

**U.S. Forest Service and Washington Department of Fish and Wildlife  
Mardon skipper (*Polities mardon mardon*) Report  
Naches Ranger District, Okanogan-Wenatchee National Forest  
Spring and summer 2009**

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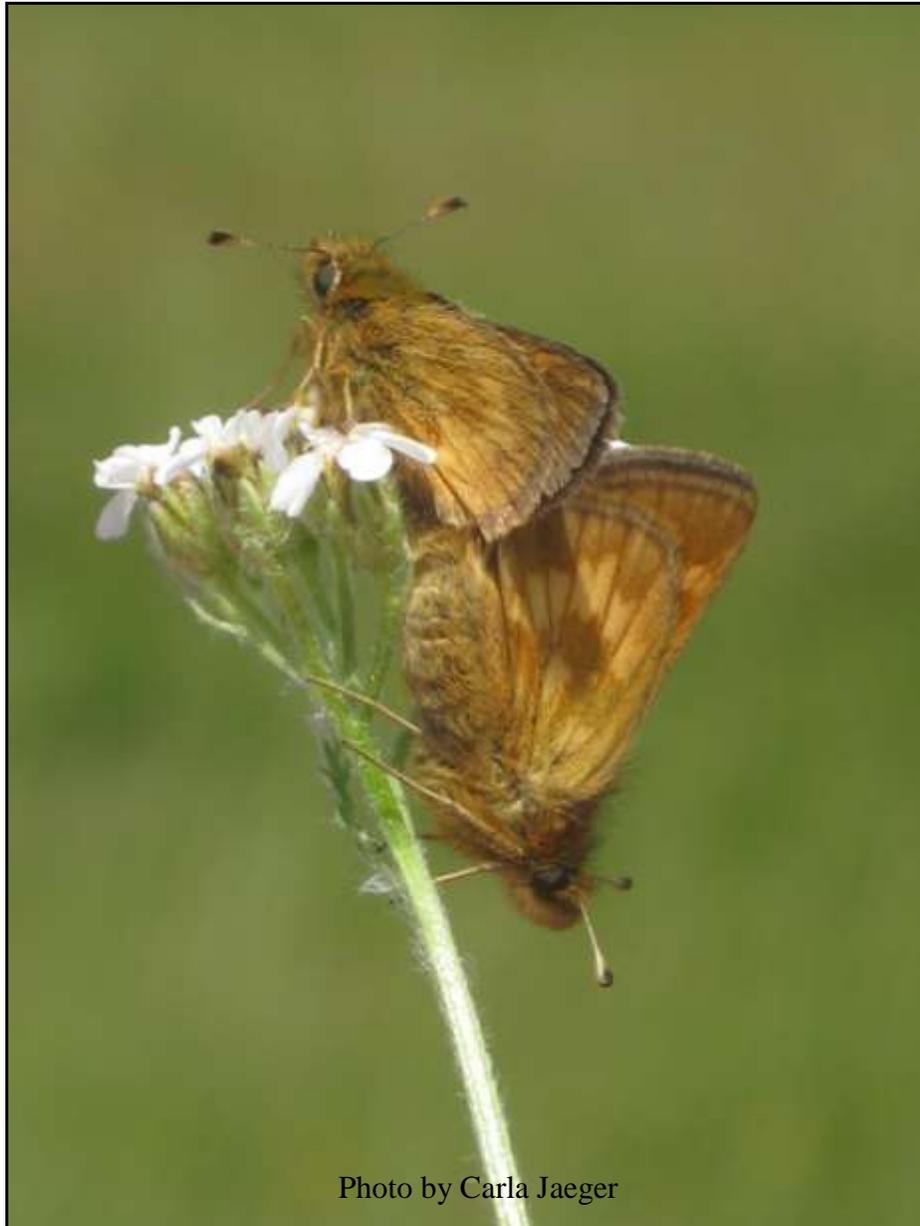


Photo by Carla Jaeger

## **Background**

The Mardon skipper (*Polites mardon*) was listed as a state endangered species by the Washington Fish and Wildlife Commission in 1999 and was designated a Federal candidate for listing under the Endangered Species Act (ESA) by the U.S. Fish and Wildlife Service in that same year. It is sensitive species in the R6 FS Sensitive Species program (R6 list as of January 2008).

Historically, no Mardon skipper colonies were known on the Naches Ranger District (NRD) and only 9 occupied sites were known in Washington (Potter et. al 1999). Surveys by the Washington Department of Fish and Wildlife (WDFW) in 2001 failed to document Mardon skippers on NRD. The closest known colony was in Klickitat Meadows on the Yakama Nation, approximately 5 miles southeast of Conrad Meadows on the NRD. Dr. David James, Associate Professor, Department of Entomology at WSU, identified the first population of Mardon skippers on the NRD, Pinegrass Ridge area, July 19, 2006. The second population was discovered by amateur lepidopterists, Bill and Jeanette Yake June 2, 2007 in Conrad Meadows.

Along with habitat loss, fragmentation, invasive weeds, and conifer encroachment, livestock grazing was a potential risk factors identified in the Mardon skipper conservation assessment (USDA Forest Service 2007b). The NRD was in the process of writing a Biological Assessment for the renewal of cattle grazing permits for the Tieton AMP in 2006. The uncertainty of the exact area of Dr James' site and the possibility of additional sites within the Tieton cattle Allotment prompted the USFS and WDFW to conduct cooperative surveys in 2007. The USFS contracted with the Xerces Society to train observes and conduct surveys 2007 through 2009.

Concerns over the potential impact of ungulate grazing on Mardon skippers, on the NRD, were elevated in 2007 and spring 2008:

- In 2007, the majority of the 38 adult Mardon skippers seen in Minnie Meadows, appeared to favor the area that was excluded by ungulate grazing; majority were seen nectaring on flowers inside a research enclosure. Area outside of the "total ungulate" enclosure lacked flowering plants and was heavily grazed (Table 5).
- One of the largest documented concentrations of adult Mardon skippers (457) was found in Conrad Finger 2 on 6/27/07, prior to cattle turn out. On July 10, Xerces Society staff returned to find cattle present, a few flowering plants, and few Mardon skipper butterflies (3 individuals). Biologist from Xerces, USFS and WDFW visited the Conrad Finger 2 and Minnie Meadows Mardon sites September 2007. Several participants of this meeting expressed concern over the level of grazing at these two sites and potential negative impacts it could have on the Mardon skipper.
- Another concern surfaced in the spring 2008 when the USFS proposed a turn out date for cattle that was two week earlier then historically in the Pinegrass and South Fork Tieton areas. This change in turn out date was proposed to reduce grazing impacts to the Federally listed bull trout in the South Fork Tieton. Mardon skipper specialists were concerned that this earlier turn out date could have additional negative impacts on the Mardon skippers through trampling and removal of important nectar sources. Regular access of nectar plants is thought to be critical to survival and fecundity of adult Mardons (USDA Forest Service 2007b). To mitigate this concern, cattle enclosures were built around Pinegrass 1 and Pinegrass 2 Mardon skipper sites. An existing, but

nonfunctioning, cattle and “total ungulate” enclosure was repaired in Minnie Meadows during 2008, prior to the cattle turn out dates.

## **2009 Objectives**

The objectives of the 2009 Mardon skipper surveys were:

1. Monitor existing populations to determine trends in peak numbers and flight periods.
2. Search for new sites within the known range of the Mardon skippers on NRD.
3. Train Forest Service personnel on the Forest to identify Mardon skippers.
4. Characterize Mardon skipper Habitat (gather detailed vegetation and physical data of large population sites: Minnie and Conrad Meadows)
5. Monitor potential grazing impacts (continue monitoring cattle/“total ungulate” enclosures).

This report provides a summary of each site visited on the Naches Ranger District during the 2009 field season, findings, and recommendations for 2010 survey season.

## **Methods**

Surveys were conducted according to the Survey Protocol for the Mardon skipper, Version 1.1 (USDA Forest Service 2007a). All site visits by Forest Service, WDFW and Xerces staff are detailed in this report. There will be no additional report from Xerces this year, since they functioned mainly as support to our survey efforts.

### **1) Monitoring Existing Populations**

Appendix A, Table A lists all Mardon skipper surveys that took place in 2009. Population surveys focused mainly on the large population sites such as Minnie Meadows and Conrad Meadow complexes. Other sites were surveyed multiple times opportunistically. Only one complete survey visit occurred in Main Conrad Meadows, Conrad Finger 2 and Minnie Meadows due to unfavorable weather conditions. The complete survey visit to these sites took place on July 1 and 2, 2009. Cursory visits occurred to determine the beginning of the flight period.

The area that was surveyed in 2008 was the same area that was surveyed during 2009 for both Conrad Meadows and Conrad Finger 2 (only Forest Service land in Conrad Meadow, and all of Conrad Finger 2). The 2009 survey at Minnie Meadows included the entire meadow where as in 2008, surveys at Minnie Meadows were concentrated in habitat we predetermined as suitable (short grass/sedge communities).

#### **○ Trends in Peak Number**

Mardon skipper numbers in 2009, at known sites, varied from the 2008 counts. Adult Mardon skipper numbers were down and flight period shorter than the previous year, at some sites such as Minnie Meadows and Pinegrass 1. This is thought to be the result of a late June frost that occurred when adult Mardon skippers began emerging at these sites (refer to Appendix A, Table A). Minnie Meadows and Pinegrass 1 are mid elevation sites (3500’-4000’). However, not all mid elevation sites were affected by the late frost such as Conrad Meadows and Conrad Finger 2. Mardon skipper numbers at these two sites were comparable to 2008 surveys results. The dense layers of thatch formed from the *Danthonia unispicata* at Conrad Meadows and Conrad Finger 2 sites, may have afforded protection to the Mardon skippers. Minnie Meadows and Pinegrass 1 sites have little to no duff layer.

At the lower elevation sites, Mardons emerged during the same time period as 2008, however counts were slightly elevated. Bear Cove and Bear Creek are low elevations sites (3000' to 3200') with small Mardon skipper populations (< 25 adults). The flight period lasted two weeks. This was true for both 2008 and 2009 flight season. This flight period was longer than expected for the population size. This most likely was a result of cool temperatures (65°-75° F), typical of the east Cascades during mid to late June.

The only high elevation Mardon skipper site monitored in 2009 was 767 Rd, which is at 5050 feet in elevation. The Mardon skipper count doubled (approximately 50) from what it was in 2008 at this site. The flight period was short, less than a week in both 2008 and 2009. The consistent, warmer weathers (75°-90° F) that generally occurs during mid to late July is thought to be the main factor influencing the flight period.

- **Mardon Skipper Flight Period (timing of key life history activities)**

The following general observations were made in regards to the three years of Mardon surveys completed on the Naches Ranger District: Low elevation sites of 2970' to 3300', the Mardon skipper flight period is generally between June 16 and June 30; mid elevation sites, 3500' to 4000', flight period occurs June 17 through July 10; and higher elevation sites, 5000', flight period occurs between July 11 and July 25 (Appendix A, Tables A & B).

Potter et al. (1999) reported very similar results for historic sites in Yakima County. Mardon skippers were flying between June 25 and July 5 at 3600'. Data in Potter et al. (1999) is limited, but numbers appeared to peak about June 30<sup>th</sup> at 3600 feet. At higher elevation sites (4700'-5000'), Potter et al. (1999) reported Mardons found June 24<sup>th</sup> and July 23<sup>rd</sup> (Appendix, Table B).

## **2) Documentation of New Mardon Skipper Sites**

- **Summary of Search for New Sites Within the Known Range**

An additional 3 new Mardon skipper sites were documented on the NRD during the 2009 survey season. All new occurrences were found within the known range; either in the South Fork Tieton, or Pinegrass Ridge areas. The present northern range of the Mardon skipper is FS RD 1200, south of Rimrock Lake. For the area that Mardon skippers have been found on the Naches Ranger District refer to Figure 2 in Appendix A. Survey efforts were focused primarily on sites visible from road systems; however some surveys occurred from visiting potential habitat interpreted off of aerial photos. The 1040, Lower 1050 and 1070 meadow sites had Mardon skipper habitat but were surveyed too late. These sites should be checked 2010 during ideal survey conditions and appropriate timing.

### **Documentation of New Colonies**

- **Summary of New Sites Found in 2009**

We searched 15 sites (meadows and harvest units) and found 3 new Mardon skipper sites. A list of all sites, their locations and whether or not Mardon skippers were found is included in Appendix A, and a description of each new (2009) Mardon skipper site is described below.

- **New Sites Discovered**

#### **750 Road**

Jeff Bernatowicz, Ann Potter, and Will Moore discovered Mardon skippers at this site on July 1, 2009. They observed 19 Mardon skippers in a 1 acre area. The site was made up of logging

landing and a small meadow. False hellebore was present, which is common at most Mardon skipper sites on the Naches Ranger District. Temperature was 80+°, with no wind and no clouds.

### **1050 Upper Meadow**

Joan St. Hilaire and Jeff Bernatowicz discovered Mardon skippers at this site on July 09, 2009. They found two male Mardons that had a lot of wing wear. Most likely late in the Mardon skipper flight period. A visit to this site should be done 2010 to determine population size. Both were caught and identified. An addition five Sonora skippers were seen. Both the Mardons and the Sonora skippers were landing on the false hellebore. Site is a large meadow with false hellebore present at the southern end of the meadow. *Danthonia unispicata* was the dominant grass species and clover was in bloom at the time of visit. This meadow receives light levels of grazing, primarily by elk. Sedges and grasses average 7” in height. A 4WD jeep trail (Tr 642) runs through the meadow. This trail will be rerouted in 2010-2011. Funding for this project has been obtained from Title II and the USFWS Recovery Program.



1050 Upper Meadow

### **Conrad Donut Meadow**

Joan St. Hilaire and Jeff Bernatowicz discovered Mardon skippers at this site on July 09, 2009. Weather was 65° F, no wind with patchy sunlight. They found 15+ Mardon skippers that had some wing wear. Most likely late for Mardons, a visit to this site should be done 2010 for a better count. Two were caught and identified. There is no false hellebore at this meadow. A clump of large conifer trees is located in the center of the meadow, hence the name. This Meadow is located approximately 700 yard east of Conrad Meadows, across the South Fork Tieton River. There is a dense mature conifer stand between this meadow and Conrad

Meadows. The only path that connects this meadow to Conrad is a narrow game trail that is heavily shaded. It appears to be a travel barrier, yet Mardon skippers exist in this meadow. Main grass species present were fescue and sedges with forbs such as *Penstemon* and *Anaphalis margaritacea* (pearly everlasting) in bloom. There was no *Danthonia unispicata* (oatgrass) in this meadow.

### **3) Expanding knowledge base of Mardon Skippers**

A spring Mardon skipper habitat and species identification field trip was conducted on the Okanogan-Wenatchee Forest spring of 2009. Forest Service and US Fish and Wildlife Service personnel were present. Several sites were visited ranging from natural meadows to old logging units. Mardon skipper identification, life history and habitat characteristics were discussed. Documentation and photo techniques were also covered.



A second field trip occurred during the fall, which included neighboring biologists from the Gifford Pinchot National Forest and the Yakima Nation. The purpose of this field trip was to compare habitat characteristics of known Mardon skipper sites and to observe ungulate grazing levels at Mardon skipper sites on the Naches Ranger District. Generally, there were differences between geographic sites in regard to moisture. The Naches Ranger District sites tended to have year round water sources, resulting in a false hellebore vegetation component at most of the sites. This differed from the Cowlitz Valley & Mt Adams Ranger Districts sites. Although the Gifford Pinchot NF sites may not have had permanent water sources, they had significantly higher year round precipitation than the Naches Ranger District sites.

### **4) Plant Community Preference by adult Mardon Skippers (Habitat Characterization)**

One portion of the Mardon skipper habitat characterization was completed during 2009. Plant communities within our high density Mardon skipper sites: Minnie Meadows, Conrad Meadows and Conrad Finger 2; were delineated by a botanist June 2009. Plant community preference by adult Mardon skippers was recorded at Minnie Meadows and Conrad Finger 2. In Minnie

Meadows, as surveyors observed adult Mardon skippers the site locations were recorded on gps units. In Conrad Finger 2, Mardons were counted along transects and numbers within each plant community were recorded. Adult Mardon skipper plant community preference observations should be repeated at Minnie Meadows and Conrad Finger 2 and a subset of Conrad Meadows during the 2010 survey season. Due to the large area, high concentrations of Mardon skippers and private land holdings at Conrad Meadows, it was decided a subset of all plant communities would be the best process to use in determine plant community preference at that site. Four plant communities were delineated at Minnie Meadows, five at Conrad Meadows and three at Conrad Finger 2. These delineated plant communities have been entered into GIS and are listed in Tables 1-3. Details regarding plant communities and grazing at these sites follows each table.

Refer to Appendix A, Photos 1-10 for picture of some of the plant communities in Conrad Meadows spring through fall of 2009.

Table 1 Plant communities, vegetation height and Mardon skipper count at Minnie Meadows

Plant Community <sup>1</sup>	Av ht (inches)		Number of Adult Mardons (mm/dd) 07/01	% of Mardons using plant community	Acres of plant community surveyed
	Date (mm/dd/yy) 06/09/09	Date (mm/dd/yy) 10/07/09			
STOC/POPR/POGR9	5	0.5-5	10	16	3.7
POPR/CAHO5/TRRE3	5-12	0.5-4	52	84	3.5
CALE8/TRRE3	5-24	15-30	0	0	3.5
JUBA/CALE8	24-30	30-35	0	0	0.4

<sup>1</sup> for plant species code/scientific name/common name refer to Table

STOC/POPR/POGR9 needlegrass/bluegrass/cinquefoil (dry)

POPR/CAHO5/TRRE3 bluegrass/short sedge/clover (moist to dry)

CALE8/TRRE3 tall carex/clover (wet to moist)

JUBA/CALE8 rushes/tall sedges (very wet)

- Most of the Mardon sightings in STOC/POPR/POGR9 border the POPR/CAHO5/TRRE3 plant community
- Grass height varies in the POPR/CAHO5/TRRE3 plant community
- Minnie is fenced, receiving regular elk use in the spring and continue use throughout the summer/fall. Cattle grazing infrequent July & August
- All enclosures occur in the POPR/CAHO5/TRRE3 plant community
- Ht within cattle enclosure 0.5-5” on 10/7/09
- Ht within “total ungulate” enclosure 24” on 10/7/09
- Ht within small enclosure (4’x4’x2’) in the POPR plant community 24” on 10/7/09

Table 2 Plant communities, vegetation height at Conrad Meadows (no Mardon count by plant community was recorded)

Plant Community	Av ht (inches)	
	Date (mm/dd/yy) 06/09/09	Date (mm/dd/yy) 10/07/09
DAUN/CAHO5/TRRE3/TRLO	2	0.5-2
POPR/CAHO5/TRRE3	5	0.5-5
CALE8/JUBA	17	2-30
CALE8/Salix spp.	17	4-32
CALE8/VECA2	2-24	2-35

DAUN/CAHO5/TREE3/TRLO oatgrass/short sedge/clovers (dry adjacent to moist/wet plant communities)

POPR/CAHO5/TRRE3 bluegrass/short sedge/clover some oatgrass scattered irregularly (dry, primarily occurs on the upper edge of the meadow, not adjacent to other moist/wet plant communities)

CALE8/JUBA tall sedge/rushes (moist to wet)

CALE8/Salix spp./JUBA tall sedges/willow/rushes (wet-standing water)

CALE8/VECA2 sedge/false hellebore (wet)

- Counted Mardons by transects and did not separate by plant community. Adult Mardon skippers were too dense to record a GPS reading on each sighting. Without a physical delineation on the ground it was difficult determining when a different plant community was entered, particularly between the DAUN/CAHO5/TREE3/TRLO and POPR/CAHO5/TRRE3 plant community types.
- Conrad receives high levels of use by elk during the spring and high levels of cattle grazing July-October. Portions of Conrad occur on private land holdings.

Table 3 Plant communities, vegetation height and Mardon skipper count at Conrad Finger 2

Plant Community	Av grass/forb ht (inches)		Number of Adult Mardons (mm/dd) 07/02	% of Mardons using plant community <sup>1</sup>	Acres of plant community surveyed
	Date (mm/dd/yy) 06/09/09	Date (mm/dd/yy) 10/07/09			
DAUN/CAHO5/TRRE3/TRLO	2	1-2	810	87	2
POPR/CAHO5/TRRE3	5	0.5-2	93	10	2
CALE8/JUBA	17	10-35	28	3	2

DAUN/CAHO5/TREE3/TRLO oatgrass/short sedge/clovers (dry adjacent to moist/wet plant communities)

POPR/CAHO5/TRRE3 bluegrass/short sedge/clover some oatgrass scattered irregularly (dry existed primarily on upper edge of meadow, not adjacent to other moist/wet plant communities)

CALE8/JUBA tall sedge/rushes (moist to wet)

- Conrad finger 2 receives high levels of use by elk during the spring and high levels of cattle grazing July-October. Portions of Conrad Finger 2 occurs on private land holdings.

Table 4 plant species code/scientific name/common name

<b>Plant Code</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Life Form</b>
CALE8	Lakeshore sedge	<i>Carex lenticularis</i>	Sedge
POPR	Kentucky bluegrass	<i>Poa pratensis</i>	Grass
DAUN	Onespike oatgrass	<i>Danthonia unispicata</i>	Grass
VECA2	False hellebore	<i>Veratrum californicum</i>	Forb
Salix spp	Willow	<i>Salix</i>	Shrub
JUBA	Baltic rush	<i>Juncus balticus</i>	Rush
CAHO5	Hood sedge	<i>Carex hoodii</i>	Sedge
TRRE3	White clover	<i>Trifolium repens</i>	Forb
TRLO	Longstalk clover	<i>Trifolium longipes</i>	Forb
POSE	Sandburg bluegrass	<i>Poa secunda</i>	Grass
POGR9	Slender cinquefoil	<i>Potentilla gracilis</i>	Forb
STOC	Western needlegrass	<i>Stipa occidentalis</i>	Grass

### Conclusion:

Mardon skippers are selecting for the dry, short grass communities in Minnie Meadows and Conrad Finger 2. Although there is no collected data in regards to adult Mardon skipper plant community preference in Conrad Meadows, anecdotal observations have been made which are similar to the findings at Minnie Meadows and Conrad Finger 2. Of the two short grass communities present at Minnie Meadows, Mardons showed a preference for POPR/CAHO5/TRRE3 plant community. However when this same plant community was located adjacent to DAUN/CAHO5/TRRE3/TRLO plant community such as in Conrad Finger 2, Mardon skippers selected for the DAUN/CAHO5/TRRE3/TRLO plant community over the

POPR/CAHO5/TRRE3 plant community (refer to Table 1 and 3). Overall it appears that the Mardon skipper has a high preference for the DAUN/CAHO5/TRRE3/TRLO plant community.

The need to further characterize Mardon skipper habitat at fine and large scales was identified for 2010 field season.

### **5) Documenting the Relationship of Grazing and Mardon Skippers**

Grass height was measured early June (just before flight period) and again in early October (after cattle were taken off the pastures) at Minnie Meadows, Conrad Meadows and Conrad Finger 2. The initial plan to monitor potential grazing impacts at the Pinegrass 1 site was abandoned due to the following: The initial purpose of the fence was to protect a population of Mardon skippers and not designed to monitor grazing impacts; The fence was difficult to maintain as elk and cattle broke the fence weekly; Pinegrass 1 site was also affected by a late frost resulting in a short flight period and low Mardon skipper numbers.

Monitoring potential grazing impact on Mardon skippers was primarily conducted at Minnie Meadows using the existing cattle and “total ungulate” exclosures. These exclosures were intact and were easy to maintain. The “total ungulate” and cattle exclosures are approximately 15 meters x 15 meters in size. During 2009 a buck and pole fence replaced a portion of the exterior wire fence that surrounds Minnie Meadows. The buck and pole fence will be completed during the 2010 field season. When completed the buck and pole fence will function as the wire fence did with less maintenance required. This fence will discourage cattle use, yet do little to discourage elk use of the meadow. This fence will also limit direct access by motorized vehicles.



The following table displays Mardon skipper numbers within and outside the exclosures within Minnie Meadows.

Table 5 Mardon Counts and plant height in Minnie Meadow

Area	Mardon Numbers <sup>2</sup> 7/1/09	% of adult Mardons	Area surveyed	Av grass/forb ht 6/9/09	Av grass/forb ht 10/07/09
w/in cattle exclosure <sup>1</sup>	24	39	15x15m <1/10 ac	5"	0.5-5"
w/in an total ungulate <sup>1</sup> exclosure	3	5	15x15m <1/10 ac	12"	24"
Outside exclosures within POPR/CAHO5/TRRE3 plant community	25	40	3.5 ac	5-12"	0.5-5"
Outside exclosures within STOC/POPR/POGR9 plant community	10	16	3.7 ac	5"	0.5-5"

<sup>1</sup>Cattle and total ungulate exclosures are located within POPR/CAHO5/TRRE3 plant community.

<sup>2</sup>A total of 62 Mardons were counted.

Table 6 Summary of Surveys at Minnie Meadows (2007 - 2009)

Survey Area within Minnie Meadows	Mardon Numbers/Percent 2007	Mardon Numbers/Percent 2008			Mardon Numbers/Percent 2009			Area surveyed	
		Date	6/20 after peak	6/24	6/30 peak	7/9	6/17 <sup>1</sup>		6/26 <sup>1</sup>
w/in cattle exclosure	Included in the <sup>2</sup> total	6/20 after peak	14/21	23/12	4/8	4/80	6/100	24/39	15x15m <1/10 ac
w/in "total ungulate exclosure	17/45	1/1	23/12	10/20	0	0	3/5	15x15m <1/10 ac	
meadow outside the two exclosures <sup>3</sup>	21 <sup>2</sup> /55	37/71	141/76	37/72	1/20	0	35/56	5 ac <sup>3</sup>	

<sup>1</sup>The visits on 6/17/09 and 6/26/09 were not conducted over the entire meadow; weather was cool, and a brief walk through the short grass communities was done to determine if adult Mardons were flying.

Mardon numbers in 2009 were down substantially from 2008, most likely due to a late frost.

<sup>2</sup>The 2007 visit did not separate the cattle exclosure from the rest of the Meadow surveyed, since the fence was broken down. Mardon skippers were at the end of their flight period based on wing wear.

<sup>3</sup>Within the short grass communities, approximately 5 acres of the 11 acre meadow were surveyed 2007 and 2008, in 2009 the entire 11 acres meadow was surveyed. Mardons were found only using the 5 ac area surveyed in 2007 & 2008

The following observations are based on three years (2007-2009) of Mardon surveys conducted at Minnie Meadows and are preliminary observations. During the beginning of the flight period, Mardon skippers appear to prefer the area within the cattle exclosure. After peak flight period, Mardons appear to show a preference for the "total ungulate" exclosure. During peak flight period, Mardons skippers are showing a preference for a particular plant community (POPR/CAHO5/TRRE3) rather than a level of grazing. The cattle exclosure and total ungulate

exclosures are located within the POPR/CAHO5/TRRE3 plant community. Refer to Appendix A, Photos 11, 12 for picture of Minnie Meadows 2009.

Refer to Appendix A, Photos 1-10 for picture of Conrad Meadows spring through fall of 2009.

### **Recommendations for 2010**

- 1) Monitor existing populations to determine size of populations, annual changes in numbers and timing of key life history activities. There will be no emphasis on finding new populations or extending the range. Incidental findings could occur and will be documented.
- 2) Monitor plant community preference by adult Mardon skippers at our large population sites: Minnie Meadows, Conrad Finger 2 and a subset of Conrad Meadows.
- 3) Begin designing site management plans; research what is available, look at examples; may contract this work or do in house
- 4) Begin to design a grazing study (pursue assistance from Forest Sciences Lab and the university to design a feasible grazing study). In the interim (2010) continue monitoring Mardon skipper populations within Minnie Meadows using the cattle and total ungulate exclosures.
- 5) Further describe (characterize) Mardon skipper habitat for all life stages on the Naches Ranger District. Characterize habitat in two ways:
  - Large-scale (Population site characterization)...in-depth vegetation and physical feature data collection within high density Mardon skipper sites.
  - Fine-scale (Oviposition site characterization)...in-depth vegetation and physical feature data collection in a small plot around oviposition sites.

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APPENDIX A

Table A.

Summary of all sites and areas surveyed on the Naches RD and adjacent area by USFS and WDFW personnel during the 2009 survey season. Datum NAD83, Zone 10T. Mardon skipper sites highlighted in blue indicate they were discovered in 2009.

Site Name	Date (mm/dd)	Elevation (feet)	UTM Easting	UTM Northing	Mardon Present	1 day count
<b>Rimrock Area</b>						
Bear Cove 1	05/22	2973			N	0
Bear Cove 1	05/27	2973			N	0
Bear Cove 1	06/01	2973			N	0
Bear Cove 1	06/17	2973			Y	19
Bear Cove 1	06/26	2973			Y	15
Bear Cove 1	06/30	2973			Y	5
Bear Cr 1	06/01	3275			N	0
Bear Cr 1	06/17	3275			Y	22
Bear Cr 1	06/26	3275			Y	16
Bear Cr 1	06/30	3275			Y	6
Rimrock 1	06/17	3318			Y	4
<b>SF Tieton Area</b>						
Bakeoven Flats 1	06/01	3350			N	0
Bakeoven Flats 1	06/17	3350			Y	59
Bakeoven Flats 1	06/26	3350			Y	35
Minnie Meadows	06/17	3500			Y	5
Minnie Meadows	06/26	3500			Y	6
Minnie Meadows	07/01	3500			Y	62
Main Conrad Mead 1	06/25	4074			Y	20+
Main Conrad Mead 1	07/02	4074			Y	1,195
Main Conrad Mead 1	07/09	4074			Y	10
Conrad Finger 2	07/02	4060			Y	931
1050 Upper Meadow	07/09	4100			Y	2
1050 Upper Meadow	07/13	4100			N	0
Conrad Donut Meadow	07/09	4100			Y	15+
1050 Lower Meadow	07/09	3920			N	0
1050 Meadow 2	07/13	4711			N	0
1050 Meadow 3	07/13	4652			N	0
1070 Meadow 1	07/17	5299			N	0
1070 Meadow 2	07/21	3971			N	0
Tenday Meadow 1	07/21	4774			N	0
Tenday Meadow 2	07/21	5019			N	0
1040-752 Meadow 1	07/22	3911			N	0
1040-763 Meadow 1	07/22	4935			N	0
1040-763 Meadow 2	07/22	4980			N	0
1040-763 Meadow 3	07/22	4688			N	0
1040 Meadow 1	07/22	4683			N	0
<b>Pinegrass Ridge Area</b>						
Pinegrass 1	06/26	4050			N	0
Pinegrass 1	07/01	4050			Y	20
767 Road	07/19	5060			Y	50
767 Road	07/22	5060			Y	10
767 N Road	07/22	5040			N	0
Pinegrass 1241	06/16	3915			Y	50-100
Pinegrass 1241	06/24,25	3915			Y	40
750 Road	07/01	4184			Y	19

Table B.

Summary of surveys at documented Mardon skipper sites. Sites highlighted in salmon are pre 1990; in pink indicates they were surveyed in 2006; purple highlights indicates they were surveyed in 2007; green highlights were surveyed 2008; and yellow highlights surveyed 2009

Site Name	Date (mm/dd/yyyy)	Elevation (feet)	Number of adults	Comments
<b>Pre 1990 South Cascades Yakima Co. (not on the NRD)*</b>			10	
Cascades 4 (USFS- GPNF)	06/25/1978	3600	10	
Cascades 4 (USFS- GPNF)	06/30/1978	3600	50+	
Cascades 4 (USFS- GPNF)	06/24/1984	3600	24	
Cascades 4 (USFS- GPNF)	07/05/1984	3600	9	
Cascades 8 (USFS- GPNF) status extirpated	07/11/1981	3500	3	
Cascades 8 (USFS- GPNF) status extirpated	06/24/1987	+5000	2	
Cascades 9 (Yakima Nation)	08/08/1955	NA**	2	
Cascades 10 (Yakima Nation)	07/23/1977	4650-4750	2	
<b>Rimrock Area</b>				
Bear Cove 1	05/16/2008	2973	0	
Bear Cove 1	06/16/2008	2973	10	near peak flight
Bear Cove 1	06/24/2008	2973	8	
Bear Cove 1	05/22/2009	2973	0	
Bear Cove 1	05/27/2009	2973	0	
Bear Cove 1	06/01/2009	2973	0	
Bear Cove 1	06/17/2009	2973	19	near peak flight
Bear Cove 1	06/26/2009	2973	15	
Bear Cove 1	06/30/2009	2973	5	
Bear Cr 1	06/08/2007	3275	6	Dr. James discovery
Bear Cr 1	05/16/2008	3275	0	
Bear Cr 1	06/16/2008	3275	15	early immergence
Bear Cr 1	06/24/2008	3275	13	
Bear Cr 1	07/01/2008	3275	15	
Bear Cr 1	06/01/2009	3275	0	
Bear Cr 1	06/17/2009	3275	22	near peak flight
Bear Cr 1	06/26/2009	3275	16	
Bear Cr 1	06/30/2009	3275	6	
Rimrock 1	06/26/2008	3318	12	
Rimrock 1	06/17/2009	3318	4	
<b>SF Tieton Area</b>				
Bakeoven Flats 1	06/17/2008	3350	7	
Bakeoven Flats 1	06/24/2008	3350	53	near peak flight
Bakeoven Flats 1	06/01/2009	3350	0	
Bakeoven Flats 1	06/17/2009	3350	59	Near peak flight
Bakeoven Flats 1	06/26/2009	3350	35	
Minnie Meadows	06/20/2007	3500	38	end of flight period
Minnie Meadows	06/17/2008	3500	0	
Minnie Meadows	06/24/2008	3500	52	
Minnie Meadows	06/30/2008	3500	187	near peak flight
Minnie Meadows	07/09/2008	3500	51	
Minnie Meadows	06/17/2009	3500	5	

Minnie Meadows	06/26/2009	3500	6	
Minnie Meadows	07/01/2009	3500	62	Near peak flight (pop influenced by June frost)
Site Name	Date (mm/dd/yyyy)	Elevation (feet)	Number of adults	Comments
Main Conrad Meadow 1	06/02/2007	4074	1	90°F for 4 days, then cooled for 2wks/B. Yake
Main Conrad Meadow 1	06/20/2007	4074	195+	Approaching peak, only 2 surveyors-surveyed a portion of meadow
Main Conrad Meadow 1	06/25/2008	4074	20	
Main Conrad Meadow 1	06/30/2008	4074	516	
Main Conrad Meadow 1	07/09/2008	4074	929	peak flight period
Main Conrad Meadow 1	06/25/2009	4074	20+	1 patch of oatgrass (not a complete survey)
Main Conrad Meadow 1	07/02/2009	4074	1,195	peak flight (cattle put out in pasture on this date as well)
Main Conrad Meadow 1	07/09/2009	4074	10	Too much wind and clouds...end of flight period (spot survey)
Conrad Finger 2	06/27/2007	4060	457	
Conrad Finger 2	07/10/2007	4060	3	end of flight period
Conrad Finger 2	06/25/2008	4060	45	
Conrad Finger 2	06/30/2008	4060	654	
Conrad Finger 2	07/09/2008	4060	911	peak flight period
Conrad Finger 2	07/16/2008	4060	201	
Conrad Finger 2	07/02/2009		931	peak flight period
Conrad 3	06/27/2007	4138	4	
Conrad 6	06/27/2007	4147	24	males/females
Surprise Lk 1	07/07/2007	4181	25	
Surprise Lk 8	07/10/2007	5237	2	
Surprise Lk 9	07/10/2007	5048	153	
Surprise Lk 10	07/10/2007	5001	8	
Surprise Lk 11	07/10/2007	5069	16	
Trail 1131-Scesion 28A	07/10/2008	4365	25	
Trail 1131-Scesion 29A	07/10/2008	4390	7	
Trail 1131-Scesion 29B	07/10/2008	4503	1	
Trail 1131-Palmer Meadow	07/10/2008	4321	176	
1050 Upper Meadow	07/09/2009	4100	2	end of flight
1050 Upper Meadow	07/13/2009	4100	0	
Conrad Donut Meadow	07/09/2009	4100	15+	end of flight
<b>Pinegrass Ridge Area</b>				
Pinegrass 1	07/05/2007	4050	10+	didn't survey entire area
Pinegrass 1	07/06/2007	4050	32	
Pinegrass 1	05/19/2008	4050	0	

Pinegrass 1	07/01/2008	4050	27	
Pinegrass 1	07/11/2008	4050	34	near peak flight
Pinegrass 1	06/26/2009	4050	0	
Pinegrass 1	07/01/2009	4050	20	Pop affected by June frost
Pinegrass zero	06/24/2008	3660	7	
Pinegrass zero	07/03/2008	3660	1	
Site Name	Date (mm/dd/yyyy)	Elevation (feet)	Number of adults	Comments
Pinegrass 1.5	07/10/2008	4270	6	
Pinegrass 2	07/05,06/2007	4300	3/2	
Pinegrass 2	07/03/2008	4300	0	
Pinegrass 2	07/10/2008	4300	1	
Site Name	Date (mm/dd/yyyy)	Elevation (feet)	Number of adults	Comments
Pinegrass Pit	07/03/2008	3840	13	
Pinegrass Pit W	07/03/2008	3784	5	
677 Road	07/11/2008	3950	1	
Pinegrass 1241	07/03/2008	3915	35	end of flight period
Pinegrass 1241	06/16/2009	3915	50-100	D.James visit, newly emerged
Pinegrass 1241	06/25,26/2009	3915	40	Fresh, breeding activity
767 Road	07/19/2006	5060	1+	Dr James 1 <sup>st</sup> site on NRD
767 Road	07/21/2006	5060	15	end of flight period
767 Road	07/29/2006	5060	0	
767 Road	07/11/2008	5060	3	
767 Road	07/17/2008	5060	22	
767 Road	07/19/2009	5060	50	D.James visit, bit past prime
767 Road	07/22/2009	5060	10	
767 N Road	07/17/2008	5040	6	
767 N Road	07/22/2009	5040	0	Most likely too late
1204-757A	07/17/2008	5055	3	
1204-757B	07/17/2008	5055	2	
1205A	07/17/2008	4880	2	
1205B	07/17/2008	4855	3	
750 Road	07/01/2009	4184	19	

\*Pre 1990 data is from the Washington State's Mardon Skipper Status Report (Potter et al 1999).

\*\*NA= information not available

Photo 1. Conrad Meadows June 25, 2009 (CALE8/JUBA plant community)



Photo 2. Conrad Meadow July 24, 2009 (CALE8/JUBA plant community)



Photo 3. Conrad Meadow September 25, 2009 (DAUN/CAHO5/TRRE3/TRLO left and CALE8/JUBA right)



Photo 4. Cattle turned out in the Conrad Meadows area 7/2/2009-10/7/2009

Photo 5. DAUN/CAHO5/TRRE3/TRLO plant community Conrad Meadows



7/24/09



Photo 6.

10/07/09

DAUN/CAHO5/TRRE3/TRLO plant community Conrad Meadows



Photo 7. Small enclosure (4'x4'x2') 6/25/09  
7/24/09



Photo 8. Small enclosure (4'x4'x2') 7/24/09



Photo 9 & 10. Small enclosure (4'x4'x2') at Conrad Meadows 10/07/09

FIGURE 1. Small portion of Conrad Meadows surveyed in 2008 and 2009

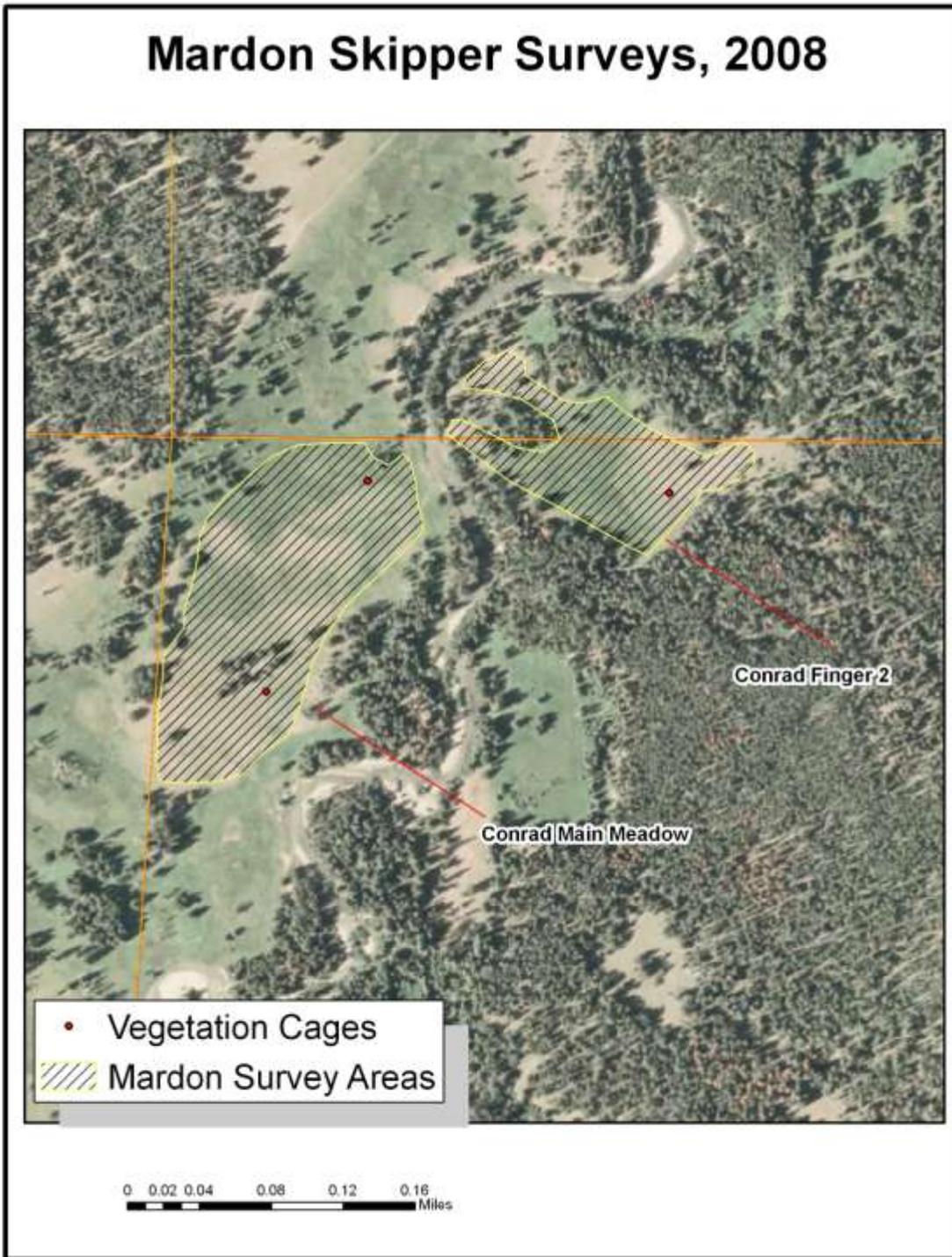




Figure 3. Mardon Skippers Survey Sites 2009

