

**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 2008**



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## **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 also a Region 6 Forest Sensitive species.

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.

Livestock grazing is one of the 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 in 2007

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 enclosure lacked flowering plants and was heavily grazed.
- 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 exclosures were built around Pinegrass 1 and Pinegrass 2 Mardon skipper sites. An existing, but nonfunctioning, cattle and elk exclosure was repaired in Minnie Meadows during 2008, prior to the cattle turn out dates.

## **2008 Objectives**

The objectives of the 2008 Mardon skipper surveys were:

- 1) Document population numbers over time.
- 2) Document the range of Mardon skippers on NRD.
- 3) Document new colonies.
- 4) Investigate the relationship of grazing and Mardon skippers.

This report provides a summary of each site visited on the Naches Ranger District during the 2008 field season, findings and recommendations for 2009 survey season.

## **Methods**

Surveys were conducted according to the Survey Protocol for the Mardon skipper, Version 1.1 (USDA Forest Service 2007a). Sites that were visited by Joan St.Hilaire and/or Jeff (“Bernie”) Bernatowicz are detailed in this report. Visits conducted by Xerces staff are recorded in a separate report (Jepsen et al. 2008), however, results are also discussed in this report. Therefore, there are some overlaps between this report and Xerces report.

## **Monitoring Existing Sites**

### **o Adult Populations Numbers Over Time**

Appendix A, Table A lists all surveys in 2008. Population surveys focused mainly on the Minnie Meadows and Conrad complexes. Other sites were surveyed multiple times opportunistically. There was an obvious start, peak, and decline in adult population counts over 3-4 weeks in the larger populations of Minnie and Conrad Meadows. Minnie Meadows and Conrad peaked about June 30 (187) and July 9 (1840). The Conrad counts were only on the USFS portion of the meadow (Figure 1). Over 50% of the meadow is private and was not surveyed. Both populations declined about 75% 7-9 days later. Given the rapid changes in weekly counts, it is unlikely Minnie meadows/Conrad counts were at exact peaks. Individuals that were present in early surveys were probably gone in later surveys. There is also some difficulty in counting large numbers of Mardons. It should be noted that the later counts in Minnie and Conrad include some Sonora skippers (*Polities Sonora*). The percentage based on sampling was probably <10% Sonora in the total count. Given all the potential biases, it is difficult to estimate an exact population. A rough estimate would place the actual 2008 population in Conrad at about 4000-5000 individuals.

Smaller populations like Bear Creek 1 and Pinegrass 1 appeared to stay relatively stable over a 2-3 week period. Limited data for upper elevations (767 Road) indicate a possible bi-module population or very extended flight period.

- **Mardon Skipper Flight Period**

In 2008, adult Mardon Skippers were first observed June 16<sup>th</sup> at 2970' to 3275' elevation (Appendix A, Tables A & B). Adult Mardons were not seen at 3500' elevation (Minnie Meadows) on June 17<sup>th</sup>, but were fairly numerous at this site on June 24<sup>th</sup>. Although adult Mardon skippers could be observed at Bear Creek 1 (3275'), Minnie Meadows (3500'), Pinegrass 1 (4050') and Conrad finger 2 (4060') during the same time period (late June, early July); the emergent date and peak flight period varied by elevation (Table 5). While Mardon numbers didn't dramatically change between the first and second visits at Bear Creek 1 and Pinegrass 1, their wing wear did. The later visit had butterflies with more wing wear than the first visit at these two sites. The upper elevations of Pinegrass (~5000') were somewhat different. The first visit to the 767 Road site (Dr James' first site) on July 11, 2008 found few Mardon skippers all with heavy wing wear. The second survey to this site on July 17<sup>th</sup> found Mardons fairly numerous with mixed days of emergence based on wing wear. Surveys of other high elevation, Pinegrass Ridge sites on July 17<sup>th</sup>, also found individuals, with a variety of wing wear and both sexes present. During 2008, adult Mardon skipper numbers probably peaked around June 16 at 2973', June 24<sup>th</sup> at 3350', June 30<sup>th</sup> at 3500', July 9-11<sup>th</sup> at 4060'. It is likely that the flight period on upper Pinegrass Ridge (above 5000') extended until at least July 24<sup>th</sup>, if not early August (Table 5).

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).

- **Weather Influences (predicting timing of surveys)**

Our finding concerning the life history of Mardon skippers on the NRD concur with the conservation assessment (USDA Forest Service 2007b). We found weather to be a significant factor influencing the timing of Mardon's emergence. In 2007, temperatures briefly warmed to 80<sup>o</sup>-90<sup>o</sup>f from June 1-5, corresponding with a June 2<sup>nd</sup> observation in Conrad Meadows at 4000 feet (Appendix, Table B). In 2007, temperatures then cooled until hot weather returned June 20<sup>th</sup>. Temperatures remained warm for the majority of the 2007 season. Spring-summer 2007 was also the driest on record. The dry conditions combined with hot weather in early June and early July probably shortened the vegetation growing season and Mardon flight period.

Spring 2008 was the inverse of 2007 (Table 1). Spring 2008 was very cold through early June. On June 11<sup>th</sup> and 12<sup>th</sup>, 2008 the high temperatures at Green Lake and White Pass East were 39<sup>o</sup>-42<sup>o</sup> F. Temperatures finally started to warm on June 13<sup>th</sup>. Based on temperature, it is unlikely that the flight period began much before the first observations on June 16<sup>th</sup>. Temperatures then stayed warm the remainder of the month, but never got as hot as 2007, even in July. Soils remained moist for much of the year, probably extending the growing/Mardon flight season in 2008.

**Table 1:** Average Maximum Temperatures (Degrees F) 2007 and 2008

Site	Elevation	June 1-15, 2007	June 1-15, 2008	June 16-30, 2007	June 16-30, 2008	July 1-15, 2007	July 1-15, 2008
Yakima Airport	1120	78	72	79	79	95	90
White Pass East	4500	58	47	58	65	75	71
Green Lake	6000	58	49	58	63	74	68
Average	3873	65	56	65	69	81	76

Historic weather records show wide variations in June temperatures. About once every 4-5 years, June temperatures remain warm enough for Mardon flight activity in early June. Once every 3-4 years, temperatures during the first 2 weeks of June remain cold enough to preclude any significant Mardon flight. The more normal pattern is a few days of hot weather, followed by cooling in early June. The periods of warmer weather typically get longer as June progresses. Based on weather records and observations, surveys should probably be planned to start about June 12-15 at the lower elevations. However, it is possible for warm weather to arrive June 1<sup>st</sup> and stay for 2 weeks. The observation of Mardon's starting to fly at 4000 feet on June 2, 2007, after just a few days of hot weather, indicates that an early flight period is possible, especially at lower elevations. At elevations above 4500 feet, it maybe normal to have a brief early flight in mid-late June, then a larger Mardon hatch in July.

### **Documentation of the Mardon Skipper Range on the Naches Ranger District**

#### **o Summary of Search for New Sites Outside of the Known Range**

Although numerous areas were surveyed north and east of the known range, there were no new Mardon skipper sites discovered outside the range established during 2007 survey season. The site documented north of Rimrock Lake in 2007 was later determined to be an aberrant Sonora skipper (*Polities Sonora*). In 2008, the areas searched outside the known range included Spencer Cr, Sleepy Park, Wildcat, Tieton Basin, Timber Wolf Mtn, Three Cr, L. Rattlesnake, Milk Cr, Pleasant Valley and Little Naches (Appendix, Table A). The timing of these area searches coincided with the Mardon skipper flight periods at comparable elevations on the NRD. Survey timing and intensity should have documented Mardons if they were present. The present northern range of the Mardon skipper is FS RD 1200, south of Rimrock Lake. Appendix, Table A is a list of effort during protocol survey conditions. Other sites/dates were surveyed when temperatures and/or winds were outside of protocol conditions. These sites were not listed in Appendix A. All surveys focused mainly on sites visible from road systems.

#### **o Summary of Search for New Sites Within the Known Range**

An additional 18 new Mardon skipper sites were documented on the NRD. This includes the 5 new sites documented by Xerces staff (Jepsen et al. 2008). All new occurrences were found either in the Rimrock, South Fork Tieton, or Pinegrass Ridge areas. Again

surveys efforts were focused primarily on sites visible from road systems. Aerial photos (figures 2-4) indicate substantial potential habitat that was not surveyed.

In 1934, Pinegrass Ridge area was probably heavily timbered (Figure 5). Large scale clear-cut logging occurred on Pinegrass Ridge during the 1960s through the 1980s due to a white pine bark beetle outbreak. These large openings created connected habitat for the Mardon skipper. There were either populations in existing meadows or Mardons colonized from mega populations in the Conrad/Minnie Meadow complexes. Cold air pockets and cattle grazing have temporarily slowed down the conifer regeneration process for the past 20 years. Conifer encroachment is now proceeding rapidly and is the greatest threat to Mardon skipper habitat on Pinegrass Ridge.

In reviewing the broad historic picture, the eruption of Mt. St. Helens on May 18, 1980 should not be ignored. The NRD was covered with 2-3" of ash (Moen and McLucas, 1981). The ash stayed fluffy in Conrad meadows through the flight period in 1980 and impacted growth of grasses and flowering plants. The ash probably drifted around, leaving some areas within the Mardon range exposed. Some colonies may have been extirpated by the ash and lack of plant growth. If not for the logging, it is doubtful Mardon skippers would be as widely distributed on Pinegrass ridge as they were in 2008.

### **Documentation of New Colonies**

#### **o Summary of New Sites Found in 2008**

In addition to the efforts described in the Xerces report (Jepsen et al. 2008), we searched over 50 sites (meadows and harvest units) and found 13 new Mardon skipper sites. A total of 18 new sites, including Xerces' survey efforts, were found during the 2008 survey season. Only those sites that were also visited by USFS/WDFW staff are detailed in this report. A list of all sites visited by USFS and/or WDFW staff, their locations and whether or not Mardon skippers were found is included in Appendix A, and a description of each new (2008) Mardon skipper site is described below.

- **New Sites Discovered**

- Backoven Flats 1**

Joan St. Hilaire discovered Mardon skippers at this site on June 17, 2008. She observed 7 newly emerged males; based on wing wear and fuzzy appearance. Temperatures were in the low 60s, all Mardons were seen resting/basking on sedge seed heads and bare ground. She caught 4 for species verification. This site was made up of a logging landing and a small meadow. False hellebore was present at the lower eastern end of the meadow. There were small patches of fescue, and abundant sedges with several small patches of bare ground. Delphinium and common camas were in bloom. Xerces and WDFW staff revisited this site on June 24<sup>th</sup> and we counted 53 individuals. Refer to Xerces report (Jepsen et al. 2008) for additional description of that visit.



Backoven Flats 1

- Bear Cove 1**

Joan St. Hilaire discovered Mardon skippers at this site on June 16, 2008. She found 10 newly emerged males and caught 6 for identification purposes. Most were seen resting on sedge seed heads and one was nectaring on a *Vicia* spp. Site consisted of a dense mat of sedges. There was one small patch of bare ground and one was observed resting there. One of the male's wings showed some wear. False hellebore was present at the eastern edge of this site. Death camas, common camas, vetch and *Potentilla* spp were in bloom. Returned June 24, 2008 with Xerces and WDFW staff and observed 8 individuals with worn wings. Refer to Xerces report (Jepsen et al. 2008).



Bear Cove 1

### **Bear Cr 1**

*This is not a new site*; it was reported in 2007 by Dr James. Since it was not described in the 2007 report, it will be included in this discussion. Joan St. Hilaire found 15 newly emerged Mardon skipper males on June 16, 2008. Five were caught for species verification. Their colors were bright and they had a fuzzy appearance. All Mardons were found between the false hellebore patch and FS RD 1200. All were observed resting/basking; two were on the false hellebore. This was a large meadow with a dispersed camp site on the south end. Mardons were using a small portion of the north end of this meadow. The area Mardons were using had fescue and sedges present with several exposed bare ground openings. Xerces and WDFW staff returned on June 24, 2008 and observed 13 individuals with wing wear.



Bear Cr 1

### **Rimrock 1**

Joan St. Hilaire and Jeff Bernatowicz found this site June 26, 2008. We observed 12 Mardon skipper males and two were caught for species verification. This site was an old timber sale unit with a small wet area that had false hellebore present. Mardons were observed at the southern, upper end of the unit along an old skid road. The primary threat at this site is conifer encroachment. Sparse patches of fescue and sedges with a lot of bare ground were present at this site. Mardon skippers were seen nectaring on vetch.



Rimrock 1

### **Pinegrass Zero**

*Site originally discovered by Xerces.* Joan St. Hilaire and Jeff Bernatowicz found this site on their way to Pinegrass 1. We observed 1 Mardon skipper on the side of the road July 1, 2008. This site is an old timber sale unit that is still fairly open with Fescue and sedges present. We later found this to be the same site as Xerces Pinegrass Zero. Refer to Xerces report (Jepsen et al. 2008).

### **Pinegrass 1.5**

Jeff Bernatowicz and Joan St. Hilaire discovered this site July 3, 2008. We observed 1 individual. It was cool and partly cloudy, not ideal weather to observe butterflies. Bernie and William Moore revisited this site on July 10, 2008 and observed 6 individuals. This site is an old logging landing and used as a hunter camp site during November. Vegetation is sparse and the ground is compact and highly disturbed. Fescue has been seeded in from the timber sale.



Pinegrass 1.5

### **Pinegrass Pit**

Jeff Bernatowicz and Joan St. Hilaire discovered this site July 3, 2008. We observed 13 Mardon skippers, mostly males. This site was an old Timber Sale unit. This site is fairly open and is probably part of the same timber sale as Pinegrass Zero. Mardons were seen at a landing and on an old skid road. No false hellebore was present but there was a wet area near the landing. Mardons were seen nectaring on vetch and clover. There were not a lot of forbs present. Vegetation was low in height with a lot of bare ground present. It appeared that fescue was seeded into the skid roads and landings as part of the timber sale.



**Pinegrass Pit**

### **Pinegrass Pit W**

Jeff Bernatowicz and Joan St. Hilaire discovered this site July 3, 2008. We observed 5 Mardon skippers at this site. This site was an old timber sale unit across the road from Pinegrass Pit. Mardon skippers were observed close to the road. This site was fairly

open with sparse sedges, fescue and vetch present. It was fairly moist with no false hellebore present.

### **Pinegrass Pit W**



### **Pinegrass 1241**

Jeff Bernatowicz and Joan St. Hilaire found this site July 3, 2008. We observed 35 Mardons in this large timber sale unit. The unit is regenerating fairly well; conifer encroachment is the primary threat to this site. Butterflies were using a large landing and old skid roads that had been seeded in with fescue. Mardons were seen nectaring on clover. Butterflies appeared to have emerged long ago due to heavy wear and faded coloring on the wings. There was a large patch of tall timothy grass that the butterflies were flying through. No false hellebore or moist areas were present.



Pinegrass 1241

### **677 Road**

Jeff Bernatowicz and Joan St. Hilaire surveyed a portion of this site July 3, 2008, but did not find any Mardon skippers. The weather was cool and windy. A re-survey of a different portion of the meadow by Jeff Bernatowicz on July 11 found one very probable Mardon. The I.D. was while the butterfly was nectaring on clover. The butterfly flew off and wasn't caught for close ID or photo documentation. The weather was marginal for survey. The site is an old cut that is closing in rapidly with regeneration. There are still many smaller moist openings.

### **767 Road (Dr James 1<sup>st</sup> site 2006)**

*This is not a new site*; it was reported in 2006 by Dr James. Since it was not described in the 2007 report, it will be included in this discussion. Jeff Bernatowicz counted 3 Mardon skippers here July 11, 2008. Joan St. Hilaire and Bernie counted 22 Mardons on the second visit July 17, 2008. This is an old timber sale that is grown in by young conifers. Soils are fairly sandy (volcanic ash) with sparse vegetation; fescue, sedges and rushes present. There are large areas of exposed soil with a few moist pockets in small depressions. Mardons were observed in an old landing and along the skid roads where fescue was seeded in. No recent sign of cattle use was observed.



767 Road

### **767 N Road**

Joan St. Hilaire and Jeff Bernatowicz discovered this site July 17, 2008. This site was an old timber sale unit that is grown in by conifers. The soil at this site is dry and sandy. The area has a lot of bare soil with sparse patches of fescue, sedges and shrubs. We observed 6 Mardon skippers nectaring on strawberry (*Fragaria vesca*). This was an atypical site for Mardon skippers on the NRD.

**1204-757A**

Joan St. Hilaire and Jeff Bernatowicz discovered this site July 17, 2008, observing 3 Mardon skippers. This site was an old timber sale unit with a small dried up creek that ran through it. Conifer encroachment is the primary concern at this site. Vegetation is sparse; sedges, vetch and clover present.

**1204-757A****1204-757B**

Joan St. Hilaire and Jeff Bernatowicz discovered this site July 17, 2008. We observed 1 Mardon skipper and 1 probable Mardon Skipper. This site is just across the road from 1204-757A. It is a moist meadow with conifer encroachment.

**1205A**

Joan St. Hilaire and Jeff Bernatowicz discovered this site July 17, 2008. We observed 2 Mardon skippers. This opening is less than 1 ac. Vetch, and *Aster conspicuus* were in bloom along with several sedge species near a small slow moving stream.



1205A

### **1205B**

Joan St. Hilaire and Jeff Bernatowicz discovered this site July 17, 2008. We observed 2 Mardon skippers and 2 Sonora skippers and 1 unknown. This opening was less than 5 acres and occurred near a small stream. False hellebore was present along the stream. Mardons were seen near an old landing. Vetch, along with several sedge species was present. This site was an old timber sale unit that was grown in by young conifers.



1205B

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

On May 31/June 1 2008, cattle exclosures were built at Pinegrass 1 and 2 (Figure 6). The research exclosures in Minnie Meadow were rebuilt along with portions of the fence along the perimeter of the meadow (Figure 6). On July 9, a single 1 meter cage was placed in Conrad finger 2, and 2 cages in Conrad (Figure 1). Photos were taken of the cages when installed and of all exclosures and cages on September 29 (Figures 7-12).

We recorded skipper numbers within the Pinegrass cattle enclosure (800 linear feet) and an area comparable in size adjacent to the enclosure (Table 2). No cattle use was seen during the surveys. Utilization was also measured inside/outside Pinegrass 1 (Table 3). Only 1 Mardon skipper was seen near Pinegrass 2. The meadow system was also too diverse to find a suitable inside/outside comparison. Thus, Pinegrass 2 was dropped.

Ungulate use of vegetation outside the enclosures appeared to be fairly high based on photos. The main Conrad 1 cage was accidentally moved at some point in the season. Photos of Conrad 2 cage seem to show little vegetation on September 29 (figure 8). The utilization of the sites is not unusual and was also noted during visits in 2007. There is an obvious disconnect between some of the literature and professional concerns over heavy utilization and Mardon populations. Conrad meadows has been grazed for over 80 years. Observations of lack of nectaring plants and low numbers of Mardon skippers in July 2007 did not result in low counts in 2008. Mardon numbers increased over 2007. The number of Mardon Skippers in the Conrad meadow system is probably higher than the combined populations for all known sites outside of NRD. While cattle grazing may impact Mardon skippers in some habitats, especially if the timing of grazing is prior to or during emergence, there does not appear to be any reason to alter the current grazing system in Conrad Meadows.

**Table 2:** One day counts at Pinegrass 1 (Cattle Enclosure)

Date	Total # of Mardon skippers observed	Total # of Mardon skippers observed in the cattle enclosure	Total # of Mardon skippers observed outside the enclosure
7/01/08	27	15	12
7/11/08	34	13	21

**Table 3:** Utilization at Pinegrass 1 (Cattle Enclosure)

Date	Average grass height inside the enclosure (inches)	Average grass height outside the enclosure (inches)
07/23/2008	6.24	6.07
10/22/2008	7.7	6.37

\*Forty percent utilization is reached when the average grass height is measured at 5.5 inches.

On the NRD cattle are turned out when soil conditions and plant growth meet a certain criteria based on soil and plant phenology range readiness monitoring. Turn out date can vary by 2 weeks from one year to the next. During the two years of Mardon skipper surveys on the District, it appears that cattle have been turned out after the Mardon peak flight period or after the completion of their flight period (Table 4).

**Table 4: Adult Mardon skipper counts & cattle turn out dates**

Date	Total # of Mardon skippers observed Conrad Finger 2	Total # of Mardon skippers observed Minnie Meadows	Total # of Mardon skippers observed Pinegrass 1
<b>2007</b>			
06/20		38	
06/27	457		
07/01	57 cow/calf turned out*		
07/05			10+
07/06			32
07/07		0	
07/10	3		
07/16		130 cow/calf turned out	158 cow/calf turned out
<b>2008</b>			
06/24		52	
06/25	45		
06/30	654	187	
07/01		130 cow/calf turned out	27 158 cow/calf turned out
07/09	911	51	
07/10	57 cow/calf turned out		
07/11			34
07/16	201		

\*Cattle turn out date is the day they arrive on the pasture. The actual day they arrive at the Mardon skipper sites maybe a few days to 2 weeks later.

### Recommendations for 2009

- 1) Search for new sites within the known range of the Mardon skipper. Searches for new sites have thus far been opportunistic of road and trail systems (figures 2-4). It is likely that Pinegrass Ridge was once a large colony. As the forest has regenerated, there are likely many more sites that can be found using current aerial photos. The distribution of the Conrad population should also be mapped.
- 2) Monitor existing known populations to determine trends in peak numbers and flight periods. 2008 was the first year populations were tracked over time in a few locations. This effort should be continued.
- 3) Develop and implement a protocol to characterize known sites and neighboring sites that are unoccupied. Gather detailed vegetation and physical data of these sites.
- 4) Continue monitoring cattle/elk exclosures. Vegetation utilization measurements should be conducted in the same area as counts. We theorize that as vegetation becomes taller and denser inside exclosures, Mardon use will decline.

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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 2008 survey season. Mardon skipper sites highlighted in blue indicate they were discovered in 2008.

Site Name	Date (mm/dd)	Elevation (feet)	Mardon Present	1 day count
<b>Rimrock Area</b>				
Bear Cove 1	05/16	2973	N	0
Bear Cove 1	06/16	2973	Y	10
Bear Cove 1	06/24	2973	Y	8
Tieton Airstrip	06/27	2940	N	0
Bear Cr 1*	05/16	3275	N	0
Bear Cr 1*	06/16	3275	Y	15
Bear Cr 1*	06/24	3275	Y	13
Bear Cr 1*	07/01	3275	Y	15
Bear Cr 2	06/24, 7/01	3230	N	0
Bear Cr 3	06/24, 7/01	3053	N	0
Rimrock 1	06/26	3318	Y	12
<b>SF Tieton Area</b>				
Bakeoven Flats 1	06/17	3350	Y	7
Bakeoven Flats 1	06/24	3350	Y	53
Bakeoven Flats 2	06/30	3267	N	0
Minnie Meadows	06/17	3500	N	0
Minnie Meadows	06/24	3500	Y	52
Minnie Meadows	06/30	3500	Y	187
Minnie Meadows	07/09	3500	Y	51
Main Conrad Mead 1	06/25	4074	Y	20
Main Conrad Mead 1	06/30	4074	Y	516
Main Conrad Mead 1	07/09	4074	Y	929
Conrad Finger 2	06/25	4060	Y	45
Conrad Finger 2	06/30	4060	Y	654
Conrad Finger 2	07/09	4060	Y	911
Conrad Finger 2	07/16	4060	Y	201
<b>Pinegrass Ridge Area</b>				
Pinegrass 1	05/19	4050	N	0
Pinegrass 1	07/01	4050	Y	27
Pinegrass 1	07/11	4050	Y	34
Pinegrass zero (Xerces site)	07/03	3660	Y	1
Pinegrass 1.5	07/10	4270	Y	6
Pinegrass 2	07/03	4300	N	0
Pinegrass 2	07/10	4300	Y	1
Pinegrass Pit	07/03	3840	Y	13
Pinegrass Pit W	07/03	3784	Y	5
677 Road	07/11	3950	Y	1
Pinegrass 1241	07/03	3915	Y	35
Pinegrey 1	07/10	4974	N	0
Pinegrey 2	07/10	4980	N	0
767 Road*	07/11	5060	Y	3
767 Road*	07/17	5060	Y	22
767 N Road	07/17	5040	Y	6
1204-757A	07/17	5055	Y	3
1204-757 B	07/17	5050	Y	2

Site Name	Date (mm/dd)	Elevation (feet)	Mardon Present	1 day count
1204-575C	07/17	5075	N	0
1205A	07/17	4880	Y	2
1205B	07/17	4855	Y	3
<b>Sleepy Park Meadows Area</b>				
Sleepy Park Meadow 5	6/27	3640	N	0
Sleepy Park Meadow 4	6/27	3680	N	0
Sleepy Park Meadow 3	6/27	3700	N	0
Sleepy Park Meadow 2	6/27	3712	N	0
<b>Spencer Creek Area</b>				
Spencer 1	06/26	3325	N	0
<b>Tieton Basin/Soup Cr Area</b>				
Tieton Basin 1	5/16	3747	N	0
Tieton Basin 2	5/16	3720	N	0
Tieton Basin 3	5/16	3400	N	0
Fish Flats	5/16	3310	N	0
Soup Cr 1	5/16, 6/16	2806	N	0
<b>Wildcat Area</b>				
Wildcat 1	6/26, 7/7	3700	N	0
Wildcat 2	7/7	4677	N	0
Wildcat 4	6/26	3780	N	0
<b>Rattlesnake Area</b>				
Timberwolf 1	07/07	5250	N	0
Timberwolf 2	07/07	5390	N	0
Timberwolf 4	07/07	5650	N	0
L. Rattlesnake 1	07/02	3800	N	0
L. Rattlesnake 2	07/02	3850	N	0
L. Rattlesnake 3	07/02	4200	N	0
L. Rattlesnake 5	07/07	5190	N	0
Corral Meadows	07/02	4100	N	0
Three Cr 1	07/07	3825	N	0
Three Cr 2	07/07	3840	N	0
Three Cr 3	07/07	4036	N	0
Three Cr 4	07/07	4230	N	0
<b>Little Naches Area</b>				
Longmire Meadow	6/25, 7/08	2800	N	0
TR 941B	6/25, 7/08	3000	N	0
4-Way	6/25	3100	N	0
Cub Cr (1911 Rd Mead)	06/25, 7/08	3150	N	0
Timothy Mead 1	07/08	3160	N	0
Timothy Mead 2	07/08	3160	N	0
Timothy Mead 3	07/08	3190	N	0
<b>Naches Area</b>				
Milk Pond 1	07/08	3015	N	0
Milk Pond 2	07/08	3030	N	0
<b>American River Area</b>				
Pleasant Valley 1	07/08	3300	N	0
Pleasant Valley 2	07/08	3300	N	0

\*David James found Bear Cr 1 site in 2007 and 767 Road site in 2006

Table B.

Summary of surveys at documented Mardon skipper sites. Sites highlighted in salmon are pre 1990, in green indicates they were surveyed in 2006 and purple indicates they were surveyed in 2007. Those sites that are not highlighted were surveyed 2008.

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)	06/25/1978	3600	10	
Cascades 4 (USFS)	06/30/1978	3600	50+	
Cascades 4 (USFS)	06/024/1984	3600	24	
Cascades 4 (USFS)	07/05/1984	3600	9	
Cascades 8 (USFS) status extirpated	07/11/1981	3500	3	
Cascades 8 (USFS) 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 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	
Rimrock 1	06/26/2008	3318	12	
<b>SF Tieton Area</b>				
Bakeoven Flats 1	06/17/2008	3350	7	
Bakeoven Flats 1	06/24/2008	3350	53	near peak flight
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	
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 surveyers-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
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

Site Name	Date (mm/dd/yyyy)	Elevation (feet)	Number of adults	Comments
Conrad Finger 2	07/16/2008	4060	201	
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-Secion 28A	07/10/2008	4365	25	
Trail 1131-Secion 29A	07/10/2008	4390	7	
Trail 1131-Secion 29B	07/10/2008	4503	1	
Trail 1131-Palmer Meadow	07/10/2008	4321	176	
<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 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	
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
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 N Road	07/17/2008	5040	6	
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	

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

\*\*NA= information not available

FIGURE 1. Small portion of Conrad Meadows surveyed in 2008

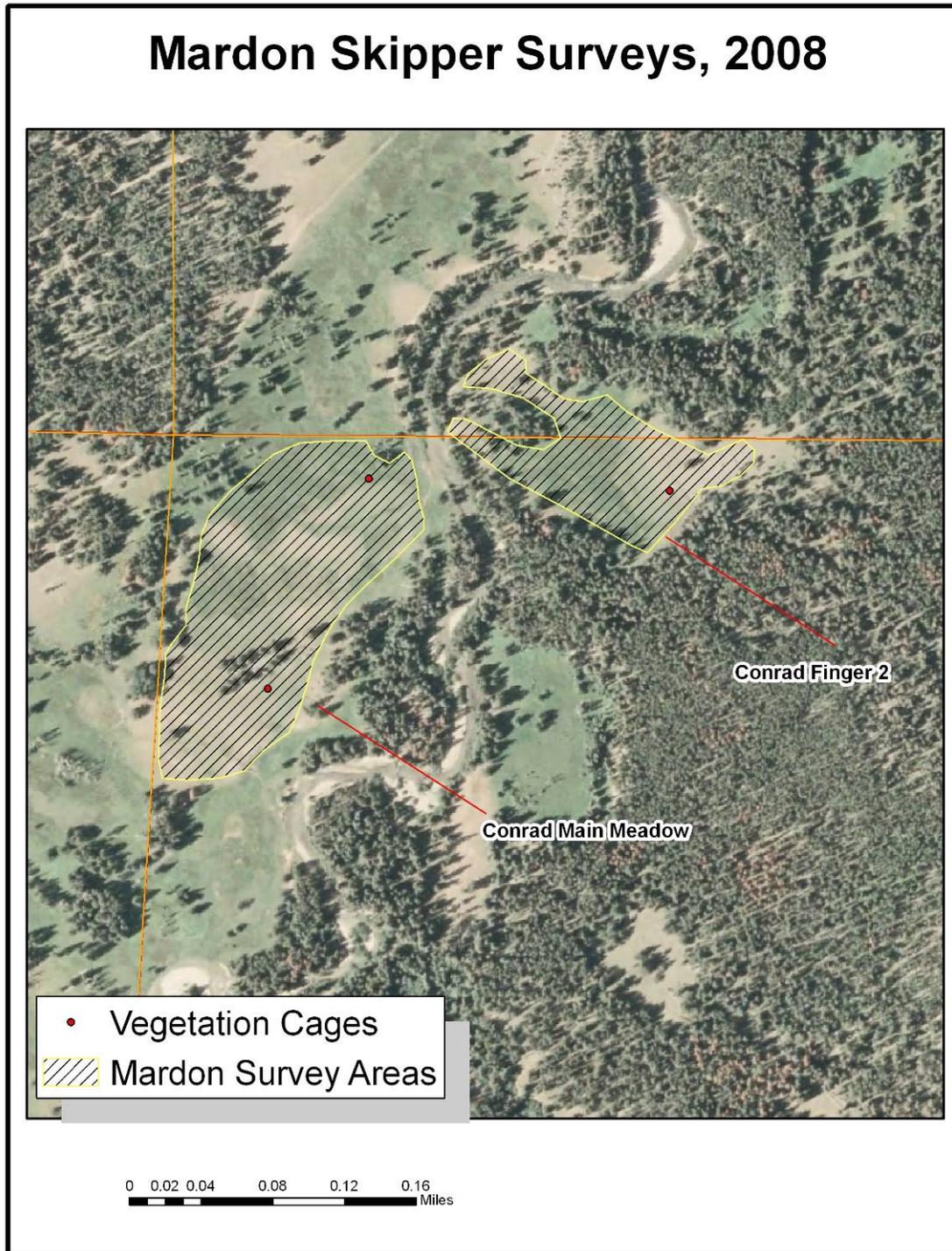


FIGURE 2: Rimrock and Lower Pinegrass Sites on 1996 Aerial Photography

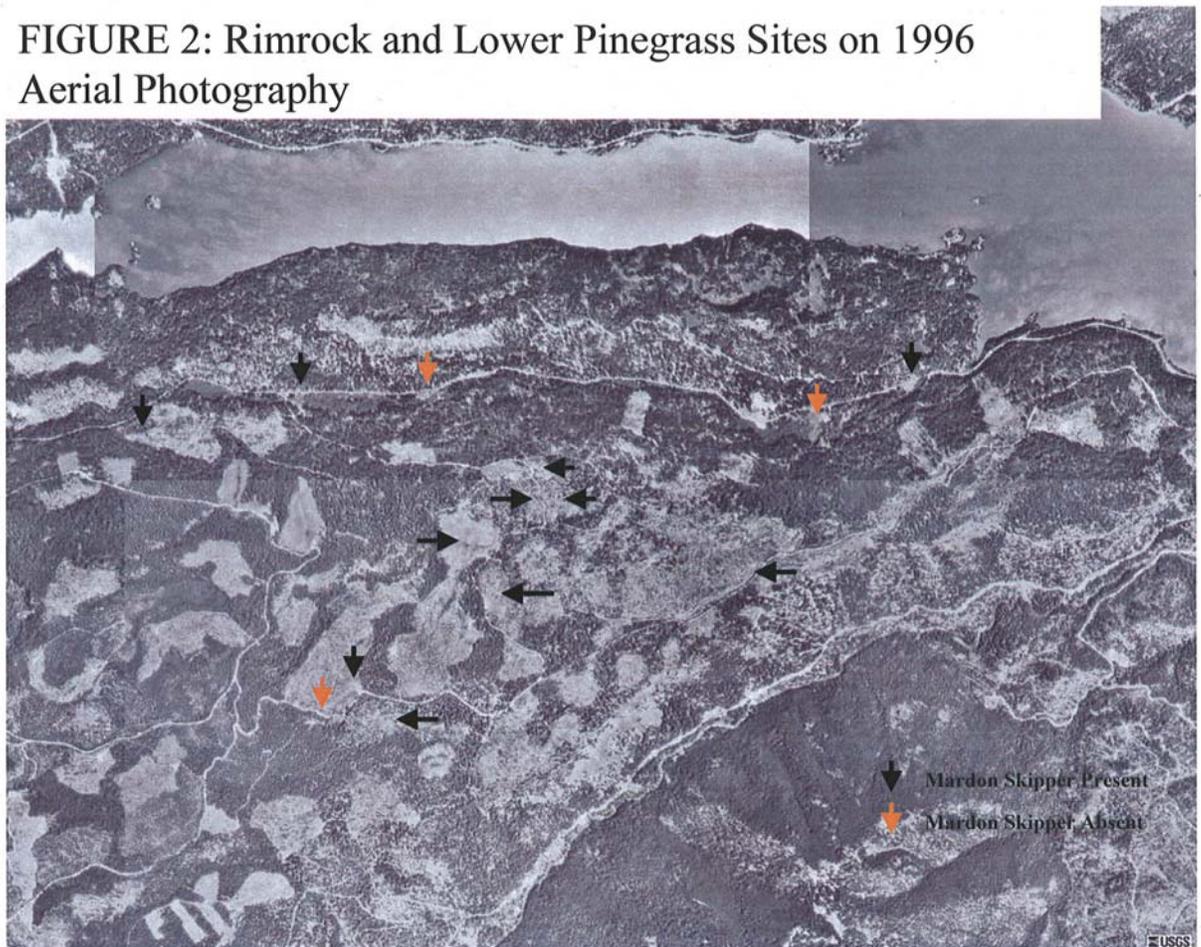


FIGURE 3: Upper Pinegrass Sites on 1996 Aerial Photography

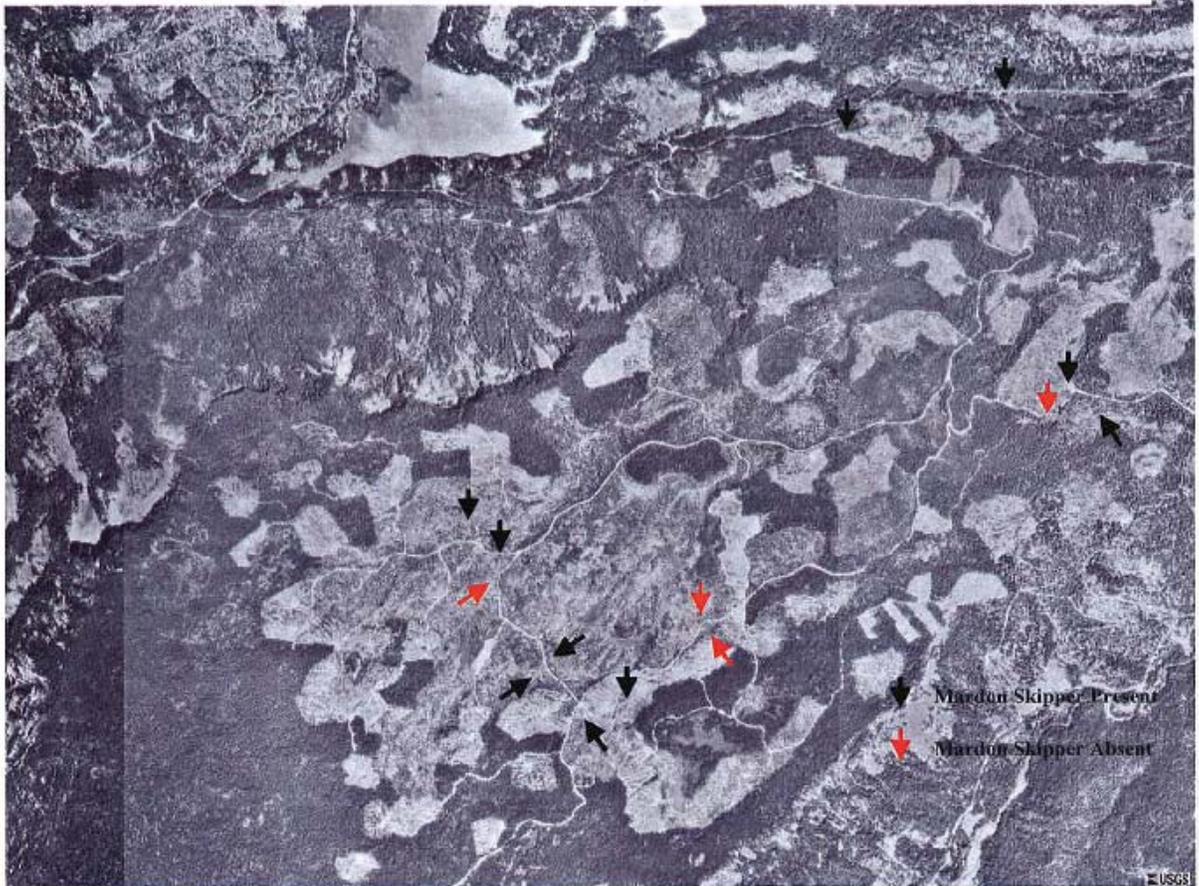


FIGURE 4: Conrad Sites on 1996 Aerial Photography

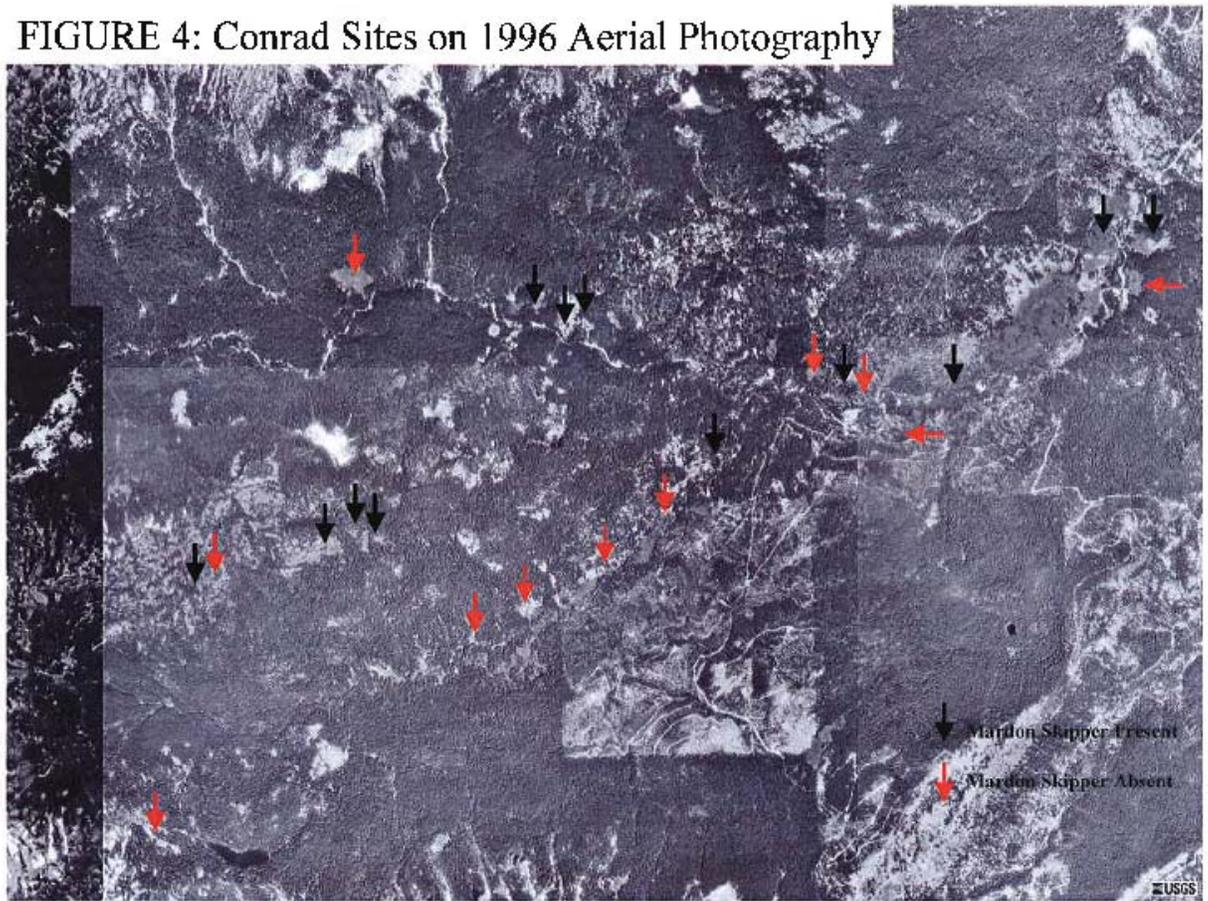


Figure 5. 1934 aerial photo of Pinegrass Ridge (mostly timbered)





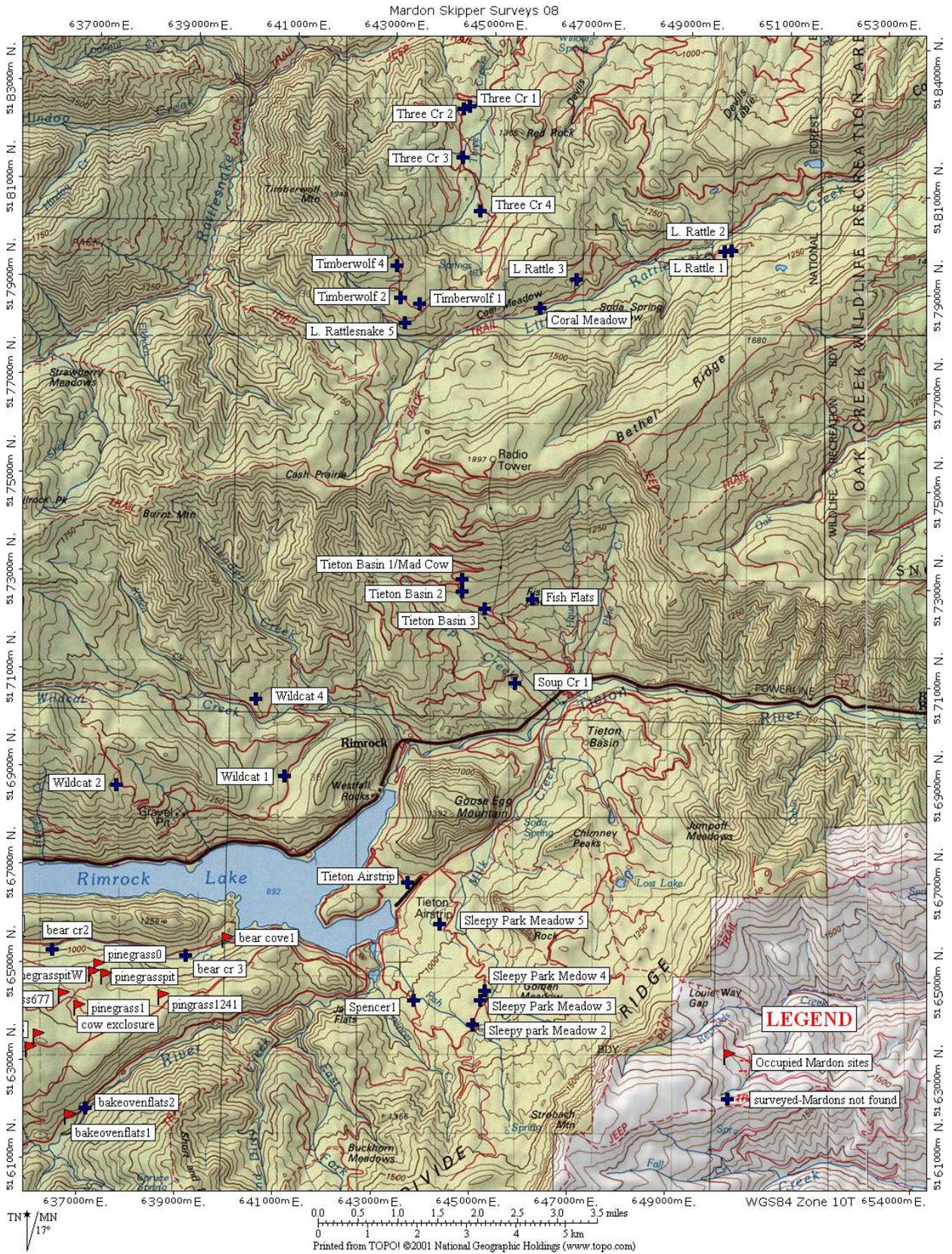


Fig 6b. Teton Basin, Wildcat and Sleepy Park Meadows Areas

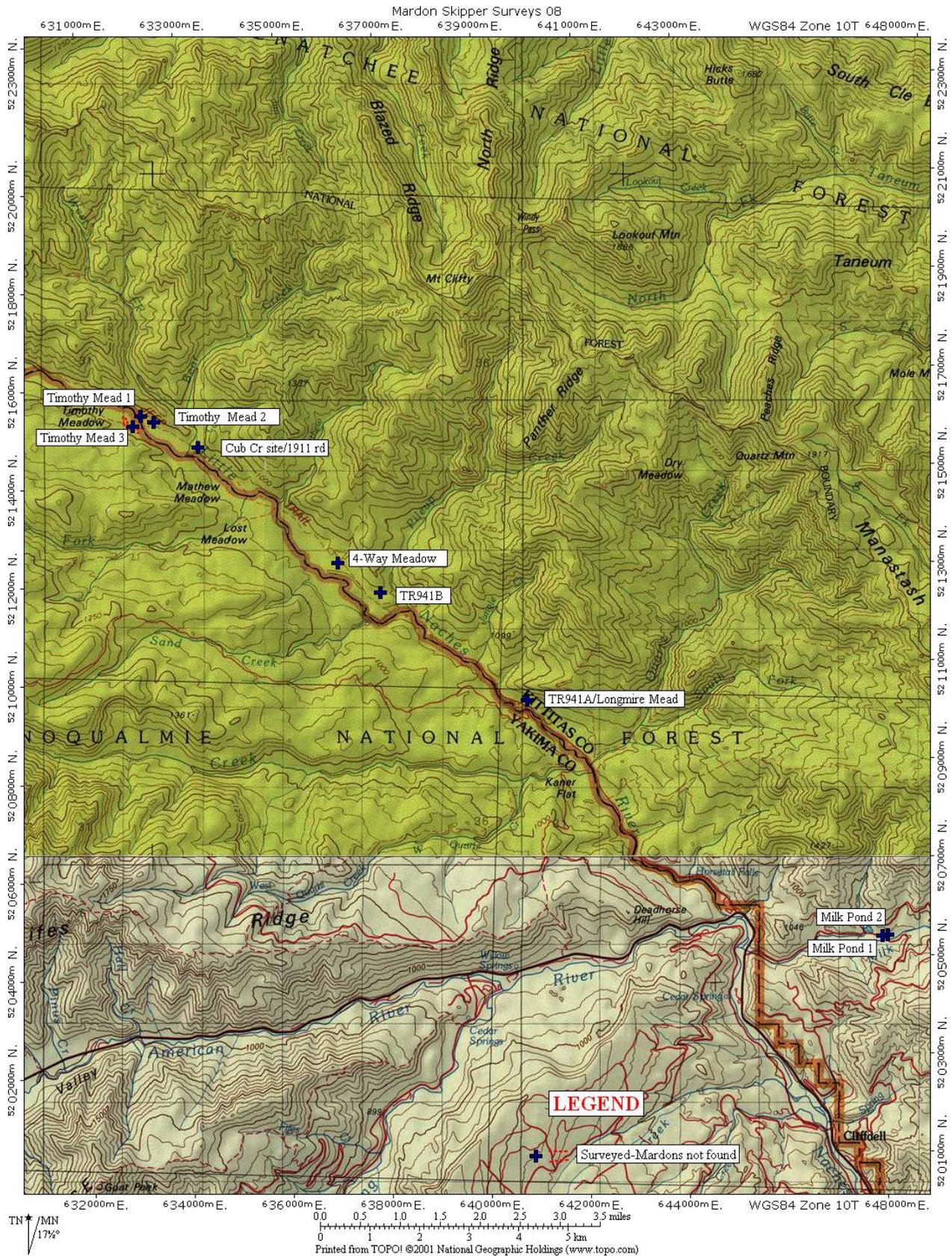


Fig 6c. Little Naches and Milk Pond Areas

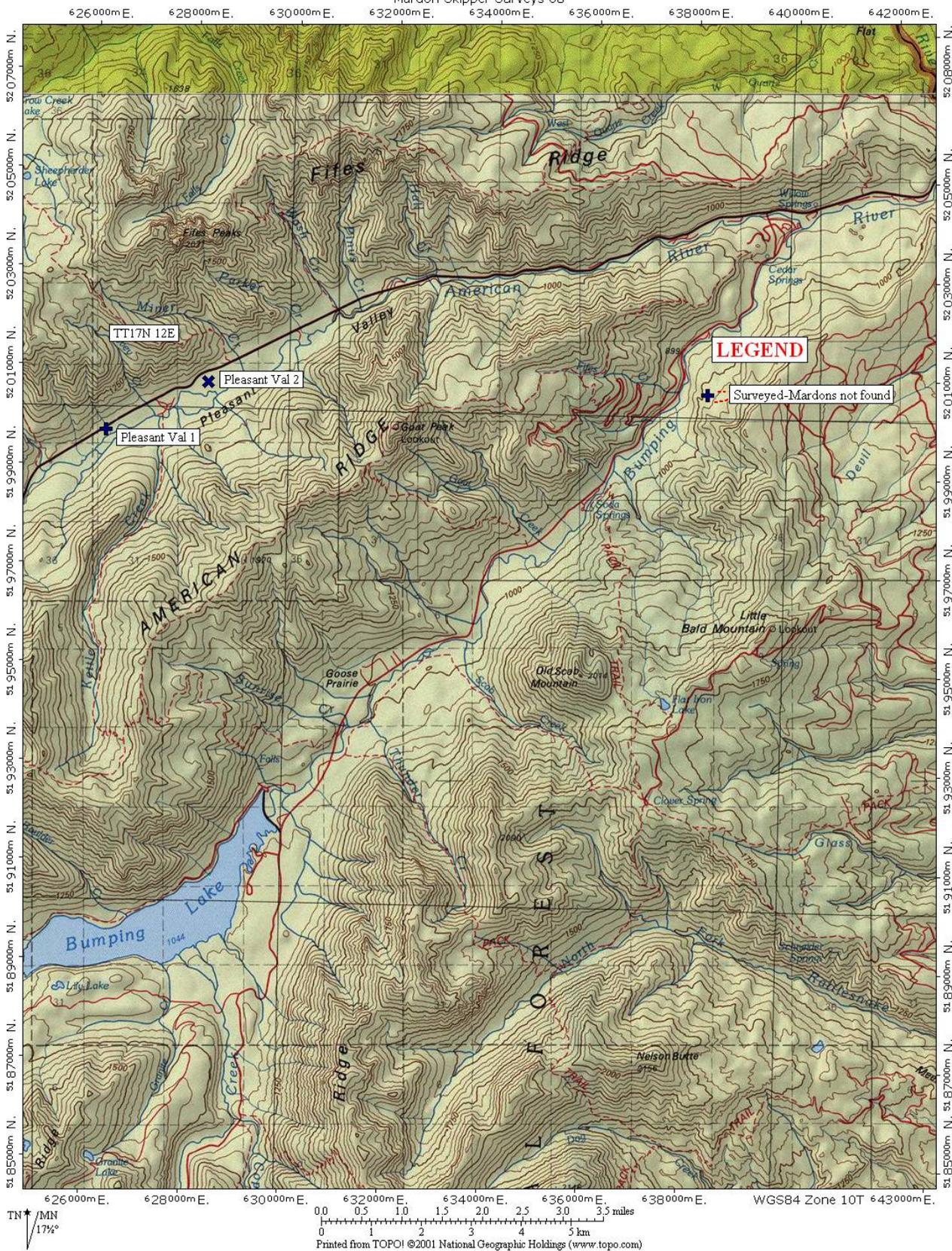


Fig 6d. American River Area

Grazing utilization cages and exclosures (Figures 7-13)



Conrad finger, top photos 7/9/08, bottom 9/29/08 FIGURE 7.



Conrad Main Meadow cage 1, top 7/9/08, bottom 9/29/08 FIGURE 8.



Conrad Main Meadow cage 2, top 7/9/08, bottom 9/29/08 FIGURE 9.



Pinegrass 1 enclosure 9/29/08 FIGURE 10. (outside enclosure)



Pinegrass 1 enclosure 9/29/08 FIGURE 11. (inside enclosure)



Minnie Meadows enclosure 9/29/08 FIGURE 12. (outside the enclosure)



Minnie Meadows exclosure 9/29/08 FIGURE 13. (inside the cattle exclosure)