

Report to the United States Forest Service
Xerces Society Surveys for *Polites mardon klamathensis*
in Southern Oregon's Mt. Ashland Area (Summer 2008)



Photograph of mating *Polites mardon klamathensis* by Sarina Jepsen

Scott Hoffman Black, Executive Director
Sarina Jepsen, Senior Conservation Associate
Logan Lauvray, Program Assistant

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SUMMARY OF 2008 SURVEY EFFORTS

Scott Hoffman Black, searched several sites around Mt. Ashland in early July 2008. The goal was to identify new populations of *Polites mardon klamathensis*. No new populations of Mardon skippers were found at identified sites around Mt Ashland and no additional searches are recommended.

In addition on June 31, 2007 Scott did one day counts of all of the mardon sites that are located on Forest Service land in Jackson County (Rogue River National Forest). Scott also met with Norm Barrett at the Short Creek site to discuss management issues at the site. This report provides general habitat management recommendations regarding grazing, fire, conifer and shrub encroachment and off-road vehicle use and specific recommendations for extant mardon populations on Forest Service land.

Table 1 at the end of this report lists the geographic location of each site surveyed, a summary of whether or not Mardon skippers were found, and whether or not the site should be resurveyed. Table 2 summarizes the known Mardon skipper sites in southern Oregon and the one day counts from each site in 2007 and 2008. Appendix A includes aerial photos of each site.

INTRODUCTION

The Mardon skipper (*Polites mardon*) is a small, tawny-orange butterfly (20-24 mm) with a stout body. The Mardon skipper is visually distinguishable from other similar skippers by a diagnostic pattern of rectangular white spots visible on the ventral hind wings (Pyle 2002). Mardon skippers are currently found at four geographically disjunct areas including low elevation grasslands of coastal northern California (note: In 2007 one Mardon skipper was found in southern Oregon approximately 20 miles northwest of known sites in California), prairies of the South Puget Sound in Washington State, and grasslands between roughly 500 and 1700 meters in the Cascade Mountain Range of Washington (around Mt. Adams), and Oregon (east of Ashland). Most sites are relatively small, and support populations of less than 50 individuals. However, there are a few robust sites that maintain populations of over two hundred individuals. The Mardon skipper is listed as a federal candidate species under the U.S. Endangered Species Act, and is listed as endangered in the state of Washington (Black & Vaughan 2005).

Polites mardon use more than one graminoid species for oviposition. The most common oviposition plants in Oregon are *Danthonia californica*, *Festuca rubra*, and *Carex* species. In Washington, the most common oviposition plants are *Festuca idahoensis* and *Carex* species (Beyer & Black 2007). Oviposition studies have not been conducted in California, but *Festuca idahoensis* is abundant at the known California Mardon skipper sites (Haggard 2003). In addition, *Polites mardon* seem to use a variety of nectar flower species. The most common observations were on *Vicia* species (Washington sites) and *Potentilla diversifolia* (Oregon sites).

Most habitats are subject to a variety of anthropogenic disturbances such as recreation, grazing, introduction of noxious weeds, various insecticides including Btk as well as natural succession (i.e., conifer and shrub encroachment on meadows) which may

threaten persistence of individual sites. Little genetic exchange between populations may contribute to possible inbreeding. Mardon skippers are assumed to have limited dispersal (Runquist 2004), though long term studies are necessary to determine the effects of climatic and other variables on dispersal and annual reproductive success. Lack of genetic interchange and migration / dispersal between populations may make it impossible for an extirpated population to become reestablished.

Taxonomy

The Mardon skipper (*Polites mardon*) is in the family *Hesperiidae* (skippers) and the subfamily *Hesperiinae* (grass skippers). It was first described by W. H. Edwards (1881) from specimens taken near Tenino, Thurston County, Washington by H. K. Morrison (Dornfeld 1980). Mattoon et al. (1998) proposed that the Oregon population be given subspecies status *Polites mardon klamathensis* and that the Washington and California populations be considered *Polites mardon mardon*. Adults of *P. m. klamathensis* have a consistently tawnier dorsal and ventral coloration, when compared to adults from other populations (Warren 2005). A group of *P. mardon* populations exists in coastal Del Norte County approximately 80 air miles to the west of *P. m. klamathensis* populations. However the series of *P. mardon* from Del Norte County populations have not yet been carefully compared to series of *P. mardon mardon* from Washington and the use of the name *P. mardon mardon* for California populations should be considered tentative (Warren 2005).

SURVEY PROTOCOL

Unless otherwise stated, all sites were surveyed during the following environmental conditions:

Minimum temperature: Above 60 degrees Fahrenheit.

Cloud cover: Partly sunny or better. On cooler days, the sun can play a very important role in getting butterflies to take to the air. On warmer days (above 60 degrees F), direct sunlight is less important, but a significant amount of the sun's energy should be coming through the clouds to help elevate the temperature of basking butterflies.

Wind: Less than 10 MPH. On windy days, butterflies will drop out of the air if they cannot maintain their direction and/or speed of flight.

Time of year: All sites were visited between late May and early June.

We followed this protocol after arriving at each potential site:

1. Approach the site and scan for any butterfly activity, as well as suitable habitat.
2. Fill out all of the site information on datasheet.
3. Give closer attention to wetter areas first. Mardon skipper seems to prefer habitat close to small streams or other seasonally wet features.
4. Walk through the site slowly (about 5 minutes to walk 100 meters), look back and forth on either side, approximately 20 to 30 feet out. Do best to walk in a path

- such that you cover the entire site with this visual field, or at least all of the areas of apparently suitable habitat.
5. If you leave your path to look at a particular butterfly, do your best to return to where you left your path when you resume walking/searching through the site.
 6. When a suspected Mardon skipper butterfly is encountered, we net the butterfly to confirm its identification. This is especially important because of its similarity to the Sonoran skipper, which also occurs at many sites supporting Mardon skippers. No vouchers were taken at sites.
 7. Record all data for sites whether butterflies are seen or not. In this way, we document both new sites where *P. mardon* is found and, as well as our overall search effort.

GENERAL MANAGEMENT RECOMMENDATIONS

In this report, we provide our observations of threats observed at brief visits to known Mardon skipper sites. However, this is not a comprehensive management plan. We suggest that a comprehensive management plan should be developed to ensure the survival of the extant Mardon skipper populations in southern Oregon. Mardon skipper populations face a variety of threats, including over grazing by domestic livestock, conifer and shrub encroachment, off road vehicle (ORV) use of meadows, recreation (including camping), applications of Btk, and landownership patterns that may lead to incompatible uses on adjacent land, thus affecting Mardon skipper site condition and survival. In this report, we provide general recommendations for managing grazing, conifer encroachment, ORV use and Btk applications. We also provide general recommendations for how to preserve Mardon skipper populations while using fire as a management tool. Other threats, such as shrub encroachment, recreation, and incompatible uses of nearby lands are not addressed in this report.

Cattle Grazing

Most of the Mardon skipper sites have some grazing by cattle and some sites have been excessively degraded. Livestock grazing may cause adverse impacts to butterfly populations by (1) trampling eggs, larvae, pupae, and adults, (2) eating larval and adult food sources, and (3) disturbing the soil, which allows weeds to invade (Warren 1993). Tall-grass and mixed-grass prairies appear to be very susceptible to the effects of overgrazing (McCabe and Post 1997, Royer and Marrone 1992, Royer and Royer 1998, cited in COSEWIC 2003), “which reduced or eliminated critical adult nectar sources and removes forage for larvae.” In a study on the Dakota skipper (*Hesperia dacotae*), Dana (1997) found that grazing cattle reduced skipper numbers in direct proportion to grazing intensity. However, grazing is not always detrimental (Dana 1991); “light or light rotational grazing can be beneficial by creating areas of mixed-grass vegetation structure preferred by the (Dakota) skipper” (Dana 1991). Mardon do seem to be resilient to some grazing pressure and some sites with heavy grazing do have seemingly robust mardon populations.

In order for grazing to have a minimal impact on the Mardon skipper, the combination of timing, intensity, and duration must be found that is best suited for the specific ecology of

the butterfly. In some sites the correct solution may be to eliminate grazing while in other sites some grazing at the appropriate time of the year may not negatively impact the site.

In Jackson County of southern Oregon, adult Mardon skippers require adequate floral nectar for survival, successful reproduction, and adequate egg production from mid-May through early July.¹ Livestock grazing or site use during this period reduces or altogether removes key nectar resources. Likewise, grazing when butterfly larvae are active on host plants can result in direct mortality or remove important larval vegetation (Smallidge & Leopold 1997). In Oregon, Mardon larvae are believed to be active from approximately late April through October, although this window of activity varies, and is probably influenced by the elevation of each site. Grazing intensity and duration are also important to consider. Although intensive grazing has been shown to be detrimental to many butterflies, moderate to light stocking levels with herds rotated through the management area to create a mosaic pattern of grazing stages can be a useful method for halting succession (Schtickzelle *et al* 2007). The timing and frequency of rotation depends on both the size of the herd and the size of the grazed area (Schtickzelle *et al* 2007). Generally speaking, grazing periods should be short, with recovery periods for the habitat relatively long.

General Recommendations (Note: Management plans should be developed for each site)

- At the most severely impacted sites cattle should be excluded from the area to allow the habitat time to repair.
- Grazing should never be allowed during the flight period of the adult Mardon skipper.
- Keep grazing periods short, with recovery periods for the habitat relatively long.

BLM and Forest Service could implement a grazing study by looking at different grazing regimes. In the long-term, habitat management research should address: 1) Does grazing degrade, maintain, or have no effect on Mardon skipper habitat quality?, 2) What grazing regime is least harmful to Mardon skippers and their habitat?, 3) How does site vegetation change over time with various applications of livestock grazing? For areas where elk are present the study design should include areas that exclude cattle but not elk. In this way we can better understand the impact of cattle grazing and work toward better management of these sites.

Prescribed fire

Due to the importance of fire in maintaining many native ecosystems, the use of controlled burning as a management tool has become increasingly common. Although the effects of fire on vegetation and vertebrate communities are more widely understood than the effects of fire on invertebrates, fire can benefit, harm, or have no significant effect on invertebrates depending on the biology of the specific taxa (Gibson *et al* 1992). Burning of meadows with populations of butterflies, such as the Mardon skipper, could extirpate the population if not done carefully, with consideration of butterfly behavior and life stage at time of burn and knowledge of where the skipper population is

¹ In Jackson County, the adult flight times span from mid-May through early July, although adult flight times at individual sites only last approximately 3-4 weeks.

distributed across the meadow. In addition, with isolated populations, there are often no source populations available for recolonization once a population has been locally extirpated. Swengel (1996) and Swengel and Swengel (2001) found that fire had consistent negative effects on prairie specialist species of butterflies that persisted for 3-5 years post-fire. In a modeling approach Schultz and Crone (1998) found that burning one-third of the butterfly occupied habitat every year to control encroaching woody shrubs would maximize the average annual population growth rate of Fender's Blue *Icaricia icarioides fenderi*. Swengel (1996) suggests that management techniques should be varied between sites, providing not only short term diversity of habitat, but counteracting any potential long term effects that reliance on one method of site management may have on a given population of butterflies. If controlled use of fire within a Mardon skipper occupied site is feasible, and there is a management goal that can be best accomplished with controlled burning, then in order to protect the Mardon skipper population, specific steps must be employed in conducting the burn. A careful and well-researched prescribed burning regimen should have the correct combination of timing, intensity, and size that is appropriate for the management area and will result in long-term stability of Mardon skipper populations. Knowledge of how butterflies respond to fire is integral to designing an effective fire management strategy. Sites that support small numbers of individuals should in general not be considered for burns.

General Recommendations (Note: Management plans should be developed for each site)

- Conditions (site size, access, vegetation desiccation and humidity levels) must allow for controlling fire once it starts.
- A management objective has been defined that will be best accomplished by use of fire.
- Identify core Mardon skipper habitats, especially egg-laying areas, as part of a burn plan.
- Burn in fall or early winter as Mardon skippers have ceased foraging and are present as larvae, or in a state of diapause to prepare for the winter.
- A single prescribed fire should not burn more than 1/10 to 1/5 of the core habitat in any given year.
- As a fire moves through an area it may leave small patches unburned. These skips should be left intact as potential micro-refuges.
- Periods between managed burns at the same site should be conservative and can be anywhere from 3-10 years for adequate recovery of butterfly populations, depending on the ecosystem.
- Not all sites within the same complex should be burned.
- If burns are undertaken a comprehensive monitoring program should be put in place to determine the short and long term impact on the population.
- Care must be taken to avoid actions that could degrade habitat and kill individual skippers as a result of heavy equipment use or people trampling meadows.

Encroaching conifers *(Note: Management plans should be developed for each site)*

In some areas fire suppression has led to grassland encroachment by native trees and shrubs (Potter and Fleckenstein, 2001), which could have a negative impact on Mardon populations. Many Mardon skipper meadows have encroaching conifers. At sites where

conifers are encroaching, the small trees should be removed as soon as possible, before the trees grow larger and reproduce. Management plans may need to be developed to selectively and carefully remove some young conifers.

General Recommendations

- Conifers over 4" Diameter at Breast Height (DBH) should be left at the site.
- Wherever possible hand cutting with chainsaws or handsaws would be optimal.
- Care must be taken to avoid actions that could degrade habitat and kill individual skippers as a result of heavy equipment use, people trampling meadows, piling of trees in meadows, or burning of piles in meadow habitat.
- Larger trees at the edges of meadows should be maintained since they may play an important role in maintaining the microclimate and hydrology at the sites.

Off-road vehicles (ORVs)

When ORVs drive through meadows occupied by the Mardon skipper, the skipper is directly threatened. In areas with ORV traffic, we recommend fencing off core Mardon skipper habitat areas.

Use of Btk

Btk (*Bacillus thuringiensis* var. *kurstaki*), a Lepidoptera-specific insecticide, has been widely used to treat defoliators in western forests (Wagner and Miller 1995). Btk is a bacterium, which when ingested, is lethal to butterfly and moth larvae.

Species such as the Mardon skipper that are single-brooded with spring-active larvae that feed during the application period for the target species are especially vulnerable to Btk (Wagner and Miller 1995). Because of the Mardon skipper's current patchy distribution on isolated sites and low vagility, its populations are even more threatened by Btk applications due to the decreased probability of re-colonization.

The threat of Btk is heightened because Btk has been shown to drift at toxic concentrations for distances greater than two miles from target spray areas (Barry 1993 and Whaley et al. 1998). As a result, aerial spraying with Btk can have significant adverse effects on Mardon skippers in the general area of an aerial Btk spray project. We recommend not spraying Btk on forested areas within five miles of any Mardon skipper population.

SITES VISITED

USFS Short Creek

On June 31 Scott Black met with Norm Barrett at the Short Creek mardon site on the Rouge River National Forest. The Forest Service has been managing the site to stop/slow encroachment of shrubs and conifers at the site. Xerces strongly supports the removal of encroaching trees and shrubs but we are very concerned with doing a larger scale logging project to open up areas around the meadow. This is the largest mardon site on Forest Service land in Southern Oregon and one of the largest of all of the sites in the area. Norm Barrett and Scott Black counted 159 mardon in a one day count. Microclimate and

hydrology are very important factors in the fecundity of butterflies. Opening up the area may cause changes microclimate and hydrology that may negatively impact the population of mardon at this site. Please see the general recommendation for conifer encroachment above. We would be happy to talk to you about developing a plan for this important site.

Conde Creek 4

Twenty four mardon skippers were counted at Conde Creek 4 (north of Service Glade). Nearly all Mardon skippers were observed within patches of flowering *Wyethia angustifolia* (Figure 1). Observed a small amount of *Festuca* sp. at this site, and abundant *Danthonia californica*.

Threats: There are many young ponderosa pines and a few Douglas firs encroaching upon this meadow (Figure 2). ATV tracks were also observed in this meadow.



Fig. 1. Conde Creek



Fig. 2. Note the many small conifers encroaching on this meadow

USFS Service Glade

Scott counted 13 Mardon skipper at the Service Glade. Observed abundant floral resources, including: sea blush, lupines, yarrow and potentilla (Fig 3).

Threats: There are some encroaching conifers and appears to be cattle activity at this site.



Fig. 3. Encroaching conifers at Service Glade

SITES VISITED AROUND MT. ASHLAND

Silver Fork Swale

Scott Hoffman Black visited 4 sites at this large site. The site ranges from 5500ft to 7500ft and is over 1000 acres. The site ranges from alpine conditions at the higher elevations to shrubs, wetlands and grassland at mid and lower elevations.

Silver Fork Swale 1. N:42° 01.783' W:122° 52.600'

This site is too high and did not meet the requirements for mardon habitat. It could be characterized as alpine meadow with willows. Recommendation: There is no need to re-check this site.

Silver Fork Swale 2. N:42° 02.350' W:122° 53.494'

This site is too high and steep for mardon habitat. Recommendation: There is no need to re-check this site.

Silver Fork Swale 3. N:42° 02.050' W:122° 53.684'

Very nice high elevation meadow. No fescue but there appeared to be some *Danthonia sp.* Site seems like it is too large and open to be good mardon habitat. No mardon were found in a survey during good conditions. Recommendation: There is no need to re-check this site.

Silver Fork Swale 4. N:42° 02.063' W:122° 53.989'

Nice lupine meadow. Wet in the center to dry and rocky at edges. Not good mardon habitat. No mardon found. Recommendation: There is no need to re-check this site.

Hanley Gap N:42° 04.062' W:123° 01.353'

No habitat for mardon at this site. Too steep and rocky. Recommendation: There is no need to re-check this site.

West Handley Gap N:42° 04.161' W:123° 01.979'

No mardon habitat. Small meadow with a small pond. Area is mostly shrubs. Recommendation: There is no need to re-check this site.

Table A: Summary of all sites surveyed in around Mt Ashland Oregon by the Xerces Society (Scott Hoffman Black) during the 2008 field season.

TABLE OF SITES VISITED AROUND MT. ASHLAND					
Site	Elevation (feet)	Longitude (W)	Latitude (N)	Mardon extant	Resurvey in 2009
Silver Fork Swale	5500-7500				
Silver Fork Swale 1		122° 52.600'	42° 01.783'	N	N
Silver Fork Swale 2		122° 53.494'	42° 02.350'		
Silver Fork Swale 3		122° 53.684'	42° 02.050'	N	N
Silver Fork Swale 4		122° 53.989'	42° 02.063'	N	N
Handley Gap	4300	123° 01.353'	42° 04.062'	N	N
West Handley Gap	4200	123° 01.979'	42° 04.161'	N	N

Table B: Summary of all known Mardon skipper sites in southern Oregon and recorded days counts from these sites in 2007 and 2008.

Site Name	Administrative Unit	Day count 2007	Day count 2008
USFS Conde Complex			
Service Glade	Ashland RD Rogue River/ Siskiyou NF	32	13
Conde Creek 4	Ashland RD Rogue River/ Siskiyou NF	42	24
Short Creek Complex			
Short Creek 1 (East)	Ashland RD Rogue River/ Siskiyou NF	29	159 total
Short Creek 2 (West)	Ashland RD Rogue River/ Siskiyou NF	40	159 total
BLM Conde Complex			
Conde Meadow	Medford District BLM, Ashland RA	0	
Indian Road Complex			
Dead Indian Road – MP 20.2(1)	Medford District BLM, Ashland RA	2	
Dead Indian Road – MP 20.2(2)	Medford District BLM, Ashland RA	2	
Dead Indian/Big Elk Junction	Private	N/A	
Moon Prairie Complex			
Pumpchance 128 – Moon Prairie	Medford District BLM, Ashland RA	62	
Pumpchance 125	Medford District BLM, Ashland RA	265	88
Wet Prairie S. of Pumpchance 125	Private	N/A	
Wildcat Complex			
Wildcat	Medford District BLM, Ashland RA	0	
Hyatt Lake East Shore	Medford District BLM, Ashland RA	0	
Buck Prairie Site			
Buck Prairie	Medford District BLM, Ashland RA	95	
Table Mt. Sites			
Burnt Creek Meadow	Medford District BLM, Ashland RA	25	
Little Hyatt Reservoir site			
Little Hyatt Reservoir South	Medford District BLM, Ashland RA	11	
PCT Complex			
PCT Meadow South & Meadow SW of PCT Meadow South	Medford District BLM, Ashland RA	20	
PCT Meadow North	Medford District BLM, Ashland RA	2	
Hobart Peak Complex			

Site Name	Administrative Unit	Day count 2007	Day count 2008
Hobart Peak East	Medford District BLM, Ashland RA	2	
Hobart Peak Middle	Medford District BLM, Ashland RA	0	
Hobart Peak West (exclosure)	Medford District BLM, Ashland RA	0	

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