

# **Presentation on Butterflies to the Master Naturalists Program, City of Fort Collins**

**By Scott Ellis**

## **I. Literature Sources**

See attached annotated bibliography

## **II. Butterfly Classification**

Class: Insecta

Order: Lepidoptera (scaly wings)

Suborder: Heterocera - Moths (antennae various shapes, but not clubbed; usually thick-bodied; structure called a frenulum that joins the front and hind wings; usually night flying).

Suborder: Rhopalocera - Butterflies (antennae nearly always clubbed at the end; no frenulum, usually thin-bodied; usually day-flying).

Butterfly families: Distinguished by wing venation, specialized anatomical structures.

- Hesperidae (Skippers)
- Papilionidae (Swallowtails)
- Lycaenidae (Blues, Coppers, and Hairstreaks)
- Nymphalidae (Brush-footed Butterflies)
- Satyridae (Woodnymphs, Arctics, and Alpines)

## **III. Butterfly Names**

Common Names: Many of our butterfly species also occur in Europe and Asia, so we use the Old World names. Lists of common names for U.S. butterflies have been developed.

## **IV. Butterfly Diversity**

- Colorado has the fourth largest number of butterfly species in the U.S., after Texas, Arizona, and New Mexico.
- Larimer County has the second largest number of butterfly species in Colorado (185 species).
- The Fort Collins natural areas probably support about 120 butterfly species.

## **V. Life Cycle**

Complete metamorphosis: (Egg, Larva, Pupa (chrysalis), Adult)

Number of generations: (Single, Multiple, Adult hibernation/ egg and larval overwintering, Migration)

How long do adult butterflies live? Usually 10-14 days; as long as 6-7 months if the butterfly hibernates or migrates.

## **VI. Adult Behavior/Survival**

- Warming up
- Nectar seeking
- Water/Nutrient Seeking - "Mud puddle clubs", carrion, decaying fruit
- Mate location (Perching (setting up a territory, and investigating passing insects by flying from the same vantage point); Patrolling (continuously flying over the habitat in search of females); Hilltopping (a special form of perching, in which males congregate at the top of hills and ridges and wait for females to fly over).
- Mating Behavior (How do butterflies know they are mating with a member of the same species?): Visual cues (flight pattern, color, reflective scales); Odor (pheromones); Time of day
- Oviposition (Olfactory cues; Physical cues; Plant leaf or flower condition}
- Predators (Birds, robberflies, ambush bugs, wasps, spiders)
- Defenses (Evasive flying, "Play dead", "Shock and awe" (contrasting coloration, eyespots), Mimicry
- Roosting and Resting

## **VII. Larval behavior/survival**

- Primary theme: eat and avoid being eaten
- Larval distribution (Solitary -often cryptically colored); Social - often brightly colored; cannibalism
- Diseases (bacteria, fungi, viruses)

- Predators (birds, beetles, true bugs, spiders, ant lions, wasps)
- Parasitoids (flies, wasps)
- Defenses (hiding coloration, chemical defenses - distasteful, or secretion of distasteful compounds): physical defenses - spines; webs, tunnels, other shelters; mutualism -ants; activity periods (feed at night).

### **VIII. Larval Foodplants**

- Many different plants, but most commonly used families in Colorado are grasses, sunflowers, rose, buckwheats, oaks, willows, and legumes.

### **IX. Field Methods**

- Observing adult behavior (nectar sources, aggregation areas, foodplant concentrations)
- Finding eggs and larvae (learning larval foodplants, behavioral and foliar damage cues).
- Butterfly counts (4<sup>th</sup> of July) - Butterflies can be used as indicators of habitat and climate change.

### **X. Conservation**

- Rare species in Fort Collins - Eyed Brown, Two Spotted Skipper, Silver-bordered fritillary. These species require wetlands, many of which have been destroyed/alterd by gravel mining, diversion and filling, livestock grazing, and noxious weed invasion.

## Useful Butterfly Books for the Fort Collins Area

1. Brock, Jim and Kenn Kaufman. 2003. Butterflies of North America. Hillstar Editions, L.C. (In print - hardcover in field guide format).

A North American field guide with good illustrations and logical groupings of similar butterflies. Small butterfly photos are expanded in size for greater detail. Range maps help indicate where the species is likely to occur.

2. Glassberg, Jeffrey. 2001. Butterflies through binoculars - the West. A field guide to the butterflies of Western North America. Oxford University Press, New York. (In print- hardcover in field guide format).

High quality photographs of living butterflies. Organized by major families and sub-groups. A range map is provided for each species.

3. Scott, James. 1986. Butterflies of North America. Stanford University Press. (In print- hardcover and paperback - large format).

Covers all of North America north of Mexico. Good color photos, but arranged in a confusing way. Excellent life history and behavior sections.

4. Ferris, C.D. and F.M. Brown. 1981. Butterflies of the Rocky Mountain States. University of Oklahoma Press. (Out of print - hardcover and paperback)

A regional field guide with black and white photos, some color photos, and good technical descriptions of the species and life histories. Easy to browse to find species you see.

5. Emmel, T.C. and M.C. Minno and B.A. Drummond. Florissant Butterflies. 1992. A guide to the fossil and present-day species of central Colorado. Stanford University Press. (In print - paperback).

Covers the Florissant (west of Colorado Springs) fossil butterfly fauna (Florissant is one of the few known locations for butterfly fossils in the world). Good color photos and descriptions of contemporary butterflies and their life histories. Species in this book also occur in the foothills west of Fort Collins.

6. Pyle, R.M. 1984. Audubon Society Handbook for Butterfly Watchers. Charles Scribners and Sons. (In print- hardback and paperback).

This book is oriented toward the field naturalist, and includes methods for watching and sampling butterflies, butterfly photography, raising adult butterflies from eggs and larvae, and conservation issues.