2) were listed in the previously published *Rare and Endangered Biota of Florida*, *Invertebrates* (Franz, 1982) as Species of Special Concern and as as Threatened Species in the 2nd edition volume (Deyrup and Franz, 1995). In addition, these species were cited in 1989 as High-Priority Status species by Dale Schweitzer of the Nature Conservancy for listing as

Endangered Species. Sponsored by the U.S. Fish and Wildlife Service, a survey by the present authors between July 1994 and July 1995 indicated that these two butterfly species have continued to decline in numbers since the time of the last survey (Hennessey and Habeck, 1991). Presently, the butterflies are found only on Long Pine Key in Everglades National Park (Fig. 3) and on Big Pine Key in the Florida Keys (Fig. 4).

Both butterfly species occur in the open tropical pinelands of Everglades National Park (Fig. 5) and Big Pine Key of the Florida Keys (Fig. 6) where their larval hostplant, *Croton linearis* (Euphorbiaceae), is found (Fig. 7). Adult leafwings and adult hairstreaks prefer dense stands of the hostplant. *Croton* was not found in areas where the pinelands had grown very thick. Stands



Fig. 3-4. 3. Current distribution of Anaea troglodyta floridalis, Strymon acis bartrami, and their hostplant, Croton linearis (Modified from Franz, 1982) on Long Pine Key in Everglades National Park. 4. Current distribution of Anaea troglodyta floridalis, Strymon acis bartrami, and their hostplant, Croton linearis (modified from Minno and Emmel, 1993) on Big Pine Key in the Florida Keys.

of *Croton* tend to grow most densely on pineland edges and in previously cleared areas (e.g., access roads, and areas damaged by hurricanes and fire). *S. a. bartrami* tends to form localized colonies near these dense *Croton* stands. In general, *A. t. floridalis* does not spend most of its time flying near the *Croton*; however, males will establish territories in areas of high host densities and females will search for these same stands of *Croton* when ovipositing. Most of the time, the leafwings can be seen flying swiftly through the pinelands.

The reduced numbers of these two species in recent years has been blamed on several factors. First, fire was excluded in their pineland habitat in past years in the Key Deer Refuge of Big Pine Key to help protect the endangered Key Deer. Unfortunately, fire exclusion prevents the occasional clearing of dense understory growth. Dense growth in the pinelands creates an unsuitable environment for many plant species and the organisms which depend on them. Second, aerially sprayed and truck-sprayed insecticides (Naled and Fenthion, respectively) are used to control mosquitoes in much of the butterflies' habitat on Big Pine Key. In lowering the number of mosquitoes, the pesticides may also be lowering the numbers of butterflies in some areas. Eliazar (1992) tested larvae of three butterfly species and determined that Naled (Dibrom 14) was extremely toxic and Fenthion (Baytex) was moderately to extremely toxic. Third, urban development in Dade County and the Keys has destroyed a good portion of the habitat and with it, the butterflies' hostplants.

To insure the conservation and recovery of these two butterfly species, prescribed burns need to be continued to keep the pinelands open enough to encourage *Croton* growth (Fig. 8). When these burns take place, large existing stands of *Croton* need to be spared because not very many areas remain which have high host densities and can serve as seed reservoirs to recolonize newly burned areas. In addition, since butterflies may be present on these plants in any of the three juvenile stages, prescribed burns would be safest when high numbers of adults of the two butterfly species are flying, so fewer immobile stages are harmed.

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Fig. 5-8. 5. Tropical pineland habitat on Long Pine Key in Everglades National Park. 6. Tropical pineland habitat on Big Pine Key in the Florida Keys. 7. Larval host, *Croton linearis*. 8. Recent prescribed burn on Big Pine Key.