

2009 Report
Inventories of Butterflies in Boulder County



By Janet Chu

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I. Acknowledgments

Our research team has conducted butterfly surveys for eight consecutive years, from 2002 through 2009, with 2002-2004 being introductory to the lands and species, and 2005-2009 more in depth. Larry Crowley, Jean Morgan, and Amy Chu have been valuable team members, joined at times by the author's grandsons Asa and Jeremy Hurst and associates Mike Sportiello and Cathy Cook. Ruth Carol Cushman and Joyce Gellhorn added expertise on plant life.

The majority of the surveys have been in Boulder County Parks and Open Space (BCPOS) lands. Therese Glowacki issued a Special Collection Permit for access into the Open Spaces; Mark Brennan oversaw research, maintained records of our monographs and organized seminars for presentation of data. Claire DeLeo provided botanical assistance and Meredith Dutlinger prepared maps. Kevin Grady provided excellent communication about wildlife sightings and wood chipping closures. Since there was no grant support in 2009, the team expanded areas of observations into the City of Boulder Open Space and Mountain Parks (OSMP) often accompanying Christian Nunes. Steve Armstead introduced us to the OSMP staff and Will Keeley issued a research permit to survey butterflies on Marshall Mesa and Left Hand Valley Reservoir. Lynn Reidel provided botanical assistance.

Boulder County Nature Association sponsored a butterfly class which visited Heil Valley Open Space and the Anne U. White Trail. Participants were Emi Lehman, Bay Roberts, Paula Hansley, Janet McLachlan, and Carrie Hodges. Many BCNA members continue to support butterfly research especially Steve Jones and Scott Severs.

Our always helpful mentors Ray Stanford and Paul Opler were readily available to make suggestions and assist in identification. Ray Stanford had chided us for years to get out into the *Eriogonum effusum* and find a Rita Blue *Euphilotes rita*. We searched the dry mesa east of Westview Drive on Hoover Hill and found one on August 17. Then Paul Opler said, "Go find a Texanus Blue *Plebejus 'lupine' texanus*, which should be even easier to find." We did the next day and caught one along with Uncas Skippers *Hesperia uncas*. These late season butterflies were new to us, and the blues set records for first sightings in Boulder County.

Cover Photo: Rocky Mountain Dotted-blue Butterflies mating on *Eriogonum umbellatum*, Walker Ranch, Meyer's Gulch August 9, 2009

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II. Abstract

Butterfly inventories continued by this team during the 2009 seasons. Ten Boulder County Open Space and three Boulder City lands were sites studied. Numbers of species of butterflies were diminished in 2009 as well as the overall populations. Much of this change was due to cloudy, cold and drizzly weather. Warm days returned in August inviting the team to explore areas previously unvisited by us, resulting in two new county records Rita Blue *Euphilotes rita* and Texanus Blue *Plebejus 'lupini' texanus*. Also Christian Nunes, OSMP, added Two-spotted Skipper *Euphyes bimaculata* raising the records of proven sightings from 198 to 201 species for Boulder County.

Ten Boulder County Open Space properties were visited during 40 days and this team recorded 87.5 research hours in the field. In August 2009, we explored OSMP properties eight days for 11.5 research hours.

In 2007, while conducting our research on these lands we observed an average of 39 individuals per research hour on seven sites, and also noted seven Rio Grande River - Mexican butterfly species not normally found in our area. In 2008 the number of individuals per research hour on the same seven research sites was 46; and in 2009 it was 37.

Detailed studies of natural resources are being provided by this team and other lepidopterists, to help with ongoing efforts to identify local effects of regional and global climate change and provide additional information regarding this phenomenon. Local interest in butterflies has reached an all-time high as we are coordinating with more local naturalists.

III. Introduction

Boulder County supports some of the highest recorded butterfly species diversity in the United States, matched only by Gilpin County, Colorado and by the southern tier of states. An ongoing inventory of butterfly populations in our county provides valuable information not only to local resource managers of public lands but to researchers in a variety of fields who are interested in our great species diversity. In particular, researchers studying the effect of climate change on flora and fauna often use long-term population databases on organisms such as butterflies, which are relatively easy to observe and identify and are sensitive to even short-term changes in climate.

Our research group's butterfly surveys, initiated in 2002 and quadrupled by 2004, contributed to this important database. We continued our multi-year county study in 2009 by surveying a range of county habitats throughout the active five-month butterfly season, particularly focusing our efforts on three county open space lands representing a variety of Boulder County's habitats: the Southeast Buffer, containing grassland habitat that we found to be very productive in our initial surveys conducted in 2007; Heil Valley, a prime as well as diverse foothills property, rich in butterflies, particularly along riparian areas; and Caribou Ranch, a montane ecosystem containing productive meadows and streams. While conducting our research on these lands in 2007, we observed a number of migratory butterfly species not normally found

in our area. In 2008 we found larger numbers of butterflies and more butterfly species than in the previous four years. Continuing studies on Boulder County Parks and Open Space (BCPOS) lands include Southeast Buffer, Anne U. White, Heil Valley, Walker Ranch, and Caribou Ranch. Less often the team studied in Rabbit Mountain, Carolyn Holmberg Preserve, Hessie, Reynold's Ranch and Steamboat Mountain. Deadman's Gulch in Roosevelt National Forest is the habitat of rare early spring butterflies. City of Boulder Open Space and Mountain Parks (OSMP) permitted us to explore Mesa Marshall and Left Hand Valley Reservoir for the first time. We also observed on a City of Boulder property on Hoover Hill. Ten BCPOS properties were visited 40 days and OSMP properties eight days.

IV. Objectives

1. Inventory butterflies in Boulder County, recording populations and species.
2. Expand information by maintaining visits to the previously studied areas in BCPOS, especially Southeast Buffer, Anne U. White, Heil Valley, and Caribou Ranch.
3. Survey both Heil Ranch and the Southeast Buffer approximately every two weeks from early April through early September for a total of 20 survey days (10 days for each location). Survey Caribou Ranch six times, because of its shorter season.
4. Survey on a less regular schedule other BCPOS properties (such as Rabbit Mountain, Walker Ranch, Carolyn Holmberg Preserve at Rock Creek and Anne U. White-Fourmile Canyon Creek) a total of 10 times, bringing our cumulative total of survey days throughout the five-month season to at least 36.
5. Survey areas new to us within City of Boulder properties.
6. Make extensive use of digital photography to record significant butterflies and blossoming plants observed in the course of our surveys.
7. In BCPOS properties with appropriate habitat (Bluestem Grasses), such as Heil Valley and the Southeast Buffer, we will reconfirm the Arogos and the Ottoe Skippers, two locally rare grassland butterfly species previously found in 2008.
8. Increase present county records of 198 different species by finding two more this year to raise the total to 200.
9. Record total numbers of individual butterflies observed for each species on each field day using spreadsheets, and analyze data for patterns expressed in the 2009 field season as well as any significant variations from data for previous years. (Chu, 2009-2010)

V. Research Methods

The methodology used in 2009 is similar to that described in our earlier report, “Butterfly Inventory and Research on Open Space Properties” (Chu, 2006). This has become the protocol for butterfly research by our team in Boulder County.

“Butterfly surveys were conducted by walking on trails, near waterways, 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 along 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), the date, time in the field, temperature and useful notes about butterfly activities and blossoms were listed. Digital photos were often made in order to assist in identification.”

The standard unit Individuals per Research Hour is used in this report. It describes the total number of individuals sighted within the time spent observing in the field, and then this number of individuals is divided by the number of hours of field research for a specific study area. Since we do not follow a measured transect nor restrict our studies to a certain time period, a unit for comparison was devised for this study.

VI. Results and Discussion

Field studies proceeded within Boulder County within diverse habitats from short-grass prairies to mixed grass to montane meadows, Ponderosa Pine habitats, to upper montane meadows. The southern migrants noted other years, were absent in 2009, such as Southern Dogface *Zerene cesonia*, Dainty Sulphur *Nathalis iole*, and Mexican Sulphur *Eurema mexicana*, consequently it was our surprise to see a Cloudless Sulphur *Phoebis sennae* in Heil Valley Plumely Canyon. While conducting our research on these lands in 2007, we observed an average of 39 individuals per research hour on seven sites including seven southern US - Mexican butterfly species not resident in the Front Range. In 2008 the number of individuals per research hour on the same seven research sites was 46; and in 2009 individuals per research hour was a smaller 37.

Boulder County Open Space Properties

A. Southeast Buffer is a short grass prairie north of Highway 128 and west of McCaslin Boulevard. This team has made observations for three years beginning at the gate off Highway 128, elevation of 5,870 ft. (N 39°54'45.9"W 105 ° 10'57.1"). Prairie dogs stripped a number of acres, but many tunnels had been vacated. Cattle were grazing the plants heavily in 2008, but they seemed to be fenced into the northwestern area in 2009. Even though the rains were generous this season, the area showed good varieties of plants, but not outstanding blossoms on the well drained ridges. On a northerly-extending ridge crest the team refers to as Swallowtail Hill, the Anise *Papilio zelicaon* and Black Swallowtails *P. polyxenes* were hill topping, chasing and circling repeatedly. The greatest number of individuals per research hour in three years of inventorying in the Southeast Buffer was due to the large influx and successful reproduction of Variegated Fritillaries *Euptoieta claudia*. Monarchs *Danaus plexippus* and a Gray Copper *Lycaena dione* were sighted in this area for the first time. The most common butterflies were the Checkered Whites *Pontia protodice*, Variegated Fritillaries, Field Crescents *Phyciodes pulchella* and Common Checkered-skippers *Pyrgus communis*.

B. Anne U. White Trail accesses a lower foothill riparian habitat (6000 – 6200 ft.). It is a well-preserved small canyon with vegetation covered slopes and a large variety of plants providing a high count of butterfly species. April 13 found the Spring White *Pontia sisymbrii* and White-lined Green Hairstreak *Callophrys sheridanii* flying. Also on this date Western Pine Elfin *Callophrys eryphon* appeared two weeks earlier than usual. Hoary Commas *Polygonia gracilis* and Mourning Cloaks *Nymphalis antiopa* had come out of their winter's hibernation and several were coursing the stream, while the Cloaks were nectaring on early blooming Sand Willows. The rare Moss Elfin *Callophrys mossii schryveri* was found on April 29. Northwestern Fritillaries *Speyeria hesperis* were flying in large numbers on July 22 and nectaring on the Monarda blossoms; present also were the bright orange Taxiles Skippers *Poanes taxiles* and the darkish Dun Skippers *Euphyes vestris*. The Dusted Skipper *Atrytonopsis hianna*, a butterfly whose territory has expanded from the eastern U.S., was photographed on this trail and in Heil Valley Plumely Canyon. Numbers of dogs off leash were reduced, and the vegetation covered some of their 'social' trails.

C. Heil Valley – Geer Watershed is the lowest of the three study areas in Heil. The study area extends from 6,120 feet to 6,500 feet. This extends from the gate (N 40 ° 08'51.3" W 105 ° 18'47.6") which excludes public access to the Manager's Cabin to a northwest saddle (N40 ° 08'07.9" W105 ° 19'10.7"). In this watershed are intermittent streams, riparian hillsides, mixed-grassy meadows and Ponderosa Pine forests. The team is seeing more Short-tailed Swallowtails *Papilio indra* along with Anise Swallowtails *P. zelicaon*. We are forever on the lookout for Black Swallowtails *P. polyxenes*, which have become very scarce; therefore we often record 'black swallowtail species,' to insure identification of the uncommon *polyxenes* correctly. The Silvery Blue *Glaucopsyche lygdamus* and the Common Ringlet *Coenonympha tullia ochracea*

were the most common butterfly species in Geer in 2009, outnumbering Cabbage Whites *Pieris rapae* which are the most numerous butterflies in Boulder County. Hoary Commas *P. gracilis* were nectaring on the long pinkish blossoms of Wax Currant. Many butterflies puddle in the left-over muddy spots above the culverts near the barn. Jean Morgan spotted a Variegated Fritillary *Euptoieta claudia* ovipositing on Nuttall's Violet and her sharp eyes found the tiny egg as well.

D. Heil Valley – Plumely Canyon (6,072 ft N 40° 09'22.3" W105° 18'02.2") study area begins at a locked gate on the road toward Red Hill and proceeds up a fairly narrow canyon to a stone ruin (6,600 ft. N 40 ° 09'29.0"W 105 ° 18'30.9"). Some water runs in the east-west forested canyon year around. It is a corridor for migrating butterflies, shown once again by a new sighting which grandson Jeremy Hurst identified, a Cloudless Sulphur *Phoebis sennae*, common along the Rio Grande River basin. The rare Hoary Elfin *Callophrys polios* was seen on May 12 and the uncommon Callippe Fritillary *Speyeria callippe* on June 16. The Mylitta Crescent *Phyciodes mylitta* was found in Plumely and not the former areas where it was sighted first in Boulder County, i.e. Anne U. White and the Geer Watershed.

Spring Azures *Celestrina ladon sidara* were nectaring on mustard and Mahonia; Western Pine Elfin *C. eryphon* on Wild Plum. The tiny and seldom seen Juniper Hairstreak *Callophrys gryneus siva* was nectaring on Wild Buckwheat; Dun Skipper *Euphyes vestris* was nectaring on Fremont Geranium a favorite summer-long food source for adults. A single Weidemeyer's Admiral *Limenitis weidemeyerii* stayed for more than an hour on a Coyote scat, which amazed participants on a Boulder County public walk. The puddle where the stream crosses the road and bike path continues to be favorite puddling mud. We find so many blues the victims of speeding bicycles. The team recorded a Poorwill and bat rushing out of a sheltered sleep in the stone ruin. A resident Prairie Falcon was pursued by many crows at the cliff face above us.

E. Heil Valley – North includes a long corridor at Red Hill, Red Gulch and North Point (5,280 ft. to about 6,360 ft.). It is in the area of the Picture Rock Trail and the former North Point residence (N 40° 09'20.4" to N 40° 12'07.1") It has a wide variety of grasses including the important host plant Big Bluestem, and Mountain Mahogany, Ponderosa Pine, with Juniper in the Red Gulch surrounded by mixed mid-sized grasses. Native Hackberry trees line the driveway to the North Point. The American Snout *Libytheana carinenta* was a new find in our years of surveying. Jean Morgan and Amy Chu were ecstatic to find this southern butterfly. The uncommon Green Skipper *Hesperia viridis* was found along with a single Hackberry Emperor *Asterocampa celtis* June 26. The team came too late to find the rare Arogos Skipper which is associated with the Big Bluestem its host plant. Cabbage Whites, Silvery Blues, Variegated Fritillaries, Field Crescents and Common Ringlets were the most common butterflies.

F. Walker Ranch – Meyer's Gulch (7,339 to 8,540 ft., N 39° 57'12.1" W 105° 20' 20.6" to N 39° 58'00.4" W 105° 20'39.8") study area follows the Meyer's Homestead Road through mixed-grass meadows, riparian habitat, pine and aspen. Flowers were magnificent and in full

bloom after the effects of the heavy snow which persisted until May. The team surveyed a wide swath to the north of the road returning by the road. Both the rare Brown Elfin *Callophrys augustinus* and Hoary Elfin were sighted in May above their host plant Kinnikinnick with three or four Hoary Elfins flying above each clump. In the cool morning Rocky Mountain Dotted-blues *Euphilotes ancilla* appeared singly over Sulphur Flowers, however in the afternoon heat they were found by the dozens puddling in the numerous muddy tracks along the road, with Boisduval's Blues *Plebejus icarioides*, Variable Checkerspots *Euphydryas anicia*, Northern Crescents *Phyciodes cocyta* and the uncommon Dreamy Duskywings *Erynnis icelus*. The team recorded a most unusual high count of 526 individual Dotted-blues on that single day, July 9, including two pair of mating Dotted-blues. A Milbert's Tortoiseshell *Aglais milberti* female worked diligently laying masses of eggs on Nettles. She would lay some eggs on the underside of a leaf, and then rest for a bit before continuing to oviposit. The most numerous butterflies besides Dotted-blues were Canyon Bramble Hairstreaks *Callophrys affinis homoperplexa*, Hoary Elfins, Boisduval's Blues, and Common Ringlets. One single Nais Metalmark *Apodemia nais* was found in the late afternoon, a special butterfly which this team searches for especially at Meyer's Gulch.

G. Caribou Ranch and Mud Lake (study areas from 8475' to 8,790 ft). cover rich parkland governed by conservation measures to preserve diverse wildlife habitat, plants and water resources. This higher altitude survey provides wet meadows which are surrounded by Ponderosa Pine, aspen glens, some Lodge Pole and Limber Pines. Both the rare Brown Elfin and Hoary Elfin were sighted on June 17 near Mud Lake. This was a fortuitous day for reproduction also. The Persius Duskywing *Erynnis persius* and Queen Alexandra were ovipositing on Golden Banner; Rocky Mountain Dotted-blues were mating. Two uncommon butterflies Greenish Blue *Plebejus saepiolus* and Arctic Blue *P. glandon rustica* were at Caribou on August 3. The team found three copper species on one day – Ruddy *Lycaena rubidus*, Blue *L. heteronea*, and Purplish Copper *L. helloides* in the Monarda rich meadow at the beginning of the Caribou Horse Trail. Most common butterflies were Queen Alexandra's Sulphurs *Colias alexandra*, Common Ringlets and Common Alpines *Erebia epispodea* dispersed around the area, while the Northern Checkerspots *Chlosyne palla* were localized over blossoming Goldenglow *Rudbeckia*. The Thicket Hairstreak *Callophrys spinetorum* was seen nectaring on Mountain Parsley.

City of Boulder Properties

A. Left Hand Valley Reservoir

A cursory first visit and we were aware that this Left Hand Valley Reservoir was a different habitat from those we had seen in other Boulder County properties. The thin soils covered an exposed layer of shale. We walked from the parking lot toward the southwest to the massive Knapweed bed, and then returned by a curving route north toward the Niwot Road on a shale hillside. We chose to walk this direction because it took us toward the reservoir and a likely

habitat for butterflies. Late summer Persius Duskywings *Erynnis persius* were present with few distinguishing marks except the three small windows in the forewings. The usual Checkered Whites, Clouded Sulphurs, Orange Sulphurs *Colias eurytheme* and Variegated Fritillaries were flying among few blossoms.

The *Eriogonum brevicaule* was in full bloom on the dry shale and *Physaria belli* a rare plant and was scattered, but present. The Woodhouse Toads were seen in the adult large healthy size and also smaller first-year size on the shale, not near the reservoir. A Deer Mouse *Peromyscus sp.* was dead at the edge of the parking lot. This area is worth looking at again in 2010. If possible the City should try to stop the massive growth of Knapweed.

B. Hoover Hill, Westview Ridge

The section of Hoover Hill visited is a dry weedy mixed grass ridge east of Westview Avenue, south of Arapahoe Road, and west of the prairie dog colony. Many *Yucca glauca*, *Eriogonum effusum* and *Liatris punctata* grow there. It is posted by the Maintenance Dept, Boulder City and used by many neighbors for dog runs in the daytime and for watching comets at night. In the winter children use it for a short sled run.

Two county records were set there in 2009. The rare Rita Blue *Euphilotes rita coloradensis* was found on August 17. Its host plant is the *Eriogonum effusum* which was in full bloom. The Rita Blue and other butterflies were nectaring on Gayfeather *Liatris punctata*. One of our mentors, Dr. Ray Stanford, who has maintained county by county records of western US butterflies for many years, chided us when he found the *effusum* growing there several years ago. He said, "Get out there and find the Rita Blue in late summer." We finally did find one, enough to set a Boulder County record for first sighting. Our other mentor Dr. Paul Opler, Curator of the Gillette Museum, CSU, Ft. Collins said, "Go find the Texana Blue *Plebejus 'lupini' texanus*. It should be even more common at this time." My daughter Amy found one. Its distinguishing traits are the many greenish scintillations on the hind wings near the sub-marginal dark spots. It is now listed as a sub-species, but is under study and will likely be reclassified as a species *Plebejus texana*.

Two other uncommon butterflies were sighted; Uncas Skipper *Hesperia uncas* and Peck's Skipper *Polites peckius*. These have not been sighted before by this team, but the reason is likely that we have not observed in the field in late August due to usual high temperatures and fewer butterflies.

C. Marshall Mesa, East of the Gun and Rod Club

The eastern portion of the Marshall Mesa is a short-grass prairie with a tremendous variety of blooming plants including short Rabbitbrush, a 'weed' *Verbena bractata*, and Gayfeather. This is an interesting area to explore again. We chose to go away from 66th St. and

parallel to the property fence with the Gun and Rod Club toward a slight depression to the south. The better place to find most butterflies is near moist soil or small streams. There is really no riparian area there, but some large trees grow at the west property fence.

It was a 'subtle' environment with a few flying butterflies which surprised us. It was our first time seeing a Leonard's Skipper *Hesperia leonardus*. Common Checkered Skippers *Pyrgus communis* were quite evident as they flew low often settling on the bare ground.

Weather was a major factor affecting days of observation for active butterflies. We knew this summer was different due to the many days we awoke to see clouds and feel mist on our faces. In 2009 this team had 40 days of field inventory in the BCPOS, the usual being about 60 days. For the first time this team also visited City of Boulder properties eight days completing a total of 48 research days in the field, resulting in 12 days short of the usual number of inventory days.

"This summer (June, July and August) had an average temperature of 67.4 °F compared with a normal of 70.2. It was 3° cooler than the summer of 2008. Rainfall reached 4.5 inches compared with a normal of 5.8 inches. There were 13 days in the 90's compared to a normal of 33." (1)

"February 2009 was the 19th warmest on record and it was also the 20th driest over 115 years of record keeping. The first week was 12 degrees warmer than normal." (2) We began the butterfly season early on the Bear Creek Trail February 5, 2009, and located two Mourning Cloaks, and in Heil Valley a white butterfly and Milbert's Tortoiseshell *Aglais milberti* were flying. March set the pattern for the summer. "The 16.4 inches of snow that fell on March 26 was the third largest single-day March snow in history. March 2009 was the 22nd warmest, 43rd wettest and 34th snowiest on record."(3) Our team often begins its season in April but, "wet, wild April put Boulder ahead of average moisture because it was the eighth wettest, 19th snowiest and 35th coolest on record."(4) Many Mourning Cloaks and Hoary Commas came out of hibernation in the sunshine on Anne U. White Trail only to be hit by a slush blizzard on April 16, which produced five inches of moisture after three straight days of a rain-snow mix.

In May we received average moisture mostly on weekends. "There was a prolonged dry spell that lasted over the first three weeks. The lowest temperature for the month was 36 ° F. Memorial Day weekend Boulder received 2.34 inches of rain or 75 % of the month's total."(5) On May 6 the early Spring Azures *Celastrina ladon sidara* emerged from their chrysalids, as did a Spring White *Pontia sisymbrii* at Heil Valley Geer Watershed.

June's weather was unfavorable perhaps, but not unprecedented. "The temperature didn't get to 90 °F and there were 21 days with precipitation. The monthly average of 64° and the total precipitation of 2.7 inches made June 2009 the 17th coolest and 26th wettest June in history." (6) These cool temperatures were pleasant for the team, but lowered the number of successful early

butterfly emergences. However, the Common Ringlets came out in greater numbers on several of our inventory sites as compared to other summer species.

The July Camera Weather Review headline read ‘Month was cool, stormy – but not a record. Cold, wet weather puts a damper on being outdoors.’ “The average temperature was 69.9 ° F, while normal is 72.5 °. Year to date precipitation is 15.86”, while the expected is 13.48.” This is the 19th coolest July, 17 days with a trace of rain or greater, although the monthly total was 0.4 inches shy of normal. July 29th and 30th had record-low maximums of 68 and 57 degrees, respectively, and the 31st had a record low of 47 degrees.” (7)

We’ve never had a greener July and it was very noticeable in the tundra which had spectacular blossoms with accompanying fragrances. Ladybug beetles were out in record numbers, solidly decorating tree trunks in the foothills and appearing in gardens all over the county. (7) Two annual North America Butterfly Counts at Cal-Wood Education Center and Gilpin County were rained out in each afternoon July 4 and 5, giving us one of the lowest single day counts of species and populations in 27 and 34 years respectively. On July 9 at Meyer’s Gulch butterflies couldn’t wait longer if they were going to emerge in 2009. On the Meyer’s Homestead roadway, the muddy puddles brought in the greatest number of Rocky Mountain Dotted-blues (526 individuals), Boisduval’s Blue *Plebejus icarioides* (80) and Western Green Hairstreak *Callophrys affinis* (27) we had ever seen in a single day.

“Summer was cooler, but not wetter, than normal,” reported Callahan. “August was the 35th coolest and 13th driest August that Boulder has ever experienced. There was a record low of 46 °F on the 17th and the 49° reading on the 18th tied the record set in 1960.” (8) We would modify Callahan’s statement to read ... ‘wetter than usual,’ as far as days for butterfly observation. Our team’s August trip seemed to be too late to locate the rare Arogos Skipper *Atrytone arogos* at Heil Valley, North Point or Southeast Buffer, although the Big Bluestem was healthy and tall. The warm days did return and fortunately, the team ventured onto Boulder City areas and found two new Boulder County records Rita Blue and Texanus Blue. We also found uncommon skippers new to our team Uncas Skipper *Hesperia uncas* and Peck’s Skipper *Polites peckius* on Hoover Hill and Leonard’s Skipper *Hesperia leonardus* on Marshall Mesa.

1(Callahan, September 7, 2009. p. 10C)

2 (Callahan, March 6, 2009 p. 6C)

3 (Callahan, April 7, 2009. p. 8C)

4 (Callahan, May 7, 2009. p. 6C)

5 (Callahan, June 4, 2009. p. 6C)

6 (Callahan, July 6, 2009. p. 8C)

7 (Callahan, August 6, 2009. p. 6C)

8. (Callahan, September 7, 2009. p. 10C)

VII. Conclusions

Ten Boulder County Open Space properties were visited during 40 days and this team recorded 87.5 research hours in the field. In August 2009, we explored OSMP properties eight days including about 11.5 research hours. Ray Stanford encouraged us to find new species. He predicted that the likely new species will include: *Euphilotes rita coloradensis* on its caterpillar plant the buckwheat *Eriogonum effusum*, *Megathymus yuccae* a large skipper butterfly on yucca, *Lycaena editha* in the high elevation along trails, *Phyciodes picta* in town or along roads along the eastern part of the county, often associated with bindweed, and *Oeneis polixenes* in highest wet tundra grasslands just east of the continental divide. We did indeed find the Rita Blue on its caterpillar plant the buckwheat *Eriogonum effusum*. We did not locate the Arogos *Atrytone arogos* or Ottoo Skippers *Hesperia ottoe* as we had in 2008.

Weather in 2009, was a main factor resulting in fewer species and populations than in 2008. June, July and August had an average temperature of 67.4 °F compared with a normal of 70.2. These summer months in 2009 were 3°F cooler than the same three summer months of 2008. There were 13 days in the 90's compared to a normal of 33 days. Butterflies are strongly affected by weather. Their emergence from chrysalids, mating and ovipositing, and finding sunlight's energy to consume host plants building successful adults, are all dependent on favorable weather. It follows that we experience considerable differences from one year to the next.

It is therefore difficult to detect short-term trends. Nevertheless, continuing and/or expanding studies should make long-term trends more recognizable. If global climate is indeed changing, then continued, long-term studies should help document the shifts. Butterflies are fairly easy to observe and monitor and are excellent indicators of healthy environments and therefore should have continued support for research.

VIII. Recommendations

- A. Support further research on butterflies, an indicator species.
- B. Facilitate a process with staff members in charge of weed management so incursions of weeds would be communicated by these teams.
- C. Devise a way to disseminate information on the butterflies and investigated habitats to BCPOS staff members during trail planning and before trail building occur.

IX. References

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X. Butterfly Survey Data Tables

Table I. Survey Dates and Locations

A. Sites Visited Within Boulder County Open Spaces– 2009

	Day	Heil Geer	Heil Plumely	Heil North, Red Hill & Gulch, North Point	SE Buffer	Anne U. White	Mud Lake Caribou	Deadmans Gulch	Rabbit Mountain	Carolyn Holmberg	Meyers Gulch Walker Ranch	Steamboat	Reynold Ranch
Feb	24										JC		
Mar	15							JC	JC				
Apr	7							JC					
	13					JC							
	14							JC					
	21	MS								JC			
	23							JC	JC				
	24										JC		
	29					JC							
May	6	JC											
	7										JC		
	11				JC								
	12		JC										
	14										JC		
	17			JC									
	18				JC								
	27										CC		
	28	JM										JC	
	29			JC									
	31	JC											
Jun	13		JC										
	14		JC										
	16		JC										
	17						JC						
	22										JC		
	23					JC							
	24	JC											
	26			JC									
	29						JC						
	30				JC								
Jul	2		JC										
	9										JC		
	22					JC							
	24				JC								
Aug	3						JC						
	12			JC									
	21												JC

2009 SE Buffer		5/11	5/18	6/30	7/24	2009 Total
Scientific Names	Common Names					
<i>Papilio polyxenes</i>	Black Swallowtail		1			1
<i>P. rutulus</i>	Western Tiger Swallowtail					
<i>P. multicaudata</i>	Two-tailed Swallowtail				1	1
<i>P. zelacaon</i>	Anise Swallowtail		2			2
black swallowtail sp.				1		1
<i>Pontia protodice</i>	Checkered White	2	1	4	4	11
<i>Pieris rapae</i>	Cabbage White			3	15	18
<i>P. occidentalis</i>	Western White					
<i>Euchloe olympia</i>	Olympia Marble	3	1			4
white sp.		6	25	13	25	69
<i>Colias philodice</i>	Clouded Sulphur	1	8	4	1	14
<i>C. philodice albino</i>				1		1
<i>C. eurytheme</i>	Orange Sulphur			1	2	3
<i>Zerene cesonia</i>	Southern Dogface					
<i>Nathalis iole</i>	Dainty Sulphur					
sulphur sp.				2		2
<i>Lycaena dione</i>	Gray Copper				1	1
<i>Strymon melinus</i>	Gray Hairstreak	1	2			3
<i>Echinargus isola</i>	Reakirt's Blue			2	6	8
<i>G. lygdamus</i>	Silvery Blue					
<i>Euphilotes ancilla</i>	Rocky Mtn. Dotted-Blue					
<i>Plebejus melissa</i>	Melissa Blue		4			4
blue sp.				1	4	5
<i>Euptoieta claudia</i>	Variegated Fritillary	14	17	95	3	129
<i>Speyeria aphrodite</i>	Aphrodite Fritillary					
<i>S. edwardsii</i>	Edwards' Fritillary			3		3
fritillary sp.	(silvered)					
<i>Phyciodes tharos</i>	Pearl Crescent				11	11
<i>P. pulchella</i>	Field Crescent		7	3	3	13
crescent sp.		2				2
<i>Cercyonis pegala</i>	Common Wood-nymph				3	3
<i>Danaus plexippus</i>	Monarch		1	2	4	7
<i>Nymphalis antiopa</i>	Mourning Cloak					
<i>Vanessa cardui</i>	Painted Lady			4		4
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral					
<i>Coenonympha tullia ochracea</i>	Common (Ochre) Ringlet					
<i>Pyrgus communis</i>	Common Checkered-skipper			4	26	30
<i>Pholisora catullus</i>	Common Sootywing				1	1
<i>Hesperia ottoe</i>	Ottoe Skipper					
<i>Atrytone arogos</i>	Arogos Skipper					
skipper, orange				1	1	2
Skipper, dark					1	1
Duskywing skipper						

SE Buffer	2007	2008	2009
# of Species identified during Year	25	20	21
# Species 2007-2009 sighted in Southeast Buffer	21	23	33
Research Hours on Site	5	21	9
# Individual Butterflies Counted	256	373	353
# Individuals / Research Hour	51	18	39
Total # Species Listed for This Area			33

SE Buffer	Research Hours	Butterfly notes	Blossoming plants	Animals	Researchers
5/11/09 12:30 – 2:00 p.m. 15 to 19 °C high clouds, slight wind	1.5	<i>cardui</i> on the hilltop.	Very little Filaree, Erigeron, rayless Composite, Museon, Salt & Pepper, Flax, Nuttall's Violet, Mertensia, large Senecio, Dandelion, Purple Deer Clover, Locoweed, Miner's Candle, Sand Lily, cream & pinkish Paintbrush, Monument Plant, yellow Mustard, Verbena bipinefolia, Hawthorn	Meadowlark, Robin, Spotted Towhee Lark Sparrows; 3 Coyotes at Prairie Dog burrows	Jan Chu, Jean Morgan
5/18/09 10:00 – 12:00 p.m. 28 °C at noon, clear to overcast, humid.	2	<i>zelicaons</i> and <i>polyxenes</i> were chasing and circling repeatedly at the crest on 'Swallowtail Hill'	Astragalus, Purple Vetch, Arnica orange, Toadflax, Milk Vetch, 3-leaf Purple Vetch, Dalmation Toadflax	Bullock's Oriole	Jan Chu, Amy Chu, Joyce Gellhorn
6/30 8:50 – 11:50 a.m. 22 °C no clouds, wind less than 5 mph. From gate north through gulley, along hilltop to fence; west to riparian stream then uphill along fence.	3	It seemed like few butterflies for the distance walked; outstanding blossoms, hot walk.	Chamomile, Lead Plant, Yucca, yellow Nightshade shrub, Cowboy's Delight Canada Thistle, Bindweed, Sweet Clover, Sunflowers, yellow Oenothera, Heterotheca, Bull Thistle, Roses, Gaura, Prairie Clover, Flax, Mariposa Lily, Gaillardia, Moth Mullein, Coneflower, Yarrow, white Larkspur, Arnica, Toadflax, white Vetch, Desert Nightshade, Gumweed, purple, Lambert's Loco, Penstemon	Mourning Dove, Meadowlark, Vesper Sparrow, Lark Sparrow, House Wren, Magpie, Red-Wing Blackbird, Kestrel, Kingbird, Robin, Bullock's Oriole	Jan Chu, Jean Morgan, Larry Crowley, Bay Roberts, Emi Lehman

Anne U. White	2009	4/13	4/29	6/23	7/22	2009 Total
<i>Scientific Name</i>	Common Name					
<i>Parnassius smintheus</i>	Rocky Mountain Parnassian					
<i>Papilio polyxenes</i>	Black Swallowtail					
<i>P. zelicaon</i>	Anise Swallowtail			1		1
<i>P. indra</i>	Short-tailed Swallowtail			1		1
black swallowtail sp.				4		4
<i>P. rutulus</i>	W. Tiger Swallowtail		1	3	3	7
<i>P. eurymedon</i>	Pale Swallowtail			4		4
<i>P. multicaudata</i>	Two-tailed Swallowtail					
yel. swallowtail sp.				1		1
<i>Pontia protodice</i>	Checkered White					
<i>P. sisymbrii</i>	Spring White	1	5			6
<i>Pieris rapae</i>	Cabbage White		2	4	3	9
<i>Euchloe ausonides</i>	Large Marble		2			2
<i>E. olympia</i>	Olympia Marble		2			2
marble sp.			2			2
<i>Anthocharis julia</i>	So. Rocky Mountain Orangetip					
white sp.		1	5	5		11
<i>Colias philodice</i>	Clouded Sulphur		1			1
<i>C. philodice/eurytheme</i>	hybrid					
<i>C. eurytheme</i>	Orange Sulphur					
<i>Nathalis iole</i>	Dainty Sulphur					
<i>Callophrys affinis homoperplexa</i>	Canyon Bramble Hairstreak					
<i>Callophrys sheridanii</i>	White-lined Green	1				1
<i>C. mossii schryveri</i>	Moss Elfin		1			1
<i>C. polios</i>	Hoary Elfin					
<i>C. eryphon</i>	Western Pine Elfin	1	12	1		14
<i>Satyrium titus</i>	Coral Hairstreak					
<i>Strymon melinus</i>	Gray Hairstreak					
<i>Cupido amyntula</i>	Western Tailed-Blue			5		5
<i>Celastrina ladon sidara</i>	Spring Azure		1			1
<i>Glycopsyche lygdamus</i>	Silvery Blue		2			
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue			4		4
<i>Echinargus isola</i>	Reakirt's Blue					
<i>Plebejus melissa</i>	Melissa Blue					
<i>P. icarioides</i>	Boisduval's Blue					
<i>P. lupini lutzi</i>	Lupine Blue					
<i>P. glandon rustica</i>	Arctic Blue					
blue sp.			2	1		3
<i>Apodemia nais</i>	Nais Metalmark					
<i>Danaus plexippus</i>	Monarch					

Anne U. White		4/13	4/29	6/23	7/22	2009 Total
<i>Euptoieta claudia</i>	Variegated Fritillary			1		1
<i>Speyeria aphrodite</i>	Aphrodite Fritillary			1		1
<i>S. edwardsii</i>	Edwards' Fritillary					
<i>S. coronis</i>	Coronis Fritillary					
<i>S. hesperis</i>	Northwestern Fritillary				21	21
fritillary sp.				2		2
<i>Chlosyne gorgone</i>	Gorgone Checkerspot					
<i>Phyciodes mylitta</i>	Mylitta Crescent					
<i>P. tharos</i>	Pearl Crescent			1		1
<i>P. cocyta</i>	Northern Crescent			1		1
<i>P. pulchella</i>	Field Crescent			2		2
<i>Junonia coenia</i>	Common Buckeye					
<i>Polygonia satyrus</i>	Satyr Comma					
<i>P. gracilis</i>	Hoary Comma	6	7	4	2	19
<i>Aglais milberti</i>	Milbert's Tortoiseshell					
<i>Nymphalis californica</i>	CA Tortoiseshell					
<i>N. antiopa</i>	Mourning Cloak	17	2		1	20
<i>Vanessa atalanta</i>	Red Admiral				1	1
<i>V. cardui</i>	Painted Lady		17	2		19
<i>V. virginiensis</i>	American Lady					
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral			1	2	3
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet			5		5
<i>Cercyonis pegala</i>	Common Wood-Nymph					
<i>C. oetus</i>	Small Wood-Nymph					
<i>Oeneis uhleri</i>	Uhler's Arctic			2		2
<i>Epargyreus clarus</i>	Silver-spotted Skipper			5	2	7
<i>Erynnis pacuvius</i>	Pacuvius Duskywing					
<i>E. persius</i>	Persius Duskywing					
<i>Pyrgus communis</i>	Common Checkered-skipper					
<i>Piruna pirus</i>	Russet Skipperling					
<i>Hesperia colorado</i>	Common Branded Skipper					
<i>Polites mystic</i>	Long Dash					
<i>Ochlodes sylvanoides</i>	Woodland Skipper				1	1
<i>Poanes taxiles</i>	Taxiles Skipper			1	14	15
<i>Euphyes vestris</i>	Dun Skipper			2	13	15
<i>Atrytonopsis hianna</i>	Dusted Skipper			1		1

Anne U. White

35	# Species in 2009 sighted at Anne U. White Trail
69	# Species 2004-2009
10	Research Hours at Site 2009
217	Individual Butterflies Sighted within Anne U. White
21.7	Individual Butterflies Sighted Per Research Hour at Anne

Anne U. White	Party Hours	Butterfly Notes	Plants Blooming	Animals	Researchers
4/13/09 1:00 – 3:18 p.m. 17 – 16 ° C slight breeze	2	<i>antiopa</i> nectaring on sand willows	Sand Lily, Nuttall's Violet, Dandelion		Jan Chu, Jean Morgan, Amy Chu
4/29/09 10:15-11:45 a.m. 16.5 ° C wind 15 mph + to none, minimal clouds	1.5		Wax Currant, Mahonia, Spring Beauty, Dandelion, Sand Lily, tiny yellow Mustard	Mtn. Chickadee, Pine Siskin, House Finch, Crow, Rock Wren, Hairy Woodpecker, Steller's Jay	Jan Chu, Larry Crowley, Amy Chu
6/23/09 9:30 – 12:30p.m. 20.5 – 26.5 ° C 20% clouds, no wind. Walked to first stream.	3	Dusted Skipper was outside the gate to AUW		Much traffic on the trail - about 80 runners and walkers, 6 leashed dogs	Jan Chu, Jean Morgan, Amy Chu
7/22/09 8:35 a.m. – 12:15 p.m. 17.5 to 25 ° C wind less than 5 mph	4	<i>taxiles</i> and <i>vestris</i> nectaring on Monarda. <i>weidemeyerii</i> were very worn.	Larkspur, Monarda, Yarrow, Fremont Geranium, Heterotheca, Gumweed, Prairie Clover, Harebell, Goldenrod, Dogbane, Red Clover, Gaillardia, Rose	Chipmunks. 3 unleashed dogs but owners turned back when advised. 8 leashed owners.	Jan Chu Larry Crowley, Paula Hensley

Heil – Geer Watershed		Upper Geer	Lower Geer	Lower Geer	Lower Geer	Lower Geer	2009 Total
	2009	4/21	5/6	5/28	5/31	6/24	
<i>Papilio polyxenes</i>	Black Swallowtail						
<i>P. zelicaon</i>	Anise Swallowtail			1			1
<i>P. indra</i>	Short-tailed Swallowtail		1ph	1	1	4	7
black swallowtail sp.					3		3
<i>P. rutulus</i>	Western Tiger Swallowtail					2	2
<i>P. eurymedon</i>	Pale Swallowtail			1	3	4	8
<i>P. multicaudata</i>	Two-tailed Swallowtail						
yellow swallowtail sp.					1		1
<i>Neophasia menapia</i>	Pine White						
<i>Pontia sisymbrii</i>	Spring White		1	5			6
<i>P. protodice</i>	Checkered White					1	1
<i>P. occidentalis</i>	Western White						
<i>Pieris rapae</i>	Cabbage White		8	2	6	11	27
<i>P. marginalis</i>	Mustard White						
<i>Euchloe ausonides</i>	Large Marble		4	4	4		12
<i>E. olympia</i>	Olympia Marble						
<i>Anthocharis julia</i>	Southern Rocky Mountain Orangetip						
white sp.			11	8	9	5	33
<i>Colias philodice</i>	Clouded Sulphur	1			2	6	9
<i>C. eurytheme</i>	Orange Sulphur	1		1	1	1	4
<i>C. alexandra</i>	Queen Alexandra's Sulphur						
<i>Eurema mexicana</i>	Mexican Sulphur						
<i>Nathalis iole</i>	Dainty Sulphur						
sulphur sp.					3	2	5
<i>Lycaena dione</i>	Gray Copper						
<i>Lycaena heteronea</i>	Blue Copper						
<i>Callophrys affinis homoperplexa</i>	Canyon Bramble Hairstreak						
<i>C. augustinus</i>	Brown Elfin						
<i>C. gryneus</i>	Siva Juniper Hairstreak						
<i>C. eryphon</i>	Western Pine Elfin	5	9		1	3	18
<i>Satyrrium titus</i>	Coral Hairstreak						
<i>S. saepium</i>	Hedgerow Hairstreak						
<i>Strymon melinus</i>	Gray Hairstreak						
<i>Leptotes marina</i>	Marine Blue						
<i>Cupido amyntula</i>	Western Tailed-Blue		1	5	4	4	14
<i>Celastrina ladon sidara</i>	Spring Azure		14		1		15
<i>Glaucopsyche piasus</i>	Arrowhead Blue			3	2		5
<i>G. lygdamus</i>	Silvery Blue		2	26	36	1	65
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue					3	3
<i>Echinargus isola</i>	Reakirt's Blue					1	1
<i>Plebejus melissa</i>	Melissa Blue						
<i>P. icarioides</i>	Boisduval's Blue					14	14
<i>P. lupini lutzii</i>	Lupine Blue						
<i>P. glandon rustica</i>	Arctic Blue						
blue sp.					7	7	14

Heil - Geer		Upper Geer	Lower Geer	Lower Geer	Lower Geer	Lower Geer	2009 Total
<i>Apodemia nais</i>	Nais Metalmark						
<i>Euptoieta claudia</i>	Variegated Fritillary				2	6	8
<i>Speyeria aphrodite</i>	Aphrodite Fritillary					8	8
<i>S. edwardsii</i>	Edwards' Fritillary			2	1	1	4
<i>S. coronis</i>	Coronis Fritillary						
<i>S. callippe</i>	Callippe Fritillary						
<i>S. hesperis</i>	Northwestern Fritillary					1ph	1
<i>S. mormonia</i>	Mormon Fritillary						
fritillary sp.					5	10	15
<i>Chlosyne gorgone</i>	Gorgone Checkerspot					1	1
<i>C. nycteis</i>	Silvery Checkerspot						
<i>C. palla</i>	Northern Checkerspot						
<i>Phyciodes mylitta</i>	Mylitta Crescent						
<i>P. tharos</i>	Pearl Crescent				1		1
<i>P. cocyta</i>	Northern Crescent					4	3
<i>P. pulchella</i>	Field Crescent			1	3	11	15
<i>Polygonia satyrus</i>	Satyr Comma					1ph	1
<i>P. gracilis</i>	Hoary Comma	6	8		2		16
<i>Aglais milberti</i>	Milbert's Tortoiseshell						
<i>Nymphalis antiopa</i>	Mourning Cloak		1		1	1	3
<i>N. californica</i>	California Tortoiseshell	1ph	2				3
<i>Vanessa atalanta</i>	Red Admiral					1	1
<i>V. cardui</i>	Painted Lady	1	3			4	8
<i>V. virginiensis</i>	American Lady						
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral					6	6
<i>Asterocampa celtis</i>	Hackberry Emperor						
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet			3	53	26	82
<i>Cercyonis pegala</i>	Common Wood-Nymph						
<i>C. oetus</i>	Small Wood-Nymph						
<i>Erebia epipsodea</i>	Common Alpine					2	2
<i>Oeneis chryxus</i>	Chryxus Arctic						
<i>O. uhleri</i>	Uhler's Arctic		1				1
<i>Danaus plexippus</i>	Monarch					1	1
<i>Epargyreus clarus</i>	Silver-spotted Skipper			1	2	6	9
<i>Thorybes pylades</i>	N. Cloudywing						
<i>Erynnis icelus</i>	Dreamy Duskywing					2	2
<i>E. pacuvius</i>	Pacuvius Duskywing			4	3	5	12
<i>E. afranius</i>	Afranius Duskywing						
<i>E. persius</i>	Persius Duskywing				2	4	6
<i>Pyrgus communis</i>	Common Checkered-skipper						
<i>Pholisora catullus</i>	Common Sootywing				1ph		1
<i>Piruna pirus</i>	Russet Skipperling						
<i>Oarisma garita</i>	Garita Skipperling						
<i>Hesperia colorado</i>	Common Branded Skipper						
<i>H. nevada</i>	Nevada skipper						
<i>Polites themistocles</i>	Tawny-edged Skipper						
<i>Ochlodes sylvanoides</i>	Woodland Skipper						
<i>Poanes taxiles</i>	Taxiles Skipper						
<i>Euphyes vestries</i>	Dun Skipper					2	2

Heil – Geer Watershed	2005	2006	2007	2008	2009
# of Species Sighted in the Year at Geer	53	60	42	56	44
# of Individuals in the year	423	1495	569	1225	492
Research Hours / Year	27.5	46	15.5	21	12.5
# of individuals per Research Hour	15.4	32.5	36.7	58.3	39
Total # of Species located in Heil - Geer Watershed					90

Heil - Geer	Re-Search Hours	Butterfly Notes	Plants Blooming	Animals	Researchers
4/21/09 11:15 – 1:15 p.m. 18 ° C, clear, slight breeze; more water than ever	2	Clouded Sulphur in stream crossing road	few Sand lily, Nuttall's Violet, Dandelion, Mahonia, Filaree, Spring Beauty		Mike Sportiello
5/6 9:30 – 12:00 p.m. 15.5 ° C, wind 0-15 mph, clear	2.5	<i>gracilis</i> nectaring on wax currant	yellow Mustard, Wild Plum, Sand Lily, Dandelion, Mahonia, Wax Currant, Spring Beauty, Buttercup, Larkspur, Nuttall's Violet, Pasque Flower, Chickweed, Salt & Pepper, white Vetch, Golden Banner, Erigeron	Flicker, Spotted Towhee, Raven, House Wren, Canyon Wren, Steller's Jay, Say's Phoebe	Jan Chu, Larry Crowley, Jean Morgan
5/28 9:30 – 10:30 a.m. 19 ° C. Hot along N. road drainage	1			Red-tailed hawk, canyon wren	Jean Morgan
5/31 9:10 – 12:30 p.m. 19 to 27 ° C 35% clouds to total overcast to sunny	3	Stream running full, one good mud puddle on road.	Rose, Larkspur, Eriogonum, Golden Banner, Vetch, Tall Chiming Bells, Salsify, Boulder Raspberry, Lambert's loco, Chickweed, Fremont geranium, Spiderwort	W. meadowlark, House Wren, W. Wood Pewee, Plumbeous Vireo, Raven, Junco, Canyon Wren, Spotted Towhee, Broad Tailed Hummingbird, Steller's Jay, Barn Swallow, Violet-green Swallow, Virginia Warbler, Chipping Sparrow, Yellow Warbler, Red-tailed Hawk, Mtn. Chickadee, Lazuli Bunting, Night Hawk, Flicker, Hairy Woodpecker, Turkey, Cordilleran Flycatcher, Crow Raven, W. Bluebird, Cowbird, Mourning Dove, W. Tanager, House Finch, Pine Siskin	Jan Chu, Larry Crowley, Jean Morgan, Jeremy Hurst, BCNA class participants: Carrie Hodges, Bay Roberts, Janet McLachlan, Paula Hansley
6/24 9:15 – 1:15 p.m. 17.5 – 24.5 ° C; no clouds, no wind.	4	Butterflies puddling, <i>claudia</i> ovipositing egg on Nuttall's Violet ,ph= photo	From barn near stream, muddy road west along the roadway and ridge to rocky crest and returned near small		

			ravine		
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2009 Heil - Plumely			Lichen Trail	Lichen Trail			2009 Total
<i>Scientific name</i>	Common name	5/12	6/13	6/14	6/16	7/2	
<i>Papilio polyxenes</i>	Black Swallowtail				1		1
<i>P. zelicaon</i>	Anise Swallowtail					2	2
<i>P. indra</i>	Short-tailed Black Swallowtail						
<i>P. rutulus</i>	Western Tiger Swallowtail	4		2	3	2	11
<i>P. eurymedon</i>	Pale Swallowtail			1	3	1	5
<i>P. multicaudata</i>	Two-tailed Swallowtail					1	1
<i>Neophasia menapia</i>	Pine White						
<i>Pontia protodice</i>	Checkered White						
<i>P. sisymbrii</i>	Spring White	2		1			2
<i>Pieris rapae</i>	Cabbage White					14	14
<i>P. marginalis</i>	Mustard White						
<i>Euchloe ausonides</i>	Large Marble	5		1	4		10
<i>E. olympia</i>	Olympia Marble		3				3
marble sp.						1	1
<i>Anthocharis sara julia</i>	Southern Rocky Mountain Orangetip	2					2
white sp.		17	2	2		6	27
<i>Colias philodice</i>	Clouded Sulphur				2	3	5
<i>C. eurytheme</i>	Orange Sulphur						
<i>C. alexandra</i>	Queen Alexandra's Sulphur						
<i>Phoebis sennae eubule</i>	Cloudless Sulphur (Eastern)				1ph		1
<i>Eurema mexicana</i>	Mexican Sulphur						
<i>Nathalis iole</i>	Dainty Sulphur						
sulphur sp.			1				1
<i>Lycaena dione</i>	Gray Copper						
<i>Callophrys affinis</i>	Canyon Bramble Hairstreak				1		1
<i>C. sheridanii</i>	White-lined Green Hairstreak						
<i>C. gryneus</i>	Siva Juniper Hairstreak				1ph		1
<i>Callophrys polios</i>	Hoary Elfin	1					1
<i>C. eryphon</i>	Western Pine Elfin	38	1		3		42
<i>Satyrrium titus</i>	Coral Hairstreak						
<i>Strymon melinus</i>	Gray Hairstreak					1	1
<i>Leptotes marina</i>	Marine Blue						
<i>Cupido amyntula</i>	Western Tailed-Blue		4	2	8	6	20
<i>Celastrina ladon sidara</i>	Spring Azure	20		1			21
<i>C. humulus</i>	Hops Azure						
<i>Glaucopsyche piasus</i>	Arrowhead Blue				3		3
<i>G. lygdamus</i>	Silvery Blue	3	2	3	6		14
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue			1	1	8	10
<i>Echinargus isola</i>	Reakirt's Blue						
<i>Plebejus melissa</i>	Melissa Blue			1	1		2
<i>P. icarioides</i>	Boisduval's Blue		3	2	1	4	10
<i>P. lupini lutzii</i>	Lupine Blue						
<i>P. glandon rustica</i>	Arctic Blue						
blue sp.		16			3	6	25
<i>Danaus plexippus</i>	Monarch						
<i>Euptoieta claudia</i>	Variegated Fritillary	5				5	10
<i>Speyeria aphrodite</i>	Aphrodite Fritillary		1	1	1	7	10

2009 Heil - Plumely			Lichen Trail	Lichen Trail			2009 Total
<i>S. edwardsii</i>	Edward's Fritillary		2	7	6		15
<i>S. coronis</i>	Coronis Fritillary						
<i>S. callippe</i>	Callippe Fritillary				1ph		1
<i>S. atlantis</i>	Atlantis Fritillary						
<i>S. hesperis</i>	Northwestern Fritillary						
fritillary sp.			5		4	5	14
<i>Polydryas arachne</i>	Arachne Checkerspot						
<i>Chlosyne gorgone</i>	Gorgone Checkerspot				1		1
<i>Phyciodes mylitta</i>	Mylitta Crescent					2	2
<i>P. tharos</i>	Pearl Crescent				1		1
<i>P. cocyta</i>	Northern Crescent						
<i>P. pulchella</i>	Field Crescent				6	4	10
<i>P. gracilis</i>	Hoary Comma	7			1	1	9
<i>Aglais milberti</i>	Milbert's Tortoiseshell						
<i>Nymphalis antiopa</i>	Mourning Cloak	1			1	1	3
<i>N. californica</i>	California Tortoiseshell						
<i>Vanessa atalanta</i>	Red Admiral				1		1
<i>V. cardui</i>	Painted Lady			1	1	3	5
<i>V. virginensis</i>	American Lady						
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral		1	2	2	2	7
<i>Asterocampa celtis</i>	Hackberry Emperor						
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet		32	16	16	5	60
<i>Cercyonis pegala</i>	Common Wood-Nymph						
<i>C. oetus</i>	Small Wood-Nymph						
<i>Epargyreus clarus</i>	Silver-spotted Skipper				1		1
<i>Thorybes pylades</i>	N. Cloudywing						
<i>E. pacuvius</i>	Pacuvius Duskywing		1				1
<i>E. afranius</i>	Afranius Duskywing						
<i>E. persius</i>	Persius Duskywing						
<i>Pyrgus communis</i>	Common Checkered-skipper					1	1
<i>Pholisora catullus</i>	Common Sootywing						
<i>Piruna pirus</i>	Russet Skipperling						
<i>Oarisma garita</i>	Garita Skipperling						
<i>Hesperia colorado</i>	Common Branded Skipper						
<i>Polites draco</i>	Draco Skipper						
<i>P. themistocles</i>	Tawny-edged Skipper						
<i>P. mystic</i>	Long Dash						
<i>Ochlodes sylvanoides</i>	Woodland Skipper						
<i>Poanes taxiles</i>	Taxiles Skipper						
<i>Euphyes vestris</i>	Dun Skipper					9	9
<i>Atrytonopsis hianna</i>	Dusted skipper	1			1ph		2
<i>Amblyscirtes aenus</i>	Bronze Roadside-skipper						
<i>A. vialis</i>	Common Roadside-skipper						
<i>skipper sp.</i>						1	1

Heil - Plumely	2005	2006	2007	2008	2009
# of Species During the Year in Plumely	56	48	45	37	44
# of Individuals Sighted During the Year	1406	367	365	480	401
Research Hours	22	18	8	13	17
# of Individuals per Research Hour	64	20	45	36	24

2009 Heil - Plumely	Re-search Hours	Butterfly Notes	Plants Blooming	Animals	Re-search Team
5/12/09 10:10 – 12:00 p.m. 20 – 25 ° C, no clouds, 10 mph wind Followed canyon to stone-house meadow; returned by the upper stream.	2	<i>ladon</i> nectaring on Mustard and Mahonia; <i>eryphon</i> nectaring on Wild Plum	Oxalis, Astragalus, Sand lily, Dandelion, Mahonia, Wild plum, Mustard, Erigeron, Filaree, Larkspur, Wax Currant, Hydrophyllum, Mertensia, Pussytoes, Canada Violet, Nuttall's Violet, Potentilla, Chickweed, Wallflower, Salt & Pepper	No sign or possible nesting prairie falcon; Pigmy Nuthatch, Towhee, Robin, House Wren, Broad-tailed Hummingbird, W. Tanager, Chickadee, Turkey Vulture, Mtn. Chickadee, Steller's Jay, Raven, Swift, Swallow	Jan Chu, Larry Crowley, Jean Morgan
6/13 10:45 – 1:45 p.m. 17 – 22.5 ° C broken clouds, no wind. Walked Lichen Trail, returned by service road.	3	<i>ochracea</i> flying in good numbers		Turkey	Jan Chu
6/14 9:00 – 1:45 p.m. 16 to 26.5 ° C clear sunny, no wind. Walked Lichen Trail; walked up service road to puddle in stream crossing.	4	<i>weidemeyerii</i> remained on Coyote scat for a long time. ph; new <i>cardui. ancilla</i> nectaring on Black Medic. Blues gathered in the puddle on the road.		Wood Pewee, Towhee, Crow. 5 Mule Deer	Jan Chu, Jean Morgan. Boulder County public walk with 21 people.
6/16 10:15 a.m. – 2:00 p.m. 17 to 21 ° C at noon 80% thin clouds, no wind	4	<i>gryneus siva</i> nectaring on Buckwheat <i>Phoebis sennae eubule</i> – verified by Ray Stanford		Poorwill and Bat in stone ruins; Prairie Falcon pursued by many Crows at the cliff face above meadow, Night Hawk;	Jan Chu, Jean Morgan, Amy Chu, Jeremy Hurst
7/2 9:10 a.m. – 1:15 p.m. 19 to 22 ° C cloudless with no wind to full clouds and 5mph wind. Followed canyon to stone-house meadow, returned by trail.	4	<i>vestris</i> nectaring on Fremont Geranium	Senecio, yellow Evening Primrose, Black Medic, Heterotheca, Prickly Poppy, Bindweed, Salsify, Milk Vetch, Cone Flower, Mariposa Lily, White Lupine, Spiderwort, Monarda, Fremont Geranium, blue Penstemon, Gaillardia, Flax, Erigeron, Yarrow, Arnica, Harebell, Dogbane, Hydrophyllum, Rose	Cordilleran Flycatcher, Wood Peewee, Am. Goldfinch, Broadtail Hummingbird, House Wren, Towhee, Crow, Raven, Townsend's Solitaire, Steller's Jay, Vireo, Mourning Dove	Jan Chu, Jean Morgan, Larry Crowley

Heil Valley – North – Red Hill, Red Gulch, North Point	2009	5/17	5/29	6/26	8/12	2009 Total
<i>Scientific name</i>	Common Name					
<i>Papilio polyxenes</i>	Black Swallowtail					
<i>P. zelicaon</i>	Anise Swallowtail		1			1
<i>P. indra</i>	Indra Swallowtail		1			1
<i>P. rutulus</i>	Western Tiger Swallowtail	2	1		1	4
<i>P. eurymedon</i>	Pale Swallowtail			1		1
<i>P. multicaudata</i>	Two-tailed Swallowtail		1			1
yellow swallowtail sp.				2		2
<i>Neophasia menapia</i>	Pine White					
<i>Pontia protodice</i>	Checkered White					
<i>P. occidentalis</i>	Western White					
<i>P. sisymbrii</i>	Spring White					
<i>Pieris rapae</i>	Cabbage White	3		56	15	74
<i>Euchloe ausonides</i>	Large Marble	3	7			10
<i>E. olympia</i>	Olympia Marble	1	4			5
white sp.		11	10		2	23
<i>Colias philodice</i>	Clouded Sulphur	6	1	3	3	13
<i>C. eurytheme</i>	Orange Sulphur	2		2	1	5
<i>C. alexandra</i>	Queen Alexandra's Sulphur					
sulphur sp.		2	1			3
<i>Lycaena heteronea</i>	Blue Copper					
<i>Callophrys affinis</i>	Canyon Bramble Hairstreak	1	1			2
<i>C. gryneus</i>	Siva Juniper Hairstreak					
<i>C. eryphon</i>	Western Pine Elfin	1	2			3
<i>Strymon melinus</i>	Gray Hairstreak			1		1
<i>Leptotes marina</i>	Marine Blue					
<i>Cupido amyntula</i>	Western Tailed-blue	3	6			9
<i>Celastrina ladon sidara</i>	Spring Azure		6			6
<i>Glaucopsyche piasus</i>	Arrowhead Blue		2			2
<i>G. lygdamus</i>	Silvery Blue	4	25			29
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-blue		1	11		12
<i>Echinargus isola</i>	Reakirt's Blue			1	1	2
<i>Plebejus melissa</i>	Melissa Blue			9		9
<i>P. icarioides</i>	Boisduval's Blue		3	1		4
<i>P. lupini lutzii</i>	Lupine Blue					
<i>P. glandon rustica</i>	Arctic Blue					
blue sp.		9	3	19	3	34
<i>Libytheana carinenta</i>	American Snout			1		1
<i>Danaus plexippus</i>	Monarch					
<i>Euptoieta claudia</i>	Variegated Fritillary	10	3	61	11	85
<i>Speyeria aphrodite</i>	Aphrodite Fritillary			7		7
<i>S. edwardsii</i>	Edwards' Fritillary		7			7
<i>S. coronis</i>	Coronis Fritillary					
<i>S. callippe</i>	Callippe Fritillary					
<i>S. mormonia</i>	Mormon Fritillary					
fritillary sp.			6	3	3	12

Heil Valley – North – Red Hill, Red Gulch, North Point	2009	5/17	5/29	6/26	8/12	2009 Total
<i>Chlosyne gorgone</i>	Gorgone Checkerspot		2			2
<i>C. nycteis</i>	Silvery Checkerspot					
<i>C. palla</i>	Northern Checkerspot					
checkerspot/crescent sp.			5			5
<i>Phyciodes mylitta</i>	Mylitta Crescent					
<i>P. tharos</i>	Pearl Crescent	2				2
<i>P. cocyta</i>	Northern Crescent					
crescent sp.				2		2
<i>P. pulchella</i>	Field Crescent	12	7	8	4	31
<i>Polygonia satyrus</i>	Satyr Comma					
<i>P. gracilis</i>	Hoary Comma		1			1
<i>Nymphalis antiopa</i>	Mourning Cloak	3		2		5
<i>N. californica</i>	California Tortoiseshell					
<i>Vanessa atalanta</i>	Red Admiral					
<i>V. cardui</i>	Painted Lady	1	2	2		5
<i>V. virginiensis</i>	American Lady					
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral			3		3
<i>Asterocampa celtis</i>	Hackberry Emperor			1		1
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet		28	9		37
<i>Cercyonis pegala</i>	Common Wood-Nymph					
<i>C. oetus</i>	Small Wood-nymph				2	2
<i>Epargyreus clarus</i>	Silver-spotted Skipper			2		2
<i>E. afranius</i>	Afranius Duskywing					
<i>E. persius</i>	Persius Duskywing					
<i>Pyrgus communis</i>	Common Checkered-skipper	2		8	2	12
<i>Pholisora catullus</i>	Common Sootywing					
<i>Piruna pirus</i>	Russet Skipperling					
<i>Oarisma garita</i>	Garita Skipperling					
<i>Hesperia juba</i>	Juba Skipper					
<i>H. pahaska</i>	Pahaska Skipper					
<i>H. viridis</i>	Green Skipper			1		1
<i>H. nevada</i>	Nevada Skipper					
<i>Polites themistocles</i>	Tawny-Edged Skipper					
<i>P. mystic</i>	Long Dash					
<i>Atrytone arogos</i>	Arogos Skipper					
<i>Ochlodes sylvanoides</i>	Woodland Skipper				1	1
<i>Poanes taxiles</i>	Taxiles Skipper					
<i>Euphyes vestries</i>	Dun Skipper			3		3
<i>Atrytonopsis hianna</i>	Dusted Skipper	1?				1?
skipper sp.				1	2	3

Heil Valley - North	2005	2006	2007	2008	2009
# of Species sighted during the Year in North	30	24	34	45	41
# of Individuals in the Year	194	216	579	654	488
Research Hours per Year	3	6	8	17	12.5
# of individuals per Research Hour	64	31	72	38	39
Total # of Species Sighted in this Area					77

Heil Valley - North	Re-search hours	Butterfly notes	Plants blooming	Animals	Research Team
5/17/09 North Point 10:20 – 1:20 p.m. 19 ° C, no wind, no clouds	3		White Oxytropis, Mtn. Parsley, Potentilla, wavy-leaved Dandelion, Sand Lily, Skunkbush, Fremont geranium, Hawthorn, Wall Flower, purple Nightshade, Fleabane, Flax	White-Breasted Nuthatch, Cowbird, Vulture, Lark Sparrow, Goldfinch, Canyon Wren, Chat, Spotted Towhee	Jan Chu, Larry Crowley
5/29/09 Red Hill – meadow, roadway, saddle 9:20 a.m. - 2:00 p.m. 19 – 22 ° C cloudless, no wind	4.5	<i>ausonides</i> nectaring on tiny vertical purple mustard; <i>edwardsii</i> fritillaries mating, ph; blues at stream crossing road	Puccoon, Wallflower, Flax, Chickweed, Penstemon, Geranium, Mountain Parsley, Larkspur, Arnica, Lambert's loco, Iris, Fleabane, Blue-eyed Grass, Nuttall's Violet, Physaria belli	Raven, Spotted Towhee, Gnatcatchers, Chipping Sparrow, Chat, Robin, Junco, Wood Peewee, W. Tanager, Meadowlark, Steller's Jay, Pine Siskin, Turkey Vulture tearing dead Skunk	Jan Chu, Larry, Crowley, Amy Chu, Jeremy Hurst
6/26 9:40 – 12:40 p.m. 21 – 26 ° C 5% to 70% clouds, 5 mph wind. Red Gulch from Arliss and Chuck's home to near the Picture Rock Trail.	3	3-pairs <i>claudia</i> mating; <i>celtis</i> ' proboscis repeatedly touching aphids on bull thistle seeking 'sap'; <i>melinus</i> nectaring on prairie clover	Coneflower, Erigeron, Mariposa Lily, Desert Nightshade, Prickly Poppy, Larkspur, Poison Hemlock, Bindweed, Cowboy's Delight, Dalmation Toadflax, Flax, Salsify, Gaillardia, St. John's Wort, Spiderwort, Fremont Geranium, Snowberry, Prickly Pear (yellow and peach), Penstemon, Harebells, Prairie Clover, Heterotheca	Chat, Magpie, Yellow Warbler, Wood Peewee, House Wren, Spotted Towhee, Lark Sparrow	Jan Chu, Larry Crowley, Jean Morgan, Amy Chu Visited Chris Mulawny's home.
8/12 9:00 – 11:00 a.m. 24-32 ° C cloudless to 45% overcast wind 0 – 6 mph Drove to former house site; walked past the upper reservoir into very dry meadow.	2	<i>claudia</i> nectaring on Gumweed; very few blossoms. Large (<i>aphrodite</i> ?) orange fritillary species; small orange skippers unnamed	Big Blue Stem thriving and blooming.		Jan Chu, Larry Crowley

Meyer's Gulch, Walker Ranch		4/24	5/7	5/14	5/27	6/22	7/9	2009 Total
	2009							
<i>Papilio smintheus</i>	Rocky Mountain Parnassian					1	22	23
<i>P. polyxenes</i>	Black Swallowtail							
<i>P. zelicaon</i>	Anise Swallowtail						2	2
<i>P. indra</i>	Indra Swallowtail					2	1	3
black sp.					1	1		2
<i>P. rutulus</i>	Western Tiger Swallowtail						1	1
<i>P. eurymedon</i>	Pale Swallowtail					3	1	4
<i>P. multicaudata</i>	Two-tailed Swallowtail					1		1
<i>Pontia protodice</i>	Checkered White						2	2
<i>Pieris rapae</i>	Cabbage White				3		3	6
white sp.				3		8	3	14
<i>Euchloe ausonides</i>	Large Marble			1		11		12
<i>Anthocharis julia</i>	So. Rocky Mountain Orangetip				3			3
<i>Colias philodice</i>	Clouded Sulphur			2		2	4	8
sulphur sp.							1	1
<i>Callophrys eryphon</i>	W. Pine Elfin			5	x	1	1	8
<i>Callophrus sheridanii</i>	Sheridan's Hairstreak			1				1
<i>Satyrrium saepium</i>	Hedgerow Hairstreak							
<i>Callophrys affinis</i>	Canyon Bramble Hairstreak		1?			8	27	35
<i>Callophrys augustinus</i>	Brown Elfin		6	1		1		8
<i>C. polios</i>	Hoary Elfin		5	57				62
<i>Strymon melinus</i>	Gray Hairstreak							
<i>Echinargus isola</i>	Reakirt's Blue						2	2
<i>Cupido amyntula</i>	Western Tailed-Blue					4		4
<i>Celestrina ladon</i>	Spring Azure			5		1		6
<i>Glaucopsyche piasus</i>	Arrowhead Blue					5		5
<i>G. lydamus</i>	Silvery Blue					2		2
<i>Lycaeides melissa</i>	Melissa Blue					2		2
<i>Plebejus saepiolus</i>	Greenish Blue					2		2
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue					39	526	565
<i>P. icarioides</i>	Boisduval's Blue					14	80	94
<i>P. lupini lutzi</i>	Lupine Blue							
<i>Apodemia nais</i>	Nais Metalmark						1ph	1
blue sp.				1	10		27	38
<i>Euptoieta claudia</i>	Variiegated Fritillary			2		3	5	10
<i>Speyeria aphrodite</i>	Aphrodite Fritillary						1	1
<i>S. edwardsii</i>	Edwards' Fritillary						1	1
<i>S. callippe</i>	Callippe Fritillary							
<i>S. hesperis</i>	Northwestern Fritillary							
fritillary sp.						1		1
<i>Chlosyne gorgone</i>	Gorgone Checkerspot					3	1	4
<i>C. nycteis</i>	Silvery Checkerspot							
<i>C. palla</i>	Northern Checkerspot						6	6
<i>Phyciodes cocyta</i>	Northern Crescent						9	9
<i>P. pulchella</i>	Field Crescent					17	16	33
crescent sp.							3	3
<i>Euphydryas chalcedona</i>	Variable Checkerspot						4ph	4
<i>Polygonia gracilis</i>	Hoary Comma			1?	x		1	2

Meyer's Gulch, Walker Ranch		4/24	5/7	5/14	5/27	6/22	7/9	2009 Total
<i>Nymphalis californica</i>	California Tortoiseshell		1					1
<i>Nymphalis antiopa</i>	Mourning Cloak		1			3		4
<i>Aglaia milberti</i>	Milbert's Tortoiseshell				x	1	1	3
<i>V. cardui</i>	Painted Lady				x		7	8
<i>Vanessa atalanta</i>	Red Admiral							
<i>V. virginiensis</i>	American Lady							
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral						2	2
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet					52	44	96
<i>Cercyonis oetus</i>	Small Wood-Nymph							
<i>Erebia epipsodea</i>	Common Alpine					12		12
<i>Oeneis uhleri</i>	Uhler's Arctic							
<i>Erynnis icelus</i>	Dreamy Duskywing					12	1	13
<i>Erynnis persius</i>	Persius Duskywing					5	4	9
duskywing sp.							1	1
<i>Oarisma garita</i>	Garita Skipperling							
<i>Polites themistocles</i>	Tawny-edged Skipper							
<i>P. mystic</i>	Long Dash							
<i>Ochlodes sylvanoides</i>	Woodland Skipper							
<i>Poanes taxiles</i>	Taxiles Skipper						1	1
<i>Euphyes vestris</i>	Dun Skipper							

Meyer's Gulch, Walker Ranch	2005	2006	2007	2008	2009
# of Species Sighted during the Year at Meyer's Gulch	20	39	30	35	45
# of Individual Butterflies	69	262	126	203	1144
Research Hours per Year	4	10.5	5	2.5	18
# Individuals per Research Hour	17	25	25	81	64
Total # of Species Located in Meyer's Gulch					45

Meyer's Gulch	Party Hours	Trail notes	Butterfly Notes	Plants Blooming	Animals	Re- search Team
4/24/09 10:00 a.m. 14 ° C 38% cloud, 10+ mph wind	0	Many snow banks remain after a huge snow storm, grass matted		No blossoms		Jan Chu, Larry Crowley
5/4 9:30 a.m. – 10:00 a.m. frigid wind, 13 ° C	0.5	Walked a short distance and returned to car because of extreme cold and wind				Jan Chu, Jean Morgan, Amy Chu

Meyer's Gulch, Walker	Party Hours	Trail notes	Butterfly Notes	Plants Blooming	Animals	Re-search Team
5/7 9:30 – 1:15 p.m. 18 – 23.5 ° C ; sparse clouds, little to no wind	4	Meyer's Homestead Trail to overlook				Jean Morgan, Carol Winkler
5/14 9:45 – 12:45 p.m. 11 – 17 ° C almost clear slight breeze	3	Meyer's Homestead Trail to Fire road #2 and #3, crossing meadow north of the road among Kinnikinnick and return by Trail	Hoary elfins were over clumps of Kinnikinnick (host plant) by threes or fours. Brown elfin was near mud on the roadway.	Dandelion, Sand Lily, Chickweed, Wax Currant, Pasque Flower, Kinnikinnick, Pussytoes, Oxytropis, Boulder Raspberry	Broad-tailed Hummingbird, Chipping Sparrow, Mtn. Bluebird, Robin, W. Bluebird, Chickadee, Raven, White Breasted Nuthatch, Owl (heard), Hairy Woodpecker, Townsend's Solitaire, Steller's Jay	Jan Chu, Jean Morgan
6/22 10:00 -1:30 p.m. 19 - 25.5 ° C; cloudless to 5% clouds. Wind 5 mph.	3.5	Walked the Meyer's Homestead Trail northwest including the meadows on either side, especially on the NE; return by Trail.	Very productive day for observing butterflies.	Larkspur, Death Camus, Wild Parsley, Fremont and Richardson Geranium, Hound's Tongue, white Anemone, Blue-eyed Grass, Shooting Star, paintbrush, Gaillardia, Salsify, Flax, white Evening Primrose, Boulder Raspberry, Senecio, Potentilla, Yarrow, Chickweed, Penstemon virens, Sulphur Flower, Lambert Loco, Onion, Fleabane, Wall Flower, Miner's Candle, Puccoon, Mertensia	Lesser Goldfinch, Am. Goldfinch, Flicker, Wh. Br. Nuthatch, Yellow Warbler, Red-tail hawk, Blue grouse, Broad-tailed Hummingbird, Raven, Chipping Sparrow, Turkey Vulture, Pygmy Nuthatch, Mtn. Bluebird, House Wren, Hairy Woodpecker, Violet-green Swallow, Mourning Dove, Crow, W. Wood Peewee.	Jan Chu, Larry Crowley Jean Morgan, Rose Grose
7/9 8:40 a.m.- 3:30 p.m. 15.5 ° C to 31 ° C 60% overcast, no wing to 20% small clouds, 0-5 wind	7	Meyer's Gulch to Fire road #2 and #3, crossing meadow north of the road in the morning, returning on the roadway.	Muddy puddles supported hundreds of dotted blues, many Boisduval's blues, Northern Checkerspots, N. crescents. 2-pair mating blues, Milbert's tortoiseshell laying egg masses on	Ceanothus fendleri Eriogonum umbellatum, Amerosedum lanceolatum in full bloom; Bog Orchid, Cow Parsnip, Lovage, Shooting Star, Anemone, Miner's Candle,		Jan Chu, Larry Crowley Jean Morgan

		Nettles	Dogbane			
Caribou, Mud Lake		2009	6/17 Mud Lake	6/29 Caribou	8/3 Caribou	2009 Total
<i>Scientific Name</i>	Common Name					
<i>Parnassius smintheus</i>	Rocky Mountain Parnassian			6		6
<i>Papilio polyxenes</i>	Black Swallowtail					
<i>P. zelicaon</i>	Anise Swallowtail	1				1
<i>P. rutulus</i>	W. Tiger Swallowtail			1		1
<i>P. eurymedon</i>	Pale Swallowtail					
yellow swallowtail sp.						
<i>Neophasia menapia</i>	Pine White					
<i>Pontia protodice</i>	Checkered White					
<i>P. occidentalis</i>	Western White					
<i>Pieris rapae</i>	Cabbage White				5	5
<i>P. marginalis</i>	Mustard White					
white sp.				3	1	4
<i>Euchloe ausonides</i>	Large Marble	2	2			4
<i>Anthocharis julia</i>	Southern Rocky Mountain Orangetip	1 ph				1
<i>Colias philodice</i>	Clouded Sulphur	1	1	5		7
<i>C. eurytheme</i>	Orange Sulphur			2		2
<i>C. eurytheme/ philodice</i>	albino					
<i>C. alexandra</i>	Queen Alexandra's Sulphur			4	39	43
<i>Eurema mexicana</i>	Mexican Sulphur					
<i>Abaeis nicippe</i>	Sleepy Orange					
<i>Nathalis iole</i>	Dainty Sulphur					
sulphur sp.				1		1
<i>Lycaena rubidus</i>	Ruddy Copper				3	3
<i>L. heteronea</i>	Blue Copper				1	1
<i>L. helloides</i>	Purplish Copper				4	4
<i>Callophrys affinis homoperplexa</i>	Canyon Bramble Hairstreak	1				1
<i>C. sheridanii</i>	White-lined Green Hairstreak					
<i>C. spinetorum</i>	Thicket Hairstreak	11				11
<i>C. augustinus</i>	Brown Elfin	2				2
<i>C. polios</i>	Hoary Elfin	2				2
<i>C. eryphon</i>	Western Pine Elfin	9				9
<i>Satyrium saepium</i>	Hedgerow Hairstreak					
<i>Strymon melinus</i>	Gray Hairstreak					
<i>Echinargus isola</i>	Reakirt's Blue			1		1
<i>Cupido amyntula</i>	Western Tailed-Blue	1				1
<i>Celastrina ladon sidara</i>	Spring Azure	2				2
<i>Glaucopsyche piasus</i>	Arrowhead Blue			2		2
<i>G. lydamus</i>	Silvery Blue	2				2
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue			3	3	6
<i>Echinargus isola</i>	Reakirt's Blue					
<i>Plebejus melissa</i>	Melissa Blue					
<i>P. saepiolus</i>	Greenish Blue			1		1
<i>P. icarioides</i>	Boisduval's Blue	1		5	4	10
<i>P. 'lupini' lutzii</i>	Lupine Blue					
<i>P. glandon rustica</i>	Arctic Blue				1	1
blue sp.		3		1	4	8
<i>Euptoieta claudia</i>	Variegated Fritillary			3	2	5

<i>Speyeria aphrodite</i>	Aphrodite Fritillary				
Caribou, Mud Lake	2009	6/17 Mud Lake	6/29 Caribou	8/3 Caribou	2009 Total
<i>S. edwardsii</i>	Edwards' Fritillary				
<i>S. coronis</i>	Coronis Fritillary				
<i>S. hesperis</i>	Northwestern Fritillary			7	7
fritillary sp.		1	2	1	4
<i>Poladryas arachne</i>	Arachne Checkerspot				
<i>Chlosyne gorgone</i>	Gorgone Checkerspot				
<i>C. nycteis</i>	Silvery Checkerspot			1	1
<i>C. palla</i>	Northern Checkerspot		3	20	23
<i>Phyciodes tharos</i>	Pearl Crescent				
<i>P. cocyta</i>	Northern Crescent				
<i>P. pulchella</i>	Field Crescent	2	1	2	5
<i>Euphydryas chalcedona</i>	Variable Checkerspot				
<i>Polygonia faunus</i>	Green Comma				
<i>P. gracilis</i>	Hoary Comma				
<i>Nymphalis antiopa</i>	Mourning Cloak	1			1
<i>Vanessa atalanta</i>	Red Admiral				
<i>V. cardui</i>	Painted Lady		1		1
<i>V. virginicensis</i>	American Lady				
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral			2	2
<i>Coenonympha tullia ochracea</i>	Common Ringlet	2	29	1	32
<i>Cercyonis pegala</i>	Common Wood-Nymph				
<i>C. oetus</i>	Small Wood-Nymph			6	6
<i>Erebia epipsodea</i>	Common Alpine	1	16		17
<i>Oeneis chryxus</i>	Chryxus Arctic				
<i>Thorybes pylades</i>	Northern Cloudywing				
<i>Erynnis icelus</i>	Dreamy Duskywing				
<i>E. pacuvius</i>	Pacuvius Duskywing		1		1
<i>E. persius</i>	Persius Duskywing	2	9		11
duskywing sp.			3		3
<i>Pyrgus communis</i>	Common Checkered-skipper				
<i>Piruna pirus</i>	Russet Skipperling				
<i>Oarisma garita</i>	Garita Skipperling				
<i>Hesperia colorado</i>	Common Branded Skipper				
<i>H. pahaska</i>	Pahaska Skipper				
<i>H. viridis</i>	Green Skipper				
<i>H. nevada</i>	Nevada Skipper				
<i>Polites draco</i>	Draco Skipper		5		5
<i>Poanes taxiles</i>	Taxiles Skipper				
<i>Euphyes vestries</i>	Dun Skipper				
skipper sp.				2	2

Caribou Ranch and Mud Lake	2005	2006	2007	2008	2009
# of Species 2009 at Caribou, Mud Lake	46	51	48	48	40
# of individuals during the year	519	586	358	647	278
Research Hours at these sights	14	26	10	12	8.5
# of Individual Butterflies per Research Hour	37	26	36	54	33
Total # of species located in this area					80

Caribou Ranch and Mud Lake	Re-Search Hours	Butterfly Notes	Animal Sightings	Blossoming Plants	Researchers
6/17 9:30 – 11:30 a.m. 16 – 18 ° C slight to strong wind, 5% high cloud, blue sky	2	<i>spinetorum</i> nectaring on mountain parsley <i>Pseudocymopterus montanus</i> , and Pussytoes; <i>polios</i> and <i>augustinus</i> flying over Kinnikinnick			Jan Chu, Jean Morgan, Amy Chu, Jeremy Hurst
6/29 9:30 - 11:30 a.m. 17 ° C clear sky, no wind, parked inside locked gate, walked along fence to bog, behind aspen to roadway	2	<i>persius</i> ovipositing on Golden Banner, <i>ancilla</i> mating			Jan Chu, Jean Morgan, Amy Chu
8/3 8:50 – 1:21 p.m. 20 – 29 ° C 5% clouds, wind 0-5 mph. Drove to ‘Monarda meadow’ and Blue Bird mine buildings	4.5	<i>alexandra</i> ovipositing on Golden Banner; <i>ancilla</i> were very worn. <i>C. palla</i> were localized over the Rudbeckia		Penstemon, Heterotheca, Monarda, Lupine, white Gilia, Goldenrod, Bedstraw, Monkshood, Sulfur flower, Blue bells, Lambert’s Loco, Erigeron, Mariposa lily, Gaillardia, Yarrow, Bracketed Lousewort, Black-eyed Susan, Meadow Rue, Rudbeckia	Jan Chu, Larry Crowley, Jean Morgan

Sites Belonging to City of Boulder

Table IX. Left Hand Valley Reservoir

Left Hand Valley Reservoir	Butterflies	7/31 2009
<i>Scientific Names</i>	Common Names	No. of Individuals
<i>Pontia protodice</i>	Checkered White	11
<i>Pieris rapae</i>	Cabbage White	5
white sp.		16
<i>Colias philodice</i>	Clouded Sulphur	15
<i>C. eurytheme</i>	Orange Sulphur	21
sulphur sp.		2
<i>Echinargus isola</i>	Reakirt's Blue	1
<i>Euptoieta claudia</i>	Variegated Fritillary	18
	Common Wood-nymph	5
<i>Cercyonis pegala</i>		
<i>Danaus plexippus</i>	Monarch	1
<i>Vanessa atalanta</i>	Red Admiral	1
	Common Checkered-skipper	3
<i>Pyrgus communis</i>		
<i>Erynnis persius</i>	Persius Duskywing	2
12	# species - 2009	
3	Research hours on site	

7/31/09 10:30 -1:30 p.m. 19 – 22 deg. C 50% clouds; 5 mph wind	Woodhouse Toads, Deer Mouse (dead in parking lot)	Much tall knapweed; Many <i>Eriogonum brevicaule</i> (yellow) blossoming on shale.	E. Kingbird, Lark Sparrow, Field Sparrow, Goldfinch, Mourning dove, Barn Swallow, Meadow Lark, Spotted Towhee, Say's Phoebe	Jan Chu, Larry Crowley, Jean Morgan, Amy Chu
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Table X. Hoover Hill, Westview Ridge

<i>Hoover Hill, Westview Ridge</i>	2009	8/17	8/20	8/25	8/27
Scientific Names	Common Names				
<i>Pontia protodice</i>	Checkered White	1	1		
<i>Pieris rapae</i>	Cabbage White	5			6
<i>Colias philodice</i>	Clouded Sulphur	1			3
<i>C. eurytheme</i>	Orange Sulphur				1
<i>Strymon melinus</i>	Gray Hairstreak	1			
<i>Echinargus isola</i>	Reakirt's Blue	1	2		
<i>Euphilotes rita coloradensis</i>	Rita Blue	1			
<i>Plebejus melissa</i>	Melissa Blue		1		
<i>P. 'lupini' texanus</i>	Texas Blue			1	
blue sp.					1
<i>Euptoieta claudia</i>	Variegated Fritillary	1			
<i>Speyeria aphrodite</i>	Aphrodite Fritillary				1
<i>Phyciodes pulchella</i>	Field Crescent	2			
<i>Danaus plexippus</i>	Monarch				1
<i>Vanessa cardui</i>	Painted Lady		1		
<i>Pyrgus communis</i>	Common Checkered-skipper	6	1		
<i>Hesperia uncas</i>	Uncas Skipper		2		3
<i>Polites peckius</i>	Peck's Skipper				1
	17				
	5.5				
	Research hours on site				

8/17/09 11:30 – 12:30 p.m. 21 °C clear sky, no wind	Rita Blue – a Boulder County record. Larry saw it, Jan caught it.	White-blooming <i>Eriogonum effusum</i> , <i>Liatris punctata</i>	Large Bull Snake	Jan Chu, Larry, Crowley, Jean Morgan, Rose Grose
8/20/09 2:00 – 3:00 p.m. 23 °C clear, no wind	Uncas Skipper was a first for us	<i>Eriogonum effusum</i> , <i>Liatris punctata</i> , Porter's white daisy	Soldier beetles on <i>E. effusum</i> , preying mantis	Jan and Amy Chu
8/25/09 11:30 – 12:30p.m. 23 °C no wind, sunny	Amy caught <i>Plebejus 'lupini' texanus</i> - a County Record	<i>Eriogonum effusum</i> , <i>Liatris punctata</i> , Porter's white daisy		Jan Chu, Amy Chu
8/27/09 12:45 – 2:15 p.m. 27 °C, clear sky	Mating <i>philodice</i> ; nectaring on <i>Liatris punctata</i> . Blue was likely <i>rita</i> or <i>taxana</i> .	<i>Eriogonum effusum</i> , <i>Liatris punctata</i> , Porter's white daisy,	Soldier beetles, preying mantis	Jan Chu, Jean Morgan

Table XI. Marshall Mesa

2009 Marshall Mesa		9/6/2009
<i>Scientific Names</i>	Common Names	# Individual Butterflies Sighted
<i>Pieris rapae</i>	Cabbage White	3
white sp.		3
<i>Colias philodice</i>	Clouded Sulphur	6
<i>C. eurytheme</i>	Orange Sulphur	8
sulphur sp.		11
<i>Euptoieta claudia</i>	Variegated Fritillary	2
<i>Speyeria aphrodite</i>	Aphrodite Fritillary	1
fritillary sp.	(silvered)	4
<i>P. pulchella</i>	Field Crescent	4
<i>Danaus plexippus</i>	Monarch	1
<i>Pyrgus communis</i>	Common Checkered-skipper	29
<i>Hesperia leonardus</i>	Leonard Skipper	3
	9 # species - 2009	
	3 Research hours on site	

9/6/09 10:07 – 1:00 p.m. 21° C 35% clouds, slight wind. East of the fence which adjoins the Rod and Gun Club, Marshall Mesa	The <i>Hesperia leonardus</i> was new to us.	Blooming Gay Feather, Rabbit - brush, yellow Composite, white small Aster, pink-lavender-vine <i>Verbena (bractata?)</i> , <i>Euphorbia</i>	Few prairie dogs	Jan Chu, Larry Crowley
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