2015 Surveys for Silver-bordered Fritillary (*Boloria selene*)

On the Deschutes National Forest

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SUMMARY

The silver-bordered fritillary (*Boloria selene*) is designated as an Interagency Special Status/Sensitive Species in Oregon. In June and July of 2015, surveys were performed for this regionally rare butterfly on public lands managed by the Deschutes National Forest where there was the possibility of finding undiscovered populations of the insect based on habitat and elevation. The following pre-selected sites were surveyed twice during the regional flight period for the butterfly: Big Marsh, Cow Meadow, Todd Lake, Park Meadow and Canyon Creek.

While no populations of the silver-bordered fritillary were observed, additional surveys of similar habitats on National Forest and BLM lands to the east of the Cascade Range are recommended.

INTRODUCTION

The silver-bordered fritillary, *Boloria selene*, ranges throughout much of the northern United States and Canada. In Oregon, the butterfly was unknown until 1961 when it was reported by Ray Albright from Big Summit Prairie in Crook County. While most subsequent Oregon records have been from that location, it has also been documented sparingly from Grant and Baker counties (Warren 2005). The Oregon subspecies of the silver-bordered fritillary is unnamed and has been placed in a regional grouping of populations that are considered unique "Pacific Northwestern segregates" (Warren et al 2012).

Boloria selene is a Special Status/Sensitive Species in Oregon. As such, it is a Federal (Forest Service and Bureau of Land Management) priority for conservation . Under the ISSSSP program, select species are those for which population viability is a concern and for which the goal is to improve the condition of the species and its habitats such that it does not become imperiled and require Federal or State listing.

Within its limited known range in Oregon, *Boloria selene* is associated with riparian areas of mid-elevation prairies where bog or marsh microhabitats support willows and where violets (including *Viola nephrophylla*) serve as the larval hostplant. Adults typically fly for several weeks between early June and mid-August as one or more broods per year (Warren 2005).

It is worth noting that our knowledge of *Boloria selene* in Oregon is based on the historical collection records gleaned from past and present amateur butterfly collectors (Evergreen Aurelians). Many of these important specimens are now housed in the Oregon State Arthropod Collection (OSAC) at Oregon State University in Corvallis.

METHODS

A list of survey sites with the potential to host silver-bordered fritillary was generated by Deschutes National Forest personnel. Each site was visited twice during the course of the butterfly's historical flight period in June and July. Sites surveyed included Big Marsh in Klamath County, Cow Meadow, Todd Lake and Park Meadow in Deschutes County, and Canyon Creek Meadow in Jefferson County (Figure 1).

As a rule, all surveys were conducted during warm and sunny conditions most conducive to butterfly activity and detection. Sites were surveyed on foot with the primary goal of detecting the target species, *Boloria selene*.

If documented, a thorough site-wide search and count (estimated number of adults present) was made along with additional observations as to areas of use, nectar resources and general threats to the butterfly or its habitats. At the same time, a checklist of all butterfly species encountered was compiled for each site on each date visited. Since the focus was on *Boloria selene* detection, it is possible that some very localized, rare or inconspicuous butterfly species may have been overlooked.

When a site was too large to be covered well from one access point (Big Marsh) it was surveyed from multiple locations based on both reasonable access and the presence of potential habitats for the butterfly. Prior to field surveys, Google Earth was used to determine the presence of open wet or marshy areas that are preferred by the silver-bordered fritillary. If a site was deemed unsuitable during the first visit, it was to be omitted from future surveys.

In some cases (Park Meadow, Canyon Creek Meadow), an entire day was needed to access and properly survey a single remote site. Big Marsh required significant effort due to the large amount of area involved.

Finally, while these surveys were originally planned as a one-person effort, the addition of a second capable surveyor - volunteer lepidopterist Gary Pearson of Springfield, Oregon - added significantly to what was able to be accomplished.

RESULTS & DISCUSSION

Silver-bordered fritillary was not documented on the Deschutes National Forest in 2015.

Subnormal precipitation over the previous winter, combined with relatively high daytime temperatures in June-July lead to an early and compressed flight period for most butterfly populations in the region. While it is possible that one or more small populations of *Boloria*

selene may have been overlooked, if present, it was unlikely. Surveys in the Big Summit Prairie area of the Ochoco National Forest found that adults were active throughout the month of June and into July, at least at some sites.

A total of 41 species of butterflies were documented during all surveys combined and are presented by site (Table, pages 18-19).

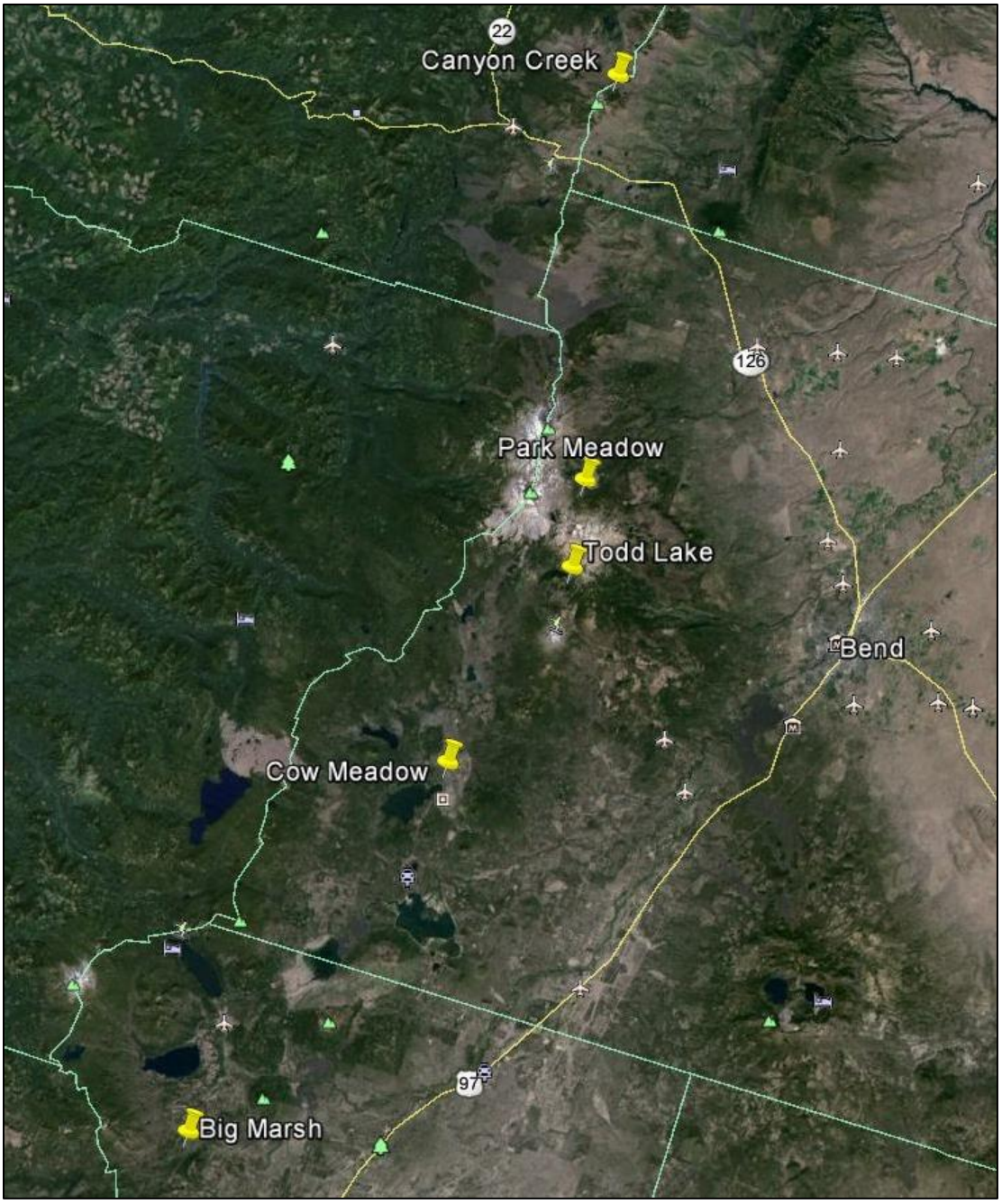

Figure 1. Map of the Deschutes NF *Boloria selene* survey area and sites surveyed in 2015.

1. Big Marsh

Site surveyed June 24 and July 28.

Boloria selene. Not observed on either date.

Habitat. A large marsh associated with Big Marsh Creek and its tributaries, with a variety of wet to dry habitats. Many portions of the marsh were noticeably drier than expected due to recent sub-normal precipitation. Ample areas of potential *Boloria selene* habitat were present along the periphery of the site. The site was surveyed from 5 road access points (Figure 2).

Threats. None noted.

Butterflies. While butterflies were present throughout the area, few areas supported a relatively high abundance. The middle area on the east side of the marsh was a relative butterfly hotspot. A total of 14 species were documented for the site as a whole.

Photo 1. North end of Big Marsh, looking SE (6/24/15).

Photo 2. Snowberry checkerspot (*Euphydryas colon*) nectaring on penstemon (Big Marsh).

Photo 3. East side, middle Big Marsh, looking NW (6/24/15).

Figure 2. Areas of access and surveys at Big Marsh.

2. Cow Meadow

Site surveyed June 25 and July 29.

Boloria selene. Not observed on either date.

Habitat. A large wet prairie on the north shore of Crane Prairie Reservoir. The vast majority of the site was very wet, with the upland and peripheral areas somewhat drier. NOTE: access to the site was difficult to locate and did not appear to be possible from the campground just to the west. Ultimately, the site was accessed from an old logging road to the east.

Threats. None noted, although inundation of the area by the reservoir in high water years may occur.

Butterflies. Butterflies were most common along the perimeter of the meadow. A total of 11 species were documented for the site, with Mormon fritillary (*Speyeria mormonia*) and field crescent (*Phyciodes pulchella*) particularly abundant.

Photo 4. Predominantly wet habitats were encountered at Cow Meadow (6/25/15).

Figure 3. Survey area at Cow Meadow.

3. Todd Lake

Site surveyed June 25 and July 29.

Boloria selene. Not observed on either date.

Habitat. A sizeable meadow with many very wet, seepy areas. Abundant forbs/wildflowers.

Threats. This popular destination showed areas of heavy impacts from human (and dog) foot traffic along the lake shore, main trail and some off trail areas. The wet meadow habitats there are extremely fragile and vulnerable to compaction.

Butterflies. Relatively abundant on June 25; less common on July 29. A total of 19 species were observed, including two species of high elevation *Eriogonum*-feeding blues.

Photo 5. Very fragile wet meadow habitat at Todd Lake. Mt. Bachelor is in the distance (6/25/15).

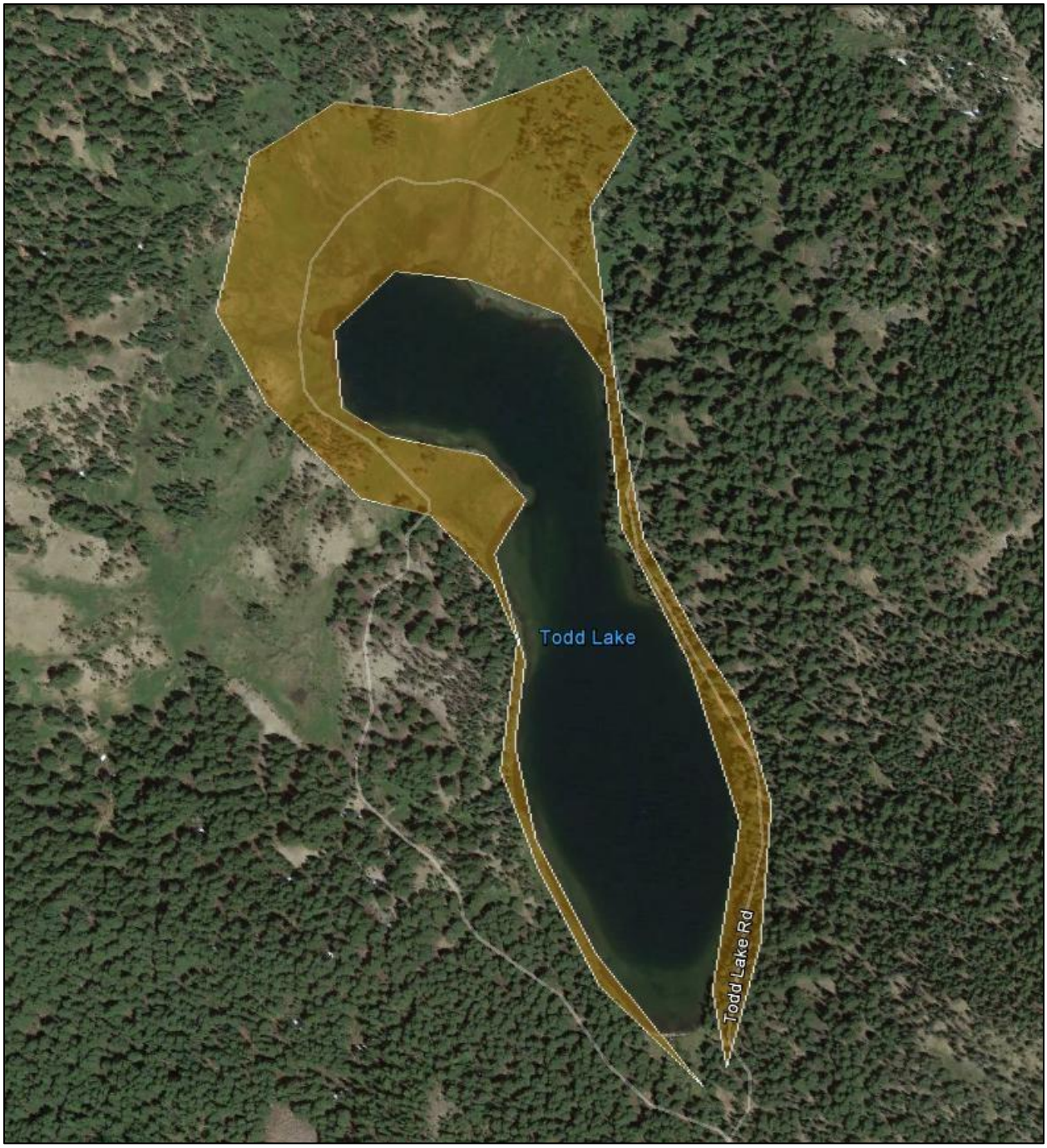

Figure 4. Survey area at Todd Lake.

4. Park Meadow

Site surveyed June 27 and July 30.

Boloria selene. Not observed on either date.

Habitat. A large subalpine meadow complex with relatively small areas of boggy, wet meadow habitat and larger areas of more upland dry meadow habitat. Willows were locally common.

Threats. Some areas under the trees were cleared for tent space and another larger area was impacted by equestrian campers. One area used by horses was notably barren and compacted.

Butterflies. Fairly abundant, with 18 species observed. The only site where the Mexican cloudywing (*Thorybes mexicana*) was documented.

Photo 6. Park Meadow: an area of lush meadow habitat with willows.

Photo 7. Mourning Cloak (*Nymphalis antiopa*): a species whose caterpillar feeds on willows.

Photo 8. A large, upland (dry) meadow portion of the Park Meadow site.

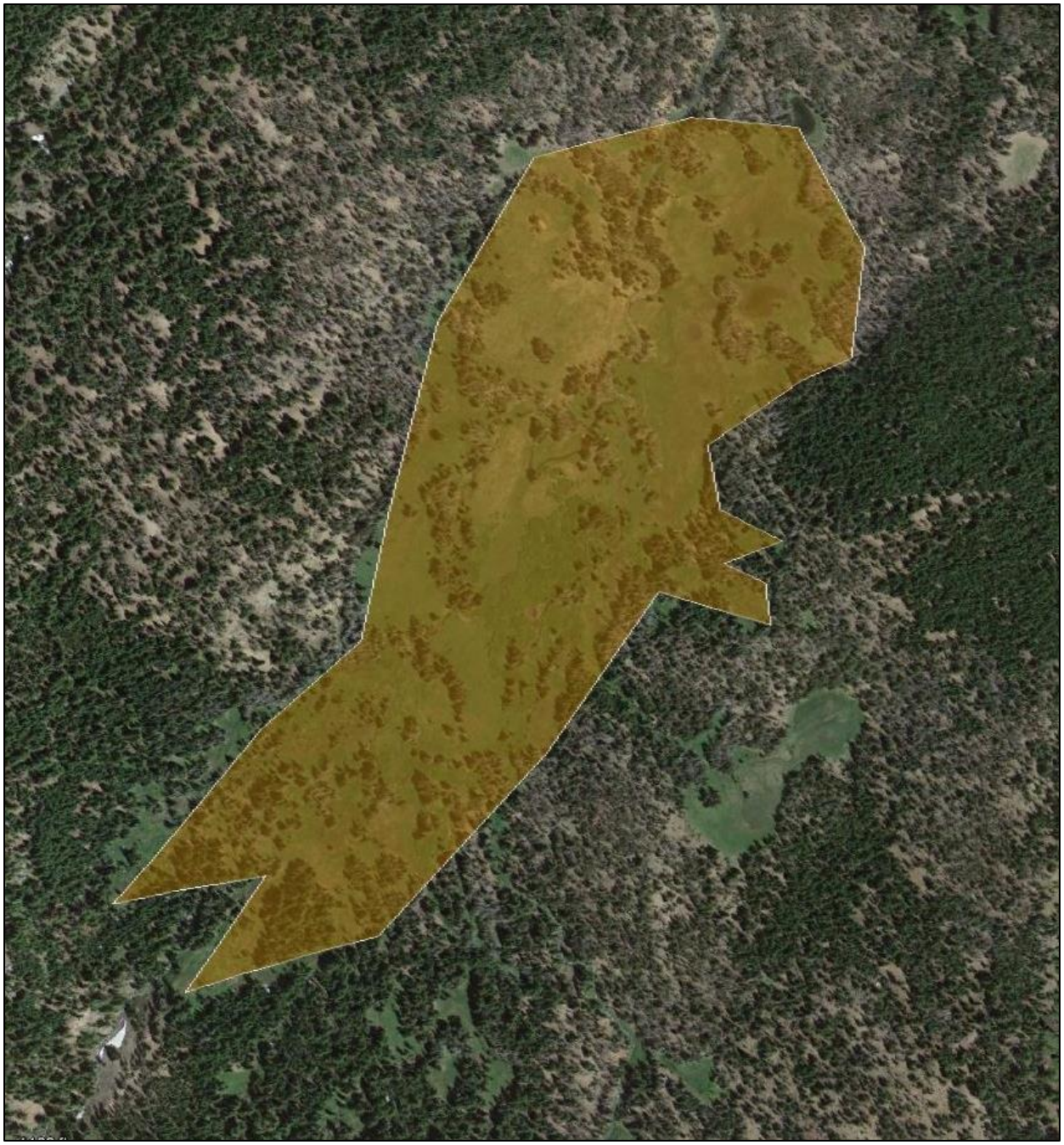

Figure 5. Area surveyed at Park Meadow.

5. Canyon Creek Meadows

Site surveyed June 28 and July 30.

Boloria selene. Not observed on either date.

Habitat. The area surveyed was a subalpine meadow complex of mostly upland meadow habitat along upper Canyon Creek. We were not aware of another boggy portion just downstream that was discovered (via Google Earth) only after the field season had concluded.

Threats. Some off trail use by hikers was noted, but the habitat was not heavily impacted overall.

Butterflies. Butterflies were fairly abundant in late June and less so by late July. **A total of 23 butterfly species** were documented there, the highest total for any site surveyed.

Photo 9. Wildflowers at Canyon Creek Meadow (June 26, 2015).

Photo 10. Lepidopterist Gary Pearson at Canyon Creek meadows.

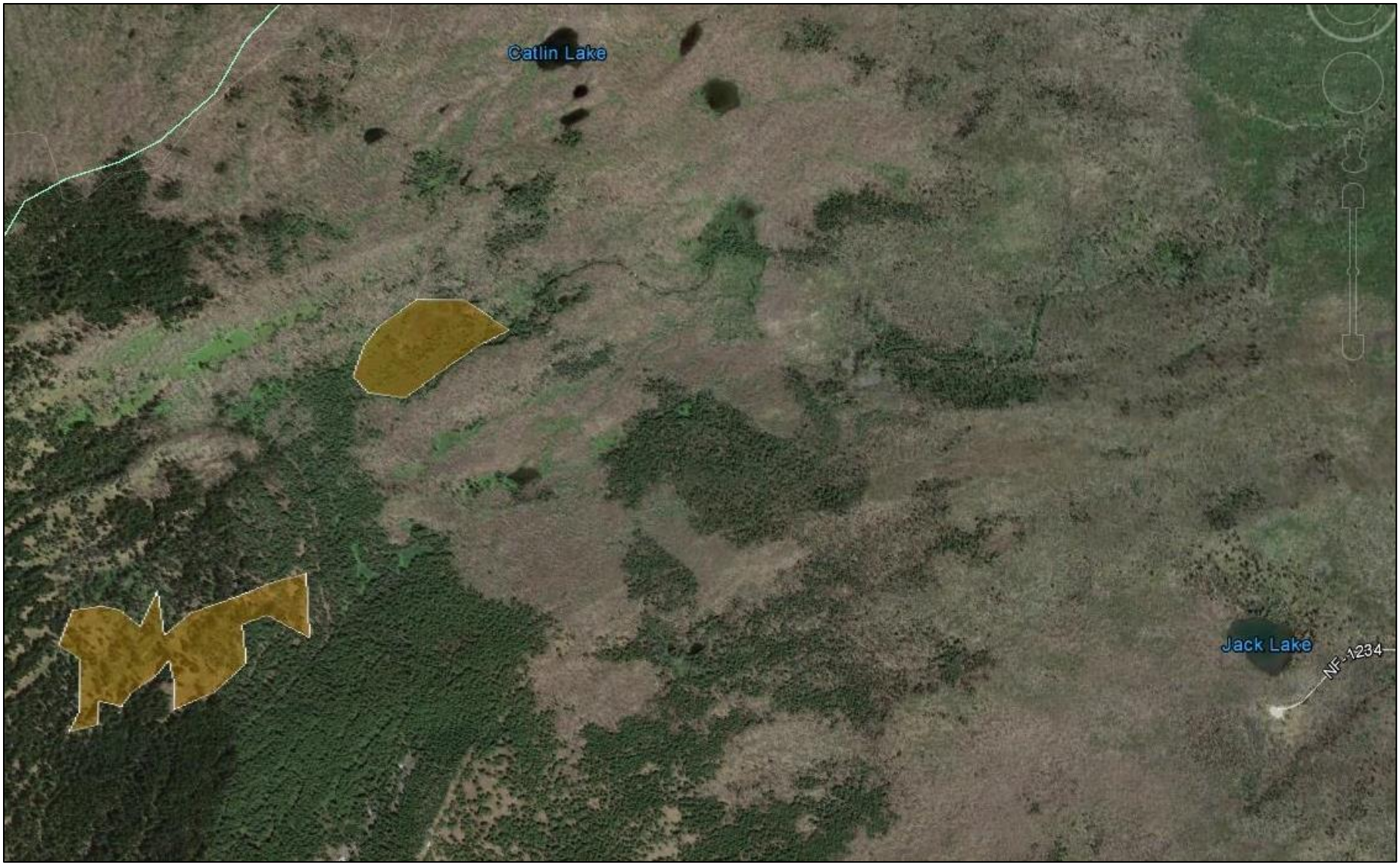

Figure 6. Canyon Creek survey area. The lower left yellow area was surveyed while the upper area remained undiscovered until after the field season. It was unlikely, however, that *Boloria selene* was present in either area.

Table. Butterfy species documented on the Deschutes National Forest during silver-bordered fritillary (*Boloria selene*) surveys in 2015.

Family	Taxon	Big Marsh	Cow Mdw	Todd Lake	Park Mdw	Canyon Cr
Hesperiidae (Skippers)	*Erynnis propertius*					X
	Hesperia colorado	X	X	X	X	X
	Ochlodes sylvanoides	X				X
	Polites sonora	X	X	X	X	X
	Thorybes mexicana				X	
Papilionidae (Swallowtails)	*Papilio eurymedon*	X				
	Parnassius clodius	X		X		X
Pieridae (Whites/Sulphurs)	*Colias eurytheme*		X	X	X	X
	Colias philodice				X	
	Pontia occidentalis				X	
Lycaenidae (Gossamer Wings)	*Callophrys spinetorum*	X			X	
	Euphilotes species on *Eriogonum marifolium*			X		
	Glaucopsyche piasus					X
	Lycaena heteronea	X				
	Lycaena mariposa	X		X		
	Lycaena nivalis					X
	Plebejus species on *Eriogonum pyrolifolium*			X		
	Plebejus anna ricei		X	X	X	X
	Plebejus icarioides			X		
	Plebejus saepiolus	X	X	X	X	
	Plebejus shasta		X			
	Satyrium saepium					X
Nymphalidae (Brushfoots)	*Adelpha bredowii*	X				
	Boloria epithore	X	X	X	X	X
	Cercyonis oetus		X			X
	Chlosyne hoffmanni				X	X
	Euphydryas colon	X				X
	Euphydryas editha				X	X
	Limenitis lorquini	X	X		X	X
	Nymphalis antiopa			X		
	Nymphalis californica	X		X		X
	Phyciodes pulchella		X			
	Polygonia gracilis			X		X

Table (continued).

Family	Taxon	Big Marsh	Cow Mdw	Todd Lake	Park Mdw	Canyon Cr
Nymphalidae (Brushfoots)	*Speyeria callippe*				X	X
	Speyeria hesperis				X	X
	Speyeria hydaspe			X	X	X
	Speyeria mormonia		X	X	X	X
	Speyeria zerene			X		X
	Vanessa atalanta				X	
	Vanessa cardui			X		
	Vanessa virginiensis			X		

Photo 11. Female silver-bordered fritillary (Big Summit Prairie, Crook Co., 6/10/15).

CONCLUSIONS

When combined with the historical data for *Boloria selene*, the results from these surveys strongly suggest that the butterfly is not present in the Cascades Range in Oregon. There is also mounting evidence that the distribution of the silver-bordered fritillary and the Pacific fritillary (*Boloria epithore*) do not overlap. Given the well documented range and distribution of the latter species, future searches for undocumented silver-bordered fritillary populations should be conducted in areas where the Pacific fritillary appears to be absent.

Future surveys are recommended for middle elevation meadow habitats to the east of the Cascades, from the Ochocos eastward to the Idaho border, north of Hwy 20. Any potential habitats in the Newberry National Volcanic Monument should also be searched due to a lack of butterfly knowledge for that area. Such survey can be accomplished without unreasonable effort or expense with the assistance of experienced lepidopterists.

By building on the work performed here, completing a statewide conservation assessment of the butterfly and its habitats could be completed in just a few years. The ultimate outcome could well be ISSSSP downlisting or delisting for the species.

LITERATURE CITED

The Evergreen Aurelians. An unpublished compilation of butterfly records for the state of Oregon. Updated periodically. 14 volumes.

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Cover Photo. Wet meadow wildflowers at Todd Lake (6/25/15).