Conservation Matters: Contributions from the Conservation Committee

The imperiled Mardon Skipper Butterfly: an initial conservation success

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I have been working to conserve species and landscapes for over 25 years. Of course, the best things about my job are the success stories. Not only do they help me to keep my chin up, but are vital to maintain public support for conservation. One recent example of "good news" for butterflies comes from the Pacific Northwest, where a diminutive butterfly, the Mardon Skipper (*Polites mardon*) (Fig. 1), is now protected throughout most of its range.

Fig. 1. Mardon skipper (*Polites mardon klamathensis*) Photo by Rich Hatfield.

What sets conservation of this butterfly apart from other efforts is the unprecedented level of cooperation between agencies, universities and nonprofits. The Mardon Skipper Working Group drew together the Xerces Society for Invertebrate Conservation, the Forest Service/Bureau of Land Management Interagency Special Status/Sensitive Species Program (ISSSSP), Washington Department of Fish and Wildlife, Washington State University, the Oregon Zoo, the Six Rivers National Forest, and the Center for Natural Lands Management.

Although people have worked on this species for a number of years, what really got conservation efforts moving was when the skipper *was listed as a candidate species under the U.S. Endangered Species Act in 2000. The threat of listing led many agencies to step forward.*

The first task was to understand the range of the butterfly and identify as many extant sites as possible. As is true of most rare butterflies, we knew little about the Mardon Skipper when we started out. Surveys had not been done across the species range, we had little information on its life history, and we did not have a handle on the site-specific threats.

The Mardon Skipper was first described in 1881 by W. H. Edwards from specimens probably taken near Tenino, Thurston County, Washington, by H. K. Morrison (Dornfeld 1980). E. J. Newcomer discovered the butterfly to be common on Signal Peak in the Cascades of Yakima County (Pyle, 1974). These were the only known populations until 1979, when Sterling and Eileen Mattoon discovered a population on High Divide Ridge in Del Norte County, California, 350 miles south of previous locations. A decade later John Hinchliff found specimens from southern Oregon in collections at the American Museum of Natural History. A population was found in Jackson County, Oregon, in 1990 by John Vernon and Mike Richard, with three more added the following year by Sterling Mattoon and others working on the Xerces Society Fourth of July Butterfly Count for the Mount Ashland area (Mattoon et al. 1998). Extensive surveys completed between 1999 and 2012 increased the number of known occupied sites from 14 to 165. Despite the relatively large number of occupied sites, many are small with only a few butterflies.

The Mardon Skipper is now known from four geographic areas (Fig. 2):

- southern Puget Sound in Washington
- the east slope of the Cascade Mountains in southern Washington
- the Cascade Mountains in southern Oregon, and
- Del Norte (north-coastal) California and the southern coast of Oregon

Species life history revealed

Knowing the life history of the Mardon Skipper was vital to conserving it, but the details were poorly understood. For instance, the common wisdom was that Mardon larvae fed mostly on fescue. This was refuted by studies that showed female Mardon Skippers oviposit on multiple graminoid species, indicating that the larvae may be generalists (Beyer and Schultz 2010)—although they do exhibit plant specificity within localities. In the Washington Cascades, females prefer to oviposit on sedges (*Carex* spp.) at one location and oatgrass (*Danthonia* spp.) at another. Yet, when present, Idaho Fescue (*Festuca idahoensis* Elmer) is generally preferred (Beyer and Schultz 2010). In the Puget Sound prairies, the Mardon Skipper greatly prefers Roemer's fescue (*Festuca idahoensis* Elmer ssp. *roemeri* (Pavlick) S. Aiken) (Henry and Schultz 2012). At the two sites studied in Oregon, California oatgrass (*Danthonia californica* Bol.) was the most frequently utilized oviposition plant (Beyer and Black 2007). Variables such as

Fig.2. Range-wide map of Mardon Skipper distribution

Fig. 3. Mardon Skipper (*Polites mardon klamathensis*) larva in fescue. Photograph by Loni Beyer.

graminoid structure, the surrounding plant structure, and tree shading also influence oviposition behavior (Henry and Schultz 2012).

It was also widely believed that the Mardon Skipper overwintered as pupae (Potter et al. 1999; Dornfeld 1980; Newcomer 1966 in Potter et al. 1999), but preliminary studies of flagged Mardon Skipper larvae in the field by Beyer and Black (2007, see Fig. 3) suggest that Cascade populations overwinter as larva.

Threats to mardon sites

One additional benefit to all of the surveys was that we were able to document threats at Mardon Skipper sites, including overgrazing by domestic livestock; conifer and shrub encroachment; off road vehicle use; prescribed and natural fire; recreation (including camping); applications of *Btk* (*Bacillus thuringiensis* var. *kurstaki*); climate change; and issues related to small population size and stochastic events.

One of the major threats is the loss of meadow habitats to conifer encroachment (Fig. 4), which has occurred throughout the Mardon Skipper range. Because of limited dispersal abilities, and an increase in distance between suitable habitat due to encroaching conifers, Mardon Skippers face a reduced probability of recolonization in the event of a local extirpation and the potential that they will exist as isolated remnant populations.

Complicating this is that prescribed fire used to deal with encroachment has been shown to extirpate some butterfly populations. A study in California showed substantially fewer Mardon Skippers in the burned areas of meadows compared to unburned areas one, two, three, and five years following the burn event (Black et al. 2014). When transect data was pooled within years, both burning and time had a significant effect on Mardon Skipper abundance. The fact that there is no interaction effect between time and burning suggests that the effect of burning on Mardon Skippers is real and not confounded by annual variation in butterfly populations (Black et al. 2014). One solution for

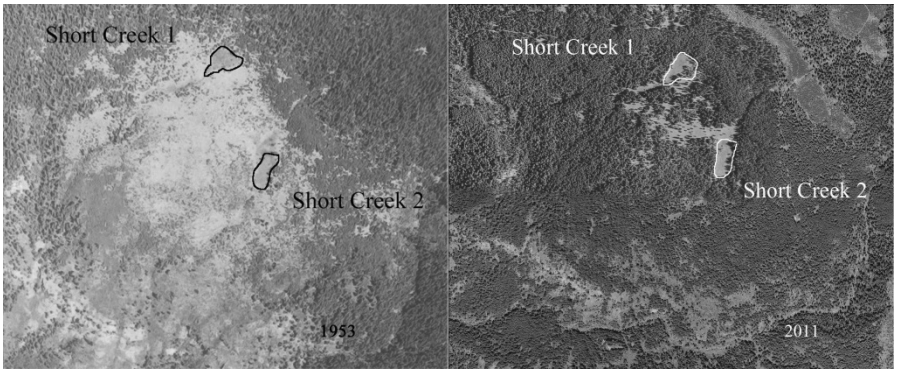

Fig.4. Example of forest encroachment from aerial photographs of the Short Creek Complex on the Rogue River – Siskiyou National Forest in southern Oregon comparing 1953 and 2011.

the Mardon Skipper has been to hand cut conifers and remove them out of the most densely occupied areas.

Information into action

The great thing about this partnership is that as information was gathered, it was put it into action. Because we had a range of partners with different strengths we were able to better understand the science and management needs, and most importantly, put this management into practice. Because we had a better understanding of the Mardon locations and its habitat needs we were able to work with the Forest Service and BLM to develop site specific management plans. These plans address overgrazing, off-road vehicles, conifer encroachment, invasive weed encroachment, and improve the meadow habitat upon which the skippers depend. There is also monitoring at key sentinel sites to track population numbers of the Mardon Skipper.

These 15 years of effort were cited as one reason the Fish and Wildlife Service did not list this butterfly, and the Mardon Skipper working group was recognized for this conservation success through the U.S. Forest Service 2012 Wings Across the Americas Butterfly Award. This process serves as a model that could be replicated toward the conservation of additional U.S. butterfly species, and potentially applied to additional animal groups.

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Irving Finkelstein at Doerun Pitcherplant Bog NA, Colquitt Co.

Fernaldella georgiana Covell, Finkelstein and Towers, at Handy Kenedy Rd. Ohoopee Dunes site, 1 mile north of Hwy. 152, Tattnall Co., Georgia, April.

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