

2010

Butterfly Inventories
In Boulder County Open Space
Properties

By Janet Chu



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I. Acknowledgments

Our research team has conducted butterfly surveys for nine consecutive years, from 2002 through 2010, with 2002-2004 introductory to the lands and species, and 2005-2010 in more depth. My valuable field team this year was composed of friends with sharp eyes and ready binoculars Larry Crowley who recorded not only the butterflies but blossoming plants and wildlife joined by Jean Morgan and Amy Chu both joined enthusiastic butterfly chasers. Venice Kelley and John Barr, professional photographers, joined us on many surveys. With their digital photos we are often able to classify the hard-to-identify butterflies later on at the desk.

The surveys have been within Boulder County Parks and Open Space (BCPOS) lands. Therese Glowacki, Manager-Resource Manager, issued a Special Collection Permit for access into the Open Spaces; Susan Spaulding, Wildlife Specialist, oversaw research, maintained records of our monographs and organized seminars for presentation of data. Claire DeLeo, Plant Ecologist, provided botanical assistance and Meredith Dutlinger prepared maps. Kevin Grady and Amanda Hatfield, Ranch Caretaker and Resource Protection Rangers, provided excellent communication about wildlife sightings at Heil Valley and Walker Ranch respectively. Since there was no BCPOS grant support in 2009 or 2010, this report is being provided in response to the granting of the Special Use Permit.

As a Boulder County Volunteer Naturalist my team and I presented a public program on the Lichen Trail, Heil Valley. 30 participants enjoyed the discovery of flying animals, concentrating on butterflies. Youngsters, aged 7 and 8, carried nets and brought many butterflies for closer looks and stories.

Our always helpful mentors Paul Opler and Ray Stanford were readily available to make suggestions and assist in identification. Robert Pyle continues to be our enthusiastic advocate. Many BCNA members continue to support butterfly research especially Steve Jones and Scott Severs.

Cover Photo: Western Pine Elfin *Callophrys eryphon* Steamboat Mountain, May 23, 2010.

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II. Abstract

Butterfly inventories continued by this team during 2010, for the ninth consecutive season. Ten Boulder County Open Space properties were the sites of our studies which we visited during 29 days, March through August. Once we were on site ready to hike, the research hours were recorded, amounting to 84 hours in the field in 2010. 84 of the known 102 species in Boulder County were seen in 2010.

In 2007, while conducting our research on these lands we observed an average of 39 individual butterflies per research hour on seven sites. In 2008 the number of individuals per research hour on the same seven research sites was 46; in 2009 it was 37; and in 2010 the number fell to 29.

During this year, this team observed four species which had not been noted previously during the nine years of counts; Lyside Sulphur *Kricogonia lyside*, Striped Hairstreak *Satyrium liparops*, Gulf Fritillary *Agraulis vanilla*, and Pale Crescent *Phyciodes pallid*. In addition four uncommon butterflies dispersed into this area from the south-southwest; Sleepy Orange *Abaeis nicippe*, Dainty Sulphur *Nathalis iole*, and Marine Blue *Leptotes marina*, Behr's Hairstreak *Satyrium behrii*.

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 shown by our coordination with greater numbers of Front Range 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 short-term changes in weather patterns and climate.

Our research group's butterfly surveys initiated in 2002 contributed to this important database. We continued our multi-year county study in 2010 by surveying a range of county habitats throughout the active six-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; 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 and 2010, 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 Anne U. White and Walker Ranch.

Results not included within this report are the following: less often the team studied in Rabbit Mountain, Carolyn Holmberg Preserve, and Steamboat Mountain. Deadman's Gulch in Roosevelt National Forest is the habitat of rare early spring butterflies and we combine our visit there with Rabbit Mountain. The annual Cal-Wood Education Center, Jamestown, one-day National Butterfly Count was also conducted on July 4 locating an unusually high number of 69 species. Exploratory inventories occurred in Coulson Gulch, Niwot Ridge, Button Rock and Loveland Pass.

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, Walker Ranch and Caribou Ranch.
3. Survey both Heil Ranch and the Southeast Buffer approximately every two weeks from early April through August. Survey Caribou Ranch two times, because of its shorter July-August season.
4. Survey on a less regular schedule other BCPOS properties (such as Rabbit Mountain, Walker Ranch Meyer's Gulch, Carolyn Holmberg Preserve at Rock Creek and Anne U. White - Fourmile Canyon Creek).
5. Record total numbers of individual butterflies observed for each species on each field day using spreadsheets, and analyze data for patterns expressed in the 2010 field season as well as any significant variations from previous years' data. (Chu, 2009-2010)
6. Make extensive use of digital photography to record significant butterflies and blossoming plants observed in the course of our surveys.
7. Reconfirm the Arogos and the Ottoe Skippers, two locally rare grassland butterfly species previously found in 2008, in appropriate habitats containing Bluestem Grasses, as in Heil Valley and the Southeast Buffer.
8. Confirm the continuation of the rare and endangered Hops Azure colony in Plumely Canyon Heir Valley.
9. Increase present county records of 201 species by finding an additional new-to-this-County butterfly this year.

V. Research Methods

The methodology used in 2010 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’ was devised for this study. It describes the total number of individual butterflies sighted divided by the total number of hours of field research by the team for a specific study area. It is not dependent on the number of researchers on team that day. Since we do not follow a measured transect nor restrict our studies to a certain time period the unit, ‘Individuals per Research Hour’ is used for comparison from one site to another and from one season to the next.

VI. Results and Discussion

A. Southeast Buffer is a short grass prairie north of Highway 128 and west of McCaslin Boulevard cut through by Rock Creek. This team has made observations for four 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 most tunnels had been vacated and the native forbs have recovered. The area showed good varieties of plants, with outstanding blossoms in June. Cattle were grazing the plants heavily in 2008, but continue to be fenced into the northwestern area in 2010. On a northerly-extending crest, the team refers to as Swallowtail Hill, the Anise Swallowtails *Papilio zelicaon* were hill topping, and Gray Hairstreaks *Strymon melinus* added their energies in chasing and circling repeatedly.

The greatest number of individuals per research hour, in four years of inventorying in the Southeast Buffer was due in part to the large spring influx and successful late June reproduction of Variegated Fritillaries *Euptoieta claudia* producing a local brood on violets. The southern migrants, absent in 2009, were numerous including Dainty Sulphur *Nathalis iole*. Sighted in this Buffer for the first time were single specimens of Sleepy Orange *Abaeis nicippe*, Lyside Sulphur *Kricogonia lyside*, Gulf Fritillary *Agraulis vanilla* and Uncas Skipper *Hesperia uncas*. Lyside Sulphur was actually a first sighting recorded by this team during our nine years of inventories. The most common butterflies were the Clouded Sulphur *Colias philodice*, Variegated and Edward's Fritillaries *Speyeria edwardsii*, Dainty Sulphurs and Field Crescents *Phyciodes pulchella*.

B. Anne U. White Trail provides access to a lower foothill riparian habitat (6,000 – 6,230 ft. N 40°3'23.2" W 105°19'37.8"). It was a well-preserved small canyon with vegetation-covered slopes and a large variety of plants providing a high count of butterfly species in the past, but it has become popular with hikers, runners and dog-owners which tend to clear-cut some of the vegetation. Snow remained later than in past years due to a late and heavy snowfall. 12" of snowpack continued to melt on the slippery trail on March 30. The Hoary Comma *Polygonia gracilis* and Mourning Cloak *Nymphalis antiopa* roused out of hibernation and coursed the stream; April 13 Cabbage Whites *Pieris rapae* added their fluttering. Sand Willows

were blooming late, so butterflies were not nectaring on these yet. Mylitta Crescent *Phyciodes mylitta* was found in Anne U. White as well as in Plumely Canyon.

June 16 there were more dog-walkers (16), whose pets impact the plants, but numbers of dogs off leash (2) were reduced. The bare ground continued to be exposed on some of the ‘social’ trails. Northwestern Fritillaries *Speyeria hesperis* were flying in large numbers on July 27 and nectaring on the Monarda blossoms; present also were the bright orange Taxiles Skippers *Poanes taxiles* and the darkish Dun Skippers *Euphyes vestris*.

C. Heil Valley – Geer Watershed is the lowest elevation 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. We did locate two and are forever on the lookout for scarce Black Swallowtails *Papilio polyxenes*, because their population had been severely devastated by European Paper Wasps. The Common Ringlet *Coenonympha tullia ochracea* was the most numerous butterfly species in Geer in 2010, outnumbering Cabbage White *Pieris rapae* which is the most numerous butterfly in Boulder County. On July 6, it was unusual to find the favorite nectaring bush *Ceanothus fendleri* in full bloom with only two Striped Hairstreaks *Satyrium liparops* on one plant which grew at the base of Big Meadow. The Striped Hairstreak was a new sighting on our nine years of inventories. It is an oak feeder, not common in Boulder County. A second new sighting was Pale Crescent *Phyciodes pallida*. In addition the Greenish Blue *Plebejus saepiolus* usually found at higher elevations flew over red clover blossoms. Many butterflies puddle in the leftover muddy spots above the culverts near the barn.

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 the presence of tiny Dainty Sulphur *Nathalis iole*, Monarch *Danaus plexippus* and Callippe Fritillary *Speyeria callippe* on June 25. The rare Hops Azures *Celestrina humulus* were flying over Hops,

their host plant in the sandstone quarry. The tiny pale blue butterflies would make a short circular flight then land with ‘toe-tips’ on top edges of Hops leaves.

Butterflies were intent on nectaring while the sun was bright. Western Pine Elfins *Callophrys eryphon* were prevalent on May 3 on Wild Plum blossoms. The tiny and seldom seen Juniper Hairstreak *C. gryneus siva* was sharing *Ceanothus fendleri* with Hops Azures *C. humulus*; Russet Skipperling *Piruna pirus* was nectaring on Fremont Geranium, a favorite summer-long food source for adults. Aphrodite Fritillaries *Speyeria aphrodite* successfully found sufficient energy to mate preparing for the next generation. Fourteen species puddled on June 25 at the stream where the road and bike path cross. This exposed site continues to be favorite puddling mud. We find many blues the victims of speeding bicycles. On that same memorable day, two field associates walked beside a Prairie Rattlesnake *Crotalus viridis*, shocked by its rattling and frightened to see they had just stepped close to either side near the large snake.

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”). Mountain Mahogany and Ponderosa Pine cover the slopes with Juniper in the Red Gulch, surrounded by mixed mid-sized grasses. Its hills are covered with a wide variety of grasses including important hosts Little and Big Bluestem where one rare Arogos Skipper was nectaring on Bull Thistle. Hackberry Emperor *Asterocampa celtis* flew among their host native Hackberry on July 14. Many of these trees line the driveway to the North Point. Behr’s Hairstreak *Satyrium behrii* was a newly identified butterfly in our nine-year list. Tiny orange Garita Skipperling *Oarisma garita* and Aphrodite Fritillary *S. aphrodite* were nectaring on *Gaillardia*. Indra Swallowtail *Papilio indra* was ovipositing on False Spring Parsley *Pseudocymopterus montanus*. Easily identified Variegated Fritillaries *Euptoieta claudia* topped the list of abundant butterflies with at least ten pair mating on July 14. Also Checkered White *Pontia protodice* and Common Ringlet *Coenonympha tullia ochracea* were numerous.

July 14 Nectaring observations:

Garita Skipperling	Gaillardia
Aphrodite and Variegated Fritillary	Gaillardia
Variegated Fritillary	Alfalfa, Arnica sp.
Arogos Skipper, Hackberry Emperor	Bull Thistle
Checkered White	Sweet Clover, Heterotheca sp., Goldenrod

For the second year a fresh dead skunk was found along the small dammed ponds. Vigorous and rare Bladderpod *Physaria belli* plants grew on the red sandstone soil north of the saddle at 6,266' N40° 10'24.1" W105° 17'11.9" .

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-grassy meadows, riparian habitat, pine and aspen. Flowers were magnificent and in full bloom after the affects of the heavy snow which persisted until early May. The team surveyed a wide swath to the north of the parking lot, returning by the road. The Hoary Elfins were numerous in May and June above their host plant Kinnikinnick with three or four Hoary Elfins flying above each clump. In 2009, Rocky Mountain Dotted-blues *Euphilotes ancilla* were found by the dozens puddling in the numerous muddy tracks along the road during the hot afternoon, but in 2010 not one was seen along Meyer's Homestead Road during the five days of observation. Uncommon Greenish Blue *Plebejus saepiolus* and Monarch *Danaus plexippus* were flying. Yellow sparkles of Dainty Sulphur *Nathalis iole* added to the Orange and Clouded Sulphur *C. eurytheme and philodice* rich yellow flashes across the meadow. The more numerous butterflies on June 2 were Silvery Blue *Glycopsyche lygdamus*; in August Small Wood Nymphs *Cercyonis oetus* fluttered above the grasses. Nais Metalmark *Apodemia nais* a special butterfly which this team searches for especially at Meyer's Gulch, was not found here but a single individual was photographed in Coulson Gulch.

G. Caribou Ranch and Mud Lake (study areas from 8,475' to 8,790 ft. N39°59'7.2" W105°31'46.5") cover rich parkland governed by conservation measures which preserve diverse wildlife habitats, plants and water resources. This higher altitude survey provides wet meadows which are surrounded by Ponderosa Pine, Aspen glens, some Lodgepole and Limber Pines. Chryxus Arctic *Oeneis chryxus* showed up on July 30, but was unexpectedly not common this summer. These appear biennially on the even numbered years along the Front Range. Small Wood Nymph *Cercyonis oetus* and Blue Copper *Lycaena heteronea* were nectaring on *Eriogonum umbellatum*. Queen Alexandra's Sulphur *Colias alexandra* and Small Wood Nymph *Cercyonis oetus* were numerous.

VII. Weather

“Boulder’s Perfect 2010 Summer an Anomaly,” headed the Daily Camera’s September Weather Report. ‘Perfect’ was an excellent description for butterflying in Boulder County as many species along with more migrants from the south were observed. June, July and August had an average temperature of 71° and a total of 6.83” of moisture. There were 27 days in the 90s, but no triple-digit readings. This summer was one degree warmer than normal and an inch wetter. ¹

National Oceanic and Atmospheric Administration scientists say the first seven months of this year were the warmest on record worldwide. Butterfly season is always affected by the local weather, but by our observation, this year the worldwide affect may have helped cause more migrant butterflies from the south to visit Boulder County.

Winter has lasting effects and ‘goes down as the fifth snowiest on record after receiving a seasonal total of 128.8 inches.’ April was dry and windy, but April 21 hail fell followed by 2.64” of moisture. ² This left snow late on the trails in the Foothills. In May rain fell mainly on the weekends. The daily distribution of rain made May a dry month, but the month exceeded its normal precipitation by just 0.03inch. There was no frost because the lowest temperature for the month was 36°. ³ June had an average temperature for the month 66.9° compared with the normal 67.0° June had five 90° days and 3.36” of rainfall compared to a normal 2.12”. ⁴ July was warm and wet, weather that was ‘just right’ for people and butterflies. The average temperature for the month is 72.5. There were 14 days in the 90s and a record-tying high of 98 ° on the 17th. Copious rain and a mudslide-causing-hailstorm fell on Nederland, but there was no flooding. The August average temperature for the month was 72.4° compared to the normal 71°; in fact these late summer weather factors were normal with sunny days and little precipitation.⁵

¹ (Callahan, September 6, 2010. p. 6C)

² (Callahan, May 6, 2010. p. 8C)

³ Colorado Daily Staff. May Weather Review, June 3, 2010.)

⁴ (Callahan, July 8, 2010. p. 8C)

⁵ (Callahan, August 5, 2010. p. 8C)

VIII. Conclusions

Ten Boulder County Open Space properties were visited during 29 days and this team recorded 84 research hours in the field. Field studies proceeded within Boulder County Open Spaces in diverse habitats from short-grass prairies to mixed grass, montane meadows, Ponderosa Pine and upper montane meadows. This season the Front Range experienced repeated strong winds from the south-southwest which brought numbers of Texas - Mexican vagrant butterflies into our area. Also many days of elevated heat in the southwestern tier of states caused the influx of uncommon butterflies searching for succulent nectaring plants.

We calculated the following average number of individual butterflies per research hour (Ave. # /RH) on the seven primary study sites.

Year	Ave. # /RH
2006	24
2007	39
2008	46
2009	37
2010	29

In 2006, June was unusually dry and hot affecting the average number of individuals per research hour. But in 2010, June had a near-normal average temperature with five days above 90° and above normal rainfall. We felt weather in 2010 was conducive to successful sightings of many butterflies. In the Front Range we do experience considerable differences in conditions from one year to the next. If a population is unusually high one year, then a typical low cycle often follows. The continuing cycle of butterflies building successful adults, their emergence from chrysalids, mating, ovipositing, and finding sunlight's energy to consume host plants, are all dependent on favorable weather.

Referring to Butterfly Survey Data Tables, the following information is summarized:

- In the Southeast Buffer the numbers of species identified during the field surveys 2007-2010 remained steady between 20 and 26. 2010 was the best year for both numbers of species and individuals per research hour.

- In Anne U. White along the Fourmile Trail, 2010 showed the fewest species (31) as compared to larger numbers in each of the preceding four years. Also fewer individuals were sighted per research hour than previously.
- In Heil Valley along the Geer Watershed the numbers of species remained fairly constant, while the individuals per research hour dropped lower than reported 2007-2009.
- In Heil Valley Plumely Canyon there has been a steady fall in the number of species recorded from 56 species in 2005 to 35 species in 2010. Some small fluctuations in numbers of individuals have occurred, with the exception being in 2005 because of the great influx of Painted Ladies along with a large emergence of Field Crescents.
- In Heil Valley's North area the number of species has been fairly regular between 24 and 45 with 38 in 2010. The numbers of individuals per research hour has been steady except for the high numbers in 2006 as reported in Plumely Canyon, Heil Ranch.
- At Walker Ranch along the Meyer's Homestead Trail the numbers of species fluctuated between 20 in 2005 to 45 in 2009, with 34 in 2010. The numbers of individuals per research hour varied greatly from 17 in 2005 to 81 in 2008, with 27 in 2010. Rocky Mountain Dotted-blue had a huge emergence in 2009 followed by their absence in 2010.
- Caribou Ranch had a steady number of species 2005 to 2009. Only two visits were made to Caribou in 2010, so the low number is not as reliable a number as compared with other sites. The highest number of individual butterflies per research hour occurred in 2008.

It is therefore difficult to detect short-term trends. Nevertheless, continuing and/or expanding studies should make long-term trends more recognizable.

Total numbers of species recorded for the study areas:

Open Space Study Areas	# of Species
Southeast Buffer	70
Anne U. White	69
Heil Valley Geer Watershed	95
Heil Valley Plumely Canyon	84
Heil Valley North	81
Meyer's Gulch	70
Caribou Ranch	80

Anne U. White is a smaller area, but definitely impacted by users. Heil Valley is a much larger area with diversity in its habitats, therefore it offers more of the requirements for many species. Caribou Ranch continues to be unexplored April through June and likely contains more invertebrate treasures.

Butterflies are fairly easy to observe and monitor and are excellent indicators of healthy environments and therefore should have continued support for research. If global climate is indeed changing, then continued, long-term studies should help document the shifts.

Butterflies designated as rare by the Colorado Natural Heritage Watch List are often found in the Open Space properties. The Arogos Skipper *Atrytone arogos* was located in 2010 at High Point and the Hops Azure *Celestrina humulus* was found on Hops plants in the mouth of Plumely Canyon, both sites in Heil Ranch. Not sighted by this team in 2010 were Ottoo Skipper *Hesperia ottoe*, Dusted Skipper *Atrytonopsis hianna*, Moss' Elfin *Callophrys mossii schryveri*, and Snow's Skipper *Paratrytone snowi*. This team has not yet located the Regal Fritillary *Speyeria idalia*, although we have looked for it when a property owner, neighboring the Southeast Buffer, reports a sighting.

IX. Recommendations

- A. Support further research on butterflies, an indicator species.
- B. Search for a university student who will walk measured transects while completing butterfly observations, which will be verifiable in the future.
- C. Facilitate a process with staff members in charge of weed management so incursions of weeds would be communicated by this team more efficiently.
- D. Devise a way to disseminate information on the butterflies and investigated habitats to BCPOS staff members during trail planning and before trail building occurs.
- E. Place a sign at the Geer to Red Hill road-crossing to SLOW BIKES AND TRUCKS as they cross the stream to prevent smashing butterflies.

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Table I. Survey Dates and Locations

	Day	Heil Geer	Heil Plumely	Heil North, RedHill North Point	SE Buffer	Anne U. White	Mud Lake, Caribou	Dead man's Gulch	Rabbit Mountain	Carolyn Holmberg	Meyers Gulch, Walker Ranch	Steamboat Mountain
Mar	18				JC							
	22	JC										
	30					JC						
Apr	11							JC	JC			
	13					JC						
	18							JC				
	27				JC							
	28										JM	
May	3		JC									
	23											JC
	26										JC	
	28	JC										
	31									JC		
Jun	2										AC	
	3	JC										
	4				JC							
	6					JC						
	7				JC							
	15				JC							
	16				JC							
	18			JC								
	25		JC									
July	6	JC										
	14			JC								
	19				JC							
	30						JC					
Aug	1	JC										
	2										JC	
	22										JC	
Miles		32	34	50	26	21	56	55	55	20	25	57
Total miles	941	160	68	100	182	63	56	110	-	20	125	57

Additional Boulder County sites inventoried:
 June 20, July 4 Cal-Wood Education Center 59 mi each
 June 29, Coulson Gulch 49 mi.
 July 17, Niwot Ridge 68 mi
 July 31 Button Rock 60
 August 11 Loveland Pass 85 mi

2010 SE Buffer		4/27	6/4	6/7	6/15	6/16	7/19
Scientific Names	Common Names						
<i>Papilio polyxenes</i>	Black Swallowtail						
<i>P. rutulus</i>	Western Tiger Swallowtail					1	
<i>P. multicaudata</i>	Two-tailed Swallowtail						
<i>P. zelacaon</i>	Anise Swallowtail	2		1		2	
black swallowtail sp.			1		1		
<i>Pontia protodice</i>	Checkered White	1	3	1	1	4	14
<i>Pieris rapae</i>	Cabbage White						
<i>P. occidentalis</i>	Western White	4		9	1	6	2
<i>Euchloe olympia</i>	Olympia Marble	1					
white sp.		15	7	2	1	8	3
<i>Kricogonia lyside</i>	Lyside Sulphur		1				
<i>Nathalis iole</i>	Dainty Sulphur			13		2	16
<i>Colias philodice</i>	Clouded Sulphur	7	1	3	1	2	31
<i>C. philodice albino</i>							2
<i>C. eurytheme</i>	Orange Sulphur					3	3
<i>Zerene cesonia</i>	Southern Dogface						
<i>Abaeis nicippe</i>	Sleepy Orange		1				
sulphur sp.		3					
<i>Lycaena dione</i>	Gray Copper						3
<i>Strymon melinus</i>	Gray Hairstreak	2					1
<i>Echinargus isola</i>	Reakirt's Blue					2	1
<i>G. lygdamus</i>	Silvery Blue						
<i>Euphilotes ancilla</i>	Rocky Mtn. Dotted-Blue						
<i>Plebejus melissa</i>	Melissa Blue			19	3	5	3
blue sp.				3			1
<i>Agraulis vanilla</i>	Gulf Fritillary		1	1			
<i>Euptoieta claudia</i>	Variegated Fritillary		1	16	1	34	39
<i>Speyeria aphrodite</i>	Aphrodite Fritillary				3	11	10
<i>S. edwardsii</i>	Edwards' Fritillary		3	7	4	17	
fritillary sp.	(silvered)		1	3		20	
<i>Chlosyne gorgone</i>	Gorgone Checkerspot		1				
<i>Phyciodes tharos</i>	Pearl Crescent						
<i>P. pulchella</i>	Field Crescent		1	41		11	
crescent sp.							
<i>Cercyonis pegala</i>	Common Wood-nymph						
<i>Danaus plexippus</i>	Monarch					2	
<i>Nymphalis antiopa</i>	Mourning Cloak					1	
<i>Vanessa cardui</i>	Painted Lady						
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral						
<i>Coenonympha tullia ochracea</i>	Common (Ochre) Ringlet						
<i>Pyrgus communis</i>	Common Checkered-skipper			7	2	3	
<i>Pholisora catullus</i>	Common Sootywing						
<i>Hesperia uncas</i>	Uncas Skipper					2	
<i>Hesperia ottoe</i>	Ottoe Skipper						
<i>Atrytone arogos</i>	Arogos Skipper						
Skipper, dark				1			

SE Buffer	2007	2008	2009	2010
# of Species identified during Year in SE Buffer	25	20	21	26
# Species 2007-2010 sighted in Southeast Buffer	21	23	33	38
Research Hours on Site	5	21	9	7.7
# Individual Butterflies Counted	256	373	353	443
# Individuals / Research Hour	51	18	39	57

Southeast Buffer

3/18/2010 1:45 – 3:00 p.m. 14 - 16 °C winds 0-5 mph thin overcast.	Trail Walked from gate through small ravine	Butterfly None	Plants No blossoms	Animals Meadowlark	GPS 6216'	Team Larry Crowley Jan Chu, Amy Chu
4/27/2010 12:30-3:00 p.m. 17 °C 40% cloudy wind 5-15 mph	Walked thru deep mud in deserted prairie dog colony, in first ravine to Swallow-tail Hill	Zelicaons were patrolling and greeting each other. Melinus were flying up to challenge the zelicaons	Wavy-leaf dandelion, sm. Purple clover, Physaria sp. Wallflower, Museon, salt & pepper, dandelion, Nuttall's violets Mertensia, sand lilies, Easter daisy, white & purple deer clovers	Brewer's blackbird, meadowlark, turkey vulture, horned lark, vesper sparrow		Larry Crowley, Jan Chu
6/4 10:30 – 11:30 p.m. 22°C 85% high overcast, no wind	From gate , past small long gulley through old prairie dog field which is now full of flowers	Two southern butterfly surprises – lyside sulphur & gulf fritillary (new to our inventories) sleepy orange(new to SE Buffer)			5,882 ft. N 39.5 45 00 W 105 10 547 position where lyside and sleepy were found.	Jan Chu, Ron Butler
6/7 9:25 -11:25 a.m. 25° C; high overcast, no wind	From gate E and W both sides of gulley					Jan Chu, Amy Chu, Ron Butler, John Barr
6/15 11:00 – 12:00 p.m. 22° C, 5mph wind	Gate toward north past old prairie dog field	3 sets of Edward's fritillary wings with no bodies	Flowers profuse; Aphrodite nectaring on Gaillardia			Jan Chu, Jean Morgan, Carol Winkler, 11 yr old Elease

Southeast Buffer						
6/16 9:00 – 11:08 a.m. 19 – 26 °C; clear sky, wind 0-5 mph	Gate to Swallowtail Hill ridge	Uncas skipper new to SE Buffer	Verbena, rose mallow, milk vetch, Filaree, rose, salsify, bull thistle, erigeron, arnica, side-blooming Penstemon, Gaura, Heterotheca, yellow clover, sego lily, prairie clover, onion, flax, evening primrose, Lambert's loco, gaillardia, toad flax, yarrow, prairie paintbrush, Callophrus serrulatus	Sparrow sp., nighthawk, mourning dove, meadow lark, horned lark	Swallowtail Hill 5889' N 39° 55'042 W 105°10'477	Jan Chu Larry Crowley, Amy Chu
7/19 9:00 – 10:30 a.m. 21 – 24 °C overcast, wind 0-15 mph.	Gate, within ravine, circle around on top the ravine, return	Butterflies were hidden deep in the grasses, but would fly when approached. Small fresh claudia, new brood. Large female albinos.	Bull thistle, Solidago, Heterotheca, Gumweed	Meadowlark, vesper sparrow		Jean Morgan, Amy Chu, Jan Chu

Anne U. White	2010	3/30	4/13	6/6	7/22
<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				
<i>P. indra</i>	Short-tailed Swallowtail				
black swallowtail sp.					
<i>P. rutulus</i>	W. Tiger Swallowtail			1	3
<i>P. eurymedon</i>	Pale Swallowtail			1	
<i>P. multicaudata</i>	Two-tailed Swallowtail			2	1
yel. Swallowtail sp.					
<i>Pontia protodice</i>	Checkered White				
<i>P. sisymbrii</i>	Spring White				
<i>Pieris rapae</i>	Cabbage White		1	1	7
<i>Euchloe ausonides</i>	Large Marble			8	
<i>E. olympia</i>	Olympia Marble				
White sp.					4
<i>Anthocharis julia</i>	So. Rocky Mountain Orangetip				
white sp.			1	6	
<i>Colias philodice</i>	Clouded Sulphur			3	1
<i>C. philodice/eurytheme</i>	hybrid				
<i>C. eurytheme</i>	Orange Sulphur				2
<i>Nathalis iole</i>	Dainty Sulphur			7	1
<i>Callophrys affinis</i> <i>homoperplexa</i>	Canyon Bramble Hairstreak				
<i>Callophrys sheridanii</i>	White-lined Green				
<i>C. mossii schryveri</i>	Moss Elfin				
<i>C. polios</i>	Hoary Elfin				
<i>C. eryphon</i>	Western Pine Elfin			2	
<i>Satyrium titus</i>	Coral Hairstreak				
<i>Strymon melinus</i>	Gray Hairstreak				
<i>Cupido amyntula</i>	Western Tailed-Blue			15	
<i>Celastrina ladon sidara</i>	Spring Azure				
<i>Glycopsyche lygdamus</i>	Silvery Blue			3	
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue			2	
<i>Echinargus isola</i>	Reakirt's Blue				1
<i>Plebejus melissa</i>	Melissa Blue				6
<i>P. icarioides</i>	Boisduval's Blue				
<i>P. lupini lutzi</i>	Lupine Blue				
<i>P. glandon rustica</i>	Arctic Blue				
blue sp.					6
<i>Apodemia nais</i>	Nais Metalmark				
<i>Danaus plexippus</i>	Monarch				
<i>Euptoieta claudia</i>	Variegated Fritillary				3
<i>Speyeria aphrodite</i>	Aphrodite Fritillary				4

Anne U. White	2010	3/30	4/13	6/6	7/22	
<i>S. edwardsii</i>	Edwards' Fritillary				1?	
<i>S. coronis</i>	Coronis Fritillary					
<i>S. hesperis</i>	Northwestern Fritillary				23	
fritillary sp.					27	
<i>Chlosyne gorgone</i>	Gorgone Checkerspot					
<i>Phyciodes mylitta</i>	Mylitta Crescent			9		
<i>P. tharos</i>	Pearl Crescent					
<i>P. cocyta</i>	Northern Crescent					
<i>P. pulchella</i>	Field Crescent					
<i>Junonia coenia</i>	Common Buckeye					
<i>Polygonia satyrus</i>	Satyr Comma					
<i>P. gracilis</i>	Hoary Comma	12	9		1	
<i>Aglais milberti</i>	Milbert's Tortoiseshell					
<i>Nymphalis californica</i>	CA Tortoiseshell					
<i>N. antiopa</i>	Mourning Cloak	10	10	4	3	
<i>Vanessa atalanta</i>	Red Admiral			2	3	
<i>V. cardui</i>	Painted Lady				2	
<i>V. virginiensis</i>	American Lady				4	
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral				4	
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet			2		
<i>Cercyonis pegala</i>	Common Wood-Nymph				1	
<i>C. oetus</i>	Small Wood-Nymph				3	
<i>Oeneis uhleri</i>	Uhler's Arctic					
<i>Epargyreus clarus</i>	Silver-spotted Skipper				1	
<i>Erynnis pacuvius</i>	Pacuvius Duskywing					
<i>E. persius</i>	Persius Duskywing					
<i>Pyrgus communis</i>	Common Checkered-skipper			1	2	
<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					
<i>Poanes taxiles</i>	Taxiles Skipper				3	
<i>Euphyes vestris</i>	Dun Skipper				13	
<i>Atrytonopsis hianna</i>	Dusted Skipper					
Anne U. White		2006	2007	2008	2009	2010
# Species sighted at Anne U.		47	44	45	35	31
# Species sighted at Anne U. White 2004-2010		47	47	66	69	69
Research Hours at Site		14	9.5	16	10	10.5
Individual Butterflies Sighted within Anne U. White		183	366	536	217	112
Individual Butterflies Sighted Per Research Hour at Anne		13.1	38.5	33.5	21.7	10.7

Anne U. White

3/30/2010 11:00 – 1:00 p.m. 16 °C wind 0-5 mph 60% clouds.	Trail W/ 12” snowpack; S facing slope open; N-facing slope snow covered. Roadway to first stream crossing.	Butterfly Some flying; mostly sunning and basking.	Plants	Animals	GPS 6216’ N 40°3’232 W105°19’37 8	Team Larry Crowley Jan Chu
4/13 10:00 a.m. -12:30 p.m. 12° - 13°C wind 0-5 overcast to nearly clear	Some snow drifts.		Mahonia buds	Pine squirrel	End of trail 6,483’ N40°03’323 W105°20’32 6	Michell e Durant, Jan Chu
6/6 11:00 – 2:00 p.m. 21 – 28 °C sunny 20% clouds, no wind,	Hiked up steep slope to bench	Mourning cloak on sand willow; large marble flying fast, stopping on tower mustards		Pine squirrel; 2 dogs off leash, 14 leashed		Jan Chu
7/22 8:30 – 11:45 a.m. 20- 31 °C no wind, 33% clouded	Road past second creek to steep, sunny slope	Monarda had nectaring taxiles skipper, hesperis fritillary; variegated fritillary on arnica. Butterflies on the wing. Dun skipper on trail and landing on nets. Large caterpillar eating Fr. Geranium.	Sulfur flower, blue lupine, white and yellow evening primroses, campanula, alfalfa, Potentilla, Heterotheca, Monarda, Gaillardia, yarrow, Fremont’s geranium, sweet & red clovers, bull thistle, larkspur, golden rod, white daisies, mullein, prickly pear, Arnica, virgin’s bower, spiderwort, Gumweed, dogbane one-sided Penstemon, Mariposa lily, stonecrop	Pigmy nuthatch, house finch, BT. hummingb ird. W. wood peewee, cordilleran flycatcher, house wren, mtn. chickadee, rock wren, Steller’s jay. 2 Sceloporu s lizards		Larry Crowley , Ron Butler, Jan Chu

Heil – Geer Watershed	2010	3/22	5/28	6/3	7/6	8/1
<i>Papilio polyxenes</i>	Black Swallowtail		1		1	
<i>P. zelicaon</i>	Anise Swallowtail		1?			
<i>P. indra</i>	Short-tailed Swallowtail		1	2		
black swallowtail sp.						
<i>P. rutulus</i>	Western Tiger Swallowtail				1	
<i>P. eurymedon</i>	Pale Swallowtail		1ph	3		1
<i>P. multicaudata</i>	Two-tailed Swallowtail					
yellow swallowtail sp.			1			
<i>Neophasia menapia</i>	Pine White					
<i>Pontia sisymbrii</i>	Spring White		1			
<i>P. protodice</i>	Checkered White		1	1	3	3
<i>P. occidentalis</i>	Western White				1	1
<i>Pieris rapae</i>	Cabbage White		5	7	9	
<i>P. marginalis</i>	Mustard White					
<i>Euchloe ausonides</i>	Large Marble					
<i>E. olympia</i>	Olympia Marble			1		
<i>Anthocharis julia</i>	Southern Rocky Mountain Orangetip		2			
white sp.			15	10	13	7
<i>Colias philodice</i>	Clouded Sulphur			2	16	
<i>albino</i>					1	1
<i>C. eurytheme</i>	Orange Sulphur		1	1	6	9
<i>C. alexandra</i>	Queen Alexandra's Sulphur				1	
<i>Eurema mexicana</i>	Mexican Sulphur					
<i>Nathalis iole</i>	Dainty Sulphur		4ph	12		5
<i>Lycaena dione</i>	Gray Copper					
<i>L. heteronea</i>	Blue Copper					
<i>Callophrys affinis homoperplexa</i>	Canyon Bramble Hairstreak				2	
<i>C. augustinus</i>	Brown Elfin					
<i>C. gryneus</i>	Siva Juniper Hairstreak					
<i>C. eryphon</i>	Western Pine Elfin		1	1		
<i>Satyrium titus</i>	Coral Hairstreak					
<i>S. saepium</i>	Hedgerow Hairstreak					
<i>S. liparops</i>	Striped hairstreak				2	
<i>Strymon melinus</i>	Gray Hairstreak				1	
<i>Leptotes marina</i>	Marine Blue			1		
<i>Cupido amyntula</i>	Western Tailed-Blue		5	2		
<i>Celastrina ladon sidara</i>	Spring Azure		1	30		
<i>Glaucopsyche piasus</i>	Arrowhead Blue			7		
<i>G. lygdamus</i>	Silvery Blue		4	9		
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue				1	
<i>Echinargus isola</i>	Reakirt's Blue			1		3
<i>Plebejus melissa</i>	Melissa Blue			1		6
<i>P. icarioides</i>	Boisduval's Blue		2	1	7	
<i>P. 'lupini' lutzi</i>	Lupine Blue				1	
<i>P. glandon rustica</i>	Arctic Blue					
	Greenish Blue				1	
blue sp.			4	8	3	5

		3/22	5/28	6/3	7/6	8/1
Heil - Geer						
<i>Apodemia nais</i>	Nais Metalmark					
<i>Euptoieta claudia</i>	Variegated Fritillary					13
<i>Speyeria aphrodite</i>	Aphrodite Fritillary				12	8
<i>S. edwardsii</i>	Edwards' Fritillary					
<i>S. coronis</i>	Coronis Fritillary					
<i>S. callippe</i>	Callippe Fritillary					
<i>S. hesperis</i>	Northwestern Fritillary				2	1
<i>S. mormonia</i>	Mormon Fritillary					
fritillary sp.				1	10	23
<i>Chlosyne gorgone</i>	Gorgone Checkerspot		1			
<i>C. nycteis</i>	Silvery Checkerspot					
<i>C. palla</i>	Northern Checkerspot					
<i>Phyciodes pallida</i>	Pale Crescent		1new			
<i>P.s mylitta</i>	Mylitta Crescent					
<i>P. tharos</i>	Pearl Crescent				2	
<i>P. cocyta</i>	Northern Crescent					
<i>P. pulchella</i>	Field Crescent			3		
<i>Polygonia satyrus</i>	Satyr Comma					
<i>P. gracilis</i>	Hoary Comma	2	1			
<i>Aglais milberti</i>	Milbert's Tortoiseshell					
<i>Nymphalis antiopa</i>	Mourning Cloak	5	1	1		
<i>N. californica</i>	California Tortoiseshell					
<i>Vanessa atalanta</i>	Red Admiral		1	2		
<i>V. cardui</i>	Painted Lady		3		4	
<i>V. virginiensis</i>	American Lady					1
<i>Limnitis weidemeyerii</i>	Weidemeyer's Admiral					
<i>Asterocampa celtis</i>	Hackberry Emperor					
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet		5	17	12	
<i>Cercyonis pegala</i>	Common Wood-Nymph				7	5
<i>C. oetus</i>	Small Wood-Nymph					
<i>Erebia epipsodea</i>	Common Alpine			3	2	
<i>Oeneis chryxus</i>	Chryxus Arctic					
<i>O. uhleri</i>	Uhler's Arctic		1			
<i>Danaus plexippus</i>	Monarch					
<i>Epargyreus clarus</i>	Silver-spotted Skipper				8	
<i>Thorybes pylades</i>	N. Cloudywing					
<i>Erynnis icelus</i>	Dreamy Duskywing					
<i>E. pacuvius</i>	Pacuvius Duskywing		3			
<i>E. afranius</i>	Afranius Duskywing			2?		
<i>E. persius</i>	Persius Duskywing		1	3		
<i>Pyrgus communis</i>	Common Checkered-skipper					
<i>Pholisora catullus</i>	Common Sootywing					
<i>Piruna pirus</i>	Russet Skipperling				1	
<i>Oarisma garita</i>	Garita Skipperling					
<i>Hesperia juba</i>	Juba Skipper			2		
<i>H. colorado</i>	Common Branded Skipper					
<i>H. nevada</i>	Nevada skipper					
<i>Polites themistocles</i>	Tawny-edged Skipper					
<i>Ochloides sylvanoides</i>	Woodland Skipper					1

<i>Poanes taxiles</i>	Taxiles Skipper					
<i>Euphyes vestries</i>	Dun Skipper				14	2
Orange skipper sp.					5	

Heil – Geer Watershed	2005	2006	2007	2008	2009	2010
# of Species Sighted in the Year at Geer	57	60	42	56	44	49
# of Individuals in the year	568	1454	569	1225	492	419
Research Hours / Year	29	53	15.5	21	12.5	14
# of individuals per Research Hour	39.7	28.4	36.7	58.3	39	29.9
Total # of Species located in Heil - Geer Watershed					90	95

3/22/2010 11:30 – 1:00 p.m. 14°C wind 5-15 mph clear sky.	Trail	Butterfly Some flying; mostly sunning and basking.	Plants	Animals	GPS	Team Larry Crowley Jan Chu
5/28/2010 10:00 – 12:30 p.m. 21 – 29 °C no wind, 55% clouds to clear	Parking lot toward Manager’s cabin (½ way) and return	Mud puddling and flying	Salsify, Filaree, milk vetch, larkspur, erigeron, mouse ears, yellow mustard, golden banner, choke cherry, sand lily, Lambert loco	Cottontail, turkeys; w. tanager, house wren, crow, immature golden eagle?		Larry Crowley, Amy Chu, Bea Butler, Cathy and Donn Cook, Jan Chu
6/3/2010 10:30 – 1:10 p.m. 21 - 23°C 95% cloudy, wind 0-5 mph	Manager’s cabin toward gate		Mountain parsley, Mertensia, sumac, plum, Filaree, spiderwort, salsify, Boulder raspberry, Erigeron, golden banner, Puccoon, choke cherry, white lupine, one-sided Penstemon, Lambert’s loco, Mullein, Rocky Mtn. maple, yellow mustard, hawthorn, Fremont geranium, yellow oxalis, mouse-ears, larkspur, Pussytoes	Goldfinch, spotted towhee, mourning dove, crow, raven, vireo, wood peewee, flicker, chipping sparrow, broad-tailed hummingbird, house wren (nest) red-tailed hawk, Steller’s jay		Larry Crowley, Jean Morgan, Amy Chu, Jan Chu
7/6 9:20- 1:15 p.m. clear sky, 21 °C , wind 5-15 mph	Base of Big Meadow to saddle overlook and return by ridge to the south.	Striped hairstreak nectaring on Ceanothus fendleri, caught near car at noted base of big meadow			Base of big meadow 6,247’ N 40°08’ 45.0 W 105° 19’11.3 #105 point	Amy Chu, Venice Kelley, an Chu
8/1/2010 8:30 –	Lichen Trail, Heil	Dry meadows	Mexican hat, alfalfa, mullein, prairie clover,	Pine siskin, wood peewee, Steller’s jay,		BoCo Public walk with 30

12:00 p.m. 20 - 27°C thin overcast, wind 0-5 mph	Ranch	and dry stream crossing road	Heterotheca, prickly poppy, bee plant, Fremont geranium, sulfur flower, catnip, dogbane chicory, Monarda, golden rod	chipping sparrow, crow, raven, spotted towhee, lazuli bunting, W. tanager, Am. and green- backed goldfinch, downy woodpecker		attendees; Larry Crowley, Kristin Lovell , Venice Kelley, Jan Chu
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2010 Heil - Plumely		5/3	6/25
<i>Scientific name</i>	Common name		
<i>Papilio polyxenes</i>	Black Swallowtail		
<i>P. zelicaon</i>	Anise Swallowtail		
<i>P. indra</i>	Short-tailed Black Swallowtail		1
<i>P. rutulus</i>	Western Tiger Swallowtail		3
<i>P. eurymedon</i>	Pale Swallowtail		2
<i>P. multicaudata</i>	Two-tailed Swallowtail		
<i>Neophasia menapia</i>	Pine White		
<i>Pontia protodice</i>	Checkered White		
<i>P. sisymbrii</i>	Spring White		
<i>Pieris rapae</i>	Cabbage White	2	4
<i>P. marginalis</i>	Mustard White		
<i>Euchloe ausonides</i>	Large Marble		
<i>E. olympia</i>	Olympia Marble		
marble sp.			
<i>Anthocharis sara julia</i>	Southern Rocky Mountain Orangetip	1	
white sp.		5	7
<i>Colias philodice</i>	Clouded Sulphur		8
<i>C. eurytheme</i>	Orange Sulphur		8
<i>C. alexandra</i>	Queen Alexandra's Sulphur		
<i>Phoebis sennae eubule</i>	Cloudless Sulphur (Eastern)		
<i>Eurema mexicana</i>	Mexican Sulphur		
<i>Nathalis iole</i>	Dainty Sulphur		1
sulphur sp.		1	2
<i>Lycaena dione</i>	Gray Copper		
<i>Callophrys affinis</i>	Canyon Bramble Hairstreak		1
<i>C. sheridanii</i>	White-lined Green Hairstreak		
<i>C. gryneus</i>	Siva Juniper Hairstreak		3
<i>C. polios</i>	Hoary Elfin		
<i>C. eryphon</i>	Western Pine Elfin	17	
<i>Satyrium titus</i>	Coral Hairstreak		
<i>Strymon melinus</i>	Gray Hairstreak		
<i>Leptotes marina</i>	Marine Blue		
<i>Cupido amyntula</i>	Western Tailed-Blue	4	
<i>Celastrina ladon sidara</i>	Spring Azure		
<i>C. humulus</i>	Hops Azure		13
<i>Glaucopsyche piasus</i>	Arrowhead Blue		
<i>G. lygdamus</i>	Silvery Blue	3	2
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue		5
<i>Echinargus isola</i>	Reakirt's Blue		
2010 Heil - Plumely		5/3	6/25

<i>Plebejus melissa</i>	Melissa Blue		1
<i>P. icarioides</i>	Boisduval's Blue		3
<i>P. lupini lutzi</i>	Lupine Blue		
<i>P. glandon rustica</i>	Arctic Blue		
blue sp.		5	3
<i>Danaus plexippus</i>	Monarch		1
<i>Euptoieta claudia</i>	Variegated Fritillary		4
<i>Speyeria aphrodite</i>	Aphrodite Fritillary		5
<i>S. edwardsii</i>	Edward's Fritillary		
<i>S. coronis</i>	Coronis Fritillary		
<i>S. callippe</i>	Callippe Fritillary		1
<i>S. atlantis</i>	Atlantis Fritillary		
<i>S. hesperis</i>	Northwestern Fritillary		
fritillary sp.			15
<i>Polydryas arachne</i>	Arachne Checkerspot		
<i>Chlosyne gorgone</i>	Gorgone Checkerspot		
<i>Phyciodes mylitta</i>	Mylitta Crescent		1
<i>P. tharos</i>	Pearl Crescent		1?
<i>P. cocyta</i>	Northern Crescent		1
<i>P. pulchella</i>	Field Crescent		
crescent sp.			3
<i>P. gracilis</i>	Hoary Comma	6	
<i>Aglais milberti</i>	Milbert's Tortoiseshell		
<i>Nymphalis antiopa</i>	Mourning Cloak	3	1
<i>N. californica</i>	California Tortoiseshell		
<i>Vanessa atalanta</i>	Red Admiral		
<i>V. cardui</i>	Painted Lady		17
<i>V. virginiensis</i>	American Lady		3
		1?	3
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral		
<i>Asterocampa celtis</i>	Hackberry Emperor		
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet		8
<i>Cercyonis pegala</i>	Common Wood-Nymph		
<i>C. oetus</i>	Small Wood-Nymph		
<i>Erebia epipsodea</i>	Common Alpine		1
<i>Epargyreus clarus</i>	Silver-spotted Skipper		1
<i>Thorybes pylades</i>	N. Cloudywing		
<i>Erynnis pacuvius</i>	Pacuvius Duskywing		
<i>E. afranius</i>	Afranius Duskywing		
<i>E. persius</i>	Persius Duskywing		2
<i>Pyrgus communis</i>	Common Checkered-skipper		
<i>Pholisora catullus</i>	Common Sootywing		
<i>Piruna pirus</i>	Russet Skipperling		4
<i>Oarisma garita</i>	Garita Skipperling		2
<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		1

<i>Euphyes vestris</i>	Dun Skipper		6
<i>Atrytonopsis hianna</i>	Dusted skipper		
<i>A. vialis</i>	Common Roadside-skipper		
<i>skipper sp.</i>			

Heil - Plumely	2005	2006	2007	2008	2009	2010
# of Species During the Year in Plumely	56	48	45	37	44	36
# of Individuals Sighted During the Year	1406	367	365	480	401	196
Research Hours	22	18	8	13	17	6.5
# of Individuals per Research Hour	64	20	45	36	24	30.1
No. of species 2005-2010						84

5/3/2010 11:30 –2:00 p.m. 13- 16 °C wind 5- 30 mph thin 10% overcast.	Trail Drove to first locked gate, hiked the canyon to stone ruins. Much water in all streamlets.	Butterfly Tailed-blues were at seep.	Plants Dandelions, Filaree, Mahonia, currant, spring beauty, Mertensia, Canada violet sand lily, wavy leaf dandelion, plum, blue- eyed Mary	Animals Nuthatch sp, crow, raven, hummingbird, spotted towhee, Steller’s jay, t. vulture, mallard, canyon wren	GPS Top of trail- lunch stop 6,227’ N 40°9’288 W105°18’274	Team Larry Crowley Jan Chu, Amy Chu
6/25/2010 8:45 – 1:00 p.m. 24- 32°C	Locked gate to Hops bramble at old quarry	Variegated fritillary nectaring on Heterotheca; Russet Skipperling nectaring on Fremont geranium; siva juniper, hops azure nectaring on Ceanothus fendleri; Aphrodite fritillary mating. 14 species at road-crossing streamlet.	Prickly poppy, white lupine, salsify, yucca, one-sided Penstemon, yarrow, poison hemlock, spiderwort, Fre. Geranium, erigeron, flax, mariposa lily, sulfur flower, Heterotheca, harebell, Gaillardia, buckbrush, rose, yellow sweet clover, black medic	Crotalus viridis, Sceloporus undulates; spotted towhee, w. tanager, pigmy nuthatch, w. wood pewee, crow, TV., canyon wren, house wren, lazuli bunting, BT hummingbird, yellow- rumped warbler, raven, Steller’s jay, Am goldfinch	Stream crossing bike – roadway 6,347’ N 40° 09289 W 105°18025 Point #103	Larry Crowley, John Barr, Jan Chu

Heil Valley – North – Red Hill, Red Gulch, North Point	2010	6/18	6/25	7/14
<i>Scientific name</i>	Common Name			
<i>Papilio polyxenes</i>	Black Swallowtail			1
<i>P. zelicaon</i>	Anise Swallowtail			
<i>P. indra</i>	Indra Swallowtail	2		
<i>P. rutulus</i>	Western Tiger Swallowtail	4		
<i>P. eurymedon</i>	Pale Swallowtail	1		2
<i>P. multicaudata</i>	Two-tailed Swallowtail	1		2
yellow swallowtail sp.				
<i>Neophasia menapia</i>	Pine White			
<i>Pontia protodice</i>	Checkered White	1		42
<i>P. occidentalis</i>	Western White			1
<i>P. sisymbrii</i>	Spring White			
<i>Pieris rapae</i>	Cabbage White			
<i>Euchloe ausonides</i>	Large Marble	1		
<i>E. olympia</i>	Olympia Marble			
<i>Anthocharis sara julia</i>	Southern Rocky Mountain Orangetip			
white sp.		5		25
<i>Colias philodice</i>	Clouded Sulphur	2		21
<i>C. eurytheme</i>	Orange Sulphur	11		7
<i>C. alexandra</i>	Queen Alexandra's Sulphur			
<i>C. iole</i>	Dainty Sulphur	3		3
sulphur sp.				
<i>Lycaena heteronea</i>	Blue Copper			
<i>Satyrium titus</i>	Coral Hairstreak			2
<i>S. behrii</i>	Behr's Hairstreak			1
<i>Callophrys affinis</i>	Canyon Bramble Hairstreak	1		
<i>C. gryneus</i>	Siva Juniper Hairstreak			
<i>C. eryphon</i>	Western Pine Elfin			
<i>Strymon melinus</i>	Gray Hairstreak			
<i>Leptotes marina</i>	Marine Blue			
<i>Cupido amyntula</i>	Western Tailed-blue	2		
<i>Celastrina ladon sidara</i>	Spring Azure			
<i>Glaucopsyche piasus</i>	Arrowhead Blue	2		
<i>G. lygdamus</i>	Silvery Blue	2		
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-blue	10		
<i>Echinargus isola</i>	Reakirt's Blue	2		
<i>Plebejus melissa</i>	Melissa Blue	7		1
<i>P. icarioides</i>	Boisduval's Blue	20		
<i>P. 'lupini' lutzii</i>	Lupine Blue			1
<i>P. glandon rustica</i>	Arctic Blue			
blue sp.		5		4
<i>Danaus plexippus</i>	Monarch			4
<i>Libytheana carinenta</i>	American Snout			
<i>Euptoieta claudia</i>	Variegated Fritillary	11		166
<i>Speyeria aphrodite</i>	Aphrodite Fritillary	7		17

Heil Valley – North – Red Hill, Red Gulch, North Point	2010	6/18	6/25	7/14
<i>S. edwardsii</i>	Edwards' Fritillary	7		
<i>S. coronis</i>	Coronis Fritillary			
<i>S. callippe</i>	Callippe Fritillary	1		
<i>S. mormonia</i>	Mormon Fritillary			
fritillary sp.		38		10
<i>Chlosyne gorgone</i>	Gorgone Checkerspot			
<i>C. nycteis</i>	Silvery Checkerspot			
<i>C. palla</i>	Northern Checkerspot			
checkerspot/crescent sp.				
<i>Phyciodes mylitta</i>	Mylitta Crescent			
<i>P. tharos</i>	Pearl Crescent			
<i>P. cocyta</i>	Northern Crescent			
crescent sp.				
<i>P. pulchella</i>	Field Crescent	4		
<i>Polygonia satyrus</i>	Satyr Comma			
<i>P. gracilis</i>	Hoary Comma			1
<i>Nymphalis antiopa</i>	Mourning Cloak			
<i>N. californica</i>	California Tortoiseshell			
<i>Vanessa atalanta</i>	Red Admiral			6
<i>V. cardui</i>	Painted Lady	2		1
<i>V. virginiensis</i>	American Lady			
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral	1		
<i>Asterocampa celtis</i>	Hackberry Emperor			2
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet	44		
<i>Cercyonis pegala</i>	Common Wood-Nymph			
<i>C. oetus</i>	Small Wood-nymph			9
<i>Epargyreus clarus</i>	Silver-spotted Skipper			
<i>E. afranius</i>	Afranius Duskywing			
<i>E. persius</i>	Persius Duskywing	4ph		
<i>Pyrgus communis</i>	Common Checkered-skipper	1		
<i>Pholisora catullus</i>	Common Sootywing			
<i>Piruna pirus</i>	Russet Skipperling			
<i>Oarisma garita</i>	Garita Skipperling	2ph		
<i>Hesperia juba</i>	Juba Skipper			
<i>H. pahaska</i>	Pahaska Skipper			
<i>H. viridis</i>	Green Skipper			
<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			1
<i>Ochlodes sylvanoides</i>	Woodland Skipper			
<i>Poanes taxiles</i>	Taxiles Skipper			
<i>Euphyes vestries</i>	Dun Skipper			4
<i>Atrytonopsis hianna</i>	Dusted Skipper			
skipper sp.		1		

ph=photo

Heil Valley - North	2005	2006	2007	2008	2009	2010
# of Species sighted during the Year in North	30	24	34	45	41	40
# of Individuals in the Year	194	216	579	654	488	429
Research Hours per Year	3	6	8	17	12.5	11.5
# of individuals per Research Hour	64	31	72	38	39	37
Total # of Species Sighted in this Area					77	81

Heil Valley-North	Butterfly Behavior	Plants	Animals	Researchers	GPS
5/3/2010 11:30 – 2:00 p.m. 13 16 °C wind 5-30 mph thin 10% overcast. Drove to first locked gate, hiked the canyon to stone ruins. Much water in all streamlets.	Tailed-blues were at seep.	Dandelions, Filaree, Mahonia, currant, spring beauty, Mertensia, Canada violet sand lily, wavy leaf dandelion, plum, blue-eyed Mary	Nuthatch sp, crow, raven, hummingbird, spotted towhee, Steller's jay, t. vulture, mallard, canyon wren	Larry Crowley Jan Chu, Amy Chu	Top of trail-lunch stop 6,227' N 40°9'28.8" W 105°18'27.4"
6-18 9:00 – 2:20 p.m. 16.5 – 25.5 ° C cloudless, wind 0-10 mph. Meadow above Plumely and Red Hill saddle	Garita Skipperling & aphrodite nectaring on gaillardia; Indra ovipositing on <i>Pseudocymopterus montanus</i> commonly referred to as mountain parsley. The PLANTS profile calls it alpine false spring parsley.	Physaria belli, wallflower, Puccoon, milk vetch, Gaura, erigeron, Potentilla, Penstemon virens, arnica, Heterotheca, gaillardia, prickly poppy, salsify, rose, white lupine, Fremont's geranium, toadflax, flax, yarrow, Lambert's loco, chickweed, Boulder raspberry, mountain parsley, onion, evening primrose, Indian paintbrush, purple nightshade, scarlet globe mallow	Abert's squirrel, mule deer (one carcass of deer-maybe a couple of months); red-tailed hawk, lazuli bunting, plumbeous vireo, chat, crossbill, robin, w. tanager, spotted towhee, w. wood peewee, TV., BT hummingbird, crow, Steller's jay, dark-eyed junco, pigmy nuthatch, chipping sparrow, goldfinch, w. b. nuthatch, blue-gray gnatcatcher and young	Larry Crowley, Jan Chu, Jean Morgan, Amy Chu, John Barr	Physaria belli on red sandstone soil north of saddle at: 6,266' N40°10241 W105°17119 (point #102)

Heil Valley-North					
7/14/2010 9:40-1:00 p.m. 29 -34 °C 80% clear, wind 0-5 mph. North Point – parking area inside locked gate, north to overlook.	Arogos skipper nectaring on bull thistle; 10 mating pairs of variegated fritillaries. Checkered white nectaring on sweet clover; hackberry nectaring on bull thistle, 12 variegated fritillaries on alfalfa, Arnica & Gaillardia; checkered white nectaring on Heterotheca and goldenrod	Bluestem, Mexican hat, Gumweed, Fremont’s geranium, Heterotheca, Prickly Pear, Prairie clover, Prickly poppy, Gaillardia, Arnica, Verbena, sulfur flower, larkspur, grandiflora daisy, Erigeron, mariposa lily, golden rod	W. tanager, yellow breasted chat, canyon wren, spotted towhee, mourning dove, kestrel, lazuli bunting	Larry Crowley, Jean Morgan, Amy Chu, Venice Kelley, Jan Chu	Top of crest overlooking Picture Trail: #106 6280 ' N40° 11'222 W105° 16'09.6

Meyer's Gulch Homestead Trail, Walker Ranch		4/28	5/26	6/2	8/2	8/22
	2010					
<i>Papilio smintheus</i>	Rocky Mountain Parnassian				1	
<i>P. polyxenes</i>	Black Swallowtail			1		
<i>P. zelicaon</i>	Anise Swallowtail					
<i>P. indra</i>	Indra Swallowtail					
black sp.						
<i>P. rutulus</i>	Western Tiger Swallowtail					
<i>P. eurymedon</i>	Pale Swallowtail			1		
<i>P. multicaudata</i>	Two-tailed Swallowtail					
<i>Neophasia menapia</i>	Pine White					3
<i>Pontia protodice</i>	Checkered White				8	1
<i>P. sisymbrii</i>	Spring White		1			
<i>Pieris rapae</i>	Cabbage White				2	4
white sp.			10	1	10	6
<i>Euchloe ausonides</i>	Large Marble		1	4		
<i>Anthocharis julia</i>	So. Rocky Mountain Orangetip					
<i>Colias philodice</i>	Clouded Sulphur		1	1	15	38
<i>C. eurytheme</i>	Orange Sulphur			1	9	30
<i>Nathalis iole</i>	Dainty Sulphur			11	6	29
sulphur sp.					1	6
<i>Lycaena heteronea</i>	Blue Copper					1
<i>Callophrus sheridanii</i>	Sheridan's Hairstreak					
<i>C. eryphon</i>	Western Pine Elfin		1			
<i>C. affinis</i>	Canyon Bramble Hairstreak		3	8		
<i>C. augustinus</i>	Brown Elfin					
<i>C. polios</i>	Hoary Elfin	1	28+	30		
<i>Strymon melinus</i>	Gray Hairstreak					2
<i>Satyrrium saepium</i>	Hedgerow Hairstreak				1	1
<i>Echinargus isola</i>	Reakirt's Blue				2	8
<i>Cupido amyntula</i>	Western Tailed-Blue					
<i>Celestrina ladon</i>	Spring Azure		3			
<i>Glaucopsyche piasus</i>	Arrowhead Blue					
<i>G. lydamus</i>	Silvery Blue			20		
<i>Lycaeides melissa</i>	Melissa Blue					10
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue					
<i>Plebejus saepiolus</i>	Greenish Blue					1
<i>P. icarioides</i>	Boisduval's Blue					
<i>P. lupini lutzii</i>	Lupine Blue					
blue sp.			3		3	3
<i>Apodemia nais</i>	Nais Metalmark					
<i>Danaus plexippus</i>	Monarch				1	
<i>Euptoieta claudia</i>	Variegated Fritillary					
<i>Speyeria aphrodite</i>	Aphrodite Fritillary					
<i>S. edwardsii</i>	Edwards' Fritillary					
<i>S. callippe</i>	Callippe Fritillary					
<i>S. hesperis</i>	Northwestern Fritillary					11
fritillary sp.						14

Meyer's Gulch, Walker Ranch		4/28	5/26	6/2	8/2	8/22
<i>Chlosyne gorgone</i>	Gorgone Checkerspot					
<i>C. nycteis</i>	Silvery Checkerspot					
<i>C. palla</i>	Northern Checkerspot					
<i>Phyciodes cocyta</i>	Northern Crescent					
<i>P. pulchella</i>	Field Crescent					1?
crescent sp.						2
<i>Euphydryas chalcedona</i>	Variable Checkerspot					
<i>Polygonia gracilis</i>	Hoary Comma		2		1	2
<i>Nymphalis californica</i>	California Tortoiseshell					
<i>Nymphalis antiopa</i>	Mourning Cloak	1	1		1	
<i>Aglais milberti</i>	Milbert's Tortoiseshell					
<i>Vanessa cardui</i>	Painted Lady		2		2	6
<i>V. atalanta</i>	Red Admiral					2
<i>V. virginensis</i>	American Lady				2	2
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral					
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet					
<i>Cercyonis pegala</i>	Common Wood-Nymph					1
<i>C. oetus</i>	Small Wood-Nymph				17	23
<i>Erebia epipsodea</i>	Common Alpine					
<i>Oeneis uhleri</i>	Uhler's Arctic					
<i>Erynnis icelus</i>	Dreamy Duskywing					
<i>E. persius</i>	Persius Duskywing			3		
duskywing sp.						
<i>Pyrgus communis</i>	Common Checkered-skipper				1	4
<i>Oarisma garita</i>	Garita Skipperling					
<i>Hesperia colorado</i>	Common Branded Skipper					3
<i>Polites themistocles</i>	Tawny-edged Skipper					
<i>P. mystic</i>	Long Dash					
<i>Ochlodes sylvanoides</i>	Woodland Skipper				3	4
<i>Poanes taxiles</i>	Taxiles Skipper					
<i>Euphyes vestris</i>	Dun Skipper					

Meyer's Gulch, Walker Ranch	2005	2006	2007	2008	2009	2010
# of Species Sighted during the Year at Meyer's Gulch	20	39	30	35	45	35
# of Individual Butterflies	69	262	126	203	1144	437
Research Hours per Year	4	10.5	5	2.5	18	16
# Individuals per Research Hour	17	25	25	81	64	27
Total # of Species Located in Meyer's Gulch					61	70

4/28/2010 10:00 – 1:00 p.m. 16 °C wind 0-45 mph, sunny	Trail With 12" snowpack; S facing slope open; N-	Butterfly sunning and basking.	Plants Cactus, spring beauty, Pasque flower, Easter daisy, candy	Animals Hummingbird house finch, kestrels mating, TV.	GPS 7388' N 39°57'32.3" W105°20'20.7"	Team Ron Butler, Amy Chu, Jan Chu
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20% cloud cover. Ground thoroughly saturated and much running water.	facing slope snow covered. Roadway to first stream crossing.		tuft, blue-eyed Mary	magpie, w. bluebird, mtn bluebird, crow, house wren		
5/26/2010 10:30 – noon 12.5° to 17°C 40% clouds, no wind; much water in streamlets	Records were kept on the return trip to car	Hoary elfins were just warming up, flying low over their host plants Kinnikinnick	Few blossoms; Pasque flowers, mouse ears,	Birds recorded by Laura Osborn; Golden mantle ground squirrels		Amy Chu, Jan Chu and Ecosystem Stewards; Susan Spalding, Michelle Durant BoCo.
6/2/2010 10:00 -2:00 p.m. 18 - 26°C partly cloudy, bright, windy to mostly cloudy	Gate to 2.6 mi to point	Crab spider eating silvery blue on tower mustard				Amy Chu
8/2/2010 8:50-11:30 a.m. 22° C 97% clouded.	Walked from parking lot to a drainage, then returned through willow-lined meadow		Pink “dianthus” Rudbeckia, hawkweed, mariposa lily, Heterotheca, Fremont’s geranium, mullein, Gumweed, yel sweet clover, goldenrod, yarrow Gilia, Gaillardia, Yel. Evening primrose, gay feather, harebell lupine, Monarda, chickory, bull thistle paintbrush, Erigeron Potentilla, red clover, Townsendia grandiflora, one-sided Penstemon, cone flower	Goldfinch, w. wood peewee, downy woodpecker, Broad-tailed hummingbird, house wren, mtn. chickadee, pigmy nuthatch, junco, cordilleran flycatcher, red-tailed hawk, chipping sparrow		Larry Crowley, Jean Morgan, Jan Chu

8/22/2010 10:00 – 3:45 p.m. 23 - 31° C none to 40% clouds 0-30 mph wind	Walked from parking area at Meyer's to pine- covered area	Butterflies nectaring, mating.	Sulfur flower, Monarda, scarlet Gilia, Heterotheca, Fremont's and Richardson's geranium, Gumweed, Gayfeather, white asters, yellow evening primrose, harebell, yarrow, chickaree, golden rod, white lupine, Rudbeckia, Gaillardia, red clover, black- eyed Susan	Flicker, raven, house wren, sparrows	Turn-around at 7,606 ' N 39° 58'17.2 W105° 21'11.6	Larry Crowley, John Barr, Jan Chu
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Caribou, Mud Lake	2010	7/30	8/15
<i>Scientific Name</i>	<i>Common Name</i>		
<i>Parnassius smintheus</i>	Rocky Mountain Parnassian	2	
<i>Papilio polyxenes</i>	Black Swallowtail	1	
<i>P. zelicaon</i>	Anise Swallowtail		
<i>P. rutulus</i>	W. Tiger Swallowtail		
<i>P. eurymedon</i>	Pale Swallowtail		
<i>Neophasia menapia</i>	Pine White		
<i>Pontia protodice</i>	Checkered White		
<i>P. occidentalis</i>	Western White	1	
<i>Pieris rapae</i>	Cabbage White		
<i>P. marginalis</i>	Mustard White		
<i>Euchloe ausonides</i>	Large Marble		
<i>Anthocharis julia</i>	Southern Rocky Mountain Orangetip		
<i>Colias philodice</i>	Clouded Sulphur		
<i>C. eurytheme</i>	Orange Sulphur	6	1
<i>C. eurytheme/ philodice</i>	albino		1
<i>C. alexandra</i>	Queen Alexandra's Sulphur	18	11
<i>Eurema mexicana</i>	Mexican Sulphur		
<i>Abaeis nicippe</i>	Sleepy Orange		
<i>Nathalis iole</i>	Dainty Sulphur	2	1
<i>Lycaena rubidus</i>	Ruddy Copper		
<i>L. heteronea</i>	Blue Copper	1	
<i>L. helloides</i>	Purplish Copper	6*	1
<i>Callophrys affinis homoperplexa</i>	Canyon Bramble Hairstreak		
<i>C. sheridani</i>	White-lined Green Hairstreak		
<i>C. spinetorum</i>	Thicket Hairstreak		
<i>C. augustinus</i>	Brown Elfin		
<i>C. polios</i>	Hoary Elfin		
<i>C. eryphon</i>	Western Pine Elfin		
<i>Satyrrium saepium</i>	Hedgerow Hairstreak		
<i>Strymon melinus</i>	Gray Hairstreak		1

Caribou, Mud Lake	2010		
<i>Echinargus isola</i>	Reakirt's Blue		1
<i>Cupido amyntula</i>	Western Tailed-Blue	1	
<i>Celastrina ladon sidara</i>	Spring Azure		
<i>Glaucopsyche piasus</i>	Arrowhead Blue		
<i>G. lygdamus</i>	Silvery Blue		
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue		
<i>Echinargus isola</i>	Reakirt's Blue		
<i>Plebejus melissa</i>	Melissa Blue		
<i>P. saepiolus</i>	Greenish Blue		3
<i>P. icarioides</i>	Boisduval's Blue		
<i>P. 'lupini' lutzi</i>	Lupine Blue	1	
<i>P. glandon rustica</i>	Arctic Blue		
blue sp.		2	
<i>Euptoieta claudia</i>	Variiegated Fritillary		
<i>Speyeria aphrodite</i>	Aphrodite Fritillary		
<i>S. edwardsii</i>	Edwards' Fritillary		2
<i>S. coronis</i>	Coronis Fritillary		
<i>S. hesperis</i>	Northwestern Fritillary		1
fritillary sp.		1	14
<i>Poladryas arachne</i>	Arachne Checkerspot		
<i>Chlosyne gorgone</i>	Gorgone Checkerspot		
<i>C. nycteis</i>	Silvery Checkerspot		
<i>C. palla</i>	Northern Checkerspot		
<i>Phyciodes tharos</i>	Pearl Crescent		
<i>P. cocyta</i>	Northern Crescent		
<i>P. pulchella</i>	Field Crescent		
<i>Euphydryas chalcedona</i>	Variable Checkerspot		
checkerspot sp.			1
<i>Polygonia faunus</i>	Green Comma		
<i>P. gracilis</i>	Hoary Comma		1
<i>Nymphalis antiopa</i>	Mourning Cloak		
<i>Vanessa atalanta</i>	Red Admiral		
<i>V. cardui</i>	Painted Lady	1	
<i>V. virginiensis</i>	American Lady		
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral	2	1
<i>Coenonympha tullia ochracea</i>	Common Ringlet		
<i>Cercyonis pegala</i>	Common Wood-Nymph		
<i>C. oetus</i>	Small Wood-Nymph	44	15
<i>Erebia epipsodea</i>	Common Alpine		
<i>Oeneis chryxus</i>	Chryxus Arctic	1	
<i>Thorybes pylades</i>	Northern Cloudywing		
<i>Erynnis icelus</i>	Dreamy Duskywing		
<i>E. pacuvius</i>	Pacuvius Duskywing		
<i>E. persius</i>	Persius Duskywing		
<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		
<i>Poanes taxiles</i>	Taxiles Skipper		
<i>Euphyes vestries</i>	Dun Skipper		

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

7/30/10 9:00 – 11:00 a.m. 18 - 21°C clear to developing clouds; no wind. Inside locked gate to the northwest bog, returning around meadows and aspen trees. Heavy rains had fallen the two days preceding this count. Roadway is becoming badly washed and rutted.	Wood nymph & blue copper nectaring on Eriogonum umbellatum sulfur flower; *purplish copper seen in roadside meadow near willows and Hwy 119 (Mud Lake Road) by Venice Kelly.	Robin, red breasted & pigmy nuthatch, downy woodpecker, house wren, mtn. chickadee, crossbill sp. Broad-tail hummingbird, w. tanager; barn swallow on Delonde cabin; , pied bill grebe on pond	Yellow evening primrose, lupine, one-sided Penstemon, Senecio, sulfur flower, Lambert's loco, Gumweed, yarrow, harebells, white Gilia, red paintbrush, Gaillardia, Tiny white saxifrage, Erigeron, mariposa lily, death Camus, bedstraw, Rudbekia, monkshood, Richardson's & Fremont's geranium, black-eyed Susan, Potentilla, onion	Larry Crowley, Amy Chu, Jan Chu
8/15/10 10:30 – 2:22 p.m. 17 - 23°C wind 0 – 10 mph	Parked inside Caribou at the beginning of the 'horse trail' and road to Blue Bell. Walked thru the 'Monarda' meadows and to the Blue Bell Mine buildings.	Cooper's hawk, house wren, mtn. chickadee, pine siskin, pigmy and red-breasted nuthatch, raven, dark-eyed junco	Gilia, Gaillardia, blue lupine, white asters, Gumweed, sulfur flower, harebell, golden rod, large purple asters, Heterotheca, yarrow, sage, bull thistle, yel. sweet and red clover, Lambert's loco, black-eyed Susan, Senecio, mullein, Fremont's geranium, fireweed	Larry Crowley, Jan Chu 'Monarda' meadow 8,610' N 39° 59'24.1 W105° 32'21.9

Table IX Compilation of Species and Locations

Butterflies on this list are species this team has observed over the years, not a complete list for Boulder County. 84 of the known 102 species were seen in 2010.

2010		South East Buffer	Anne U. White	Geer, Heil	Plumely, Heil	North, Heil	Meyer's Gulch, Walker	Cari-bou Ranch
Scientific Name:	Common Name:							
PAPILIONIDAE								
<i>Parnassius smintheus</i>	Rocky Mountain Parnassian						1	2
<i>Papilio polyxenes</i>	Black Swallowtail			2		1	1	1
<i>P. zelicaon</i>	Anise Swallowtail	5		1?				
<i>P. indra</i>	Short-tailed Swallowtail			3	1	2		
<i>P. rutulus</i>	Western Tiger Swallowtail	1		1	3	4		
<i>P. eurymedon</i>	Pale Swallowtail				2	3	1	
<i>P. multicaudata</i>	Two-tailed Swallowtail					3		
PIERIDAE								
<i>Neophasia menapia</i>	Pine White						3	
<i>Pontia protodice</i>	Checkered White	24		8		43	9	
<i>P. occidentalis</i>	Western White	22		2		1		1
<i>P. sisymbrii</i>	Spring White						1	
<i>Pieris rapae</i>	Cabbage White		9	21	6		6	
<i>P. marginalis</i>	Mustard White							
<i>Euchloe ausonides</i>	Large Marble		8			1	5	
<i>E. olympia</i>	Olympia Marble	1		1				
<i>Anthocharis julia</i>	So. Rocky Mountain Orangetip			2	1			
<i>Colias philodice</i>	Clouded Sulphur	45	4	18,1alb	8	23	55	1alb
<i>C. eurytheme</i>	Orange Sulphur	6	2	17	8	18	40	7
<i>C. alexandra</i>	Queen Alexander			1				29
<i>Zerene cesonia</i>	Southern Dogface							
<i>Phoebis sennae eubule</i>	Cloudless Sulphur (Eastern)							
<i>Eurema mexicana</i>	Mexican Sulphur							
<i>Abaeis nicippe</i>	Sleepy Orange	1						
<i>Kricogonia lyside</i>	Lyside Sulphur	1 new						
<i>Nathalis iole</i>	Dainty Sulphur	31	8	21	1	3	46	3
LYCAENIDAE								
<i>Lycaena rubidus</i>	Ruddy Copper							
<i>L. heteronea</i>	Blue Copper						1	1
<i>L. helloides</i>	Purplish Copper							7
<i>L. dione</i>	Gray Copper	3						
<i>Callophrys affinis homoperplexa</i>	Canyon Bramble Hairstreak			2	1	1	11	
<i>C. sheridanii</i>	Sheridan's Hairstreak							
<i>C. gryneus</i>	Siva Juniper Hairstreak				3			
<i>C. spinetorum</i>	Thicket Hairstreak							
<i>C. augustinus</i>	Brown Elfin							
<i>C. mossii schryveri</i>	Moss Elfin							
<i>C. polios</i>	Hoary Elfin						59	
<i>C. eryphon</i>	Western Pine Elfin		2	2	17		1	
<i>Satyrrium behrii</i>	Behr's Hairstreak					1 new		40
<i>S. titus</i>	Coral Hairstreak					2		

<i>S. liparops</i>	Striped Hairstreak			2new				
<i>S. saepium</i>	Hedgerow Hairstreak						2	
<i>Strymon melinus</i>	Gray Hairstreak	3		1			2	1
<i>Leptotes marina</i>	Marine Blue							
<i>Cupido amyntula</i>	Western Tailed-Blue		15	7	4	2		1
<i>Celastrina ladon sidara</i>	Spring Azure			31			3	
<i>C. humulus</i>	Hops Azure				13			
<i>Glaucopsyche piasus</i>	Arrowhead Blue			7		2		
<i>G. lygdamus</i>	Silvery Blue	3		13	5	2	20	
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue			1	5	10		
<i>E. rita coloradensis</i>	Rita Blue							
<i>Echinargus isola</i>	Reakirt's Blue	3	1	4		2	10	
<i>Plebejus melissa</i>	Melissa Blue	30	6	4	1	8	10	
<i>P. saepiolus</i>	Greenish Blue			1			1	3
<i>P. icarioides</i>	Boisduval's Blue			10	3	20		
<i>P. 'lupini' lutzi</i>	Lupine Blue			1		1		1
<i>P. 'lupini' texanus</i>	Texana Blue							
<i>P. glandon</i>	Arctic Blue							
<i>Libytheana carinenta</i>	American Snout							
<i>NYMPHALIDAE</i>								
<i>Danaus plexippus</i>	Monarch	2			1	4	1	
<i>Apodemia nais</i>	Nais Metalmark							
<i>Agraulis vanilla</i>	Gulf Fritillary	2 new						
<i>Euptoieta claudia</i>	Variiegated Fritillary	91	3	13	4	177		
<i>Speyeria aphrodite</i>	Aphrodite Fritillary	24	4	20	5	17		
<i>S. edwardsii</i>	Edwards' Fritillary	31	1?					2
<i>S. coronis</i>	Coronis Fritillary							
<i>S. callippe</i>	Callippe Fritillary				1			
<i>S. atlantis</i>	Atlantis Fritillary							
<i>S. hesperis</i>	Northwestern Fritillary		23	3			11	1
<i>S. mormonia</i>	Mormon Fritillary							
<i>Poladryas arachne</i>	Arachne Checkerspot							
<i>Chlosyne gorgone</i>	Gorgone Checkerspot	1		1				
<i>C. nycteis</i>	Silvery Checkerspot							
<i>C. palla</i>	Northern Checkerspot							
<i>Phyciodes pallida</i>	Pale Crescent			1 new				
<i>P. mylitta</i>	Mylitta Crescent		9		1			
<i>P. tharos</i>	Pearl Crescent			2	1?			
<i>P. cocyta</i>	Northern Crescent				1			
<i>P. pulchella</i>	Field Crescent	53		3		4	1?	
<i>Euphydryas anicia</i>	Variable Checkerspot							
<i>Polygonia faunus</i>	Green Comma							
<i>P. satyrus</i>	Satyr Comma							
<i>P. gracilis</i>	Hoary Comma		22	3	6	1	5	1
<i>Junonia coenia</i>	Common Buckeye							
<i>Aglais milberti</i>	Milbert's Tortoiseshell							
<i>Nymphalis antiopa</i>	Mourning Cloak	1	27	7	4		3	
<i>N. californica</i>	California Tortoiseshell							
<i>Vanessa atalanta</i>	Red Admiral		5	3		6	2	
<i>V. cardui</i>	Painted Lady		2	7	17	3	10	1
<i>V. virginiensis</i>	American Lady		4	1	3		4	

<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral		4		4	1		3
<i>Asterocampa celtis</i>	Hackberry Emperor					2		
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet		2	34	8	44		
<i>Cercyonis pegala</i>	Common Wood Nymph		1	12			1	
<i>C. oetus</i>	Small Wood Nymph		3			9	40	59
<i>Danaus plexippus</i>	Monarch	2						
<i>Erebia epipsodea</i>	Common Alpine			5	1			
<i>Oeneis chryxus</i>	Chryxus Arctic							1
<i>O. uhleri</i>	Uhler's Arctic			1				
HESPERIIDAE								
<i>Epargyreus clarus</i>	Silver-spotted Skipper		1	8	1			
<i>Thorybes pylades</i>	Northern Cloudywing							
<i>Erynnis icelus</i>	Dreamy Duskywing							
<i>E. pacuvius</i>	Pacuvius Duskywing			3				
<i>E. afranius</i>	Afranius Duskywing			2?				
<i>E. persius</i>	Persius Duskywing			4	2	4		
<i>Pyrgus communis</i>	Common Checkered-skipper	12	3			1	5	
<i>Pholisora catullus</i>	Common Sootywing							
<i>Piruna pirus</i>	Russet Skipperling			1	4			
<i>Ancyloxypha numitor</i>	Least Skipper							
<i>Oarisma garita</i>	Garita Skipperling				2	2		
<i>Hesperia uncas</i>	Uncas Skipper	2						
<i>Hesperia juba</i>	Juba Skipper			2				
<i>Hesperia colorado</i>	Western Branded Skipper							
<i>Hesperia ottoe</i>	Ottoe Skipper							
<i>H. leonardus</i>	Leonard Skipper							
<i>H. pahaska</i>	Pahaska Skipper							
<i>H. viridis</i>	Green Skipper							
<i>H. nevada</i>	Nevada Skipper							
<i>Polites peckius</i>	Peck's Skipper							
<i>Polites draco</i>	Draco Skipper							
<i>P. themistocles</i>	Tawny-edged Skipper							
<i>Atrytone arogos</i>	Arogos Skipper					1		
<i>P. mystic</i>	Long Dash							
<i>Paratrytone snowi</i>	Snow's Skipper							
<i>Ochlodes sylvanoides</i>	Woodland Skipper			1				7
<i>Poanes taxiles</i>	Taxiles Skipper		3		1			
<i>Euphyes bimacula</i>	Two-spotted Skipper							
<i>E. vestris</i>	Dun Skipper		13	16	6	4		
<i>Atrytonopsis hianna</i>	Dusted Skipper							