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# Lepidopteran Survey of Grand Teton National Park

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## LEPIDOPTERAN SURVEY OF GRAND TETON NATIONAL PARK

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### Objectives

Lepidopterans play an integral role in high altitude Rocky Mountain ecosystems as larval herbivores and, more importantly, as pollinating adults. Lepidopterans also constitute a major food source for many other invertebrates and vertebrates in Rocky Mountain food chains. However, very little is known of the important lepidopteran aspect of ecology within Wyoming ecosystems, and virtually nothing of scientific value has been published on the lepidopterans of the National Parks in Wyoming.

In 1979-80, we proposed the initiation of a base line study on the macro-lepidopteran species and the formulation of a synoptic list of these species inhabiting Grand Teton National Park. These major objectives would facilitate the determination of populational levels, habitat preferences, seasonal flight periods, life histories, and economic/ecological designations as detrimental defoliators or beneficial pollinators of the species within the Park.

Studies conducted in Rocky Mountain National Park and elsewhere in Colorado, Wyoming and Utah (Bagdonas, 1976; Bagdonas, *et al.* 1977a, 1977b, 1977c, 1977d, 1978a, 1978b, 1978c, 1979a, 1979b, 1979c, 1979d, 1979e, 1979f, 1979g) have indicated many lepidopteran species in the Rocky Mountains are survivors of the Pliocene glaciations. The data obtained from these "relict" or "marker" species can be used in the ageing and the determination of the rates of evolution within the high altitude ecosystems of Grand Teton National Park. Some lepidopteran specimens in a small Park collection, housed at the Colter Bay Ranger Station are recognized Rocky Mountain "Pleistocene relicts".

As proposed in 1979-80, all data collected will be used toward the completion of a book for the National Park Service on the butterflies and moths of Grand Teton National Park. With expanded studies, this book could logically cover the lepidopterans of both Grand Teton and Yellowstone National Parks.

## Methods

The macro-lepidopteran fauna was monitored in portions of Grand Teton National Park from June 1 through August 18, 1979. Aerial nets were used to collect and identify diurnal species of butterflies and moths. Nocturnal species were attracted throughout the Park with the aid of portable Bio Quip No. 2808 ultra violet lamps powered by U.S. Army surplus 12 volt magnesium dry cell batteries. In addition, an electrical, mixed light trap with a 300 watt bulb, stationed at the UW-NPS Research Center, was operated as frequently as weather conditions permitted throughout the field season.

All macro-lepidopteran specimens, observed and/or collected, were recorded with accompanying weather conditions and floral descriptions of the study areas. The majority of collected specimens have been pinned and spread. Reference collections of both diurnal and nocturnal species of macro-lepidopterans within the Park were formulated to increase taxonomic consistency for ourselves, regional museums, and the U.S. National Museum (Smithsonian) in Washington, D.C. In addition, unknown moth species have been turned over to specialists at the Smithsonian for classification.

A conscious effort was made to sample all major habitat types in Grand Teton National Park, including the remote high altitude and talus slope areas. However, emphasis was placed on the high altitude areas in the northern portions of the Grand Teton Range, because of the proximity to the UW-NPS Research Center and because of relatively little human disturbance in these areas.

## Results

From June 1 through August 18, 1979, our field team spent over 3400 hours in the field and laboratory working on the Grand Teton Project. A total of 59 days and 35 nights were spent in the field collecting, observing, and recording data on both butterflies and moths. Over 8,500 butterflies were recorded comprising 57 species in 7 families. Approximately 2,500 moths were also recorded during the field season. However, many of the approximately 100 moth species in 10 families are unknowns and have been sent to taxonomic experts at the U.S. National Museum in Washington, D.C.

Of special importance was the discovery of the very rare sphingid moth, Proserpinus clarkiae in the Park. Two specimens recorded near two Ocean Lake and Harem Hill on June 24 and 25, 1979 are the first Wyoming records for this species. In addition, populations of the beautiful silk moths, Hemileuca eglanterina and H. hera picta were discovered in the Park in several areas. Relative population numbers for these two important species during the field season are given in Figure 1.

Relative numbers of butterfly species in flight throughout the field season are also given in the lower part of Figure 1.

Important data have been collected for lepidopterans in areas covering approximately half of the Park but only a third of the Park has been covered extensively. An expanded research program is planned to include the additional areas of the Grand Tetons.

### Conclusions

Classification of Grand Teton lepidopterans is still in progress, but we can conclude many new species have been recorded for the Park and the State of Wyoming. The proposed three-year project is on schedule with good data being recorded from about a third of the Park in 1979. We can expect the total number of lepidopteran species to double or triple when other areas are sampled in an expanded research program.

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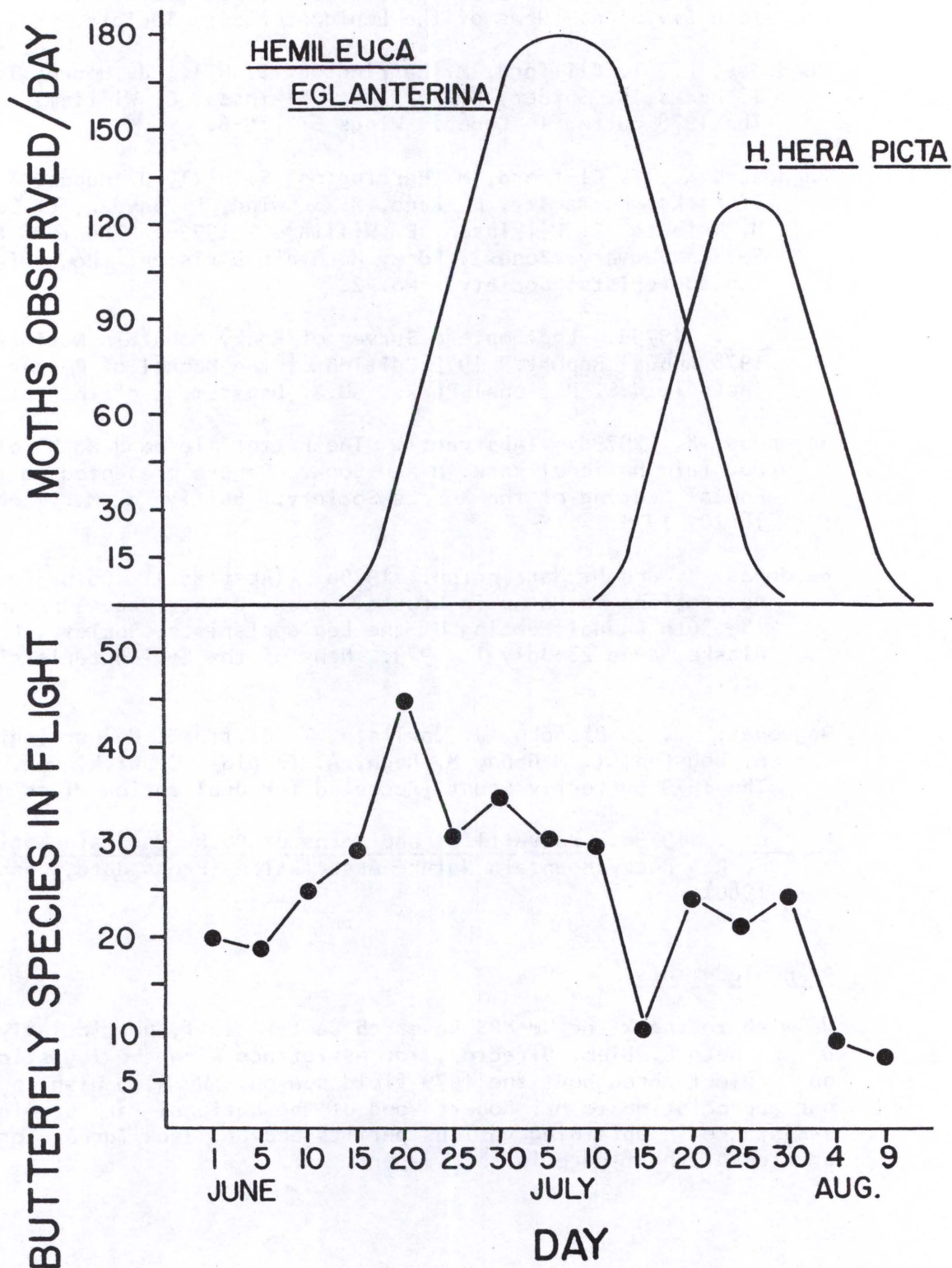


FIGURE 1