

Boulder County Parks and Open Space

Small Grant 2017

Reworked 1-18-2018

**Inventories
Of Butterfly Populations Within Communities
In Certain Boulder County Open Spaces**

By Janet Chu



January 18, 2018

Cover Photos by Howard Witkin.

Painted Ladies (*Vanessa cardui*) (dorsal, ventral). September 17, 2017.

The most numerous of the butterflies counted in the Boulder County Open Space properties in 2017. These Painted Ladies had an unusually large migration from the U.S. desert Southwest.

Self-published by the author, Janet Chu for Boulder County Parks and Open Space Department

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I. Acknowledgements

Boulder County Parks and Open Space (BCPOS) department has been supportive in continuing to allow access to many properties for inventorying butterflies. Since 2002, they have welcomed the butterfly research specialists. In 2017, Susan Spaulding, Senior Wildlife Specialist provided close contact and advice; Amanda Hatfield and Kevin Grady, Resource Protection Rangers assisted in field work. We enjoy and hold dear the opportunities to cooperate with the Open Space staff members. We sincerely thank the department for providing Research Permits which have been necessary for the conduction of this research for the past fifteen years. I wish to commend the staff members and Open Space Department for the fine planning and conservation methods they are diligently performing.

Our mentor, providing professional suggestions and assistance in identification, continues to be Dr. Paul A. Opler, C.P. Gillette Museum of Arthropod Diversity, Colorado State University, Ft. Collins. My volunteer team is composed of John Barr, Amy Chu, Larry Crowley, Dan Fosco, Venice Kelly, Chuck Lowry, Jean Morgan, Pam Piombino and Wynne Whyman. John, Dan, Venice, Pam and Wynne greatly assist with digital photos.

II. Abstract

This year the butterflies were inventoried on nine select properties under Boulder County Parks and Open Space (BCPOS) ownership. Painted Ladies were the most numerous of butterfly individuals. These immigrant plus resident butterflies, are indicator species used to understand if the environment is remaining vital. The BCPOS properties are influenced by state-wide and national environmental changes.

III. Objectives

The overall objectives were:

1. Determine species and populations for the butterflies in each of the surveyed lands.

2. Add to the detailed inventories, where the location and nature of habitats is known to support butterfly and associated species.
3. Survey Plumely Canyon and Anne U. White, previously devastated by the flood of 2013, to observe successional changes and garner data.
4. Explore Southeast Buffer, Heil Valley, Walker Ranch, Reynold's and Caribou Ranches for numbers and species of butterflies, while noticing blossoming plants and some vertebrates. Include Steamboat Mountain which had not been visited since 2011.

IV. Research Methods

The research methods continue to be consistent with past years. Survey through the six-month butterfly season and continue the long-term inventory by revisiting nine sites, including exploring the flood-ravaged areas Anne U. White and Plumely Canyon. Each field day in Anne U. White and Steamboat Mountain we were escorted by a Boulder County Ranger, because of dangerous wash-outs. However, the team entered the mouth of Plumely Canyon by hiking from a service road in Heil Valley.

Team members were each granted a Research Permit for the Open Space lands extending from March through September 2017. On every field day weather permitting, we hiked for about three hours following, streams, trails and roads, and concentrated our survey efforts in areas containing adequate water, plentiful flower blossoms, and host plants which support significant numbers of butterflies. This inventory is necessarily meandering instead of following a restricted transect. We observed butterflies on the wing and used a net and release-live technique, recording both species' identities and numbers observed. Butterflies were released live at the spot where they were caught. If a 'difficult to identify butterfly' was taken, it was given to the Gillette Museum, Colorado State University for identification and curating into the permanent collection. When possible blossoming plants, birds, other vertebrates were listed. For the last several years, we used digital photos in place of capturing specimens, which helped verification of identification of butterflies. Rare butterflies as noted by the Colorado Natural Heritage Program Watch List were sought: Arogos (*Atrytone arogos*) and Ottoe (*Hesperia ottoe*) Skippers, Hops Azure (*Celastrina humulus*), Dusted

Skipper (*Atrytonopsis hianna*), and Moss's Elfin (*Callophrys mossii schryveri*). Each was seen in the 2017 inventory except the Ottoe Skipper.

Total numbers of individual butterflies and species observed during each field day were recorded on spreadsheets and analyzed for patterns occurring during the field seasons, noting changes in populations and species. For each location, 'Individuals per Research Hour' (I/RH) were calculated using the number of individual butterflies observed (I) divided by the research hours (RH) in the field. 'Species per Research Hour' (S/RH) were also determined. These are standard comparisons which this author developed for comparison, season to season and year to year.

V. Introduction

Butterfly inventories, listing numbers of individual butterflies and the identified species have taken place in BCPOS for numbers of years: 14 years in Heil Valley Ranch (Plumely Canyon) and Caribou Ranch; 13 years in Heil Valley (North, including North Pointe and Red Gulch); 12 years in the Southeast Buffer and Heil Valley (Geer Watershed). Caribou Ranch vicinity and Geer Watershed were surveyed many times in 2017. The other Open Spaces were surveyed fewer times due to personal matters and travels by the research team. Twelve volunteer research associates spent 98 hours in the field during 50 days in 2017. Springtime weather was deleterious to the early emerging butterflies because of April snow, hail, extreme cold, and this after a week of warm, short-sleeve weather in March.

Painted Ladies (*Vanessa cardui*) made their way to the Foothills around Boulder County on April 15-17 from the Mojave and southwestern deserts. These immigrated in even greater numbers in mid-September in the Boulder – Denver metropolitan area. It is likely some, which appeared to be a smaller sized were a second brood produced locally. Because inter-annual variation is large the inventories are very important.

The hatch time is an unknown date for most species, therefore the surveyor efforts may or may not be there on site during just the right date. Experience in the field does show us within a week or so when the species will be flying. There are many inconsistencies confronted when gathering data on butterflies such as their original habitats. Certain butterflies colonize each year and raise broods here, but do not overwinter. Examples are the well-known Monarch (*Danaus plexippus*), Painted Lady, Variegated Fritillary (*Euptoieta claudia*), and tiny Reakirt's Blue (*Echinargus isola*). These are migrants from warmer climates which fly through a variety of pesticide and weather conditions.

Some are non-migratory such as the Gray Hairstreak, Common Checkered-skipper (*Pyrgus communis*), Boisduval's Blue and Hops Blue. The Colorado state insect Colorado Hairstreak (*Hypaurotis crysalus*), which is not found in Boulder County because its host the Scrub Oak, does not survive here, however does live in southern and western Colorado. These inconsistencies would be influenced by local conditions year-round. Some overwinter locally and emerge early in the spring such as the Mourning Cloak (*Nymphalis antiopa*), Hoary Comma (*Polygonia gracilis*) and the higher altitude Rocky Mountain Parnassian (*Parnassius smintheus*). These butterflies would be affected by the late winter snows or early high temperatures.

At times we do find butterflies which live normally along the Rio Grande River. The Lyside Sulphur (*Kricogonia lyside*), Southern Dogface (*Zerene cesonia*) and Fulvia Checkerspot (*Chlosyne fulvia*) were found in the Southeast Buffer. The Sleepy Orange (*Abaeis nicippe*), and Mexican Sulphur (*Eurema mexicana*) have been found at Caribou. An Eastern Cloudless Sulphur (*Phoebis sennae eubule*) was photographed in Heil Valley (Plumely Canyon). These are found singly and cause great excitement. It has been thought that a lower level Jet Stream has picked these butterflies up and swirled them into Boulder County with strong south-southwesterly winds.

VI. Narration for Each Open Space

This Narration (VI.) is a companion to the Data Tables (Section IX, page 19-52). It highlights species that were most numerous, dates of flights, and locations where butterflies are found.

A. Southeast Buffer

The Southeast Buffer was explored in May and then September. Swallowtail Hill, a long ridge, continues to produce swallowtails. On May 5 an Anise Swallowtail (*Papilio zelicaon*), was sighted out east from its usual Foothills habitat. Also, on May 5 a Black Swallowtail (*P. polyxenes*) was surprisingly encountered. This has become an uncommon butterfly since European Paper Wasps (*Polistes dominulus*) were introduced to help farmers eliminate caterpillar pests. This wasp develops as a predator of caterpillars and some other insects, populations of which have probably been affected by the establishment of this new wasp.¹

¹ Colorado State University Extension European Paper Wasp – 5.611

During May, the Olympia Marble (*Euchloe olympia*) was noted nectaring on barely-visible tower mustard blossoms. The Large Marble (*E. ausonides*) was seen for the first time in this Open Space; however, it is often found at Heil Valley (Geer Watershed) nectaring on watercress and other mustards. Also, the Silvery Blues were found in the ravine, where Field Crescents (*Phyciodes pulchella*) were flying on May 30.

The butterfly inventory continued late into September 2017, because the weather was mild. Typically, other years the inventory ended by August 31. On September 16 Leonard's Skippers (*Hesperia leonardus*) were on the south end of Swallowtail Hill, flying together into the sky from small patches of short white heath asters (*Symphyotrichum ericoides*).

B. Heil Valley (Geer Watershed)

Sue Hirschfeld recorded butterflies in the Geer Watershed on nine visits. The resident Hoary Commas, Milbert's Tortoiseshells (*Aglais milberti*), and Mourning Cloaks greeted Spring together in early April. On April 13, wild plums were in bloom and the seldom-seen Julia Orangetips (*Anthocharis sara julia*) nectared in its sweet blossoms. Southern Dogface (*Zerene cesonia*), an occasional visitor from the deep south and south Texas, was newly found in Geer and seen on two different days, July 18 and August 10, by Hirschfeld.

The most abundantly seen Common Wood Nymphs (*Cercyonis pegala*) totaled 181 individuals in the Geer Watershed, as compared to the Small Wood Nymphs at zero. Silver-

spotted Skippers (*Epargyreus clarus*) were more abundant in this location than in any other Open Space, likely because of a thick stand of their host plant, wild licorice.

By August 10 most flowers had blossomed and were forming seeds. These plants had become desiccated with the long late, dry summer weather. However, the Canada thistle was an available nectar plant for the many unidentified white individuals that were below the large culvert near the Manager's cabin.

C. Heil Valley (North)

The North section of Heil Valley has two areas that are inventoried. One is the Red Gulch in northeast section of Heil, which is entered by permission through Ron Lafollette's private property on Red Gulch Road. Red Gulch has a streamlet which comes from the Red Saddle spring near the Picture Rock Trail. On June 13, 26 species were found in the Red Gulch. One reason it was so rich is that it is not trampled by the public or dogs and, therefore, is quite verdant. Swallowtails, Western Tigers (*Papilio rutulus*), Pale (*P. eurymedon*) and Two-tailed (*P. multicaudata*) were all flying over the sloping meadow and streamlet on June 13. Six species of blues were also noted that day. The Silvery Blues usually uncommon, were the most abundant blues in the Open Spaces in 2017. More Melissa Blues (*Plebejus melissa*) (9) were seen here than in any other area. There are usually more Melissas throughout the Open Spaces, but they were absent in 2017. There were five Red Admirals (*Vanessa atalanta*), associated with their host plant, nettles. Four Weidemeyer's Admirals (*Limenitis weidemeyerii*), often seen taking nutrients from fresh dung, were there in June.

The other surveyed property within Heil Valley is North Pointe, a former ranch property off Highway 36 near Neva Road. North Pointe is especially active with butterflies and birds in April. The old rutted roadway has a steep natural wall on the north, making for a warm reflective surface for butterflies. These early butterflies seek the heat and any nectar-producing flowers. There is a deep streamlet at the base of the valley, which is covered with vegetation.

Hoary Commas and Mourning Cloaks were flying together in April with one California Tortoiseshell (*N. californica*). The Commas and Cloaks often commingle in the spring over streams. The Tortoiseshell is a visitor from south-central Colorado. Painted Ladies were more common than other species in the North section in April and June.

D. Heil Valley (Plumely Canyon)

Only two visits were made in 2017, from the locked gate to the mouth of Plumely Canyon. Walking continues to be difficult as the 2013 flood created large areas of cobble deposits and large boulders fields. Silvery Blues (*Glaucopsyche lygdamus*) were more numerous (87) than any other butterfly on May 16 at the mouth of Plumely Canyon. On this day we were fortunate to observe the emergence of this single species, which means individuals begin their adult phase simultaneously. The cold snowy April did not slow their appearance; whereas other species' emergences were retarded by the several feet of snow and extreme cold. Butterflies might emerge if a day or two are quite warm, but then many are intolerant of the following nights' freeze.

On August 28, a fresh new Monarch, perhaps on its southern migration to Mexico, was pursued by a fritillary. On that day the Plumely streamlet was dry, except for a few shallow damp spots where Cabbage Whites (*Pieris rapae*) and fritillaries gathered for a precious sip of water. Only a single Hops Azure was located at the mouth of the canyon near its host plant, the American hops on July 28. This butterfly was noted as rare and notably endangered by the Colorado Natural Heritage Watch List. It is unique to this area only, amongst all our study sites on Open Space, due to the presence of the wild hops bushes. This area is illustrative of important micro-habitats within Open Space that are closed to the public, for the benefit of rare species.

E. Walker Ranch

Dan Fosco extended the Walker Ranch Trail of the butterfly surveys by adding the Lower Loop to South Boulder Creek. There, the only sightings on March 29 were the White-line Green Hairstreaks (*C. sheridanii*) nectaring on blossoming spring beauties. On April 12,

Spring Whites (*Pontia sisymbrii*) and Julia Orangetips (*Anthocharis sara julia*), which are exceptionally early-flying butterflies, were observed.

While searching this area, in May 2017, the Elfins, Brown (*Callophrys augustinus*), Hoary (*C. polos*) and the notably rare Moss' (*C. mossii schryveri*), were on the southwest facing slope and nearer moisture. In the same area the emergence of unusually large numbers (40) of Canyon Bramble Hairstreaks (*C. affinis*) were seen. These are usually observed only a half dozen a day on the dirt road, flying up ahead of our footsteps, but on this day, were seen newly emerged adults.

Along the Meyer's Homestead Trail the Rocky Mountain Dotted-blues (*Euphilotes ancilla*), are often noted by the dozens nectaring on sulfur-flower wild buckwheat. But, on June 6 there were none found. It is known that this blue is totally dependent on this specific wild buckwheat (*Eriogonum umbellatum*). Dr. Paul Opler has studied these two-species interdependencies in depth, in the western U.S. and found specific blue butterflies use only specific buckwheats as hosts.

The Duskywings, Pacuvius (*Erynnis pacuvius*) and Persius (*E. persius*) were found together June 6. They are most often in separate habitats, but on this date, both species were puddling in the muddy ruts. Gorgone Checkerspots (*Chlosyne gorgone*), often flying nearer moisture, were in the lower Loop Trail on June 6. Also, the Common Ringlets, some summers the most common butterfly in the entirety of the open spaces, were observed having low numbers in 2017, (24).

F. Reynold's Ranch

Heavy April snow added to the soggy ground moisture at both the North Bog and Giggey's Lake. Usually these areas are quite lush with grasses and flowers until early summer. This very wet situation, plus new barbed wire fences, have limited the areas of access for research.

Common Ringlets and Common Alpines (*Erebia epipsodea*) were flying on June 20. Greenish Blues (*Plebejus saepiolus*) are often found within this higher elevation Open Space, and were observed June 20 and again August 1.

During the month of August, 16 Queen Alexandra's Sulphurs (*Colias alexandra*) were in the meadows. Many Small Wood Nymphs were there also among their host plants, the grasses. The late-flying Western Branded Skippers (*Hesperia colorado*) were hovering low, but the Pine Whites (*Neophasia menapia*) flew in their usual place, high in the ponderosa and lodgepole pine tree tops on August 30.

A new species was recorded for this area on August 30. Likely this Blue Copper (*Lycaena heteronea*) was blown from its usual habitat lower in elevation. Each season Ruddy Coppers (*L. rubidus*) continue to be located near the national forest fence of the North Bog. Swallowtails, both Anise (*Papilio zelicaon*) and Western Tiger (*P. rutulus*) were flying on this day.

In Reynold's Ranch (Giggey Lake) the Common Ringlet is a favorite butterfly, because it is so easily identified. It is mid-sized with a unique ochre-tan color, with a small single ringlet on the forward wing. On July 20, 2017, 18 were sighted within one hour. It appears that 2014 through 2016 were poor survival years for the Ringlet. In comparison, several years ago, in 2013, the Ringlet was celebrated as the most common butterfly in the county Open Space properties.

Reynold's Ranch is higher altitude and the property where the – Greenish Blue (*Plebejus saepiolus*) is found. The aspen groves surround Giggey Lake, where red clovers and milk vetches were common provided auspicious habitat. Some species, such as Boisduval's Blue were once relatively common in 2005 and are now relatively difficult to find. This is especially noted in Heil Valley (North Point) but was obvious in the Geer Watershed also. In the Southeast Buffer the Gray Hairstreak (*Strymon melinus*) were fewer this year. This was noticeable from 2013 through 2017. In 2007 and 2009 several of these butterflies were located each day in the Southeast Buffer.

We have failed to see the uncommon Silver-bordered Fritillaries (*Boloria selene*), since July 11, 2006. It was our hope to find that this species had established a colony in this unusually low-elevation marsh covered by cinquefoil shrubs. However, none have been seen since that date. Its violet hosts continue to grow there. It is likely that our inventories were not in the Bog at the auspicious time, since the adults may fly only for two weeks each season.

G. Caribou Ranch

Early in the season April 14, when the spring beauties blossom, the native White-lined Green Hairstreaks (*Callophrys sheridanii*) (10 individuals) emerge; Variegated Fritillaries (1) and Painted Ladies (2) migrate from the south. Green (*Polygonia faunus*) (1) and Hoary Commas (*P. gracilis*) (4) and Mourning Cloaks (7) share the sunlight as local emergent cohabiters. During 2017, Small Wood Nymphs were present in the greatest numbers (152). Queen Alexandra's Sulphurs (*Colias alexandra*) came in second at 150 individuals at Caribou Ranch. The Rocky Mountain Parnassian was unexpectedly low in numbers (9), and observed only on the June 11 and July 16 dates.

To the Caribou Ranch Open Space proper, were included the Bridge Meadow between Mud Lake and Caribou, and Sherwood Road. There seemed to be more moisture in the meadow than on the Caribou Trail and thus more blossoms. Blue Bird Mine has been inventoried several years, especially to re-locate the Purplish Copper (*Lycaena helloides*) which was found on July 21, and Northwestern Fritillary (*Speyeria hesperis*) on September 6. The Black Swallowtail (*Papilio polyxenes*) in Caribou, was one of only two individuals sighted this 2017 in the Open Spaces. These especially have been decimated by European Paper Wasps. The Common Buckeye (*Junonia coenia*) was recorded in this area for the first time. It is often found in late summer in Heil Valley (North), but not in these higher elevations. Perhaps a blast of wind carried it upward.

The numbers of Individuals per Research Hour (I/RH) was second lowest (at 29) in eleven years at Caribou Ranch in 2017. Even with the greatest number of Research Hours in 2017, the butterflies were just not present. Venice Kelly was in the field 26 Research Hours in 15

days from April to September. The first lowest number of individuals was in 2006 with only 24 I/RH. This is accounted for by only two inventories taken only August 30 and September 15, during six Research Hours.

Notice the great increase in I/RH in 2016. That year during 10 Research Hours were the greatest number of individuals ever recorded at Caribou (650). Queen Alexandra's Sulphurs the most numerous butterflies; (166) made up 12%, compared to all the individuals during 2017, (1,977). These natives were found only in two Open Space properties out of the nine investigated, Caribou Ranch and Reynold's Ranch.

H. Anne U. White

Anne U. White has been closed since the flood of September 2013. The butterfly inventory occurred only once in 2017 under the supervision of Ranger Amanda Hatfield. Continuity is important, but impossible at times. A comparison is shown in May 2014 (before the flood) when 11 species and 62 individual butterflies were counted. (Chart V- H, Anne U. White). In May 2017, some 25 species and 94 individuals were present. The most significant reason for more butterflies in 2017, we observe, is closure to the public and dogs. Previously it was heavily used with disturbances of the host and nectar plants. The Dusted Skippers (*Atrytonopsis hianna*) were seen in both years. These are listed in the Colorado Natural Heritage Watch List of rare species to be reported. A Dreamy Duskywing (*Erynnis icelus*), not seen previously in this canyon was found in 2017.

I. Steamboat Mountain

This property was visited only once during the 2017 survey season. The day was hot, at 87 degrees. Our access was hindered by a rock, which prevented the usual drive to the old ranch site. Ranger Amanda Hatfield accompanied some of the group to the top of the Steamboat Mountain. Pale (*P. eurymedon*) and Two-tailed Swallowtails (*P. multicaudata*) flew near the peak. Variegated and Aphrodite Fritillaries (*Speyeria aphrodite*) along with a Gorgone Checkerspot (*Chlosyne gorgone*) were active.

J. Painted Ladies

The unusual migration of the Painted Ladies were major events in April and September in the Boulder – Denver region. These were larger by far than the irruption in 2001 in the Front Range. The Ladies were widespread and observed by many people in towns and the lower Foothills. These are always migrant visitors in Colorado, sometimes raising a second brood. Scattered over seven Open Spaces, 11% of the butterfly individuals in 2017 were Painted Ladies (180 Painted Ladies out of 1,977 total number of individuals counted).

Excitement began in April. Unusually large numbers of these ladies were coming from the southwestern desert, especially Mohave Desert and Anza Borrego State Park, CA. These deserts had excessive moisture at the right time, and the largest bloom of flowers that had been seen in twenty years. This produced an inordinate amount of food for the Painted Lady caterpillars. More than 100 plants, especially thistles, mallows and legumes provided food for these voracious eaters. In mid-April the migration began and was noted especially in the Colorado Foothills.

“They seem to come fast from the west-southwest toward the east-northeast. Their pattern is not a straight line, but rather a zippy zigzag, not far above the ground. These are being seen north of Baseline Lake, Boulder.”³ More reports came in to the on-line magazine, Nature - Net, Boulder.

“I am at 8,100' to the East of Nederland, and there were flocks of the Painted Ladies surrounding me, when I was just out riding my bike. Up here, they appeared to be feeding on kinnikinnick, which already has a few blossoms. It was like a fairy tale riding through the thick groups of Painted Ladies!”⁴. Another came from butterfly researcher, Venice Kelly, “The Painted Ladies are all over Switzerland Trail and Peak to Peak Highway. I started seeing them yesterday and the numbers really increased today. I can't remember seeing so many before.”⁵.

“I just came back from Betasso Preserve where I am monitoring bluebird boxes. The Painted Ladies were everywhere at Betasso. I got good looks at many,” wrote Carol McCasland.⁶

Petrea Mah added, “I saw a large number of them at the Crestone Mountain Zen Center last week, 8,500 feet” ⁷. And finally well-known writer/naturalist, Robert Pyle added, “..... it’s a huge bloom year in the SW. Nectar abundance figures in one of the main hypotheses of the irruptions.” ⁸.

Following this migration were several days of state-wide hail, snow and extreme cold. Most local butterfly flight activity ceased. But in late summer the migration began again with sightings of Painted Ladies noticed all over the metro area. This was reported by several newspapers including the Daily Camera. Its front-page headline, “Flood of Painted Lady butterflies enriches late-summer palate. Unusually large migration produces ‘clouds’ of color.” “An unusually large number of Painted Ladies, has descended on Colorado's Front Range in recent weeks, feeding on flowers and sometimes flying together in what seem like clouds,” Paul Schlatter of the National Weather Service reported, October 3, 2017. Sarah Garrett, a lepidopterist at the Butterfly Pavilion in Westminster, Colorado, said, “People from as far away as the Dakotas have called to report seeing the butterflies, whose population typically surges with plentiful flowers. Research on the Painted Ladies in North America is limited, but in Europe, studies using radio tracking have shown they migrate south from Europe to Africa in the fall and return in the spring,” Garrett said. ⁷.

Hundreds were seen in seven of the nine Open Spaces during mid-September through October after the inventories ended. About forty reports came via Nature-Net Boulder from gardens. People were especially, noticing them nectaring. However, on the Switzerland Trail and Peak to Peak Highway September 19, a continuous swarm, all going west, was flying past for more than an hour, while we stood admiring the golden aspen. It has been generally thought that the U.S. individuals do not return to the desert, but survive here until the frost moistens their wings, followed by death.

Personal e-mails.:

³ Janet Chu. 2chuhouse2@gmail.com . April 15, 2017

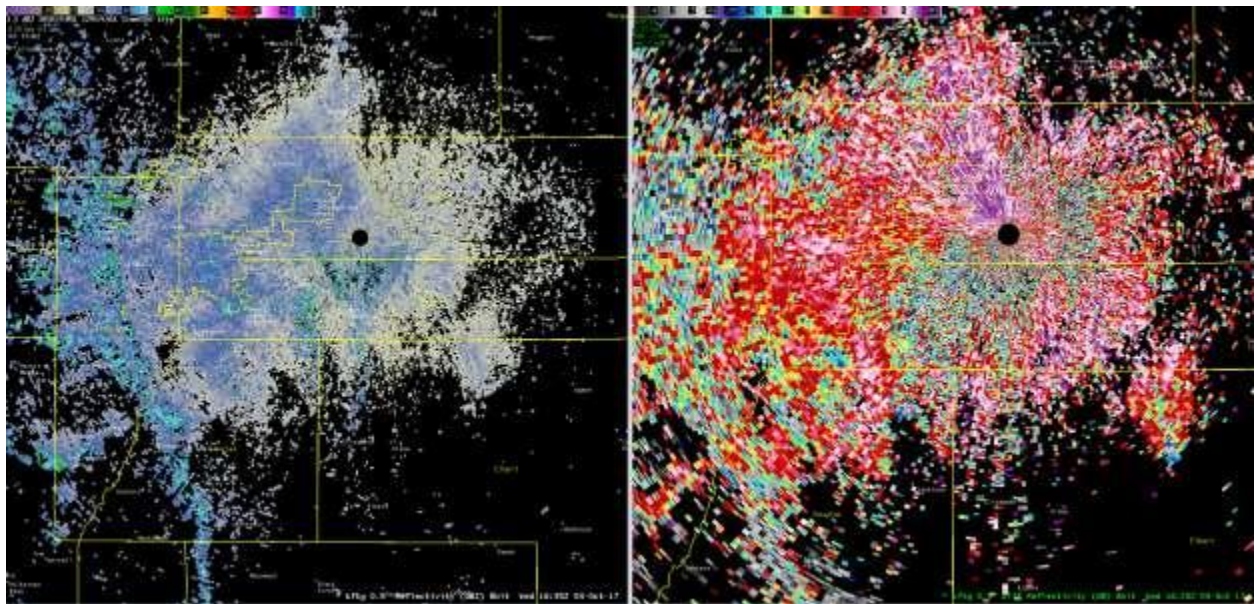
⁴. Claire Farley. clairetfarley@gmail.com. April 15, 2017

⁵ Venice Kelly. venicekelly555@gmail.com. April 15, 2017

⁶. Carol McCasland. carolmccasland@comcast.net . April 15, 2017

7. Petrea Mah. petreamah@comcast.net. April 15, 2017
8. Robert Pyle. tlpyle@willapabay.org. April 17, 2017
9. Daily Camera. Wednesday, September 20, 2017. p. 1A.
10. <http://www.msn.com/en-us/weather/topstories/massive-wave-of-butterflies-lights-up-denver-weather-radar/ar-AA5X2H9?li=BBnb7Kz>

Painted Ladies on Radar, October 3, 2017, Denver, CO.



70-mile wide wave of butterflies October 3, 2017

In this Oct. 3, 2017, radar images provided by the National Weather Service show a 70-mile-wide wave of butterflies a mile above the ground drifting northward across the Denver metro area. Forecasters say the photos show the way the radar detects the insects' shapes and direction of travel. © The Associated Press. ¹⁰

VII. Conclusion

Butterfly inventories have continued for up to 14 years on BCPOS properties. Twelve volunteer research associates spent 98 hours in the field during 50 days in 2017. Each recorded his/her data which has been compiled towards the creation of this report. These associates serve as extended arms for the County staff, observing and sharing up-to-the-minute-concerns.

These butterfly inventories should continue for the longer the data is collected, the more will be the confidence in trend lines. Variation from one year to the next requires diligent and continuous monitoring. This provides valuable data which can influence management decisions and register faunal changes. It can be available to correlate changes in species, populations and climate patterns.

VIII. Recommendations

A. Questions remain unanswered. Why is the Individuals per Research Hour declining for butterflies? Do these results coincide with state-wide, national and international reports?

*Butterfly inventories should continue in 2018.

B. Reopen (clean) the Frog Pond. This spring-fed pond is historically a fine habitat for butterflies, dragonflies and even herptiles. After the 2014 road repair, the drainage has flowed into the pond. The gravel-loaded wash filled the pond.

*Channel the road-fill onto the road and into the stream across the road.

IX. Data Tables - Follow on pages 19-52.

A. Southeast Buffer

Southeast Buffer	2017	5-5	5-5	5-29	9-6
<i>Papilio polyxenes</i>	Black Swallowtail		1		
<i>P. zelicaon</i>	Anise Swallowtail	1			
<i>P. rutulus</i>	W. Tiger Swallowtail				
<i>P. multicaudata</i>	Two-tailed Swallowtail				
<i>Pontia protodice</i>	Checkered White			1	1
<i>P. occidentalis</i>	Western White				
<i>Pieris rapae</i>	Cabbage White				3
<i>Euchloe olympia</i>	Olympia Marble	2	1	2	
* <i>E. ausonides</i>	Large Marble			1	
white sp.		5	1	11	
<i>Colias philodice</i>	Clouded Sulphur				5
<i>C. eurytheme</i>	Orange Sulphur				6
sulphur sp.			6		
<i>Zerene cesonia</i>	Southern Dogface				
<i>Abaeis nicippe</i>	Sleepy Orange				
<i>Kricogonia lyside</i>	Lyside Sulphur				
<i>Nathalis iole</i>	Dainty Sulphur				
<i>Lycaena dione</i>	Gray Copper				
<i>Strymon melinus</i>	Gray Hairstreak				
<i>Cupido amyntula</i>	W. Tailed-blue				
<i>Glaucopsyche lygdamus</i>	Silvery Blue	2	1	5	
<i>Euphilotes ancilla</i>	Rocky Mtn. Dotted-Blue				
<i>Echinargus isola</i>	Reakirt's Blue				
<i>Plebejus melissa</i>	Melissa Blue				
blue sp.		6	7		
<i>Danaus plexippus</i>	Monarch				3
<i>Agraulis vanilla</i>	Gulf Fritillary				
<i>Euptoieta claudia</i>	Variegated Fritillary	2		2	
<i>Speyeria aphrodite</i>	Aphrodite Fritillary				
<i>S. edwardsii</i>	Edwards' Fritillary				
fritillary sp.					6
<i>Chlosyne fulvia</i>	Fulvia Checkerspot				
<i>C. gorgone</i>	Gorgone Checkerspot			1	
<i>Phyciodes tharos</i>	Pearl Crescent				
<i>P. pulchella</i>	Field Crescent			6	
<i>Aglaia milberti</i>	Milbert's Tortoiseshell				
<i>Nymphalis antiopa</i>	Mourning Cloak	1			
<i>Vanessa cardui</i>	Painted Lady		1		11
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral				
<i>Coenonympha tullia ochracea</i>	Common(Ochre) Ringlet		1		
<i>Cercyonis pegala</i>	Common Wood Nymph				
<i>Erynnis aفرانيوس</i>	Aفرانيوس Duskywing				
<i>E. persius</i>	Persius Duskywing				
<i>Pyrgus communis</i>	Common Checkered-skipper		1		5
<i>Pyrgus scriptura</i>	Small Checkered-skipper				
<i>Pholisora catullus</i>	Common Sootywing				
<i>Hesperia uncas</i>	Uncas Skipper				

Southeast Buffer	2017	5-5	5-5	5-29	9-6
<i>H. ottoe</i>	Ottoe Skipper				
<i>H. leonardus</i>	Leonard's Skipper				12
<i>Atrytone arogos</i>	Arogos Skipper				
<i>Anatrytone logan</i>	Delaware Skipper				

Date, Conditions	Location within Southeast Buffer	Butterfly Activity	Blossoming Plants	Animals	Researcher
5-5-2017 10:25 – 12:15 p.m. 19-21°C 99% blue, wind 2-12 mph 2 hrs.	Hwy 128 gate to Swallowtail Hill	Very little; Zelicaon on Swallowtail Hill	All flowers very short Dandelion Dandelion wavy-leaf Deer clover, tiny purple Erigeron Evening primrose-yellow Filary Flax Grass white-eyed? Green gentian Harebell Lambert's loco Miner's candle Musineon Nuttall's violet Paintbrush, white Penstemon purple salt & pepper Sand lily Senecio Wall flower Wall flower	Grackle Meadowlark Turkey vulture Vesper Sparrow	Larry Crowley Jan Chu Amy Chu Ron Butler
5-5-2017 2.5 hrs.	Rock Creek, thru 2 locked gates		Arnica Ball cactus, yellow Biscuitroot Crane's Bill- Filaree Dandelion – false Dandelion Wavy Leaf Erigeron -fleabane Evening Primrose -yellow Flax, blue Golden Banner Mertensia Pea vetch, purple Salt and Pepper	Blackbirds, red-wing Mallard Meadowlark Mourning Dove Red-tail hawk Sparrow, chipping Sparrow, lark Sparrow. Song Starling Turkey Vulture <i>Tyta luctuosa</i> (introduced to control bindweed)	Dan Fosco Chuck Lowry Janet Hanley

5-29-2017 10:30-12:00 p.m. 19°C sunny to cloudy, wind 5- 20 mph 1.5 hrs	Hwy 128 to Swallowtail Hill	Few	All short, small, few Allium sp. Blue bell Blue Flag Butter and Eggs Castilleja yellow-pink Daisies, spreading Evening primrose Loco/vetch pea sp.- white, pink, blue, hot pink Mouse-ear Musineon Penstemon v. Penstemon, one-sided Pussy toe Salsify Senecio sp. Sunflower little Yarrow, white	Great horned owl Coyote pup Garter snake, plains T. radix	Dan Fosco Amy Chu Jan Chu
9-6-2017 10:00-12:15 p.m. 20-24°C Clear blue sky, smoky; wind 5-10 mph 2 hrs	Southeast Buffer from Hwy 128 gate to Swallowtail Hill	Butterflies scarce except for skippers		Eagle, golden Kestrel Meadowlark Sparrow, Vesper	Amy Chu Jan Chu Larry Crowley WynneWhyman

A. Southeast Buffer (Cont.)

Southeast Buffer	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
# of Species identified during the year in SE Buffer	25	20	21	24	19	18	20	15	23	13	16
# Species 2007-2017 sighted in Southeast Buffer	21	23	33	37	41	44	44	44	46	46	47
Research Hours on Site	5	21	9	7.7	11.5	9	12	8	12	4.5	8
# Individual Butterflies Counted	256	373	353	443	160	227	169	178	294	121	119
# Individuals / Research Hour	51	18	39	40	14	25	14	22	24.5	27	15
# Species / Research Hour	5	0.9	2	3	2	2	1.6	2	2	3	2

B. Heil Valley (Geer Watershed)

Heil Valley Geer Watershed	2017	3/19	4/8	4/13	5/22	6/11	6/26	7/2	7/9	7/18	7/25	8/10
<i>Papilio polyxenes</i>	Black Swallowtail											
<i>P. zelicaon</i>	Anise Swallowtail											
<i>P. indra</i>	Indra Swallowtail					1ph						
<i>P. rutulus</i>	Western Tiger Swallowtail											
<i>P. eurymedon</i>	Pale Swallowtail					7		3	6	3	1	
<i>P. multicaudata</i>	Two-tailed Swallowtail					1		1			1	
swallowtail yel sp.									1	2		
<i>Neophasia menapia</i>	Pine White										1	
<i>Pontia sisymbrii</i>	Spring White											
<i>P. protodice</i>	Checkered White								2			
<i>P. occidentalis</i>	Western White			2								
<i>Pieris rapae</i>	Cabbage White	1	3	4			2				49	
<i>P. marginalis</i>	Mustard White											
<i>Euchloe ausonides</i>	Large Marble			2	2							
<i>E. olympia</i>	Olympia Marble											
<i>Anthocharis sara julia</i>	Julia Orangetip			8								
white sp.			3	14	1	9		9	20	19		64
<i>Colias philodice</i>	Clouded Sulphur											
<i>C. eurytheme</i>	Orange Sulphur											2
<i>C. alexandra</i>	Queen Alexandra's Sulphur											
* <i>C. cesonia</i>	Southern Dogface									2ph		1
<i>Eurema mexicana</i>	Mexican Sulphur											
<i>Nathalis iole</i>	Dainty Sulphur											
sulphur sp.								11	5	2	1	14
<i>Lycaena dione</i>	Gray Copper											
<i>L. heteronea</i>	Blue Copper											
<i>Callophrys affinis homoperplexa</i>	Canyon Bramble Hairstreak				1	1						
<i>C. gryneus</i>	Siva Juniper Hairstreak											
<i>C. augustinus</i>	Brown Elfin											
<i>C. eryphon</i>	Western Pine Elfin			8								
elfin sp.												
<i>Satyrrium titus</i>	Coral Hairstreak											
<i>S. liparops</i>	Striped 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											
<i>Celastrina ladon sidara</i>	Echo Azure		1			2						
<i>Glaucopsyche piasus</i>	Arrowhead Blue					2						
<i>G. lygdamus</i>	Silvery Blue				4	5						
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue											
<i>Echinargus isola</i>	Reakirt's Blue											
<i>Plebejus melissa</i>	Melissa Blue						1ph					
<i>P. saepiolus</i>	Greenish Blue											
<i>P. icarioides</i>	Boisduval's Blue					1			2	1		
<i>P. lupini lutzi</i>	Lupine Blue											
<i>P. glandon rustica</i>	Arctic Blue											
blue sp.						16	4	2	2			
<i>Danaus plexippus</i>	Monarch											

Heil Valley Geer Watershed	2017	3/19	4/8	4/13	5/22	6/11	6/26	7/2	7/9	7/18	7/25	8/10
<i>Apodemia nais</i>	Nais Metalmark											
<i>Euptoieta claudia</i>	Variegated Fritillary										1	
<i>Speyeria aphrodite</i>	Aphrodite Fritillary								2	4	2	2
<i>S. edwardsii</i>	Edwards' Fritillary											
<i>S. coronis</i>	Coronis Fritillary											
<i>S. callippe</i>	Callippe Fritillary											
<i>S. hesperis</i>	Northwestern Fritillary											
<i>S. mormonia</i>	Mormon Fritillary											
fritillary sp.								6	23	10	7	6
<i>Chlosyne gorgone</i>	Gorgone Checkerspot											
<i>C. nycteis</i>	Silvery Checkerspot											
<i>C. palla</i>	Northern Checkerspot											
<i>Phyciodes pallida</i>	Pale Crescent											
<i>P. tharos</i>	Pearl Crescent											
<i>P. cocyta</i>	Northern Crescent											
<i>P. pulchella</i>	Field Crescent											
<i>Polygonia satyrus</i>	Satyr Comma											
<i>P. gracilis</i>	Hoary Comma		8	4								
<i>Junonia coenia</i>	Common Buckeye											
<i>Aglais milberti</i>	Milbert's Tortoiseshell		1	1								
<i>Nymphalis antiopa</i>	Mourning Cloak	2	1	1								
<i>N. californica</i>	California Tortoiseshell											
<i>Vanessa atalanta</i>	Red Admiral											
<i>V. cardui</i>	Painted Lady			2		2		1	2		3	2
<i>V. virginiensis</i>	American Lady											
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral											
<i>Asterocampa celtis</i>	Hackberry Emperor											
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet				2	9	3	1	3			
<i>Cercyonis pegala</i>	Common Wood-Nymph							5	35	77	51	13
<i>C. oetus</i>	Small Wood-Nymph											
<i>Erebia epipsodea</i>	Common Alpine											
<i>Oeneis chryxus</i>	Chryxus Arctic											
<i>O. uhleri</i>	Uhler's Arctic											
<i>Epargyreus clarus</i>	Silver-spotted Skipper					5	1	4	5	2		
<i>Thorybes pylades</i>	N. Cloudywing											
<i>Erynnis icelus</i>	Dreamy Duskywing											
<i>E. pacuvius</i>	Pacuvius Duskywing				1	2						
<i>E. afranius</i>	Afranius Duskywing											
<i>E. persius</i>	Persius Duskywing										1	
<i>Pyrgus communis</i>	Common Checkered-skipper											
<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. colorado</i>	Western 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								1			
<i>Atrytonopsis hianna</i>	Dusted Skipper											
skipper sp.						1		2		2		

B. Heil Valley (Geer Watershed)

Date, Conditions Heil Valley - Geer Watershed	Location within Heil - Geer	Butterfly Activity	Blossoming Plants	Animals	Researchers
3/19/2017 1:00-2:00 1hr	Parking near barn, little cabin over the south ridge	Very little		Bob cat	Larry and Scott Crowley Betty Parks
4/8/2017 10:30-12:00 21°C, 5- 20 mph wind 40% clouds 1 ½ hr.	From Barn to large circle northwest– west – east and ½ mi toward gate	Very few; new cabbage and echo azure.	Dandelions; Nuttall’s violet, dandelion, wavy leaf Mahonia, sand lily, spring beauty, pasque, wall flower:	Mtn bluebird Raven Red-tail hawks Turkey vulture Turkeys Coyote Chorus frogs	John Barr Amy Chu Jan Chu Cathy Cook Larry Crowley Dan Fosco Venice Kelly Wynne Whyman
4/13/2017 2 hrs	The road to Manager’s cabin.		Wild plum	Am Crow Chickadee black-cap Flicker Jay, Scrub Jay, Steller’s Junco Meadowlark Pygmy nuthatch Red-tailed hawk Townsend’s solitaire	Pam Piombino
5/22/2017 Cool, breezy, patches of snow, vegetation flattened by snow 2hr 15 min	Heil Meadow, Bluebird Trail, Sue Olmsted’s	Few butterflies			Sue Hirschfeld
6/11/2017 9:00–12:45 p.m. 17°C to 25°C, overcast, clouds and sun 3 hr 45 min	Heil Meadow, Bluebird Trail, Sue Olmsted’s				Sue Hirschfeld
6/26/2017 10:11-11:30 15-18°C, clouds to sun 2 ½ hrs.	Geer Meadow				Sue Hirschfeld
7/2/2017 2 ½ hrs.					Sue Hirschfeld
7/9/2017 23-35 °C Clear sky, no wind 2 ½ hrs.	Heil Geer Meadow Sue Olmsted’s bluebird trail.	Wood Nymphs and Fritillaries most common			Sue Hirschfeld
7/18/2017 8:45-11:45 a.m. 28 °C 3 hrs.	Heil Geer Meadow along Sue Olmsted’s bluebird trail.				Sue Hirschfeld
7/25/2017 9:15-11:30 a.m. 27-33-°C	Bluebird Trail crossing Geer	Most of the time no butterflies			Sue Hirschfeld

Date, Conditions Heil Valley - Geer Watershed	Location within Heil - Geer	Butterfly Activity	Blossoming Plants	Animals	Researchers
Cloudy with drizzle; still to light breeze. 2 hrs. 15 min	Meadow	flying. Worn Persius, Variegated Fritillary			
8/10/2017 17-23 °C - 11:30a.m. Clear, calm, light breeze 2hr 15 min	Heil Meadow	Whites concentrated in Canada Thistle at large culvert below road headed west.			Sue Hirschfeld

B. Heil Valley (Geer Watershed)

Heil Valley (Geer Watershed)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
# of Species Identified Annually in Geer Watershed	42	56	44	49	36	38	38	42	22	43	30
Cumulative # of Species Sighted in Geer Watershed 2007-2017	81	87	90	91	91	91	91	92	92	92	93
Research Hours at Site	15.5	21	12.5	14	14	10	11	18	11	10	21
# Individual Butterflies Counted	569	1225	492	419	436	530	264	738	200	488	628
# Individuals / Research Hour	37	58	39	30	31	53	24	41	18	29	39
# Species / Research Hour	2.7	2.7	3.5	3.5	2.6	3.8	3.5	2.3	2	4.3	1.4

C. Heil Valley (North – North Pointe, Red Gulch)

Heil Valley Ranch North Pointe, Red Gulch,	2017	4/14	4/18	6/11	6/13
<i>Papilio polyxenes</i>	Black Swallowtail				
<i>P. zelicaon</i>	Anise Swallowtail				
<i>P. indra</i>	Indra Swallowtail				
<i>P. rutulus</i>	Western Tiger Swallowtail				3
<i>P. eurymedon</i>	Pale Swallowtail				2
<i>P. multicaudata</i>	Two-tailed Swallowtail			1	6
swallowtail yel.			1	4	

<i>Neophasia menapia</i>	Pine White				
<i>Pontia protodice</i>	Checkered White			1	1
<i>P. occidentalis</i>	Western White				
<i>P. sisymbrii</i>	Spring White				
<i>Pieris rapae</i>	Cabbage White	4	15		
white sp.		8	2	5	1
<i>Euchloe ausonides</i>	Large Marble	3			1
<i>E. olympia</i>	Olympia Marble				
<i>Anthocharis sara julia</i>	Julia Orangetip				
<i>Colias philodice</i>	Clouded Sulphur		1		
sulphur sp.					
<i>C. eurytheme</i>	Orange Sulphur				1
<i>C. alexandra</i>	Queen Alexandra's Sulphur				
<i>Nathalis iole</i>	Dainty Sulphur				
<i>Lycaena dione</i>	Gray Copper				
<i>Lycaena heteronea</i>	Blue Copper				
<i>L. helloides</i>	Purplish Copper				
<i>Callophrys affinis</i>	Canyon Green Hairstreak				
<i>C. gryneus</i>	Siva Juniper Hairstreak				
<i>C. eryphon</i>	Western Pine Elfin				
elfin sp.		3			
<i>Satyrium behrii</i>	Behr's Hairstreak				
<i>S. titus</i>	Coral Hairstreak				
<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>	Echo (Spring) Azure		2		
<i>Glaucopsyche piasus</i>	Arrowhead Blue				1
<i>G. lygdamus</i>	Silvery Blue	1	4		3
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-blue				2
<i>Euphilotes ancilla barnesi</i>	ssp. RM Dotted-blue ID -Opler				
<i>Echinargus isola</i>	Reakirt's Blue				1
<i>Plebejus melissa</i>	Melissa Blue				9
<i>P. icarioides</i>	Boisduval's Blue				2
<i>P. lupini lutzi</i>	Lupine Blue				
<i>P. glandon rustica</i>	Arctic Blue				
blue sp.			1		4
<i>Danaus plexippus</i>	Monarch			1	
<i>Limenitis archippus</i>	Viceroy				
<i>Libytheana carinenta</i>	American Snout				
<i>Euptoieta claudia</i>	Variegated Fritillary		1	2	10
<i>Speyeria aphrodite</i>	Aphrodite Fritillary				4
<i>S. edwardsii</i>	Edwards' Fritillary				
<i>S. coronis</i>	Coronis Fritillary				
<i>S. callippe</i>	Callippe Fritillary				
<i>S. hesperis</i>	Northwestern Frit				
<i>S. mormonia</i>	Mormon Fritillary				
fritillary sp.					2
<i>Euphydryas anicia</i>	Variable Checkerspot				
<i>Chlosyne gorgone</i>	Gorgone Checkerspot				2
<i>C. nycteis</i>	Silvery Checkerspot				
<i>C. palla</i>	Northern Checkerspot				
<i>Phyciodes pallida</i>	Pale Crescent				
<i>P. tharos</i>	Pearl Crescent				
<i>P. cocyta</i>	Northern Crescent				2
<i>P. pulchella</i>	Field Crescent			1	1
<i>Polygonia satyrus</i>	Satyr Comma				
<i>P. gracilis</i>	Hoary Comma	2	3		
<i>Nymphalis antiopa</i>	Mourning Cloak	10	2		
<i>Junonia coenia</i>	Buckeye, Common				
<i>N. californica</i>	California Tortoiseshell		1		
<i>Vanessa atalanta</i>	Red Admiral			2	5

North Pointe, Red Gulch, Heil Valley Ranch	2017	4/14	4/18	6/11	6/13
<i>V. cardui</i>	Painted Lady	2	11	12	4
<i>V. virginensis</i>	American Lady				
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral			3	1
<i>Asterocampa celtis</i>	Hackberry Emperor				
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet				12
<i>Cercyonis pegala</i>	Common Wood-Nymph				
<i>C. oetus</i>	Small Wood-Nymph				
<i>Erebia epipsodea</i>	Common Alpine				
<i>Epargyreus clarus</i>	Silver-spotted Skipper			2	1
<i>Erynnis afranius</i>	Afranius Duskywing				
<i>E. pacuvius</i>	Pacuvius Duskywing				
<i>E. persius</i>	Persius Duskywing				
<i>E. icelus</i>	Dreamy Duskywing				
<i>Pyrgus communis</i>	Common Checkered-skipper				3
<i>Pholisora catullus</i>	Common Sootywing				
<i>Piruna pirus</i>	Russet Skipperling				2
<i>Oarisma garita</i>	Garita Skipperling				
<i>Hesperia juba</i>	Juba Skipper				1ph
<i>H. colorado</i>	W. Branded 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				
<i>Ochlodes sylvanoides</i>	Woodland Skipper				
<i>Poanes taxiles</i>	Taxiles Skipper				
<i>Euphyes vestries</i>	Dun Skipper				2
<i>Atrytonopsis hianna</i>	Dusted Skipper				
skipper sp.					2?

C. Heil Valley (North – North Pointe, Red Gulch) (Con't)

Date, Conditions	Location	Butterfly Behavior	Blossoming Plants	Animals	Researchers
4/14/2017 11:00-12:15 p.m. 16-21 °C, Sunny blue, 0-5 mph wind 1hr15min	North Pointe to pond		Flowers were sparse. Dandelion Erigeron, white Filary Flax Golden banner Mertensia Wild plum	Am Goldfinch Broad-tailed humming brown creeper canyon wren jay scrub Jay Steller's meadowlark mourning dove raven r-cr kinglet red-tailed hawks robin. rock wren spotted towhee Turkey vulture yel-br chat	Amy Chu Chuck Lowry Jan Chu Larry Crowley Pam Piombino

4/18/2017 10:45 – 12:00 p.m. 13-19 °C, sky 90% clouds, high overcast, wind 0-15mph 1hr 15min	Red Gulch, dry 'streamlet' thru Ron LaFollette's property	Slow, sluggish (cold)	Dandelion Milk vetch Nuttall's violet Purple mustard Sand lily	Golden Eagle Magpie Bull snake (largest Cathy Cook had seen)	Amy Chu Jan Chu Janet Hanley Larry Crowley Venice Kelly
6/11/2017 8:30 a.m.- noon, 17-21°C, Mostly clouds, no breeze 3 ½ hrs.	To the trail fork above large pond	Ninebark attracted Ladies, spotted skipper and admirals	Allium sp. Arnica CO Ninebark shrub Daisy, fleabane sp Flax Gaura Globe Mallow Ground Cherry- Quincula lobate Heterotheca sp. Locos Mouse Ear Penstemon grandiflora Penstemon, virens Prickly Poppy Primrose, yel Scorpion weed Spiderwort Sulfur flower Thistle sp. Verbena ambrosifolia ? Wall flower Yucca	Hummingbird, Brdtd Gnatcatcher, blu-gr Jay, scrub Towhee, spotted Lazuli Bunting Hawk Red-tail Wren, canyon Wren, rock Wren, House Yellow br chat W. Chorus Frog - tadpoles Woodhouse Toad. Dragonflies – Variegated Meadowhawk, 12-sp. skimmer Darners, Widow skimmers Underwing moth	Dan Fosco Jim Scott
6/13/2017 10:00-12:30 p.m. 18- 24 °C, clear to cloudy, wind 5-22 mph 1 ½ hrs	Red Gulch, wet 'streamlet' thru Ron La Follette's	Vivid dancer 12 spotted Variegated Skimmer- Dragonflies	Briton's skull cap Cranes bill Filaree Daisy, spreading Flax, Blue Geranium, Frem Gaillardia Gaura, scarlet Lily mariposa Loco weed Loco, white Marble seed Mustard, Blue Penstemon one-si Prickly poppy Salsify Spiderwort Townsendia daisy Yucca	House Wren Am. Goldfinch Woodhouse Toad	Chuck Lowry Jan Chu Janet Hanley Jean Morgan Venice Kelly John Barr Lynn, Gene Monroe Sue Hirschfield

C. Heil Valley (North – North Pointe, Red Gulch)

# of Species Identified During Each Year in Heil-North	34	45	41	40	33	24	30	50	38	31	33
Cumulative # Species 2007-2016 Sighted in Heil-North	50	62	77	81	81	85	86	89	90	91	91
Research Hours on Site	8	17	12.5	11.5	11.5	6.5	12	27	32	13	7.5
# Individual Butterflies Counted	579	654	488	429	272	188	402	1077	508	246	204
# Individuals / Research Hour	72	38	39	37	24	29	36	40	16	19	27
# Species / Research Hour	4	2.6	3.3	3.4	2.9	3.6	2.5	1.9	1.2	2.4	4.4

D. Heil Valley (Plumely Canyon)

Heil Valley – Plumely Canyon	2017	5/16	7/28
<i>Papilio polyxenes</i>	Black Swallowtail		
<i>P. zelicaon</i>	Anise Swallowtail		
<i>P. indra</i>	Indra Black Swallowtail	2	
<i>P. rutulus</i>	Western Tiger Swallowtail		
<i>P. eurymedon</i>	Pale Swallowtail	1	
<i>P. multicaudata</i>	Two-tailed Swallowtail	2	1
swallowtail, black			1
swallowtail, yellow			10
<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	11
<i>P. marginalis</i>	Mustard White		
<i>Euchloe ausonides</i>	Large Marble	6	
<i>E. olympia</i>	Olympia Marble		
<i>Anthocharis sara julia</i>	Julia Orangetip	2	
white sp.		22	5
<i>Colias philodice</i>	Clouded Sulphur		
<i>C. eurytheme</i>	Orange Sulphur		6
<i>C. alexandra</i>	Queen Alexandra's Sulphur		
<i>Zerene cesonia</i>	Southern Dogface		1
<i>Phoebis sennae eubule</i>	Cloudless Sulphur		
<i>Eurema mexicana</i>	Mexican Sulphur		
<i>Nathalis iole</i>	Dainty Sulphur		
sulphur sp.			5
<i>Lycaena dione</i>	Gray Copper		
<i>C. mossii schryveri</i>	Moss's Elfin		
<i>C. polios</i>	Hoary Elfin		
<i>C. eryphon</i>	Western Pine Elfin	2	
<i>Callophrys affinis homoperplexa</i>	Canyon Bramble Hairstreak		
<i>C. sheridanii</i>	White-lined Green Hairstreak		
<i>C. gryneus</i>	Siva Juniper Hairstreak		
<i>Satyrrium titus</i>	Coral Hairstreak		
<i>Strymon melinus</i>	Gray Hairstreak		1
<i>Leptotes marina</i>	Marine Blue		
<i>Cupido amyntula</i>	Western Tailed-Blue	6	
<i>Celastrina ladon sidara</i>	Echo Azure	6	
<i>C. humulus</i>	Hops Azure		1
<i>Glaucopsyche piasus</i>	Arrowhead Blue	2	
<i>G. lygdamus</i>	Silvery Blue	87	
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue		
<i>Echinargus isola</i>	Reakirt's Blue		3
<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.		37	1
<i>Danaus plexippus</i>	Monarch		1
<i>Euptoieta claudia</i>	Variegated Fritillary	1	8
<i>Speyeria aphrodite</i>	Aphrodite Fritillary		6
<i>S. edwardsii</i>	Edwards' Fritillary		
<i>S. callippe</i>	Callippe Fritillary		
<i>S. atlantis</i>	Atlantis Fritillary		
<i>S. hesperis</i>	Northwestern Fritillary		4
fritillary sp.			21
<i>Polydryas arachne</i>	Arachne Checkerspot		

Heil Valley – Plumely Canyon	2017	5/16	7/28
<i>Chlosyne gorgone</i>	Gorgone Checkerspot		
<i>C. palla</i>	Northern Checkerspot		
<i>Phyciodes pallida</i>	Pale Crescent		
<i>P. tharos</i>	Pearl Crescent		
<i>P. cocyta</i>	Northern Crescent		
<i>P. pulchella</i>	Field Crescent		
crescent sp.			1
<i>Polygonia interrogationis</i>	Question Mark		
<i>P. gracilis</i>	Hoary Comma	7	
<i>Aglaia milberti</i>	Milbert's Tortoiseshell		
<i>Nymphalis antiopa</i>	Mourning Cloak	1	
<i>N. californica</i>	California Tortoiseshell		
<i>Vanessa atalanta</i>	Red Admiral		
<i>V. cardui</i>	Painted Lady	3	7
<i>V. virginiensis</i>	American Lady		
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral		3
<i>L. archippus</i>	Viceroy		
<i>Asterocampa celtis</i>	Hackberry Emperor		
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet	31	
<i>Cercyonis pegala</i>	Common Wood-Nymph		29
<i>C. oetus</i>	Small Wood-Nymph		
<i>Erebia epipsodea</i>	Common Alpine		
<i>Epargyreus clarus</i>	Silver-spotted Skipper		
<i>Thorybes pylades</i>	N. Cloudywing		
<i>Erynnis pacuvius</i>	Pacuvius Duskywing	1	
<i>E. afranius</i>	Afranius Duskywing		
<i>E. persius</i>	Persius Duskywing		
<i>Pyrgus communis</i>	Common Checkered-skipper		
<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. colorado</i>	Western Branded Skipper		
<i>H. pahaska</i>	Pahaska 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		
<i>Atrytonopsis hianna</i>	Dusted skipper		

D. Heil Valley (Plumely Canyon)

Date, Conditions	Location leading into Heil-Plumely	Butterfly Activity	Blossoming Plants	Animals	Researchers
5/16/2017 10:00 - 12:30 p.m. 16-18 °C 85% clear to dark clouds. 10-15 mph wind 2hrs 30 min	From first locked gate to second. Walked streambed.	Mating Silvery Blues. Flight close to the ground; puddling.	Very few Blossoms Bindweed Black medic Choke cherry Dandelion Erigeron Flax Golden banner Lupine Milk Vetch Mouse ear Mtn Parsley Oxalis Penstemon, 2 sided	Broad-tailed hummingbird Crow. Raven Robin Towhee, spotted Rock Squirrel Bull snake	Amy Chu Chuck Lowry Jan Chu Jean Morgan John Barr Larry Crowley Sue Hirschfeld Venice Kelly
7/28/2017 10:30-1:30 p.m. 26 °C mostly sunny. 3 hrs.	Plumely Canyon road was washed out leading up into the forest.	Monarch chased by Fritillary. Creek was dry except for few wet spots up canyon – Cabbages and Frits in wet areas.			Dan Fosco Sue Hirschfeld

D. Heil Valley (Plumely Canyon)

Heil Valley – Plumely Canyon	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
# of Species Identified Each Year in Plumely Canyon	45	37	44	36	44	41	48	33	38	18	27
Cumulative # Species 2007-2017 sighted in Plumely Canyon	81	81	82	84	86	88	89	89	89	90	90
Research Hours on Site	8	13	17	6.5	18	7.5	16	8	16	7	5.5
# Individual Butterflies Counted	365	480	401	196	526	342	470	479	310	162	348
# Individuals / Research Hour	45	36	24	30	29	46	29	60	19	23	63
# Species / Research Hour	5.6	2.8	2.6	5.5	2.4	5.4	3.0	4.1	2.3	2.6	4.9

E. Walker Ranch

Walker Ranch Meyer's Homestead And Loop Trails	2017	3/29	4/12	5/4	6/6	6/6
<i>Parnassius smintheus</i>	Rocky Mountain Parnassian					
<i>Papilio polyxenes</i>	Black Swallowtail					
<i>P. zelicaon</i>	Anise Swallowtail					
<i>P. indra</i>	Indra Swallowtail				1	
<i>P. rutulus</i>	Western Tiger Swallowtail					1
<i>P. eurymedon</i>	Pale Swallowtail				7	4
<i>P. multicaudata</i>	Two-tailed Swallowtail				1	
<i>Neophasia menapia</i>	Pine White					
<i>Pontia protodice</i>	Checkered White					
<i>P. sisymbrii</i>	Spring White		1			
<i>Pieris rapae</i>	Cabbage White					
white sp.			2	7	5	4
<i>Euchloe ausonides</i>	Large Marble					1
marble sp.				1		
<i>Anthocharis sara julia</i>	Julia Orangetip		1			
<i>Colias philodice</i>	Clouded Sulphur					
<i>C. eurytheme</i>	Orange Sulphur				1	
<i>C. alexandra</i>	Queen Alexandra's Sulphur					
<i>Nathalis iole</i>	Dainty Sulphur					
sulphur sp.				1	1	3
<i>Lycaena heteronea</i>	Blue Copper					
<i>Satyrrium saepium</i>	Hedgerow Hairstreak					
<i>Callophrys affinis</i>	Canyon Bramble Hairstreak			8	17	40+
<i>C. sheridanii</i>	White-line Green Hairstreak	8	11	2		
<i>C. gyrneus siva</i>	Siva Juniper Hairstreak					1
<i>C. spinetorum</i>	Thicket Hairstreak		1			1
<i>C. augustinus</i>	Brown Elfin		5			
<i>C. polios</i>	Hoary Elfin		10	7		
<i>C. mossii schryveri</i>	Moss' Elfin			1		
<i>C. eryphon</i>	Western Pine Elfin					
elfin sp.				7		
<i>Strymon melinus</i>	Gray Hairstreak					
<i>Cupido amyntula</i>	Western Tailed-Blue				1	1
<i>Celestrina ladon sidara</i>	Echo Azure		1	5	1	
<i>Glaucopsyche piasus</i>	Arrowhead Blue					
<i>G. lygdamus</i>	Silvery Blue			5	15	1
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue					2
<i>Echinargus isola</i>	Reakirt's Blue					
<i>Plebejus melissa</i>	Melissa Blue					
<i>P. saepiolus</i>	Greenish Blue					
<i>P. icarioides</i>	Boisduval's Blue					
<i>P. lupini lutzi</i>	Lupine Blue					
<i>Agriades glandon rustica</i>	Arctic Blue		2			
blue sp.				7	5	5
<i>Danaus plexippus</i>	Monarch					
<i>Apodemia nais</i>	Nais Metalmark					
<i>Euptoieta claudia</i>	Variegated Fritillary				2	
<i>Speyeria aphrodite</i>	Aphrodite Fritillary					
<i>S. edwardsii</i>	Edwards' Fritillary					
<i>S. callippe</i>	Callippe Fritillary					
<i>S. hesperis</i>	Northwestern Fritillary					
<i>S. mormonia</i>	Mormon Fritillary					
fritillary sp.						
<i>Chlosyne gorgone</i>	Gorgone Checkerspot					10
<i>C. nycteis</i>	Silvery Checkerspot					

Walker Ranch Meyer's Homestead And Loop Trails	2017	3/29	4/12	5/4	6/6	6/6
<i>C. palla</i>	Northern Checkerspot					
<i>Phyciodes cocyta</i>	Northern Crescent			1		1
<i>P. pulchella</i>	Field Crescent					1
<i>Phyciodes pallida</i>	Pale Crescent					
<i>Polydrias arachne</i>	Arachne Checkerspot					
<i>Euphydryas anicia</i>	Variable Checkerspot					
<i>Polygonia satyrus</i>	Satyr Comma					
<i>Polygonia gracilis</i>	Hoary Comma		7	7	1	
<i>Aglais milberti</i>	Milbert's Tortoiseshell					
<i>Nymphalis antiopa</i>	Mourning Cloak		4	2		
<i>N. californica</i>	California Tortoiseshell			1		
<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					
<i>Coenonympha tullia ochracea</i>	Common (Ochre) Ringlet				18	8
<i>Cercyonis pegala</i>	Common Wood Nymph					
<i>C. oetus</i>	Small Wood Nymph					
<i>Erebia epipsodea</i>	Common Alpine					
<i>Oeneis chryxus</i>	Chryxus Arctic					
<i>O. uhleri</i>	Uhler's Arctic					
<i>Erynnis icelus</i>	Dreamy Duskywing					
<i>E. pacuvius</i>	Pacuvius Duskywing			1	10	4
<i>E. persius</i>	Persius Duskywing				6	2
duskywing sp.						
<i>Pyrgus communis</i>	Common Checkered-skipper					
<i>Piruna pirus</i>	Russet Skipperling					
<i>Oarisma garita</i>	Garita Skipperling					
<i>Hesperia juba</i>	Juba Skipper					
<i>H. colorado</i>	Western Branded Skipper					
<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					
<i>Euphyes vestris</i>	Dun Skipper					

E. Walker Ranch

Date, Conditions	Location within Walker	Butterfly Activity	Blossoming Plants	Animals	Researchers
3/29/2017 11:30 a.m.– 2:00 p.m. 10° C breezy, mostly cloudy, intermittent sun 2 hr15 min	Lower Walker Loop, down to South Boulder Creek	Saw butterflies only when sun was shining	Very few of each: Candytuft Kinnikinnick Oregon grape Pasque flower Sand lily Spring beauty		Dan Fosco

4/12/2017 11:30 a.m. – 3:00 p.m. 16-22° C, sunny, no breeze 3.5 hrs.	Meyers Homestead Trail -past power lines by ¼ to ½ mi.		Common throughout: Ball cactus Candytuft Kinnikinnick Oregon grape Pasque flower Sand lily Spring beauties		Dan Fosco John Barr
5/4/2017 1:50-3:40 p.m. Sunny, breezy on top; 18 °C 3hrs	Lower Walker Ranch Loop S. Boulder Creek	All species of butterflies and plants in flower were much smaller than previous 5 years.	Ball Cactus Chickweed Erigeron Fleabane Kinnikinnick Lambert's loco Mertensia Mountain Parsley Oregon Grape Physaria Sand Lily	Broadtail Hummingbird Mountain Bluebird Raven Townsend's solitaire Yellow Rump Warbler	Dan Fosco
6/6/2017 10:10-12:20 p.m. 16° C 80% blue to cloudy; wind 0-10 mph 2-10 min	Meyer's Homestead Trail to wet crossover	Cold, not flying much; some puddling. Many puddles.	Campanula Choke cherry Dandelion Death camus Erigeron, white Filary Flax Geranium Fremont Golden banner Lambert's loco Larkspur Mouse-ear Parsley, mtn Pasque flower Penstemon, blue mist Potentilla Pussy toes Sand lily Senecio Sulfur flower Wall flower Yarrow	Bluebird mtn Bluebird w. Clark's nutcracker Crow Hummingbird br tl Nuthatch wh. br. Pine siskin Raven Robin Sparrow chipping Towhee gr. Tailed Turkey vulture Mule deer One fawn, dead	Amy Chu Jan Chu Janet Hanley Larry Crowley Sue Hirshfeld
6/6/2017 10:15-12:30 p.m. 17 ° C 2-15 hrs.	Loop Trail To main mud puddle, halfway toward Boulder Creek	puddling	Boulder raspberry Cinquefoil Daisy, fleabane Dogbane Evening primrose Geranium, Fremont Locoweed Mouse-ear Parsley, mountain Parsley, whiskbroom Penstemon, Granda Penstemon, virens Physaria, bellii (?sp) Puccoon Rose Scorpion weed Skullcap, S britonii	Turkey Vulture Red Tail Lazuli Bunting Turkey	Dan Fosco Jean Morgan Wynne Whyman

E. Walker Ranch

Walker Ranch, Meyer's Homestead Trail and Loop –	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
# Species Identified during 2017 in Walker	30	35	45	35	50	47	62	43	45	43	31
# Species Sighted in Walker 2007-2017	33	38	60	70	72	75	75	75	76	76	76
# Research Hours on Site	5	4	18	16	16.5	7	14.5	11	29	17	13.5
# Individual Butterflies Counted	160	203	1144	437	472	399	394	322	351	549	299
# Individual Butterflies / Research Hour	32	54	64	27	29	57	27	29	12	32	22
# Species / Research Hour	6.0	8.8	2.5	2.2	3.0	6.7	4.3	3.9	1.5	2.5	2.3

F. Reynold's Ranch

Reynold's Ranch Giggey Lake, North Bog	2017	6/20	8/1	8/1	8/30	8/30
<i>Parnassius smintheus</i>	Parnassian, Rocky Mtn.					
<i>Papilio polyxenes</i>	Black Swallowtail					
<i>P. zelicaon</i>	Anise Swallowtail	1				
<i>P. rutulus</i>	W. Tiger Swallowtail	5				
<i>P. eurymedon</i>	Pale Swallowtail					
<i>P. multicaudata</i>	Two-tailed Swallowtail					
<i>Neophasia menapia</i>	Pine White				1	1
<i>Pieris rapae</i>	Cabbage White					
<i>Pontia protodice</i>	Checkered White					
white sp.						2
<i>Euchloe ausonides</i>	Large Marble	2				
<i>Anthocharis julia</i>	Julia Orangetip					
<i>Colias philodice</i>	Clouded Sulphur				3	
<i>C. eurytheme</i>	Orange Sulphur		4		3	
<i>C. alexandra</i>	Queen Alexandra's Sulphur		2	6	5	3
sulphur sp.			3			
<i>Lycaena rubidus</i>	Ruddy Copper		3			
* <i>L. heteronea</i>	Blue Copper				1	
<i>L. helloides</i>	Purplish Copper					
<i>Callophrys affinis</i>	Canyon Green Hairstreak					
<i>C. spinetorum</i>	Thicket Hairstreak					
<i>C. eryphon</i>	W. Pine Elfin					
<i>Strymon melinus</i>	Gray Hairstreak					
<i>Celastrina ladon sidara</i>	Echo (Spring) Azure					
<i>Glaucopsyche lygdamus</i>	Silvery Blue					
<i>Echinargus isola</i>	Reakirt's Blue			1		
<i>Plebejus melissa</i>	Melissa Blue					
<i>Euphilotes ancilla</i>	R Mtn Dotted Blue					
<i>Plebejus saepiolus</i>	Greenish Blue	4	4	1		
<i>Glaucopsyche piasus</i>	Arrowhead Blue					
<i>P. icarioides</i>	Boisduval's Blue		1			
<i>P. glandon rustica</i>	Arctic Blue					
blue sp.			4	3		
<i>Danaus plexippus</i>	Monarch					
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral					
<i>Euptoieta claudia</i>	Variegated Fritillary		1			
<i>Speyeria aphrodite</i>	Aphrodite Fritillary					1
<i>S. edwardsii</i>	Edwards' Fritillary					
<i>S. coronis</i>	Coronis Fritillary					
<i>S. callippe</i>	Callippe Fritillary					
<i>S. hesperis</i>	Northwestern Fritillary					
<i>S. mormonia</i>	Mormon Fritillary					
<i>Boloria selene</i>	Silver-bordered Fritillary					
fritillary sp.			1	1		
<i>Chlosyne palla</i>	Northern Checkerspot	1				
<i>Phyciodes pallida</i>	Pale Crescent					
<i>P. tharos</i>	Pearl Crescent		1			
<i>P. cocyta</i>	Northern Crescent					
<i>P. pulchella</i>	Field Crescent				2	1
<i>Polygonia gracilis</i>	Hoary Comma					
<i>Vanessa virginiensis</i>	American Lady					
<i>Vanessa cardui</i>	Painted Lady	3	3		1	
<i>Aglaia milberti</i>	Milbert's Tortoiseshell				1	
<i>Nymphalis antiopa</i>	Mourning Cloak					1
<i>Coenonympha tullia ochracea</i>	Common (Ochre) Ringlet	18				
<i>Vanessa atalanta</i>	Red Admiral					

Reynold's Ranch Giggey Lake, North Bog	2017	6/20	8/1	8/1	8/30	8/30
<i>Cercyonis oetus</i>	Small Wood Nymph		2	3	27	16
<i>Erebia epipsodea</i>	Common Alpine	13				
<i>Oeneis chryxus</i>	Chryxus Arctic					
<i>Erynnis icelus</i>	Dreamy Duskywing					
<i>E. persius</i>	Persius Duskywing	1				
<i>Oarisma garita</i>	Garita Skipperling					
<i>Hesperia colorado</i>	W. Branded Skipper				6	
<i>Polites draco</i>	Draco Skipper					
<i>Ochlodes sylvanoides</i>	Woodland Skipper					
<i>Pyrgus communis</i>	Common Checkered- Skipper		1			
<i>Euphyes vestris</i>	Dun Skipper					
Skipper sp.					3	

F. Reynold's Ranch

Date, Conditions	Location within Reynold's	Butterfly Activity	Blossoming Plants	Animals	Researchers
6/20/2017 11:00 – 12:00 p.m. 28 °C, windy, 1 hr	Giggey Lake (south meadow)	Butterflies hiding in grass out of wind. Swallowtails flying. Not boggy except in a few places.	Bistort Black-eyed Susan Blue flag Daisy, cutleaf Elephant head Gaillardia Geranium, Frem. Golden banner Locoweed Mouse ears Mustards Onion Geyer Paintbrush, red, yellow Parsley, whiskbroom Penstemon Potentilla Pussy toes, pink, white Salsify Senecio Sulfur flower Wallflower Yarrow	Swallows Violet-green Black birds, Red- winged	Venice Kelly Jeff Maclachlan
8/1/2017 10:00 – 12:00 p.m. 24-27 °C, Partly cloudy, breezy 2 hrs	Giggey Lake	Coppers to the west of the lake in forest opening, back by far fence line.	Aster, golden, blue-purple sp. Allium sp. Bistort Black-eyed Susan Clover, red Death camus Evening primrose Fleabane sps. White Gaillardia Geranium Goldenrod Gumweed Harebell Heterotheca Locoweed Lily, mariposa Marsh marigold	Cattle grazing	Dan Fosco

	Giggey Lake (con't)		Paint brush, red and cream Potentilla, shrubby and herbaceous Sulfur flower Thistle, white Thistle, Canada yarrow		
8/1/2017 12:10-2:00p.m. 24-27 °C, Partly sunny to mostly cloudy 2 hrs.	North Bog		Combined list of flowers above.		Dan Fosco
8/30/2017 9:45-12:45 p.m. 25°C, Cloudy, some sun 3 hrs.	West of North Bog, hill and meadow west of the hill		Arnica, little sunflower Asters yellow, blue/purple Chickweed Fairy trumpet, white Fleabane, white Gaillardia Goldenrod Harebell Paintbrush, red Penstemon Sulphur flower Thistle, bull Thistle, Canada Thistle, white Yarrow	Clark's nutcracker eating limber pine cone seeds they flew off with a whole cone in its beak	Venice Kelly Dan Fosco
8/30/2017 9:45-11:45 p.m. 25°C, Cloudy, some sun 2 hrs.	West of North Bog, thru gate to valley		Artemisia Black-eyed Susan Bushy cinquefoil Chamomile Clover, purple, white Erigeron Geranium, Fremont's Goldenrod Harebell Heterotheca Monarda Paint Brush, red Pinedrops Scorpion weed Strawberry Sulfur flower Sweet Clover Thistle, Canada, Yarrow	Raven Clark's Nutcracker Blue Grouse Chickaree squirrel	Jan Chu Jean Morgan Larry Crowley Pam Piombino Richard Holmes

F. Reynold's Ranch

Reynold's Ranch, Giggey Lake and North Bog	2011	2012	2013	2014	2015	2016	2017
# Species Identified during 2017 in Reynold's	32	46	36	9	26	32	26
# Species Sighted in Reynold's 2011-2017	35	55	55	55	57	57	58
# Research Hours on Site	13	11.5	10.5	4	6	11	10
# Individual Butterflies Counted	541	635	395	47	183	612	171
# Individuals / Research Hour	41.6	55	37.6	12	3	5.6	17
# Species / Research Hour	2.5	4	3.4	2.1	4	3	2.6

G. Caribou Ranch

Caribou Ranch and Mud Lake	2017	4/14	5/4	6/9	6/11	7/13	7/16	7/19	7/21	7/24	8/2	8/12	8/24	8/26	8/28	9/6	9/12
<i>Parnassius smintheus</i>	Rocky Mountain Parnassian				2		7										
<i>Battus philenor</i>	Pipevine Swallowtail																
<i>Papilio polyxenes</i>	Black Swallowtail									1							
<i>P. zelicaon</i>	Anise Swallowtail				2												
<i>P. rutulus</i>	W. Tiger Swallowtail			2		3	6		1	1	1						
<i>P. eurymedon</i>	Pale Swallowtail				1	1			1								
<i>P. multicaudata</i>	Two-tailed Swallowtail						1		1								
<i>Neophasia menapia</i>	Pine White												1	6	4	4	
<i>Pontia protodice</i>	Checkered White						1			1	4		2				
<i>P. occidentalis</i>	Western White					3											
<i>Pieris rapae</i>	Cabbage White										3			2			
<i>P. marginalis</i>	Mustard White																
<i>Euchloe ausonides</i>	Large Marble			2	13	1											
<i>Anthocharis sara julia</i>	Julia Orangetip		1	1	1												
white sp.			1	1		1			1								
<i>Colias philodice</i>	Clouded Sulphur						1	1				3				2	1
<i>C. eurytheme</i>	Orange Sulphur						5		2		4	2	2	6	4		2
<i>C. alexandra</i>	Queen Alexandra's Sulphur					20	28	14	25	10	18	14	2	14	5		1
sulphur sp.												6					
<i>Eurema mexicana</i>	Mexican Sulphur																
<i>Abaeis nicippe</i>	Sleepy Orange																
<i>Nathalis iole</i>	Dainty Sulphur																
<i>Lycaena rubidus</i>	Ruddy Copper					2				3		2					
<i>L. heteronea</i>	Blue Copper					2						1					
<i>L. helloides</i>	Purplish Copper								5	1			1	5	2		
<i>Callophrys affinis homoperplexa</i>	Canyon Green Hairstreak				3												
<i>C. sheridani</i>	White-lined Green Hairstreak	10	2														
<i>C. spinetorum</i>	Thicket Hairstreak			1	3												
<i>C. augustinus</i>	Brown Elfin		1														
<i>C. polios</i>	Hoary Elfin		3														
<i>C. eryphon</i>	Western Pine Elfin				7												
elfin sp.			2														
<i>Satyrrium saepium</i>	Hedgerow Hairstreak														1	1	

Caribou Ranch and Mud Lake	2017	4/14	5/4	6/9	6/11	7/13	7/16	7/19	7/21	7/24	8/2	8/12	8/24	8/26	8/28	9/6	9/12
<i>Cupido amyntula</i>	Western Tailed-Blue																
<i>Celastrina ladon sidara</i>	Echo (Spring) Azure			2	1												
<i>Glaucopsyche piasus</i>	Arrowhead Blue																
<i>G. lygdamus</i>	Silvery Blue				2												
<i>Euphilotes ancilla</i>	Rocky Mountain Dotted-Blue					10	6			1							
<i>Echinargus isola</i>	Reakirt's Blue																
<i>Plebejus melissa</i>	Melissa Blue														1		
<i>P. saepiolus</i>	Greenish Blue					2	1										
<i>P. icarioides</i>	Boisduval's Blue					1	8			1	2						
<i>P. lupini lutzi</i>	Lupine Blue					2					1						
<i>P. glandon rustica</i>	Arctic Blue											1	6	2	1	1	
blue sp.					5	11	6	2	1	2	2	4					
<i>Euptoieta claudia</i>	Variegated Fritillary	1			1		1									2	
<i>Speyeria aphrodite</i>	Aphrodite Fritillary																
<i>S. edwardsii</i>	Edwards' Fritillary																
<i>S. coronis</i>	Coronis Fritillary																
<i>S. hesperis</i>	Northwestern Fritillary								3	1	1	1					
<i>S. mormonia</i>	Mormon Fritillary																
fritillary sp.						1				2						1	
<i>Poladryas arachne</i>	Arachne Checkerspot					2	1		1								
<i>Chlosyne gorgone</i>	Gorgone Checkerspot																
<i>C. nycteis</i>	Silvery Checkerspot					1											
<i>C. palla</i>	Northern Checkerspot			1		4	2		6	1							
<i>Phyciodes pallida</i>	Pale Crescent																
<i>P. tharos</i>	Pearl Crescent																
<i>P. cocyta</i>	Northern Crescent								3								
<i>P. pulchella</i>	Field Crescent				1	1								3	2	14	10
<i>Euphydryas anicia</i>	Variable Checkerspot																
<i>Polygonia faunus</i>	Green Comma	1	1												4		1
<i>P. gracilis</i>	Hoary Comma	4	1			1				1		3				2	1
<i>*Junonia coenia</i>	Common Buckeye															1	
<i>Nymphalis antiopa</i>	Mourning Cloak	7	2	1	2							1			3	3	5
<i>Vanessa atalanta</i>	Red Admiral													1	3		
<i>V. cardui</i>	Painted Lady	2	1		8	8	3		2	5	7	50	4	20	6	1	
<i>V. virginensis</i>	American Lady																

<i>Danaus plexippus</i>	Monarch																
<i>Limnitis weidemeyerii</i>	Weidemeyer's Admiral							3									
<i>Coenonympha tullia ochracea</i>	Common (Ochre) Ringlet				6	6	3										
<i>Cercyonis pegala</i>	Common Wood-Nymph																
<i>C. oetus</i>	Small Wood-Nymph					2	16	3	33	8	24	13	12	11	15	15	6
<i>Erebia epipsodea</i>	Common Alpine				2												
<i>Oeneis chryxus</i>	Chryxus Arctic																
<i>Thorybes pylades</i>	Northern Cloudywing				1												
<i>Erynnis icelus</i>	Dreamy Duskywing				2												
<i>E. pacuvius</i>	Pacuvius Duskywing																
<i>E. persius</i>	Persius Duskywing				14	5	8	1									
<i>Pyrgus ruralis</i>	Two-banded Checkered-Skipper																
<i>P. communis</i>	Common Checkered-Skipper															4	1
<i>Piruna pirus</i>	Russet Skipperling								1	1							
<i>Oarisma garita</i>	Garita Skipperling					1											
<i>Hesperia juba</i>	Juba Skipper																
<i>H. colorado</i>	Western Branded Skipper														1		
<i>H. pahaska</i>	Pahaska Skipper																
<i>H. viridis</i>	Green Skipper																
<i>H. nevada</i>	Nevada Skipper				1												
<i>Polites draco</i>	Draco Skipper						2										
<i>P. mystic</i>	Long Dash																
<i>Poanes taxiles</i>	Taxiles Skipper																
<i>Ochlodes sylvanoides</i>	Woodland Skipper																
<i>Euphyes vestries</i>	Dun Skipper								2								

G. Caribou Ranch

Caribou Ranch, Mud Lake	Location	Butterfly Behavior	Blossoming Plants	Animals	Researchers
4/14/2017 19°C 11:20 – 12:45 p.m. Blue sky, bright sun, breezy then calm.	Bridge Meadow; along the road at the side, then down into the meadow.			Golden mantled ground squirrel	Venice Kelly Jeff Maclachlan Ranger Sara Hatfield
Caribou Ranch, Mud Lake	Location	Butterfly Behavior	Blossoming Plants	Animals	Researchers
5/4/2017 2:15-3:21 p.m. 16°C Full sun, breezy	Bridge Meadow And road nearby	Not many butterflies after snow and clouds		Ruby-crowned kinglet Flicker	Venice Kelly
6/9/2107 11:30 – 12:30 p.m. 18°C, very breezy, High overcast to cloudy	Mud Lake, East meadow, south meadow, and around lake		Blue bells Daisy, cut-leaf Larkspur Mouse-ears Potentilla Pussy toes, pink, white Senecio, black-tipped? Wall flower	Frogs singing Red-winged blackbird Clark's nutcracker	Venice Kelly
6/11/2017 10:15-12:00 p.m. 2130% cloudy	Bridge Meadow and Sherwood Road to the seep.		Golden banner Bluebells Larkspur Parsley, whiskbroom Tower Mustard Senecio, black-tipped, Potentilla Sedum	Hermit Thrush singing	Venice Kelly Jeff Maclachlan
7/13/2017 9:45-11:45 a.m. 21°C, Full sun, No breeze to some breeze	Bridge Meadow			2 young moose	Venice Kelly
7-16-2017 9:40-11:25 a.m. 20 – 24°C, blue sky	Inside locked gate at Caribou north toward bog and return thru meadow.	Crispy dry ground	Angelica Arnica Aster Bedstraw Cinquefoil, blue leaf Cow parsnip Daisy		Venice Kelly Janet Hanley Jan Chu

Caribou Ranch, Mud Lake	Location	Butterfly Behavior	Blossoming Plants	Animals	Researchers
			Dandelion, false Figwort Gaillardia Geranium Richardson's Geranium, sticky Gilia Scarlet Golden rod Lily Mariposa Loco white Locoweed Lousewort, bracted Lupine Wyeth's Mertensia, green Monkshood Mountain Death Camus Onion, nodding Osha Paintbrush, white Parsley, Mountain Parsley, whisk broom Penstemon, blue mist Pussy toes, pink Pussy toes, small leaved Rose, Wild Salsify Senecio Stonecrop Sulfur flower Sunflower Susan, Black-eyed Wall flower Yarrow		
7-19-2017 10:45-12:15 p.m. 28°C High, hazy clouds, 75% coverage	Caribou Main trail, partway meadows by locked gate, Mud pond			White moth, orange antennae camouflaged	Wynne Whyman
7-21-2017 10:00-11:30 a.m. 24-30 °C Blue sky to cloudy	Bluebird Mine area to water falls.	Queen Alexandra's ovipositing on golden banner leaf.		Golden mantled ground squirrels Chipmunk Cow moose with young American Dipper	Venice Kelly Jan Chu Chuck Lowry
7-24-2017 11-1 p.m. 23°C, Partly sunny, often cloudy	Bridge Meadow				Venice Kelly Richard Holmes
8/2/2017 9:30-11:45 a.m. 16- 19°Ccloudy, windy, sunny	Caribou Ranch Open Space, DeLonde Homestead			2 garter snakes	Venice Kelly

Caribou Ranch, Mud Lake	Location	Butterfly Behavior	Blossoming Plants	Animals	Researchers
8-12-2017 1 ½ hrs	Bridge Meadow and Sherwood Road				Venice Kelly Jeff Maclachlan Richard Holmes
8-24-2017 10:45-12:26 p.m. 16-19°C Mostly cloudy with sun peeking through	Bridge Meadow and Sherwood Road	Sunlight enticed some butterfly activity. Especially Small Wood Nymph flying			Venice Kelly
8-26-2017 11:40-1:15 p.m. 23°C, breezy, mostly sunny	Bridge Meadow and Sherwood Road				Venice Kelly Jeff Maclachlan
8-28-2017 11:30-2:00p.m. 32 °C, mostly sunny	Sherwood Road to seep to small aspen grove				Venice Kelly John Barr
9/6/2017 10:00 – 12:15 p.m. Sunny, smoky haze 18-22 °C	Blue Bird Mine	Worn Hedgerow Hairstreak and and Buckeye new to this area. Field Crescents of varied sizes- most small			Venice Kelly Jeff Maclachlan
9/12/2017 1:15-2:50 p.m. 21°C 50% clouds	Sherwood Road past the Conger Mine			Mother Moose Her calf	Venice Kelly Jeff Maclachlan

G. Caribou Ranch (Con't)

Caribou Ranch, Mud Lake	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
# of Species Identified Caribou Ranch and Mud Lake	48	48	40	20	46	28	38	47	55	50	59
Cumulative # of Species Sighted in Caribou/Mud Lake 2007-2017	75	75	80	80	81	82	83	83	84	85	86
# of Research Hours on Site	10	12	8.5	6	12.5	8	8	14	15	10	27.5
# of Individual Butterflies Counted	358	647	278	145	488	304	361	752	587	657	770
# Individuals /Research Hour	36	54	33	24	39	38	45	54	39	65	28
# Species /Research Hour	4.8	4.0	4.7	3.3	3.7	3.5	4.8	3.4	3.6	5.0	2.1

H. Anne U. White Trail

Anne U. White Trail	5/192013	5/30/ 2017
Rocky Mountain Parnassian		
Black Swallowtail		
Anise Swallowtail	1ph	
Indra Swallowtail		3
W. Tiger Swallowtail	1	2
Pale Swallowtail		6
Two-tailed Swallowtail		2
Checkered White		
Spring White	7	
Cabbage White	2	3
Large Marble	6	10
Olympia Marble		
White sp.	12	7
Julia Orangetip	5	1
Clouded Sulphur		
Orange Sulphur		
Dainty Sulphur		
Sulphur sp		1
Canyon Bramble Hairstreak		3
White-lined Green Hairstreak		
Siva Juniper Hairstreak		
Moss' Elfin		
Hoary Elfin		
Western Pine Elfin	10	13
Coral Hairstreak		
Gray Hairstreak		
Western Tailed-Blue		4
Echo Azure	8	4
Arrowhead Blue		
Silvery Blue		8
Rocky Mountain Dotted-Blue		2
Reakirt's Blue		1
Greenish Blue		
Melissa Blue		1
Boisduval's Blue		
Lupine Blue		
Arctic Blue		
Blue sp.		5
Nais Metalmark		
Monarch		
Variegated Fritillary		
Aphrodite Fritillary		
Edwards' Fritillary		
Coronis Fritillary		
Callippe Fritillary		
Northwestern Fritillary		
Mormon Fritillary		
Fritillary sp.		1
Gorgone Checkerspot		
Northern Checkerspot		
Pale Crescent		4
Pearl Crescent		

Anne U. White Trail	5/19/2013	5/30/2017
Northern Crescent		
Field Crescent		1
Satyr Comma		
Common Buckeye		
Milbert's Tortoiseshell		
California Tortoiseshell		
Mourning Cloak	4	3
Red Admiral		1
Painted Lady		2
American Lady		
Weidemeyer's Admiral		
Common (Ochre) Ringlet		
Common Wood-Nymph		
Small Wood-Nymph		
Uhler's Arctic	1	2
Silver-spotted Skipper		
Common Sootywing		
Pacuvius Duskywing		1
Persius Duskywing		
*Dreamy Duskywing icelus		1ph
Common Checkered-Skipper		
Russet Skipperling		
Juba Skipper		
W. Branded Skipper		
Green Skipper		
Tawny-edged Skipper		
Long Dash		
Woodland Skipper		
Taxiles Skipper		
Dun Skipper		
Dusted Skipper	1ph	4ph
*new in Anne U. White in 2017	ph=photo	

Date, Conditions	Location within Anne U White	Butterfly Activity	Blossoming Plants	Animals	Researcher
May 30, 2017 10:00 a.m. -1:30 P.M. 18 - 22 °C Nearly all clear, wind 0-5 mph. 3.5 hours	Locked gate to picnic bench on top hill	Puddling Flying Patrolling Dusted Skipper is on the Colorado Endangered Species List	Arnica Heart-leaf Boulder raspberry Dandelion Erigeron Forget-me-not Fremont's geranium Mouse-ear Pea-vetch pale blue Penstemon one-sided Salsify Skull cap Snowball Saxifrage Solomon's Seal, False Spiderwort Wall flower	Flycatcher, cordilleran Goldfinch, lesser House wren Hummingbird Mallard ducks Steller's jay Vireo W. tanager W. wood peewee Fence lizard	Amy Chu Ann Cooper Dan Fosco Jan Chu Janet Hanley Jean Morgan John Barr Larry Crowley Ranger Amanda Hatfield Venice Kelly Wynne Whyman

I. Steamboat Mountain

Steamboat Mountain 2011 and 2017		6/2/2011		6/20/2017
<i>Scientific name</i>	Common Name			
<i>Papilio polyxenes</i>	Black Swallowtail			
<i>P. zelicaon</i>	Anise Swallowtail	1		
<i>P. indra</i>	Indra Swallowtail			
<i>P. rutulus</i>	Western Tiger Swallowtail			
<i>P. eurymedon</i>	Pale Swallowtail			3
<i>P. multicaudata</i>	Two-tailed Swallowtail			3
yellow swallowtail sp.				5
<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			2
<i>Euchloe ausonides</i>	Large Marble			
<i>E. olympia</i>	Olympia Marble	1		
white sp.		5		9
<i>Colias philodice</i>	Clouded Sulphur			
<i>C. eurytheme</i>	Orange Sulphur			
<i>C. meadi</i>	Mead's Sulphur			
<i>C. alexandra</i>	Queen Alexandra's Sulphur			
<i>Lycaena heteronea</i>	Blue Copper			
<i>Satyrrium saepium</i>	Hedgerow Hairstreak			
<i>Callophrys affinis</i>	Canyon Bramble Hairstreak			
<i>C. gyneus</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			
<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			1
<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.				1
<i>Danaus plexippus</i>	Monarch			
<i>Euptoieta claudia</i>	Variegated Fritillary			1
<i>Speyeria aphrodite</i>	Aphrodite Fritillary			5
<i>S. edwardsii</i>	Edwards' Fritillary			
<i>S. coronis</i>	Coronis Fritillary			
<i>S. callippe</i>	Callippe Fritillary			
<i>S. mormonia</i>	Mormon Fritillary			
fritillary sp.				23
<i>Chlosyne gorgone</i>	Gorgone Checkerspot	5		
<i>C. nycteis</i>	Silvery Checkerspot			
<i>C. palla</i>	Northern Checkerspot			
checkerspot/crescent sp.				
<i>Phyciodes pallida</i>	Pale Crescent			
<i>P. tharos</i>	Pearl Crescent			
<i>P. cocyta</i>	Northern Crescent			
<i>P. pulchella</i>	Field Crescent			
<i>Polygonia satyrus</i>	Satyr Comma			
<i>P. gracilis</i>	Hoary Comma			

Steamboat Mountain 2011 and 2017		6/2/2011		6/20/2017
<i>Nymphalis antiopa</i>	Mourning Cloak			
<i>N. californica</i>	California Tortoiseshell			
<i>Vanessa atalanta</i>	Red Admiral			
<i>V. cardui</i>	Painted Lady			
<i>V. virginiensis</i>	American Lady			
<i>Limenitis weidemeyerii</i>	Weidemeyer's Admiral			
<i>Asterocampa celtis</i>	Hackberry Emperor			
<i>Coenonympha tullia ochracea</i>	Ochre (Common) Ringlet			
<i>Cercyonis pegala</i>	Common Wood-Nymph			
<i>C. oetus</i>	Small Wood-nymph			
<i>Epargyreus clarus</i>	Silver-spotted Skipper			
<i>E. afranius</i>	Afranius Duskywing			
<i>E. persius</i>	Persius Duskywing			
<i>Pyrgus communis</i>	Common Checkered-skipper			
<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			
<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			
<i>Poanes taxiles</i>	Taxiles Skipper			
<i>Euphyes vestries</i>	Dun Skipper			
<i>Atrytonopsis hianna</i>	Dusted Skipper			

I. Steamboat Mountain

Steamboat Mountain 2011 and 2017	Butterfly Notes	Plants blooming	Animals	GPS	Researchers
6/2/2011 11:00 – 1:25 p.m. 24-31°C 25% clouds; wind 0-5 with 45 mph gusts on the peak of Steamboat 2.5 hrs	Wind was taking the whites off the cliff. One pair of Gorgone Checkerspots mating.	Boulder raspberry, Choke cherry, Erigeron, Geyer's onion Heuchera parvifolia, Mertensia, Milkvetch, Miner's candle, Mouse-ear, Oxalis yellow, Penstemon one-sided, P. ssp a second. Hydrophyllum, Parsley mtn , Physaria belli Potentilla, Sand lily, Senecio, Skull cap, Skunk bush Stonecrop Townsendia grandiflora Spiderwort Wallflower	Turkey vulture, Golden eagle, wh.thr. swift, w. wood pewee, raven, violet-green swallow, pigmy nuthatch, canyon wren, house wren, yellow warbler, dark-eyed junco, spotted towhee chipping sparrow. Fence lizard	Begin 5922' N40°14'24.6" W 105°16'50.1" Mtn. top 6209' N40°14'07.9" W105°17'02.9"	Jan Chu Larry Crowley Jean Morgan

Steamboat Mountain 2011 and 2017	Butterfly Notes	Plants blooming	Animals	GPS	Researchers
6/20/2017 10:30 – 1:10 p.m. 24-30°C No wind, sky 75% blue 2.5 hrs.	Fritillaries mating, nectaring on bull thistle	Alfalfa Bindweed Blue Flag Boulder raspberry Butter and Eggs Campanula Cinquefoil, Clover Easter Daisy Erigeron Fairy Trumpet, wh Gaillardia Geranium Frem Heterotheca Lily, Segoe Mertensia Mouse-ear Mustard, tall yel Oxalis, yel Prickly pear Sedum St John's wort Sulfur flower Thistle, bull Wall flower Waterleaf Wild Rose	Chat Yel br Goldfinch Hawk Red-tailed Mourning dove, nest w/ 2 eggs Night hawk Raven Swallows, cliff? Towhee Spotted Turkey vulture W. tanager Wren Canyon Wren Rock Lizard Mule deer	Just inside gate, walked toward "old ranch house" then to Steamboat Mtn crest	Amanda Hatfield, Ranger Amy Chu Jan Chu Jean Morgan Larry Crowley Sue Hirschfield