

Boulder County Parks and Open Space
Boulder, Colorado

Small Grants Program 2006

BUTTERFLY INVENTORY
AND RESEARCH
ON OPEN SPACE PROPERTIES

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Table of Contents

| | | |
|-----------------|---|----|
| Acknowledgments | | 3 |
| I. | Abstract | 4 |
| II. | Introduction and Literature Review | 5 |
| III. | Research Methods | 6 |
| IV. | Results and Data Analyses | 7 |
| | A. Survey Dates and Locations for 2006 | 7 |
| | B. Numbers of Butterfly Species Observed in BCPOS Habitats | 7 |
| | Table 1. Survey Dates and Locations | 8 |
| | C. Populations in Each Habitat | 9 |
| | D. Species Numbers and Days of Field Work | 9 |
| | E. Largest Populations for Each Habitat | 9 |
| | F. Forty Frequently Observed Butterflies | 10 |
| | Photographs of Butterflies with Large Populations | |
| | G. Butterfly Surveys for 2006 (Tables 3-8) | 10 |
| | H. Burned and Unburned Transects - Big Meadow, Heil Valley | 11 |
| V. | Discussion of the Results | 12 |
| | A. Findings of the Inventory | 12 |
| | B. Application to Natural Resource and/or Visitor Management | 15 |
| VI. | Conclusion | 17 |
| VII. | Recommendations | 18 |
| VIII. | References | 19 |
| | Table 2. Commonly Sighted Butterflies (Months,Locations) | 20 |
| | Table 3. Plains - Carolyn Holmberg at Rock Creek, Pella Crossing | 21 |
| | Table 4. Foothills - Anne U. White, Steamboat Mountain Rabbit Mountain Observations and Notes – Plains, Foothills | 22 |
| | Table 5. Foothill/Montane Transition - Heil Valley Ranch Geer Canyon | 23 |
| | Table 6. Foothill/Montane Transition - Heil Valley Ranch Plumely Canyon Observations and Notes – Heil Valley | 24 |
| | Table 7. Montane – Meyers Gulch, Reynolds Ranch Observations and Notes - Montane | 25 |
| | Table 8. Upper Montane/Lower Sub-alpine – Caribou, Mud Lake | 26 |
| | Table 9. Big Meadow Data - Heil Valley Ranch | 27 |

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I. Abstract

Inventories of butterfly species and population numbers were recorded on several Boulder County Parks and Open Space properties. In 2006 butterfly species composition and abundance were recorded on ten sites within eight properties managed by BCPOS. The ecosystems explored were a) plains - Carolyn Holmberg Preserve at Rock Creek and Pella Crossing; b) foothills - Heil Valley Ranch, Steamboat Mountain, Rabbit Mountain; c) montane - Meyers Gulch, Reynolds Ranch; and d) sub-alpine - Caribou Ranch and Mud Lake. The total number of species recorded in these study areas is 105 for 2002 through 2006; in comparison, Boulder County as a whole has 198 observed species. In 2006 there were fewer species and smaller populations counted compared to previous years, probably due to the unusually dry, hot June. The search continued for the rare arogos (*Atrytone arogos*) and ottoe (*Hesperia ottoe*) skippers, which were not located. The current state of recovery by host plants and dependent butterflies after the Overland fire at Heil Ranch was investigated by comparing burned and unburned portions of the Big Meadow, showing small differences between the two areas in two observations.

The inventory technique used was to traverse roadways, waterways, and trails, and observe butterflies with the unaided eye, binoculars or by a net and release process. This continuing five year study was performed each year from 2002 through 2006 to expand the baseline data and to determine butterfly flight periods, species locations and populations, improve researchers' field identification skills, and recruit and involve additional observers. Weather and climate patterns directly affected host plant availability and nectaring sources this year, with drought conditions in June being the main factor reducing butterflies. Montane canyon habitats yielded the greatest numbers of species and the greatest abundance. Plains habitats supported the fewest species and the lowest number of individuals.

In summary, this extensive study has established a baseline within eight properties managed by BCPOS. Sixty days of surveying yielded new details on flight periods and locations of 105 species on these properties. It is recommended that butterfly inventories continue on these same areas, and that additional properties be surveyed. It would also be highly valuable for Caribou Ranch to be opened earlier in the year to legitimate researchers.

II. Introduction and Literature Review

The physiography of Boulder County to some extent mirrors that of the state of Colorado, with the short grass prairie in the east rising gently to meet forested foothills, which in turn thrust up abruptly from the plains, forming a transition to successively higher mountains. Boulder County, however, climaxes on the western boundary with the high alpine peaks of the continental divide. Colorado's four major rivers, the Colorado, Rio Grande, Arkansas and Platte, all have their headwaters in the mountains, greatly influencing the diverse fauna (Brown, 1957). Boulder County has four major drainages: Boulder Creek, Four Mile Creek, Left Hand Creek, and the St. Vrain River, all leading to the plains. This diversity of ecological zones (plains, foothills, montane, sub-alpine and alpine) creates a tremendous variety of habitats for myriad creatures, including those of the order Lepidoptera – butterflies and moths. Some Colorado counties routinely exhibit the highest butterfly species diversity in the United States, and Boulder County is among these count leaders. The presence of BCPOS properties within all of the ecological zones provides a great opportunity to monitor butterfly species, allowing researchers to better quantify and understand the county's butterfly populations.

Historically, Colorado has been of interest to lepidopterists. In 1866, Tryon Reakirt's Coloradian Butterflies list contained 72 species. The list was based primarily upon specimens in the collections of William S. Wood, Jr., James Ridings, and Winslow J. Howard, who was the earliest resident entomologist in Colorado. Howard collected materials west of Denver and near Central City, south to Pikes Peak. In 1871 Theodore L. Mead published a list including 121 species from Colorado. Frank Clay Cross listed 235 proposed species (some now recognized as sub-species) in his 1937 report published by the Colorado Museum of Natural History (now called the Denver Museum of Nature and Science). Colorado Butterflies, by F. Martin Brown (1957) recognized 248 species. Brown lists many Boulder County prototypes recorded by early collector Don Eff.

Butterflies of the Rocky Mountain States (1980), by Ferris and Brown, published individual county maps originally produced in Ray E. Stanford's collected distribution data. The Audubon Society Field Guide to North American Butterflies by Robert Michael Pyle (1981) was the first to include photos of live specimens. A Field Guide to Western Butterflies by Paul A. Opler (1999) contains information and regional maps and continues to be a useful field guide today. The Natural Heritage Foundation sponsored both the Field Survey of Boulder County Open Space, Hall and Heil Ranches by Simonson and Pineda (1995) and A Systematic Inventory of Rare and Imperiled Butterflies on the City of Boulder Open Space and Mountain Parks by Pineda and Ellingson (1998). Both

specifically describe Boulder County butterflies. A more recent publication is the Master's thesis by Stephen Armstead, "A Butterfly Monitoring Program for Assessing the Composition and Distribution of Butterfly Communities in the City of Boulder Open Space and Mountain Parks" (2003), which looked closely at the butterflies on City of Boulder public lands. BCPOS has provided small grants which resulted in two unpublished documents that list identified butterflies, periods of flight and host plants: 1) An Inventory of Butterflies at Heil Valley Ranch Open Space 2003 (Chu, Cook, and Cook) and 2) An Inventory of Butterflies at Heil Valley Ranch Open Space, 2002-2004; Caribou Ranch Open Space 2004. (Chu, Cook, and Cook). This research was extended in 2006 to include expanded surveys of additional BCPOS properties and a study of a burned meadow area.

III. Research Methods

Butterfly surveys were conducted by walking near waterways, trails and other areas where butterflies congregate, rather than within strictly measured transects. Butterflies shift locations based on the availability of host plants, nectar and moisture. Therefore while inventorying large areas, researchers moved among trails, streams and roadways to observe as many different plant communities and habitats as possible. However, the tendency was to repeatedly survey productive habitats over the course of the research, within a field season as well as from one year to the next. As butterflies were sighted, they were identified on the wing either by the unaided eye or by using close-focusing binoculars, or in the hand using a 'net and release' procedure. Locations of the inventory site, species and numbers (clearly identified at close range) were listed on the enclosed spreadsheets (Tables 2-9). These records also include the date, time in the field, temperature and useful notes about butterfly activities and blossoms. Digital photos were often made in order to assist in identification.

Surveys have been conducted on BCPOS properties for 5 years in this project and have covered the variety of elevations from plains and foothills to montane and the lower sub-alpine. Butterflies at Heil Valley Ranch have been inventoried five consecutive summers by this research team; Caribou Ranch three summers; and at each of the following sites two summers: Carolyn Holmberg Preserve at Rock Creek, Rabbit Mountain, Pella Crossing, Anne U. White, Steamboat Mountain, Meyers Gulch and Reynolds Ranch.

Habitats and the locations studied are listed below:

| | |
|--------------------------------|--|
| Plains | Carolyn Holmberg at Rock Creek Farm, Pella Crossing |
| Foothills | Anne U. White Trail, Steamboat Mountain, Rabbit Mountain |
| Foothill/Montane | Heil Valley Ranch (Geer Watershed, Plumely Canyon, Red Hill) |
| Montane | Meyers Gulch, Reynolds Ranch |
| Upper Montane/Lower Sub-alpine | Caribou Ranch, Mud Lake |

Three field guides are used as references: 1) Brock & Kaufman (2003) Butterflies of North America, 2) Glassberg (2001) Butterflies through Binoculars, the West, and 3) Opler (1999) A Field Guide to Western Butterflies. Excellent photographs, range maps, individual descriptions of physical characteristics, life cycles, host and nectar plants, flight periods, and habitats are found in these guides. Scientific Names for Butterfly Species of North America, North of Mexico, Opler and Warren (2003) is our source for scientific names, which continually undergo some change due to increased field research and DNA mapping. The North America Butterfly Association Annual Butterfly Count list is used for determining standardized common names when there is confusion with multiple names. Desk references are Brown (1957), Ferris and Brown (1980) and Pyle (2002).

The C.P. Gillette Museum of Arthropod Diversity, Colorado State University and the University of Colorado Museum Entomology Collection provided actual specimens for reference. Paul Opler and Ray Stanford have shared invaluable experiences and information. Researchers were experienced, faithful and long time associates: Donn Cook and Cathy Cook, both 6-year BCPOS volunteer naturalists who participated in butterfly counts for eight years. (Donn is also a retired Science teacher, and Cathy a Meetings Coordinator for the Geological Society of America, Boulder); Larry Crowley (a retired Science teacher, avid birder, and participant in butterfly counts many years); Jean Morgan (a retired elementary teacher participated in butterfly counts for many years); and Mike Sportiello (a professional Biologist, avid birder, 3-year butterfly observer).

IV. Results and detailed data analyses

A. Survey Dates and Locations for 2006 (see Table 1, page 8)

Field inventories by all researchers are included in this table.

B. Numbers of species observed in BCPOS habitats:

| | | |
|-----------------------------------|-----|------------|
| Plains | 21 | 2005-2006 |
| Foothills | 70 | 2005-2006 |
| Foothill/Montane | 83 | 2002-2006 |
| Montane | 59 | 2005-2006 |
| Upper Montane/Lower Sub-alpine | 69 | 2005-2006 |
| Total number of butterfly species | 105 | 2002 -2006 |

Table 1 Survey Dates and Locations for 2006

| 2006 | | Plains | | Foothills | | Foothills / Montane | | Montane | | Montane / Sub-alpine |
|-------|------|-------------------|------|--------------------|--------------|------------------------|------|-------------------|------|-------------------------|
| Month | Date | Location | | | | Heil Valley | | | | Caribou Ranch |
| April | 4/5 | Rock Creek | 4/4 | Anne U. White | 4/4 | Lower Geer | | | | |
| | | | 4/5 | Rabbit Mountain | 4/8 | Lower Geer | | | | |
| | | | 4/10 | Anne U. White | 4/10 | Lower Plumely | 4/12 | Meyers Gulch | | |
| | | | 4/21 | Anne U. White | 4/13 | Upper Geer | 4/13 | Reynolds Ranch | | |
| | 4/19 | Rock Creek | 4/27 | Anne U. White | 4/17 | Upper Geer | | | | |
| | | | | | 4/26 | Upper Geer | | | | |
| May | | | 5/2 | Anne U. White | 5/2 | Plumely | | | | |
| | | | 5/11 | Rabbit Mountain | 5/6 | Upper Geer | | | | |
| | 5/17 | Rock Creek | 5/15 | Anne U. White | 5/14 | Upper Geer | | | | |
| | 5/23 | Rock Creek | 5/19 | Steamboat Rock | 5/26 | Lower Geer | | | | |
| | 5/24 | Rock Creek | 5/29 | Anne U. White | 5/27 | Upper Geer | | | | |
| June | 6/2 | Pella Crossing | | | 6/1 | Red Hill | | | | |
| | | | | | 6/3 | Lower Geer | 6/5 | Reynolds Ranch | 6/4 | Mud Lake |
| | | | | | 6/11 | Upper Geer | 6/6 | Reynolds Ranch | | |
| | | | | | 6/13 | Plumely | | | | |
| | | | | | 6/14 | Upper Geer | 6/19 | Meyers Gulch | 6/19 | W. Meadow |
| | | | 6/26 | Anne U. White | 6/17 | Lower Geer | 6/20 | Meyers Gulch | 6/27 | Mud Lake |
| July | | | | | 7/16 | Lower Plumely | | | 7/1 | North, W. Meadow |
| | | | 7/26 | Anne U. White | 7/28 | Upper Geer | | | 7/17 | North, W. Meadow |
| Aug. | | | | | 8/4 | Red Hill | 8/8 | Reynolds Ranch | | |
| | | | 8/16 | Steamboat Rock | 8/20 | Upper Geer | 8/11 | Meyers Gulch | | |
| | | | 8/17 | Anne U. White | 8/21 | Geer | | | 8/21 | Roadway, Meadow |
| | | | | | 8/28 | Plumely | | | | |
| | | | 8/24 | Anne U. White | 8/30 8/31 | Lower Geer Plumely | | | | |

C. Populations of butterflies counted in each habitat in 2006:

| | Individuals Counted: | Average no. per Trip: |
|-------------------------|-------------------------|--------------------------|
| Plains | 250 | 27.7 |
| Foothills | 500+ | 38.5 |
| Foothill/Montane | | |
| Geer | 1,459 | 85.8 |
| Plumely | 741 | 92.6 |
| Montane | 351 | 58.5 |
| Montane/ Sub-alpine | 695 | 86.8 |
| Total population | 3,996 | |

D. Species numbers and days of field work in each habitat:

| | 2004 | | 2005 | | 2006 | | Species |
|--------------|------|------|------|------|------|------|---------|
| | # | Days | # | Days | # | Days | Total: |
| 1. Plains | - | - | 18 | 6 | 10 | 9 | 21 |
| 2. Foothills | - | - | 56 | 8 | 50 | 13 | 73 |
| 3. Foothill- | | | | | | | |
| Montane | 39 | 9 | 57 | 16 | 60 | 25 | 83 |
| 4. Montane | - | - | 21 | 3 | 52 | 6 | 59 |
| 5. Montane- | | | | | | | |
| Sub-alpine | 39 | 4 | 46 | 6 | 51 | 7 | 69 |

E. Largest populations of butterflies for each habitat – number of individuals seen in 2006:

| | | | |
|---|---------------------------|--|-----|
| <u>Plains:</u> | cabbage white | (<i>Pieris rapae</i>) | 60 |
| | Olympia marble | (<i>Euchloe olympia</i>) | 27 |
| | purplish copper | (<i>Lycaena helloides</i>) | 10 |
| | common checkered skipper | (<i>Pyrgus communis</i>) | 8 |
| <u>Foothills:</u> | western tiger swallowtail | (<i>Papilio rutulus</i>) | 41 |
| | cabbage white | | 39 |
| | spring azure | (<i>Celestrina ladon sidara</i>) | 18 |
| | hoary comma | (<i>Polygonia gracilis</i>) | 41 |
| | mourning cloak | (<i>Nymphalis antiopa</i>) | 26 |
| <u>Foothills/Montane: Heil Valley - Geer Watershed:</u> | | | |
| | pale swallowtail | (<i>Papilio eurymedon</i>) | 57 |
| | cabbage white | | 125 |
| | silvery blue | (<i>Glaucopsyche lygdamus</i>) | 53 |
| | Boisduval's blue | (<i>Plebejus icarioides</i>) | 83 |
| | hoary comma | | 55 |
| | common ringlet | (<i>Coenonympha tullia ochracea</i>) | 79 |
| | common wood-nymph | (<i>Cercyonis pegala</i>) | 74 |

| | | | |
|---|----------------------------|----------------------------------|----|
| <u>Foothills/Montane: Heil Valley - Plumely Canyon:</u> | | | |
| | hops azure | (<i>Celastrina humulus</i>) | 23 |
| | silvery blue | (<i>Glaucopsyche lygdamus</i>) | 22 |
| | Aphrodite fritillary | | 25 |
| | hoary comma | | 33 |
| | common ringlet | | 69 |
| | common wood-nymph | | 22 |
| | common branded skipper | (<i>Hesperia colorado</i>) | 75 |
| <u>Montane:</u> | Rocky Mountain parnassian | (<i>Parnassius smintheus</i>) | 25 |
| | hoary elfin | (<i>Callophrys polios</i>) | 39 |
| | Aphrodite fritillary | | 21 |
| | small wood-nymph | (<i>Cercyonis oetus</i>) | 42 |
| <u>Montane/Sub-alpine:</u> | clouded sulphur | (<i>Colias philodice</i>) | 23 |
| | Queen Alexandra's sulphur | (<i>C. alexandra</i>) | 72 |
| | Rocky Mountain dotted-blue | (<i>Euphilotes ancilla</i>) | 23 |
| | Boisduval's blue | | 24 |
| | northwestern fritillary | (<i>Speyeria hesperis</i>) | 21 |
| | common ringlet | | 61 |
| | small wood-nymph | | 22 |

The large populations of butterflies listed here indicate they are finding enough nectar to provide energy for mating and laying eggs, and that there is an abundance of host plants for their caterpillars. We can expect to find these successful butterflies year after year on BCPOS properties, if their habitats remain vital and intact. The largest county-wide single population of any species was that of the cabbage white, an invasive species that has become successful, adapting from the domestic cabbage, kale and broccoli to the plentiful wild mustard family (*Brassicaceae*). In fact it breeds repeatedly, producing three or four new broods each summer.

F. Forty Frequently Observed Butterflies - (See Table 2)

Forty of the most frequently observed butterflies were selected to illustrate phenology, defined here as the recurrence of life cycles of the butterflies during which the climate and the seasons play a major role. Refer to Table 2 for information on the months observed during 2002 – 2006, numbers of days seen, and habitats where they live. Western tiger swallowtail, hoary comma, clouded sulphur and Boisduval's blue show larger populations over the years and long flight periods. However, the most frequently observed do not necessarily exhibit the highest populations.

G. Butterfly Surveys for 2006 (See Tables 3-8)

The records previously discussed compare the species numbers (refer to Section D, page 9) with the largest populations observed in the various habitats (refer to Section E, page 9). Surveys are detailed field records of the BCPOS butterflies, which contain specific data from each 2006 field day -

Boulder County Parks and Open Space - 2006

Butterflies

with the Largest Populations

Key for Habitats where the following species were in greatest numbers:

P=Plains F=Foothills M=Montane S=Sub-alpine



Cabbage whites had the greatest population overall. (P,F)
They can lay eggs on any mustard family plants to raise broods several
times a year.



- Olympia Marble (P)
- The host plants are rock cresses and other mustards.



Common checkered skipper (P)
They lay eggs on cheese weed and other mallow family plants.



Purplish Copper – sometimes a meal for a well-camouflaged crab spider. (P)
These live in open moist situations, like the ditch at Rock Creek, and feed on docks and knotweed.



Aphrodite Fritillary (F,M)



Variegated Fritillary (F)



Northwestern Fritillary (M)

Fritillaries all live on Violet family plants.



Hoary Comma (F)
Nectaring on
rabbit brush in late
summer.

Pale Swallowtail (F)
Puddling for substances to
incorporate into sperm. Their host
plants are Rose family and
Ceanothus.



Mourning Cloak (F)
Lives on many
kinds of tree
leaves.





Hops Azure is uncommon and dependent upon the Hops plant. (F)



Boisduval's Blue female nectaring on red clover. (F,M,S)
They were seen over Lupines, their host plants.



Silvery Blue finding moisture and substances on scat. (M)
More common in the spring, they lay eggs on Lupines.

Late summer butterflies



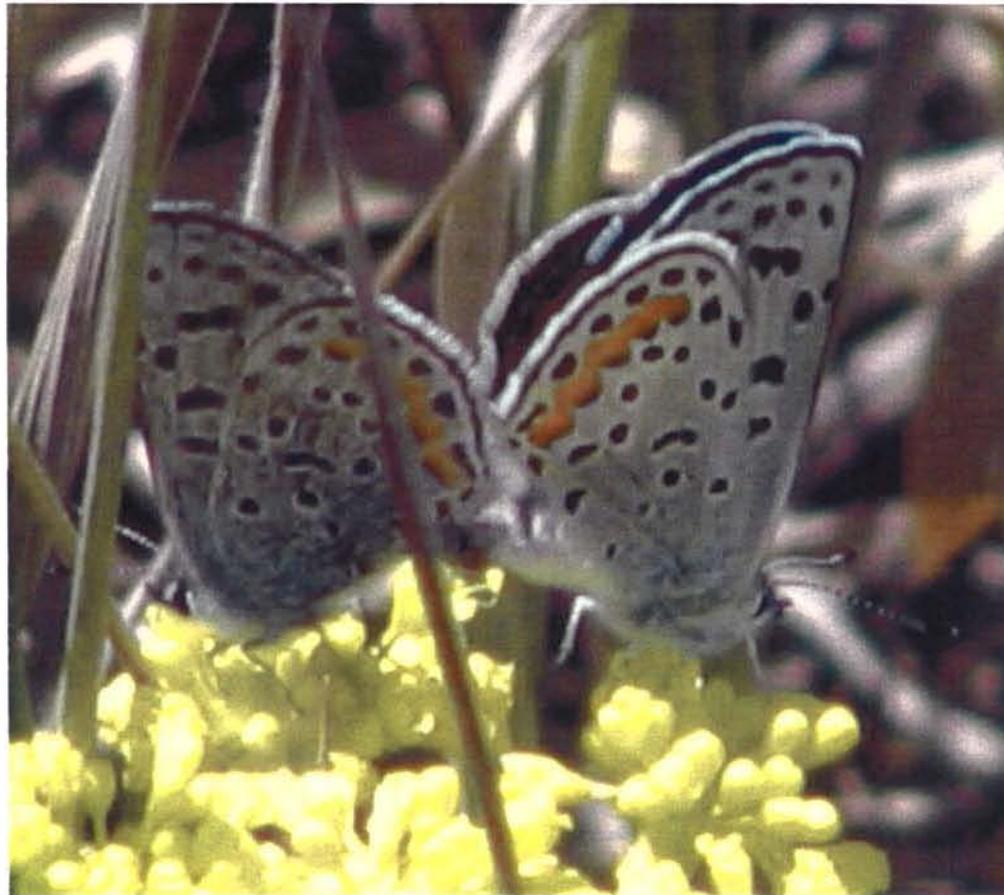
Common wood nymph (M)

Common wood nymph nectars on Buddleia in town; but on Gaillardia or gayfeather in the wild – as does common branded skipper.



Common branded skipper (F)

Dotted Blues mating;
Female on the left, male on right.
They were common on the Myer Gulch roadway; one butterfly on nearly every wild buckwheat
flower head. This is their host plant and source of nectar.



Higher Altitude Butterflies



Sunlight streaming through a Clouded Sulphur's wings (S)

Legumes, especially clovers are their host plants.



Rocky Mountain Parnassian nectaring on Ninebark blossoms at Caribou. (M)
The Parnassian is completely dependent upon Stonecrop for its caterpillars.

the location, date of field inventory, species names (both scientific and common), numbers of each species observed, researcher, and notes of special interest (time of the survey, temperature, weather conditions, specific location inventoried, notable butterfly behavior, blooming flowers.) Detailed data is to be found on spreadsheets (Tables 3 - 8) near the end of this paper. Maps follow the Observations and Notes.

Table 3 Plains - Carolyn Holmberg Preserve at Rock Creek, Pella Crossing

Table 4 Foothills - Anne U. White, Steamboat Mountain and Rabbit Mountain -
Observations and Notes of Special Interest – Plains, Foothills

Table 5 Foothills / Montane Transition - Heil Valley Ranch - Geer Watershed

Table 6 Foothills / Montane Transition - Heil Valley Ranch - Plumely Canyon
Observations and Notes of Special Interest – Heil Valley Ranch

Table 7 Montane - Meyers Gulch and Reynolds Ranch

Observations and Notes of Special Interest - Montane

Table 8 Upper Montane/Lower Sub-alpine - Caribou, Mud Lake

Observations and Notes of Special Interest - Upper Montane/Lower Sub-alpine

H. Burned and Unburned Transects - Big Meadow, Heil Valley Ranch (See Table 9)

A prototype research project was begun in the Big Meadow in the Upper Geer watershed at Heil Valley Ranch. Two transects were established here in an east-west direction, one in a burned meadow and a second in an unburned meadow. Butterflies and blossoming plants were compared in two short transects. Since the Overland Fire of 2003, the burned meadow has somewhat recovered, but still shows differences when compared to the unburned area. Detailed data for Big Meadow – Burned and Unburned Transects are listed on Table 9, followed by a photograph and a map of the Big Meadow.

Observations were made on June 14 and July 28, 2006. Six butterfly species were located in the burned meadow and four in the unburned meadow in both June and July. In the burned meadow in June, 12 individuals were observed compared to five in the unburned. In July, 11 were flying in the burned and 13 in the unburned meadow. By July 28 plants in both meadows were very desiccated. Each transect did, however, cross a moist depression. The fenced spring above the unburned meadow continued to produce surface water which provided subsurface moisture at this transect, but moisture was in the sub-soil in the burned meadow also.

In the burned meadow canyon bramble hairstreak (*Callophrys affinis*) was nectaring on the important buckbrush (*Ceanothus fendleri*). This flowering bush was not growing within the transect in the unburned meadow. Boisduval's blue butterflies were in the burned meadow where their host plant,

white lupine (*Lupinus argenteus ingratus*), was more common. The persius duskywing (*Erynnis persius*) was also observed where its host plant golden banner (*Thermopsis divaricarpa*) had recovered following the fire. In the unburned meadow there were noticeably more bindweed (*Convolvulus arvensis*), an alien species, and fewer Fremont geranium (*Geranium fremontii*), yellow Mexican hat (*Ratibida columnifera*), blanketflower (*Gaillardia aristata*), goldenrod (*Solidago* sp.) and golden aster (*Heterotheca* sp.) blossoms in July, compared to the burned meadow.

V. Discussion of the Results

A. Findings of the Inventory

Boulder County's dramatic changes in elevation and several streams create a variety of habitats. These changes in elevation provide life's necessities to a spectacular number and variety of resident butterflies and plants. Streams offer pathways for butterflies to follow as they search for nectar and host plants. These factors provide a challenge for researchers who wish to locate productive habitats, learn to identify and record the multiplicity of butterflies and begin to know species requirements for successful life cycles. Notwithstanding, on each surveyed property inventories were compiled by identifying butterfly species and blossoming plants. From April through August 2006, there were 60 field days of data collection. Each daily investigation generally began about 9 a.m. and ended at noon or later. The weather was a primary factor in determining the length of time researchers spent in the field and the abundance of observable butterflies. The first half of 2006 was three degrees warmer than normal, and 3.67 inches drier. The following excerpt exemplifies these conditions:

"Strong relentless winds in March were followed by April, the eighth warmest and the 18th driest April on record. May was the 10th warmest and 10th driest on record. June 2006 was the seventh warmest June on record. The first 21 days of June were eight degrees warmer than normal and (...the County) had just a third of an inch of moisture. This prolonged dry spell brought Colorado to its kindling point. Boulder's only break from the drought came in the form of a garden-wrecking hailstorm on the 24th." (Callahan, July 6, 2006)

Good weather - sunny, dry, non-windy days - allowed the team to proceed with 15 field days in April; butterflies were just beginning to fly, and flowers were scarce, so exposed, newly flowing tree sap provided the primary food source. In May warmth and dryness caused plants to be smaller, with fewer juicy leaves and blooms, and kept the plants from developing abundantly.

Extensive studies were made in Heil Valley Ranch in the Geer watershed and Plumely Canyon. One butterfly new on both the cumulative Open Space and Geer lists, the California tortoiseshell (*Nymphalis californica*), raised the Heil Valley list to 83 species total. Caribou Ranch Open Space was

available for observations only in July and August, resulting in a list of 71 species, fewer than may actually reside there. However, one trip was made on June 19, with Denny Morris, BCPOS wildlife technician, who conducts regular bird surveys, which allowed this researcher to add four early butterflies to the Caribou list.

On the foothills list are 73 species observed in 2005-2006; Anne U. White continues to be one of the most productive sites with 72 species. Fourteen mylitta crescent (*Phyciodes mylitta*) were recorded for the very first time in Boulder County in 2005 in the Anne U. White riparian area, raising the county list from 197 to 198. Several uncommon butterflies were sighted and photographed there including the moss elfin (*Callophrys mossii*), hoary elfin, and dusted skipper (*Atrytonopsis hianna*). Mylitta crescent established a colony in that riparian area and dispersed to the Heil Valley Ranch both in 2005 and 2006.

The plains properties are dry with little vegetation variety, and the list shows only 21 species so far. There was a noticeable drop in the average numbers of butterflies in all but the montane habitat in 2006. The month of June was very hot and dry, driving many of the northward dispersing butterflies away from the Front Range. The golden-yellow wall flower (*Erysimum asperum*) was extremely stunted by the lack of moisture. July was the fifth consecutive month in Boulder with an above-average temperature, but the first half of the month was uncharacteristically cool and wet (Callahan, 2006). Weather of this sort makes surveying for butterflies relatively unproductive, thus there were only five days of observation.

The total number of species recorded in these BCPOS study areas is 105, as compared to the comprehensive Boulder County record which lists 198 species. This number, occurring within the ten Open Space properties, amounts to 52% of the county total. Of the 83 species recorded in the foothills montane sub-alpine complex, seven species were sighted in both 2004 and 2005, but were not sighted in 2006. Conversely, five species were observed that had not been seen the previous two years.

Many of the species observed each year live locally on specific host plant species. Their caterpillars feed on leaves and petals, eventually produce chrysalids, and finally emerge as easily observed adults. If researchers are in the field near host plants on the day when butterflies emerge, then large numbers of these adults are observed and recorded. For example, 69 common wood-nymphs (*Cercyonis pegala*) were sighted on July 28 in the Geer watershed. At least three species were found localized near their host plants: Arctic blue (*Plebejus glandon rustica*) near lupines (*Lupinus sp.*) hops azure on the wild hops (*Humulus lupulus americanus*), and wood-nymph in grasses on the moist hillsides. After emerging from their chrysalis, butterflies disperse as they hunt for mates and nectar, so large numbers of a species observed near their host plants indicates recent adult emergence.

Seven species were sighted in both 2004 and 2005 that were not sighted from April through August 2006, encompassing 25 field days at Heil Valley Ranch. These include short-tailed black swallowtail (*Papilio indra*), mustard white (*Pieris marginalis*), dainty sulphur (*Nathalis iole*), gray hairstreak (*Strymon melinus*), lupine blue (*Plebejus lupini lutzi*), red admiral (*Vanessa atalanta*), and painted lady (*V. cardui*). The first six of these species do not usually occur here in large numbers, so the severe June weather may have had an adverse effect on their survival. Butterflies that are known to be vagrants, such as the short-tailed black swallowtail, dainty sulphur, red admiral, and painted lady, set up temporary seasonal colonies.

In 2005 the Boulder area had myriad painted ladies dispersing into this county from the southern California desert. In 35 field days we counted more than 772 individuals, and on only five days did we not see these travelers. Painted ladies (which differ from monarchs, which migrate here and return to Mexico) produced two broods here in 2005 but succumbed to freezing during the cold winter. Painted ladies do go through an approximate 11-year population irruption cycle that was immense in 2005. It normally follows that they provide food for the parasites and predators whose cycles then follow the high level trend, thus decreasing the number of the ladies the following year.

The dainty sulphur, a regular visitor to Boulder County not sighted in 2006, sets up temporary colonies here and often appears on the driest of dirt trails on the hottest days. This sulphur species follows marigold blossoms and the summer's heat northward from the sub-tropics, normally completing full broods in the peninsular Florida and the U.S. Southwest (Opler, 1999)

One of the surprises of this investigation was the first butterfly species sighted this season, the California tortoiseshell. Overall, six individuals were observed in April in three locations. These had not been recorded before in our study areas. They may have overwintered from a large emergence south of this region last fall, according to naturalist and author Robert Pyle (personal communication). In addition, strong relentless winds blew in March and may have carried the California tortoiseshells here from the west. They were found before blossoms were available and were nectaring on the rising sap oozing from river birch limbs (*Betula fontinalis*).

One of their exceptionally large irruptions was reported recently:

Oregon's Cascade Mountains, from Mount Hood to Mount Jefferson are exploding with bright orange butterflies that pulse in massive swarms through forests and meadows.... millions of California tortoiseshells are probably offspring of a swarm that started in California in early summer and later swept into Oregon," said Arthur Shapiro, professor at University of CA at Davis. "Their boom and bust numbers seem related to weather, though it's not clear just how. ... Clouds of tortoiseshells were seen Aug. 11 on Mount Jefferson, east of Salem. They are known for these population explosions." Oregonian, Aug. 24, 2006.

Caribou Ranch listed several species which were not recorded in 2004 or 2005, but were observed in 2006: nine variable checkerspots (*Euphydryas chalcedona*) found at one site July 14, and one each of brown elfin (*Callophrys augustinus*) and green comma (*Polygonia faunus*). Variable checkerspots are sometimes found in high prairie with mixed conifers (Opler, 1999), as was the case at Caribou Ranch, where Indian paintbrush (*Castilleja linariifolia*) and penstemons, their host plants, occurred. The brown elfin occurs early in the season and is uncommon, as is the green comma.

In 2002, our surveying began in Heil Valley Ranch Open Space; in 2004 Caribou Ranch Open Space was first surveyed; and in 2005 and 2006, eight additional lands managed by BCPOS were added to our research area. As part of the survey special notations were made if caterpillars were observed feeding, and if butterflies were observed nectaring or ovipositing. In mid-April, when few flowers were available, common dandelions (*Taraxacum officinale*) provided nectar to the checkered white (*Pieris protodice*) and common checkered skipper. One source of sugary sap, before the freezing nights had disappeared, were cracks in river birch branches on which California tortoiseshell, mourning cloak and hoary comma were imbibing. The Boisduval's blue were noted ovipositing on white-flowered silvery lupine bud clusters (*Lupinus argenteus ingratus*) at Heil Valley, and melissa blue were ovipositing on young milk vetch (*Astragalus* sp). On May 26, southwest of the barn at Heil, a two-tailed swallowtail (*Papilio multicaudata*) was stretching its long proboscis, nectaring in the posterior of golden banner blossoms. It's likely some other insect had already cut a hole in the blossom's petal base.

A favorite nectaring plant for numerous fritillaries and canyon bramble hairstreak was buckbrush with its plentiful tiny white blossoms. Spreading dogbane (*Apocynum androsaemifolium*) and bee balm (*Monarda fistulosa*) attracted many nectaring fritillaries and hummingbirds. An Olympia marble colony was found on Rabbit Mountain on its food plant, tiny blue flowered mustard (*Arabis* sp.). Wild buckwheat (*Erigonum umbellatum*) is a favorite for blues and hairstreaks. On the Meyers Gulch roadway-trail, each buckwheat flower head had one or two Rocky Mountain dotted-blues, and some were mating. Serviceberry (*Amelanchier alnifolia*) at Caribou Ranch attracted many nectaring butterflies, such as gorgone checkerspot (*Chlosyne gorgone*), chryxus arctic (*Oeneis chryxus*), Rocky Mountain parnassian, and field crescent (*Phyciodes pulchella*). June was so dry that on the 13th, we saw Aphrodite fritillary nectaring on the bindweed.

B. Application to Natural Resource and/or Visitor Management

One of the first steps in developing policy is to identify organisms that exist in these Open Space areas, and then design effective management plans. This small grant has provided an

opportunity to gather evidence of the butterfly species that inhabit certain BCPOS properties. Previously much of the acreage was privately owned with few records kept about butterflies or other invertebrates. Boulder County Open Spaces are also relatively new as public lands. The first study on Heil Valley Ranch was supported by the Natural Heritage Program in 1995 (Simonson, Pineda). However, credit must be given to early collectors such as Theodore P.A. Cockerell, J. Donald Eff, Charles L. Remington and P.S. Remington who preserved vouchers in museums, thereby adding to the list of known butterflies in Boulder County.

Application of this information to Open Space management was best stated by Stephen Armstead -

“The Colorado Front Range, including the foothills, is well known and documented for its biological diversity including that of numerous species of butterflies (Opler 1994). Approximately 176 resident or regular colonist skippers and butterflies have been documented in this region representing the fourth richest butterfly region in the United States (CNHP 1998, Opler 1994). Butterflies are excellent invertebrates to include in grassland monitoring programs. They are well studied, easily observed, and can be sensitive to changes in vegetation and management practices (Murphy and Wilcox 1986, New 1997). Many of the butterflies of special interest on Open Space and Mountain Parks include grassland specialist butterflies such as the ottoe skipper (*Hesperia ottoe*), arogos skipper (*Atrytone arogos*), and the regal fritillary (*Speyeria idalia*).” (Armstead, 2004)

Though the life of an individual butterfly may be ephemeral, the large overall numbers and the abundance and variety of species in BCPOS properties – 105 at last count – dictates that they should affect natural resource and visitor management, especially around plant communities containing species upon which butterflies are totally dependent for their reproduction. It will require years of study before butterfly population dynamics in BCPOS properties are understood, but if there are sudden radical environmental changes (e.g., fires or newly cut roadways), existing and future data will allow assessment of losses. Multiple factors affect populations: for example, weather influences plant growth from season to season; temperatures fluctuate, causing the emergence of adults to vary by a couple of weeks, either early or late; and rampant parasitism and increased predation can occur if the butterfly population is large, destroying extensive numbers.

When host plants are numerous and varied, and the local environment is complex, then a great number of butterfly species can exist in a given area. Monocultures such as agricultural crops support little butterfly species variety. Thinned ponderosa pine stands at Heil Valley Ranch along the Red Hill Road and prairie dog towns, which devastate the plant life leaving bindweed, teasel and mullein to survive, also do not support high species diversity. Agricultural lands purchased by BCPOS and left to lie fallow are invitations to invasive weeds and require revegetation with native species wherever

possible.

Finally, butterflies often fly over warm trails, facilitating their sighting, which can increase natural history awareness by the public, especially when shared by BCPOS staff and volunteers during public walks. The butterflies have a dependence on plants and moisture, which makes for interesting stories to share with visitors. Continued observations and greater knowledge will lead staff members to preserve critical habitat areas, and volunteers and the public to further respect Open Space properties.

The accompanying records will be registered in the Listing and Mapping of Western USA County Records. We have conferred with Ray Stanford, Western Regional Editor for Western North American Butterflies, U.S.G.S., especially for sightings of only one individual of a species. When butterflies were not identified in the field we sought assistance by sending digitized images to Paul Opler, Department of Bioagricultural Sciences, Colorado State University, Ft. Collins. New discoveries by the lepidopterists continue to alter scientific naming of species and further rearrangement of relationships. A comprehensive up-to-date source (Opler, Warren, 2003) provided the scientific names included in this report. Common names follow the convention of the North American Butterfly Association list. Weather plays an important role in our field success, therefore each field day we make a determination if the weather is advantageous for butterfly flight. Sunny, clear, dry days are especially good. Reference is made to the "Weather Review," Daily Camera both daily to plan field days and monthly to include in the final report.

The Boulder County list on the Butterflies of North America web site provides access for review, additional information, range maps, and photographs: <http://www.butterfliesandmoths.org>. This BCPOS study initiated a change on the County list when mylitta crescent was recorded for the first time by our researchers in 2005 at both Heil and Anne U. White. A butterfly species observed in the county for the first time is indeed a treat for both new and experienced butterfly researchers.

VI. Conclusion

Butterfly species recorded for the BCPOS study areas total 105 for years 2002 – 2006, with the two rare butterflies yet to be added (arogos and ottoe skippers). The plains produced 21 species; the foothill habitats produced 75 species. The foothill/montane complex in the Heil Valley Ranch Open Space supported 83 species; the montane 62; and upper montane/lower sub-alpine area 69 species.

"Patterns in butterfly species composition, richness, abundance, uniqueness, and diversity are compared across sites and contribute to the development of a butterfly species list and phenology for the Boulder Valley." (Armstead, 2004)

The continuation of this study will provide an ongoing index of butterfly diversity and provide

guidance for the long-term conservation needs of local butterfly populations. The vitality of the BCPOS butterfly habitats is currently good to excellent - the best existing near moisture and mixed vegetation. It will be important to carefully consider the monitoring of these habitats to preserve the diversity of butterfly species and host plants. This project establishes a baseline on Boulder County Open Space lands that will serve as a reference for future studies. Field work also introduced and raised the awareness of volunteer naturalists and the general public toward butterflies and their habitat requirements. A two day study across a burned and unburned meadow showed small differences, but should be continued on this or on a newly burned site. *In toto*, the field research supported by recent BCPOS grants provides substantial information on butterfly diversity, monthly flight times, and locations of host plant - butterfly colony relationships within the diverse habitats of BCPOS.

VII. Recommendations

1. Continue inventories of butterflies on BCPOS properties. Expand to areas not yet visited such as Hall Ranch, the northern reaches of Heil and east county agricultural/riparian lands.
2. Work with botanists to locate food plants, including tall and short bluestem grass to find the rare aragos and ottoe skippers butterflies.
3. Grant access to Caribou Ranch earlier in the season for study of the early season butterflies.
4. Allow voucher specimens when individuals are unidentifiable in the field. Grant that a single butterfly of a species may be removed, given to a professional for identification, and then placed in the permanent collection of the C. P. Gillette Museum, Colorado State University, Ft. Collins.
5. Use G.P.S. to verify locations of butterfly colonies and findings of particular interest. It is important that this specific information remain confidential. Collectors should not be allowed this information.
6. Search for rare and new county butterflies. Opler invites awareness that, "Although not applied yet to other counties, the following should be considered for addition on the watch list: (*Celastrina lucia*), (*Plebejus "acmon" texana*), (*Plebejus "lupini" spangelatus*) (not the same species as "lutzi"). There is also the (*P. lupini*) species that feeds on *Eriogonum effusum* and is found with *Euphilotes rita*."
7. Study meadows and woodlands adjoining the Caribou trails to highlight any changes resulting from public use.
8. Continue introduction of butterflies to volunteers for BCNA Ecosystem Stewardship Initiative (ESI) with a) evening presentations, b) field experiences, c) assistance with surveys on sites chosen by the ESI volunteers, d) permission given by BCPOS for net and release procedures on the Open Space properties during inventory work.
9. Continue to issue permits for volunteer naturalists and their associates to observe, identify and record

the butterflies.

10. Consult with invertebrate specialists prior to prescribe burns, so that critical habitat is protected.

11. New public trails should be marked for the public by use of parallel rows of logs or rocks, and not cut, graded, and graveled. In the early years of use, the ground cover will continue to be present to prevent erosion and provide more blossoms. The north end of Heil, between the locked gate on Pyrite Road and the silo, or the horse trail through the north of Heil toward Hall Ranch would be good places for trails left not graded. In these areas the grasses are thick, and local flowers are well established. Erosion will occur less rapidly.

12. Maintain policy of no dogs at Heil Valley and Caribou Ranch trails.

13. Print and distribute "Heil Valley Butterflies" checklist produced in 2004.

14. Continue to promote awareness of butterflies to BCPOS naturalists, staff and the public.

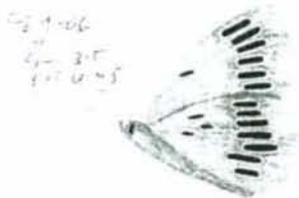
15. Agricultural lands purchased by BCPOS and left to lie fallow are invitations to invasive weeds and need revegetation with natives, where possible.

VIII. References

- Armstead, Stephen Bryan. 2003. A Butterfly Monitoring Program for Assessing the Composition and Distribution of Butterfly Communities in the City of Boulder Open Space and Mountain Parks. Thesis. University of Colorado, Boulder, Colorado.
- Armstead, Steve. 2004. A Butterfly Monitoring Program for Assessing the Composition and Distribution of Butterfly Communities in the City of Boulder Open Space and Mountain Parks. City of Boulder Open Space & Mountain Parks Dept. and CU. Paper presented at Boulder County Nature Association Symposium.
- Beidleman, Linda H., R. Beidleman, B. Willard. 2000. Plants of Rocky Mountain National Park. Rocky Mountain Nature Association and Falcon Publishing, Inc.
- Brock, Jim and K. Kaufman. Butterflies of North America, 2003. Houghton Mifflin Company. New York, New York.
- Brown, F. Martin. 1957. Colorado Butterflies. Denver Museum of Natural History, Denver, Colorado
- Butterflies of North America Web site. <http://www.butterfliesandmoths.org> Big Sky Institute at Montana State University and the NBII Mountain Prairie Information Node. Shane C. Erstad, Douglas H. Johnson, and Terry L. Shaffer from Northern Prairie.
- Callahan, William. "Weather Review," Daily Camera. July 6, 2006. p.7C.
- Callahan, William. "Weather Review," Daily Camera. August 3, 2006. p. 9B.
- Chu, Janet, C. Cook, D. Cook. An Inventory of Butterflies at Heil Valley Ranch Open Space 2003. Unpublished, Small Grants Program, Boulder County Parks and Open Space, Boulder, Colorado
- Chu, Janet, C. Cook, D. Cook. An Inventory of Butterflies at Heil Valley Ranch Open Space, 2002-2004; Caribou Ranch Open Space 2004. Unpublished, Small Grants Program, Boulder County Parks and Open Space, Boulder, Colorado
- CNHP, Pineda, P. M. and A. R. Ellingson. 1998. A Systematic Inventory of Rare and Imperiled Butterflies on the City of Boulder Open Space and Mountain Parks. February 1998. Colorado Natural Heritage Foundation. Fort Collins, Colorado.

- Ferris, Clifford and F. Martin Brown. 1980. Butterflies of the Rocky Mountain States. University of Oklahoma Press, Norman, OK.
- Glassberg, Jeffrey. 2001. Butterflies through Binoculars, the West. Oxford University Press, Inc. New York, New York.
- Guennel, G.K. 1995. Guide to Colorado Wildflowers. Volumes 1 and 2. Westcliffe Publishers, Englewood, Colorado.
- Kershaw, Linda, A. MacKinnon, and J. Pojar. 1998. Plants of the Rocky Mountains. Lone Pine Publishers, Edmonton, Alberta, Canada.
- North Foothills Open Space Management Plan, Draft. 1996. Boulder County Parks and Open Space.
- Opler, P.A. 1994. Conservation and management of butterfly diversity in the United States. Office of Information Transfer. U.S. Fish and Wildlife Service, Fort Collins, Colorado.
- Opler, Paul A. 1999. A Field Guide to Western Butterflies. Houghton Mifflin Company. New York.
- Opler, P.A., A.D. Warren. February 14, 2003. Scientific Names for Butterfly Species of North America, north of Mexico. Oregonian newspaper. Aug. 24, 2006. Pages A1 and A12. Portland, Oregon.
- Pesman, M. Walter. 1992. Meet the Natives, Tenth Edition. Denver Botanical Gardens, Inc. Roberts Rinehart Publishers. Lanham, Maryland.
- Pyle, Robert Michael. 1981. Audubon Society Field Guide to North American Butterflies. Alfred A. Knopf, New York.
- Pyle, Robert Michael. 2002. The Butterflies of Cascadia. Seattle Audubon Society, Seattle, Washington.
- Pyle, Robert Michael. 2006. Personal phone communication.
- Robertson, Leigh. 1999. Southern Rocky Mountain Wildflowers. Falcon Publishing, Inc. Helena, Montana.
- Simonson, Sara and P. Pineda. 1995. Field Survey of Boulder County Open Space, Hall and Heil Ranches. Research sponsored by Natural Heritage Program.
- Stewart, Bob, P. and H. Brodtkin. 2001. Butterflies of Arizona, a Photographic Guide. West Coast Lady Press, Arcata, California.
- Weber, William A. and R.C. Wittmann. 2001. Colorado Flora, Eastern Slope. Third Edition. University Press of Colorado, Boulder, Colorado.

Tables 3-9 follow this page.



A most unusual silvery blue (*Glycopsyche lygdamus*) with exceptionally elongated black dots found and sketched by Mike Sportiello June 1, 2006, Upper Geer watershed, Heil Valley Ranch.

BCPOS Butterfly Survey
COMMONLY SIGHTED
BUTTERFLIES
2002-2006

2

| # of days observed | Scientific Name: | Common Name: | April | May | June | July | August |
|--------------------|------------------------------------|--------------------------|----------------------|---------------------|-----------------------------|-----------------------|-----------------------|
| 17 | <i>Echinargus isola</i> | Reakirt's Blue | | P6; H6 | F5; M6; H5-6; C5-6 | H5-6; C4-5 | F5; M6; H4 |
| 16 | <i>Plebejus melissa</i> | Melissa Blue | | H2-4-5-6 | F5; M5; H2-4-5-6; C5 | H5-6; C4-5 | M6; H4-5-6 |
| 19 | <i>P. icarioides</i> | Boisduval's Blue | | H2-4-5-6 | M5-6H2-3-4-5-6 C4-5-6 | H2-5; C4-5-6 | C4 |
| 10 | <i>P. lupini</i> | Lupine Blue | | | F5; H2-4; C4-6 | C4-5-6 | H5; C4 |
| 15 | <i>Euptoieta claudia</i> | Variegated Fritillary | | P5; H5 | P5; F5; M5; H3-5-6; C5-6 | H2-5; C4-5 | F6; H6 |
| 17 | <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | F5; H2-3-4-5-6 | F5-6; H2-5-6; C4-6 | M6; H4-5-6 |
| 15 | <i>S. edwardsii</i> | Edwards' Fritillary | | F6; H2 | M6; H2-3-5-6 | H2-6 C6 | F5-6; H4-5-6 |
| 11 | <i>S. coronis</i> | Coronis Fritillary | | H4 | H5-6; C6 | F6; H5-6; C6 | F6; H6 |
| 11 | <i>Phyciodes tharos</i> | Pearl Crescent | H5 | P5; F6; H2-5 | F5; H3-5; C4 | | |
| 14 | <i>P. cocyta</i> | Northern Crescent | | P6 | F5-6; H2-5-6; C4-6 | F5; H5; C4-5-6 | H4-5 |
| 15 | <i>P. pulchella</i> | Field Crescent | H4 | P5-6; F6; H2-4-5 | P6; F5-6; M5-6; C6 | F5; H5; C6 | H4-5 |
| 25 | <i>P. gracilis</i> | Hoary Comma | F6; M6; H4-5-6 | F5-6; H2-4-5-6 | F6; M5; H2-5-6; C5-6 | H2-5; C4-6 | M6; H6; C6 |
| 17 | <i>Nymphalis antiopa</i> | Mourning Cloak | F5-6; M6; H2-3-4-5-6 | F6; H2-5-6 | F5; H2-5; C5 | H5 | |
| 16 | <i>Vanessa cardui</i> | Painted Lady | P5; H5 | P5; H4-5 | P5; F5-6; M5; H3-4-5; C5 | F5; H5; C5 | F5; H5; C5 |
| 16 | <i>Limenitis weidemeyerii</i> | Weidemeyer's Admiral | | F6; H6 | F5-6; H2-3-4-5-6 | F5; H2-5; C4-6 | M6; H4-5; C5 |
| 17 | <i>Coenonympha tullia ochracea</i> | Ochre (Common) Ringlet | | F6; H4-5-6 | F5; M5-6; H4-5-6; C4-5-6 | F5; H5; C4-5-6 | |
| 10 | <i>Cercyonis pegala</i> | Common Wood Nymph | | | | F6; H2-5-6; C6 | F5; H4-5-6; C5 |
| 12 | <i>C. oetus</i> | Small Wood Nymph | | | | F6; H2-5-6; C4-6 | F6; M6; H4; C4-5-6 |
| 10 | <i>Erynnis pacuvius</i> | Pacuvius Duskywing | | H4-5-6 | M5; H4-5-6; C5 | C5 | F6 |
| 15 | <i>E. persius</i> | Persius Duskywing | | F6; H2-5-6 | M5-6; H2-3-5-6 C4-5-6 | C4-6 | |
| 15 | <i>Pyrgus communis</i> | Common Checkered-skipper | P6 | P6; F6; H5-6 | P5; F5-6; M6; H2-5-6 | C5; H6 | F6; H4-5-6 |
| 11 | <i>Poanes taxiles</i> | Taxiles Skipper | | | F5-6; H2-4-5-6 | F5-6; H2-5-6; C6 | |
| 11 | <i>Euphyes vestris</i> | Dun Skipper | | | F5-6; M6; H2-5-6 | F5-6; H2-5-6 | H4 |

Common Sightings
Janet Chu

BCPOS Butterfly Survey

1

Plains
2005-2006

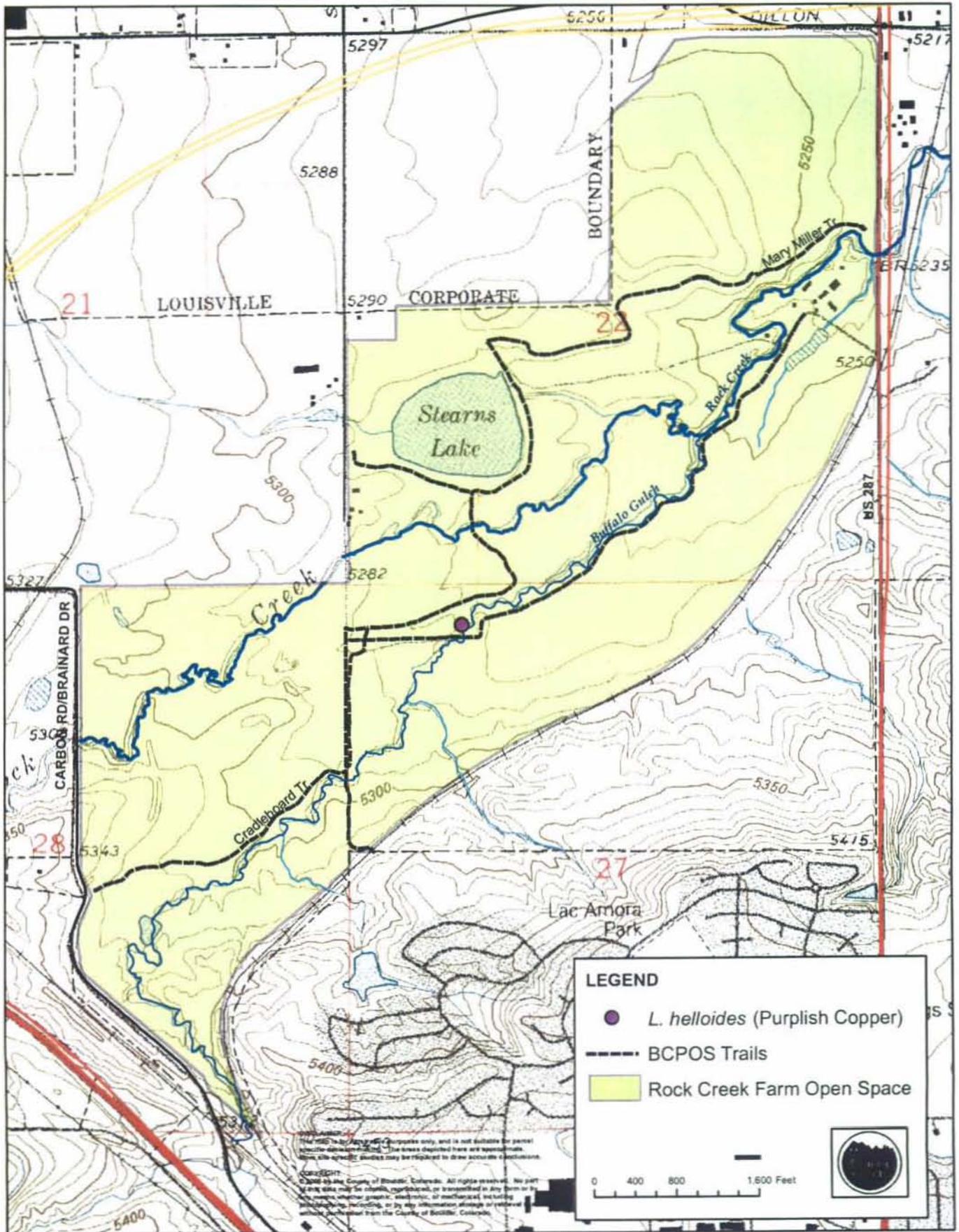
| | | | | Rock Creek Farm | Rock Creek Farm | Rock Creek Farm | Rock Creek Farm | Rock Creek Farm | Pella Crossing |
|---------------------------|------|-------------------------------|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|
| # of individuals observed | | | 2006 Dates: | 4/5 | 4/19 | 5/17 | 5/23 | 5/24 | 6/2 |
| 2005 | 2006 | Scientific Names | Common Names | CC | JC | JC | MS | JC | JC |
| 1? | | <i>Papilio polyxenes</i> | Black Swallowtail | | | | | | |
| 4 | 1 | <i>P. rutulus</i> | Western Tiger Swallowtail | | | | | | |
| 181 | 9 | <i>Pontia protodice</i> | Checkered White | | 1 | | 3 | 5 | |
| 50 | 60 | <i>Pieris rapae</i> | Cabbage White | 4 | 18 | 12 | 1 | 6 | 19 |
| | 27 | <i>Euchloe olympia</i> | Olympia Marble | | | | | | |
| | | white sp. | | | 1 | | 14 | 10 | |
| 17 | | <i>Colias philodice</i> | Clouded Sulphur | | | | | | |
| 2 | 10 | <i>Lycaena helloides</i> | Purplish Copper | | | | 4 | 6 | |
| | | | Canyon | | | | | | |
| 1 | | <i>Callophrys affinis</i> | Bramble Hairstreak | | | | | | |
| 1 | | <i>Strymon melinus</i> | Gray Hairstreak | | | | | | |
| 2 | | <i>G. lygdamus</i> | Silvery Blue | | | | | | |
| 2 | | <i>Echinargus isola</i> | Reakirt's Blue | | | | | | |
| 1 | | <i>Danaus plexippus</i> | Monarch | | | | | | |
| 29 | | <i>Euptoieta claudia</i> | Variegated Fritillary | | | | | | |
| 9 | | <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | | | | |
| 10 | 1 | <i>Phyciodes tharos</i> | Pearl Crescent | | | | | | |
| | 1 | <i>P. cocyta</i> | Northern Crescent | | | | | 1 | |
| 23 | 2 | <i>P. pulchella</i> | Field Crescent | | | | | 2 | |
| | | crescent sp. | | | | 1 | | | 1 |
| | 1 | <i>Polygonia gracilis</i> | Hoary Comma | | | | | | |
| 3 | | <i>Vanessa atalanta</i> | Red Admiral | | | | | | |
| 31 | | <i>V. cardui</i> | Painted Lady | | | | | | |
| 1 | | <i>V. virginiensis</i> | American Lady | | | | | | |
| 6 | 8 | <i>Pyrgus communis</i> | Common Checkered-skipper | | 1 | | 5 | 2 | |
| 373 | 120 | Total # of Individuals | Researchers: | CC = Cathy Cook | | MS= Mike Sportiello | | | |
| 19 | 10 | Total # of Species | | | | | | | |

12/11/2006

Table 3

Plains
Janet Chu
21-

Carolyn Holmberg Preserve at Rock Creek Farm



The information on this map is for informational purposes only, and is not suitable for parcel boundary determination. The lines depicted here are approximate. More site specific studies may be required to draw accurate conclusions.

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LEGEND

- *L. helioides* (Purplish Copper)
- BCPOS Trails
- Rock Creek Farm Open Space

0 400 800 1,600 Feet



BCPOS Butterfly Survey
Foothills
 2005-2006

| | | | | Anne U. White | Rabbit Mountain | Anne U. White | Anne U. White | Anne U. White | Anne U. White | Rabbit Mountain | Anne U. White | Steam boat Rock | Anne U. White | Anne U. White | Anne U. White | Steam boat Rock | Anne U. White | Anne U. White | |
|------------------|------------|-----------------------------|--------------------------------|------------------|--------------------|------------------|------------------|------------------|------------------|--------------------|------------------|-----------------------|------------------|------------------|------------------|-----------------------|------------------|------------------|---|
| # of individuals | 2006 Dates | 2006 Dates | 2006 Dates | 4/4 | 4/5 | 4/10 | 4/21 | 4/27 | 5/2 | 5/11 | 5/15 | 5/19 | 5/29 | 6/26 | 7/26 | 8/16 | 8/17 | 8/24 | |
| 2005 | 2006 | Scientific Name | Common Name | CC | JC | CC | DC | DC | DC | JC | JC | JC | CC | DC | JC | JC | MS | JC | |
| | | | Rocky Mountain Parnassian | | | | | | | | | | | | | | | | |
| 2 | | <i>Parnassius smintheus</i> | | | | | | | | | | | | | | | | | |
| | 2 | <i>Papilio polyxenes</i> | Black Swallowtail | | | | | | | 1 | | | | 1 | | | | | |
| 4 | 4 | <i>P. zelicaon</i> | Anise Swallowtail | | | | | | | | | 2 | 2 | | | | | | |
| 1? | | <i>P. indra</i> | Short-tailed Black Swallowtail | | | | | | | | | | | | | | | | |
| 34 | 40 | <i>P. rutulus</i> | W. Tiger Swallowtail | | | | | | | 27 | 3 | 2 | 6 | | 2 | | | | |
| 3 | 11 | <i>P. eurymedon</i> | Pale Swallowtail | | | | | | | | 2 | | 9 | | | | | | |
| 4 | 7 | <i>P. multicaudata</i> | Two-tailed Swallowtail | | | | | | x | | | | 5 | | 1 | | | | |
| | | swallowtail sp | | | | | | | | | | | | 3 | | | | | |
| 14 | | <i>Pontia protodice</i> | Checkered White | | | | | | | | | | | | | | | | |
| 1 | | <i>P. occidentalis</i> | Western White | | | | | | | | | | | | | | | | |
| | 12 | <i>P. sisymbrii</i> | Spring White | | | 1 | | 4 | x | | 3 | | 3 | | | | | | |
| 44 | 39 | <i>Pieris rapae</i> | Cabbage White | | | | | 6 | x | | 7 | | 13 | 5 | 1 | | | 2 | 4 |
| 26 | 12 | <i>Euchloe ausonides</i> | Large Marble | | | | | | | | 4 | 5 | 3 | | | | | | |
| 11 | 8 | <i>E. olympia</i> | Olympia Marble | | | | | | | 1 | | 7 | | | | | | | |
| 7 | 13 | <i>Anthocharis julia</i> | So. Rocky Mountain Orangetip | | | | | | | | 8 | | 5 | | | | | | |
| | | white sp. | | | | | | | | | 35+ | 12 | | | | | | | |
| | 1 | <i>Colias philodice</i> | Clouded Sulphur | | | | | | | | | 1 | | | | | | | |
| 6 | 1 | <i>C. eurytheme</i> | Orange Sulphur | | | | | | | 1 | | | | | | | | | |
| | | <i>C. alexandra</i> | Queen Alexandra Sulphur | | | | | | | | | | | | | | | | |
| 1 | | <i>Nathalis iole</i> | Dainty Sulphur | | | | | | | | | | | | | | | | |
| | | | Canyon | | | | | | | | | | | | | | | | |
| 2 | 2 | <i>Callophrys affinis</i> | Bramble Hairstreak | | | | | 1 | | | | | 1 | | | | | | |
| | 1 | <i>C. mossii</i> | Moss Elfin | | | | 1 | | | | | | | | | | | | |
| | 1 | <i>C. polios</i> | Hoary Elfin | | | | | | | | 1 | | | | | | | | |
| 10 | 14 | <i>C. eryphon</i> | Western Pine Elfin | | | 1 | | | | | 9 | | 4 | | | | | | |

BCPOS Butterfly Survey
Foothills
 2005-2006

| | | | Anne U. White | Rabbit Mountain | Anne U. White | Anne U. White | Anne U. White | Anne U. White | Rabbit Mountain | Anne U. White | Steamb oat Rock | Anne U. White | Anne U. White | Anne U. White | Steam boat Rock | Anne U. White | Anne U. White |
|------------------|------------------------------------|------------------------------|------------------|--------------------|------------------|------------------|------------------|------------------|--------------------|------------------|-----------------------|------------------|------------------|------------------|-----------------------|------------------|------------------|
| # of individuals | | 2006 Dates | 4/4 | 4/5 | 4/10 | 4/21 | 4/27 | 5/2 | 5/11 | 5/15 | 5/19 | 5/29 | 6/26 | 7/26 | 8/16 | 8/17 | 8/24 |
| 1 | <i>Satrium titus</i> | Coral Hairstreak | | | | | | | | | | | 1 | | | | |
| | <i>S saepium</i> | Hedgerow Hairstreak | | | | | | | | | | | | | | | |
| 1 | <i>S. behrii</i> | Behr's Hairstreak | | | | | | | | | | | | | | | |
| 1 | <i>Strymon melinus</i> | Gray Hairstreak | | | | | | | | | | | | | | | |
| 2 | <i>Cupido amyntula</i> | Western Tailed-Blue | | | | | | | | | | | | | | | |
| 3 | 16+ <i>Celastrina ladon sidara</i> | Spring Azure | | | | | many | x | | 6 | | 10 | | | | | |
| 5 | 6 <i>Glycopsyche lygdamus</i> | Silvery Blue | | | | | | x | | 3 | 1 | 1 | | | | | |
| | | Rocky Mtn. Dotted-Blue | | | | | | | | | | | | | | | |
| 20 | <i>Euphilotes ancilla</i> | Dotted-Blue | | | | | | | | | | | | | | | |
| 3 | <i>Echinargus isola</i> | Reakirt's Blue | | | | | | | | | | | | | | | |
| 5 | <i>Plebejus melissa</i> | Melissa Blue | | | | | | | | | | | | | | | |
| | 1 <i>P. icarioides</i> | Boisduval's Blue | | | | | | | | | | | | | | | |
| | 2 <i>P. lupini lutzii</i> | Lupine Blue | | | | | | | | | | | | | | | |
| | 1 <i>P. glandon rustica</i> | Arctic Blue | | | | | | | | | | | | | | | 1 |
| | | blue sp. | | | | | | | | 8 | | 2 | | | | | |
| | <i>Apodemia nais</i> | Nais Metalmark | | | | | | | | | | | | | | | |
| | 1 <i>Danaus plexippus</i> | Monarch | | | | | | | | | | | | 1 | | | |
| | 3 12 <i>Euptoieta claudia</i> | Variiegated Fritillary | | | | | | | | | | | | | | | 12 |
| | 11 4 <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | | | | | | | | | | 4 | | | |
| | 1 15 <i>S. edwardsii</i> | Edwards' Fritillary | | | | | | | | | | 3 | | | | | 12 |
| | 2 5 <i>S. coronis</i> | Coronis Fritillary | | | | | | | | | | | | 2 | 1 | | 2 |
| | 2 11 <i>S. hesperis</i> | Northwestern Fritillary | | | | | | | | | | | | | | 11 | |
| | 37 31 | fritillary sp. | | | | | | | | | | 3 | 6 | 15 | | | 7 |
| | 2 19 <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | | | | | | | | 19 | | | | | | |
| | 9 | <i>C. nycteis</i> | | | | | | | | | | | | | | | |
| | 14 | <i>Phyciodes mylitta</i> | | | | | | | | | | | | | | | |
| | 3 4 <i>P. tharos</i> | Pearl Crescent | | | | | | | | | | 4 | | | | | |
| | 27 1 <i>P. cocyta</i> | Northern Crescent | | | | | | | | | | | 1 | | | | |
| | 67 11 <i>P. pulchella</i> | Field Crescent | | | | | | | | 1 | 1 | 3 | 6 | | | | |
| | 1 | <i>P. pulchella camillus</i> | | | | | | | | | | | | | | | |
| | | crescent sp. | | | | | | | | 3 | | 2 | | | | | |
| | 2 | <i>Junonia coenia</i> | | | | | | | | | | | | | | | |
| | 1? | <i>Polygonia satyrus</i> | | | | | | | | | | | | | | | |
| | 4 41 <i>P. gracilis</i> | Hoary Comma | 4 | | 21 | | 5 | x | | 4 | | 1 | 5 | | | | |
| | | anglewing sp. | | | | | | | | | | | | | | | 1 |

BCPOS Butterfly Survey
 Foothills
 2005-2006

| | | | Anne U. White | Rabbit Mountain | Anne U. White | Anne U. White | Anne U. White | Anne U. White | Rabbit Mountain | Anne U. White | Steamb oat Rock | Anne U. White | Anne U. White | Anne U. White | Steam boat Rock | Anne U. White | Anne U. White |
|------------------|-----|------------------------------------|------------------|--------------------|------------------|------------------|------------------|------------------|--------------------|----------------------|-----------------------|------------------|------------------|------------------|-----------------------|------------------|------------------|
| # of individuals | | 2006 Dates | 4/4 | 4/5 | 4/10 | 4/21 | 4/27 | 5/2 | 5/11 | 5/15 | 5/19 | 5/29 | 6/26 | 7/26 | 8/16 | 8/17 | 8/24 |
| | 4 | <i>Aglais milberti</i> | | | 1 | | | | | | | | | | | | 3 |
| 7 | 26 | <i>Nymphalis antiopa</i> | 7 | | 13 | | 2 | x | | 2 | | 1 | | | | | |
| 17 | 1 | <i>Vanessa atalanta</i> | | | | | | | | | | 1 | | | | | |
| 65 | 3 | <i>V. cardui</i> | | | | | | | | | | | 3 | | | | |
| 1 | 3 | <i>V. virginiensis</i> | | | | | | | | | | | | | | | 3 |
| 21 | 6 | <i>Limenitis weidemeyerii</i> | | | | | | | | | | 3 | | 3 | | | |
| 22 | 1 | <i>Coenonympha tullia ochracea</i> | | | | | | | | | | 1 | | | | | |
| 4 | 2 | <i>Cercyonis pegala</i> | | | | | | | | | | | | 2 | | | |
| | 2 | <i>C. oetus</i> | | | | | | | | | | | | 1 | | | 1 |
| 10 | 14 | <i>Oeneis uhleri</i> | | | | | | x | | 6 | | 7 | | | | | |
| 18 | 7 | <i>Epargyreus clarus</i> | | | | | | | | | | 5 | | | | | 2 |
| | 10 | <i>Erynnis pacuvius</i> | | | | | | | | | | | | | | | 10 |
| | 2 | <i>E. persius</i> | | | | | | | | 1 | | 1 | | | | | |
| 3 | 2 | <i>Pyrgus communis</i> | | | | | | | | 1 | | | 1 | | | | |
| 1 | 2 | <i>Piruna pirus</i> | | | | | | | | | | | 2 | | | | |
| | | <i>Oarisma garita</i> | | | | | | | | | | | | | | | |
| 6 | | <i>Hesperia colorado</i> | | | | | | | | | | | | | | | |
| | | <i>H. pahaska</i> | | | | | | | | | | | | | | | |
| | | <i>Polites themistocles</i> | | | | | | | | | | | | | | | |
| 1 | 12 | <i>P. mystic</i> | | | | | | | | | | | | | | | 12 |
| 23 | 15 | <i>Ochlodes sylvanoides</i> | | | | | | | | | | | | | 12 | | 3 |
| 24 | 17 | <i>Poanes taxiles</i> | | | | | | | | | | | 12 | 5 | | | |
| 71 | 12 | <i>Euphyes vestris</i> | | | | | | | | | | | 10 | 2 | | | |
| | 2 | <i>Atrytonopsis hianna</i> | | | | | | | | 1 | | 1 | | | | | |
| 691 | 474 | Total # of Individuals | skipper sp. | | | | | x = at least one | | 1 | | 1 | | | 1 | | 2 |
| 58 | 50 | Total # of species | Researchers: | CC=Cathy Cook | | DC=Donn Cook | | JC=Jan Chu | | MS = Mike Sportiello | | | | | | | |

BCPOS Butterfly Survey
PLAINS, FOOTHILLS NOTES
 2006

| Notes on Plains | LOCATION | | Field Researchers |
|--|--|--|------------------------|
| 4/5/ 2006 Rock Creek 9:45-10:30 am | Parking lot around dam | | Cathy and Donn Cook |
| 4/19/ 2006 Rock Creek 12:25 - 1:45 pm 12 deg C. clear sky | <i>protodice, communis</i> nectaring on dandelion | water cress, dandelion blossoms. Great horned owl adult and young; Swainson's hawk offering twigs to another hawk. | Jan Chu |
| 5/17/ 2006 Rock Creek 1:00 - 2:30 pm 24.5 - 25 deg C. clear sky | Trail to west | Very dry; voles, prairie dogs | Jan Chu, Carol Cushman |
| 5/23/ 2006 Rock Creek 11:45-1:45 pm 24 - 27 deg C. | | Dorcas copper? Checked museum specimens. Found to be purplish copper. | Mike Sportiello |
| 5/24/2006 Rock Creek 10 - 12 pm 21 deg C. clear sky | Stearns Lake shore to great horned owl trees | | Jan Chu |
| 6/2/ 2006 Pella Crossing 11:00 - 12:00 pm 25 to 28 deg C. clear sky, few clouds | Zweck-Turner ditch, running full of water; Heron Lake, Sunset Lake | Single species <i>rapae</i> . Many milkweeds in bud. Bindweed and flax in bloom. | Jan Chu |
| Notes on Foothills | | | |
| 4/4/ 2006 Anne U. White 12:10-12:40 pm 20% sun | Parking lot to first stream crossing. | <i>antiopa</i> and <i>gracilis</i> basking on rock next to snow bank along stream. 15-20 turkey vultures | Cathy and Donn Cook |
| 4/5/2006 Rabbit Mountain 12:50 - 2:50 p.m. 23 - 24 deg C. | Walked Eagle Trail to post (J-3 Wildlife Survey post) No butterfly;. One butterfly flew over my car as I drove away. | few locusts, green bodied wasp | Jan Chu |
| 4/10/ 2006 Anne U. White 1:00 - 3:30 pm 100% sun, light breeze | Walked the entire trail counting BFs only on the way up. | One fresh pine elfin on trail near willows and small pines. Flowers in bloom: sand lily, spring beauty, one nuttall's violet | Cathy and Donn Cook |
| 4/21/ 2006 Anne U. White | short walk | New species for our Inventories. Moss elfin | Donn Cook |

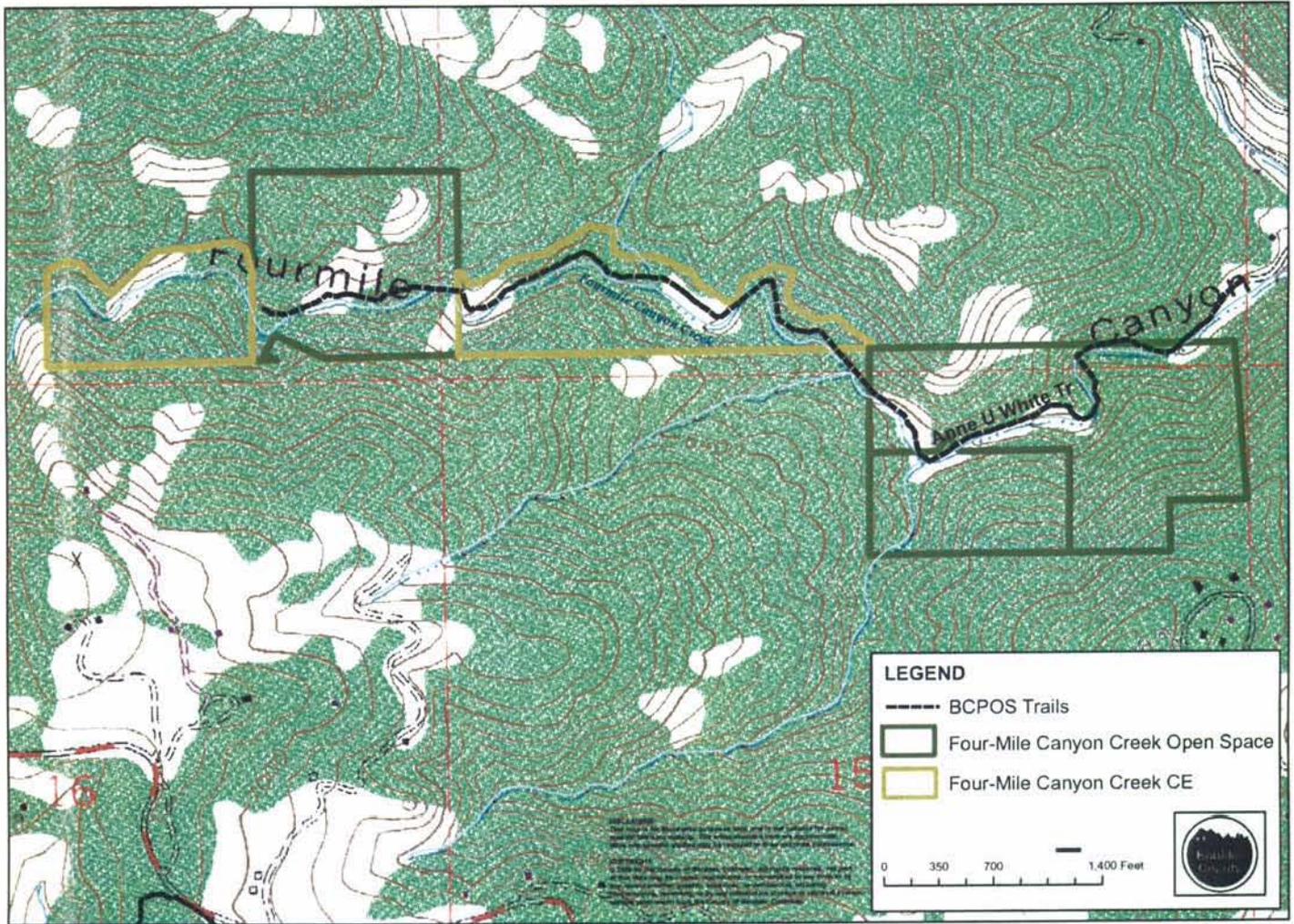
PLAINS-FOOTHILLS
 NOTES
 JANET CHU
 22-4

BCPOS Butterfly Survey
 PLAINS, FOOTHILLS NOTES
 2006

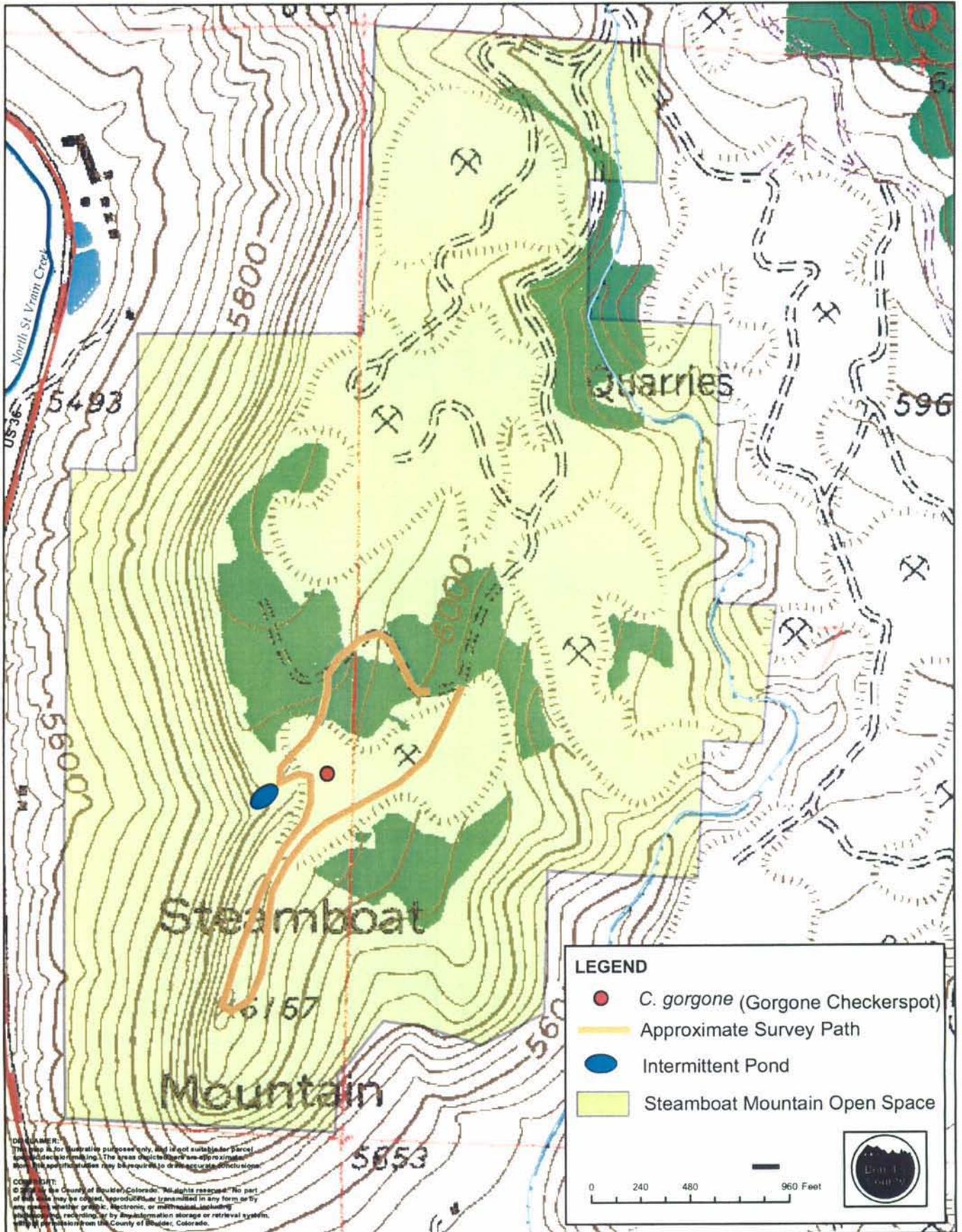
| Notes on Plains | LOCATION | | Field Researchers |
|--|--|---|--|
| 5/11/ 2006 Rabbit Mountain 12:15 - 1:15 pm 12 - 17 deg C. 20% to 90% cirrus cloud cover, breeze | East on roadway to near canal (through locked gate). | Forester moth flying over one juniper bush; one dead magpie. Colony of <i>Euchloe olympia</i> . Rock cress, <i>Arabis</i> sp. is food for <i>Olympia</i> marble. | Jan Chu, Mike Sportiello |
| 5/15/ 2006 Anne U. White 1:00 - 2:30 pm 18 - 21 deg C. clear, sun | Trail to first stream crossing | <i>julia</i> on wax currant. Dusted skipper on trail with wide, dark band, orange block on forewing dorsal. Golden banner, blue locoweed | Jan Chu |
| 5/19/ 2006 Steamboat Rock 10:15 - 1:15 pm 27.5 deg C. partly cloudy | Loop from fork in road to pond to point to house foundation | spring-fed pond was completely dry; wall flowers small; mtn. mahogany in bloom | Jan Chu, Mike Sportiello |
| 5/29/ 2006 Anne U. White 10:00 - 12:30 pm clear, high cloud cover | | 24 species | Cathy & Donn Cook, Joe & Carol Krieg |
| 6/26/2006 Anne U. White 1:30 - 3 pm | 100 yards on trail | Butterflies nectaring on dogbane and monarda; hairstreak on sulphur flower. | |
| 7/26/ 2006 Anne U. White 9:07 - 11:30 am 21 - 28 deg C. clear to cloudy | Walked in beyond first crossing to second shaded crossing | <i>Monarda fistulosa</i> in full bloom; fritillaries and hummingbirds nectaring on them. | Jan Chu, Larry Crowley, Amy Chu, Jeremy Hurst |
| 8/16/ 2006 Steamboat Rock 9:15 - 12:15 pm. 22.5 deg C. 80% clear to cloud cover | Fork in road, along ridge to 'pond' to peak, to road | very dry, few gayfeather, arnica sp. Goldenrod, toadflax. Remaining <i>Heterotheca</i> sp. | Jan Chu, Larry Crowley |
| 8/17/ 2006 Anne U. White 12:30 - 2:00 pm sunny to partly cloudy at end; est. 29 deg C. | 3/4 mile to 1 mile on trail (92 deg C in Boulder at 3 p.m.) | creek pretty dry, small amount of water in a few spots | Mike Sportiello |
| 8/24/ 2006 Anne U. White 9:30 - 11:00 am 28 deg C. 20% clear | Walked to first large stream crossing, no water | tiny skippers | Jan Chu, Larry Crowley |

PLAINS-FOOTHILLS
 NOTES
 JANET CHU
 22-5

Four-Mile Canyon Creek Open Space: Anne U White Trail



Steamboat Mountain Open Space



LEGEND

- *C. gorgone* (Gorgone Checkerspot)
- Approximate Survey Path
- Intermittent Pond
- Steamboat Mountain Open Space

0 240 480 960 Feet

DISCLAIMER:
 This map is for illustrative purposes only, and is not suitable for parcel mapping or development planning. The above depicted lines are approximate. More detailed specifications may be required to delineate accurate delineations.

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BCPOS Butterfly Survey
Heil Valley Ranch - Geer
2004-2006

1

| Heil Valley - Geer | | | Location: | Lower Geer | Lower Geer | Upper Geer | Lower Geer | Upper Geer | Upper Geer | Lower Geer | Upper Geer | Upper Geer | Lower Geer | Upper Geer | Upper Geer | Lower Geer | |
|--------------------|------|------|---------------------------|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----|
| | | | 2006 | 4/4 | 4/8 | 4/13 | 4/17 | 4/26 | 5/6 | 5/14 | 5/26 | 5/27 | 6/1 | 6/3 | 6/11 | 6/14 | 6/17 | 7/28 | 8/20 | 8/30 | | |
| # of individuals | | | Survey Dates: | 4/4 | 4/8 | 4/13 | 4/17 | 4/26 | 5/6 | 5/14 | 5/26 | 5/27 | 6/1 | 6/3 | 6/11 | 6/14 | 6/17 | 7/28 | 8/20 | 8/30 | | |
| 2004 | 2005 | 2006 | Scientific Name | Common Name | JC | CC, DC | JC | MS | MS | MS | MS | JC | JC, MS | MS | JC, CC, DC | MS | JC | JC | JC | MS | JC | |
| | 1 | 1 | <i>Papilio polyxenes</i> | Black Swallowtail | | 1 | | | | | | | | | | | | | | | | |
| 3 | 1 | 2 | <i>P. zelicaon</i> | Anise Swallowtail | | | | | | | | | | | 1 | 1 | | | | | | |
| 2 | 12 | | <i>P. indra</i> | Short-tailed Black Swallowtail | | | | | | | | | | | | | | | | | | |
| | | | 'black' swallowtail | Western Tiger Swallowtail | | | | | | | | | 1 | | 1 | | | | | | | |
| 5 | 14 | 10 | <i>P. rutulus</i> | Pale Swallowtail | | | | | | | | 4 | | | 1 | 1 | | | | 4 | | |
| 12 | 18 | 57 | <i>P. eurymedon</i> | Two-tailed Swallowtail | | | | | | | 1 | 16 | 6 | 4 | 10 | 6 | 9 | | | 5 | | |
| 6 | | 13 | <i>P. multicaudata</i> | Swallowtail sp. | | | | | | | | | | | | | | | | | | |
| | | | swallowtail sp. | | | | 1 | | | | | | | | 4 | 2 | 1 | | | 6 | | |
| | 1 | | <i>Neophasia menapia</i> | Pine White | | | | | | | | | | | 5 | 2 | | 5 | 1 | | 1 | |
| 1 | 7 | | <i>Pontia protodice</i> | Checked White | | | | | | | | | | | | | | | | | | |
| 2 | | | <i>P. occidentalis</i> | Western White | | | | | | | | | | | | | | | | | | |
| 19 | 110 | 125 | <i>Pieris rapae</i> | Cabbage White | 1 | | 1 | 1 | 1 | 2 | 11 | 8 | 13 | | | | 4 | 1 | 31 | 14 | 13 | 24 |
| 2 | 1 | | <i>P. marginalis</i> | Mustard White | | | | | | | | | | | | | | | | | | |
| 13 | 2 | 20 | <i>Euchloe ausonides</i> | Large Marble | | | | | | | 2 | 8 | 5 | 5 | | | | | | | | |
| | 6 | 1 | <i>E. olympia</i> | Olympia Marble | | | | | | | | | | | 1 | | | | | | | |
| | | | marble sp. | | | | | | | | | | | | 2 | | | | | | | |
| 1 | | 13 | <i>Anthocharis julia</i> | Southern Rocky Mountain Orangetip | | | | | | | | | | | | | | | | | | |
| | | | white sp. | | | | | | | | | | | | | | | | | | | |
| 2 | 5 | 9 | <i>Colias philodice</i> | Clouded Sulphur | | | | | | | 1 | 10 | 41 | 11 | 20 | 6 | | 20 | 3 | | 1 | 8 |
| | 6 | 1 | <i>C. eurytheme</i> | Orange Sulphur | | | | | | | | | | | 2 | 2 | 1 | | | | 1 | 3 |
| | | 3 | <i>C. alexandria</i> | Queen Alexandra | | | | | | | | | | | | | | | | | | |
| | 2 | | <i>Nathalis iole</i> | Dainty Sulphur | | | | | | | | | | | | | | | | | | |
| | | | sulphur sp. | | | | | | | | | | | | | | | | | | | |
| | | 1 | <i>Lycaena heteronea</i> | Blue Copper Canyon | | | | | | | | | | | | | | | | | 1 | 2 |
| 2 | 1 | 19 | <i>Callophrys affinis</i> | Bramble Hairstreak | | | | | | | 1 | | | | 4 | 12 | | 1 | 1 | | | |
| | | | <i>C. sheridanii</i> | Sheridan's Hairstreak (White-lined Green) | | | | | | | | | | | | | | | | | | |
| | | | <i>C. gyrneus</i> | Siva Juniper Hairstreak | | | | | | | | | | | | | | | | | | |
| | | | <i>C. augustinus</i> | Brown Elfin | | | | | | | | | | | | | | | | | | |
| 15 | 11 | 42 | <i>C. eryphon</i> | Western Pine Elfin | | | | | | | | | | | | | | | | | | |
| 1 | 1 | | <i>Strymon melinus</i> | Gray Hairstreak | | | | | | | | | | | | | | | | | | |

BCPOS Butterfly Survey
Heil Valley Ranch - Geer
2004-2006

2

| Heil Valley - Geer | | | Location: | Lower Geer | Lower Geer | Upper Geer | Lower Geer | Upper Geer | Upper Geer | Lower Geer | Upper Geer | Upper Geer | Lower Geer | Upper Geer | Upper Geer | Lower Geer | | |
|-------------------------------|------|------|--------------------------------|-----------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|---|--|
| Species observed in 2002-2006 | | | 2006 | 4/4 | 4/8 | 4/13 | 4/17 | 4/26 | 5/6 | 5/14 | 5/26 | 5/27 | 6/1 | 6/3 | 6/11 | 6/14 | 6/17 | 7/28 | 8/20 | 8/30 | | | |
| # of individuals | | | | Survey Dates: | | | | | | | | | | | | | | | | | | | |
| 2004 | 2005 | 2006 | Scientific Name | Common Name | JC | CC, DC | JC | MS | MS | MS | MS | JC | JC, MS | MS | JC, CC, DC | MS | JC | JC | JC | MS | JC | | |
| | 1 | | <i>Leptotes marina</i> | Marine Blue | | | | | | | | | | | | | | | | | | | |
| 1 | 5 | 15 | <i>Cupido amyntula</i> | Western Tailed-Blue | | | | | | | | 12 | 1 | | 1 | 1 | | | | | | | |
| 8 | 1 | 2 | <i>Celastrina ladon sidara</i> | Spring Azure | | | | | | | | 1 | 1 | | | | | | | | | | |
| 3 | 3 | 14 | <i>Glaucopsyche piasus</i> | Arrowhead Blue | | | | | | | | 1 | 11 | 1 | | | 1 | | | | | | |
| 20 | 9 | 53 | <i>G. lygdamus</i> | Silvery Blue | | | | | 3 | 3 | | 2 | 29 | 11 | 1 | 4 | 1 | | | | | | |
| | | | | Rocky Mountain | | | | | | | | | | | | | | | | | | | |
| 3 | 4 | 5 | <i>Euphilotes ancilla</i> | Dotted-Blue | | | | | | | | | | | 2 | 2 | 1 | | | | | | |
| | 3 | 2 | <i>Echinargus isola</i> | Reakirt's Blue | | | | | | | | | | | | | | | 1 | | | 1 | |
| 4 | 11 | 14 | <i>Plebejus melissa</i> | Melissa Blue | | | | | | | | | 3 | | | | 1 | 2 | 7 | 1 | | | |
| | | | <i>P. saepiolus</i> | Greenish Blue | | | | | | | | | | | | | | | | | | | |
| 7 | 23 | 83 | <i>P. icarioides</i> | Boisduval's Blue | | | | | | | | 6 | 31 | 11 | 5 | 9 | 14 | 5 | | | | | |
| 5 | | | <i>P. lupini lutzii</i> | Lupine Blue | | | | | | | | | | | | | | | | | | | |
| 1 | | 20 | <i>P. glandon rustica</i> | Arctic Blue | | | | | | | | | | | 20 | | | | | | | | |
| | | | blue sp. | | | | | | 3 | 10 | | 5 | 30 | 19 | | 24 | 2 | | | | | 1 | |
| | 1 | 3 | <i>Danaus plexippus</i> | Monarch | | | | | | | | | | | | | | | 2 | | | 1 | |
| | 9 | 2 | <i>Euptoieta claudia</i> | Variagated Fritillary | | | | | | | | | | | | | | 2 | | | | | |
| 3 | 44+ | 11 | <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | | | | | | | 1 | | 1 | | 4 | 4 | 1 | | | | |
| | 2 | 3 | <i>S. edwardsii</i> | Edwards' Fritillary | | | | | | | | | 2 | | 1 | | | | | | | | |
| 1 | | 4 | <i>S. coronis</i> | Coronis Fritillary | | | | | | | | | | | | | | 1 | 3 | | | | |
| | 2 | | <i>S. callippe</i> | Callippe Fritillary | | | | | | | | | | | | | | | | | | | |
| | | | | Northwestern | | | | | | | | | | | | | | | | | | | |
| | 6 | | <i>S. hesperis</i> | Fritillary | | | | | | | | | | | | | 1 | 2 | 1 | 2 | | | |
| | 1 | | <i>S. mormonia</i> | Mormon Fritillary | | | | | | | | | | | | | | | | | | | |
| | | | fritillary sp. | | | | | | | | | | 7 | 12 | | 42 | 10 | | 20 | 54 | 20 | | |
| 7 | 1 | 2 | <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | | | | | | | | | 2 | | | | | | | | | |
| 2 | | | <i>C. nycteis</i> | Silvery Checkerspot | | | | | | | | | | | | | | | | | | | |
| | | 3 | <i>C. palla</i> | Checkerspot | | | | | | | | | | | | 3 | | | | | | | |
| | | | checkerspot sp. | | 1 | | | 1 | 1? | 1 | | | 1 | | | | | | | | | | |
| | 6 | 2 | <i>Phyciodes mylitta</i> | Mylitta Crescent | | | | | | | | | | | | | | | 2 | | | | |
| | 1 | | <i>P. tharos</i> | Pearl Crescent | | | | | | | | | | | | | | | | | | | |
| | 6 | 6 | <i>P. cocyta</i> | Northern Crescent | | | | | | | | | | 1 | | 4 | | 1 | | | | | |
| 23 | 89 | 21 | <i>P. pulchella</i> | Field Crescent | | | | | | | | | | 11 | 8 | 1 | | 1 | | | | | |
| | | | crescent sp. | | | | | | | 1 | | | | | | | | | | | | | |
| 4 | 5 | 55 | <i>P. gracilis</i> | Hoary Comma | 2 | 10 | 12 | 15 | 4 | 1 | 2 | | 3 | 3 | | | | 3 | | | | | |
| | | | | Milbert's | | | | | | | | | | | | | | | | | | | |
| 1 | | | <i>Aglais milberti</i> | Tortoiseshell | | | | | | | | | | | | | | | | | | | |
| 5 | 7 | 32 | <i>Nymphalis antiopa</i> | Mourning Cloak | 3 | 4 | 8 | 12 | 1 | | | | 1 | 2 | 1 | | | | | | | | |
| | | | | California | | | | | | | | | | | | | | | | | | | |
| | 4 | | <i>N. californica</i> | Tortoiseshell | 1 | | | 3 | | | | | | | | | | | | | | | |

BCPOS Butterfly Survey
Heil Valley Ranch - Geer
2004-2006

3

| Heil Valley - Geer | | | | Location: | Lower Geer | Lower Geer | Upper Geer | Upper Geer | Upper Geer | Upper Geer | Upper Geer | Upper Geer | Lower Geer | Upper Geer | Upper Geer | Lower Geer | Upper Geer | Upper Geer | Lower Geer | Upper Geer | Upper Geer | Lower Geer |
|--------------------|------|------|--|--------------------------|---------------|--------------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | | | | 2006 | 4/4 | 4/8 | 4/13 | 4/17 | 4/26 | 5/6 | 5/14 | 5/26 | 5/27 | 6/1 | 6/3 | 6/11 | 6/14 | 6/17 | 7/28 | 8/20 | 8/30 | |
| # of individuals | | | | Survey Dates: | 4/4 | 4/8 | 4/13 | 4/17 | 4/26 | 5/6 | 5/14 | 5/26 | 5/27 | 6/1 | 6/3 | 6/11 | 6/14 | 6/17 | 7/28 | 8/20 | 8/30 | |
| 2004 | 2005 | 2006 | Scientific Name | Common Name | JC | CC, DC | JC | MS | MS | MS | MS | JC | JC, MS | MS | JC, CC, DC | MS | JC | JC | JC | MS | JC | |
| 8 | | | <i>Vanessa atalanta</i> | Red Admiral | | | | | | | | | | | | | | | | | | |
| 174 | | | <i>V. cardui</i> | Painted Lady | | | | | | | | | | | | | | | | | | |
| | | 1 | <i>V. virginiensis</i> | American Lady | | | | | | | | | | | | | | | | | 1 | |
| | | | | Weidemeyer's | | | | | | | | | | | | | | | | | | |
| | 5 | 8 | <i>Limenitis weidemeyerii</i> | Admiral | | | | | | | | 2 | 1 | | 1 | 1 | | 3 | | | | |
| | | | <i>Coenonympha tullia ochracea</i> | Ochre (Common) | | | | | | | | | | | | | | | | | | |
| 16 | 42 | 79 | | Ringlet | | | | | | | 1 | 2 | 37 | 13 | 8 | 9 | 6 | 3 | | | | |
| | 3 | 74 | <i>Cercyonis pegala</i> | Nymph | | | | | | | | | | | | | | | | 69 | 4 | 1 |
| | | 2 | <i>C. oetus</i> | Small Wood-Nymph | | | | | | | | | | | | | | | | 2 | | |
| | | | wood nymph sp. | | | | | | | | | | | | | | | | | | | 1 |
| | | 5 | <i>Erebia epipsodea</i> | Common Alpine | | | | | | | | | | | 2 | | 1 | 2 | | | | |
| | | 2 | <i>Oeneis chryxus</i> | Chryxus Arctic | | | | | | | | | | | 2 | | | | | | | |
| | | 20 | <i>O. uhleri arctic sp.</i> | Uhler's Arctic | | | | | | | | | | 14 | 6 | | | | | | | |
| | | | | Silver-spotted | | | | | | | | | | | | | | | | | | |
| | 3 | 15 | <i>Epargyreus clarus</i> | Skipper | | | | | | | | 2 | 3 | 1 | | 1 | 6 | 2 | | | | |
| | 1 | | <i>Thorybes pylades</i> | N. Cloudywing | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | <i>Erynnis icelus</i> | Dreamy Duskywing | | | | | | | | | | | | | | | | | | |
| | 3 | 3 | <i>E. pacuvius</i> | Pacuvius Duskywing | | | | | | | | | | | | | | | | | 2 | |
| | | 1 | <i>E. afranius</i> | Afranius Duskywing | | | | | | | | 1? | | | | | | | | | | |
| 11 | 6 | 25 | <i>E. persius</i> | Persius Duskywing | | | | | | | | 6 | 12 | | 1 | | 3 | 3 | | | | |
| | | | | Common Checkered-skipper | | | | | | | | | | | | | | | | | | |
| 54 | 10 | 5 | <i>Pyrgus communis</i> | Skipper | | | | | | | | | | 1 | | | | | 1 | 1 | 2 | |
| | | 1 | <i>Piruna pirus</i> | Russet Skipperling | | | | | | | | | | | | | 1 | | | | | |
| | | 1 | <i>Oarisma garita</i> | Garita Skipperling | | | | | | | | | | | | | 1 | | 3 | | | |
| | | | | Common Branded | | | | | | | | | | | | | | | | | | |
| | | 21 | <i>Hesperia colorado duskywing sp.</i> | Skipper | | | | | | | | | | | | | | | | | 35 | 11 |
| | | 1 | <i>H. viridis</i> | Green Skipper | | | | | | | | | | | | | | | | | | |
| | | 1 | <i>Polites themistocles</i> | Tawny-edged Skipper | | | | | | | | | | | | | | | | | | |
| | 6 | 3 | <i>P. mystic</i> | Long Dash | | | | | | | | | | | | | | | | | | |
| | | 4 | <i>Ochlodes sylvanoides</i> | Woodland Skipper | | | | | | | | | | | | | | | | | | |
| | | 7 | <i>Poanes taxiles</i> | Taxiles Skipper | | | | | | | | | | | | | | | | | | 2 |
| | | 4 | <i>Euphyes vestris</i> | Dun Skipper | | | | | | | | | | | | | 1 | | | | | |
| | | 22 | | Bronze Roadside-skipper | | | | | | | | | | | | | | | | | | |
| | | 1 | <i>Amblyscirtes aenus skipper sp.</i> | | | | | | | | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| 39 | 57 | 60 | Total # of species | | | | | | | | | | | | | | | | | | | |
| Researchers: | | | | JC=Jan Chu | CC=Cathy Cook | MS=Mike Sportiello | DC=Donn Cook | | | | | | | | | | | | | | | |

Heil Valley Ranch Open Space: South



BCPOS Butterfly Survey
Heil Valley Ranch - Plumely 2004 - 2006

1

| Total # of individuals/ year | Species observed in 2002-2006: | Location: 2006 Survey Dates: | | | | | | | | | | |
|------------------------------|--------------------------------|------------------------------|-----------------------------|--------------------------------|--------------------------|-----------------------------|--------------|---------------------|---------------------|----|----|-------|
| | | Lower Plumely 4/10 | Roadway, Plumely Canyon 5/2 | Red Hill 6/1 | Plumely Canyon 6/13 | Plumely Canyon (lower) 7/16 | Red Hill 8/4 | Plumely Canyon 8/28 | Plumely Canyon 8/31 | | | |
| 2004 | 2005 | 2006 | Scientific Name | Common Name | No. of Individuals/ trip | | | | | | | |
| | | | | | JC | JC | JC,CC | JC | JC | JC | JC | JC,CC |
| | | 1 | <i>Papilio polyxenes</i> | Black Swallowtail | | | | | 1 | | | |
| | 1 | | <i>P. indra</i> | Short-tailed Black Swallowtail | | | | | | | | |
| | | x | | 'black' swallowtail | | | 3 | | | 1 | | |
| | | | | Western Tiger | | | | | | | | |
| 9 | 27 | 12 | <i>P. rutulus</i> | Swallowtail | | 1 | 4 | 2 | 5 | | | |
| 1 | 14 | 11 | <i>P. eurymedon</i> | Pale Swallowtail | | | 4 | 6 | 1 | | | |
| 6 | 1 | 20 | <i>P. multicaudata</i> | Two-tailed Swallowtail | | 1 | 7 | 3 | 7 | 2 | | |
| 12 | | | <i>Neophasia menapia</i> | Pine White | | | | | | | | |
| | | 11 | <i>Pontia protodice</i> | Checkered White | | | 1 | | | | | |
| 2 | | 2 | <i>P. sisymbrii</i> | Spring White | 2 | | | | | | | |
| 9 | 170 | 14 | <i>Pieris rapae</i> | Cabbage White | | 3 | | 2 | 7 | | 2 | |
| | 6 | | <i>P. marginalis</i> | Mustard White | | | | | | | | |
| 3 | 8 | 7 | <i>Euchloe ausonides</i> | Large Marble | | | 4 | 3 | | | | |
| 2 | 1 | 4 | <i>E. olympia</i> | Olympia Marble | | | 4 | | | | | |
| | | | | Southern Rocky Mountain | | | | | | | | |
| | | 28 | <i>Anthocharis julia</i> | Orangetip | | | 9 | | | | | |
| | | | white sp. | | | | 15 | 3 | 1 | | | |
| | 9 | 13 | <i>Colias philodice</i> | Clouded Sulphur | 1? | 1? | 4 | | 1 | 3 | 5 | |
| 2 | 49 | | <i>C. eurytheme</i> | Orange Sulphur | | | | | | | | |
| | 3 | | <i>C. alexandra</i> | Queen Alexandra | | | | | | | | |
| | 1 | | <i>Eurema mexicana</i> | Mexican sulphur | | | | | | | | |
| | 5 | | <i>Nathalis iole</i> | Dainty Sulphur | | | | | | | | |
| | X | | sulphur sp. | | | | | | 1 | | | |
| | 3 | 1 | <i>Lycaena dione</i> | Gray Copper | | | | | 1 | | | |
| | | | | Canyon | | | | | | | | |
| | 2 | 6 | <i>Callophrys affinis</i> | Bramble Hairstreak | | | 4 | 2 | | | | |
| | | | | Sheridan's Hairstreak | | | | | | | | |
| 3 | 4 | 1 | <i>C. sheridanii</i> | (White-lined Green) | | 1 | | | | | | |
| | 1 | 1 | <i>C. gyrneus</i> | Siva' Juniper Hairstreak | | | | 1 | | | | |
| 16 | 52 | 12 | <i>C. eryphon</i> | Western Pine Elfin | | 11 | 1 | | | | | |
| | 1 | 1 | <i>Satyrium titus</i> | Coral Hairstreak | | | | 1 | | | | |
| | 1 | | <i>Strymon melinus</i> | Gray Hairstreak | | | | | | | | |

BCPOS Butterfly Survey
Heil Valley Ranch - Plumely 2004 - 2006

| Total # of individuals/ year | | | Species observed in 2002-2006: | Location: 2006 Survey Dates: | Lower Plumely 4/10 | Roadway, Plumely Canyon 5/2 | Red Hill 6/1 | Plumely Canyon 6/13 | Plumely Canyon (lower) 7/16 | Red Hill 8/4 | Plumely Canyon 8/28 | Plumely Canyon 8/31 |
|------------------------------|------|------|--------------------------------|---------------------------------|--------------------------|--------------------------------|-----------------|------------------------|--------------------------------|-----------------|------------------------|------------------------|
| 2004 | 2005 | 2006 | Scientific Name | Common Name | No. of Individuals/ trip | | | | | | | |
| | 2 | | <i>Leptotes marina</i> | Marine Blue | | | | | | | | |
| | 2 | 3 | <i>Cupido amyntula</i> | Western Tailed-Blue | | 2 | | 1 | | | | |
| 1 | 28 | 1 | <i>Celastrina ladon sidara</i> | Spring Azure | | 1 | | | | | | |
| | 13 | 23 | <i>C. humulus</i> | Hops Azure | | | | 23 | | | | |
| | | 1 | <i>Glaucopsyche piasus</i> | Arrowhead Blue | | | | 1 | | | | |
| 1 | 17 | 24 | <i>G. lygdamus</i> | Silvery Blue | | 16 | 2 | 6 | | | | |
| | | | | Rocky Mountain | | | | | | | | |
| | 6 | 1 | <i>Euphilotes ancilla</i> | Dotted-Blue | | | | 1 | | | | |
| 18 | 13 | 1 | <i>Echinargus isola</i> | Reakirt's Blue | | | 1 | | | | | |
| 21 | 13 | 17 | <i>Plebejus melissa</i> | Melissa Blue | | | 7 | 1 | | 7 | 1 | 1 |
| 2 | 16 | 15 | <i>P. icarioides</i> | Boisduval's Blue | | | 10 | 5 | | | | |
| | 5 | | <i>P. lupini lutzii</i> | Lupine Blue | | | | | | | | |
| | 2 | | <i>P. glandon rustica</i> | Arctic Blue | | | | | | | | |
| | | | blue sp. | | | 4 | 2 | 3 | | | 1 | |
| 1 | | 3 | <i>Danaus plexippus</i> | Monarch | | | | | | 3 | | |
| 2 | 29 | 2 | <i>Euptoieta claudia</i> | Variagated Fritillary | | | | | | 1 | 1 | |
| 58 | 73 | 25 | <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | | 15 | 3 | 3 | 2 | 2 |
| 1 | 2 | 9 | <i>S. edwardsii</i> | Edwards' Fritillary | | | 5 | 1 | 1 | 1 | 1 | |
| | 11 | 5 | <i>S. coronis</i> | Coronis Fritillary | | | | 1 | 1 | | 3 | |
| | 1 | | <i>S. callippe</i> | Callippe Fritillary | | | | | | | | |
| | 1 | | <i>S. atlantis</i> | Atlantis Fritillary | | | | | | | | |
| 20 | | 1 | <i>S. hesperis</i> | Northwestern Fritillary | | | | 1 | | | | |
| | 2 | | <i>S. mormonia</i> | Mormon Fritillary | | | | | | | | |
| | X | | fritillary sp. | | | | 23 | 11 | 26+ | 6 | 7 | 6 |
| | 8 | 8 | <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | | 8 | | | | | |
| | 26 | | <i>P. tharos</i> | Pearl Crescent | | | | | | | | |
| 42 | 16 | 8 | <i>P. cocyta</i> | Northern Crescent | | | | 8 | | | | |
| 15 | 98 | 12 | <i>P. pulchella</i> | Field Crescent | | | 7 | 4 | | | | 1 |
| | | | crescent sp. | | | | 1 | 1 | | | | |
| | 2 | | <i>Polygonia satyrus</i> | Satyr Comma | | | | | | | | |
| 1 | 24 | 33 | <i>P. gracilis</i> | Hoary Comma | 14 | 15 | | | | | 4 | |
| | | | anglewing sp. | | 3 | | | | | | | |
| 5 | 19 | 16 | <i>Nymphalis antiopa</i> | Mourning Cloak | 10 | 6 | | | | | | |
| | | 2 | <i>N. californica</i> | California Tortoiseshell | 2 | | | | | | | |
| 7 | 31 | | <i>Vanessa atalanta</i> | Red Admiral | | | | | | | | |
| 2 | 397+ | | <i>V. cardui</i> | Painted Lady | | | | | | | | |

HEIL - PLUMELY
Janet Chu
24-2

BCPOS Butterfly Survey
Heil Valley Ranch - Plumely 2004 - 2006

3

| otal # of individuals/ year | Species observed in 2002- 2006: | | | Location: 2006 Survey Dates: | Lower Plumely 4/10 | Roadway, Plumely Canyon 5/2 | Red Hill 6/1 | Plumely Canyon 6/13 | Plumely Canyon (lower) 7/16 | Red Hill 8/4 | Plumely Canyon 8/28 | Plumely Canyon 8/31 |
|--------------------------------|------------------------------------|------|-------------------------------|------------------------------------|--------------------------|--------------------------------------|-----------------|---------------------------|--------------------------------------|-----------------|---------------------------|---------------------------|
| | 2004 | 2005 | 2006 | Scientific Name | Common Name | No. of Individuals/ trip | | | | | | |
| 3 | 6 | 6 | <i>Limenitis weidemeyerii</i> | Weidemeyer's Admiral | | | 1 | 5 | | | | |
| | 1 | 3 | <i>Asterocampa celtis</i> | Hackberry Emperor | | | | | 3 | | | |
| | | | <i>Coenonympha tullia</i> | | | | | | | | | |
| 4 | 21 | 69 | <i>ochracea</i> | Ochre (Common) Ringlet | | | 61 | 8 | | | | |
| 50 | 15 | 22 | <i>Cercyonis pegala</i> | Common Wood-Nymph | | | | | 4 | 17 | | 1 |
| 5 | 1 | 1 | <i>C. oetus</i> | Small Wood-Nymph | | | | | 1 | | | |
| | | 3 | <i>Epargyreus clarus</i> | Silver-spotted Skipper | | | | 3 | | | | |
| | 2 | | <i>Thorybes pylades</i> | Northern Cloudywing | | | | | | | | |
| | 4 | 2 | <i>E. pacuvius</i> | Pacuvius Duskywing | | | | 2 | | | | |
| | 2 | 4 | <i>E. persius</i> | Persius Duskywing | | 1? | 3 | | | | | |
| | | | | Common Checkered-skipper | | | | | | | | |
| 1 | 7 | 13 | <i>Pyrgus communis</i> | Common Checkered-skipper | | | 3 | | | 6 | 2 | 2 |
| | 7 | | <i>Piruna pirus</i> | Russet Skipperling | | | | | | | | |
| | 1 | | <i>Oarisma garita</i> | Garita Skipperling | | | | | | | | |
| | | | | Common Branded Skipper | | | | | | | | |
| | 56 | 75+ | <i>Hesperia colorado</i> | Skipper | | | | | | | 52+ | 23 |
| | 1 | 1 | <i>H. pahaska</i> | Pahaska Skipper | | | 1 | | | | | |
| | | | <i>H. viridis</i> | Green Skipper | | | | | | | | |
| 42 | 7 | 10 | <i>Ochlodes sylvanoides</i> | Woodland Skipper | | | | | | 1 | 1 | 8 |
| 1 | 9 | 3 | <i>Poanes taxiles</i> | Taxiles Skipper | | | | | 3 | | | |
| | 93 | 9 | <i>Euphyes vestris</i> | Dun Skipper | | | | 7 | 2 | | | |
| | 1 | | <i>Atrytonopsis hianna</i> | Dusted Skipper | | | | | | | | |
| | 1 | | <i>Amblyscirtes aenus</i> | Bronze Roadside-skipper | | | | | | | | |
| | | | | Common Roadside-Skipper | | | | | | | | |
| 1 | | | <i>A. vialis</i> | | | | | | | | | |
| | | | skipper sp. | | | | | | 2 | | | |
| 370 | 1093 | 472 | No. of Individuals | | | | | | | | | |
| 36 | 67 | 53 | No. of Species | | | | | | | | | |
| | | | | | | Researchers: | JC=Jan Chu | CC=Cathy Cook | | | | |

BCPOS Butterfly Survey
Heil Valley - NOTES
2006

7

| NOTES: | LOCATION: | BUTTERFLY NOTES | BLOSSOM AND ANIMALS | | FIELD OBSERVERS: |
|--|---|--|--|---|--------------------------------|
| 4/4/ 2006 Geer 11:00-1:00 pm 19 - 20.5 deg C. 10- 40% intermittent sun | Parking lot, roadway, Geer Streamlet to Manager's Residence | California tortoiseshell basking on rock - photos | | garter snake, Abert's squirrel | Janet Chu |
| 4/8/ 2006 Geer Canyon 11:30 - 2:00 pm 100% sun - high clouds at 2:00 pm | Roadway from public parking lot past Manager's Residence; creek drainage and road. | female <i>Papilio polyxenes</i> | dandelion, spring beauties | | Cathy and Donn Cook |
| 4/10/ 2006 Plumely, Lower Canyon 10:00 - 1:00 pm 19.5 - 22 deg C. sky clear, wind from SW | Roadway into Plumely, only to narrows where briars are to the north | <i>gracilis, antiopa and californica</i> all imbibing sap from large R. Mt. birch bush; photos | willow beginning to bloom, one spring beauty, few dandelions | | Jan Chu, Jean Morgan |
| 4/13/ 2006 Upper Geer 10:15-12:15 pm 22 - 22.5 deg C clear sky, SW wind | Above Manager's Residence following stream | | turkey; few blossoms: <i>Viola nuttallii</i> , spring beauties | salt & pepper (photo), buttercups | Jan Chu, Jean Morgan |
| 4/ 17/ 2006 Upper Geer Creek 10:30 - 1:30 pm 18 - 24 deg C. cloudless to few wispy clouds, slight wind | Above Manager's Residence, adjacent creek south, confluence 3/4 mi S- SE; confluence W-SW 1 1/4 mi. . | <i>californica, antiopa, gracilis</i> at a bare river birch. | All creeks had water through most of their course; banks fairly wooded. spr. beauty, pasque flower, sagebrush buttercup, Oregon grape | hairy woodpecker pair, red-tailed hawk; red fox skull - bare to the bone, covered in beetles; wild turkeys; | Mike Sportiello |
| 4/26/ 2006 Upper Geer Canyon 11:15 - 2:15 pm 13 deg - 18 deg C. sunny to ocercase, breezy | 1/2 mi up 4-17 watercourse | 2 small brown butterflies | Golden banner, Nuttall violet, wild plum, wax currant, | | Mike Sportiello |
| 5/2/ 2006 Plumely Canyon 9:45 - 2:00 pm 19.5 - 21 deg C. sunny to partly cloudy, gusty wind | Gate, roadway, canyon to wild plum patch, tree trunk fallen across road n. to s. | | 14 flower species; 10 bird species | 4- rock wrens singing and wagging tail; 2- gnatcatchers; | Jan Chu, Ruth Carol Cushman |
| 5/6/2006 Geer, Upper Creek 11:45 - 2 pm 16 - 19 deg C. 50% sun; little breeze, rained twice for few minutes; to no sun, steady rain. | (same as 4/26) 1/2 mi. west over hillside meadow to dry ravine, NW to sm. creek with water, to parking near barn. | 'green hairstreak' may be <i>sheridanii</i> | no snow on ground | mertensia, salsify | Mike Sportiello |

HEIL - Geer, Plumely
NOTES
Janet Chu

BCPOS Butterfly Survey
Heil Valley - NOTES
2006

5

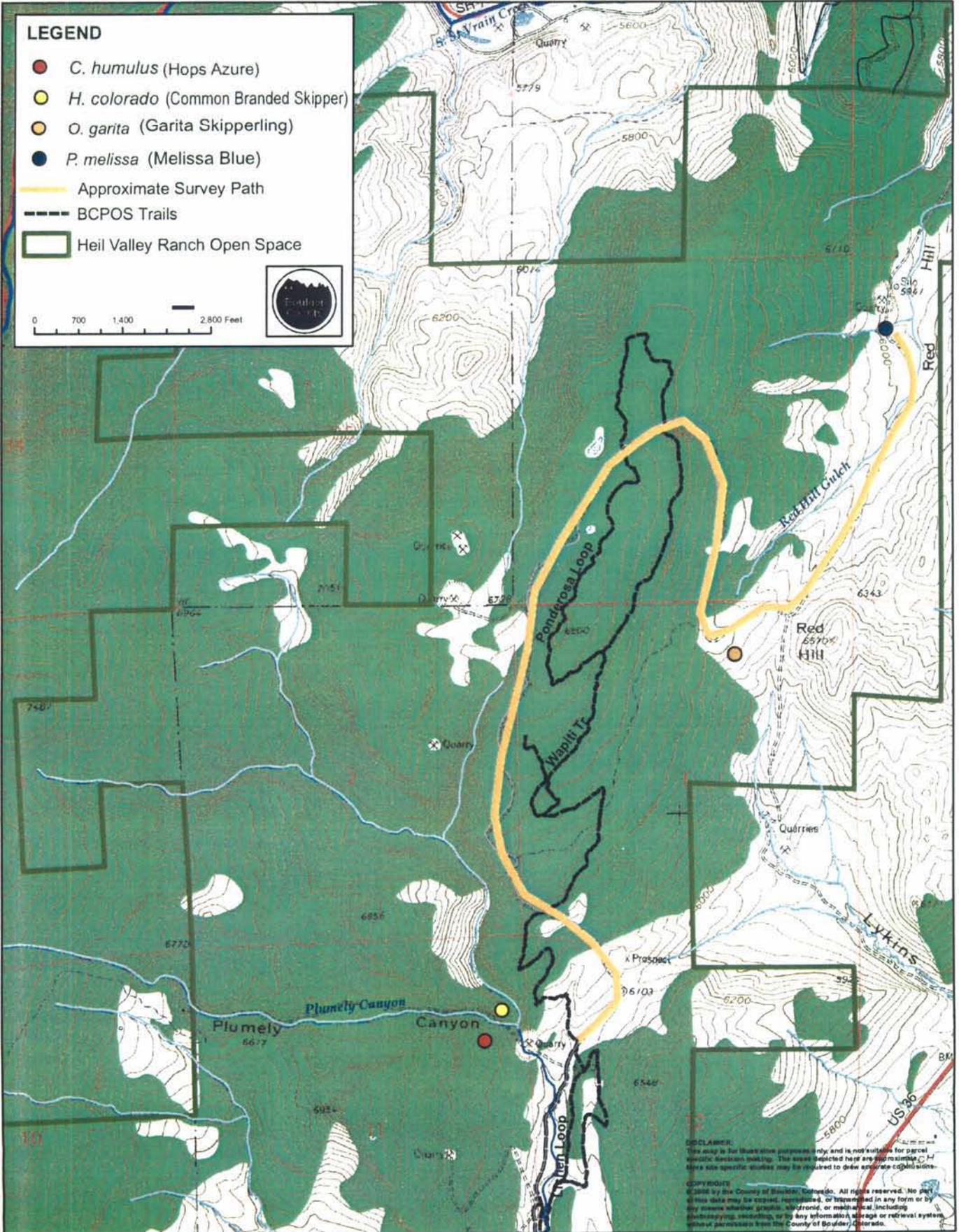
| NOTES: | LOCATION: | BUTTERFLY NOTES | BLOSSOM AND ANIMALS | | FIELD OBSERVERS: |
|--|---|--|---|--|--|
| 5/14/2006 Geer, Upper 11:00 - 1:30 pm 16 - 22 deg C. Clear with slight breeze; in west clouds hiding sun. | West side of barn heading south; 1/2 mile; returned along north creek along road from barn to creek crosses under road (south side) | | | Many flowers blooming | Mike Sportiello |
| 5/26/2006 Geer, Lower 10:00 - 12:30 pm 22 deg C Partly cloudy | From public parking lot, upstream 1/2 mile toward Manager's Residence | <i>amyntula</i> within a large patch of white milkvetch vine w/ tendrils; | 2-tailed swallowtail nectaring on golden banner. | a <i>boisduval</i> ovipositing on white lupine bud clusters | wild turkey killed by predator; indigo bunting Jan Chu, Jean Morgan |
| 5/27/2006 Geer, Upper 9:30 - 2:30 pm 27 deg C. few clouds, light breeze | From Manager's Residence walked a number of intermittent streams SW, W, WNW. Mike followed route same as 4/17/06. | Extreme dryness away from streamlets | Bramble hairstreak ovipositing on grass florets; <i>persius</i> & <i>eurymedon</i> patrolling golden banner | 20 min on ridgetop in burned pines S. of barn - 7 field crescents | one dead deer in upper Geer Cr. (BoCo photo of Mike); 7 voles, one dead (ph.) Jan Chu, Jean Morgan, Mike Sportiello |
| 6/1/2006 Red Hill 9:40 - 1:00 pm 17 - 25 deg C. clear sky | Red Hill - saddle, red sand ravine north, roadway, old prairie dog area | | melissa blue ovipositing on young <i>Astragalus</i> sp. | very dry, no noticeable streamlets | mnt. parsley, evening primrose, flax in bloom Jan Chu, Cathy and Donn Cook, Jean Morgan, Joe Krieg |
| 6/1/2006 Geer, Upper 7:45 - 2:30 pm 12 - 24 deg C. clear sky | Upper Geer, 3/4 mi upper creek, NW to steep hillside meadow, then further to top of steep hillside meadow | Most unusual silvery blue. Virginia Scott (Curator, CU museum collection) and I compared specimen. Spots were about 4x as long as high. (Sketch) | | | Mike Sportiello |
| 6/3/2006 Geer 9:00 - 11:00 am 28 deg C. high clouds to overcast | Geer - parking lot, stream, pavilion | Difficult locating flowers and butterflies except near moist earth | | brown bear near parking area | BoCo Public walk Jan Chu, Cathy and Donn Cook, Joe Krieg |
| 6/11/2006 Geer 10:30 am - 3 pm 23 - 28 deg C. clear, breezy | Upper Geer | | | | Mike Sportiello |
| 6/13/2006 Plumely 9:15 - 12:30 pm 24.5 deg C. Clear | Parked by inner gate; walked into Plumely. | Very dry. Aphrodite nectaring on <i>Convolvulus arvensis</i> bindweed. | Dogbane in full bloom attracting fritillaries. | <i>Lycaena dione</i> (ph.) | (100 deg F. in Denver) Jan Chu, Jean Morgan |
| 6/14/2006 Geer, Upper 9:30 - 12:00 pm 28 deg C. Clear | Manager Kevin Grady took us to burned and unburned meadows. | Big meadow, burned and unburned | <i>themistocles</i> (ph) | sulphur flower, Sedum sp. Wild licorice, purple thistle, silvery potentilla, | poison hemlock, Campanula, wild rose Jan Chu, Jean Morgan, Kevin Grady |

HEIL - Geer, Plumely
NOTES
Janet Chu

BCPOS Butterfly Survey
Heil Valley - NOTES
2006

| NOTES: | LOCATION: | BUTTERFLY NOTES | BLOSSOM AND ANIMALS | | FIELD OBSERVERS: | |
|--|---|--|--|--|---|--|
| 6/17/2006 Geer, Lower 9-12 pm 18 - 24 deg C. clear | Gate toward Manager's Residence | Many butterflies, 24 species; successful teaching day. | <i>rapae</i> and <i>mylitta</i> crescents mating pairs. | Cathy carried a large potted blooming Coreopsis which | attracted butterflies right away. BCNA class | Jan Chu, Mike Sportiello, ASA Hurst, Cathy Comstock, Becky Eeds, Emi age 8, Bay Roberts, Barbara Hawke, Marty Oetzel, Erin Robertson |
| 7/16/2006 Plumely 9:35 - 11:30 am 27 - 26 deg C. partly cloudy | Roadway, just into lower Plumely Canyon | 2 hackberry butterflies caught at same moment by 2 netters | | | | Jan Chu, Larry Crowley, Asa Hurst |
| 7/28/ 2006 Upper Geer 10:50 - 12:30 pm 22.5 deg C. clear | Upper Geer, big meadow | robber fly caught <i>Cercyonis</i> <i>pegala</i> (ph.) | | | | Jan Chu, Amy Chu, Jeremy Hurst |
| 8/04/ 2006 Red Hill 9:30 - 12:30 pm 22 deg C. partly cloudy to overcast | Meadow atop Marietta Canyon, elk enclosure, beyond Red Hill saddle north, almost to silo | very dry, but found more blossoms in meadow near silo | bee balm, <i>Heterotheca</i> , old monarda, <i>Erigeron</i> <i>grandiflora</i> | | greenish snake, 2 kestrel families | Jan Chu, Larry Crowley, Asa Hurst, Jeremy Hurst |
| 8/20/2006 Upper Geer 10 am - 1 pm. 21.5 deg C. sunny; end 25 deg C. half cloudy | Along the first creek, following upper creek and adjacent meadow for 1/4 mile | water in patches in lower creek; good water in upper creek; | not a lot of flowers in bloom | mud patch along creek below road between Kevin's house and barn was full of ~ 40 skippers, | mostly common branded, 1 American Lady, 1 common checkered skipper | Mike Sportiello |
| 8/28/ 2006 Plumely 9:30 am - 2:00 pm 16 - 23 deg C. 40% clear to 20% clear | From second locked gate though 'homestead' meadow | water only in the canyon beside meadow ruins | few blazing star, golden rod blossoms | | numerous skippers on gumweed especially in lower Plumely | Jan Chu, Larry Crowley, June and Gene Joerns |
| 8/30/ 2006 Lower Geer Canyon 10:00 - 12 pm 27 - 29 deg C. 20% sun, high clouds to overcast, breezy | Drove to Big Meadow, walked toward Manager's Residence to gate | very little water beside road | only blue or short white asters | 'apricot moth' | black Abert's squirrel and black furred brown bear (ph.) | Jan Chu, June and Gene Joerns |
| 8/31/ 2006 Plumely 9:30 - 11:00 am 24 deg C. high clouds to small shower | Second gate through canyon to 'homestead' meadow | | fewer skippers than Aug. 28 | | | Jan Chu, Larry Crowley, Cathy Cook |

Heil Valley Ranch Open Space: North



LEGEND

- *C. humulus* (Hops Azure)
- *H. colorado* (Common Branded Skipper)
- *O. garita* (Garita Skipperling)
- *P. melissa* (Melissa Blue)
- Approximate Survey Path
- - - BCPOS Trails
- Heil Valley Ranch Open Space

0 700 1,400 2,800 Feet



DISCLAIMER:
This map is for illustrative purposes only and is not suitable for parcel specific decision making. The areas depicted here are approximate. If there are site specific studies may be required to draw accurate conclusions.

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BCPOS Butterfly Survey

Montane
2005-2006

1

| | | | | Meyers Gulch | Meyers Gulch | Meyers Gulch | Meyers Gulch | Reynold Ranch | Reynold Ranch | Reynold Ranch | Reynold Ranch |
|-------------|------|-----------------------------|---------------------------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|
| Individuals | | | 2006 Dates | 4/12 | 6/19 | 6/20 | 8/11 | 4/13 | 6/5 | 6/6 | 8/8 |
| 2005 | 2006 | Scientific Name | Common Name | DC | MS | JC | JC | CC, DC | JC | DC | JC |
| | 25 | <i>Parnassius smintheus</i> | Rocky Mtn Parnassian | | 17 | 7 | | | 1 | | |
| | | <i>Papilio zelicaon</i> | Anise Swallowtail | | | | | | | x | |
| 3 | 7 | <i>P. rutulus</i> | W. Tiger Swallowtail | | | 3 | | | 4 | | |
| 4 | 9 | <i>P. eurymedon</i> | Pale Swallowtail | | 4 | 3 | | | 1 | x | |
| | 1 | <i>P. multicaudata</i> | Two-tailed Swallowtail | | | | | | 1 | | |
| | | swallowtail sp. | | | 6 | | | | | | |
| | 2 | <i>Neophasia menapia</i> | Pine White | | | | | | | | 2 |
| 13 | | <i>Pontia protodice</i> | Checkered White | | | | | | | | |
| | 4 | <i>Pieris rapae</i> | Cabbage White | | | 1 | 3 | | | | |
| 5 | 4 | <i>Euchloe ausonides</i> | Large Marble | | | | | | 4 | | |
| 1 | | <i>Anthocharis julia</i> | So. Rocky Mountain Orangetip | | | | | | | | |
| | | white sp. | | | | | 2 | | 4 | | |
| | 3 | <i>Colias philodice</i> | Clouded Sulphur | | | 1+1 alb | 1 | | | | |
| | 5 | <i>C. eurytheme</i> | Orange Sulphur | | | | 1+alb. | | | | 3 |
| | 13 | <i>C. alexandra</i> | Queen Alexandra Sulphur | | | | | | | | 13 |
| | | sulphur sp. | | | | | | | | | 4 |
| 2 | 10 | <i>Callophrys affinis</i> | Canyon Bramble Hairstreak | | 1 | 7 | 2 | | | | |
| | 1 | <i>C. sheridani</i> | Sheridan's Hairstreak | 1 | | | | | | | |
| | 1 | <i>C. spinetorum</i> | Thicket Hairstreak | | | | | | 1 | | |
| | 2 | <i>C. augustinus</i> | Brown Elfin | 1 | | | | | | x | |
| 8 | 39 | <i>C. polios</i> | Hoary Elfin | 20 | | | | | 18 | x | |
| | 3 | <i>Satyrrium saepium</i> | Hedgerow Hairstreak | | | 1 | 1 | | | | 1 |

Table 7

12/11/2006

Montane
Janet Chu
25-

BCPOS Butterfly Survey

2

Montane
2005-2006

| | | | | Meyers Gulch | Meyers Gulch | Meyers Gulch | Meyers Gulch | Reynold Ranch | Reynold Ranch | Reynold Ranch | Reynold Ranch |
|-------------|----|--------------------------------|--------------------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|
| Individuals | | 2006 Dates | | 4/12 | 6/19 | 6/20 | 8/11 | 4/13 | 6/5 | 6/6 | 8/8 |
| 1 | 1 | <i>Cupido amyntula</i> | Western Tailed-Blue | | | | | | | x | |
| 7 | 3 | <i>Celastrina ladon sidara</i> | Spring Azure | 1 | | | | | 1 | x | |
| | 2 | <i>Glaucopsyche piasus</i> | Arrowhead Blue | | | 2 | | | | | |
| 3 | 4 | <i>G. lygdamus</i> | Silvery Blue | | | 2 | | | 1 | x | |
| | 18 | <i>Euphilotes ancilla</i> | Rocky Mtn Dotted-Blue | | 4 | 14 | | | | | |
| | 3 | <i>Echinargus isola</i> | Reakirt's Blue | | | 1 | 2 | | | | |
| 1 | 1 | <i>Plebejus melissa</i> | Melissa Blue | | | | 1 | | | | |
| 1 | 3 | <i>P. icarioides</i> | Boisduval's Blue | | 1 | 1 | | | 1 | | |
| | 3 | <i>P. glandon rustica</i> | Arctic Blue | | | | | | | | 3 |
| | | blue sp. | | | 15 | 1 | | | 7 | | 1 |
| | 1 | <i>Apodemia nais</i> | Nais Metalmark | | | 1 | | | | | |
| 2 | | <i>Euptoieta claudia</i> | Variegated Fritillary | | | | | | | | |
| | 21 | <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | | 14 | | | | 7 |
| | 3 | <i>S. edwardsii</i> | Edwards' Fritillary | | | | | | 2 | x | |
| | 1 | <i>S. atlantis</i> | Atlantis Fritillary | | | 1 | | | | | |
| | 1 | <i>S. mormonia</i> | Mormon Fritillary | | | | | | | | 1 |
| | 48 | fritillary sp. | | | 17 | 6 | 17 | | | | 8 |
| 3 | | <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | | | | | | | |
| | 5 | <i>C. nycteis</i> | Silvery Checkerspot | | | 5 | | | | | |
| | 8 | <i>C. palla</i> | Northern Checkerspot | | 7? | 1 | | | | | |
| 6 | 5 | <i>P. pulchella</i> | Field Crescent | | 3 | | | | 2 | | |
| | 5 | <i>Euphydryas chalcedona</i> | Variable Checkerspot | | | 5 | | | | | |
| 1 | 13 | <i>Polygonia gracilis</i> | Hoary Comma | 6 | | | | 3 | 2 | | 2 |
| | 3 | <i>Aglais milberti</i> | Milbert's Tortoiseshell | 1 | | 1 | | | | x | |
| | 3 | <i>Nymphalis antiopa</i> | Mourning Cloak | 1 | | | | 1 | | x | |
| 7 | | <i>Vanessa cardui</i> | Painted Lady | | | | | | | | |
| | 1 | <i>Limnitis weidemeyerii</i> | Weidemeyer's Admiral | | | | 1 | | | | |

Table 7

Montane
Janet Chu
25-2

12/11/2006

Montane
2005-2006

| | | | | Meyers Gulch | Meyers Gulch | Meyers Gulch | Meyers Gulch | Reynold Ranch | Reynold Ranch | Reynold Ranch | Reynold Ranch |
|-------------|-----|--|------------------------------|-----------------|-----------------|----------------------|-----------------|------------------|------------------|------------------|------------------|
| Individuals | | 2006 Dates | | 4/12 | 6/19 | 6/20 | 8/11 | 4/13 | 6/5 | 6/6 | 8/8 |
| 4 | 13 | <i>Coenonympha tullia</i> <i>ochracea</i> | Ochre (Common) Ringlet | | 3 | 5 | | | 4 | x | |
| | 42 | <i>Cercyonis oetus</i> | Small Wood-Nymph | | | | 5 | | | | 37 |
| | 2 | <i>Erebia epipsodea</i> | Common Alpine | | 1 | | | | | x | |
| | 2 | <i>Oeneis chryxus</i> | Chryxus Arctic | | | 1 | | | | x | |
| 2 | 5 | <i>O. uhleri</i> | Uhler's Arctic | | | | | | 5 | | |
| | 1 | <i>Thorybes mexicana</i> | Mexican Cloudywing | | | | | | | x | |
| | 4 | <i>Erynnis icelus</i> | Dreamy Duskywing | | | 4 | | | | | |
| 1 | | <i>E. pacuvius</i> | Pacuvius Duskywing | | | | | | | | |
| 5 | 8 | <i>E. persius</i> | Persius Duskywing | | | | | | 7 | x | |
| | | | duskywing sp. | | 6 | | | | | | |
| | 1 | <i>Pyrgus communis</i> | Common Checkered- skipper | | | 1 | | | | | |
| | 3 | <i>Hesperia colorado</i> | Common Branded Skipper | | | | | | | | 3 |
| | 1 | <i>H. pahaska</i> | Pahaska Skipper | | | | 1 | | | | |
| | 1 | <i>H. viridis</i> | Green Skipper | | | | 1 | | | | |
| | 2 | <i>Polites mystic</i> | Long Dash | | | 2 | | | | | |
| | 6 | <i>Ochlodes sylvanoides</i> | Woodland Skipper | | | | 6 | | | | |
| | 1 | <i>Euphyes vestris</i> | Dun Skipper | | 1 | | | | | | |
| | | | skipper sp. | | 2 | | 6 | | | | |
| 80 | 377 | Total # of Individuals | | | | | | | | | |
| 21 | 52 | Total # of Species | Researchers | DC=Donn Cook | CC=Cathy Cook | MS = Mike Sportiello | JC=Jan Chu | | | | |

BCPOS Butterfly Survey
Montane
 2006

| | | | |
|--|---|---|---|
| 4/12/ 2006 Meyers Gulch 11:00 - 1:30 pm | one mile | Spring Beauty, pasque flower, mouse-eared chickweed | Donn Cook |
| 4/13/ 2006 Reynold Ranch 11:50 - 1:50 pm 100% sun | one hour in and back. Very DRY. | Pasque flower the only one in bloom. Sheridan's hairstreak along the Peak to Peak highway. | Cathy and Donn Cook |
| 6/5/2006 Reynold Ranch 10:00 - 12:00 pm 21 - 24 deg C. few clouds | From Magnolia Road about one mile on the roadway. | hoary elfin over beds of kinnickinnik, thicket hairstreak (photos); wax currant in bloom | Jan Chu, Jean Morgan |
| 6/6/2006 Reynold Ranch | | new species Mexican cloudywing caught by Donn, ID by Cathy Cook | Donn Cook, Joe Krieg |
| 6/19/ 2006 Meyers Gulch 9 am - 12 pm sunny, 23 deg C. | | | Mike Sportiello |
| 6/20/ 2006 Meyer Gulch 9:15 - 12 pm 23.5 - 26 deg C. clear to cloudy | Parking lot, north road into first valley | Dotted blues nectaring on wild buckwheat; <i>nycteis</i> and <i>palla</i> near willows. | Jan Chu, Larry Crowley, Mike Sportiello, Joe Kreig |
| 8/8/ 2006 Reynold Ranch 9:45 - 12 pm 20 deg C. clear sky, strong W. wind. | Roadway thru streamlet 'east' over hilltop to aspens | dry, but fair number of blossoms | Jan Chu, Mike Sportiello, Larry Crowley |
| 8/11/ 2006 Meyers Gulch 9:00 - 12 pm, 23 deg C. partly cloudy to sunny to overcast | Parking lot north along road, then followed moist gulch (Lots of knapweed, chickery near gate) | butterflies mostly on <i>Rudbeckia</i> <i>ampla</i> "golden glow" and Canada thistle near willows | Jan Chu, Larry Crowley |

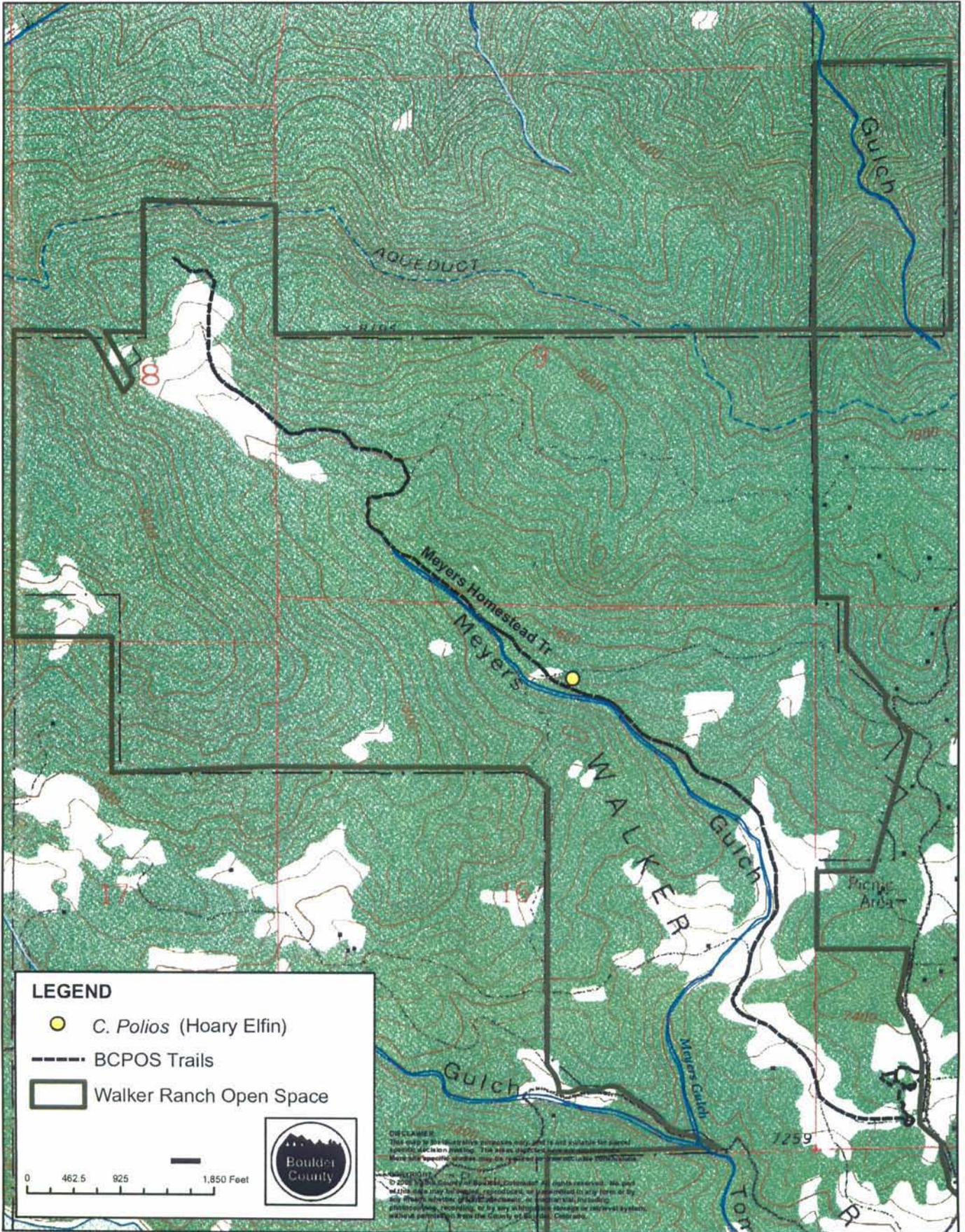
Table 7

Upper Montane / Sub-alpine 2004-2006

| Upper Montane / Lower Sub-alpine | | | | | Mud Lake | Caribou | Mud Lake | Caribou | Caribou | Caribou | Caribou |
|----------------------------------|------|------|--------------------------------|------------------------------|----------|---------|----------|---------|---------|---------|---------|
| Individuals observed | | | | 2006 Survey Dates: | 6/4 | 6/19 | 6/27 | 7/1 | 7/14 | 7/14 | 8/21 |
| 2004 | 2005 | 2006 | Scientific Name | Common Name | MS | JC | JC | JC MS | JC | MS | JC |
| 2 | 29 | 18 | <i>Parnassius smintheus</i> | Rocky Mountain Parnassian | | 6 | 2 | 9 | 1 | | |
| 1 | 1 | 2 | <i>Papilio zelicaon</i> | Anise Swallowtail | 1 | | | | 1 | | |
| 4 | 7 | 18 | <i>P. rutulus</i> | W. Tiger Swallowtail | 1 | 6 | | 3 | 8 | | |
| | | | yellow swallowtail sp. | | | | 1 | 5 | | 2 | |
| 3 | 2 | 9 | <i>P. eurymedon</i> | Pale Swallowtail | | 2 | 1 | 3 | 1 | 2 | |
| | 2 | 3 | <i>Neophasia menapia</i> | Pine White | | | | | | | 3 |
| | 38 | | <i>Pontia protodice</i> | Checkered White | | | | | | | |
| 5 | 6 | 12 | <i>Pieris rapae</i> | Cabbage White | | 1 | | | 2 | | 9 |
| 3 | 7 | 16 | <i>P. marginalis</i> | Mustard White | | 2 | | 1 | 12 | 1 | |
| | | | white sp. | | 12 | | | | | | |
| 1 | 10 | 7 | <i>Euchloe ausonides</i> | Large Marble | | 1 | | 2 | 2 | 2 | |
| | 5 | 4 | <i>Anthocharis julia</i> | Southern Rocky Mtn Orangetip | 4 | | | | | | |
| | | | white sp. | | | 2 | | | 5 | 2 | |
| | 5 | 23 | <i>Colias philodice</i> | Clouded Sulphur | 12 | 6 | | 1 | | | 4 |
| 2 | 8 | | <i>C. eurytheme</i> | Orange Sulphur | | | | | | | |
| 75 | 11 | 72 | <i>C. alexandra</i> | Queen Alexandra's Sulphur | | | 9 | 36 | 23 | 4 | |
| | 1 | | <i>Eurema mexicana</i> | Mexican Sulphur | | | | | | | |
| 4 | 2 | | <i>Nathalis iole</i> | Dainty Sulphur | | | | | | | |
| | | | sulphur sp. | | | | | | 6 | 10 | 1 |
| 5 | | | <i>Lycaena rubidus</i> | Ruddy Copper | | | | | | | |
| 4 | | 6 | <i>L. helloides</i> | Purplish Copper | | | | | 4 | 2 | |
| | 3 | | <i>Callophrys affinis</i> | Canyon Bramble Hairstreak | | | | | | | |
| | 5 | 3 | <i>C. spinetorum</i> | Thicket Hairstreak | | | 2 | | | 1 | |
| | | 4 | <i>C. augustinus</i> | Brown Elfin | 4 | | | | | | |
| 1 | | 4 | <i>C. eryphon</i> | Western Pine Elfin | 4 | | | | | | |
| 1 | | | <i>Strymon melinus</i> | Gray Hairstreak | | | | | | | |
| 1 | 3 | 1 | <i>Cupido amyntula</i> | Western Tailed-Blue | | | | | 1 | | |
| 1 | 16 | 4 | <i>Celastrina ladon sidara</i> | Spring Azure | 3 | | | | 1 | | |
| | | 1 | <i>G. piasus</i> | Arrowhead Blue | | | | 1 | | | |
| 1 | 5 | 7 | <i>Glaucopsyche lygdamus</i> | Silvery Blue | 4 | 3 | | | | | |
| 6 | 6 | 23 | <i>Euphilotes ancilla</i> | Rocky Mountain Dotted-Blue | 1 | | 12 | 8 | | 2 | |
| | 7 | 2 | <i>Echinargus isola</i> | Reakirt's Blue | | 1 | 1 | | | | |
| | | 1 | <i>Plebejus melissa</i> | Melissa Blue | | | | | | | |
| 5 | | 6 | <i>P. saepiolus</i> | Greenish Blue | | | | 2 | 4 | | |
| 10 | 29 | 24 | <i>P. icarioides</i> | Boisduval's Blue | | 2 | 3 | 12 | 3 | 4 | |
| 13 | 2 | 5 | <i>P. lupini lutzi</i> | Lupine Blue | | 2 | | 3 | | | |
| | 3 | 8 | <i>P. glandon rustica</i> | Arctic Blue | | | | 3 | 1 | 4 | |
| | | | blue sp. | | 10 | 4 | 5 | 7 | 3 | 5 | |

Table 8

Walker Ranch Open Space: Meyers Homestead Trail



Upper Montane / Sub-alpine 2004-2006

| Individuals observed | | | 2006 Survey Dates: | | | | | | | | |
|----------------------|------|------|-------------------------------|--------------------------|--|------------|----------------------|--------------|--------------|------------|------------|
| 2004 | 2005 | 2006 | Scientific Name | Common Name | 6/4 MS | 6/19 JC | 6/27 JC | 7/1 JC MS | 7/14 JC | 7/14 MS | 8/21 JC |
| 1 | 10 | 1 | <i>Euptoieta claudia</i> | Variiegated Fritillary | | 1 | | | | | |
| 1 | | 1 | <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | | | 1 | | |
| | | 3 | <i>S. edwardsii</i> | Edwards' Fritillary | | | | 1 | | 1 | 1 |
| | | 6 | <i>S. coronis</i> | Coronis Fritillary | | | 2 | | | | 4 |
| 1 | | 21 | <i>S. hesperis</i> | Northwestern Fritillary | | | | 1 | 18 | 2 | |
| | 1 | 48 | fritillary sp. | | 2 | | 2 | 9 | 8 | 26 | 1 |
| 1 | | | <i>Poladryas arachne</i> | Dotted Checkerspot | | | | | | | |
| | | 4 | <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | 4 | | | | | |
| 1 | | 7 | <i>Chlosyne nycteis</i> | Silvery Checkerspot | | 1 | | 3 | 2 | 1 | |
| 9 | 8 | 11 | <i>C. palla</i> | Northern Checkerspot | 1 | | | 2 | 4 | 4 | |
| | | | checkerspot sp. | | | | | | | | |
| 1 | | | <i>Phyciodes tharos</i> | Pearl Crescent | | | | | | | |
| 14 | 2 | 6 | <i>P. cocyta</i> | Northern Crescent | | | 4 | 1 | 1 | | |
| 1 | 4 | 10 | <i>P. pulchella</i> | Field Crescent | 3 | 2 | | | 4 | | 1 |
| | | 9 | <i>Euphydryas anicia</i> | Variable Checkerspot | | | | | 9 | | |
| | | 1 | <i>Polygonia faunus</i> | Green Comma | | | | 1 | | | |
| 2 | 2 | 10 | <i>Polygonia gracilis</i> | Hoary Comma | | | | 1 | 8 | | 1 |
| | 1 | 2 | <i>Nymphalis antiopa</i> | Mourning Cloak | 1 | | | | | | 1 |
| | 98 | | <i>Vanessa cardui</i> | Painted Lady | | | | | | | |
| | 1 | | <i>V. virginiensis</i> | American Lady | | | | | | | |
| 5 | | 13 | <i>Limnitis weidemeyerii</i> | Weidemeyer's Admiral | | | | 1 | 5 | 3 | 4 |
| | | | <i>Coenonympha tullia</i> | | | | | | | | |
| 6 | 76 | 61 | <i>ochracea</i> | Common Ringlet | 14 | 19 | 6 | 16 | 1 | 5 | |
| | 3 | 1 | <i>Cercyonis pegala</i> | Common Wood-Nymph | | | | | | 1 | |
| 30 | 1 | 22 | <i>C. oetus</i> | Small Wood-Nymph | | | | | 10 | 1 | 11 |
| | 38 | 13 | <i>Erebia epipsodea</i> | Common Alpine | 2 | 9 | | 2 | | | |
| 5 | | 20 | <i>Oeneis chryxus</i> | Chryxus Arctic | | 2 | 2 | 12 | 2 | 2 | |
| | | | arctic sp. | | 1 | | | 1 | | | |
| | 3 | | <i>Thorybes pylades</i> | Northern Cloudywing | | | | | | | |
| | 2 | 7 | <i>Erynnis icelus</i> | Dreamy Duskywing | | | | 7 | | | |
| | 5 | | <i>E. pacuvius</i> | Pacuvius Duskywing | | | | | | | |
| 3 | 22 | 20 | <i>E. persius</i> | Persius Duskywing | | 8 | 7 | | 5 | | |
| | | | duskywing sp. | | 14 | | | 7 | | | |
| | 1 | | <i>Pyrgus communis</i> | Common Checkered-skipper | | | | | | | |
| 35 | | | <i>Piruna pirus</i> | Russet Skipperling | | | | | | | |
| | | 4 | <i>Oarisma garita</i> | Garita skipperling | | | | 4 | | | |
| 1 | | | <i>Hesperia colorado</i> | Common Branded Skipper | | | | | | | |
| 1 | | 1 | <i>H. pahaska</i> | Pahaska Skipper | | | | 1 | | | |
| | 20 | 1 | <i>H. nevada</i> | Nevada Skipper | | | 1 | | | | |
| | 7 | | <i>Polites draco</i> | Draco Skipper | | | | | | | |
| | | 1 | <i>Poanes taxiles</i> | Taxiles Skipper | | | | | 1 | | |
| | | | skipper sp. | | 6 | | | | | 2 | |
| 266 | 519 | 586 | Total # of Individuals | | Researchers: | | MS = Mike Sportiello | | JC = Jan Chu | | |
| 39 | 46 | 51 | Total # of species - | | Number of Species Observed on Caribou Ranch = 69 | | | | | | |

BCPOS Butterfly Survey
MONTANE / SUB-ALPINE Notes
 2006

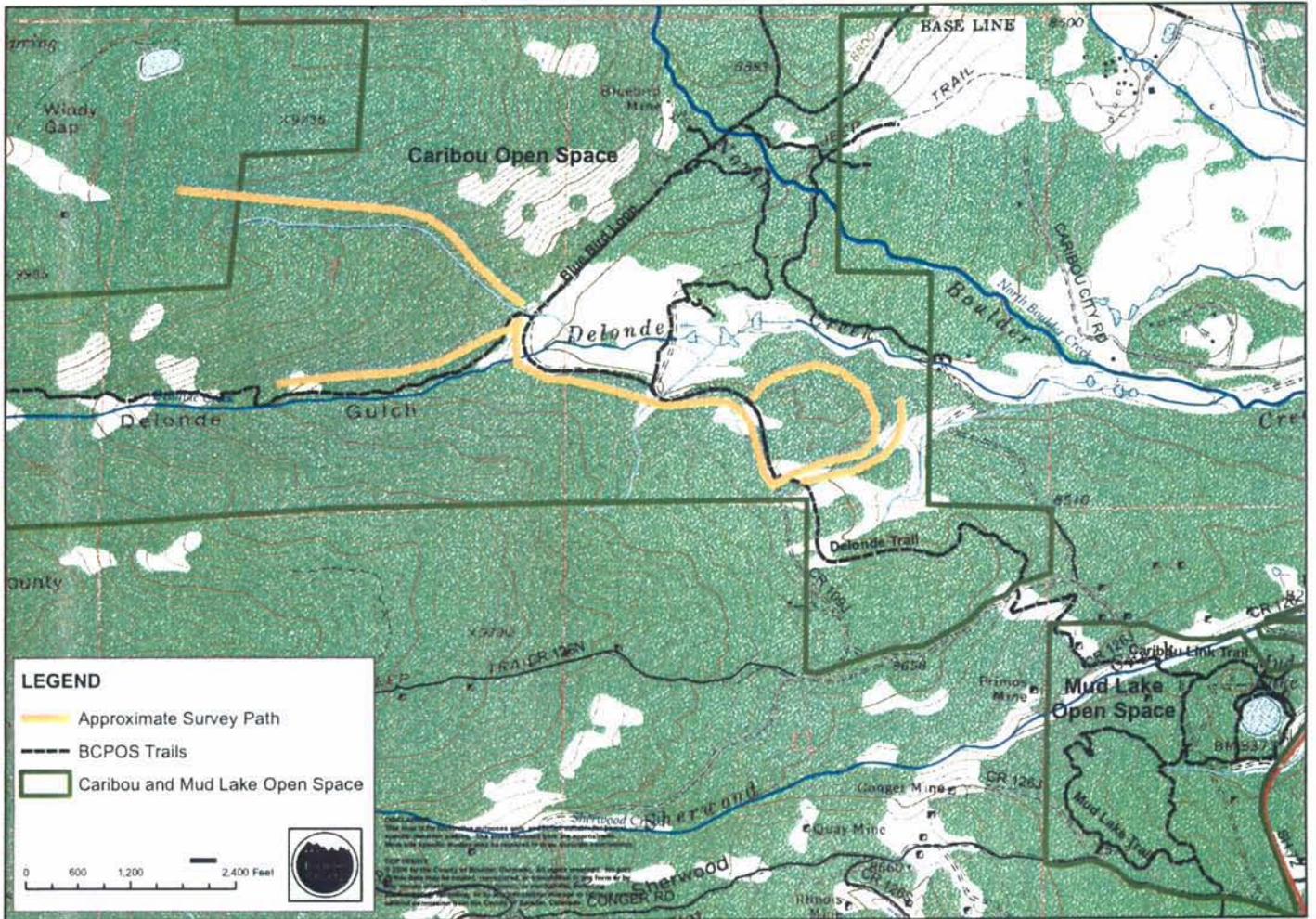
1

| | | | | | |
|---|---|---|--|---|--|
| 6/04/2006 Mud Lake 9:45 - 2 pm 20 - 26 deg C. mostly clear, breezy | Butterflies seen where trail to Caribou Ranch crosses small creek and in small meadow adjoining this crossing and creek | | | | |
| 6/19/ 2006 Caribou 8:20-11:00 am 19 deg C. clear | Inside locked gate, return through meadow past barn, roadway | <i>Amelanchier alnifolia</i> Serviceberry attracted <i>gorgone</i> checkerspot, <i>chryxus</i> arctic; wild iris attracted <i>rutulus</i> and <i>persius</i> . | | Denny conducted bird survey | Jan Chu, Denny Moore |
| 6/27/ 2006 Mud Lake 9:45 - 12:30 pm 18 degC. 80% clear | toured area | butterflies nectaring on <i>Ceanothus fendleri</i> ; pair of <i>ancilla</i> mating | most butterflies on open, old roadway, not in pines | | Jan Chu, Jean Morgan |
| 7/1/2006 Caribou 9:30 - 12:30 pm 19 - 21 deg C. clear to cloudy, rain | MS - trail west of large meadow beside homestead for 3/4 mile; others north through meadow and pines | many <i>chryxus</i> | Deep spring and bog in aspen grove NW, inside locked gate | | Jan Chu, Larry Crowley, Mike Sportiello, Asa Hurst |
| 7/14/ 2006 Caribou 9:40 - 1:00 pm 24 - 25 deg C. clear, slight breeze | <i>chryxus</i> nectaring on blackeyed susan <i>Rudbeckia hirta</i> | Many <i>S. hesperia</i> flying. We didn't notice its host plant <i>Viola adunca</i> , Mountain blue violet. | Flowers at 9,000 ft were spectacular, especially monarda and smooth aster <i>Aster laevis</i> . Invasive meadow aster were numerous in large beds. | trail west of large meadow is best surveyed only for first quarter mile or so; not very productive above that | Jan Chu, Mike Sportiello, Jean Morgan, Larry Crowley |
| 8/21/ 2006 Caribou 9:45 - 11:45 am. 18 deg C. | Inside gate, roadway, meadow, bog | Noticeably few butterflies | few <i>Heterotheca</i> sp., harebell, blue lupine, white <i>Erigeron</i> sp. Fireweed, Canada thistle, black eyed susan, <i>Rudbeckia</i> . Many remaining white weed daisy, | 2-red-breasted nuthatch and mtn chickadee feasting on ants as we walked in and also left Caribou | Jan Chu, Larry Crowley |
| 6/4/ 2006 Mud Lake 9:45 - 2 pm 21 - 28 deg C. mostly clear, breezy | most butterflies seen at meadow and at creek crossing adjacent to meadow on trail to Caribou | | | | Mike Sportiello |

Table 8

Montane / Sub-alpine Notes
 Janet Chu

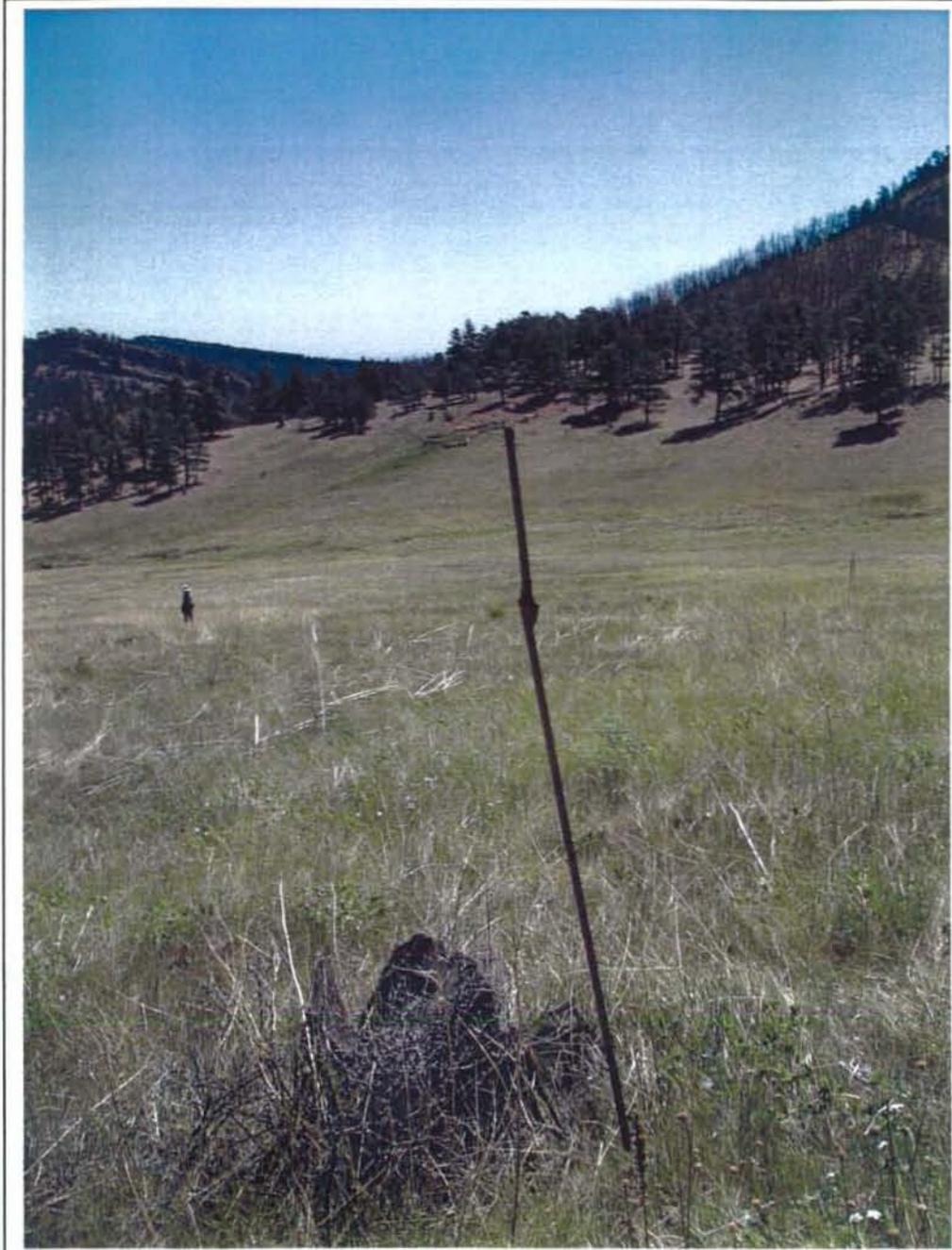
Caribou and Mud Lake Open Space



BCPOS Butterfly Survey
Big Meadow - Burned and Unburned - Geer, Heil
2006

| | Location: | Burned Meadow, Upper Geer, East | Unburned Meadow, Upper Geer, West | Burned Meadow, Upper Geer, East | Unburned Meadow, Upper Geer, West |
|---|---|---|---|------------------------------------|--------------------------------------|
| Survey Dates: | | 14-Jun-06 | 14-Jun-06 | 28-Jul-06 | 28-Jul-06 |
| Scientific Name | Common Name | | | | |
| <i>P. eurymedon</i> | Pale Swallowtail | | 2 | | |
| | yellow swallowtail sp. | | | 1 | |
| <i>Pieris rapae</i> | Cabbage White | | | | 1 |
| | sulphur sp. | | | 1 | |
| <i>Callophrys affinis</i> | Canyon Bramble Hairstreak | 1 | | | |
| <i>Glaucopsyche piasus</i> | Arrowhead Blue | 1 | | | |
| <i>Plebejus melissa</i> | Melissa Blue | 1 | | 3 | 4 |
| <i>P. icarioides</i> | Boisduval's Blue | 5 | 1 | | |
| <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | 1 | | |
| | fritillary sp. | 1 | | 1 | 2 |
| <i>Cercyonis pegala</i> | Common Wood-Nymph | | | 4 | 6 |
| <i>Erebia epipsodea</i> | Common Alpine | | 1 | | |
| <i>E. persius</i> | Persius Duskywing | 3 | | | |
| <i>Pyrgus communis</i> | Common Checkered-skipper | | | 1 | |
| Total number of species | | 6 | 4 | 6 | 4 |
| Total number of individuals | | 12 | 9 | 7 | 17 |
| 6/14 Burned meadow, Upper Geer, East 10:20 - 10:45 am | Meadow, dip, meadow toward east from scrag toward space in pines. (Refer to photo.....) | white lupine <i>Lupinus argenteus ingratus</i> , daisy fleabane, <i>Oxytropis lamberti</i> , Fremont geranium, snowberry, <i>Ceanothus fendleri</i> | <i>C. affinis</i> nectaring on <i>C. fendleri</i> . Ponderosa pine showing black burn-scars | Jan Chu, Jean Morgan | |
| 6/14 Unburned meadow Upper Geer, West 11:00 - 11:20 am | Meadow, dip, meadow toward west from ridge near spring (Refer to photo....) | Fremont geranium, purple thistle, cut-leaf daisy, yellow aster, white lupine, <i>Oxytropis lamberti</i> , <i>Phacelia heterophylla</i> , yellow winter cress, purple legume, bindweed | | Jan Chu, Jean Morgan | |
| 7/28 Burned meadow Upper Geer, East 11:15 - 11:50 am | | Fremont geranium, bindweed, yellow Mexican hat, <i>Gaillardia</i> , goldenrod, <i>Heterotheca</i> sp. blossoms | | Jan Chu, Amy Chu, Jeremy Hurst | |
| 7/28 Unburned meadow Upper Geer, West 12:00 - 12:20 am | greater numbers of bindweed | Similar, but fewer blossoms | | Jan Chu, Jeremy Hurst | |

Table 9



Big Meadow
Unburned,
Looking Eastward.
Fenced spring is in center on the far hill.

- transect



Big Meadow, East Burned area, looking Eastward

- transect

Heil Valley Ranch Open Space: Big Meadow

