John V. Calhoun
Palm Harbor, Florida

September 25, 2013

U.S. Fish and Wildlife Service
Division of Policy and Directives Management
Attn: FWS-R4-ES-2013-0084
4401 N. Fairfax Drive
MS 2042-PDM
Arlington, VA 22203

RE: PEER REVIEW OF DOCKET NO. FWS-R4-ES-2013-0084

General comments

Like many other tropical species of butterflies, *Anaea troglodyta* and *Strymon acis* precariously survive in Florida at the northern reaches of their ranges. Although these species were discovered in Florida during the latter half of the nineteenth century, the endemic subspecies *A. t. floridalis* and *S. a. bartrami* were not recognized and described until 1941 and 1943, respectively. They share the same habitat and hostplant, thus they are inexorably linked and vulnerable to the same threats. Their habitat, which has always been limited in extent, has been profoundly impacted by human activity. Fragmentation has reduced populations to mere vestiges which may never recover.

Efforts to save rare butterflies in southern Florida have resulted in little success, perhaps suggesting that we are desperately attempting to prevent the disappearance of species whose survival in Florida has *always* been tenuous. We are essentially forcing the proverbial square peg into a round hole. The only clear success story is the Atala butterfly (*Eumaeus atala*). Following decades without records, *atala* was rediscovered and recovered through the efforts of private individuals. This species was never formally listed as endangered, yet it continues to thrive on the southern Florida mainland. Unlike other rare species, however, *atala* is capable of colonizing urban habitats and can exploit landscape cycads as hostplants. On the other hand, conservation efforts that involve native habitats and hostplants have been far less encouraging. Long-term strategies to stabilize the Schaus' Swallowtail (*Papilio aristodemus ponceanus*) have proved disappointing. Despite several years of captive breeding and reintroductions, the Miami Blue (*Cyclargus thomasi bethunebakeri*) rapidly lost ground and is now known to occur at a single locality (assuming, of course, that the remaining population represents the endemic Florida subspecies and not an unrecognized Cuban entity). We have already lost two south Florida specialties, the Zestos Skipper (*Epargyreus z. zestos*) and the endemic Rockland Grass Skipper (*Hesperia meskei pinocayo*), both of which winked out without any attempt to mitigate their decline. The continued survival of Klot's Skipper (*Euphyes pilatka klotsi*), an endemic found only sparingly on Big Pine Key, is uncertain at best.

This scenario should be of no surprise to anyone who has witnessed the astonishing loss of habitat throughout southern Florida, especially the Keys. I am very fortunate to have had the opportunity to observe all these species in Florida, but they no longer occur where I encountered them many years ago. Additional Florida butterflies will likely become extinct as habitats diminish, but we must try to prevent this outcome whenever possible. Ignoring the decline of *floridalis* and *bartrami* would only serve to compound our irresponsibility.

I therefore support the listing of these butterflies as endangered, if for nothing more than to bring much needed attention to the factors that threaten many rare endemic taxa of Florida. The proposed rule, as published in the Federal Register (78(158):49878-49901), includes pertinent data and provides sound arguments for listing these taxa. Citations are copious and relevant. In addition, please consider the following comments and observations pertaining to the proposed rule.

1. *Taxonomy*
    a. Existing evidence supports the recognition of *floridalis* as a subspecies of *troglodyta*. As noted in the proposal, Smith et al. (1994) suggested that a comparison of the immature stages of *floridalis* and West Indian relatives may aid in determining the status of *floridalis*. Although I am not aware of any detailed comparative studies, figures and descriptions by Askew & Stafford (2008) of the early stages of *A. troglodyta cubana* from the Cayman Islands do not reveal any significant differences. Consistent differences in adult morphology, however, indicate that these taxa at least deserve subspecific recognition.
    b. Opler & Warren (2003) based their taxonomic treatment of *floridalis* on that of G. Lamas, as published in Lamas (2004).
    c. In addition to the literature cited, Calhoun (1997) also listed *floridalis* as an endemic subspecies of *troglodyta*.

2. *Life History*
    a. Although many recent authors have detailed the life histories of *floridalis* and *bartrami*, it was Matteson (1930) who first discovered the hostplant and figured the early stages of *floridalis*, which he considered "common in Miami." He also correctly surmised that *bartrami* larvae "probably feed on *Croton linearis*."
    b. Also of interest are the figures and descriptions of the early stages of both *floridalis* and *bartrami* by Minno et al. (2005).
    c. In addition to the numerous literature citations given to determine the phenology of adults, there are many historical specimens of both taxa available for examination in various museum collections, including the McGuire Center for Lepidoptera and Biodiversity (Florida Museum of Natural History, Gainesville, Florida).

3. *Historical Ranges*
    a. Although few specimens exist to support the regular occurrence of these species north of present-day Miami-Dade County, Skinner (1894) and Slosson (1895) mentioned captures of *bartrami* during two different years at Lake Worth in Palm Beach County, suggesting that a local population existed in that vicinity.
    b. Information regarding the range and status of *floridalis* and *bartrami* were also provided by Minno & Emmel (1994a, 1994b).

4. *Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*
    a. There is no direct evidence that collecting activities have affected, or could affect, populations of these butterflies. As noted in the proposed rule, these species are very

rare and few adults are observed at any given time. This would make it very difficult for anyone to obtain enough adults to impact a population. The rarer of the two, *floridalis* flies rapidly, does not visit flowers, and is very challenging to capture. It can require a great deal of time to capture only one or two individuals. Although *bartrami* freely visits nectar sources, few adults are typically seen together. In addition, remaining populations of these butterflies occur primarily on protected land. Although it is still possible to poach specimens, heightened awareness by others makes it more difficult for a collector to remain undetected in such areas, especially when they are present for long periods (as would likely be necessary to collect a series of either species).

b. It is stated that multiple websites have been found to offer for sale specimens of south Florida butterflies that are candidates for listing, while one site specifically offered *floridalis* and *bartrami*. This is somewhat misleading, as the only applicable species listed on the most current edition of the Candidate Notice of Review (21 November 2012) are *floridalis* and *bartrami*. It was not known when, or from where, such specimens were collected. Without more evidence, it cannot be assumed that they were obtained recently or that they originated from protected areas. Many lepidopterists who collected these species during past decades are getting older and parting with their collections. It is certainly possible that the specimens being sold were collected many years ago when these butterflies were less scarce and occurred in unregulated areas.

5. *Other Natural or Manmade Factors Affecting Its Continued Existence*
    a. It is stated that losses in genetic diversity within populations of both taxa may already have occurred. The very low number of existing populations, particularly of *floridalis*, would limit the ability to improve genetic viability. Only one metapopulation of this taxon is currently known (Long Pine Key).
    b. Although I fundamentally support the proposed listing of these taxa, I struggle to understand how their status will be significantly improved in the long-term. It is stated that the effects of small population size, isolation, and loss of genetic diversity are likely significant threats. These threats, as well as others, are expected to "continue at current levels or potentially increase in the future." It is further argued that "these threats have impacted the butterflies in the past, are impacting these butterflies now, and will continue to impact these butterflies in the future." Although captive breeding and release programs have been conducted for the Schaus' Swallowtail for many years, such efforts have not resulted in any new sustainable populations. Similar programs for the Miami Blue have been unsuccessful and both species continue to decline. With the addition of federal protection and the potential designation of critical habitat, what will be done differently to increase the chances of recovery for *floridalis* and *bartrami*?

LITERATURE CITATIONS

Askew, R. R. & P. A. van B. Stafford. 2010. Butterflies of the Cayman Islands. Apollo Books, Stenstrup, Denmark. 169 pp.

Calhoun, J. V. 1997. Updated list of the butterflies and skippers of Florida (Lepidoptera: Papilionoidea and Hesperioidea). Holarctic Lepid. 4:39-50.

Lamas, G. (ed.). 2004. Atlas of Neotropical Lepidoptera. Checklist: Part 4A. Hesperioidea – Papilionoidea. Scientific Publ., Gainesville, Florida. xxxvi+439 pp.

Matteson, J. H. 1930. *Anaea Portia* – the leaf-wing and a list of the Rhopalocera of Miami, Florida. Privately printed, Miami, Florida. 16 pp.

Minno, M. C., J. F. Butler, & D. W. Hall. 2005. Florida butterfly caterpillars and their host plants. Univ. Florida Pr., Gainesville, Florida. 341 pp.

Minno, M. C. & T. C. Emmel. 1994a. Bartram's hairstreak. *Strymon acis bartrami* (Comstock and Huntington). Pp. 626-627. *In* M. Deyrup & R. Franz (eds.), Rare and endangered biota of Florida, Vol. IV. Invertebrates. University Florida Pr., Gainesville, Florida.

_____. 1994b. Florida leafwing. *Anaea troglodyta floridalis* Johnson and Comstock. Pp. 649-651. *In* M. Deyrup & R. Franz (eds.), Rare and endangered biota of Florida, Vol. IV. Invertebrates. University Florida Pr., Gainesville, Florida.

Opler, P. A. & A. D. Warren. 2003. Butterflies of North America. 2. Scientific names list for butterfly species of North America, north of Mexico. Contrib. C. P. Gillette Mus. Arth. Study, Ft. Collins, Colorado. 83 pp.

Skinner, H. 1894. [Capture of *Thecla acis*]. Entomol. News 5:180.

Slosson, A. T. 1895. Collecting at Lake Worth, Fla. Entomol. News 6:133-136.

Smith, D. S., L. D. Miller & J. Y. Miller. 1994. Butterflies of the West Indies and south Florida. Oxford Univ. Pr., New York, New York. x+264 pp, 33 pls.