Mardon skipper (*Polites mardon*) surveys at the North Fork Hunter Creek Area of Critical Environmental Concern (ACEC)

Final report from the Xerces Society to the Interagency Special Status Sensitive Species Program (ISSSSP) and Coos Bay BLM District, Gold Beach, Oregon

Assistance Agreement L13AC00102, Modification 6

*Figure 1. Mardon skipper surveyors on the North Fork Hunter Creek ACEC. Photo by Candace Fallon/Xerces Society.*

By Candace Fallon

The Xerces Society for Invertebrate Conservation

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Summary
Candace Fallon (Xerces Society) and Kip Wright (Coos Bay BLM) conducted occupancy surveys for mardon skipper butterflies (*Polites mardon*) on June 6 and 14, 2017, on the North Fork Hunter Creek Area of Critical Environmental Concern (ACEC), Coos Bay BLM District, in Curry County, Oregon. Vicky Wilkins (Fauna and Flora International) and Laura Rost (Xerces Society) assisted with surveys on June 6 and June 14, respectively. The primary purpose of these surveys was to assess mardon skipper occupancy and distribution on 42 acres of previously documented occupied habitat and 32 acres of unsurveyed adjacent habitat. The surveyors were successful in confirming mardon skipper presence at one of the previously documented meadows. No mardon skippers were observed at any of the other meadows surveyed. However, surveyors did observe several mardon skippers in a forest opening on private property adjacent to BLM land, which suggests this butterfly may be more widespread on the ACEC than previously documented. Annual surveys would be helpful in monitoring the status of occupied meadows and may identify additional occupied sites.

Introduction
Mardon skippers are stout, furry butterflies with tawny orange-brown wings. They can be found in open meadows and grasslands across Washington, Oregon, and California. As members of the grass-feeding family Hesperiidae, these small skippers rely on native graminoid host plants to complete their life cycle. Adults sip nectar from a wide variety of flowering plants and are usually on the wing from late May through early July. Like many prairie-obligate species in the Pacific Northwest, mardon skipper populations are thought to be in decline, primarily due to loss and degradation of habitat. Although their historic range is not known, they now persist in fragmented populations in four main geographic regions: the southern Puget Sound, the east side of the Washington Cascades, the southern Oregon Cascades, and the southern Oregon coast down into Del Norte, California.

Although previously listed as a federal candidate species under the Endangered Species Act, concentrated survey and conservation efforts and the discovery of new populations led to its removal in the fall of 2012 (USFWS 2012). However, the mardon skipper remains a state endangered species in Washington, and an OR/WA Bureau of Land Management and U.S. Forest Service Region 6 Sensitive Species (BLM 2015; USFS 2015). It has a global rank of G2/G3T2/T3 (imperiled) and state ranks of S1 in Washington and S2 in Oregon (ORBIC 2016, WNHP 2017).

Coastal Oregon mardon skipper populations occur in a small geographic area in the Coast Range of Southwest Oregon (Hatfield et al. 2013a). All sites in this region are relatively small (1 to 10 ha) and cover an area approximately 12 miles by 12 miles in size (Hatfield et al. 2013a). Six occupied sites are documented: two on the North Fork Hunter Creek ACEC, and four others at Windy Valley, Signal Buttes, Lone Ranch State Beach, and Road #100 (Hatfield et al. 2013a). The two Hunter Creek sites were discovered by Dana Ross in 2008. One day population counts were conducted at these sites in 2008, 2009, and 2012 (Hatfield et al. 2013a); however, no skippers have been detected in recent years (Wright 2017, pers. comm.; Table 1). It should be noted that lack of detection from 2014-2016 may have been influenced by weather, survey timing, and/or surveyor experience, and does not necessarily reflect species absence (Wright 2017, pers. comm.).
Table 1. Summary of previous mardon counts and survey efforts at Hunter Creek ACEC. See Figure 1 for meadow locations.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Meadow 5</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Meadow 3</td>
<td>10</td>
<td>2</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Methods**

**Survey Area**

Surveys occurred in open meadow habitats on the North Fork Hunter Creek ACEC (Parcel 1) in Curry County, Oregon. The ACEC is located approximately 10 kilometers (6 miles) inland from the Pacific Ocean and straddles two ecoregions—the Southern Oregon Coastal Mountains and the Coastal Siskiyous. Site elevations range from 300 to 760 m (1000 to 2500 ft.). The ACEC is composed of a mosaic of mixed evergreen and riparian hardwood forests, open fens, oak savannas, and scattered prairies (Brian 2004).

**Survey Period**

The flight period of mardon skipper in Oregon is May through July, although the exact timing varies depending on elevation and other environmental conditions. The known Hunter Creek populations are usually active from late May to mid-June, with the earliest and latest detection dates at these sites on May 17 and June 12, respectively (Ross 2008; Wright 2017, pers. comm.). To ensure mardon skippers would be active during our selected survey dates, Wright scouted the area several times early in the season to check flowering phenology and lepidopteran activity.

**Survey Methodology**

Surveys took place between 9:20 AM and 3:15 PM on still days with minimum air temperatures above 13° C (55° F). At least 30 person minutes were spent at each site. Surveyors slowly walked through appropriate habitat and netted any skippers encountered for positive identification. With the exception of one site visit at 9:20 AM, surveyors followed the general survey conditions and time of day recommendations provided by Hatfield et al. (2013b):

- Conduct surveys only when ambient air temperature (air temperature in the shade) is greater than 55° F (13° C). Warmer temperatures above 60° F (16° C) are preferable.
- Survey between 1000 and 1600 hours.
- Survey only when sunshine is sufficient to cast a distinct shadow. Do not survey during rainy weather.
- Wind should be on average below 10 miles per hour or at or below Beaufort Scale 3 (leaves and small twigs constantly moving).

**Results**

Surveyors spent two days (June 6 and 14, 2017) visiting eight mid-elevation montane meadows within the North Fork Hunter Creek ACEC in Curry County, OR (Figure 2; see photos and site specific data in the Appendices). Mardon skippers were observed in two locations, both of which are on private land but directly adjacent to BLM land (Figure 2). Approximately 10 mardon skippers were observed on the western edge of Meadow 3, and two mardon skippers were observed along the trail near Meadow 13. No mardon skippers were observed on the ACEC itself.
Figure 2. Survey sites on the North Fork Hunter Creek ACEC. MASK=mardon skipper. Meadow numbering system provided by Wright (2017, pers. comm.).
In addition to mardon skippers, surveyors identified eleven other species of butterflies in the meadows and along the trails leading between meadows (Table 1). Greenish blues (Icaricia saepiolus; Figure 3) and ochre ringlets (Coenonympha tullia) were very abundant on both survey dates. Surveyors also observed a black bear (Ursus arctos), a female grouse (Dendragapus sp.) and her chicks, and numerous green sidebands (Monadenia fidelis flavus). Bear signs, including tree scratches, scat, and paw prints (Figure 4), were prevalent throughout the ACEC.

Table 2. Butterfly species observed during mardon skipper surveys.

<table>
<thead>
<tr>
<th>Species name</th>
<th>Common name</th>
<th>Meadow(s)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boloria bellona</td>
<td>Meadow fritillary</td>
<td>12, 13</td>
<td></td>
</tr>
<tr>
<td>Callophrys augustinus</td>
<td>Brown elfin</td>
<td>7</td>
<td>Two individuals observed.</td>
</tr>
<tr>
<td>Carterocephalus palaemon</td>
<td>Arctic skipper</td>
<td>12</td>
<td>One individual observed.</td>
</tr>
<tr>
<td>Celastrina ladon</td>
<td>Spring azure</td>
<td>3</td>
<td>One individual observed.</td>
</tr>
<tr>
<td>Coenonympha tullia</td>
<td>Ochre ringlet</td>
<td>3, 7, 8, 12, 13, 15</td>
<td>Very abundant.</td>
</tr>
<tr>
<td>Colias eurytheme</td>
<td>Orange sulphur</td>
<td>Private land</td>
<td>One individual observed.</td>
</tr>
<tr>
<td>Erynnis sp.</td>
<td>Duskywing</td>
<td>Private land</td>
<td></td>
</tr>
<tr>
<td>Hesperia juba</td>
<td>Juba skipper</td>
<td>3</td>
<td>One individual observed.</td>
</tr>
<tr>
<td>Icaricia saepiolus</td>
<td>Greenish blue</td>
<td>3, 13</td>
<td>Very abundant.</td>
</tr>
<tr>
<td>Oeneis nevadensis</td>
<td>Great arctic</td>
<td>8</td>
<td>One individual by photo plot.</td>
</tr>
<tr>
<td>Papilio eurymedon</td>
<td>Pale swallowtail</td>
<td>12</td>
<td>One individual observed.</td>
</tr>
<tr>
<td>Polites mardon</td>
<td>Mardon skipper</td>
<td>3, private land</td>
<td>12 individuals observed.</td>
</tr>
</tbody>
</table>


**Discussion**

Mardon skippers were only observed on the private inholding in the center of the North Fork Hunter Creek ACEC, which is managed by the South Coast Lumber Company. Both occupied sites were located within 50 meters (164 ft.) of the Coos Bay BLM District boundary. It is therefore likely that mardon skippers occupy BLM-managed meadows (e.g., Meadow 13 and the eastern part of Meadow 3) adjacent to the private sites, although we were unable to confirm this during our surveys. No mardon skippers were observed in any of the newly surveyed meadows (Meadows 7-8, 12-13, and 15-16). Cloudy survey
conditions during June 6 visits to Meadows 15 and 16 were not ideal, and Meadow 16 was only briefly visited before determining it was unlikely to be occupied due to lack of host and nectar plants.

Mardon skippers require open grassland habitats with graminoid host plants and plentiful nectar sources that bloom during the adult flight period. Site occupancy can be patchy, and mardon skippers are rarely distributed homogeneously across a meadow (Beyer and Black 2007). Short stunted grasses and a moisture gradient are important habitat components and often dictate where mardon skippers will be found in a meadow. Hatfield et al. (2013b) suggest that this may be associated with palatability of the host plant due to proximity to a water source. Mardon skipper larvae appear to be graminoid generalists (Beyer and Schultz 2010), but adults may exhibit plant specificity within sites (Hatfield et al 2013a). Documented host plants in Oregon and California include California oatgrass (*Danthonia californica*) and Roemer’s fescue (*Festuca roemeri*) (Beyer and Black 2007), both of which can be found on the ACEC (Brian 2004).

Mardon skippers have been observed using a variety of nectar sources across their range (Table 3). In the ACEC, abundance and diversity of blooming forbs varied from meadow to meadow, with the southern meadows exhibiting some of the lowest diversity and abundance. Commonly encountered flowering species included yellow monkeyflower (*Mimulus* sp.), buttercup (*Ranunculus* sp.), blue eyed grass (*Sisyrinchium* sp.), cat’s ear lilies (*Calochortus* sp.), golden iris (*Iris innominata*), and camas (*Camassia* sp.). Small numbers of cinquefoil (*Potentilla* sp.), owl clover (*Orthocarpus* sp.), mules ears (*Wyethia* sp.), and sea blush (*Plectritis congesta*) were present at a few of the sites. Moisture-loving species like *Mimulus* were usually indicative of a moisture gradient, and these areas were prioritized for surveys. Mardon skippers detected in Meadow 3 were found primarily in bunchgrasses and flowers adjacent to large patches of *Mimulus*.

**Table 3.** Documented mardon skipper nectar plants and known presence on the ACEC (Brian 2004; Beyer and Black 2007; Ross 2008; Kerwin 2011; Barrett 2015, pers. obs.; Fallon and Hatfield 2015; Hatfield et al. 2016; Fallon 2017, pers. obs.).

<table>
<thead>
<tr>
<th>Species name</th>
<th>Common name</th>
<th>Flower color</th>
<th>Present on ACEC</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Achillea millefolium</em></td>
<td>Yarrow</td>
<td>White/yellow</td>
<td>Yes</td>
</tr>
<tr>
<td><em>Calochortus</em> spp.</td>
<td>Cat’s ear lily</td>
<td>White/purple</td>
<td>Yes</td>
</tr>
<tr>
<td><em>Camassia quamash</em></td>
<td>Small camas</td>
<td>Purple</td>
<td>Yes</td>
</tr>
<tr>
<td><em>Delphinium</em> spp.</td>
<td>Larkspar</td>
<td>Purple/blue</td>
<td>Unknown</td>
</tr>
<tr>
<td><em>Dichelostemma capitatum</em></td>
<td>Common brodiaea</td>
<td>Purple/blue</td>
<td>Unknown (but <em>D. congestum</em> is)</td>
</tr>
<tr>
<td><em>Eriogonum umbellatum</em></td>
<td>Oregon-flower buckwheat</td>
<td>Yellow</td>
<td>Unknown (but <em>E. ternatum</em> is)</td>
</tr>
<tr>
<td><em>Eriophyllum lanatum</em></td>
<td>Oregon sunshine</td>
<td>Yellow</td>
<td>Yes</td>
</tr>
<tr>
<td><em>Hieracium</em> sp.</td>
<td>Hawkweed</td>
<td>Yellow/orange</td>
<td>Yes</td>
</tr>
<tr>
<td><em>Horkelia fusca</em></td>
<td>Dusky horkelia</td>
<td>Pink</td>
<td>Unknown (but <em>H. sericata</em> is)</td>
</tr>
<tr>
<td><em>Plectritis congesta</em></td>
<td>Sea blush</td>
<td>Pink</td>
<td>Yes</td>
</tr>
<tr>
<td><em>Potentilla diversifolia</em></td>
<td>Varileaf cinquefoil</td>
<td>Yellow</td>
<td>Unknown</td>
</tr>
<tr>
<td><em>Potentilla gracilis</em></td>
<td>Slender cinquefoil</td>
<td>Yellow</td>
<td>Unknown</td>
</tr>
<tr>
<td><em>Vicia</em> spp.</td>
<td>Vetch</td>
<td>Purple/blue</td>
<td>Unknown</td>
</tr>
<tr>
<td><em>Viola</em> spp.</td>
<td>Purple violet</td>
<td>Purple</td>
<td>Yes</td>
</tr>
<tr>
<td><em>Wyethia angustifolia</em></td>
<td>California compassplant</td>
<td>Yellow</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Throughout its range, the mardon skipper is threatened by factors that degrade its habitat, including conifer encroachment, invasive plants, grazing by domestic livestock, off-road vehicle (ORV) use, prescribed and natural fire, and recreation. Climate change and the inherent issues that go along with small population sizes and stochastic events can also pose risks. Within the North Fork Hunter Creek ACEC, conifer encroachment and invasive grasses may be the primary threats to mardon skipper populations. Wildfire may also pose a threat. Prolonged drought and erratic weather patterns over the last few years have led to widely varying flight seasons across the mardon skipper’s range, which has the potential to affect small populations that are phenologically tied to specific host and nectar resources.

In order to monitor site use on the ACEC and stay informed about potential extirpations, we recommend annual occupancy surveys. These can be done in a subset of meadows at Hunter Creek, in both the previously occupied sites (Meadows 3 and 5) and meadows adjacent to occupied sites (e.g., Meadow 13). Given the apparently small population of mardon skippers at these sites (see Table 1) and this species’ patchy use of occupied meadows, multiple visits over the course of the suspected flight period are advised so surveyors do not miss the flight window. If conducted during the peak of the flight season and following the modified peak count sampling protocol in Hatfield et al. (2013b), surveys in occupied habitat can be compared year to year to get a sense of detectability and whether the population is persisting.

Annual monitoring would also be helpful in tracking invasive species and conifer encroachment in the meadows. Wright (2017, pers. comm.) notes that several of the southern meadows are now composed of up to 50 percent non-native grasses (in particular, the bristly dogtail grass, *Cynosurus echinatus*). Invasive plants can crowd out native species and compete with them for critical limited resources. Targeted control or removal of these species may improve conditions for mardon skippers by encouraging the growth of native bunch grasses and forbs.

Conifer and shrub encroachment is an ongoing issue in the open meadows on the ACEC (see photos in Appendix), and substantial work has already been completed to remove and/or girdle encroaching conifers and keep meadows open. We recommend continuing this work to ensure meadows remain at an early seral stage. The two known occupied meadows have some of the most open grassland habitat on the ACEC; opening up other meadows on the ACEC may be beneficial to mardon skippers, provided the necessary resources are available. Managers may also want to consider opening up corridors between meadows to facilitate mardon dispersal between sites. This could be especially beneficial in the northern complex of meadows (Meadows 3, 7, and 8) and in Meadow 5 where a stand of trees along the trail splits the meadow in two (see Hatfield et al. 2013a).

Although the North Fork Hunter Creek ACEC’s proximity to the ocean has likely been a moderating factor on fire risk, dry site conditions and relatively sparse vegetation make it more susceptible to wildfire than its coastal counterparts further north. Given the small size and patchy nature of mardon skipper populations on the ACEC, wildfires may pose a significant threat to their persistence at this site. The northern boundary of the Chetco Bar wildfire, which burned over 191,000 acres in 2017 (InciWeb 2017), occurred just 10 air kilometers (6 miles) south of Hunter Creek. This same fire burned the Windy Valley mardon skipper site on the nearby Rogue River-Siskiyou National Forest (Vaughn 2017, pers. comm.), one of the largest known populations in Oregon. Land managers could assess and take actions to mitigate the risk of large, high-intensity fires on the ACEC, particularly regarding invasive plants and encroaching shrubs and fire fuels in the understory.
Acknowledgements
We are grateful to Kip Wright for initiating this project and the Interagency Special Status Sensitive Species Program (ISSSSP) for funding it. Kip was instrumental in the completion of these field surveys and providing background information on mardon skippers at the ACEC. We thank our field assistants, Vicky Wilkins (Flora and Fauna International) and Laura Rost (Xerces Society), who helped with surveys, and Sarina Jepsen (Xerces Society), Kelli Van Norman (ISSSSP), and Kip Wright, who reviewed this report.

References

Beyer, L. and S. H. Black. 2007. Site utilization by adults and larvae of mardon skipper butterfly (Polites mardon) at four sites in Washington and Oregon.


Fallon, C. 2017. Personal observation. Senior Conservation Biologist, the Xerces Society for Invertebrate Conservation, Portland, OR.


Wright, Kip. 2017. Personal communication with Candace Fallon, the Xerces Society for Invertebrate Conservation. ACEC Coordinator/Wildlife Biologist, Coos Bay BLM District. April 25, June 6, June 14, September 28, October 5, October 12.
## Appendix 1: Sites Surveyed

<table>
<thead>
<tr>
<th>Survey date</th>
<th>Site name</th>
<th>Elev. (ft.)</th>
<th>Temp (°F)</th>
<th># MASK observed</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-Jun-17</td>
<td>Meadow 3</td>
<td>2232</td>
<td>66</td>
<td>6</td>
<td>Only detected on private parcel.</td>
</tr>
<tr>
<td>6-Jun-17</td>
<td>Meadow 8</td>
<td>2240</td>
<td>66</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6-Jun-17</td>
<td>Meadow 7</td>
<td>2582</td>
<td>67</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6-Jun-17</td>
<td>Meadow 13</td>
<td>1591</td>
<td>78</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6-Jun-17</td>
<td>Meadow 12</td>
<td>1575</td>
<td>79</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6-Jun-17</td>
<td>Meadow 15</td>
<td>1056</td>
<td>69</td>
<td>0</td>
<td>Conditions not ideal for surveys.</td>
</tr>
<tr>
<td>6-Jun-17</td>
<td>Meadow 16</td>
<td>1032</td>
<td>69</td>
<td>0</td>
<td>Conditions not ideal for surveys.</td>
</tr>
<tr>
<td>14-Jun-17</td>
<td>Meadow 5</td>
<td>2264</td>
<td>58</td>
<td>0</td>
<td>Historic site. Visited twice in one day to take advantage of better survey conditions.</td>
</tr>
<tr>
<td>14-Jun-17</td>
<td>Meadow 3</td>
<td>2232</td>
<td>64</td>
<td>4</td>
<td>Only detected on private parcel. MASK nectaring on hawkweed.</td>
</tr>
<tr>
<td>14-Jun-17</td>
<td>Meadow 8</td>
<td>2240</td>
<td>69</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>14-Jun-17</td>
<td>Meadow 7</td>
<td>2582</td>
<td>69</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>14-Jun-17</td>
<td>Meadow 13</td>
<td>1591</td>
<td>70</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>14-Jun-17</td>
<td>Private site</td>
<td>1649</td>
<td>70</td>
<td>2</td>
<td>MASK nectaring on Oregon sunshine.</td>
</tr>
</tbody>
</table>
Appendix 2: Photos of Meadows Surveyed

Meadows 5 (left) and 3 (right). These are the two known mardon skipper sites on the ACEC.

Meadows 8 (left) and 7 (right). Note encroaching shrubs and trees, which could be removed to improve mardon skipper habitat.

Meadows 13 (left) and 12 (right).
Meadow 15 (left) and private site along trail (right). No photos are available for Meadow 16.