

**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 2010**

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Mardon skippers (*Polities mardon mardon*). Photo by Joan St.Hilaire, USFS

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 on 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 observers 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 than 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.

2010 Objectives

The objectives of the 2010 Mardon skipper surveys were:

1. Monitor existing populations to determine size of populations, annual changes in numbers and timing of key life history activities. Document new sites.
2. Determine plant community preference by Mardon skippers. Record numbers of adult Mardon skippers during peak flight period within all plant communities delineated within Minnie and Conrad meadows (survey the entire Minnie Meadows as well as a subset of Conrad).
3. Begin designing site management plans; research what is available, look at examples; may contract this work or do in-house

This report provides a summary of each site visited on the Naches Ranger District during the 2010 field season, findings, and recommendations for 2011 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 Mardon skipper sites that had surveys completed during 2010. Population surveys focused mainly on the large population sites such as Minnie Meadows and Conrad Meadow complexes. Other sites were surveyed multiple times opportunistically. One complete survey visit occurred in Main Conrad Meadows and Conrad Finger 2 due to unfavorable weather conditions. The complete survey visit to these sites took place on July 15, 2010. cursory visits occurred to determine the beginning of the flight period.

The area that was surveyed in 2010 was not the same area that was surveyed during 2008 and 2009 for Conrad Meadows and Conrad Finger 2. A subset of each plant community was surveyed throughout each meadow. The 2009 and 2010 surveys 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).

o Trends in Peak Number

Mardon skipper counts in 2010 were similar to 2009 in the lower elevation sites. At mid elevation sites, numbers were lower than previous years. This was most likely due to cooler temperatures and overcast conditions that occurred mid June to mid July.

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

The following general observations were made in regards to the four seasons of Mardon surveys completed on the Naches Ranger District: In lower 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). In 2010, the flight period at mid elevation sites, was later than the previous 3 years June 15 through July 17th. This was most likely due to the cooler temperatures that extended from mid June to mid July. Potter et al. (2002) noted that weather can influence emergence and flight period duration.

2) Documentation of New Mardon Skipper Sites

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

One new Mardon skipper site was documented on the NRD during the 2010 survey season. This new occurrence was found within the known range. 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 Map 2 in Appendix A. New search areas were determined from viewing potential habitat interpreted off of aerial photos.

○ **Summary of New Sites Found in 2010**

We searched 4 new meadows and found 1 new Mardon skipper site. A list of all sites, their locations and whether or not Mardon skippers were found is included in Appendix A, and a description of the new Mardon skipper site is described below.

○ **New Sites Discovered**

1070 Meadow 2

Jeff Bernatowicz, Joan St.Hilaire, Doug Archer, and Annette Heinen discovered Mardon skippers at this site on July 15, 2010. We observed 20 Mardon skippers in a small, approximately 2 acre meadow. All Mardon skippers had a lot of wing wear; indicating the end of the flight period. This site is a meadow adjacent to the South Fork Tieton River, approximately 3950 feet elevation and 1 mile east of Conrad Meadows. A well-used horse trail runs through the middle. Meadow was fairly dry at the time of visit. Temperature was 80°, with no wind and no clouds. Meadow has been degraded by the presence of invasive plants and high levels of grazing by domestic and wild ungulates.

3) Plant Community Preference by adult Mardon Skippers (Habitat Characterization)

Plant communities in Minnie Meadows, Conrad Meadows and Conrad Finger 2 were delineated June 2009. Plant community preference by adult Mardon skippers was recorded at Minnie Meadows, Conrad Meadows and Conrad Finger 2 during the 2010 survey season. GPS coordinates were recorded for individual and groups of Mardon skippers in Minnie Meadows. In Conrad Finger 2 and main Conrad Meadows, Mardons were counted along ten foot wide transects that were arbitrarily placed to represent all plant community types present in both meadows.

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

Plant Community ¹	Av ht (inches)		Number of Adult Mardons (mm/dd/yy) 06/28/10	% of Mardons using plant community	Acres of plant community surveyed
	Date (mm/dd/yy) 7/09/10	Date (mm/dd/yy) 08/26/10			
ACOCO/CAHO5	1-12	1-6	10	38	3.7
POPR/CAHO5/TRRE3	1-5	1-12	16	62	3.5
CALE8/TRRE3	24	15-24	0	0	3.5
JUBA/CALE8	24-32	24-36	0	0	0.4

¹ for plant species code/scientific name/common name refer to Table 5

ACOCO/CAHO5 needlegrass/short sedge (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)

- Minnie is fenced, receiving regular elk use spring through fall. Cattle grazing is infrequent July & August
- All exclosures occur in the POPR/CAHO5/TRRE3 plant community
- Plant height within cattle exclosure 0.5-5” on 8/26/10
- Plant height within “total ungulate” exclosure 9-14” on 8/26/10
- Plant height within small exclosure (4’x4’x2’) in the POPR plant community 24” on 8/26/10

Table 2. Plant communities, vegetation height and Mardon skipper counts at Conrad Meadows

Plant Community ¹	Av ht (inches)		Numbers of adult Mardons (mm/dd) 07/15/10	% of Mardons Counted 7/15/10	Acres of plant community surveyed 7/15/10
	Date (mm/dd/yy) 07/09/10	Date (mm/dd/yy) 08/26/10			
DAUN/CAHO5/TRRE3/TRLO	3-10	0.5-3	65	44	1.1
POPR/CAHO5/TRRE3	1-14	1-3	80	54	2
CALE8/JUBA	12-24	1-3	3	2	2.2
CALE8/Salix spp.	12-36	4-20	1	<1	0.6
CALE8/VECA2	2-24	24-60	0	0	0.9

¹for plant species code/scientific name/common name refer to Table 5

DAUN/CAHO5/TRRE3/TRLO oatgrass/short sedge/clovers (dry adjacent to moist/wet plant communities)

POPR/CAHO5/TRRE3 bluegrass/short sedge/clover; some oatgrass scattered irregularly through portions of this community

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)

- The dense patches of oatgrass most likely provide protection to over wintering larvae or pupae. Clover is located throughout the oatgrass and bluegrass communities and serves as the primary nectar source. Cinquefoil (*Potentilla sp.*) is located within CAHO5/JUBA plant community and used occasionally as a nectar source by Mardon skippers. Oviposition has been observed on onespoke oatgrass and Kentucky bluegrass (Erica Henry, personal communication).
- Conrad receives moderate 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 07/15/10	% of Mardons Counted	Acres of plant community surveyed
	Date (mm/dd/yy) 07/09/10	Date (mm/dd/yy) 08/26/10			
DAUN/CAHO5/TRRE3/TRLO	3-10	0.5-3	9	7	0.51
POPR/CAHO5/TRRE3	1-14	1-3	107	86	0.30
CALE8/JUBA	12-24	1-3	9	7	0.69

¹for plant species code/scientific name/common name refer to Table 5

DAUN/CAHO5/TRRE3/TRLO oatgrass/short sedge/clovers (dry adjacent to moist/wet plant communities)

POPR/CAHO5/TRRE3 bluegrass/short sedge/clover with some oatgrass scattered irregularly through portions of this community (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. Estimated Mardon skipper numbers for Conrad Meadows.

Plant Community ¹	Acres within Conrad Meadows	% plant com within meadow	% of plant community surveyed 07/15/10	Mardons/Ac recorded 07/15/10	Estimated Mardon skipper numbers entire meadow ²
DAUN/CAHO5/TRRE3/TRLO	7	8	16	59	414
POPR/CAHO5/TRRE3	27	29	7	40	1080
CALE8/JUBA	43	47	5	1.5	65
CALE8/Salix spp.	11.5	12	5	2	23
CALE8/VECA2	4	4	23	0	0
TOTAL Meadow	92	100			1582

¹for plant species code/scientific name/common name refer to Table 5

² Approximately 1,582 adult Mardons were estimated for the entire meadow based on numbers of Mardon skippers recorded/ac by plant community and total acres of each plant community within the meadow.

Table 5. Plant species code, scientific name and common names for plant communities in Conrad and Minnie Meadows and Conrad Finger 2.

Plant Code	Common Name	Scientific Name	Life Form
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
ACOCO	Western needlegrass	<i>Achnatherum (stipa) occidentale</i>	Grass

Refer to Appendix A, Figures 1-4 for picture of some of the plant communities present in Conrad Meadows spring through fall of 2009.

Conclusion of Plant Community Preference:

Mardon skippers are selecting for the dry, short grass communities in Minnie Meadows, Conrad Meadows and Conrad Finger 2. Patches of *Danthonia* are scattered throughout the *Poa* plant community in Conrad Meadows and Conrad Finger 2. This mosaic pattern makes it difficult to determine if Mardons are selecting for one short grass community over another. They most likely prefer the combination of both. The high concentrations of Mardon skippers in Conrad Meadows and Conrad Finger 2 in comparison to Minnie Meadows, leads us to believe that *Danthonia* is an important grass species for the Mardon skipper. One thought is the dense *Danthonia* layer provides higher survival rates for overwintering Mardons. Refer to Appendix A, Figures 1-4 for picture of plant communities at Conrad Meadows spring through fall of 2009.

4) Documenting the Relationship of Grazing and Mardon Skippers

Grass height was measured early July (prior to cattle turn-out) and again in late August (after cattle were taken off the pasture at Minnie Meadows but still on the pasture at 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; and the fence was difficult to maintain as elk and cattle broke the fence weekly. During the 2010 survey season the area inside the enclosure was wet. Over 90% of the adult mardons were seen using a dry fescue patch outside the enclosure. This fence was removed fall 2010.

Monitoring potential grazing impact on Mardon skippers was primarily conducted at Minnie Meadows using the existing cattle and “total ungulate” enclosures. These enclosures were intact and were easy to maintain. The total ungulate and cattle enclosures are each 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 was extended around the meadow but was not completed in 2010. 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.



Figure 1. Buck and pole fence around Minnie Meadows exterior. Photo by Carla Jaeger 7/2010

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

Table 6. Mardon Counts and plant height in Minnie Meadow

Area	Mardon Numbers ² 6/28/10	% of adult Mardons	Area surveyed	Av grass/forb ht 7/9/10	Av grass/forb ht 8/26/10
w/in cattle exclosure ¹ POPR/CAHO5/TRRE3	10	38	15x15m <1/10 ac	1-5"	9"
w/in total ungulate ¹ exclosure POPR/CAHO5/TRRE3	0	0	15x15m <1/10 ac	12"	14"
Outside exclosures within POPR/CAHO5/TRRE3 plant community	6	24	3.5 ac	1-5"	1-12"
Outside exclosures within STOC/POPR/POGR9 plant community	10	38	3.7 ac	1-12"	1-6"

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

²A total of 26 Mardons were counted.

Table 7. Summary of Surveys at Minnie Meadows (2007 - 2010)

Survey Area within Minnie Meadows	Mardon Numbers/ Percent 6/20/2007 After peak	Mardon Numbers/ Percent 6/30/2008 peak	Mardon Numbers/ Percent 7/1/2009 peak	Mardon Numbers/ Percent 6/28/2010 peak	Area surveyed
w/in cattle enclosure	Included in the total ¹	23/12	24/39	10/38	15x15m <1/10 ac
w/in "total ungulate enclosure	17/45	23/12	3/5	0	15x15m <1/10 ac
meadow outside the two enclosures ²	21 ² /55	141/76	35/56	16/62	5 ac ³

¹The 2007 visit did not separate the cattle enclosure from the rest of the Meadow surveyed, since the fence for the cattle enclosure was broken down. Mardon skippers were at the end of their flight period based on wing wear.

²Within the short grass communities, approximately 5 acres of the 11 acre meadow were surveyed 2007 and 2008, in 2009 & 2010 the entire 11 acres meadow was surveyed. Mardons were found only using the 5 ac area surveyed in 2007 & 2008

Conclusion of Relationship of Grazing and Mardon Skippers:

The following observations were based on four seasons (2007-2010) of Mardon surveys conducted at Minnie Meadows. Adult Mardon skippers were first observed during early flight period, within the cattle enclosure. During peak flight period, Mardons skippers showed a preference for POPR/CAHO5/TRRE3 plant community primarily outside of the total ungulate enclosure. Mardon skipper numbers have continued to decrease during the three years of survey efforts; from 187 in 2008, 62 in 2009 to 26 in 2010. Some of the factors that could be affecting adult Mardon skipper counts are: Cooler weather conditions -overcast conditions during late June, early July and wetter springs; and ungulate use change -while elk use has remained the same, cattle use of Minnie Meadows has reduced. Cattle use has reduced as a result of increased efforts at keeping cattle out of meadow and the type of exterior fencing has changed from wire to a more reliable buck and pole fence. No substantial conclusions can be made regarding the relationship of ungulate grazing and Mardon skippers at this time due to the short collection period (4 seasons), and the many variables encountered: Change in domestic grazing management (turn-out and take-off dates are 2 weeks earlier); change in fencing around the meadow; and unusual weather conditions during flight periods.

Recommendations for 2011

- 1) Begin designing site management plans; research what is available, look at examples; may contract this work or do in house
- 2) 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 enclosures.
- 3) Monitor existing populations at Conrad Finger 2 (early July, prior to cattle turnout) to determine size of population, annual changes in numbers and timing of key life history activities.

LITERATURE CITED

Jepsen S., L. Lauvray and SH Black. 2007. Report of the U.S. Forest Service, Xerces Society Surveys for *Polites mardon mardon* in the Naches Ranger District of Washington (Summer 2008). The Xerces Society for Invertebrate Conservation, Portland, OR. 56pp.

Jepsen S., L. Lauvray and SH Black. 2008. Report of the U.S. Forest Service, Xerces Society Surveys for *Polites mardon mardon* in the Naches Ranger District (Wenatchee National Forest) of Washington (Summer 2008). The Xerces Society for Invertebrate Conservation, Portland, OR. 15pp.

Potter, A., J. Fleckenstein, S. Richardson and D. Hays. 1999. Washington States Status Report for the Mardon Skipper. WDFW, Olympia, WA.

Potter, A., J. Fleckenstein, and J. Feen. 2002. Mardon Skipper Range and Distribution in Washington in Relation to State and Federal Highways with a Habitat Description and Survey Method Guidelines, a report to the Washington Department of Transportation.

Moen, S. W. and G.B. McLucas. 1981. Report of Investigations 24: Mount St. Helens Ash- Some Properties and Possible Uses. Washington Department of Natural Resources, Geology and Earth Resources Division. WA. 3pp.

St.Hilaire, J. J. Bernatowicz and W. Moore. Naches Ranger District Mardon Skipper (*Polites mardon*) Surveys 2007. Naches Ranger District files. Naches, WA

USDA Forest Service and USDI Bureau of Land Management. 2007a. Survey Protocol for the Mardon Skipper (*Polities mardon*) version 1.1. Portland OR. 30pp.

USDA Forest Service and USDI Bureau of Land Management. 2007b. Conservation Assessment for the Mardon Skipper (*Polities mardon*) version 1.0. K. E. Anthony and R. Huff. Portland OR. 42pp.

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 2010 survey season. Mardon skipper sites highlighted in blue indicate they were discovered in 2010.

Site Name	Date (mm/dd)	Elevation (feet)	Mardon Present	1 day count
Rimrock Area				
Bear Cove 1	6/22	2973	Y	10
Bear Cove 1	6/28	2973	Y	19
Bear Cr 1	6/22	3275	Y	7
Bear Cr 1	6/28	3275	Y	28
SF Tieton Area				
Bakeoven Flats 1	6/22	3350	Y	1
Bakeoven Flats 1	6/25	3350	Y	9
Bakeoven Flats 1	7/7	3350	Y	3
Minnie Meadows	6/25	3500	Y	5
Minnie Meadows	6/28	3500	Y	26
Minnie Meadows	7/7	3500	Y	14
Main Conrad Mead 1	6/28	4074	Y	30
Main Conrad Mead 1	7/7	4074	Y	50
Main Conrad Mead 1	7/15	4074	Y	149/1582 ¹
Conrad Finger 2	7/15	4060	Y	
1070 meadow 2	7/15	3966	Y	20
1050 Meadow 4	7/21	4092	N	0
1050 Meadow 5	7/21	4119	N	0
1050 Meadow 6	7/21	4243	N	0
Pinegrass Ridge Area				
Pinegrass 1	6/28	4050	Y	41
Pinegrass 1241	6/25	3915	Y	50
Pinegrass 1241	6/28	3915	Y	93
767 Road	7/27	4148	Y	9

¹A total of 149 Mardons were recorded for Main Conrad Meadows on 7/15/10. This was not the same area surveyed in previous years. Transects were placed arbitrarily in each plant community. Approximately 1,582 adult Mardons were estimated for the entire meadow based on numbers of Mardon skippers recorded/ac by plant community and total acres of each plant community.

Table B.

Summary of surveys at documented Mardon skipper sites. Sites highlighted in salmon are pre-1990; in dark pink indicates they were surveyed in 2006; purple highlights indicates they were surveyed in 2007; green highlights were surveyed 2008; yellow highlights surveyed 2009, and dark pink 2010

Site Name	Date (mm/dd/yyyy)	Elevation (feet)	Number of adults	Comments
Pre 1990 South Cascades Yakima Co. (not on the NRD)*			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	

Site Name	Date (mm/dd/yyyy)	Elevation (feet)	Number of adults	Comments
Rimrock Area				
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 Cove 1	06/22/2010	2973	10	
Bear Cove 1	06/28/2010	2973	19	near peak flight
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	
Bear Cr 1	06/22/2010	3275	7	
Bear Cr 1	06/28/2010	3275	28	near peak flight
Rimrock 1	06/26/2008	3318	12	
Rimrock 1	06/17/2009	3318	4	
SF Tieton Area				
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	
Bakeoven Flats 1	06/22/2010	3350	1	
Bakeoven Flats 1	06/25/2010	3350	9	
Bakeoven Flats 1	07/07/2010	3350	3	
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)
Minnie Meadows	06/25/2010	3500	5	
Minnie Meadows	06/28/2010	3500	26	near peak flight
Minnie Meadows	07/07/2010	3500	14	

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)
Main Conrad Meadow 1	06/28/2010	4074	30	
Main Conrad Meadow 1	07/07/2010	4074	50	
Main Conrad Meadow 1	07/15/2010	4074	149 ¹	end of flight
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	4060	931	peak flight period
Conrad Finger 2	07/15/2010	4060	124 ¹	end of flight
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-Scicion 28A	07/10/2008	4365	25	
Trail 1131-Scicion 29A	07/10/2008	4390	7	
Trail 1131-Scicion 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
1070 Meadow 2	06/21/2010	3966	20	end of flight
Pinegrass Ridge Area				
Pinegrass 1	07/05/2007	4050	10+	didn't survey entire area
Pinegrass 1	07/06/2007	4050	32	

Site Name	Date (mm/dd/yyyy)	Elevation (feet)	Number of adults	Comments
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 1	06/21/2010	4050	41	near peak flight
Pinegrass zero	06/24/2008	3660	7	
Pinegrass zero	07/03/2008	3660	1	
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
Pinegrass 1241	06/25/2010	3915	50	
Pinegrass 1241	06/28/2010	3915	93	near peak flight
767 Road	07/19/2006	5060	1+	Dr James 1 st 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 Road	07/27/2010	5060	9	
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

¹Area surveyed 2010 for Conrad Finger 2 and Main Conrad Meadow is not the same area surveyed as in previous years (only a subset of each plant community was surveyed). Approximately 1,582 adult Mardons were estimated for the entire meadow based on numbers of Mardon skippers recorded/ac by plant community and total acres of each plant community.



Figure 1. CALE8/JUBA plant community in Conrad Meadows 6/25/09. Photo by Carla Jaeger



Figure 2. CALE8/JUBA plant community in Conrad Meadows 7/24/09. Photo by Carla Jaeger

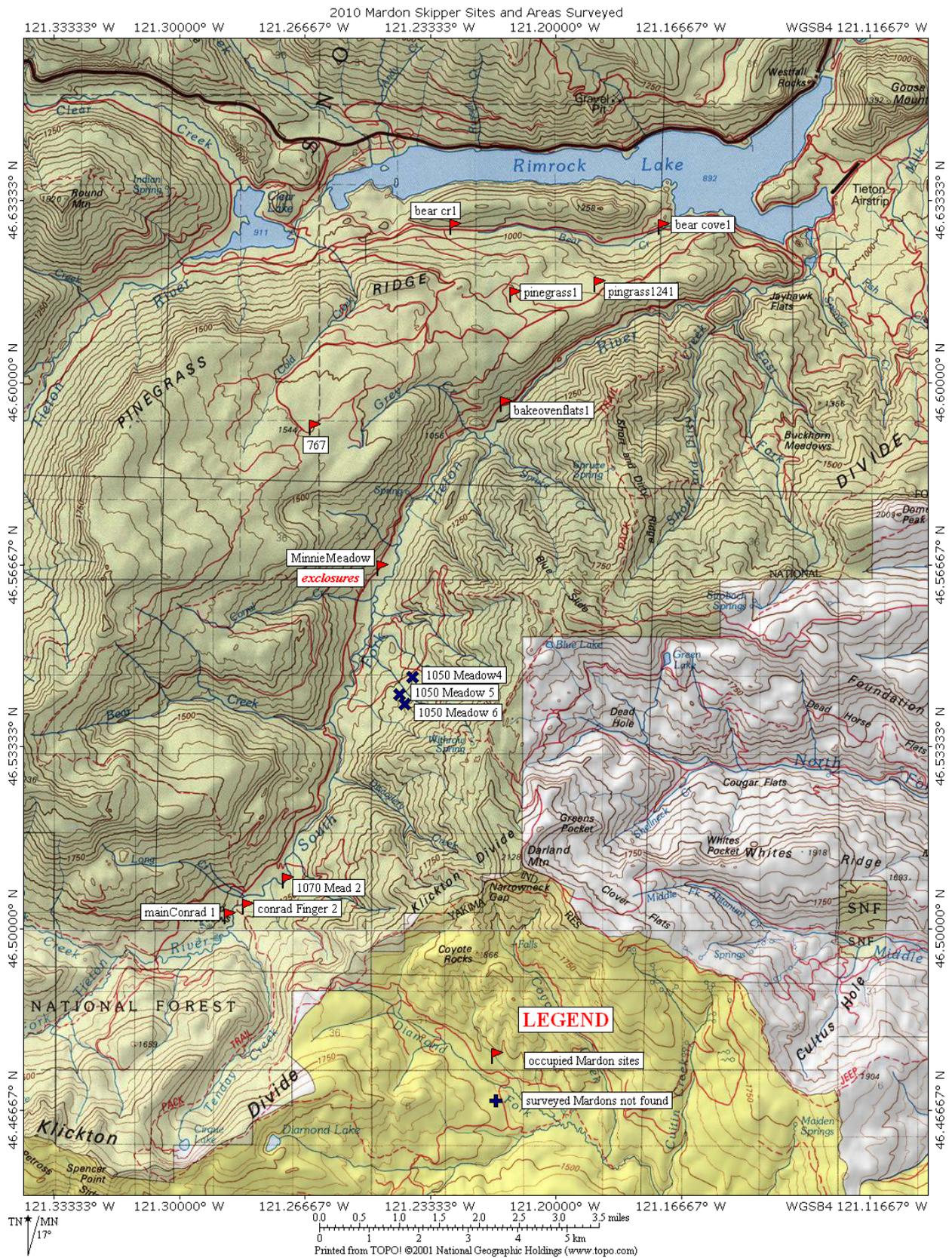


Figure 3. DAUN/CAHO5/TRRE3/TRLO plant community, Conrad Meadows 7/24/09.
Photo by Carla Jaeger



Figure 4. DAUN/CAHO5/TRRE3/TRLO plant community, Conrad Meadows 10/07/09.
Photo by Carla Jaeger

Map 1. Mardon skipper sites & areas surveyed during 2010



Map 2. Mardon skipper sites on the Naches Ranger District

