

2020

Butterflies of Boulder County Open Spaces Boulder, Colorado

17 Years of Inventories



By Janet Chu
November, 2020

Cover Photo : Viceroy (*Limenitis archippus*) by Chris Friedman
September 4, 2020 at the Duck Pond at Walden Pond, Boulder, CO



Queen Alexandra's Sulphur (*Colias alexandra*)
(male) July 7, 2020
Smith Hill Road, Golden Gate State Park, Golden, CO
Photos by Chris Friedman



Orange Sulphur (*Colias eurytheme*)
(female) July 8, 2020
Farmer's Ditch, Clear Creek, Boulder, CO

“Inventories are taking flight after 17 years. Now to begin something new” Jan Chu

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I. Acknowledgments

We sincerely thank the Boulder County Parks and Open Space (BCPOS) for obtaining and maintaining these properties. Gratitude is given by the Butterfly researchers for providing funds and research permits making inventories possible. Susan Spaulding, Senior Wildlife Specialist has provided close contact and funding over the years. Amanda Hatfield and Kevin Grady, Resource Protection Rangers have offered timely suggestions to enhance field work. We enjoy and hold dear the opportunities to cooperate with the staff members. I wish to commend the Open Space Department for the continued scientific and varied conservation methods which it diligently performs.

Our mentors providing professional suggestions and assistance in identification are Dr. Paul A. Opler, C.P. Gillette Museum of Arthropod Diversity, Colorado State University, Ft. Collins and Mike Fisher, author of the Butterflies of Colorado. Active volunteers in 2019 include: John Barr, Amy Chu, Larry Crowley, Chris Friedman, Linda Hardesty, Sue Hirschfeld, Richard Holmes, Venice Kelly, with others helping as time allowed: Cathy Comstock, Cathy Cook, Ann Cooper, Dan Fosco, Chuck Lowry, Jeff MacLachlan, Jean Morgan, and Pam Piombino. Each team member was granted written Research and Parking Permits for access to the Open Space lands extending from March through December 2020.

Dr. Daniel Ziskin designed the computer program to determine the Individuals per Research Hour (I/RH), toward the final statistical compilation for All Open Spaces surveyed. I am indebted to him for this specialized computer program which he has made available each year. His work has provided a different view of the butterfly inventory. Note the graphs and interpretations for the Trends for the Open Spaces surveyed, and Caribou Open Space - Sherwood Road Transect in Section VI.

II. Abstract

Butterfly Inventories took place for the 17th consecutive year within Boulder County Open Space properties. Over the years 2004-2020, 130 butterfly species have been sighted in the Open Spaces. The full list of 202 known butterfly species in Boulder County is displayed in the Appendix I and Butterflies of the Colorado Front Range website. The list includes the very first archival specimens in the C.P. Gillette Museum, Colorado State University, Ft. Collins, as well as the Entomology Collection in the University of Colorado Museum of Natural History, Boulder.

Butterfly Research Volunteers helped collect data during 354 field hours. Venice Kelly studying on Sherwood Road and in the main Caribou Ranch contributed at least 58 hours on site. Late wet snowfall slowed butterfly emergences, resulting in some typically spring species flying with the early summer species. Certain summer species flew later into the fall. August and September into October were mostly hot and dry allowing the continued flight by many white and sulphur (*Pieridae*) and brushfoot (*Nymphalidae*) butterflies.

III. Objectives

The overall objectives were:

- 1) Explore the following areas to record both numbers of individuals and species of butterflies within Open Space properties: Southeast Buffer (Rock Creek), Heil Valley (Red Gulch, North Pointe, Geer Watershed, Plumely Canyon), Walker (Meyer's Homestead Trail), Reynold's (North Bog, Giggey Lake), Caribou Ranch (Sherwood Road, Bluebird Mine, DeLonde Homestead), Mud Lake and the Anne U. White Trail.
- 2) Determine trends using Individuals/Research Hour (I/RH) for each of the butterfly species in each of the surveyed lands.
- 3) Calculate the final Summary Trend (I/RH) for the Boulder County Open Spaces surveyed.
- 4) For a third year, follow at least one transect recording numbers and species of butterflies, establishing references for further studies.
- 5) Add to detailed inventories the location and nature of habitats known to support many associated species available for nectar and host plants for caterpillars.

IV. Research Methods

Research methods for the 2020 butterfly inventories continued to be consistent with past years to survey populations and species through a six-month season. These Open Space areas were chosen because of the varied habitats and elevations and were within Heil Valley, Walker, Caribou, and Reynold's Ranches, Anne U. White Trail, and the Southeast Buffer.

Two methods were used. The first involved one transect on Sherwood Road, nestled between Mud Lake and Caribou Ranch which followed the modified Pollard method (Pollard, 1993). This method was begun within the Open Spaces, to allow for repeated sampling using static transects and methods over time. A person conducting a transect followed a preplanned path, observed butterflies within 6 meters in all directions within the time frame 10 am to 4 pm. Venice Kelly chose this transect because of familiarity with the area, following Sherwood Road to the Conger Mine and ending in the Bridge Meadow. Sherwood Road was surveyed 29 times between April 9 and September 15, 2020. No specimens were taken, because Venice has excellent photographic records.

The second method involved meandering, our standard method of surveying. On every field day the research team hiked for about three hours following trails, roads and streams. Survey efforts were concentrated in areas containing moisture, plentiful flower blossoms for butterflies, and host plants for support of significant numbers of caterpillars. This inventory method is necessarily circuitous, as compared with restricted limitations defined by transects. We observed butterflies on the wing and used the net and release-live technique, recording species and numbers. For the last several years digital photos which helped in identification were used in place of curating any specimens. Total numbers of individual butterflies and species observed during each field day were recorded on spreadsheets and analyzed for patterns occurring during the field season. 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. The 'RH' were the total of a group's time not the total individual summation of times contributed. 'Species per Research Hour' (S/RH) were also determined by dividing the number of species (S) observed during each day by the research hours in the field (RH).

These are units of standards which this author developed for comparison, season to season and year to year. Photos and locations of rare butterflies as noted by the Colorado Natural Heritage Program Watch List were sought: Arogos Skippers, (*Atrytone arogos*), Hops Azure

(*Celastrina humulus*), and Moss' Elfin (*Callophrys mossii schryveri*). Not one of these was recorded within the Open Spaces in 2020. However, these were seen in other parts of the county.

V. Introduction

Historically this project began to inventory the butterfly species within the Boulder County Open Space properties. Over the many years early explorers had collected butterflies which are curated in the Colorado State University, C.P. Gillette Museum of Arthropod Diversity, and the Entomology Collection of the Museum of Natural History, University of Colorado. Gillette curated the Colorado State University College collection from 1891 to about 1930. Since that time, the internationally recognized entomologists, George List, T. O. Thatcher, Howard E. Evans, Paul A. Opler, Don Bright, and Don Givens have continued enhancing and expanding the collection. In the 1870's T.D. Cockerel placed the early archival specimens in what became the Entomology Collection Museum of Natural History in the University of Colorado, Boulder. The complete list can be found in the Butterflies of the Colorado Front Range website and in the final section of this paper. There are several active lists of butterflies locally maintained by Steve R. Jones and Christian Nunes for the City of Boulder Mountain Parks and Open Space- and the Butterfly Pavilion – Denver metropolitan areas. Paul A. Opler actively observes butterflies statewide as well as west to California.

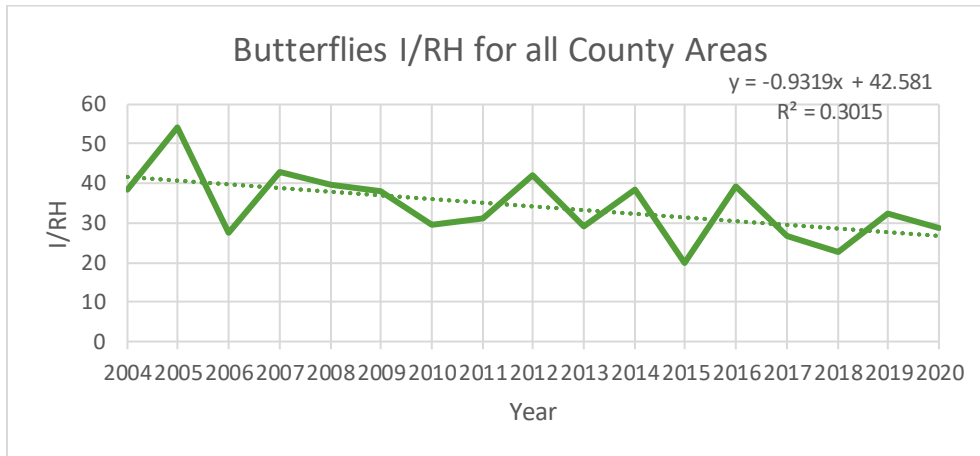
Since the creation of Boulder County Parks and Open Space in 1975, this was the first and only revue of butterflies. During the past seventeen years there were inventories of butterfly species, consequently there are now records of the species which live in the various Open Space areas. Inventories were conducted during 2020 in the Southeast Buffer (Swallowtail Hill, Rock Creek headwaters), Heil Valley (Geer Watershed, North Pointe, Red Gulch, Plumely Canyon entrance), Walker Ranch (Meyer's Homestead Trail), Reynold's Ranch (North Bog, West Hill), Caribou Ranch (Sherwood Road, Bridge Meadow, Bluebird Mine), Mud Lake and Anne U. White Trail. Data for each area, including Caribou transect and meanderings are combined and follow in Section XI.

VI. Trends

For seventeen continuous years, the counts have continued in Boulder County Open Spaces. The unit for comparison from season to season and area to area has continued to be Individuals per Research Hour (I/RH). With Daniel Ziskin's program we sought to determine a

trend in the areas which had observations. A trend had emerged for the numbers of butterflies observed in seven Open Space properties. “In 2019 the trend was -1.0. This meant that in 2004 a researcher could have expected to see 43 butterflies per hour. By 2019, that researcher should expect to see 27 butterflies per hour, a decrease of 1.7% per year.” (Chu 2019).

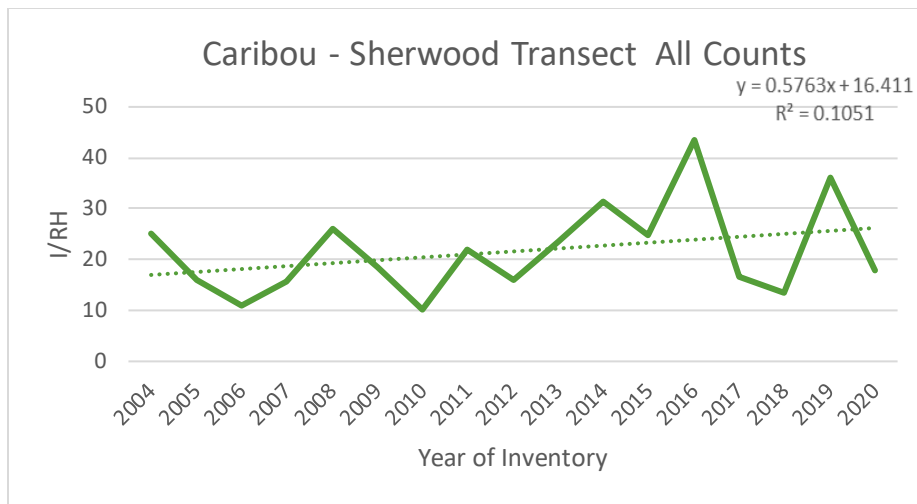
When considering the addition of 2020 data, there has been a trend showing a 4% loss in the I/RH. In other words, a researcher in 2004 could have expected to see the 43 butterflies per research hour, but by 2020 only 35. Ziskin had analyzed collectively all the information for each species and within each surveyed Open Space.



| Butterflies - I/RH for County Areas | | | | | | | | | | | | | | | | | |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Butterflies/Research Hour All Species All County | 38.6 | 54.2 | 27.4 | 43.1 | 39.6 | 38 | 29.7 | 31 | 42.1 | 29.1 | 38.5 | 19.9 | 39.4 | 26.9 | 22.7 | 32.2 | 28.9 |
| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |

By 2020, the confidence level is only 0.30 giving us pause about the trend’s validity. The number of research hours had dwindled. Several factors caused this. Researchers faced the Covid restrictions, the many above 90-degree days, the serious drought and increasing ages of researchers. It has yet to be determined what the causes of the apparent decline are – herbicides, pollution from nearby roads and towns, climate change.

For only one property, Caribou Ranch Open Space including the Sherwood Road transect, were there continuous data for the number of Individuals per Research Hour (I/RH) to be relevant. The summary computed results are shown below:



| # Individuals /Research Hour | 36 | 54 | 33 | 24 | 39 | 38 | 45 | 54 | 39 | 65 | 28 | 25 | 44 | 29 |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Year of Research | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |

This trend line showed that in 2004 about 16 individual butterflies could reasonably be seen per Research Hour, and in 2020 about 26 would be seen. That is an increase of 6.1%. Statistically the trend accounts for 11% of the observed variability. The other 89 % is attributed to natural variability and experimental error. The level of confidence in our trend $R = 0.1$ is not high. It should be at least $R = 0.5$ to be useful for statistical confidence.

“Just like almost every other component of an ecosystem, there is inter-annual variability. In a relatively stable ecosystem, we should expect variations of butterfly populations to fluctuate around a mean value. However, we believe we are observing both normal inter-annual variability super-imposed on an overall decline of butterfly abundance on Boulder County Open Space.” (Chu,2009)

The reasons that the Sherwood Transect shows an increasing number of butterflies, may be the many host and nectar plants along the sunny roadway and meadow, the continuous flowing Sherwood Stream, and the seep from the Conger Mine. There is also an uninterrupted Caribou - Mud Lake natural ecosystem with meadows, Ponderosa Pines and Quaking Aspen.

VII. Narration for Each Open Space

A. Southeast Buffer – Rock Creek

The headwaters of the small Rock Creek in the Southeast Buffer had some moisture, but the hilltop was dry during the summer. On June 3, Swallowtail Ridge continued to assure the

researchers that it had a fitting name. Both Anise (*Papilio zelicaon*) and Black (*P. polyxenes*) Swallowtails were flying together. These and an Orange Sulphur (*Colias eurytheme*) were nectaring on Gaillardia. On April 27, a yellow Swallowtail sp. greeted us at Swallowtail Hill. (There is a benchmark BPZA21ORI PE vegetation research at Swallowtail Hill). To our surprise a Golden Eagle flew up from below us as we surveyed the view to the west. No additional observations were made during May through August.

B. Heil Valley – Geer Watershed

On June 10, the researchers walked from the parking lot to the Manager's cabin. That day thirty-two of the annual forty species were flying in the Geer Watershed. Four Swallowtails- Black Swallowtail (*Papilio polyxenes*), Anise Swallowtail (*P. zelicaon*), Western Tiger Swallowtail (*P. rutulus*) and Pale Swallowtails (*P. eurymedon*) were observed. The most numerous butterflies were Common Ringlets (*Coenonympha tullia ochracea*). Additional fliers were Orange Sulphurs, Western Green Hairstreaks (*Callophrys affinis homoperplexa*), Silvery Blues (*Glycopsyche lygdamus*) and Boisduval's Blues (*Plebejus icarioides*).

On August 12, the Aphrodite Fritillaries (*Speyeria aphrodite*) were numerous while seven other species were each fewer in numbers. On September 12, the final walk of the season, the researchers walked from the Barn and fanned out uphill following the waterway then through the meadow. We found eight Cabbage Whites (*Pieris rapae*) surviving the drought along with even fewer Skippers - Juba (*Hesperia juba*), Western Branded Skipper (*Hesperia colorado*), and Woodland Skipper (*Ochlodes sylvanoides*). This 2020 season lasted well into October, but the plants and butterflies suffered during the long drought, smoke from fires in Colorado, and the extreme heat, producing reduced nectaries.

C. Heil Valley – North

Heil Valley North includes the North Pointe roadway and Red Gulch valley. Researchers walked from the entrance of North Pointe uphill to the large pond site, which has been dry for three years. During a three-hour observation on April 7, 2020, there were only seven species flying. Of course, it was early in the season, but there were four Painted Ladies (*Vanessa cardui*) and two Mourning Cloaks (*Nymphalis antiopa*) on this roadway. One early season butterfly, the White-lined Green Hairstreak (*Callophrys sheridanii*) was blown about in the wind. Both

Checkered Whites (*Pontia protodice*) and Cabbage Whites were seen among the sparse small mustards.

The Red Gulch, on the northwest corner of Heil Valley remains a special area, undisturbed by trail, hikers, or dogs. However, we do seek permission from Ron LaFollette and cross his private land into the Gulch. Often there is some water in the headwater of Red Gulch, but not this season. Twenty-nine species were sighted on June 6, which was an outstanding day for butterfly flight. Two species appeared earlier than usual in the Open Spaces; two Dainty Sulphurs (*Nathalis iole*) that flew in from the southern warmer climes and the Hackberry Emperors (*Asterocampa celtis*) just emerged from their chrysalids among their hosts the Hackberry trees. In previous years July 4, 2014 was the earliest sightings for the Hackberry.

On June 17, six species of blue butterflies were counted; Silvery Blue (*Glaucopsyche lygdamus*), Rocky Mountain Dotted-blue (*Euphilotes ancilla*), Reakirt's Blue (*Echinargus isola*), Melissa Blue (*Plebejus melissa*), Boisduval's Blue (*P. icarioides*) and Lupine Blue (*P. lupini lutzi*). That is unusual to find so many species of blues on the same day.

D. Heil Valley – Plumely Canyon

Only one visit was made in 2020 to the entrance of Plumely Canyon on May 6. As we walked along the service road, inside the first locked gate, along the stream thirty-seven Painted Ladies (*Vanessa cardui*) and nineteen Western Pine Elfins (*Callophrys eryphon*) were visiting the dandelion blossoms for nectar. Echo Azures (*Celastrina echo*), Western Tailed-Blues (*Cupido amyntula*) and Silvery Blues paused for water and substances in the stream which crossed the road and bike path. The Western Tiger Swallowtail (*Papilio rutulus*) flew repeatedly up and down the streambed.

E. Walker Ranch – Meyer's Homestead Trail

Only two walks were taken in 2020 to look for butterflies. Early fliers on the Homestead Trail May 13, were the uncommon Spring White (*Pontia sisymbrii*) and White-lined Green Hairstreaks (*Callophrys sheridanii*). Several Hoary Commas (*Polygonia gracilis*) and one Mourning Cloak (*Nymphalis antiopa*) often seen flying near each other, were again found in the

same airstrip. These butterflies typically fly early and begin our season. Near the lower end of the meadow in the aspen were many Julia Orange-tips (*Anthocharis julia*), cruising by at a high speed. Brown Elfins (*Callophrys augustinus*), Hoary Elfins (*C. polios*) and Western Pine Elfins were flying near the low blooming Kinnikinnick plants. Echo Azures were the only blues sighted that day puddling in the moistened sand.

On June 24, twenty-three species were tallied on the Homestead Trail. Rocky Mountain Dotted-Blues and Common Ringlets (*Coenonympha tullia ochracea*) were numerous. The Dotted-Blues were often seen on their hosts the Sulfur Flowers. The difficult-to-distinguish Pacuvius Duskywings (*Erynnis pacuvius*) and Persius Duskywings (*E. persius*) were flying along with the Northern Checkerspot (*Chlosyne palla*) and Northern Crescent (*Phyciodes cocyta*).

F. Reynold's Ranch – North Bog and Giggey Lake

Observations were made at the North Bog and the Reynold's West hillside leading into the aspen-rich valley only once each in 2020. On May 18, Hoary Elfins (*Callophrys polios*) were numerous. These were flying over their host plants the Kinnikinnick, along with a Brown Elfin (*C. augustinus*). Variegated Fritillaries (*Euptoieta claudia*) and Painted Ladies had immigrated into this higher elevation. By August 4 only the Small Wood Nymphs (*Cercyonis oetus*) remained in large numbers. The attractive Western Branded Skipper (*Hesperia colorado*) represented the Brushfoot butterflies.

G. Caribou Ranch – Sherwood Road, Bridge Meadow

Caribou Ranch and Sherwood Road are special areas because of their higher elevation within the Open Space properties. Venice Kelly is to be commended for recording data during at least 29 field days spanning 58 field hours. Her study area is Caribou Ranch and the nearby transect, Sherwood Road and into Bridge Meadow. She walked this transect for twenty days in addition to sampling near the DeLonde Homestead, Bluebird Mine and Mud Lake. She added an Atlantis Fritillary (*Speyeria atlantis*) to the County Open Space list. This was verified by several photos and was not collected. This is a most difficult species to identify but was verified by our authority Paul Opler. There have been 89 species found in Caribou- Sherwood over fourteen years.

With such a great number of observations, one could really get a good record of flight times. During April 9, the Mourning Cloaks were chasing one another in the early season sunlight. Most of the Cloaks appear in the spring after hibernation, mate in early summer, estivate during the heat of the summer and reappear in the autumn. Julia Orange-tips (*Anthocharis julia*) were numerous from May 10 until June 23. It can be easily noted by looking at Venice's records that this butterfly is active as an adult in the early season. Brown Elfins (*Callophrys augustinus*) were seen only in May. The Queen Alexandra's Sulphurs (*Colias alexandra*) fly June 17 through August 10. The two butterflies active June 12 through the end of July are Rocky Mountain Dotted-Blues, and the biennial Arctic Chryxus (*Oeneis chryxus*). Purplish Copper (*Lycaena helloides*) and the Small Wood Nymph show up around July 17 through September 15. The Edith's Copper (*L. editha*) and Ruddy Copper (*L. rubidus*) have only a short four-week flight time beginning in mid-August. Later yet is the Pine White (*Neophasia menapia*) in mid to late August.

By June 12 Venice noted the dry crunchy ground cover, which lasted into the end of October. A sighting of the Hoary Comma on July 10 found it ovipositing on Wax Currants. At the end of the summer the Ruddy Copper was nectaring on Goldenrod flowers.

H. Anne U. White Trail

The trail was only visited once as far as inventorying butterflies. On May 3, the Western Tiger Swallowtail and Orange Sulphur (*Colias eurytheme*) lit up the shady path. Western Pine Elfins were circling above the young ponderosa pines. Only these three species were identified on this early walk.

VIII. Results

This was a poor butterflying season. The Covid19 isolation, drought and heat were very discouraging for the butterflying team. If we subtract the 58 Research Hours (RH) that Kelly made in Caribou Ranch - Sherwood transect, the remaining RH made by the team amount only to 37. On the other hand, counting the hours times the numbers of volunteers, the total number of volunteer hours inventorying for Boulder County was 354. Of this, 116 volunteer hours were at Caribou. The remaining 238 volunteer hours were in seven other Open Space areas.

The two times the group was in Heil Ranch, Geer Watershed and Red Gulch, masks were worn and social distancing was maintained. See photo taken at the end of the inventory on Heil Ranch, Red Gulch.



April 27, 2020. Discussing the findings following the Butterfly inventory in Red Gulch.
Left to right: Larry Crowley, Richard Holmes, Sue Hirschfeld, Linda Hardesty, Pam Piombino, Chris Friedman
photo by Amy Chu

We failed to complete enough field inventories to determine two of our objectives with complete satisfaction.

- 2) Determine trends (I/RH) for each of the butterfly species in each of the surveyed lands.
- 3) Calculate the final Summary Trend (I/RH) for the Boulder County Open Spaces.

The trend of Butterflies (I/RH) in 2020, can be determined with little confidence in the Open Spaces, because of the shortened season and lack of field days. Due to restrictions placed on us by the Covid 19 challenge, the high heat and drought, the team failed to complete inventories during late June through August.

Fortunately, the I/RH and trend at Caribou could be determined. The trend shows an overall maintenance of the numbers of butterfly Individuals/Research Hour and an increase of 6.1%. It continues to be safe and substantial habitat for the many species.

Noticeably certain species showed up early. On June 17, the Dainty Sulphur was sighted in the Heil Ranch Red Gulch. These are more often common in August-September. Also, the Hackberry Emperor emerged early on that day. Previously, in 2014, we had seen these on July 4, but the Sulphurs are usually mid-July migrants and the Emperor emerge later.

IX. Conclusion

The Boulder County Open Spaces are generally a refuge for the butterflies. The various habitats found at different elevations make for a wide variety of host and nectar-producing plants. The waterways, whether small or large are important gathering places for the male butterflies.

During the past seventeen years there were inventories of butterfly species resulting records of the species which live in the various Open Space areas. This research was fully supported by the County with grants and close cooperation with the staff members. Boulder County Nature Association provided funding and intellectual interest. The most productive areas within the Open Space properties have been identified such as Anne U. White Trail, Walker Ranch, and Caribou Ranch. This inventory was reported nationally to the Lepidopterist Society, High Country Lepidopterists, as well as Boulder County Parks and Open Space, and Boulder County Nature Association. It was acclaimed for its considerable and long-term effort and it served as a model to groups beginning surveys.

A trend of Individual butterflies per Research Hour (I/RH) was calculated for 2007-2019 but data was less complete for the continuation into 2020. The objective to complete a transect, to record numbers and species of butterflies and to establish references for further studies was accomplished in Caribou – Sherwood Road. I acknowledge that a trend would become more valuable if this study were repeated for thirty or forty years.

Now that fire has burned so much land in Heil Ranch these records will be invaluable to draw comparisons of butterflies returning or surviving. This report was written following the Cal-Wood – Heil Ranch Fire October 21, 2020. Heil Ranch Open Space, especially the Geer Watershed has been seriously damaged by the fire that ravaged the land. Only time and moisture will heal the forests and meadows. Thus during 2021-2022 there should be records made of the recovering butterflies.

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Boulder County Parks and Open Space < www.bouldercounty.org/openspace/education/research >

Butterflies and Moths of North America. < www.butterfliesandmoths.org>

North American Butterfly Association <www.naba.org>

XI. Data Tables

Every table continues to preserve the name of each species that has been found in that Open Space area. It is important to carry the sightings from one year to the next, even if the species had not been observed in 2020. These Data Tables contain information from both the Inventory Method and Transect Method.

A. Southeast Buffer – Rock Creek

| Southeast Buffer | 2020 | 4/27 | 6/3 | 6/3 | Total |
|------------------------------------|--------------------------|------|-----|-----|-------|
| <i>Papilio polyxenes</i> | Black Swallowtail | | 1 | | 1 |
| <i>P. zelicaon</i> | Anise Swallowtail | | 1 | | 1 |
| <i>P. rutulus</i> | W. Tiger Swallowtail | | | | |
| <i>P. multicaudata</i> | Two-tailed Swallowtail | | | | |
| yellow swallowtail sp | | 1 | | | 1 |
| <i>Pontia protodice</i> | Checkered White | | 5 | 2 | 7 |
| <i>P. occidentalis</i> | Western White | | | | |
| <i>Pieris rapae</i> | Cabbage White | 2 | | | 2 |
| <i>Euchloe olympia</i> | Olympia Marble | | | | |
| * <i>E. ausonides</i> | Large Marble | | | | |
| white sp. | | 5 | 1 | 7 | 13 |
| <i>Colias philodice</i> | Clouded Sulphur | | 1 | | 1 |
| <i>C. eurytheme</i> | Orange Sulphur | | 1 | 1 | 2 |
| sulphur sp. | | | 1 | | 1 |
| <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 | 1 | | | 1 |
| <i>Euphilotes ancilla</i> | Rocky Mtn. Dotted-Blue | | | | |
| <i>Echinargus isola</i> | Reakirt's Blue | | | | |
| <i>Plebejus melissa</i> | Melissa Blue | | | | |
| blue sp. | | | | | |
| <i>Danaus plexippus</i> | Monarch | | | | |
| <i>Agraulis vanilla</i> | Gulf Fritillary | | | | |
| <i>Euptoieta claudia</i> | Variegated Fritillary | | 3 | 1 | 4 |
| <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | 1 | 1 |
| <i>S. edwardsii</i> | Edwards' Fritillary | | 1 | | 1 |
| fritillary sp. | | | 9 | | 9 |
| <i>Chlosyne fulvia</i> | Fulvia Checkerspot | | | | |
| <i>C. gorgone</i> | Gorgone Checkerspot | | 1 | 1 | 2 |
| <i>Phyciodes tharos</i> | Pearl Crescent | | | | |
| <i>P. pulchella</i> | Field Crescent | | 1 | | 1 |
| checkersp/crescent sp. | | | | | |
| <i>Aglais milberti</i> | Milbert's Tortoiseshell | | | | |
| <i>Nymphalis antiopa</i> | Mourning Cloak | 1 | | | 1 |
| <i>Vanessa cardui</i> | Painted Lady | | 1 | 1 | 2 |
| <i>Limenitis weidemeyerii</i> | Weidemeyer's Admiral | | | | |
| <i>Coenonympha tullia ochracea</i> | Common(Ochre) Ringlet | | | 2 | 2 |
| <i>Cercyonis pegala</i> | Common Wood Nymph | | | | |
| <i>Erynnis afraninus</i> | Afraninus Duskywing | | | | |
| <i>E. persius</i> | Persius Duskywing | | | | |
| <i>Burnsius (Pyrgus) communis</i> | Common Checkered-skipper | | 1 | 1 | 2 |
| <i>Pyrgus scriptura</i> | Small Checkered-skipper | | | | |
| <i>Pholisora catullus</i> | Common Sootywing | | | | |
| <i>Hesperia uncas</i> | Uncas Skipper | | | | |
| <i>H. ottoe</i> | Ottoe Skipper | | | | |
| <i>H. leonardus</i> | Leonard's Skipper | | | | |
| <i>Atrytone arogos</i> | Arogos Skipper | | | | |
| <i>Anatrytone logan</i> | Delaware Skipper | | | | |
| Orange skipper sp. | | | 2 | | 2 |

A. Southeast Buffer – Rock Creek (Continued)

| Date, Conditions | Location within | Butterfly Activity | Blossoming Plants | Animals | Researcher |
|---|--|--|--|---|--|
| 4/27/2020 10:00-12:30 pm- sky mostly blue, wind 0-5 mph 1.5 hr | Hwy 128 gate to Swallowtail Hill (benchmark Swallowtail Hill- BPZA21ORI PE vegetation research) (GPS N 39.91786, _ W -105.17952) | Swallowtail Hill with yellow Swallowtail | All flowers very short Dandelion Easter Daisy Forget-me-not Locoweed, white Mustard, small, white Nuttall's Violets | Crow Eagle, Golden Finch, House Hawk, Red-tail Jay, Scrub Magpie Mourning Dove Nuthatch, Red-breasted Robin Say's Phoebe Towhee, Spotted Wren, House Voles W. Chorus frog | Chris Friedman Jan Chu Larry Crowley Linda Hardesty Pam Piombino Richard Holmes Sue Hirschfeld |
| 6/3/2020 9:00-11:30 am 20-23 °C, 90% blue sky, 0-5 mph wind 2.5x2=5hrs | Coalton Parking lot onto trail and into meadow and off 128 to Swallowtail Hill | Seemed like few butterflies. Swallowtail, Orange sulphur nectaring on Gaillardia | Bindweed Bull Thistle Butter and eggs Clover, sweet Cowboy's Delight Dandelion Filary Flax Gaura Mariposa lily Paintbrush white Penstemon Primrose Yel evening Salsify Saxifrage sp Senecio Wall flower Yarrow Yucca | Common Grackle Golden Eagle Spotted Towhee W. Kingbird Red-wing Blackbird Robin Say's Phoebe Sparrow sp. Red-tail Hawk Magpie Mallard Meadowlark Mourning Dove Cottontail Prairie Dog | Amy Chu Chris Friedman Linda Hardesty (lower SE) Larry Crowley Jean Morgan Jan Chu (upper) |

| Southeast Buffer | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| # of Species identified during the year in Southeast Buffer | 25 | 20 | 21 | 24 | 19 | 18 | 20 | 15 | 23 | 13 | 16 | 18 | 12 | 17 |
| Cumulative # Species 2007-2020 sighted in Southeast Buffer | 21 | 23 | 33 | 37 | 41 | 44 | 44 | 44 | 46 | 46 | 47 | 47 | 48 | 48 |
| Research Hours on Site | 5 | 21 | 9 | 7.7 | 11.5 | 9 | 12 | 8 | 12 | 4.5 | 8 | 9 | 5.5 | 6.5 |
| # Individual Butterflies Counted | 256 | 373 | 353 | 443 | 160 | 227 | 169 | 178 | 294 | 121 | 119 | 271 | 39 | 57 |
| # Individuals / Research Hour | 51 | 18 | 39 | 40 | 14 | 25 | 14 | 22 | 24.5 | 27 | 15 | 30 | 7 | 8.8 |
| # Species / Research Hour | 5 | 0.9 | 2 | 3 | 2 | 2 | 1.6 | 2 | 2 | 3 | 2 | 2 | 2 | 2.6 |

B. Heil Valley-Geer Watershed

| Heil Valley- Geer Watershed | 2020 | 4/1 | 6/10 | 6/27 | 8/12 | 9/12 | Total |
|--|------------------------------|-----|------|------|------|------|-------|
| <i>Papilio polyxenes</i> | Black Swallowtail | | 3 | | | | 3 |
| <i>P. zelicaon</i> | Anise Swallowtail | | 4 | | | | 4 |
| <i>P. indra</i> | Indra Swallowtail | | | | | | |
| <i>P. rutulus</i> | Western Tiger Swallowtail | | 4 | | | | 4 |
| <i>P. eurymedon</i> | Pale Swallowtail | | 8 | 1 | | | 9 |
| <i>P. multicaudata</i> | Two-tailed Swallowtail | | | | | | |
| swallowtail yel sp. | | | 1 | | 1 | | 2 |
| Swallowtail dark | | | 1 | | | | 1 |
| <i>Neophasia menapia</i> | Pine White | | | | | | |
| <i>Pontia sisymbrii</i> | Spring White | | | | | | |
| <i>P. protodice</i> | Checkered White | | 3 | 2 | | | 5 |
| <i>P. occidentalis</i> | Western White | | | | | | |
| <i>Pieris rapae</i> | Cabbage White | | 3 | | 2 | 8 | 13 |
| <i>P. marginalis</i> | Margined White | | | | | | |
| <i>Euchloe ausonides</i> | Large Marble | | | | | | |
| <i>E. olympia</i> | Olympia Marble | | | | | | |
| <i>Anthocharis sara julia</i> | Julia Orangetip | | | | | | |
| white sp. | | | 3 | 12 | | | 15 |
| <i>Colias philodice</i> | Clouded Sulphur | | 3 | | 1 | | 4 |
| <i>C. eurytheme</i> | Orange Sulphur | | 14 | 1 | 1 | 3 | 19 |
| <i>C. alexandra</i> | Queen Alexandra's Sulphur | | | | | | |
| <i>C. cesonia</i> | Southern Dogface | | | | | | |
| <i>Eurema mexicana</i> | Mexican Sulphur | | | | | | |
| <i>Nathalis iole</i> | Dainty Sulphur | | 2 | 1 | | 1 | 4 |
| sulphur sp. | | | 5 | | | | 5 |
| <i>Lycaena dione</i> | Gray Copper | | | | | | |
| <i>L. heteronea</i> | Blue Copper | | | | | | |
| <i>Callophrys affinis homoperplexa</i> | Western Green Hairstreak | | 13 | | | | 13 |
| <i>C. gryneus</i> | Siva Juniper Hairstreak | | | | | | |
| <i>C. sheridanii</i> | White-lined Green Hairstreak | | | | | | |
| <i>C. augustinus</i> | Brown Elfin | | | | | | |
| <i>C. eryphon</i> | Western Pine Elfin | | 1 | | | | 1 |
| elfin sp. | | | 1 | | | | 1 |
| <i>Satyrium titus</i> | Coral Hairstreak | | | | | | |
| <i>S. liparops</i> | Striped Hairstreak | | | | | | |
| <i>S. saepium</i> | Hedgerow Hairstreak | | | | | | |
| <i>Strymon melinus</i> | Gray Hairstreak | | | | 1 | | 1 |
| <i>Leptotes marina</i> | Marine Blue | | | | | | |
| <i>Cupido amyntula</i> | Western Tailed-Blue | | 1 | | | | 1 |
| <i>Celastrina echo sidara</i> | Echo Azure | | | | | | |
| <i>C. echo lucia</i> | " Lucia type | | | | | | |
| <i>Glaucopsyche piasus</i> | Arrowhead Blue | | 1 | | | | 1 |
| <i>G. lygdamus</i> | Silvery Blue | | 12 | | | | 12 |
| <i>Euphilotes ancilla</i> | Rocky Mountain Dotted-Blue | | 3 | | | | 3 |
| <i>Echinargus isola</i> | Reakirt's Blue | | | 2 | | | 2 |
| <i>Plebejus melissa</i> | Melissa Blue | | | | | | |
| <i>P. saepiolus</i> | Greenish Blue | | | | | | |
| <i>P. icarioides</i> | Boisduval's Blue | | 24 | | | | 24 |
| <i>P. lupini lutzi</i> | Lupine Blue | | | | | | |
| <i>P. glandon rustica</i> | Arctic Blue | | | | | | |
| blue sp. | | | 2 | 1 | | | 3 |
| <i>Danaus plexippus</i> | Monarch | | | | | | |
| <i>Apodemia nais</i> | Nais Metalmark | | | | | | |
| <i>Euptoieta claudia</i> | Variegated Fritillary | | 1 | 5 | 2 | 1 | 9 |
| <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | 8 | 5 | 35 | 3 | 51 |
| <i>S. edwardsii</i> | Edwards' Fritillary | | | | | 1 | 1 |
| <i>S. coronis</i> | Coronis Fritillary | | | | | | |
| <i>S. callippe</i> | Callippe Fritillary | | | | | | |

| Heil Valley- Geer Watershed | 2020 | 4/1 | 6/10 | 6/27 | 8/12 | 9/12 | Total |
|------------------------------------|--------------------------|-----|------|------|------|------|-------|
| <i>S. hesperis</i> | Northwestern Fritillary | | | | | 2 | 2 |
| <i>S. mormonia</i> | Mormon Fritillary | | | | | | |
| fritillary sp. | | | 25 | 7 | | 3 | 35 |
| <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | 1 | | | | 1 |
| <i>C. nycteis</i> | Silvery Checkerspot | | | | | | |
| <i>C. palla</i> | Northern Checkerspot | | | | | | |
| <i>Phyciodes pallida</i> | Pallid (Pale) Crescent | | | | | | |
| <i>P. tharos</i> | Pearl Crescent | | | | | | |
| <i>P. cocyta</i> | Northern Crescent | | | | | | |
| <i>P. pulchella</i> | Field Crescent | | 1 | | | | 1 |
| <i>Crescent/checkerspot</i> | | | 1 | | | | 1 |
| <i>Polygonia satyrus</i> | Satyr Comma | | | | | | |
| <i>P. gracilis</i> | Hoary Comma | | | | | | |
| <i>Junonia coenia</i> | Common Buckeye | | | | | | |
| <i>Aglaia milberti</i> | Milbert's Tortoiseshell | | | | | | |
| <i>Nymphalis antiopa</i> | Mourning Cloak | | | | | | |
| <i>N. californica</i> | California Tortoiseshell | | | | | | |
| <i>Vanessa atalanta</i> | Red Admiral | | | | | | |
| <i>V. cardui</i> | Painted Lady | | 10 | | | | 10 |
| <i>V. virginiensis</i> | American Lady | | | | 1 | | 1 |
| <i>Limnitis weidemeyerii</i> | Weidemeyer's Admiral | | 2 | | | | 2 |
| <i>Asterocampa celtis</i> | Hackberry Emperor | | | | | | |
| <i>Coenonympha tullia ochracea</i> | Ochre (Common) Ringlet | | 36 | | | | 36 |
| <i>Cercyonis pegala</i> | Common Wood-Nymph | | | | 5 | | 5 |
| <i>C. oetus</i> | Small Wood-Nymph | | | | | | |
| wood nymph sp. | | | | | | | |
| <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 | | | | 5 |
| <i>Thorybes pylades</i> | N. Cloudywing | | 1 | | | | 1 |
| <i>Erynnis icelus</i> | Dreamy Duskywing | | 2 | | | | 2 |
| <i>E. pacuvius</i> | Pacuvius Duskywing | | 1 | | | | 1 |
| <i>E. afranius</i> | Afranius Duskywing | | | | | | |
| <i>E. persius</i> | Persius Duskywing | | 9 | | | | 9 |
| duskywing sp. | | | 1 | | | | 1 |
| <i>Burnsius (Pyrgus) communis</i> | Common Checkered-skipper | | 1 | | | 1 | 2 |
| <i>Pholisora catullus</i> | Common Sootywing | | | | | | |
| <i>Piruna pirus</i> | Russet Skipperling | | | | | | |
| <i>Oarisma garita</i> | Garita Skipperling | | | | | | |
| <i>Hesperia juba</i> | Juba Skipper | | 1 | | | 3 | 4 |
| <i>H. colorado</i> | Western Branded Skipper | | | | | 3 | 3 |
| <i>H. nevada</i> | Nevada skipper | | | | | | |
| <i>Polites themistocles</i> | Tawny-edged Skipper | | 6 | | | | 6 |
| <i>Ochlodes sylvanoides</i> | Woodland Skipper | | | | | 1 | 1 |
| <i>Poanes taxiles</i> | Taxiles Skipper | | | | | | |
| <i>Euphyes vestries</i> | Dun Skipper | | | | | | |
| <i>Atrytonopsis hianna</i> | Dusted Skipper | | | | | | |
| <i>Polites mystic</i> | Long Dash skipper | | 2 | | | | 2 |
| skipper sp. | | | | 1 | | 3 | 4 |

B. Heil Valley-Geer Watershed (Continued)

| Date, Conditions | Location within Heil - Geer | Butterfly Activity | Blossoming Plants | Animals | Researchers |
|---|---|--|---|---|---|
| 4/1/2020 11:30-1:30 pm Sunny, 15°C 0-5 mph wind | Parking lot toward Manager's cabin on roadway | Few flying short distance or hugging the dirt roadway | Few Spring beauty | Eagle, Golden pr. | Chris Friedman Linda Hardesty Jan Chu Jean Morgan (Kevin Grady) |
| 6/10/2020 8:55-11:45 am 20 °C sky 80% blue Wind 3-20 mph | Geer Watershed – barn streamlet, west meadow, pines to Big Meadow. Also Parking lot to Barn | Cool, slow at first, breezy (Snow in the peaks last night) Arrowhead nectaring on lupine. | Bindweed Clover, red Clover, sweet Dandelion Flax Globe mallow Golden Banner Hydrophyllum Lambert's loco Lupine, white Mouse ear Rose Salsify Watercress | House wren Cordilleran flycatcher Goldfinch, lesser Sparrow, vesper Robin Hummingbird, br tl Western tanager Vireo, Plumbeous Bunting, Lazuli | Amy Chu Cathy Comstock Chris Friedman Larry Crowley Jean Morgan Linda Hardesty Pam Piombino Sue Hirschfeld Sue Olmstead Wynne Whyman |
| 6/27/2020 9:30-11:30 20-23 °C Gentle cool breeze | Olmstead's Bluebird trail | Fritillaries streaming thru small valley. | | | Sue Hirschfeld |
| 8/12/2020 8:00-10:00 am 22-25 °C, | Lichen Trail, return Wapiti Trail | | | Wild Turkey Lark Sparrow Steller's Jay Lesser Goldfinch | Chris Friedman Linda Hardesty |
| 9/12/2020 8:30-12:00 pm 15-19°C, Sky clear, /wind 0-5 mph | Pavilion parking lot to Ranger's cabin along road and streamside | Very few butterflies following 60 degree drop in temp and 5" of snow | Flowers very small almost no blossoms except for blue asters. Blossoms: Prickly poppy Gumweed White aster Geranium, Fremont Chickory Storksbill Sunflower Bindweed Sweet pea – invasive | Chickadee, black-cap Hummingbird br-tled Jay, Steller's Magpie Sparrow, Lincoln Towhee, spotted Turkey vulture Warbler, Wilson Wren, canyon Wren, rock Bull snake Coyote tracks Cottontail W. fence lizard Insects: Hoverfly Cochineal bugs Ichneumon wasp Wasp Leaf hopper Beetle, red-backed darkling | Chris Friedman Jan Chu Jean Morgan Larry Crowley Pam Piombino Trice Morrow |

65 Volunteer Hours for Boulder County

B. Heil Valley-Geer Watershed (Continued)

| Heil-Geer Watershed | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| # of Species Identified Annually in Geer Watershed | 42 | 56 | 44 | 49 | 36 | 38 | 38 | 42 | 22 | 43 | 30 | 40 | 44 | 40 |
| Cumulative # of Species Sighted in Geer Watershed 2007-2020 | 81 | 87 | 90 | 91 | 91 | 91 | 91 | 92 | 92 | 92 | 93 | 93 | 94 | 94 |
| Research Hours at Site | 15.5 | 21 | 12.5 | 14 | 14 | 10 | 11 | 18 | 11 | 10 | 21 | 20 | 13.5 | 16.5 |
| # Individual Butterflies Counted | 569 | 1225 | 492 | 419 | 436 | 530 | 264 | 738 | 200 | 488 | 628 | 665 | 584 | 346 |
| # Individuals / Research Hour | 37 | 58 | 39 | 30 | 31 | 53 | 24 | 41 | 18 | 29 | 39 | 33 | 43 | 21 |
| # Species / Research Hour | 2.7 | 2.7 | 3.5 | 3.5 | 2.6 | 3.8 | 3.5 | 2.3 | 2 | 4.3 | 1.4 | 2 | 3.3 | 2.5 |

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

| Heil Valley Ranch North Pointe, Red Gulch | 2020 | 4/7 | 4/27 | 6/17 | Total |
|---|------------------------------|-----|------|------|-------|
| <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 | | | | |
| <i>P. rutulus</i> | Western Tiger Swallowtail | | | | |
| <i>P. eurymedon</i> | Pale Swallowtail | | | 1 | 1 |
| <i>P. multicaudata</i> | Two-tailed Swallowtail | | | 1 | 1 |
| swallowtail yel. | | | 1 | 3 | 4 |
| <i>Neophasia menapia</i> | Pine White | | | | |
| <i>Pontia protodice</i> | Checkered White | 3 | | 4 | 7 |
| <i>P. occidentalis</i> | Western White | | | | |
| <i>P. sisymbrii</i> | Spring White | | | | |
| <i>Pieris rapae</i> | Cabbage White | 1 | 2 | 23 | 26 |
| white sp. | | 1 | 5 | 4 | 10 |
| <i>Euchloe ausonides</i> | Large Marble | | | | |
| <i>E. olympia</i> | Olympia Marble | | | | |
| <i>Anthocharis sara julia</i> | Julia Orangetip | | | | |
| <i>Colias philodice</i> | Clouded Sulphur | 1 | | 5 | 6 |
| Alba form | | | | 1 | 1 |
| sulphur sp. | | 3 | | 3 | 6 |
| <i>C. eurytheme</i> | Orange Sulphur | | | 9 | 9 |
| <i>C. alexandra</i> | Queen Alexandra's Sulphur | | | | |
| <i>Nathalis iole</i> | Dainty Sulphur | | | 2 | 2 |
| <i>Lycaena dione</i> | Gray Copper | | | | |
| <i>Lycaena heteronea</i> | Blue Copper | | | | |
| <i>L. helloides</i> | Purplish Copper | | | | |
| <i>Callophrys affinis</i> | Western Green Hairstreak | | | | |
| <i>C. gryneus</i> | Siva Juniper Hairstreak | | | | |
| <i>C. sheridanii</i> | White-lined Green Hairstreak | 1 | | | 1 |
| <i>C. eryphon</i> | Western Pine Elfin | | | | |
| elfin sp. | | | | | |
| <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 | | | | |
| <i>Celastrina echo sidara</i> | Echo Azure | | | | |

| Heil Valley Ranch North Pointe, Red Gulch | 2020 | 4/7 | 4/27 | 6/17 | Total |
|--|-------------------------------|------------|-------------|-------------|--------------|
| <i>Glaucopsyche piasus</i> | Arrowhead Blue | | | | |
| <i>G. lygdamus</i> | Silvery Blue | | 1 | 1 | 2 |
| <i>Euphilotes ancilla</i> | Rocky Mountain Dotted-blue | | | 2 | 2 |
| <i>Euphilotes ancilla barnesi</i> | ssp. RM Dotted-blue ID -Opler | | | | |
| <i>Echinargus isola</i> | Reakirt's Blue | | | 2 | 2 |
| <i>Plebejus melissa</i> | Melissa Blue | | | 5 | 5 |
| <i>P. icarioides</i> | Boisduval's Blue | | | 4 | 4 |
| <i>P. lupini lutzi</i> | Lupine Blue | | | 4 | 4 |
| <i>P. glandon rustica</i> | Arctic Blue | | | | |
| blue sp. | | | | 65 | 65 |
| <i>Libytheana carinenta</i> | American Snout | | | | |
| <i>Danaus plexippus</i> | Monarch | | | | |
| <i>Limenitis archippus</i> | Viceroy | | | | |
| <i>Euptoieta claudia</i> | Variegated Fritillary | | | 24 | 24 |
| <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | 15 | 15 |
| <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. | | | | 27 | 27 |
| <i>Euphydryas anicia</i> | Variable Checkerspot | | | | |
| <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | | 1 | 1 |
| Crescent/checkerspot | | | | 2 | 2 |
| <i>C. nycteis</i> | Silvery Checkerspot | | | | |
| <i>C. palla</i> | Northern Checkerspot | | | | |
| <i>Phyciodes pallida</i> | Pallid (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 | | | | |
| <i>Nymphalis antiopa</i> | Mourning Cloak | 2 | 1 | | 3 |
| <i>Junonia coenia</i> | Buckeye, Common | | | | |
| <i>N. californica</i> | California Tortoiseshell | | | | |
| <i>Vanessa atalanta</i> | Red Admiral | | | 1 | 1 |
| <i>Aglais milberti</i> | Milbert's Tortoiseshell | | 1 | | 1 |
| <i>V. cardui</i> | Painted Lady | 4 | | 3 | 7 |
| <i>V. virginiensis</i> | American Lady | | | | |
| <i>Limenitis weidemeyerii</i> | Weidemeyer's Admiral | | | 3 | 3 |
| <i>Asterocampa celtis</i> | Hackberry Emperor | | | 4 | 4 |
| <i>Coenonympha tullia ochracea</i> | Ochre (Common) Ringlet | | | 22 | 22 |
| <i>Cercyonis pegala</i> | Common Wood-Nymph | | | | |
| <i>C. oetus</i> | Small Wood-Nymph | | | | |
| wood nymph sp. | | | | | |
| <i>Erebia epipsodea</i> | Common Alpine | | | | |
| <i>Epargyreus clarus</i> | Silver-spotted Skipper | | | 8 | 8 |
| <i>Erynnis afranius</i> | Afranius Duskywing | | | | |
| <i>E. pacuvius</i> | Pacuvius Duskywing | | | | |
| <i>E. persius</i> | Persius Duskywing | | | | |
| <i>E. icelus</i> | Dreamy Duskywing | | | | |
| duskywing sp | | | | | |
| <i>Burnsius (Pyrgus) communis</i> | Common Checkered-skipper | | | 12 | 12 |
| <i>Pholisora catullus</i> | Common Sootywing | | | 1 | 1 |
| <i>Piruna pirus</i> | Russet Skipperling | | | 1 | 1 |
| <i>Oarisma garita</i> | Garita Skipperling | | | | |
| <i>Hesperia juba</i> | Juba Skipper | | | 1 | 1 |
| <i>H. colorado</i> | W. Branded Skipper | | | | |
| <i>H. pahaska</i> | Pahaska Skipper | | | | |

| | | | | | |
|-----------------------------|---------------------|--|--|---|---|
| <i>H. viridis</i> | Green Skipper | | | 1 | 1 |
| <i>H. nevada</i> | Nevada Skipper | | | | |
| <i>Polites themistocles</i> | Tawny-Edged Skipper | | | | |
| <i>P. mystic</i> | Long Dash | | | | |
| <i>Atrytone arogos</i> | Arogos Skipper | | | | |
| <i>Ochlodes sylvanoides</i> | Woodland Skipper | | | | |
| <i>Poanes taxiles</i> | Taxiles Skipper | | | 1 | 1 |
| <i>Euphyes vestries</i> | Dun Skipper | | | 5 | 5 |
| <i>Atrytonopsis hianna</i> | Dusted Skipper | | | | |
| skipper sp. | | | | | |

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

| Date, Conditions | Location | Butterfly Behavior | Blossoming Plants | Animals | Researchers |
|---|---|---|--|---|--|
| 4/7/2020 11:30-2:00pm 20°C, Sunny sky, 0-15mph wind | North Pointe to top past pond. Frogs singing | Blown about in the wind | Yellow, mustard-family flowers; Dandelions; Yellow Violets; and a small pink-violet flower | Canyon wren Spotted towhee Steller's jay W. Chorus Frog | Chris Friedman Jan Chu Jean Morgan Linda Hardesty Venice Kelly Jeff McLaughlin Richard Holmes John Barr |
| 4/27/2020 10:00-12:30 pm 65-75 0-5 wind 97% clear sky | East from LaFollette's into lower Red Gulch | Few, not active | forget-me-not tiny Few in bloom Easter Daisy Nuttall's violet White locoweed Spring beauty | Crow Dove, mourning Eagle, golden Finch, house Magpie Nuthatch, red-breast Robin Say's Phoebe Scrub jay Towhee spotted Wren, house Junco Red-tailed hawk-- 2 voles W. chorus frog | Chris Friedman Jan Chu Larry Crowley Linda Hardesty Pam Piombino Richard Holmes Sue Hirschfeld |
| 6/17/2020 8:45-1130 am 90%blue sky Wind 0-5 mph | East from LaFollette's into lower Red Gulch | Blues flying fast. Silver-spotted skipper nectaring on Hydrophyllum. Boisduval's ovipositing on lupine bud. 2 Weidemeyer's interacting. No water in stream. | Bindweed Butter & eggs Erigeron Flax Gaillardia Gaura Geranium, Fremont Globe mallow Hemlock Heterotheca Hydrophyllum Lupine, white Mariposa Milk Vetch Mullein moth Penstemon Poppy, Prickly Prickly Pear Salsify Spiderwort Thistle, bull Yucca | Crow Goldfinch, Lesser Towhee, spotted Dove, Mourning Chat, Yel breasted Racer snake | Amy Chu Anne McDonnell Chris Friedman Janet Chu Jean Morgan Larry Crowley Linda Hardesty Pam Piombino Sue Hirschfeld |

64 volunteer Hours for Boulder Count

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

| Years of Counts in Heil North | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| # of Species Identified During Each Year in Heil-North | 34 | 45 | 41 | 40 | 33 | 24 | 30 | 50 | 38 | 31 | 33 | 50 | 35 | 32 |
| Cumulative # Species 2007-2020 Sighted in Heil-North | 50 | 62 | 77 | 81 | 81 | 85 | 86 | 89 | 90 | 91 | 91 | 92 | 93 | 93 |
| Research Hours on Site | 8 | 17 | 12.5 | 11.5 | 11.5 | 6.5 | 12 | 27 | 32 | 13 | 7.5 | 13.5 | 12 | 8 |
| # Individual Butterflies Counted 2020 | 579 | 654 | 488 | 429 | 272 | 188 | 402 | 1077 | 508 | 246 | 204 | 442 | 359 | 298 |
| # Individuals / Research Hour | 72 | 38 | 39 | 37 | 24 | 29 | 36 | 40 | 16 | 19 | 27 | 33 | 29 | 37 |
| # Species / Research Hour | 4 | 2.6 | 3.3 | 3.4 | 2.9 | 3.6 | 2.5 | 1.9 | 1.2 | 2.4 | 4.4 | 3.7 | 2.9 | 4.7 |

D. Heil Valley – Plumely Canyon

| Heil Valley – Plumely Canyon | 2020 | 5/6 |
|--|------------------------------|-----|
| <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 | 1 |
| <i>P. eurymedon</i> | Pale Swallowtail | |
| <i>P. multicaudata</i> | Two-tailed Swallowtail | |
| swallowtail, black sp. | | 1 |
| <i>Neophasia menapia</i> | Pine White | |
| <i>Pontia protodice</i> | Checkered White | 1 |
| <i>P. occidentalis</i> | Western White | |
| <i>P. sisymbrii</i> | Spring White | |
| <i>Pieris rapae</i> | Cabbage White | 1 |
| <i>P. marginalis</i> | Margined White | |
| <i>Euchloe ausonides</i> | Large Marble | |
| <i>E. olympia</i> | Olympia Marble | 1 |
| <i>Anthocharis julia</i> | Julia Orangetip | |
| white sp. | | 7 |
| <i>Colias philodice</i> | Clouded Sulphur | |
| <i>C. eurytheme</i> | Orange Sulphur | |
| <i>C. alexandra</i> | Queen Alexandra's Sulphur | |
| <i>Zerene cesonia</i> | Southern Dogface | |
| <i>Phoebis sennae eubule</i> | Cloudless Sulphur | |
| <i>Eurema mexicana</i> | Mexican Sulphur | |
| <i>Nathalis iole</i> | Dainty Sulphur | |
| <i>Lycaena dione</i> | Gray Copper | |
| <i>C. mossii schryveri</i> | Moss Elfin | |
| <i>C. polios</i> | Hoary Elfin | |
| <i>C. eryphon</i> | Western Pine Elfin | 19 |
| <i>Callophrys affinis homoperplexa</i> | Western Green Hairstreak | 1 |
| <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 | |
| <i>Leptotes marina</i> | Marine Blue | |
| <i>Cupido amyntula</i> | Western Tailed-Blue | 1 |
| <i>Celastrina echo</i> | Echo Azure | 6 |
| <i>C. humulus</i> | Hops Azure | |
| <i>Glaucopsyche piasus</i> | Arrowhead Blue | |
| <i>G. lygdamus</i> | Silvery Blue | 2 |
| <i>Euphilotes ancilla</i> | Rocky Mountain Dotted-Blue | |
| <i>Echinargus isola</i> | Reakirt's Blue | |

| | | |
|-------------------------------------|--------------------------|-----|
| Heil Valley - Plumely Canyon | 2020 | 5/6 |
| <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. | | 8 |
| <i>Danaus plexippus</i> | Monarch | |
| <i>Euptoieta claudia</i> | Variegated Fritillary | 1 |
| <i>Speyeria aphrodite</i> | Aphrodite Fritillary | |
| <i>S. edwardsii</i> | Edwards' Fritillary | |
| <i>S. callippe</i> | Callippe Fritillary | |
| <i>S. atlantis</i> | Atlantis Fritillary | |
| <i>S. hesperis</i> | Northwestern Fritillary | |
| fritillary sp. | | |
| <i>Polydryas arachne</i> | Arachne Checkerspot | |
| <i>Chlosyne gorgone</i> | Gorgone Checkerspot | |
| <i>C. palla</i> | Northern Checkerspot | |
| <i>Phyciodes pallida</i> | Pallid (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 | 1 |
| <i>Aglaia milberti</i> | Milbert's Tortoiseshell | |
| <i>Nymphalis antiopa</i> | Mourning Cloak | |
| <i>Junonia coenia</i> | Common Buckeye | |
| <i>N. californica</i> | California Tortoiseshell | |
| <i>Vanessa atalanta</i> | Red Admiral | |
| <i>V. cardui</i> | Painted Lady | 37 |
| <i>V. virginiensis</i> | American Lady | |
| <i>Limenitis weidemeyerii</i> | Weidemeyer's Admiral | |
| <i>L. archippus</i> | Viceroy | |
| <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>Erebia epipsodea</i> | Common Alpine | |
| <i>Epargyreus clarus</i> | Silver-spotted Skipper | |
| <i>Thorybes pylades</i> | N. Cloudywing | |
| <i>Erynnis pacuvius</i> | Pacuvius Duskywing | |
| <i>E. afranius</i> | Afranius Duskywing | |
| <i>E. persius</i> | Persius Duskywing | |
| <i>Burnsius 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 | 1 |
| <i>H. colorado</i> | Western Branded Skipper | |
| <i>H. viridis</i> | Green 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>Atrytone arogos</i> | Arogos Skipper | |
| <i>Euphyes vestris</i> | Dun Skipper | |
| <i>Atrytonopsis hianna</i> | Dusted skipper | |

D. Heil Valley – Plumely Canyon (Continued)

| Date, Conditions | Location leading into Heil-Plumely | Butterfly Activity | Blossoming Plants | Animals | Researchers |
|--|---|--|--|-----------------------------------|--|
| 5/6/2020 10:45-12:45 pm 12-18 °C 50% High clouds, 0-5 mph wind | From First locked gate, to streamlet to Plumely barricade | Pine elfins circling in the air. Blues at stream. Others flying fast. Ladies and elfins nectaring on dandelions. | Chickweed Cress, winter Dandelion Locoweed Blue Mahonia Plums, wild Sand lily Vetch, milk | Steller's Jay Towhee Turkey | Amy Chu Chris Friedman Jan Chu Jean Morgan Larry Crowley Linda Hardesty Richard Holmes Sue Hirschfeld |

| Heil Valley - Plumely Canyon | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| # of Species Identified Each Year in Plumely Canyon | 45 | 37 | 44 | 36 | 44 | 41 | 48 | 33 | 38 | 18 | 27 | 27 | 44 | 13 |
| Cumulative # Species 2007-2018 sighted in Plumely Canyon | 81 | 81 | 82 | 84 | 86 | 88 | 89 | 89 | 89 | 90 | 90 | 90 | 93 | 93 |
| Research Hours on Site | 8 | 13 | 17 | 6.5 | 18 | 7.5 | 16 | 8 | 16 | 7 | 5.5 | 5 | 15.5 | 2 |
| # Individual Butterflies Counted | 365 | 480 | 401 | 196 | 526 | 342 | 470 | 479 | 310 | 162 | 348 | 166 | 335 | 90 |
| # Individuals / Research Hour | 45 | 36 | 24 | 30 | 29 | 46 | 29 | 60 | 19 | 23 | 63 | 33 | 22 | 45 |
| # 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 | 5.4 | 2.8 | 6.5 |

E. Walker Ranch

| Walker Ranch-Meyer's Homestead | 2020 | 5/13 | 6/24 | 6/24 | 6/24 | Total |
|--------------------------------|---------------------------|------|------|------|------|-------|
| <i>Parnassius smintheus</i> | Rocky Mountain Parnassian | | 2 | 3 | 3 | 8 |
| <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 | | | | | |
| <i>P. eurymedon</i> | Pale Swallowtail | | 2 | 2 | 2 | 6 |
| <i>P. multicaudata</i> | Two-tailed Swallowtail | | | | | |
| swallowtail sp. | swallowtail sp. | 1 | | | | 1 |
| <i>Neophasia menapia</i> | Pine White | | | | | |
| <i>Pontia protodice</i> | Checkered White | | | 1 | | 1 |
| <i>P. sisymbrii</i> | Spring White | 1ph | | | | 1 |
| <i>P. occidentalis</i> | Western White | | | | | |
| <i>Pieris rapae</i> | Cabbage White | | 1 | | 1 | 2 |
| white sp. | white sp. | 4 | 1 | | | 5 |
| <i>Euchloe ausonides</i> | Large Marble | 1ph | | | | 1 |
| <i>Anthocharis julia</i> | Julia Orangetip | 10ph | | | | 10 |

| Walker Ranch- Meyer's Homestead | 2020 | 5/13 | 6/24 | 6/24 | 6/24 | Total |
|--|-----------------------------|-------------|-------------|-------------|-------------|--------------|
| <i>Colias philodice</i> | Clouded Sulphur | 2 | 1 | | 1 | 4 |
| <i>C. eurytheme</i> | Orange Sulphur | | | 1 | | 1 |
| <i>C. alexandra</i> | Queen Alexandra's Sulphur | | | | | |
| <i>Nathalis iole</i> | Dainty Sulphur | | | | | |
| sulphur sp. | | | 2 | | | 2 |
| <i>Lycaena heteronea</i> | Blue Copper | | | | | |
| <i>Satyrrium saepium</i> | Hedgerow Hairstreak | | | | | |
| <i>Callophrys affinis</i> | W. Green Hairstreak | 7 | | | 1 | 8 |
| <i>C. sheridanii</i> | White-line Green Hairstreak | | | | | |
| <i>C. gyrneus siva</i> | Siva Juniper Hairstreak | | | | | |
| <i>C. spinetorum</i> | Thicket Hairstreak | | | | | |
| <i>C. augustinus</i> | Brown Elfin | 6ph | | | | 6 |
| <i>C. polios</i> | Hoary Elfin | 17ph | | | | 17 |
| <i>C. eryphon</i> | Western Pine Elfin | 2ph | | | | 2 |
| elfin sp. | elfin sp. | 3 | | | | 3 |
| <i>Strymon melinus</i> | Gray Hairstreak | | | | | |
| <i>Cupido amyntula</i> | Western Tailed-Blue | | 1 | | 2 | 3 |
| <i>Celestrina echo</i> | Echo Azure | 8ph | | | | 8 |
| <i>Glaucopsyche piasus</i> | Arrowhead Blue | | | | 3 | 3 |
| <i>G. lygdamus</i> | Silvery Blue | | | 1 | | 1 |
| <i>Euphilotes ancilla</i> | Rocky Mountain Dotted-Blue | | 19 | 2 | 21 | 42 |
| <i>Echinargus isola</i> | Reakirt's Blue | | 1 | | 2 | 3 |
| <i>Plebejus melissa</i> | Melissa Blue | | | | | |
| <i>P. saepiolus</i> | Greenish Blue | | | | | |
| <i>P. icarioides</i> | Boisduval's Blue | | 3 | | 9 | 12 |
| <i>P. lupini lutzi</i> | Lupine Blue | | | | | |
| <i>Agriades glandon rustica</i> | Arctic Blue | | 1 | | | 1 |
| blue sp. | blue sp. | 8 | 29 | 3 | 24 | 61 |
| <i>Danaus plexippus</i> | Monarch | | | | | |
| <i>Apodemia nais</i> | Nais Metalmark | | | | | |
| <i>Euptoieta claudia</i> | Variegated Fritillary | 15 | | 1 | | 16 |
| <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | 1 | | | 1 |
| <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. | | | 4 | | | 4 |
| <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | | | | |
| <i>C. nycteis</i> | Silvery Checkerspot | | | | | |
| <i>C. palla</i> | Northern Checkerspot | | | | 1 | 1 |
| <i>Phyciodes cocyta</i> | Northern Crescent | | | 2 | 1 | 3 |
| <i>P. pulchella</i> | Field Crescent | | | | | |
| <i>Phyciodes pallida</i> | Pallid (Pale) Crescent | | | | | |
| <i>Polydryas arachne</i> | Arachne Checkerspot | | | | | |

| Walker Ranch- Meyer's Homestead | 2020 | 5/13 | 6/24 | 6/24 | 6/24 | Total |
|--|--------------------------|-------------|-------------|-------------|-------------|--------------|
| <i>Euphydryas anicia</i> | Variable Checkerspot | | | 3 | 1 | 4 |
| Checkerspot sp. | Checkerspot sp. | | 2 | | | 2 |
| <i>Polygonia satyrus</i> | Satyr Comma | | | | | |
| <i>Polygonia gracilis</i> | Hoary Comma | 4ph | | | | 4 |
| <i>Aglaia milberti</i> | Milbert's Tortoiseshell | | | | 1? | 1 |
| <i>Nymphalis antiopa</i> | Mourning Cloak | 1 | | | | 1 |
| <i>N. californica</i> | California Tortoiseshell | | | | | |
| <i>Vanessa atalanta</i> | Red Admiral | | | | | |
| <i>V. cardui</i> | Painted Lady | 9 | | | 1 | 10 |
| <i>V. virginensis</i> | American Lady | | | | | |
| <i>Limenitis weidemeyerii</i> | Weidemeyer's Admiral | | | | | |
| <i>Coenonympha tullia ochracea</i> | Ochre (Common) Ringlet | | 28 | 8 | 6 | 42 |
| <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 | | 1 | 2 |
| <i>E. persius</i> | Persius Duskywing | | 5 | 3 | | 8 |
| duskywing sp. | | | 5 | | | 5 |
| <i>Burnsius (Pyrgus) communis</i> | Common Checkered-skipper | | | 1 | | 1 |
| <i>Pholisora catullus</i> | Common Sootywing | | | | | |
| <i>Piruna pirus</i> | Russet Skipperling | | 2 | | 1 | 3 |
| <i>Oarisma garita</i> | Garita Skipperling | | | 1 | | 1 |
| <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 | | | | | |

*First time sighting for this area

ph=photo available

E. Walker Ranch – Homestead Trail

| Date Conditions | Location Walker | Butterfly Behavior | Blooming Plants | Animals | Researchers |
|---|---|--|---|---|---|
| 5/13/2020 9:45-12:30 pm 13-18 °C, cloudy to clearing, wind 5-20 mph 3hrs | Meyer's Homestead Trail And associated meadows | Julia , Variegated flying fast; Hoary elfins, and blues at mud | Chickweed Pasque flower Sand lily Willow | Chickadee, bl cap Crow Flicker Hummingbird bd tled Junco Nuthatch, wh br Raven Red tail Robin Sparrow, Chipping Sparrow, Lark | Amy Chu Chris Friedman Jan Chu Jean Morgan John Barr Larry Crowley Sue Hirschfeld |

| | | | | | |
|--|--|---|---|---|--|
| | | | | Turkey vultures Chipmunk | |
| 6/24/2020 8:40-12:00 pm 15-19 °C, Clear to cloudy to clearing 3 hrs | Meyer's Homestead Trail and meadow, ridgetop straight west from pavilion/restroom. Three separate groups. | Cabbage ovipositing, Variable ch trying to mate;,, dotted blue nectaring on sulfur flower, blues puddling | Bedstraw Ceonothus fendleri Clover, red Erigeron Flax Gaillardia Geranium,Fremont Hawkweed Heterotheca Lambert's loco Lupine Milk Vetch Paintbrush, red Potentilla Rose Salsify Stone crop Sulfur flower Yarrow | Shinea masonii moth Goldfinch, lesser Jay Steller's Mourning Dove Plumbeous vireo Raven Red-tail Robin Sparrow chipping Swallow, Violet -gr W. Bluebird Wren, house Abert's Squirrel Chipmunks | Amy Chu Chris Friedman Jan Chu Jean Morgan Larry Crowley Linda Hardesty Sue Hirschfeld Wynne Whyman |

45 Volunteer Hours for Boulder County

E. Walker Ranch – Homestead Trail

| Walker Ranch, Meyer's Homestead Trail | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| # Species Identified during 2020 in Walker | 30 | 35 | 45 | 35 | 50 | 47 | 62 | 43 | 45 | 43 | 31 | 58 | 47 | 37 |
| # Species Sighted in Meyer's Trail 2007-2020 | 33 | 38 | 60 | 70 | 72 | 75 | 75 | 75 | 76 | 76 | 76 | 77 | 78 | 78 |
| # Research Hours on Site | 5 | 4 | 18 | 16 | 16.5 | 7 | 14.5 | 11 | 29 | 17 | 13.5 | 53 | 27 | 6 |
| # Individual Butterflies Counted | 160 | 203 | 1144 | 437 | 472 | 399 | 394 | 322 | 351 | 549 | 299 | 759 | 449 | 305 |
| # Individual Butterflies / Research Hour | 32 | 54 | 64 | 27 | 29 | 57 | 27 | 29 | 12 | 32 | 22 | 14 | 16 | 51 |
| # 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 | 1 | 1.7 | 6.1 |

F. Reynold's Ranch- North Bog

| Reynold's Ranch Giggey Lake, North Bog | 2020 | 5/18 | 8/4 |
|---|------------------------|------|-----|
| <i>Parnassius smintheus</i> | Parnassian, Rocky Mtn. | | |
| <i>Papilio polyxenes</i> | Black Swallowtail | | |
| <i>P. zelicaon</i> | Anise Swallowtail | | |
| <i>P. rutulus</i> | W. Tiger Swallowtail | | |
| <i>P. eurymedon</i> | Pale Swallowtail | | |
| <i>P. multicaudata</i> | Two-tailed Swallowtail | | |
| <i>Neophasia menapia</i> | Pine White | | |
| <i>Pieris rapae</i> | Cabbage White | | |
| <i>Pontia protodice</i> | Checkered White | | |
| <i>P. occidentalis</i> | Western White | | |
| white sp. | | 3 | |
| <i>Euchloe ausonides</i> | Large Marble | | |
| <i>Anthocharis julia</i> | Julia Orangetip | | |
| <i>Colias philodice</i> | Clouded Sulphur | 1 | |
| <i>C. eurytheme</i> | Orange Sulphur | | 5 |

| Reynold's Ranch Giggey Lake, North Bog | 2020 | 5/18 | 8/4 |
|---|----------------------------|-------------|------------|
| <i>C. alexandra</i> | Queen Alexandra's Sulphur | | 4 |
| sulphur sp. | | 1 | |
| <i>Lycaena rubidus</i> | Ruddy Copper | | |
| <i>L. heteronea</i> | Blue Copper | | |
| <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>C. polios</i> | Hoary Elfin | 28+ | |
| * <i>C. augustinus</i> | Brown Elfin | 1 | |
| <i>Satyrrium saepium</i> | Hedgerow Hairstreak | | |
| <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 | | |
| | | | |
| <i>Plebejus melissa</i> | Melissa Blue | | |
| <i>Euphilotes ancilla</i> | R Mtn Dotted Blue | | |
| <i>Plebejus saepiolus</i> | Greenish Blue | | |
| <i>Glaucopsyche piasus</i> | Arrowhead Blue | | |
| <i>P. icarioides</i> | Boisduval's Blue | 1 | |
| <i>P. glandon rustica</i> | Arctic Blue | | |
| blue sp. | | 1 | |
| <i>Danaus plexippus</i> | Monarch | | |
| <i>Limnitis weidemeyerii</i> | Weidemeyer's Admiral | | |
| <i>Euptoieta claudia</i> | Variegated Fritillary | 8 | |
| <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | 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 | | |
| <i>Boloria selene</i> | Silver-bordered Fritillary | | |
| fritillary sp. | | | 1 |
| <i>Chlosyne palla</i> | Northern Checkerspot | | |
| <i>Phyciodes pallida</i> | Pallid (Pale) Crescent | | |
| <i>P. tharos</i> | Pearl Crescent | | |
| <i>P. cocyta</i> | Northern Crescent | | |
| <i>P. pulchella</i> | Field Crescent | | |
| <i>Polygonia gracilis</i> | Hoary Comma | 4 | |
| <i>Vanessa virginiensis</i> | American Lady | | |
| <i>Vanessa cardui</i> | Painted Lady | 8 | |
| <i>Aglais milberti</i> | Milbert's Tortoiseshell | | |
| <i>Nymphalis antiopa</i> | Mourning Cloak | | |
| <i>Coenonympha tullia ochracea</i> | Common (Ochre) Ringlet | | |
| <i>Vanessa atalanta</i> | Red Admiral | | |
| <i>Cercyonis oetus</i> | Small Wood Nymph | | 22 |
| <i>C. pegala</i> | Common Wood Nymph | | |
| wood nymph sp. | | | |
| <i>Erebia epipsodea</i> | Common Alpine | | |
| <i>Oeneis chryxus</i> | Chryxus Arctic | | |
| <i>Erynnis icelus</i> | Dreamy Duskywing | | |
| <i>E. pacuvius</i> | Pacuvius Duskywing | | |
| <i>E. persius</i> | Persius Duskywing | | |
| <i>Oarisma garita</i> | Garita Skipperling | | |
| <i>Hesperia colorado</i> | W. Branded Skipper | | 2 |
| <i>Polites draco</i> | Draco Skipper | | |
| <i>Ochlodes sylvanoides</i> | Woodland Skipper | | |
| <i>Burnsius (Pyrgus) communis</i> | Common Checkered- skipper | | |
| <i>Euphyes vestris</i> | Dun Skipper | | |

F. Reynold's Ranch- North Bog

| Date, Conditions | Location within Reynold's | Butterfly Activity | Blossoming Plants | Animals | Researchers |
|--|--|---|--|--|--|
| 5/18/2020 10:10-12:10 pm 17-21°C, Clear to high clouds, 0 wind | North Bog (crossed fence to north National Forest) | Hoary Elfins active above their host Kinnikinnick, Ladies on dandelions | Dandelions Very few candytuft, Mouse-ear Senecio snow-on-the mtn willow | Blackbird, red-wing Bluebird, mtn Hummingbird Raven Red-tail Robin Swallow, Tree Cow carcass | Amy Chu Chris Friedman Jan Chu Linda Hardesty Pam Piombino Sue Hirschfeld Venice Kelly |
| 8/4/2020 11:00-12:00 p.m. 26°C, Clear sky, little breeze | Reynold's West | Very dry, not much nectaring except the oetus. | Harebell, Gumweed Fremont geranium Yellow Aster Purple aster Fairy Trumpet Gaillardia Fireweed Small white asters Goldenrod | | Venice Kelly |

F. Reynold's Ranch- North Bog

| 2020 Reynold's Ranch, Giggey Lake, North Bog | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|------|------|------|------|------|------|------|------|------|------|
| # Species Identified during 2020 in Reynold's | 32 | 46 | 36 | 9 | 26 | 32 | 26 | 29 | 25 | 12 |
| # Species Sighted in Reynold's 2011-2020 | 35 | 55 | 55 | 55 | 57 | 57 | 58 | 61 | 61 | 61 |
| # Research Hours on Site | 13 | 11.5 | 10.5 | 4 | 6 | 11 | 10 | 10 | 5 | 3 |
| # Individual Butterflies Counted | 541 | 635 | 395 | 47 | 183 | 612 | 171 | 199 | 237 | 92 |
| # Individuals / Research Hour | 41.6 | 55 | 37.6 | 12 | 3 | 5.6 | 17 | 20 | 47 | 30 |
| # Species / Research Hour | 2.5 | 4 | 3.4 | 2.1 | 4 | 3 | 2.6 | 2.9 | 5 | 4 |

G. Caribou Ranch – Sherwood Road, Bridge Meadow

| Caribou, Sherwood Road | 2020 | 4/ 9 | 4/ 27 | 5/ 3 | 5/ 8 | 5/ 10 | 5/ 16 | 5/ 17 | 5/ 21 | 5/ 27 | 5/ 30 | 6/ 3 | 6/ 12 | 6/ 17 | 6/ 23 | 6/ 24 | 7/ 1 | 7/ 2 | 7/ 6 | 7/ 10 | 7/ 17 |
|--------------------------------------|---------------------------------|---------|----------|---------|---------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|---------|---------|---------|----------|----------|
| <i>Parnassius smintheus</i> | Rocky Mountain Parnassian | | | | | | | | | | | | 3 | 11 | | 2 | 26 | 10 | 6 | 5 | 1 |
| <i>Battus philenor</i> | Pipevine Swallowtail | | | | | | | | | | | | | | | | | | | | |
| <i>Papilio polyxenes</i> | Black Swallowtail | | | | | | | | | | | | | | | | | | | 1 | |
| <i>P. zelicaon</i> | Anise Swallowtail | | | | | | | | | | | | | | | | | | | | |
| <i>P. rutulus</i> | W. Tiger Swallowtail | | | | | | | | | | | 1 | | | | 1 | | | 1 | 1 | 2 |
| <i>P. eurymedon</i> | Pale Swallowtail | | | | | | | | | | 1 | 1 | | 1 | 2 | | 1 | 1 | 1 | 1 | |
| <i>P. multicauda ta</i> | Two-tailed Swallowtail | | | | | | | | | | | 1 | | | | | | | | | |
| <i>Neophasia menapia</i> | Pine White | | | | | | | | | | | | | | | | | | | | |
| <i>Pontia protodice</i> | Checkered White | | | | | | | | 1 | | | | 3 | | | 2 | 2 | 1 | 6 | | |
| <i>P. occidentalis</i> | Western White | | | | | | | | | | | | | | | | | | | | |
| <i>Pieris rapae</i> | Cabbage White | | | | | | | | | | | | | | | | | | | | |
| <i>P. marginalis</i> | Margined White | | | | | | | | | | | | | | | | | | | | |
| <i>Euchloe ausonides</i> | Large Marble | | | | | | | | 6 | 9 | 3 | 5 | 4 | 3 | | | | 2 | | | |
| <i>Anthocharis julia</i> | Julia Orangetip | | | | | 3 | 4 | 6 | 6 | 15 | 7 | 13 | 5 | 15 | 1 | | | | | | |
| white sp. | | | | | | | | | | | | 4 | | 2 | | 1 | | | | 1 | |
| <i>Colias philodice</i> | Clouded Sulphur | | | | | | | 1 | 1 | | | | 1 | | | | 2 | | | | |
| <i>C. eurytheme</i> | Orange Sulphur | | | | | | | | 4 | | 1 | 6 | 5 | 4 | | 2 | | 4 | 2 | 4 | 2 |
| alba | | | | | | | | | | | | 2 | | 2 | | | | | | | |
| <i>C. alexandra</i> | Queen Alexandra's Sulphur | | | | | | | | | | | | | 3 | | | 19 | 20 | 10 | 17 | 10 |
| <i>Phoebis sennae eubule</i> | Cloudless Sulphur | | | | | | | | | | | | | | | | | | | | |
| sulphur sp. | | | | | | | | | | 2 | | | | 2 | | | | | | | |
| <i>Eurema mexicana</i> | Mexican Sulphur | | | | | | | | | | | | | | | | | | | | |
| <i>Abaeis nicippe</i> | Sleepy Orange | | | | | | | | | | | | | | | | | | | | |
| <i>Nathalis iole</i> | Dainty Sulphur | | | | | | | | | | | | | 1 | | | | 1 | 3 | | |
| <i>Lycaena editha</i> | Edith's Copper | | | | | | | | | | | | | | | 1 | | 1 | 2 | | 4 |
| <i>Lycaena rubidus</i> | Ruddy Copper | | | | | | | | | | | | | | | | | | | | |
| <i>L. heteronea</i> | Blue Copper | | | | | | | | | | | | | | | | | | | | |
| <i>L. helloides</i> | Purplish Copper | | | | | | | | | | | | | | | | | | | | 5 |

| Caribou, Sherwood Road | 2020 | 4/ 9 | 4/ 27 | 5/ 3 | 5/ 8 | 5/ 10 | 5/ 16 | 5/ 17 | 5/ 21 | 5/ 27 | 5/ 30 | 6/ 3 | 6/ 12 | 6/ 17 | 6/ 23 | 6/ 24 | 7/ 1 | 7/ 2 | 7/ 6 | 7/ 10 | 7/ 17 |
|--|------------------------------------|---------|----------|---------|---------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|---------|---------|---------|----------|----------|
| <i>Callophrys affinis homo- perplexa</i> | Western Green Hairstreak | | | | | | | | | 1 | | | | | | | | | 1 | | |
| <i>C. sheridanii</i> | White-lined Green Hairstreak | | 5 | 4 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| <i>C. spinetorum</i> | Thicket Hairstreak | | | | | | | | | | | | 1 | | | | | | | | |
| <i>C. augustinus</i> | Brown Elfin | | | | | 2 | 1 | 5 | 2 | 3 | 1 | | | | | | | | | | |
| <i>C. polios</i> | Hoary Elfin | | | | 2 | 7 | | 21 | | 12 | | | | 1 | | | | | | | |
| <i>C. eryphon</i> | Western Pine Elfin | | | | | | 4 | 4 | 8 | 6 | 4 | 4 | 2 | 1 | 1 | 1 | | 1 | | | |
| elfin sp. | | | | | | | | | 1 | 4 | | | | | | | | | | | |
| <i>Satyrium saepium</i> | Hedgerow Hairstreak | | | | | | | | | | | | | | | | | | | | |
| <i>Strymon melinus</i> | Gray Hairstreak | | | | | | | | | 1 | | | | | | | | | | | 2 |
| <i>Cupido amyntula</i> | Western Tailed-Blue | | | | | | | | | | | 2 | 2 | 3 | | 5 | 2 | | | | |
| <i>Celastrina ladon sidara</i> | Echo Azure | | | | | | | 1 | | 4 | 1 | | | | | | | | | | |
| <i>Glaucopsyche epiasus</i> | Arrowhead Blue | | | | | | | | | | | | | | | | | | | | |
| <i>G. lygdamus</i> | Silvery Blue | | | | | | | | 1 | 3 | 4 | | | | | | | | | | |
| <i>Euphilotes ancilla</i> | Rocky Mountain Dotted-Blue | | | | | | | | | | | | 5 | 10 | 5 | 17 | 9 | 32 | 15 | 6 | 3 |
| <i>Echinargus isola</i> | Reakirt's Blue | | | | | | | | | | | | | | 1 | 3 | 1 | 3 | 2 | | 2 |
| <i>Plebejus melissa</i> | Melissa Blue | | | | | | | | | | | | | | | | | | | | |
| <i>P. saepiolus</i> | Greenish Blue | | | | | | | | | | | | | | | 2 | | | | | |
| <i>P. icarioides</i> | Boisduval's Blue | | | | | | | | | | | | | | 1 | | 6 | 4 | | 4 | 3 |
| <i>P. lupini lutzi</i> | Lupine Blue | | | | | | | | | | | 1 | 4 | 7 | 2 | | 3 | 5 | 2 | 3 | |
| <i>P. glandon rustica</i> | Arctic Blue | | | | | | | | | | | | | | | 1 | | 1 | 1 | 1 | |
| blue sp. | | | | | | | | | 1 | 2 | | 10 | 7 | 21 | 2 | 9 | 12 | 2 | 7 | 9 | 10 |
| <i>Euptoieta claudia</i> | Variegated Fritillary | | | | | | | | 1 | 2 | | 4 | 1 | | | | 2 | | | | 1 |
| <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | | | | | | | | | | | | | | | | | | | 1 |
| *** <i>S. atlantis</i> | Atlantis Fritillary | | | | | | | | | | | | | | | | | | | | |
| <i>S. edwardsii</i> | Edwards' Fritillary | | | | | | | | | | | | | 1 | | | | | | | |
| <i>S. coronis</i> | Coronis Fritillary | | | | | | | | | | | | | | | | | | | | |
| <i>S. hesperis</i> | Northwestern Fritillary | | | | | | | | | | | | | | | | | | | | |
| <i>S. mormonia</i> | Mormon Fritillary | | | | | | | | | | | | | | | | | | 1 | | |
| fritillary sp. | | | | | | 1 | | | | | | | 7 | 3 | | | 1 | | 2 | 2 | 10 |
| <i>Poladryas arachne</i> | Arachne Checkerspot | | | | | | | | | | | | | | | | | | | | |
| <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | | | | | | | | | | | | | | | | | | | |

| Caribou, Sherwood Road | 2020 | 4/ 9 | 4/ 27 | 5/ 3 | 5/ 8 | 5/ 10 | 5/ 16 | 5/ 17 | 5/ 21 | 5/ 27 | 5/ 30 | 6/ 3 | 6/ 12 | 6/ 17 | 6/ 23 | 6/ 24 | 7/ 1 | 7/ 2 | 7/ 6 | 7/ 10 | 7/ 17 |
|---|--------------------------------|---------|----------|---------|---------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|---------|---------|---------|----------|----------|
| <i>C. nycteis</i> | Silvery Checkerspot | | | | | | | | | | | | | 1 | | 2 | | 2 | 2 | | |
| <i>C. palla</i> | Northern Checkerspot | | | | | | | | | | | | | 4 | | 8 | 6 | 3 | 6 | 2 | 7 |
| | | | | | | | | | | | | | | | | | | | | | |
| <i>Phyciodes pallida</i> | Pallid Crescent | | | | | | | | | | | | | | | | | | | | |
| <i>P. tharos</i> | Pearl Crescent | | | | | | | | | | | | | | | | | | | | |
| <i>P. cocyta</i> | Northern Crescent | | | | | | | | | | | | | 1 | 2 | 1 | 2 | | 4 | | 4 |
| <i>P. pulchella</i> | Field Crescent | | | | | | | | | | | | | | | | | | 1 | | |
| <i>Euphydryas anicia</i> | Variable Checkerspot | | | | | | | | | | | | | | | 5 | | | | | |
| <i>Polygonia faunus</i> | Green Comma | | | 1 | | | | | | | | | 1 | | | | | | | | |
| <i>P. gracilis</i> | Hoary Comma | | 1 | 1 | | 1 | | | | | | | | | | | | | 1 | | 1 |
| <i>*P. satyrus</i> | Satyr Comma | | | | | | | | | | | | | | | | | | | 1 | |
| <i>Junonia coenia</i> | Common Buckeye | | | | | | | | | | | | | | | | | | | | |
| <i>Aglaia milberti</i> | Milbert's Tortoiseshel l | | | | | | | | | | | | | | | | | | | | |
| <i>Nymphalis antiopa</i> | Mourning Cloak | 3 | | 3 | | | | | | | | 2 | | | | 1 | | | | | |
| <i>Vanessa atalanta</i> | Red Admiral | | | | | | | | | | | | | | | | | | | | |
| <i>V. cardui</i> | Painted Lady | | | 8 | 2 | 8 | 2 | 6 | 3 | 2 | 5 | 4 | | 1 | | 1 | | | 3 | | 1 |
| <i>V. virginiensis</i> | American Lady | | | | | | | | | | | | | | | | | | | | |
| <i>Danaus plexippus</i> | Monarch | | | | | | | | | | | | | | | | | | | | |
| <i>Limenitis weidemeyerii</i> | Weidemeye r's Admiral | | | | | | | | | | | | | | | | | 1 | | 2 | 4 |
| <i>Coenonymph a tullia ochracea</i> | Common (Ochre) Ringlet | | | | | | | | | | | 19 | 11 | 10 | 3 | 10 | 14 | 11 | 5 | | |
| <i>Cercyonis pegala</i> | Common Wood- Nymph | | | | | | | | | | | | | | | | | | | | |
| <i>C. oetus</i> | Small Wood- Nymph | | | | | | | | | | | | | | | | | | | | 7 |
| <i>Erebia epipsodea</i> | Common Alpine | | | | | | | | | | | | | | | | | | | | |
| <i>Oeneis chryxus</i> | Chryxus Arctic | | | | | | | | | | | | 2 | 8 | 3 | 3 | 17 | 8 | 6 | 5 | 4 |
| <i>O. uhleri</i> | Uhler's Arctic | | | | | | | | | | | | | | | | | | 1 | | |
| <i>Thorybes pylades</i> | Northern Cloudywing | | | | | | | | | | 1 | | | | | | | | | | |
| <i>Erynnis icelus</i> | Dreamy Duskywing | | | | | | | | | 3 | | 1 | | | | 2 | | | | | |
| <i>E. pacuvius</i> | Pacuvius Duskywing | | | | | | | | | 4 | | | | | | | | | | | |

| Caribou, Sherwood Road | 2020 | 4/ 9 | 4/ 27 | 5/ 3 | 5/ 8 | 5/ 10 | 5/ 16 | 5/ 17 | 5/ 21 | 5/ 27 | 5/ 30 | 6/ 3 | 6/ 12 | 6/ 17 | 6/ 23 | 6/ 24 | 7/ 1 | 7/ 2 | 7/ 6 | 7/ 10 | 7/ 17 |
|---------------------------------------|---|---------|----------|---------|---------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|---------|---------|---------|----------|----------|
| <i>E. persius</i> Duskywing | Persius Duskywing | | | | | | | 1 | | 4 | 1 | 5 | | 2 | 1 | 3 | 7 | 6 | 2 | | |
| duskywing sp. | | | | | | | | | | | | | | | | | | | | | |
| <i>Pyrgus ruralis</i> | Two- banded Checkered- Skipper | | | | | | 1 | 1 | 1 | | | | | | | | | | | | |
| <i>Burnsius communis</i> | Common Checkered- Skipper | | | | | | | | | | | | | 5 | | 3 | | 1 | 1 | | |
| <i>Piruna pirus</i> | Russet Skipperling | | | | | | | | | | | | | | | | | | 1 | | |
| <i>Oarisma garita</i> | Garita Skipperling | | | | | | | | | | | | | | | | 1 | | 1 | | |
| <i>Hesperia juba</i> | Juba Skipper | | | | | | | | | | | | | | | | | | | | |
| <i>H. colorado</i> | Western Branded Skipper | | | | | | | | | | | | | | | | | | | | |
| <i>H. colorado ochracea</i> | Ochre Branded Skipper | | | | | | | | | | | | | | | | | | | | |
| <i>H. pahaska</i> | Pahaska Skipper | | | | | | | | | | | | | | | | | | | | |
| <i>H. viridis</i> | Green Skipper | | | | | | | | | | | | | | | | | | | | |
| <i>H. nevada</i> | Nevada Skipper | | | | | | | | | | | 1 | 2 | 2 | | | | | | 1 | 1 |
| <i>Polites draco</i> | Draco Skipper | | | | | | | | | | | | | | | 2 | 3 | | | | |
| <i>P. mystic</i> | Long Dash | | | | | | | | | | | | | | | | | | | | |
| <i>Poanes taxiles</i> | Taxiles Skipper | | | | | | | | | | | | | | | | | 1 | | | |
| <i>Ochlodes sylvanoides</i> | Woodland Skipper | | | | | | | | | | | | | | | | | | | | |
| <i>Euphyes vestries</i> | Dun Skipper | | | | | | | | | | | | | | | | | | | | |
| skipper sp. | | | | | | | | | | | | | | | | | 3 | | | 3 | |

| Caribou, Sherwood Road | 2020 | 7/20 | 7/27 | 7/29 | 8/3 | 8/10 | 8/25 | 8/30 | 9/5 | 9/15 | Totals |
|---------------------------------------|---------------------------------|------|------|------|-----|------|------|------|-----|------|---------------|
| <i>Parnassius smintheus</i> | Rocky Mountain Parnassian | | 1 | | | | | | | | 70 |
| <i>Battus philenor</i> | Pipevine Swallowtail | | | | | | | | | | 0 |
| <i>Papilio polyxenes</i> | Black Swallowtail | | | | | | | | | | 1 |
| <i>P. zelicaon</i> | Anise Swallowtail | | | | | | | | | | 0 |
| <i>P. rutulus</i> | W. Tiger Swallowtail | | | | | | | | | | 6 |
| <i>P. eurymedon</i> | Pale Swallowtail | | | | 1 | | | | | | 9 |

| Caribou, Sherwood Road | 2020 | 7/20 | 7/27 | 7/29 | 8/3 | 8/10 | 8/25 | 8/30 | 9/5 | 9/15 | Totals |
|--|------------------------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|------------|-------------|---------------|
| <i>P.multicaudata</i> | Two-tailed Swallowtail | | | | | | | | | | 1 |
| <i>Neophasia menapia</i> | Pine White | | | | | 3 | 5 | | | | 8 |
| <i>Pontia protodice</i> | Checkered White | 1 | 5 | 1 | 1 | 2 | | | | | 25 |
| <i>P. occidentalis</i> | Western White | | | | | | | | | | 0 |
| <i>Pieris rapae</i> | Cabbage White | | | | 1 | | | | | | 1 |
| <i>P. marginalis</i> | Margined (Mustard) White | | | | | | | | | | 0 |
| <i>Euchloe ausonides</i> | Large Marble | | | | | | | | | | 32 |
| <i>Anthocharis julia</i> | Julia Orangetip | | | | | | | | | | 75 |
| white sp. | | | 1 | 1 | | | 1 | | | | 11 |
| <i>Colias philodice</i> | Clouded Sulphur | | | | | 1 | | | | | 6 |
| <i>C. eurytheme</i> | Orange Sulphur | 3 | 8 | 5 | 3 | 12 | 8 | 4 | 8 | 2 | 87 |
| alba | | | | 1 | 1 | | | | | | 4 |
| <i>C. alexandra</i> | Queen Alexandra's Sulphur | 22 | 13 | 8 | 13 | 7 | | | | | 142 |
| <i>Phoebis sennae eubule</i> | Cloudless Sulphur | | | | | | | | | | 0 |
| sulphur sp. | | | | | | | | 1 | | | 7 |
| <i>Eurema mexicana</i> | Mexican Sulphur | | | | | | | | | | 0 |
| <i>Abaeis nicippe</i> | Sleepy Orange | | | | | | | | | | 0 |
| <i>Nathalis iole</i> | Dainty Sulphur | | 2 | | | 3 | 1 | 1 | | | 12 |
| <i>*Lycaena editha</i> | Edith's Copper | 1 | 1 | | 1 | | | | | | 11 |
| <i>Lycaena rubidus</i> | Ruddy Copper | 1 | 1 | 1 | 3 | 2 | | | | | 8 |
| <i>L. heteronea</i> | Blue Copper | 1 | 1 | 1 | | 3 | | | | | 6 |
| <i>L. helioides</i> | Purplish Copper | 14 | 20 | | 6 | | | | | | 45 |
| <i>**Saryrium behri</i> | Behr's Hairstreak | | | | | 1 | | | | | 1 |
| <i>Callophrys affinis homoperplexa</i> | Western Green Hairstreak | 1 | | | | | | | | | 3 |
| <i>C. sheridanii</i> | White-lined Green Hairstreak | | | | | | | | | | 14 |
| <i>C. spinetorum</i> | Thicket Hairstreak | | | | | | | | | | 1 |
| <i>C. augustinus</i> | Brown Elfin | | | | | | | | | | 14 |
| <i>C. polios</i> | Hoary Elfin | | | | | | | | | | 43 |
| <i>C. eryphon</i> | Western Pine Elfin | | | | | | | | | | 37 |
| elfin sp. | | | | | | | | | | | 5 |
| <i>Satyrium saepium</i> | Hedgerow Hairstreak | | | | | | | | | | 0 |
| <i>Strymon melinus</i> | Gray Hairstreak | | | | | 1 | | 1 | | | 5 |
| <i>Cupido amyntula</i> | Western Tailed-Blue | 3 | 1 | | | | | | | | 18 |
| <i>Celastrina ladon sidara</i> | Echo Azure | | | | | | | | | | 6 |
| <i>Glaucopsyche piasus</i> | Arrowhead Blue | | | | | | | | | | 0 |
| <i>G. lygdamus</i> | Silvery Blue | | | | | | | | | | 7 |
| <i>Euphilotes ancilla</i> | Rocky Mountain Dotted-Blue | 4 | 1 | 2 | | | | | | | 109 |

| Caribou, Sherwood Road | 2020 | 7/20 | 7/27 | 7/29 | 8/3 | 8/10 | 8/25 | 8/30 | 9/5 | 9/15 | Totals |
|---------------------------------------|-------------------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|------------|-------------|---------------|
| <i>Echinargus isola</i> | Reakirt's Blue | | 4 | 1 | 4 | 1 | 1 | | 1 | 2 | 26 |
| <i>Plebejus melissa</i> | Melissa Blue | | | | | | | | | | 0 |
| <i>P. saepiolus</i> | Greenish Blue | 3 | | | 1 | | | | | | 6 |
| <i>P. icarioides</i> | Boisduval's Blue | 5 | 1 | 1 | 2 | | | | | | 27 |
| <i>P. lupini lutzi</i> | Lupine Blue | 1 | 2 | | | 2 | | | | | 32 |
| <i>P.glandon rustica</i> | Arctic Blue | | | | | | | | | | 4 |
| blue sp. | | 3 | 3 | | | 2 | | | | | 100 |
| <i>Euptoieta claudia</i> | Variegated Fritillary | | | | 1 | 1 | | | | | 13 |
| <i>Speyeria aphrodite</i> | Aphrodite Fritillary | | 1 | | 2 | | | | | | 4 |
| *** <i>S. atlantis</i> | Atlantis Fritillary | 1 | | | | | | | | | 1 |
| <i>S. edwardsii</i> | Edwards' Fritillary | | | | | | 1 | 1 | | | 3 |
| <i>S. coronis</i> | Coronis Fritillary | | | | | | | | | | |
| <i>S. hesperis</i> | Northwestern Fritillary | 1 | 3 | 1 | 2 | 3 | | | | | 10 |
| <i>S. mormonia</i> | Mormon Fritillary | 1 | 3 | | 1 | | | 1 | | | 7 |
| fritillary sp. | | 2 | 3 | 1 | 8 | 8 | 2 | | 1 | | 51 |
| <i>Poladryas arachne</i> | Arachne Checkerspot | | | | | 2 | | | | | 2 |
| <i>Chlosyne gorgone</i> | Gorgone Checkerspot | | | | | | | | | | 0 |
| <i>C. nycteis</i> | Silvery Checkerspot | | 1 | | | | | | | | 6 |
| <i>C. palla</i> | Northern Checkerspot | 6 | 3 | | | | | | | | 49 |
| <i>Phyciodes pallida</i> | Pallid Crescent | | | | | | | | | | 0 |
| <i>P. tharos</i> | Pearl Crescent | | | | | | | | | | 0 |
| <i>P. cocyta</i> | Northern Crescent | | 5 | | | | | | | | 25 |
| <i>P. pulchella</i> | Field Crescent | | | | | | | | | 1 | 2 |
| <i>Euphydryas anicia</i> | Variable Checkerspot | | | | | | | | | | 5 |
| <i>Polygonia faunus</i> | Green Comma | | | | 1 | 1 | | | | | 4 |
| <i>P. gracilis</i> | Hoary Comma | | 1 | | 1 | | 2 | 1 | 3 | 4 | 17 |
| <i>P. satyrus</i> | Satyr Comma | | | | | | | | | | 0 |
| comma sp. | | | | | 1 | | | | 1 | | 2 |
| <i>Junonia coenia</i> | Common Buckeye | | | | | | | | | | 0 |
| <i>Aglaia milberti</i> | Milbert's Tortoiseshell | | | | | | | | | | 0 |
| <i>Nymphalis antiopa</i> | Mourning Cloak | | | | 4 | | | | 1 | 2 | 16 |
| <i>Vanessa atalanta</i> | Red Admiral | | | | | | | | | | 0 |
| <i>V. cardui</i> | Painted Lady | 1 | 1 | 1 | | | | 2 | 1 | | 52 |
| <i>V. virginiensis</i> | American Lady | | | | | | | 1 | | | 1 |
| <i>Danaus plexippus</i> | Monarch | | | | | | | | | | 0 |
| <i>Limenitis weidemeyerii</i> | Weidemeyer's Admiral | 1 | 1 | | | 3 | | | | | 12 |

| Caribou, Sherwood Road | 2020 | 7/20 | 7/27 | 7/29 | 8/3 | 8/10 | 8/25 | 8/30 | 9/5 | 9/15 | Totals |
|---------------------------------------|------------------------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|------------|-------------|---------------|
| <i>Coenonympha tullia ochracea</i> | Common (Ochre) Ringlet | | | | | | | | | | 83 |
| <i>Cercyonis pegala</i> | Common Wood-Nymph | | | | | | | | | | 0 |
| <i>C. oetus</i> | Small Wood-Nymph | 8 | 24 | 20 | 23 | 38 | 7 | 8 | 2 | | 137 |
| <i>Erebia epipsodea</i> | Common Alpine | | | | | | | | | | 0 |
| <i>Oeneis chryxus</i> | Chryxus Arctic | 5 | 2 | | | | | | | | 63 |
| <i>O. uhleri</i> | Uhler's Arctic | | | | | | | | | | 1 |
| <i>Thorybes pylades</i> | Northern Cloudywing | | | | | | | | | | 1 |
| <i>Erynnis icelus</i> | Dreamy Duskywing | | | | | | | | | | 6 |
| <i>E. pacuvius</i> | Pacuvius Duskywing | | | | | | | | | | 4 |
| <i>E. persius</i> | Persius Duskywing | | | | | | | | | | 32 |
| | | | | | | | | | | | 0 |
| duskywing sp. | | | | | | | | | | | 0 |
| <i>Pyrgus ruralis</i> | Two-banded Checkered-Skipper | | | | | | | | | | 3 |
| <i>Brunsius communis</i> | Common Checkered-Skipper | | 1 | 1 | | | | 2 | | | 14 |
| <i>Piruna pirus</i> | Russet Skipperling | 3 | | | | | | | | | 4 |
| <i>Oarisma garita</i> | Garita Skipperling | | 1 | | | | | | | | 3 |
| <i>Hesperia juba</i> | Juba Skipper | | | | | | | | | | 0 |
| <i>H. colorado</i> | Western Branded Skipper | | | | 1 | | | | 3 | | 4 |
| <i>H. colorado ochracea</i> | Ochre Branded Skipper | | | | | | | | | | 0 |
| <i>H. pahaska</i> | Pahaska Skipper | | | | | | | | | | 0 |
| <i>H. viridis</i> | Green Skipper | | | | | | | | | | 0 |
| <i>H. nevada</i> | Nevada Skipper | | | | | | | | | | 7 |
| <i>Polites draco</i> | Draco Skipper | | | | | | | | | | 5 |
| <i>P. mystic</i> | Long Dash | | | | | | | | | | 0 |
| <i>Poanes taxiles</i> | Taxiles Skipper | | | | | | | | | | 1 |
| <i>Ochlodes sylvanoides</i> | Woodland Skipper | | 2 | | 1 | 6 | | 1 | | | 10 |
| <i>Euphyes vestries</i> | Dun Skipper | | | | | | | | | | 0 |
| | | | | | | | | | | | 0 |
| skipper sp. | | | 1 | | | | | | | | 4 |

G. Caribou Ranch, Sherwood Road

| Caribou Ranch, Sherwood Road | Location | Butterfly Behavior | Blossoming Plants | Animals | Researchers |
|---|---------------------------|--|--|--|---|
| 4/9/2020 11:30-12:40pm 7°C Sunny | Sherwood Road Transect | Cloaks chasing | | Robins, Junco's, Steller's jays Mallard ducks | Venice Kelly Jeff MacLachlan |
| 5/3/2020 10-12:00 p.m sunny , 12°C, windy | Sherwood Road Transect | | Pasque flowers Dandelions Spring beauties Kinnikinnick | Crossbills Kinglet, ruby-crowned | Venice Kelly Jeff MacLachlan |
| 5/10/2019 11:48-1:15 pm 6°C, 50% cloudy, cold breezy | Sherwood Road | | Spring Beauties Candytufts Pasque Flowers | | Venice Kelly |
| 5/16/2020 1:00-2:30 pm 14°Csunny,40%cloudy, breezy | Sherwood Road Transect | Orange tips flying by, | Daisy ,Cutleaf Larkspur Oregon grape Pasque Spring Beauties Candytufts | Sparrow, chipping Jay, Steller's Kinglet, ruby crowned | Venice Kelly |
| 5/17/2020 10:45-12:30 pm 14-15°C, sunny, high clouds | Sherwood Road Transect | | Candy tufts Spring beauty | Sparrow, chipping Hummingbird, Br tled Junco | Venice Kelly Jeff MacLachlan |
| 5/21/2020 14 °C sunny, breezy 1 hr. | Sherwood Road Transect | | | | Venice Kelly |
| 5/27/2020 9:00-11:30 am 13-18°C Clear, wind 2-25 | Sherwood Road Transect | Pine Elfins swirling, Orangetips flying near ground, Elfins over kinnikinnick, Duskywings at seep | Chickweed Dandelion Easter Daisy Golden Banner Harebell Kinnikinnick Larkspur, tiny Mertensia Parsley, mtn Potentilla Pussy Toes Sedum Senecio Strawberry Yarrow | Hummingbird, brd tl Crossbills Nuthatch | Jean Morgan Venice Kelly Jan Chu Larry Crowley |
| 5/30/2020 1:00-2:00 pm 21 °C | Sherwood Road Transect | | Paint brush Wall flower Iris Yellow Mustard | | Venice Kelly |
| 6/3/2020 9:30-1:30 pm 18-25°C, Sunny to 30% clouds, still to breezy | Sherwood Rd transect | Hoary elfins were old, worn | Wall flower Fremont geranium Tower mustard Paintbrush Penstamen Pussy toes, white | Elk, 2 young Garter snake at seep | Venice Kelly Wynne Whyman |
| 6/12/2020 11:30-1:15 pm 21-25 °C Mostly blue sky, windy | Sherwood Transect | Dry, crunchy ground | Gaillardia Penstemon pink Clover, red Skullcap Solomon seal Sulphur flower | | Venice Kelly |
| 6/17/2020 9:30-11:30 am 19-23 °C, Blue sky, windy | Sherwood Transect | Many flying butterflies | Anemone, red Chicory Choke cherry Orchid, bog Potentilla Rose Salsify | | Jeff MacLachlan Venice Kelly |

| Caribou Ranch Sherwood Road | Location | Butterfly Behavior | Blossoming Plants | Animals | Researchers |
|--|--|--|--|--|--|
| 6/23/2020 9:30-11:00 am 18 °C, 30-40 % Cloud cover | Mud Lake | Butterflies flying between clouds | Sulfur Flower Potentilla Penstemon, pink purple Geranium, Fremont Sedum Golden Banner, Red Clover Bed straw Wall flower Gaillardia Lupine Salsify Tower mustard Rose Coral Root Geyer onion Mountain parsley Columbine Strawberry | | Venice Kelly |
| 6/24/2020 9:30-12:00 pm 20-22 °C, cloudy to sunny; breezy | Sherwood transect | Fresh male Edith's Copper; puddling blues. Mourning cloak old. | Locoweed Sweet Clover Black-eyed Susan Osha Cow Parsnip Miner's candle | Vole getting drink from seep | Venice Kelly |
| 7/1/2020 9:10-12:10 pm Sky clear 0-20 mph | Caribou Ranch Inside locked gate | Few flying | Bog Orchid Ceanothus fendleri Coral Root Geranium, Fremont Richardson's Geyer onions Hairbell Lambert's loco Osha Paintbrush, orange Penstemon, one-sided Potentilla Rudbeckia Susan Black-eyed Wall flower Partial list | Crossbill, red Raven family Williamson's sapsucker Solitaire Chipmunk | Amy Chu Chris Friedman Jan Chu Larry Crowley Linda Hardesty Suzanne Venice Kelly |
| 7/2/2020 9:30-12:00 pm 18-22 °C, | Sherwood transect | | Fairy Trumpets Gumweed Aster, Purple Susan, Black-eyed Harebell Globe flower | | Venice Kelly |
| 7/6/2020 10:00 – 12:30 pm 20-24 °C, 30% cloud cover | Sherwood Transect | . | Evening primrose White clover | Long-tailed weasel ran across the road | Venice Kelly |
| 7/10/2020 9:45-11:45 am Blue sky, too hot 26 °C, | Caribou Open Space; from parking lot, trail to first meadow | Satyr Comma ovipositing | Mariposa lily Pine Drops Purple Asters Gumweed Sulphur flowers | | Venice Kelly Jeff MacLachlan |
| 7/17 10:20-12:00 pm 25-27 °C, Full sun. | Bluebird Mine | | Dog band dried up Purple Asters | Two Dippers flying up and down near the waterfall. Sad to see spraying | Venice Kelly Jeff MacLachlan |

| Caribou Ranch Sherwood Road | Location | Butterfly Behavior | Blossoming Plants | Animals | Researchers |
|---|----------------------|--|---|----------------|---|
| 7/20/2020 9:30-11:45 am 23-27 °C, All blue sky, very breezy | Sherwood transect | | Rudbeckia Monarda | | Venice Kelly |
| 7/27/2020 9:30 – 12:00 pm 18-23 °C, Sunny, then clouds | Sherwood Transect | | | | Venice Kelly Jeff MacLachlan |
| 7/29.2020 9:30-noon 18-23 °C, 40% cloudy to overcast | Sherwood transect | | | | Venice Kelly Wynne Whyman |
| 7/29/2020 9:30-1:00pm 20-23 °C, full sun, 10-25 mph | Homestead | Ruddy copper nectaring on Golden rod | Purple aster Sulphur flowers Golden rod | | Venice Kelly Jeff MacLachlan Wynne Whyman |
| 8/3/2020 9:45-11:45 am 18-23 °C Mostly sun to some clouds | Bridge Meadow | . | Agoseris (orange) | | Venice Kelly Jeff MacLachlan |
| 8/10/2020 9:45-2:pm 18-25 °C Smoky hazy, 30% clouds | Sherwood Transect | Pine white at the seep. First time sighting the Behr's hairstreak | Very few lupines or nectar plants | | Venice Kelly Wynne Whyman |
| 8/25/2020 10:30-12:15 pm 25 °C Very hazy. 30% clouds. | Sherwood Transect | Pine white nectaring on blue aster; orange sulphur on white aster. | | Pocket gopher | Venice Kelly |
| 8:30/2020 10:30-12:00 pm 19-20 °C Blue sky, quite breezy. | Sherwood Transect | Butterflies hanging on due to wind | | | Venice Kelly Jeff MacLachlan |
| 9/15/2020 11:30-12:36 pm 20 °C, hazy sky | Sherwood Transect | Following snowfall; Fresh field crescent. Commas and Cloaks taking sap from aspens. | | | Venice Kelly Jeff MacLachlan |

116 volunteer hours for Boulder County

| Caribou Ranch-Sherwood Road | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| # Species Identified in Caribou Ranch | 48 | 48 | 40 | 20 | 46 | 28 | 38 | 47 | 55 | 50 | 59 | 61 | 65 | 64 |
| Cumulative # Species Sighted in Caribou 2007-2020 | 75 | 75 | 80 | 80 | 81 | 82 | 83 | 83 | 84 | 85 | 86 | 88 | 88 | 89 |
| # Research Hours on Site | 10 | 12 | 8.5 | 6 | 12.5 | 8 | 8 | 14 | 15 | 10 | 27.5 | 43 | 53 | 57.5 |
| # Individual Butterflies Counted | 358 | 647 | 278 | 145 | 488 | 304 | 361 | 752 | 587 | 657 | 770 | 1071 | 2336 | 1692 |
| # Individuals /Research Hour | 36 | 54 | 33 | 24 | 39 | 38 | 45 | 54 | 39 | 65 | 28 | 25 | 44 | 29 |
| #Species/Research Hour | 4.8 | 4.0 | 4.7 | 3.3 | 3.7 | 3.5 | 4.8 | 3.4 | 3.6 | 5.0 | 2.0 | 1.0 | 1.2 | 1.1 |

H. Anne U. White

| Anne U. White Trail | 2020 | 5/3 |
|---------------------------------|------------------------------|-----|
| Parnassius smintheus | Rocky Mountain Parnassian | 0 |
| Papilio polyxenes | Black Swallowtail | 0 |
| P. zelicaon | Anise Swallowtail | 0 |
| P. indra | Short-tailed Swallowtail | 0 |
| P. rutulus | W. Tiger Swallowtail | 1 |
| P. eurymedon | Pale Swallowtail | 0 |
| P. multicaudata | Two-tailed Swallowtail | 0 |
| Pontia protodice | Checkered White | 0 |
| P. sisymbrii | Spring White | 0 |
| Pieris rapae | Cabbage White | 0 |
| Euchloe ausonides | Large Marble | 0 |
| E. olympia | Olympia Marble | 0 |
| white sp. | | 3 |
| Anthocharis sara julia | Julia Orangetip | 0 |
| Colias philodice | Clouded Sulphur | 0 |
| C. eurytheme | Orange Sulphur | 1 |
| Nathalis iole | Dainty Sulphur | 0 |
| Callophrys affinis homoperplexa | Canyon Bramble Hairstreak | 0 |
| C. sheridanii | White-lined Green Hairstreak | 0 |
| C. gyrneus siva | Siva Juniper Hairstreak | 0 |
| C. mossii schryveri | Moss' Elfin | 0 |
| C. polios | Hoary Elfin | 0 |
| C. eryphon | Western Pine Elfin | 15 |
| Satyrrium titus | Coral Hairstreak | 0 |
| Strymon melinus | Gray Hairstreak | 0 |
| Cupido amyntula | Western Tailed-Blue | 0 |
| Celastrina ladon sidara | Echo Azure | 0 |
| Glycopsyche piasus | Arrowhead Blue | 0 |

| Anne U. White Trail | 2020 | 5/3 |
|-----------------------------|----------------------------|------------|
| G. lygdamus | Silvery Blue | 0 |
| Euphilotes ancilla | Rocky Mountain Dotted-Blue | 0 |
| Echinargus isola | Reakirt's Blue | 0 |
| P. saepiolus | Greenish Blue | 0 |
| Plebejus melissa | Melissa Blue | 0 |
| P. icarioides | Boisduval's Blue | 0 |
| P. lupini lutzi | Lupine Blue | 0 |
| P. glandon rustica | Arctic Blue | 0 |
| blue sp. | | 1 |
| Apodemia nais | Nais Metalmark | 0 |
| Danaus plexippus | Monarch | 0 |
| Euptoieta claudia | Variegated Fritillary | 0 |
| Speyeria aphrodite | Aphrodite Fritillary | 0 |
| S. edwardsii | Edwards' Fritillary | 0 |
| S. coronis | Coronis Fritillary | 0 |
| S. callippe | Callippe Fritillary | 0 |
| S. hesperis | Northwestern Fritillary | 0 |
| S. mormonia | Mormon Fritillary | 0 |
| fritillary sp. | | 0 |
| Chlosyne gorgone | Gorgone Checkerspot | 0 |
| C. palla | Northern Checkerspot | 0 |
| Phyciodes pallida | Pale Crescent | 0 |
| P. tharos | Pearl Crescent | 0 |
| P. cocyta | Northern Crescent | 0 |
| P. pulchella | Field Crescent | 0 |
| Polygonia satyrus | Satyr Comma | 0 |
| P. gracilis | Hoary Comma | 1 |
| Junonia coenia | Common Buckeye | 0 |
| Aglais milberti | Milbert's Tortoiseshell | 0 |
| Nymphalis californica | California Tortoiseshell | 0 |
| N. antiopa | Mourning Cloak | 0 |
| Vanessa atalanta | Red Admiral | 0 |
| V. cardui | Painted Lady | 0 |
| V. virginensis | American Lady | 0 |
| Limenitis weidemeyerii | Weidemeyer's Admiral | 0 |
| Coenonympha tullia ochracea | Common Ringlet | 0 |
| Cercyonis pegala | Common Wood-Nymph | 0 |
| C. oetus | Small Wood-Nymph | 0 |
| Oeneis uhleri | Uhler's Arctic | 0 |
| Epargyreus clarus | Silver-spotted Skipper | 0 |
| Pholisora catullus | Common Sootywing | 0 |
| Erynnis pacuvius | Pacuvius Duskywing | 0 |
| E. persius | Persius Duskywing | 0 |

| Anne U. White Trail | 2020 | 5/3 |
|----------------------------|---------------------|------------|
| Piruna pirus | Russet Skipperling | 0 |
| Hesperia juba | Juba Skipper | 0 |
| H. colorado | W. Branded Skipper | 0 |
| H. viridis | Green Skipper | 0 |
| Polites themistocles | Tawny-edged Skipper | 0 |
| P. mystic | Long Dash | 0 |
| Ochlodes sylvanoides | Woodland Skipper | 0 |
| Poanes taxiles | Taxiles Skipper | 0 |
| Euphyes vestris | Dun Skipper | 0 |
| Atrytonopsis hianna | Dusted Skipper | 0 |

| Date, Conditions | Location leading into Heil-Plumely | Butterfly Activity | Blossoming Plants | Animals | Researchers |
|--|---|--|--------------------------|----------------------|--------------------|
| 5/3/2020 9:30-10:30 am 21°C Full sun no wind | Transect | Pine elfins circling in the air. | | Nuthatch, red-breast | Amy Chu Jan Chu |

2 volunteer hours for Boulder County

| Anne U. White | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| # of Species identified during the year in Anne U. White | 44 | 45 | 35 | 31 | 47 | 50 | 29 | 17 | 10 | | 24 | 32 | 23 | 4 |
| Research Hours on Site | 9.3 | 16 | 10 | 10.5 | 19.5 | 13.5 | 11 | 6 | 3 | 0 | 3.5 | 18.5 | 10 | 1 |
| # Individual Butterflies Counted | 366 | 536 | 217 | 112 | 773 | 509 | 334 | 105 | 33 | | 96 | 319 | 216 | 22 |
| # Individuals / Research Hour | 38.5 | 33.5 | 21.7 | 10.7 | 39.6 | 37.7 | 30 | 17.5 | 11 | | 27.4 | 24 | 21.6 | 22 |
| # Species / Research Hour | 4.6 | 2.8 | 3.5 | 3 | 2.4 | 3.7 | 2.6 | 2.8 | 3.3 | | 6.8 | 1.7 | 2.2 | 4 |

Appendix I. Butterflies Observed During Boulder County Open Space Surveys - 2004-2020

| Common Name | Scientific Name | Author(s) |
|--|------------------------------|-----------------------|
| Parnassian and Swallowtails Papilionidae Family | | |
| Parnassian, Rocky Mountain | <i>Parnassius smintheus</i> | Doubleday |
| Swallowtail, Black | <i>Papilio polyxenes</i> | Fabricius |
| Swallowtail, Anise | <i>P. zelicaon</i> | Lucas |
| Swallowtail, Indra | <i>P. indra</i> | Reakirt |
| Swallowtail, Western Tiger | <i>P. rutulus</i> | Lucas |
| Swallowtail, Pale | <i>P. eurymedon</i> | Lucas |
| Swallowtail, Two-tailed | <i>P. multicaudata</i> | W.F.Kirby |
| Whites and Sulphurs Pieridae Family | | |
| White, Pine | <i>Neophasia menapia</i> | C.&R. Felder |
| White, Spring | <i>Pontia sisymbrii</i> | (Boisduval) |
| White, Checkered | <i>P. protodice</i> | (Boisduval & LeConte) |
| White, Western | <i>P. occidentalis</i> | (Reakirt) |
| White, Cabbage | <i>Pieris rapae</i> | (Linnaeus) |
| White, Margined | <i>P. marginalis</i> | Scudder |
| Marble, Large | <i>Euchloe ausonides</i> | (Lucas) |
| Marble, Olympia | <i>E. olympia</i> | (W.H. Edwards) |
| Orangetip, Julia | <i>Anthocharis julia</i> | (W.H. Edwards) |
| Sulphur, Clouded | <i>Colias philodice</i> | Godart |
| Sulphur, Orange | <i>C. eurytheme</i> | Boisduval |
| Sulphur, Queen Alexandra's | <i>C. alexandra</i> | W.H. Edwards |
| Dogface, Southern | <i>Zerene cesonia</i> | (Stoll) |
| Orange, Sleepy | <i>Abaeis nicippe</i> | (Cramer) Sulphur, |
| Lyside | <i>Kricogonia lyside</i> | (Godart) |
| Sulphur, Cloudless (Eastern) | <i>Phoebis sennae eubule</i> | (Linnaeus) |
| Sulphur, Mexican | <i>Eurema mexicana</i> | (Boisduval) |
| Sulphur, Dainty | <i>Nathalis iole</i> | Boisduval |
| Coppers, Hairstreaks, Blues Lycaenidae Family | | |
| Copper, Gray | <i>Lycaena dione</i> | (Scudder) |
| Copper, Blue | <i>L. heteronea</i> | Boisduval |
| Copper, Ruddy | <i>L. rubidus</i> | (Behr) |

| | | |
|-------------------------------|--|--------------------------|
| Copper, Purplish | <i>L. helloides</i> | (Boisduval) |
| Hairstreak, Western Green | <i>Callophrys affinis homoperplexa</i> | W. Barnes & Benjamin |
| Hairstreak, Juniper | <i>C. gryneus siva</i> | (W.H. Edwards) |
| Hairstreak, White-lined Green | <i>C. sheridanii</i> | (W.H. Edwards) |
| Hairstreak, Thicket | <i>C. spinetorum</i> | (Hewitson) |
| Elfin, Brown | <i>C. augustinus</i> | (Westwood) |
| Elfin, Western Pine | <i>C. eryphon</i> | (Boisduval) |
| Elfin, Moss' | <i>C. mossii schryveri</i> | (Cross) |
| Elfin, Hoary | <i>C. polios</i> | (Cook & F. Watson) |
| Elfin, Western Pine | <i>C. eryphon</i> | (Boisduval) |
| Hairstreak, Hedgerow | <i>Satyrrium saepium</i> | (Boisduval) |
| Hairstreak, Behr's | <i>S. behrii</i> | (W.H. Edwards) |
| Hairstreak, Coral | <i>S. titus</i> | (Fabricius) |
| Hairstreak, Striped | <i>S. liparops</i> | (LeConte) |
| Hairstreak, Hedgerow | <i>S. saepium</i> | (Boisduval) |
| Hairstreak, Gray | <i>Strymon melinus</i> | Hübner |
| Blue, Marine | <i>Leptotes marina</i> | (Reakirt) |
| Tailed-Blue, Western | <i>Cupido amyntula</i> | (Boisduval) |
| Azure, Echo | <i>Celastrina echo</i> | (Clench) |
| Azure, Hops | <i>C. humulus</i> | Scott & D. Wright |
| Blue, Arrowhead | <i>Glaucopsyche piasus</i> | (Boisduval) |
| Blue, Silvery | <i>G. lygdamus</i> | (E. Doubleday) |
| Dotted-Blue, Rocky Mountain | <i>Euphilotes ancilla</i> | (W. Barnes & McDunnough) |
| Blue, Reakirt's | <i>Echinargus isola</i> | (Reakirt) |
| Blue, Melissa | <i>Plebejus melissa</i> | (W.H. Edwards) |
| Blue, Greenish | <i>Icaricia saepiolus</i> | (Boisduval) |
| Blue, Boisduval's | <i>I. icarioides</i> | (Boisduval) |
| Blue, Lupine | <i>I. lupini lutzi</i> | P. dos Passos |
| Blue, Arctic | <i>Agriades glandon rustica</i> | (W.H. Edwards) |
| Metalmarks | Riodinidae Family | |
| Metalmark, Nais | <i>Apodemia nais</i> | (W.H. Edwards) |
| Brushfoot | Nymphalidae Family | |
| Monarch | <i>Danaus plexippus</i> | (Linnaeus) |

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| Snout, American | <i>Libytheana carinenta</i> | (Cramer) |
| Fritillary, Gulf | <i>Agraulis vanillae</i> | (Linnaeus) |
| Fritillary, Variegated | <i>Euptoieta claudia</i> | (Cramer) |
| Fritillary, Aphrodite | <i>Speyeria aphrodite</i> | (Fabricius) |
| Fritillary, Edwards' | <i>S. edwardsii</i> | (Reakirt) |
| Fritillary, Coronis | <i>S. coronis</i> | (Behr) |
| Fritillary, Callippe | <i>S. callippe</i> | (Boisduval) |
| Fritillary, Atlantis | <i>S. atlantis</i> | (W.H. Edwards) |
| Fritillary, Northwestern | <i>S. hesperis</i> | (W.H. Edwards) |
| Fritillary, Mormon | <i>S. mormonia</i> | (Boisduval) |
| Fritillary, Silver-bordered | <i>Boloria selene</i> | ([Schifferrmüller]) |
| Checkerspot, Fulvia | <i>Chlosyne fulvia</i> | (W.H. Edwards) |
| Checkerspot, Gorgone | <i>C. gorgone</i> | (Hübner) |
| Checkerspot, Silvery | <i>C. nycteis</i> | (E. Doubleday) |
| Checkerspot, Northern | <i>C. palla</i> | (Boisduval) |
| Checkerspot, Arachne | <i>Polydryas arachne</i> | (W.H. Edwards) |
| Checkerspot, Variable | <i>Euphydryas anicia</i> | (E. Doubleday) |
| Crescent, Pallid | <i>Phyciodes pallida</i> | (W.H. Edwards) |
| Crescent, Pearl | <i>P. tharos</i> | (Drury) |
| Crescent, Northern | <i>P. cocyta</i> | (Cramer) |
| Crescent, Field | <i>P. pulchella</i> | (Boisduval) |
| Comma, Green | <i>Polygonia faunus</i> | (W.H. Edwards) |
| Comma, Satyr | <i>P. satyrus</i> | W.H. Edwards) |
| Comma, Hoary | <i>P. gracilis</i> | (Grote & Robinson) |
| Buckeye, Common | <i>Junonia coenia</i> | (Hübner) |
| Tortoiseshell, Milbert's | <i>Aglaia milberti</i> | (Godart) |
| Cloak, Mourning | <i>Nymphalis antiopa</i> | (Linnaeus) |
| Tortoiseshell, California | <i>N. californica</i> | (Boisduval) |
| Admiral, Red | <i>Vanessa atalanta</i> | (Linnaeus) |
| Lady, Painted | <i>V. cardui</i> | (Linnaeus) |
| Lady, American | <i>V. virginiensis</i> | (Drury) Admiral, |
| Weidemeyer's Admiral | <i>Limenitis weidemeyerii</i> | W.H. Edwards |
| Viceroy | <i>L. archippus</i> | (Cramer) |

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| Emperor, Hackberry | <i>Asterocampa celtis</i> | Boisduval, LeConte |
| Ringlet, Common | <i>Coenonympha tullia ochracea</i> | W.H. Edwards |
| Wood-Nymph, Common | <i>Cercyonis pegala</i> | Fabricius) |
| Wood-Nymph, Small | <i>C. oetus</i> | (Boisduval) |
| Alpine, Common | <i>Erebia epipsodea</i> | Butler |
| Arctic, Chryxus | <i>Oeneis chryxus</i> | (E. Doubleday) |
| Arctic, Uhler's | <i>O. uhleri</i> | (Reakirt) |
| Skippers | <i>Hesperiidae</i> | |
| Skipper, Silver-spotted | <i>Epargyreus clarus</i> | (Cramer) |
| Cloudywing, Northern | <i>Thorybes pylades</i> | (Scudder) |
| Duskywing, Dreamy | <i>Erynnis icelus</i> | (Scudder & Burgess) |
| Duskywing, Pacuvius | <i>E. pacuvius</i> | (Lintner) |
| Duskywing, Persius | <i>E. persius</i> | (Scudder) |
| Checkered-skipper, Two-banded | <i>Pyrgus ruralis</i> | (Boisduval) |
| Checkered-skipper, Common | <i>Burnsius communis</i> | (Grote) |
| Sootywing, Common | <i>Pholisora catullus</i> | (Fabricius) |
| Skipperling, Russet | <i>Piruna pirus</i> | (W.H. Edwards) |
| Skipperling, Garita | <i>Oarisma garita</i> | (Reakirt) |
| Skipper, Uncas | <i>Hesperia uncas</i> | W.H. Edwards |
| Skipper, Ottoe | <i>H. ottoe</i> | (W.H. Edwards) |
| Skipper, Leonard's | <i>H. leonardus pawnee</i> | Dodge |
| Skipper, Juba | <i>H. juba</i> | (Scudder) |
| Skipper, Western Branded | <i>H. colorado</i> | (Scudder) |
| Skipper, Pahaska | <i>H. pahaska</i> | Leussier |
| Skipper, Green | <i>H. viridis</i> | (W.H. Edwards) |
| Skipper, Nevada | <i>H. nevada</i> | (Scudder) |
| Skipper, Draco | <i>Polites draco</i> | (W.H. Edwards) |
| Skipper, Tawny-edged | <i>P. themistocles</i> | (Latreille) |
| Long Dash | <i>P. mystic</i> | (W.H. Edwards) |
| Skipper, Arogos | <i>Atrytone arogos</i> | (Boisduval & LeConte) |
| Skipper, Woodland | <i>Ochlodes sylvanoides</i> | (Boisduval) |
| Skipper, Taxiles | <i>Poanes taxiles</i> | (W.H. Edwards) |
| Skipper, Dun | <i>Euphyes vestris</i> | (Boisduval) |
| Skipper, Dusted | <i>Atrytonopsis hianna</i> | (Scudder) |