Summary of Comments and Recommendations

In the April 18, 1994, proposed rule and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. Appropriate State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. A newspaper notice inviting public comment was published in the "Fayetteville Observer," Fayetteville, North Carolina, on May 6, 1994. Only one written comment was received, and that letter expressed support for the proposal.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that Saint Francis' satyr should be classified as an endangered species. Procedures found at section 4(a)(1) of the Act and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to Saint Francis' satyr (Neonympha mitchellii francisci) are as follows:

A. The present or threatened destruction, modification, or curtailment of its habitat or range. Because of its relatively recent discovery, it is impossible to determine what the original range of Saint Francis' satyr might have been. However, based upon its demonstrated dependency on periodic fires and the general trend of fire suppression on private lands, it seems reasonable to assume that it once occupied a more extensive area. This assumption is further supported by extensive recent searches of suitable habitat where the species could not be found. As stated by Hall (1993):

In order for *francisci* to have survived over the past 10,000 years, there must surely have been more populations and greater numbers of individuals than apparently now exist * * * . As is true for many species that were once widespread in the sandhills, massive habitat alteration must also be a major factor in the diminution of the range of *francisci* * * reductions in *francisci*'s range would have accompanied the extensive loss of wetland habitats in the coastal plain. Again, the draining of swamps, pocosins, Carolina bays, savannas, flatwoods, and bogs for conversion to agriculture and silviculture is well known. In the case of *francisci*,

however, the extirpation of beavers from the Carolinas may have been the greatest factor.

Beavers had been virtually eliminated from North Carolina by the turn of the century. Reintroductions began in 1939, but it was several decades before they again became an agent for creation of the sedge meadow habitats favored by Saint Francis' satyr (Hall 1993, Woodward and Hazel 1991). Hall further states:

As the landscape mosaic of open woodlands and wetlands of the coastal plain declined throughout the past two centuries, the range of francisci must have become increasingly fragmented. Although isolated populations may have persisted as long as suitable habitat remained, the structure of their metapopulation would have been destroyed. Opportunistic colonization of newly available habitats as well as the repopulation of sites wiped clean by fire or other catastrophe would have become eventually impossible; one by one, the isolated remnants would have blinked out of existence. Although again speculative, the fracturing of metapopulations has been used to explain the decline of the arogos skipper and a number of butterflies associated with the tall-grass prairies (Panzer, 1988, D. Schweitzer, pers. comm.). That francisci was a relict to begin with only exacerbated this problem; the overall effect was to bring it as close to extinction as any butterfly in the country.

The sole surviving population of this species is now fragmented into less than half a dozen small colonies that occupy a total area no larger than a few square miles.

B. Overutilization for commercial, recreational, scientific, or educational purposes. Both subspecies of Neonympha mitchellii are highly prized by collectors, including commercial collectors who often systematically collect every individual available. Several populations of the northern subspecies are known to have been obliterated by collectors, and others are believed extremely vulnerable to this threat (Refsnider 1991). As mentioned in the Background section, the single known population of Saint Francis' satyr was so hard-hit by collectors in the 3 years following its initial discovery that it was believed to have been collected to extinction. Subsequent to the emergency listing of the northern subspecies in 1991 (56 FR 28828) and prior to the publication of the emergency listing of Saint Francis' satyr, the North Carolina population was the last site where Neonympha mitchellii could legally be collected. Following the emergency listing of Mitchell's satyr, the North Carolina Natural Heritage Program received several inquiries from collectors about access to the last available population. Several expressed

apprehension about any restriction on collecting of this rare and much-soughtafter satyr. Collectors reportedly visited the known site every day throughout the flight periods, taking every adult they saw (Hall 1993). After this first wave of over-collection, many unsuccessful searches for the butterfly were made before it was eventually rediscovered. Numbers of individuals then seen were much lower than those reported by Parshall and Kral (1989), with the highest single count consisting of only 11 butterflies (Hall 1993). Even though part of this population is protected from collectors by virtue of being within dangerous artillery impact areas on Department of Defense (DOD) land, intensive collecting from the periphery of these areas could reduce total population numbers below the levels needed for long-term survival. Very little is known about this species' life history and ecological requirements, but it appears to be a more vagile species than its northern relative. It may well be dependent upon a large metapopulation structure in order to colonize new sites or recolonize those from which it has been extirpated.

C. Disease or predation. This butterfly, like others, is undoubtedly consumed by predators, but there is no evidence that predation is a threat to the species at this point. Disease is not known to be a factor in its decline.

D. The inadequacy of existing regulatory mechanisms. Insects are not protected from collection under North Carolina law. There are also no DOD regulations that would restrict the collecting of Saint Francis' satyr in North Carolina. Federal listing of this species will provide legal protection against indiscriminate taking and illegal trade.

E. Other natural or manmade factors affecting its continued existence. Although the habitat occupied by this species is dependent upon some form of disturbance to set back succession (e.g., periodic fire and/or beaver impoundments), intense fires at critical times during the life cycle of the species can eliminate small colonies. Historically, this would not have been a problem since there were undoubtedly other adjacent populations that could recolonize extirpated sites. However, the fact that only one population of this species now remains makes it more vulnerable to such threats as catastrophic climatic events, inbreeding depression, disease, and parasitism. Part of the occupied area is adjacent to regularly traveled roads, where there is the threat of toxic chemical spills into the species' wetland habitat. Current military use of the impact areas is