

# Survey Results for the Coronis Fritillary in Southwest Oregon 2011

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## Introduction

The Coronis Fritillary (*Speyeria coronis*) is a relatively large, showy, heavily silvered fritillary with a distribution from Southern Washington east through the Great Basin to central South Dakota, Wyoming, Nebraska, and Colorado; south through Nevada and California to northwest Baja California. Six subspecies are currently recognized (Warren et al. 2011); one of which (*Speyeria coronis coronis*) is currently designated a Forest Service (FS) and Bureau of Land Management (BLM) sensitive species in Oregon (USDA FS 2008, USDI BLM 2008).

Little information exists on the precise distribution of *S. c. coronis*, especially within Oregon. It occurs sparsely in the Siskiyou Mountains (Pyle 2002), and has been recorded in Jackson and Josephine counties, including the lower Rogue River valley and the Illinois River valley (Scheuering 2006). Prior to initiating this project, precise location information for this species was not available in the federal agencies databases used to house detection information for wildlife species of interest (BLM's Geographic Biotic Observation database (GeoBOB) system, the Forest Service's Natural Resource Information System (NRIS) Fauna system).

This project was designed as an exploratory effort to increase our collective knowledge of this unique subspecies biology, and provide other biologists improved information on how to identify *Speyeria coronis* and how to differentiate it from other members of the genus *Speyeria*. The primary goal of this survey effort was to document adult *S. coronis* at some of the historic localities and document occurrence of this species at previously undocumented sites on federally administered lands within the Illinois Valley. Ultimately, the intent of this survey effort is to provide land managers a better understanding of the range of this species across the federal lands of southwestern Oregon, and help inform future land management planning efforts to minimize disturbance to this sensitive species.

## Study Area and Methodology

Surveys were conducted during the summer of 2011 and focused on investigating the Illinois Valley area of Josephine County, Oregon. This area was selected for two reasons: 1) the Illinois Valley is specifically mentioned in the literature as occupied by *S. c. coronis* (Scheuering 2006), and 2) the primary host plant (*Viola hallii*) is associated with rocky serpentine habitats (Scheuering 2006) and the Illinois Valley area contains the majority of the serpentine soils found in southwest Oregon.

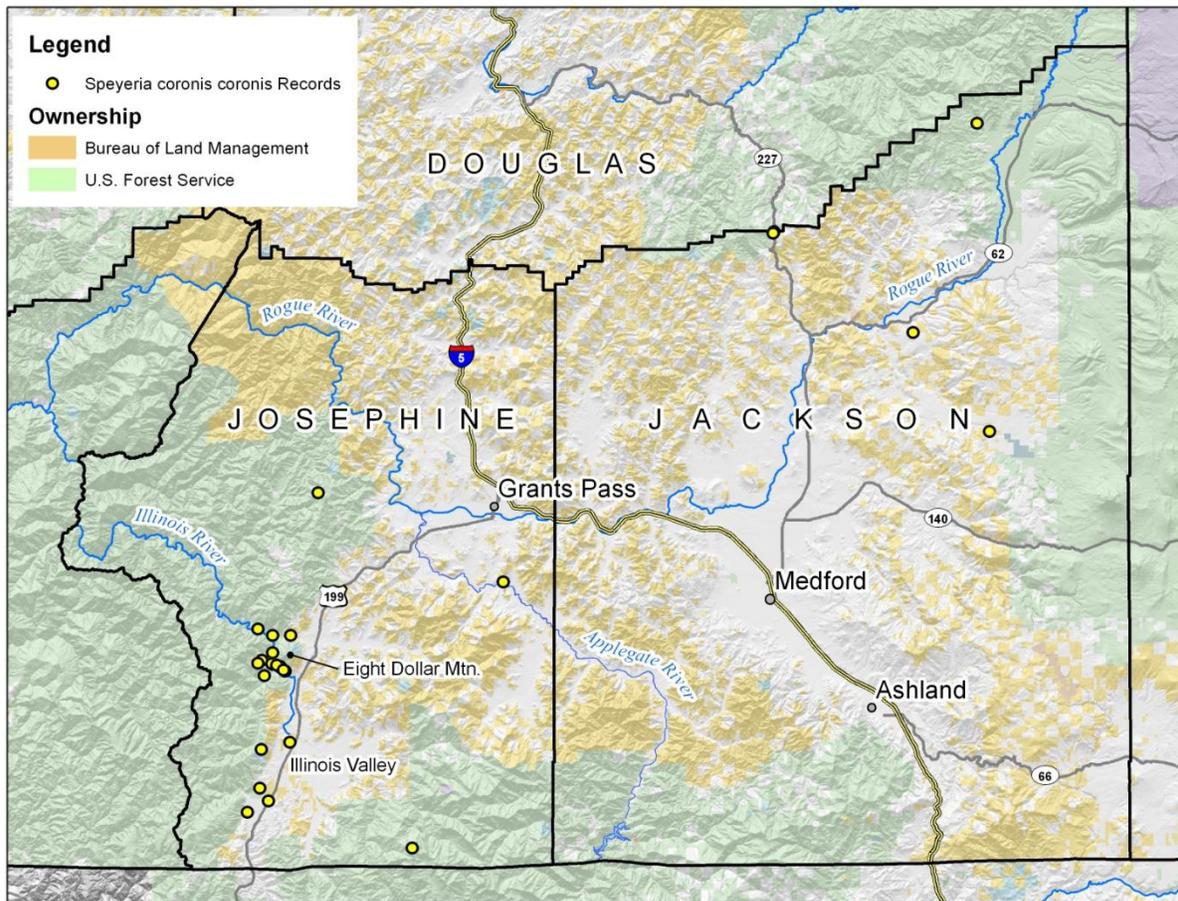
Prior to initiating surveys for the 2011 field season, the BLM formed a cooperative agreement with the Xerces Society, a non-profit organization dedicated to invertebrate conservation, to help guide the survey efforts and offer taxonomic assistance. Scott Hoffman Black, the Executive Director for the Xerces Society was extremely helpful throughout the project, and much of this project would not have been possible without his contributions. Scott served as a project advisor, helped conduct field surveys, and coordinated specimen identification.

Surveys were conducted by individuals walking throughout the survey site concentrating on any potential *Speyeria* flying. The 2011 survey efforts were focused on only *Speyeria coronis*, so other butterflies that were obviously not a *Speyeria* species were ignored and we did not attempt to compile a species list for each survey site. Butterfly nets were used to capture and examine any butterfly that was potentially a Coronis Fritillary. Captured butterflies were examined and then released unharmed after species identification, with the exception of those butterflies that were collected as voucher specimens. Voucher specimens were collected at survey sites where *S. c. coronis* was observed in order to have conclusive evidence of presence at these sites.

## Results

### *Historic locality data*

Prior to initiating this project, precise location information for this species was not available in either the BLM or FS databases for sensitive species occurrences. The Xerces Society compiled a database of *S. c. coronis* records for Oregon, which is shown on map 1. Not only was this the first effort we are aware of to collect and organize the existing records for this subspecies in Oregon, but this data was very useful in planning the 2011 survey efforts by providing precise survey locations where *S. c. coronis* was previously documented, rather than generalized geographical reference locations such as “Eight Dollar Mountain”.



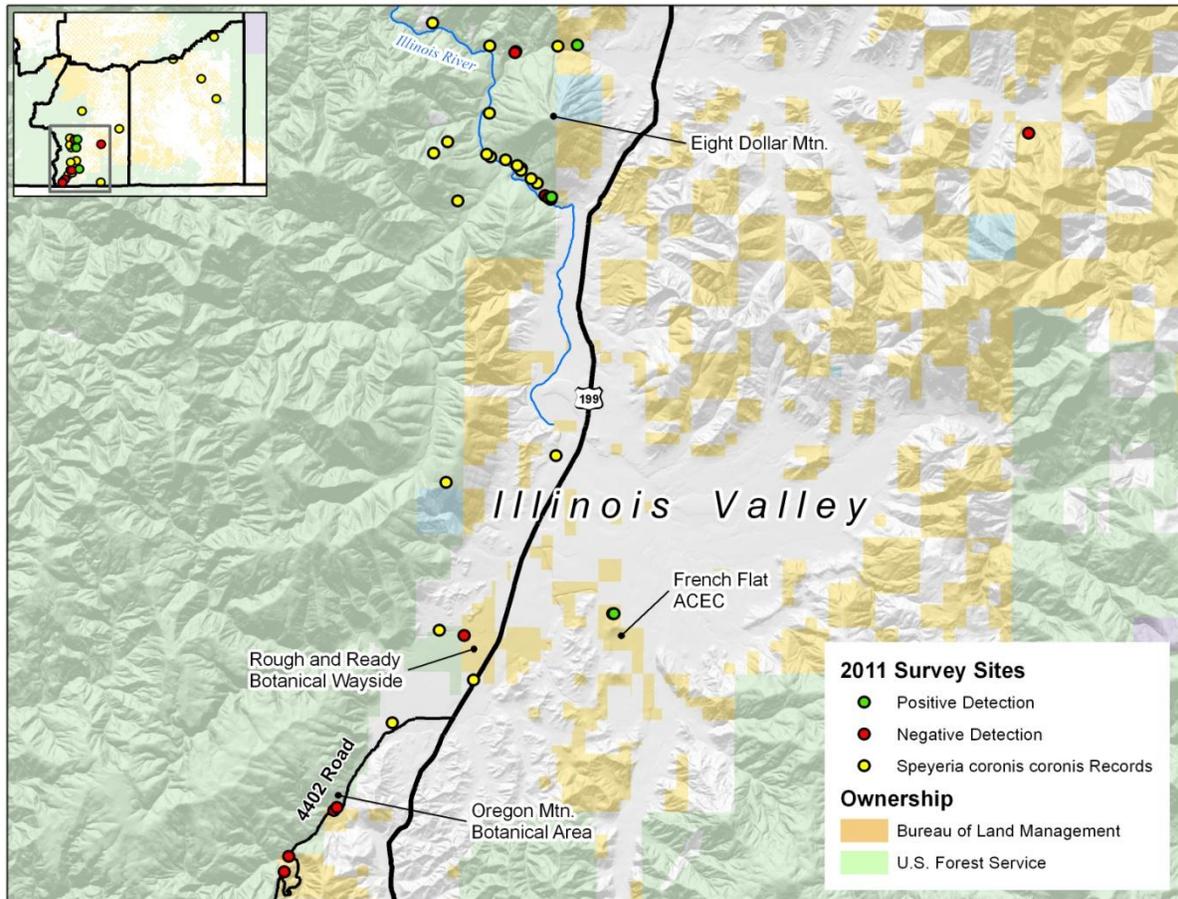
Map 1. Location of *Speyeria coronis coronis* Records Within Oregon as Compiled by the Xerces Society.

In total, 37 records were compiled for Oregon. The bulk of these detections are from Josephine County (32) and the majority of those are centered around Eight Dollar Mountain or within the greater Illinois Valley area. Most of the Josephine County detections are also from the lower slopes of the Illinois Valley, at elevations less than 2000 feet. However, there are two Josephine County records that are not representative of this lower elevation habitat type, one record from the Onion Mountain / Big Pines area at 4400 feet, and a record from Bolan Lake at 5100 feet. There is a single detection along the lower Applegate River, about 13 miles upstream from the confluence of the Applegate and the Rogue Rivers.

Only five detections are reported in Jackson County, all north of highway 140. These records are scattered across the northern half of Jackson County, and are at locations with a higher elevation ( $\geq 3000$  feet) than the majority of the Josephine county records.

### Surveys

During the summer of 2011, a total of 17 independent survey attempts were conducted at 12 different survey locations (Appendix A, Table 1). Map 2 illustrates the location of all the 2011 survey sites, as well as the locations where *S. coronis* were documented. A few survey sites were visited on multiple occasions.



Map 2. Location of the 2011 Survey Sites and the Survey Results.

Adult *S. coronis* were observed at three survey locations: North Eight Dollar Mountain, South Eight Dollar Mountain, and the French Flat Area of Critical Environmental Concern (ACEC). A total of four voucher specimens were collected during these survey efforts ( $\geq 1$  at each site), and are currently housed in the Xerces Society collection.

## Discussion

### *Species Identification*

Members of the genus *Speyeria* are notoriously difficult to differentiate. Pyle (2002) states “*Speyeria* species vary infamously both from place to place and within populations, rendering certain identification more than challenging. Much of our regional understanding of them owes to the efforts of national fritillary authority Paul Hammond. Lacking his acumen and experience, one should feel free to put down any frit encounter as *Speyeria* spp.”



Picture 1. Display of three voucher specimens collected during the 2011 survey season illustrating the similarities in appearance between *S. coronis* and *S. zerene*. The uppermost specimen is *S. zerene* and the bottom two are *S. coronis*.

This survey effort was no exception, and the inherent difficulty in distinguishing members of this genus proved problematic for this survey effort. Several other species of *Speyeria* inhabit southwest Oregon, including *S. zerene*, *S. callippe*, *S. hydaspe* and *S. atlantis*, and one or more of these species are likely to occur at many of the 2011 survey sites. In particular, both *S. coronis* and *S. zerene* were present and flying at the same time at both the north and south sides of Eight Dollar Mountain. Zerene Fritillaries (*S. zerene*) were abundant along the Forest Service 4402 road at the Oregon Mountain Botanical Area and nearby where Rock Creek crossed the 4402 road, and Callippe (*S. hydaspe*) and Hydaspe (*S. hydaspe*) Fritillaries were observed at survey sites along the 4402 road as well.



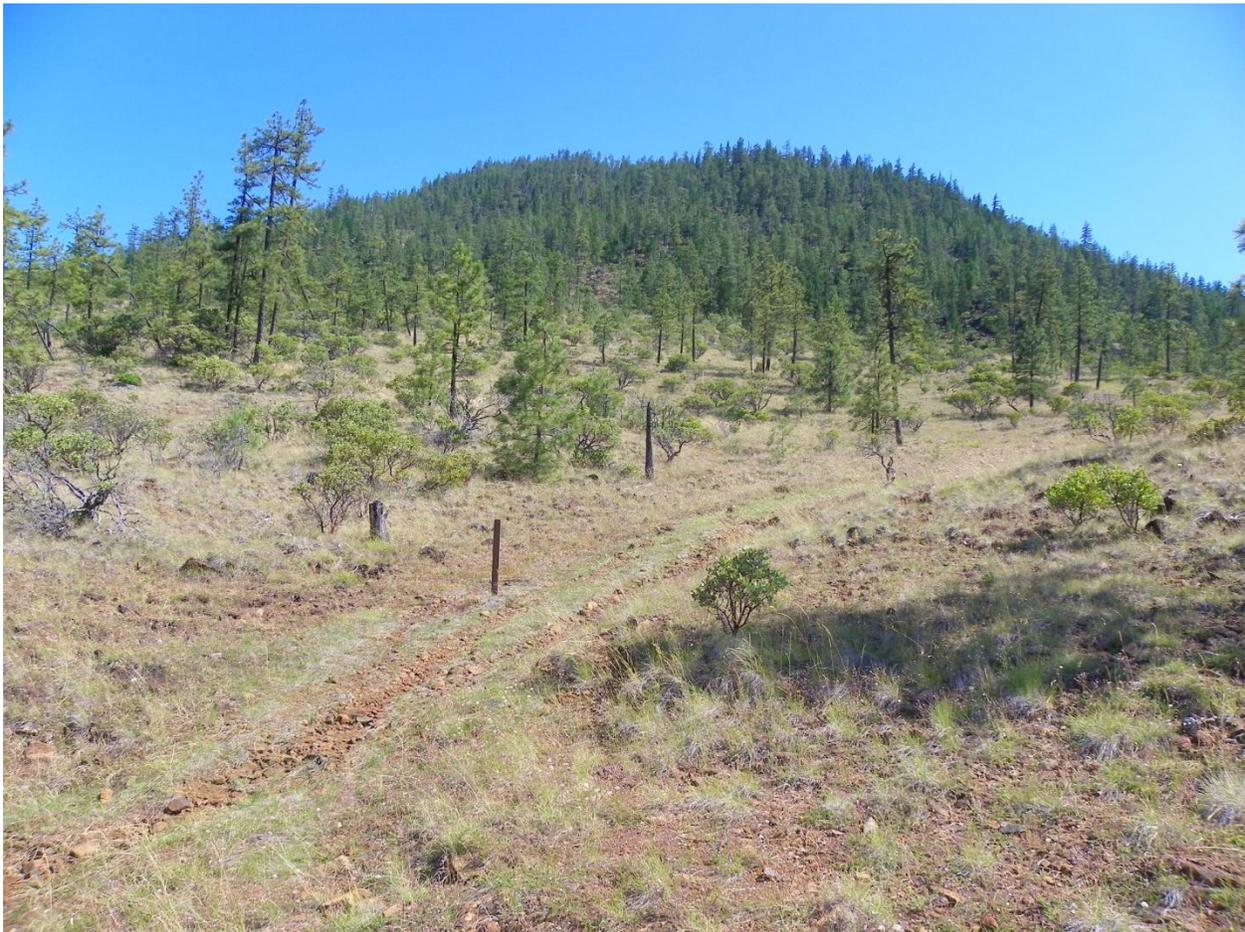
Picture 2. Zerene Fritillary (*Speyeria zerene*) and Variable Checkerspot (*Euphydryas chalcedona*) nectaring on Yerba Santa (*Eriodictyon californicum*) at the junction of the FS 4402 road and Rock Creek, Josephine County, OR.

In particular, *S. zerene* and *S. coronis* are very similar in appearance and we had difficulty differentiating *S. zerene* from *S. coronis*. Some observations of what was initially thought to be *S. coronis* were later identified as *S. zerene*. Picture 1 illustrates visually how similar in appearance these two species are. It is highly probable that *S. coronis* is present at the Oregon Mountain Botanical Area, but voucher specimens were not collected at this site and all the digital photographs taken at this location appear to be representative of *S. zerene* (Picture 2). Several individuals were captured and examined in-hand at this location, but unfortunately we had not yet developed an understanding of what characteristics are diagnostic for differentiating *S. coronis* from *S. zerene* and cannot say with certainty which species of the two was actually examined.

The Xerces Society is currently working on a related effort to update the ISSSSP species facts sheet for the Coronis Fritillary. This update will include specific information on the diagnostic characters that can be used to definitively identify *Speyeria coronis* and how to differentiate it from other members of the genus *Speyeria* that co-occur within the range of *S. coronis*. This work will be extremely helpful to any future efforts to survey for this species in Oregon.

### Surveys

*Speyeria coronis* was documented at three locations during the 2011 survey effort, including North Eight Dollar Mountain, South Eight Dollar Mountain, and the French Flat ACEC. This survey effort confirmed *S. coronis* does occur on lands administered by Medford BLM, which was previously suspected but not formally documented because the precision of the historic records were too imprecise and could not be attributed to a single point locality. The detections at north and south Eight Dollar Mountain represent an area of known *S. coronis* occurrence, so the detections in 2011 reaffirm occupancy at these sites. The detection at the French Flat ACEC represents a previously undocumented occurrence for this species, and is approximately three air-miles from the nearest record. This detection is also located to the east of Highway 199, whereas the majority of the Josephine County Records occur west of Highway 199.



Picture 2. Habitat Conditions at the south Eight Dollar Mountain Survey Location.

In general, the habitat conditions present where *S. coronis* were observed consisted of serpentine influenced, rocky hill-slopes dominated by Jeffery pine (*Pinus jeffreyi*) and other serpentine associated forbes and grasses

(picture 2). *Viola hallii* is listed as the primary host plant for this species (Scheuering 2006), and this plant was observed at all three locations where *S. coronis* were detected.

Like most large butterflies, *S. coronis* is a fast and agile flyer. It was exceeding difficult to capture on the wing, and we found the only way to have any real success at capturing multiple specimens within a relatively short timeframe was to target individuals that were engaged in nectering, puddling or some other behavior that involved “putting down”. Because of the difficulty of identification within this genus, it is almost impossible to determine species without examining individuals in-hand.

During the first survey attempts in late June, the few *Speyeria* that were observed at the survey sites appeared to be patrolling, and were not engaging in any behaviors that allowed for easy viewing or capture. On multiple occasions surveyors attempted to chase after a darting *Speyeria*, only to return out of breath and empty handed. It was not until later in the survey season that we could capture adult *Speyeria* with reliability. We speculate this was due to a general increase in the total number of *Speyeria* flying at the survey sites as the survey season progressed (more opportunities) or because of behavioral shifts in the adult *Speyeria* at these sites that allowed for easier capture, or likely a combination of both.

The timing of the 2011 survey effort was delayed slightly (the 1<sup>st</sup> survey attempt was conducted on June 20) as the winter and spring of 2011 were unusually moist and cool, which resulted in a later than usual flowering period for most plants and the emergence of adult butterflies as well. It is expected that under “normal” weather conditions, adult *Coronis* Fritillaries would be flying in early June. The south Eight Dollar Mountain survey site was visited four times over the course of the 2011 survey season, and it appeared that the peak flight of *Speyeria* at this location occurred during the first two weeks of July. The literature suggests *S. coronis* typically peaks in June, whereas *S. zerene* peaks in July (Pyle 2002), but this description covers a large geographic region (all of Cascadia) and individual populations may exhibit differing or unique peak flights from this generalized description. It remains unclear if our observations are representative of the peak flight of *S. coronis* or *S. zerene*. In southwest Oregon, it may be that *S. coronis* peaks earlier, and *S. zerene* peaks a month later, but there is a degree of overlap in flight periods and because it is not easily discernable which species of *Speyeria* is seen flying, it is difficult to determine if one species is more abundant at a given time of the year.

### *Next Steps*

Several aspects of the biology of the *Coronis* Fritillary warrant further investigation. One potential area of investigation would be to attempt a census at one of the eight dollar mountain sites in order to gain a better understanding of population numbers at these sites. A potential method that could be used for this purpose is the modified Pollard walk (Pollard 1993). Under this technique, surveyors would walk slowly (about 5 minutes to walk 100 meters) through areas of suitable habitat and net all *Speyeria* species encountered. Pollard walks would be completed every 10-14 days (depending on weather) at least three times over the presumed flight period. In this way relative counts for both *S. zerene* and *S. coronis* could be determined we can start to answer questions such as 1) Is one species generally more abundant than the other, and 2) when the peak flight for each species occurs and if they have a similar or differing peak flights at these sites. Mark-recapture techniques could also be used to generate population estimates but these are more time consuming and expensive.

It is reported that adult *S. coronis* move uphill shortly after emerging, probably in search of nectar, and females, at least, apparently return to basin habitats later in the season to deposit eggs (Scheuering 2006) but the magnitude of these movements are not discussed. However, it has also been reported that of all the *Speyeria* that occur within California, *S. coronis* is the most vagile and is often seen flying miles from suitable breeding sites (Brittnacher et al, 1978). In this study, the primary host plant *Viola hallii* was only observed growing in more open, rocky, serpentine hill-slopes, and was not observed in the lower elevation flats near the Illinois River. The observed occurrence pattern of the *Viola hallii* at these sites brings into question the above reported behavior and a number of theories could explain this inconsistency, including: 1) this movement pattern is not accurately

described for *S. c. coronis*, 2) *S. coronis* at these sites are utilizing a different species of *Viola* other than *V. hallii* that does occur in the basin habitats, or 3) *Viola hallii* is present within these lower elevation habitats and was not detected. This matter warrants further investigation. As *Viola hallii* generally flowers prior to the adult *S. coronis* emergence, it would be useful to survey these sites prior to the adult emergence when the majority of the *Viola hallii* is flowering, so a more accurate picture of the distribution of this plant species could be obtained at these sites.

The five records reported for Jackson County warrant additional consideration. Additional survey efforts should be made at these sites to determine if *S. coronis* is present at these locations. There is very little serpentine within Jackson County, so if *S. coronis* is confirmed at these sites, it would be very interesting to examine the habitat conditions at these locations, as they are likely to be quite different from those present in the Illinois Valley. It is conceivable that these detections represent a different subspecies, such as *S. c. snyderi* or *S. c. simaetha*, as these two subspecies blend in the southern Oregon Cascades (Pyle 2002), and these records are more or less in the Cascades, and not the Siskiyou Mountains. Future survey efforts should include visits to these Jackson County localities.

## Literature Cited

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## Appendix A.

Table 1 includes a list of all the survey locations where surveys were conducted during the 2011 field season, the date of surveys, the survey results and any relevant comments. Site names are associated with nearby geographic features. The survey sites associated with the south side of Eight Dollar Mountain are in very close proximity, and although they are included here as independent survey sites, any butterflies found at these locations are likely representative of a single population.

Survey Site	Date	<i>S. coronis</i> Detected?	Survey Comments
4402 rd Darlingtonia fen	7/6/11	No	Captured 1 <i>Speyeria</i> sp, Not <i>S. coronis</i> , likely Hydaspe Fritillary ( <i>S. hydaspe</i> )
4402 rd Oregon Mtn. Botanical Area	7/6/11	No	Rocky serpentine hill-slope, many <i>Speyeria</i> on the wing, captured 3, but final species identification inconclusive, either <i>S. coronis</i> or <i>S. zerene</i>
4402 rd ridge	7/6/11	No	No <i>Speyeria</i> obs at this site, did see Leanira Checkerspot on yellow Aster
4402 rd Rock Creek pullout	7/6/11	No	Population of flowering yerba santa at pullout, great spot many butterfly species observed nectering, including <i>Speyeria</i> ( <i>S. zerene</i> and <i>S coronis</i> ???)
Eight dollar Mtn. North	6/30/11	Yes	Pullout along road, observed many <i>Speyeria</i> on the wing, collected one for voucher, confirmed as <i>S. coronis</i>
Eight dollar Mtn. North 110 rd meadow	6/20/11	No	Observed two <i>Speyeria</i> on wing but could not capture for ID, not many flying
Eight dollar Mtn. North 110 rd meadow	7/21/11	No	surveyed throughout meadow complex between road and river, no <i>Speyeria</i> observed on the wing
Eight dollar Mtn. South A	6/20/11	No	2nd pull out, searched rocky hill-slope below road, observed a few <i>Speyeria</i> on wing but could not capture for ID
Eight dollar Mtn. South A	6/24/11	Yes	2nd pull out, Scott Hoffman Black independent survey effort, observed two <i>Speyeria</i> on wing and captured one as voucher, confirm as <i>S. coronis</i>
Eight dollar Mtn. South B	6/30/11	Yes	observed many <i>Speyeria</i> on the wing, Captured four <i>Speyeria</i> at this location and below (site C), voucher specimens confirm both <i>S. coronis</i> and <i>S. zerene</i> present

Survey Site	Date	<i>S. coronis</i> Detected?	Survey Comments
Eight dollar Mtn. South C	6/30/11	Yes	Flat area on serpentine hill-slope, observed many <i>Speyeria</i> on the wing, captured four <i>Speyeria</i> here and at site B, voucher specimens confirm both <i>S. coronis</i> and <i>S. zerene</i> present
Eight dollar Mtn. South C	7/6/11	No	Appeared to be fewer <i>Speyeria</i> on the wing then last visit, captured one which was similar to others captured at this site ( <i>S. zerene</i> or <i>S. coronis</i> )
Eight dollar Mtn. South C	7/21/11	No	fewer <i>Speyeria</i> on the wing but some still flying, captured one which was similar to others captured at this site ( <i>S. zerene</i> or <i>S. coronis</i> )
French Flat ACEC	6/20/11	No	Observed one <i>Speyeria</i> on the wing but unable to capture for ID
French Flat ACEC	7/21/11	Yes	3 <i>Speyeria</i> observed on wing, 1 captured and collected at point location, nectering on purple Aster, Specimen verified as <i>S. coronis</i>
Rough and Ready Botanical Wayside	6/30/11	No	Hiked out into R & R Botanical Wayside from trailhead, no <i>Speyeria</i> observed, habitat apparently unsuitable on BLM, collected a Melissa's Blue
White Creek Meadow	6/30/11	No	Investigated potential suitable habitat but found to be apparently unsuitable and no <i>Speyeria</i> observed at this site