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 Craters of the Moon National Monument
 July 31- August 17th, 2001
 Butterfly Survey/Assessment

For just over two weeks I surveyed numerous, different environments at Craters of the Moon National Monument, taking samples of the various types of butterflies so as to see what kinds of butterflies are present at the Monument.

I broke down the multitude of environments at Craters into three categories: riparian, sagebrush, and south end areas, which consisted mainly of lava, cinders, and sparse vegetation. The riparian areas I surveyed included Quickshot Canyon, Leech Creek, Big Cottonwood Creek and Little Cottonwood Creek. The sagebrush environments included all the roads along the north end of the park from Blizzard Mountain Road to Big Cottonwood Creek Road, as well as non-riparian mountain ridges. The south end areas included the Loop Road, Tree Molds Trail, and the Wilderness Trail to Echo Crater. I usually spent one day at each location to see the different types of butterflies that may come out as light differences and light intensities changed and became more suitable to some and less favorable to others.

I observed by far the most butterflies in riparian areas. Butterflies sighted there include Coral Hairstreak (8), Draco Skipper (8), Western Square-dotted Blue (20), and Compton's Tortoiseshell (8). Sagebrush areas exhibited the second most numbers of butterflies, with prodigious amounts of Becker's white (>30), Clouded Sulfur (13), and Draco Skippers (9). South end areas exhibited the smallest number of butterflies, exhibiting only the Variable Checkerspot and the Giant Sulfur, both in small numbers (3 for both).

The only difficulty that I encountered during the course of my survey was the time of year. By August, most butterfly species have already flown and are either dead, migrating south, or have begun to hibernate, making it difficult to obtain a true survey of all the different types of butterflies that could occur at the Monument.

Included below is a list of likely butterfly species in the Monument, as taken from the USGS Northern Prairie Research website, for future reference (www.npwrc.usgs.gov/resource/distr/lepid/bflyusa/id/toc.htm).

Family Hesperidae, The Skippers:

Grass Skippers

- Woodland
- Draco
- Western Branded
- Juba
- Garita

Spread-wing

- Common Checkered
- Two-Banded
- Persius
- Silver-spotted

Family Papilionidae, the Swallowtails and Parnassians

Parnassians

Clodious

Rocky Mountain

Swallowtails

Anise

Indra

Western Tiger

Two tailed

Pale

Family Pieridae, the White and Sulfurs

Whites

Becker's

Spring

Checkered

Western

Margined

Cabbage

Large Marble

Desert Marble

Stella Orangetip

Sulfurs

Clouded

Orange

Queen Alexandra's

Giant

Pelidinc

Family Lycaenidae, the Gossamer-Wings

Coppers

Lustrous

Ruddy

Blue

Purplish

Mariposa

Hairstreaks

Coral

Behr's

Sooty

California

Slyvan

Western Green,

Sheridian's Green

Western Green
Thicket
Blue
Western Square-dotted
Arrowhead
Silvery
Melissa
Greenish
Boisduval's
Lupine

Family Nymphalidae, the Brush Foots
Heliconieans and Frittilaries

Mexican
Great Spangled
Coronis
Zerne
Callippe
Great Basin
Northwest
Mormon
True Brush Foots
Northern Crescent
Field
Mylitta,
Hoary Comma
California tortoiseshell
Milberts tortoiseshell
Compton's tortoiseshell
Painted Lady
Red Admiral

Family Satyridae, the Satyrs and Wood-nymphs
Satyrs

Common Ringlet
Common Wood Nymph
Small Wood Nymph
Common Alpine
Chryxar Arctic

Family Hesperidae, the Skippers

Family Facts:

- The family is known as the Skippers because the butterflies exhibit a rapid, erratic ("skipping") flight pattern. The Skippers are not considered to be "true" butterflies, but are more closely related to the true butterflies than are the moths.
- There are at least 250 species of Skippers in North America, with 34 of them occurring in Idaho. The Skippers of Idaho represent three subfamilies, the Pyrginae (Spread-Winged Skippers), the Hesperinae (Grass Skippers), and the Heteropterinae (Skipperlings).
- These butterflies are generally characterized by the following: 1) a large, hairy body; 2) a large head, at least as wide or wider than the thorax; 3) fully developed and functioning forelegs in both sexes; 4) small, pointed wings; 5) unique pattern of venation on the forewing; and 6) curved or hooked antennae tips. Males of many species possess a patch of scent scales on the forewing, called a stigma, useful in attracting females. Males may also have a folded portion of the forewing on the leading edge, called a costal fold, which encloses scent scales.
- Many species of Skippers bask in the sun with a unique posture, the forewings being open only half way and the hindwings open fully.
- Eggs are tiny (less than the width of the head of a pin!) and vary in appearance, but often are dome-shaped. Caterpillars generally are green with tapered bodies, often live in shelters constructed with leaves and silk, and frequently are the stage which overwinters. Pupae hang in loose cocoons and may have a silk girdle.

Family Papilionidae, the Swallowtails and Parnassians

Family Facts:

- In Idaho, this family consists of two subgroups, the Swallowtails (Subfamily Papilioninae) and the Parnassians (Subfamily Parnassiinae). The Swallowtails are large butterflies bearing one or two long, tail-like extensions off the rear of the hindwing. They are often black and yellow in color. Parnassians are medium- to large-sized white butterflies that often have sections of their wings which appear somewhat transparent.
- About 30 species belong to this Family in North America, with nine occurring in Idaho. Of those eight, two are species of Parnassians. There is only one other species of Parnassian that occurs in North America, and it occurs in Alaska and northwestern Canada.
- In addition to the traits described above, members of this family are generally characterized by the following: 1) medium to large size; 2) unique pattern of wing venation on the fore- and hindwing; and 3) fully developed and functioning forelegs in both sexes.
- Other interesting traits of Swallowtails include a behavior called hill topping, in which males and females congregate at the tops of slopes or ridges in their effort to locate a mate. Swallowtails continue to move their wings while taking nectar from flowers, unlike other butterflies. This behavior is believed to help stabilize the large butterflies who otherwise might unbalance the flower, causing it to tip or bend.
- Eggs of both Swallowtails and Parnassians are round and green. The young caterpillars of Swallowtails often look like a bird dropping while older caterpillars are often greenish and marked with large eyespots. They are equipped with an osmeterium, a Y-shaped gland located behind the head which can be pushed out to emit a chemical disagreeable to potential predators. The Parnassian caterpillars vary in appearance but are often black, and they may be equipped with an osmeterium. Swallowtail pupae form no cocoon, often have both a cremaster and a silk girdle, and typically are the overwintering stage. Parnassian pupae generally are in a loose cocoon located on the ground in leaf litter; the egg and the caterpillar are the usual overwintering stages.

Family Pieridae, the Whites and Sulphurs

Family Facts:

- Most members of Family Pieridae are white or yellow in color, as the family's common name implies.
- There are about 60 species of Pierids in North America, with 19 occurring in Idaho. Those in Idaho represent two subfamilies, the Pierinae (Whites, Marbles, and Orangetips) and the Coliadinae (Sulfurs). Most are fairly common.
- Members of this family are generally characterized by the following: 1) medium size; 2) the tips of the legs, called the claws, are forked; 3) the forelegs of males and females are full-sized and fully functional; 4) the

wings of many species reflect and absorb ultraviolet light in specific patterns, which helps the butterflies identify potential mates of the same species; and 5) many exhibit sexual dimorphism, meaning that butterflies of the same species look differently, depending on their sex. Several species are seasonally variable, with individuals emerging early in the season looking differently than those emerging later.

- Eggs are generally round and elongated, like a cylinder, and ribbed. Caterpillars are generally green and without hairs or spines. The caterpillars of most Whites feed on various species of mustards (Family Brassicaceae), while the caterpillars of most Sulphurs feed on legumes (Family Leguminosae). Pupae typically have both a cremaster and a silk girdle, and often are pointed at the head. Generally no cocoon is formed.

Family Lycaenidae, the Gossamer-Winged Butterflies

Family Facts:

- The family is known as the Gossamer-Winged butterflies because their wings, like the fabric, generally appear delicate and shimmery. Their wings are covered both by pigmented scales and by light-refracting scales.
- There are at least 100 species of Lycaenids in North America, with 47 occurring in Idaho.
- There are three main subfamilies represented in Idaho: the Blues (Subfamily Polyommatae), the Coppers (Subfamily Lycaeninae), and the Hairstreaks and Elfins (Subfamily Theclinae).
- The butterflies are generally characterized by the following: 1) small size, with a wingspan usually less than two inches; 2) reduced forelegs in males but full-sized forelegs in females; 3) a slightly different pattern of wing veins. Most of the Hairstreaks have a thin tail extending from the rear of the hindwing.
- Eggs generally appear round and flattened. Caterpillars generally are small, shaped like slugs, and hairy. The caterpillars of many of the species of Blues and Hairstreaks have a dorsal nectary organ which produces a sugary solution agreeable to ants. The ants feed on the solution and in turn protect the caterpillar from predators (a behavior referred to as "tending"). Pupae are generally small and round, may have a silk girdle, and are located near or on the ground. Generally no cocoon is formed. The pupa may have a nectary organ as well, allowing it to be tended by ants. Some pupa are capable of emitting barely audible sounds, a behavior believed to aid in protection from potential predators. Overwintering occurs as either the egg, caterpillar, or pupa.

Family Riodinidae, the Metalmarks

Family Facts:

- The common name of this family, the Metalmarks, refers to the bright, metallic spots marking the wings of many of its members.
- Some sources consider this family to be a subfamily of the Lycaenidae. Like the Lycaenids, the males of this family have reduced forelegs while the females have full-sized, fully functional forelegs.
- There are only about 20 species of this family occurring in North America; only one can be found in Idaho. It belongs to the Subfamily Riodininae.
- In addition to the traits listed above, the butterflies are generally characterized by: 1) the foreleg of most males, in addition to being reduced, has a uniquely shaped first segment (the coxa) which extends beyond its joint with the second segment, rather than meeting it flush; 2) the hindwing exhibits unique venation; and 3) most species perch on the undersides of leaves with the wings held open and completely flat.
- Eggs vary in shape but often appear round and flattened. The caterpillars are usually hairy, plump, and are the common overwintering stage. Pupae are hairy and attached with silk to either the host plant or to ground debris or leaf litter. There is no cocoon.

Family Nymphalidae, The Brush-Footed Butterflies

Family Facts:

- The family is known as the Brush-Footed butterflies because the forelegs of the adults are small and hairy, resembling tiny brushes, and are not used for walking.
- At least 150 species of Nymphalids can be found in North America, with 47 occurring in Idaho. These include the Fritillaries (Subfamily Heliconiinae), the true Brush-Foots (Subfamily Nymphalinae), and the Admirals and Relatives (Subfamily Limenitidinae).
- The butterflies in this family vary considerably in their appearance, but generally can be characterized by the following, in addition to their reduced forelegs: 1) medium to large in size and brightly and/or uniquely

marked; 2) the pattern of wing veins of the forewing is unique; and 3) the rigid antennae are tipped with little knobs, called clubs.

- Interesting traits demonstrated by some members of this family include lengthy migrations, territoriality, and the ability to overwinter as adults.
- Eggs vary in shape and in their arrangement on the plant. Caterpillars vary considerably in their appearance, but are often hairy or spiny. Pupae have a cremaster from which they are suspended upside down, but have no silk girdle and form no cocoon. Caterpillars are the typical overwintering stage, although the adults of some species may overwinter as well.

Family Satyridae, the Satyrs and Wood-Nymphs

Family Facts:

- This family is considered by some authors to be a subfamily of the Nymphalidae, the Brush-footed butterflies, because the forelegs of both sexes in both Families are reduced in size. Unlike most of the Nymphalidae, however, the bases of the veins of the forewing are swollen in all the Satyridae. The swollen parts contain special hearing organs.
- There are about 50 species of this family in North America, with nine occurring in Idaho. All belong to the subfamily Satyrinae.
- In addition to the traits described above, the butterflies of this family can generally be characterized by the following: 1) medium size, with a wingspan of 1 to 2 inches; 2) wings fairly plain, usually brown, gray, or orange in color, often with eyespots; 3) antenna with swollen but not knobbed tips; and 4) males often have a stigma (region of scent scales used in attracting females) on the forewing.
- Satyrs are often found in forest openings or in grassy fields and meadows. Other species belonging to this family, commonly called Arctics and Alpines, occur where their name describes. Wood-nymphs, however, are found in a variety of habitats including sagebrush steppe.
- Eggs are generally elongated or dome-shaped. Caterpillars are often green and well camouflaged, and have two "tails" at the rear. They most commonly feed on grasses and sedges, and are often the stage which overwinters. Pupae, sometimes within a silk cocoon, may suspend from a cremaster or may be nestled in a leaf nest on or under ground.

Family Danaidae, The Milkweed Butterflies

Family Facts:

- The family is known as the Milkweed butterflies because the caterpillars of most of its members feed on some variety of milkweed (Family Asclepiadaceae). When feeding on these plants, the caterpillars obtain certain chemicals which remain in their bodies. The chemicals cause them to be distasteful to predators, both as caterpillars and later as adults, and through experience, potential predators learn to avoid these species.
- Some authors consider this group of butterflies to be a subfamily of the Nymphalidae, the Brush-footed butterflies, because the Danaidae, like the Nymphalidae, have forelegs that are reduced in size. However, unlike the Nymphalidae and most of the other butterflies in our region, the Danaidae are unique in that their antennae are not covered with scales.
- Most members of this family occur in Asia; only four species occur in North America, one of which is the well-known Monarch. Two species occur in Idaho, and both belong to the Subfamily Danainae.
- In addition to the traits described above, this family is also characterized by: 1) large size, with a wingspan typically of three inches or more; 2) orange, brown, or black coloration in North American species; and 3) a hair pencil, a brushy extension from the rear of the abdomen in males, which is used to direct pheromones towards a female during courtship.
- Eggs are typically elongated and ribbed. Caterpillars are typically brightly colored and without hair or spines but bearing a pair of long filaments at each end. Pupae form no cocoon, have a cremaster but no silk girdle, and may be spotted.