

# Periodic Status Review for the Mardon Skipper



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FISH AND WILDLIFE  
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The Washington Department of Fish and Wildlife maintains a list of endangered, threatened, and sensitive species (Washington Administrative Codes 220-610-010 and 220-200-100). In 1990, the Washington Wildlife Commission adopted listing procedures developed by a group of citizens, interest groups, and state and federal agencies (Washington Administrative Code 220-610-110). The procedures include how species listings will be initiated, criteria for listing and delisting, a requirement for public review, the development of recovery or management plans, and the periodic review of listed species.

The Washington Department of Fish and Wildlife is directed to conduct reviews of each endangered, threatened, or sensitive wildlife species at least every five years after the date of its listing by the Washington Fish and Wildlife Commission. The periodic status reviews are designed to include an update of the species status report to determine whether the status of the species warrants its current listing status or deserves reclassification. The agency notifies the general public and specific parties who have expressed their interest to the Department of the periodic status review at least one year prior to the five-year period so that they may submit new scientific data to be included in the review. The agency notifies the public of its recommendation at least 30 days prior to presenting the findings to the Fish and Wildlife Commission. In addition, if the agency determines that new information suggests that the classification of a species should be changed from its present state, the agency prepares documents to determine the environmental consequences of adopting the recommendations pursuant to requirements of the State Environmental Policy Act.

This is the Draft Periodic Status Review for the Mardon Skipper. It contains a review of information pertaining to the status of Mardon Skippers in Washington. It was reviewed by species experts and is available for a 90-day public comment period from 22 March 2023 through 19 June 2023. Comments received will be considered during the preparation of the final periodic status review. The Department will present the results of this periodic status review to the Fish and Wildlife Commission at a meeting in September 2023.

Submit written comments on this document by 19 June 2023 via e-mail to: [TandEpubliccom@dfw.wa.gov](mailto:TandEpubliccom@dfw.wa.gov) or by mail to:

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**DRAFT**

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## EXECUTIVE SUMMARY

The mardon skipper (*Polites mardon*) is a small tawny-orange butterfly with a stout, hairy body found in five disjunct regions in Washington, Oregon, and California: 1) south Puget Sound, 2) southern Washington Cascades, 3) southern Oregon Cascades, 4) southern Oregon coast, and 5) coastal northern California. The mardon skipper is estimated to occupy 165 sites that represent approximately 66 populations rangewide. “Sites” refers to the specific locations with documented species presence, and “populations” represent local clusters of sites that are assumed to function as a local population.

In Washington, most of the known sites are in the southern Washington Cascades with a few sites located in the south Puget Sound prairies in Thurston and Pierce Counties. It has been state-listed as endangered since 1998 and was a federal candidate for Endangered Species Act listing from 1999-2012. In 1999, only 10 sites were known from the southern Washington Cascades, and a few from the south Puget Sound. However, after extensive surveys, approximately 117 sites and approximately 49 mardon skipper populations were documented in Washington State, with nearly all found in the southern Washington Cascade region. Therefore, the U.S. Fish and Wildlife Service determined that rangewide listing was not warranted.

Mardon skippers were once more broadly distributed on the south Puget Sound prairies. Urban development, forest encroachment, introduction of invasive species, and land conversion to agriculture have reduced the south Puget Sound region prairies and available mardon skipper habitat to a fraction of their previous extent. In the late 1980s, mardon skippers were found on eight sites, but today remain on only three: the Artillery Impact Area of Joint Base Lewis-McChord, and the North and South Units of Scatter Creek Wildlife Area (WLA). The numbers of mardon skippers at the Scatter Creek WLA have declined significantly since 2008-2009, from hundreds to only a few individuals documented in 2021. In 2022, surveys conducted at both units of Scatter Creek WLA detected no mardon skippers during their flight period. Further monitoring over the next few years will determine if the Scatter Creek WLA populations are extirpated. The dramatic decline in mardon skipper numbers in the south Puget Sound prairies shows that mardon skipper numbers are critically low compared to what has been documented over the last two decades.

Mardon skippers have narrow habitat requirements, though specific host and nectar plants appear to vary by region. Generally, mardon skippers require open grassland and meadows dominated by short-statured grasses or sedges and forbs including larval host plants (grasses and sedges), and nectar sources for adults. South Puget Sound populations are found on prairies with glacial outwash soils dominated by native grasses such as Roemer’s fescue (*Festuca roemerii*) interspersed with early blue violet (*Viola adunca*) and other nectar plants.

Mardon skipper populations are affected by several factors including conifer/shrub encroachment, invasive grasses, grazing by domestic livestock, off-road vehicle use, prescribed and natural fire, recreation, pesticides, issues related to small population size, and climate change-driven factors (e.g., drought, shifts in flowering resource phenology and hydraulic periods). Mardon skippers have limited dispersal abilities.

Barriers and distance between sites likely limit recolonization and colonization of new sites. Many populations are small and at risk of extirpation.

Although many additional mardon skipper sites and populations were documented in the southern Washington Cascades since state listing, the south Puget Sound prairie sites and populations have seriously declined, and the skipper's status is precarious. Washington defines "Endangered" to mean any wildlife species native to the state that is seriously threatened with extinction throughout all or a significant portion of its range. Given that the south Puget Sound populations represent a significant portion of its range and the threat of extinction in these few remaining sites is high, it is recommended that the mardon skipper remain listed as endangered in Washington.

## INTRODUCTION

The mardon skipper (*Polites mardon mardon*) has been state-listed as endangered since 1998. This periodic status review summarizes the distribution, population status, natural history, threats, and management activities for the mardon skipper in Washington and assesses whether the subspecies should retain its current status or if it should be reclassified. This document is intended to review information pertinent to Washington and is not meant to serve as a comprehensive literature review for the species.

## DESCRIPTION & LEGAL STATUS

The mardon skipper butterfly is a small (<1 in; 20-24 mm) tawny-orange butterfly with a stout, hairy body (Figure 1). Skippers are small butterflies that get their name from their fast erratic flight; they can be recognized because when perched, they hold their front and hind wings at different angles. Mardon skipper is a grass skipper in the subfamily Hesperinae whose larvae (caterpillars) feed on grasses and sedges.



**Figure 1.** Female (left) and male (right) Mardon Skipper (photo by Julie K. Combs).

The mardon skipper was a federal candidate for Endangered Species Act listing from 1999-2012. After extensive surveys that documented many previously unreported populations, the U.S. Fish and Wildlife Service (USFWS) determined that listing was not warranted (USFWS 2012). The subspecies *Polites mardon mardon* includes the south Puget Sound and southern Washington Cascades populations and has been state-listed as endangered since 1998. This subspecies has a National Heritage Status Rank of N2N3 and a state rank of S1 in Washington (NatureServe 2009).

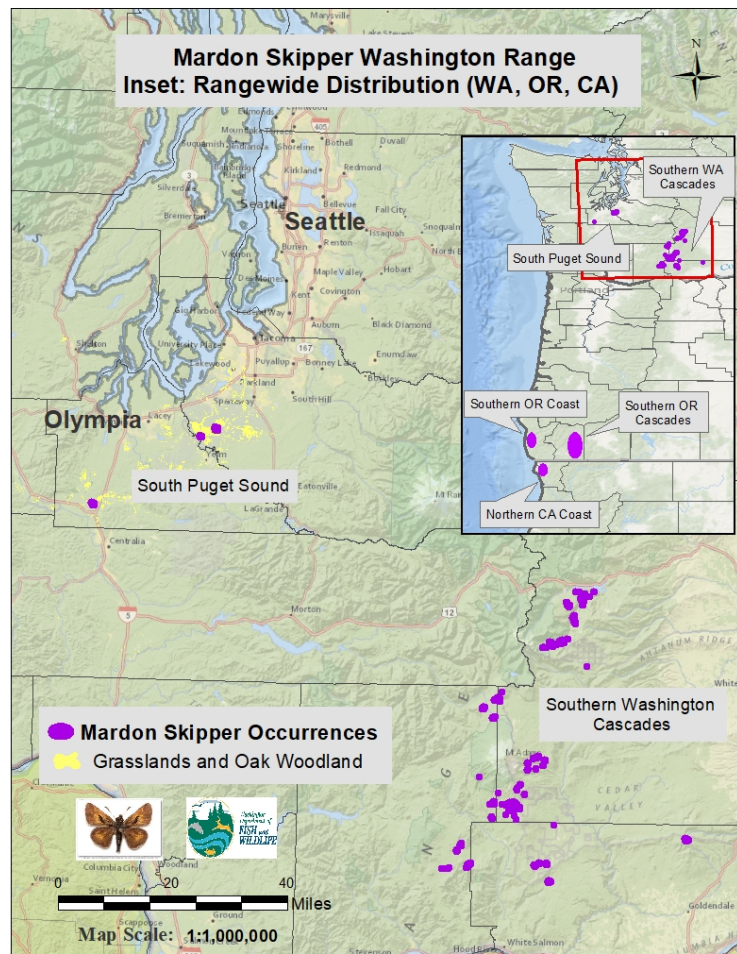
W.H. Edwards (1881) first described the mardon skipper from specimens collected near Tenino, Thurston County, Washington and it was considered Washington's only endemic butterfly for nearly 100 years (Pyle & LaBar 2018, Dornfeld 1980). Today, the mardon skipper is known from five disjunct regions across Washington, Oregon and California (Figure 2): 1) south Puget Sound, 2) southern Washington Cascades, 3) southern Oregon Cascades, 4) coastal regions in southern Oregon, and 5) northern California (Hatfield et al. 2015). Taxonomically, the Washington populations are considered the subspecies *Polites mardon mardon*, the southern Oregon Cascades populations are recognized as *P. mardon klamathensis*, and the southern Oregon and northern California coastal populations are an unnamed segregate, *P. mardon* NCA-S OR coastal segregate (Warren et al. 2016). Since genomic work on this species has not been conducted, there remains uncertainty about appropriate subspecific taxonomy.

The mardon skipper can be difficult to distinguish from other co-occurring Hesperinae skippers. The Sonora skipper (*Polites sonora*) is an uncommon grassland species in Washington with a flight period that often overlaps with the mardon skipper. In southern Washington Cascades meadows, the Sonora skipper, juba skipper (*Hesperia juba*), common branded skipper (*Hesperia comma harpalus*), Nevada skipper (*Hesperia nevada*), woodland skipper (*Ochlodes sylvanoides*), and the sagem ( *Atalopedes campestris*) may be present during the mardon skipper flight period (Potter et al. 2002). These species have slightly different wing markings and require close examination for proper identification in the field.

## DISTRIBUTION

In Washington, nearly all the known populations are located in the southern Washington Cascades; only a few are located in isolated south Puget Sound prairies at Scatter Creek Wildlife Area (WLA) in Thurston County and within the 7,000 acres of the Joint Base Lewis-McChord (JBLM) Artillery Impact Area (AIA) in Pierce County, hereafter referred to as JBLM-AIA.

Mardon skippers were once more broadly distributed across the south Puget Sound, and as recently as the late 1980s were found at eight sites (Potter et al. 1999). Today, mardon skippers remain at JBLM-AIA and the North and South Units of Scatter Creek WLA. In 2021, only four mardon skippers were detected at the South Unit and no mardon skippers were detected at the North Unit of Scatter Creek WLA. In 2022, surveys conducted at the North and South Units of Scatter Creek detected no mardon skippers, though several years of monitoring will be needed to confirm extirpation at these sites.



**Figure 2.** Known mardon skipper occurrences in Washington and rangewide distribution across Washington, Oregon, and California (inset).

Mardon skippers in the south Puget Sound region inhabit glacial outwash prairies (Pyle 1989, Hinchliff 1996). In the southern Washington Cascades, mardon skippers are found in open grasslands and small mountain meadows within grand fir (*Abies grandis*), Douglas-fir (*Pseudotsuga menziesii*), or lodgepole pine (*Pinus contorta*)/mixed conifer woodlands. Mardon skippers occur patchily in meadows and clear-cuts (i.e., forest harvest units) in the dry and transitional forest zones surrounding Mt. Adams, especially within the Gifford Pinchot National Forest; Okanogan-Wenatchee National Forest; and Yakama Indian Reservation, from the communities of Trout Lake and Glenwood north to Rimrock Lake (sites are in Klickitat, Skamania, and Yakima



Counties) (Hinchliff 1996, Harke & LaMarr 2000, Harke 2001, Potter & Fleckenstein 2001, St. Hiliare et al. 2010, Kerwin 2011).

## NATURAL HISTORY

**Life history.** Mardon skippers are univoltine, completing one life cycle from egg, larva (caterpillar), pupa (chrysalis) to adult annually. They live in the adult stage for 5–14 days, emerging between May and July. Specific timing varies depending on elevation and weather (Beyer & Black 2007, Potter et al. 2002). The flight period duration ranges from a week to over a month depending on the number of skippers present and weather conditions (e.g., wet or cold conditions delay emergence, conversely, warm and dry conditions promote earlier emergence). In Washington, peak flight period occurs in May in the south Puget Sound prairies and June-July in montane habitats (Pyle & LaBar 2018). Females lay eggs (oviposit) on specific grasses and sedges with host species varying by region. Females seek egg-laying sites by slowly flying and hovering just above the grassland vegetation, landing on their hostplant grasses, and then quickly laying single eggs (A. Potter, pers. obs.). The females drop eggs singly into the grass without affixing them to the host plant. James & Nunnallee (2011) identified five larval instar stages.

Studies in the south Puget Sound found that eggs hatch within 7–10 days and larvae move little, if at all, from their natal host plant. They feed until late fall, overwinter (diapause) as larvae in silken chambers at the base of grass tufts, and emerge the following spring to feed again before pupating in April (Henry 2010, Henry & Beyer 2013). Research conducted in the southeastern Cascades also suggests that populations overwinter as larvae (Beyer 2009, Beyer & Black 2007). Male butterflies emerge first, followed by females; late-season individuals are primarily or solely females (A. Potter, WDFW, unpubl. data). Both males and females feed by using their long proboscis to explore flowers and sip floral nectar. Mardon skippers use a diverse selection of nectar plants across the species range (Appendix A). Male mardon skippers seek mates by perching on low vegetation and then darting out to inspect passing butterflies to determine if they are female (A. Potter, pers. obs.). When males detect another male, they engage in territory defense behavior of tight, upward spiraling flight. There are no detailed studies that examine survivorship of different life stages of mardon skippers.

**Movements.** Limited research indicates that mardon skippers are relatively sedentary and do not migrate; they fly low, close to ground vegetation, rarely dispersing beyond their natal meadows. Few data on dispersal distance have been reported, but based on observations of grassland feeding skippers, dispersal distances are likely very limited. The annual dispersal distance for the species is generally assumed to be 0.5 mi (0.8 km) or less (Potter & Fleckenstein 2001). However, Runquist (2004) observed three marked males that had dispersed up to 1.0 mi (1.6 km) in a southern Oregon coastal population. Mardon skippers often occur in multiple grassland sites in close proximity, some very small with a small number of skippers. These sites are likely part of a metapopulation, in which the smaller sites wink ‘on and off’ with extirpations and re-colonization (Hanski 2004). The species’ short, rounded wings do not appear to be adapted for long-distance dispersal, and the lack of intervening populations between the distinct geographic areas suggests the species probably evolved under more open, contiguous environmental conditions (Runquist 2004).

Mardon skippers will fly along narrow gravel roads and powerlines and use roadside meadows and small grassy openings where nectar plants are available; they have not been observed flying through closed-canopy forest (Potter & Fleckenstein 2001). Several mardon skipper sites are surrounded by closed-canopy forest which likely creates barriers that isolate these sites. Historic conditions in the southern Cascades landscape prior to fire suppression included more open grassland habitats (Agee 1994) that would have facilitated mardon skipper dispersal and interconnection of populations (metapopulation structure). When mardon skipper numbers increase, some individuals may disperse using habitat corridors and colonize nearby suitable habitat (Potter & Fleckenstein 2001).

### **Habitat Requirements**

Mardon skippers have narrow habitat requirements, the characteristics of which vary by region. Generally, mardon skippers require open grassland habitat that is dominated by short-statured grasses or sedges and forbs including larval host plants (grasses and sedges), and nectar sources for adults. Across their range, mardon skippers have been observed feeding on floral nectar from many species (Appendix A). Mardon skippers require specific environmental and structural conditions that facilitate successful reproduction and survival through their annual cycle. Occupied sites retain sufficient moisture for host plants to remain green during larval development but are not persistently wet (Beyer & Black 2007, Kerwin 2011). They occupy grassland patches as small as 0.5 ac (0.2 ha), but these smaller patches are typically within a network of multiple sites. Habitat quality is probably more important than its extent; if plants needed for oviposition and nectar disappear from a site, local extinction will follow. Availability of flower nectar is important for the survival of adult butterflies; nectar provides water and carbohydrates necessary to meet energetic needs for flight and allows females to produce more eggs (Murphy et al. 1983).

Female butterflies are selective during oviposition, depositing eggs in locations that are favorable to larval development and survival. Larvae generally cannot travel far, if at all, from their natal locations. Females select sites away from trees to lay eggs (oviposition sites), possibly because tree and shrub cover reduces solar insolation, and shading of habitat creates a cooler environment (Beyer & Schultz 2010, Henry & Schultz 2012). Mardon skippers also seldom fly higher than one meter. The short, open structure of grass and sedge communities is important to facilitate access to oviposition sites and nectar sources. Plant communities dominated by nonnative grasses and woody shrubs reduce and restrict mobility and access to nectar plants and host plants. Habitat structure and oviposition plant species vary somewhat between the five regions where mardon skippers occur. We focus discussion below on occupied habitat requirements for mardon skippers that occur in the southern Washington Cascades and the south Puget Sound.

***Southern Washington Cascades.*** In the southern Washington Cascades, mardon skippers are found in a variety of habitat types on both the west and east crest of the southern Cascades. Habitats range from dry to mesic meadows associated with wetlands, riparian areas, and old clear-cuts, at elevations from 1,800 to 5,500 ft (549–1,677 m). Jurisdictions include the Gifford Pinchot and Okanogan-Wenatchee National Forests, Yakama Indian Reservation, Conboy National Wildlife Refuge, Washington Department of Natural Resources, and private lands. Some of the Gifford Pinchot National Forest sites are in older clear-cuts which are now dominated by fescue bunchgrasses, and site conditions range from dry to mesic meadows associated with wetlands or riparian habitats (Potter et al. 1999, 2002). In contrast, the Okanogan-Wenatchee National

Forest sites are located on the eastside of the Cascade Crest and the habitat consists of mostly mesic montane meadows with a permanent water source, e.g. springs or riparian habitat.

Mardon skippers in the southern Washington Cascades select for open habitats, high graminoid cover, and meadow-specific vegetative structure (Beyer & Schultz 2010). Females tend to be host plant generalists, laying eggs on 23 species (8 sedges and 15 grasses) across nine meadows. Out of the 23 host plants documented, Idaho fescue (*Fescue idahoensis*) and Kentucky bluegrass (*Poa pratensis*), were the two most common oviposition plants selected (Beyer & Schultz 2010). In contrast, in the Naches Ranger District mardon skippers appear to be strongly associated with onespike oatgrass (*Danthonia unispicata*) (Jepsen et al. 2008).

**South Puget Sound.** In the south Puget Sound lowlands, the mardon skipper is found on prairies with glacial outwash soils. Occupied sites are open grasslands with abundant Roemer's fescue (*Festuca roemerii*) interspersed with early blue violet (*Viola adunca*) and other nectar plant species (Hays et al. 2000). Adult mardon skippers select for short-statured (low structure), open areas that allow unconstrained access to nectar and oviposition plants. They may select areas with only limited cover of the invasive shrub Scotch broom (*Cytisus scoparius*) and invasive grasses such as tall oatgrass (*Arrhenatherum elatius* (L.) P. Beauv. ex J. Presl & C. Presl.). Puget Sound populations are specialists and use Roemer's fescue as the primary oviposition plant, though California oatgrass (*Danthonia californica*) is occasionally used for oviposition in areas of Scatter Creek (Beyer 2012, A. Potter, pers. obs.).

## POPULATION AND HABITAT STATUS

The mardon skipper's disjunct distribution (Figure 2) and strong association with early seral, semi-mesic grassland habitats suggest a relict distribution that was likely much more widespread during a drier post-glacial period (Runquist 2004). Populations in each disjunct geographic region have likely become isolated over long geologic time scales. Mardon skippers were likely more prolific within each disjunct geographic region prior to the widespread loss of grassland and montane meadow habitats due to fire suppression, invasive species, and development over the past century (Potter et al. 1999, Beyer & Schultz 2010, Halpern et al. 2010, Schultz et al. 2011).

Prior to 1979, there were three known locations of the mardon skipper: 1) Gifford Pinchot National Forest in Yakima County, Washington, 2) Grand Mound in Western Washington, and 3) Lake of the Woods, Klamath County, Oregon, based on three males in the collections of the American Museum of Natural History. Recent intensive survey efforts determined that these historic locations no longer support mardon skippers but discovered many other inhabited sites. In 1999, the mardon skipper was known from approximately 10 sites in the southern Cascades of Washington (Potter et al. 1999). Since that time, the USFS, Bureau of Land Management (BLM), WDFW, the Xerces Society, USFWS and others conducted surveys during 2000-2011 across the five disjunct regions, and documented 117 sites representing approximately 49 populations (Table 1; USFWS 2012 and references therein). "Sites" refers to the specific locations with documented species presence (some of which are single observations) and "populations" represent local clusters of sites that are assumed to function as a local population (USFWS 2012). The USFWS (2012) 12-month finding currently represents the best estimate of rangewide distribution and site occupancy of the mardon skipper,

as there have not been comprehensive surveys since that time. It is important to note that many of these sites have not been revisited in the last 10-15 years; therefore, the current status of mardon skippers has not been verified for many locations listed in the Table 1 (K. Van Norman, pers. comm.). Additional undocumented sites likely exist, particularly in the southern Washington Cascades, and it is likely that some previously occupied sites have become extirpated.

**Table 1.** Summary of known occupied sites and populations of the mardon skipper in Washington State (adapted from USFWS 2012).

LOCATION	Number of occupied sites	Estimated number of populations
<b>Polites mardon mardon</b>		
<b>Washington, South Puget Sound</b>		
Joint Base Fort Lewis-McChord, Pierce Co.	4	1
Thurston County	2	2?
<b>Washington, southern Cascades</b>		
Okanogan-Wenatchee NF	36	15
Gifford Pinchot NF	43	13
Yakama Indian Reservation	23	11
Private Ownership (Glenwood area)	6	4
Conboy Lake NWR	3	3
<b>TOTAL</b>	<b>~117 sites</b>	<b>~49 populations</b>

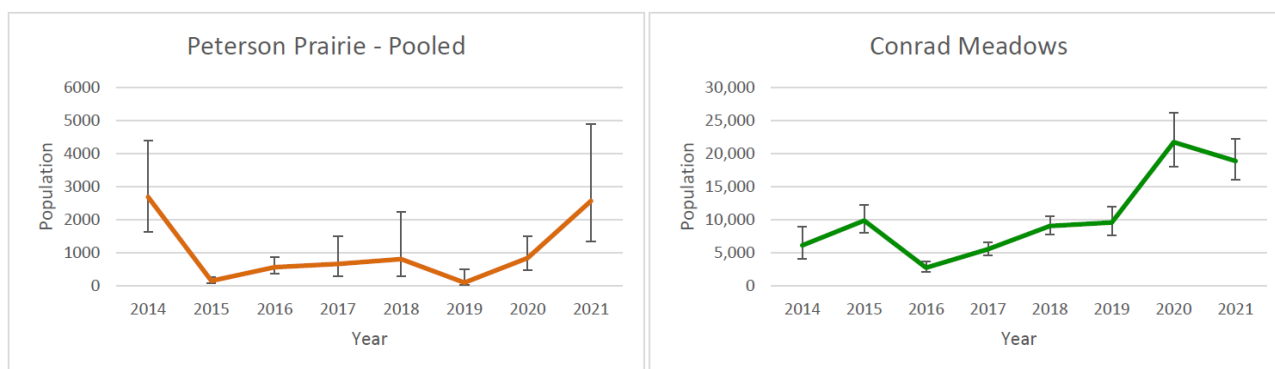
For a few selected sites, long-term monitoring efforts provide clear trends in population status over time in three geographic regions—southern Washington Cascades, the southern Oregon Cascades, and the south Puget Sound. Below we show relative abundance and population trends from the southern Washington Cascades and from the south Puget Sound populations.

### Southern Washington Cascades Status

In Washington State, of the 111 sites in the southern Washington Cascades, most (68% or 79 sites total) occur on the Okanogan-Wenatchee and the Gifford Pinchot National Forests. The remainder are on the Yakama Indian Reservation (23), private land (6), and Conboy Lake National Wildlife Refuge (3) (Table 1). Occupied areas range from small <math>< \frac{1}{2}</math> acre (<math>< 0.25</math> ha) sites situated in a network of grasslands and forest matrix, to large (80 ha; 200 ac) meadow complexes (Potter et al. 1999). A combination of survey methods has been employed across selected sites, including detection/no detection, random walks, and distance sampling (Hatfield et al. 2013a).

Since 2014, distance sampling surveys have been employed at the four largest mardon skipper ‘sentinel’ sites in the southern Washington and Oregon Cascades and will continue through the 2023 field season (Blackburn et al. 2021). The two sites in the southern Washington Cascades are located within the Okanogan-Wenatchee National Forest (Conrad Meadows) and the Gifford Pinchot National Forest (Peterson Prairie). Figure 3 shows an eight-year population trend from 2014-2021 at the two monitoring sites. Population estimates in 2021 for Peterson Prairie and Conrad Meadows were estimated a approximately 2,500-18,000, respectively, and appear to be relatively stable (Blackburn et al. 2021).





**Figure 3.** Population trend estimates for sentinel sites in Washington from 2014-2021 (from Blackburn et al. 2021).

While these two sites show robust numbers of mardon skippers, it is important to keep in mind that most of the known mardon skipper sites scattered throughout the southern Washington Cascades are small, fragmented, and support much lower numbers of mardon skippers (Potter et al. 1999, Blackburn et al. 2021). For example, in 2021, monitoring during the peak flight period across seven sites within the Peterson Prairie complex showed only three sites with mardon skippers, with counts ranging from only 3-35 individuals (Blackburn et al. 2021). Smaller, fragmented sites support few mardon skippers and are prone to forest encroachment. Conversion to forest from meadows is a key concern in many of the montane meadow sites.

### South Puget Sound Status

In the late 1980s, mardon skippers were found on eight sites in the south Puget Sound prairies, but today only three remain; one on the JBLM-AIA, and two at the Scatter Creek Wildlife Area (WLA). However, in 2022 only one population complex of mardon skippers were documented across the JBLM-AIA site. Prior to the 1990s, mardon skippers were more broadly distributed across the south Puget Sound prairies, but urban development, forest encroachment, introduction of invasive species, and land conversion to agriculture have reduced the south Puget Sound region prairies to a fraction of their previous extent. Currently, less than 3% of that original prairie landscape remains dominated with native prairie (Crawford & Hall 1997).

2022 is the first year in which no mardon skippers were detected in Thurston County. Several years of monitoring will be needed to determine if populations of mardon skippers are extirpated from Thurston County. Some of the highest numbers of mardon skippers in Thurston County were detected in 2008 and 2009 at the Scatter Creek WLA (Buckland et al. 2001). Potter & Olson (2012) estimated density per hectare and maximum abundance. The maximum estimated abundances in 2008-2009 at Scatter Creek South were 324–801 and 189–204 at Scatter Creek North. These estimates show much higher numbers observed in the past compared to today. As a result of the low number of butterfly observations in recent years, mardon skippers have been systematically surveyed at Scatter Creek North and South Units since 2013. Surveyors methodically traversed suitable habitat, historical locations, and areas outside previously documented areas. Results showed a steep decline in observations per year after 2017 at both sites (Table 2).

**Table 2.** Total counts by year of mardon skippers detected during systematic surveys from 2013-2022 at Scatter Creek Wildlife Area, North and South units, Washington (Potter & Gill 2021, Potter 2018 & 2019, Potter unpubl. data).

Site/Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Scatter Creek North	3	14	19	17	36	3	2	1	0	0
Scatter Creek South	9	20	29	86	92	30	20	24	4	0

The JBLM-AIA mardon skipper population in Pierce County is the only known location of mardon skippers where mardon skipper can be found in the south Puget Sound. Currently, there are approximately four sites that make up one population across the 7,000-acre complex. There are a variety of vegetation conditions within the several square miles of JBLM-AIA, most of which have been significantly affected by the frequent fires resulting from ordnance explosions. The closed, undeveloped nature of the JBLM-AIA, coupled with a low-intensity, high fire frequency, has in some areas supported significant patches of mardon skipper habitat. However, fire intensity and frequency have increased on the JBLM-AIA in recent years, resulting in a shift from native fescue to non-native annual grasses in some mardon skipper occupied areas (A. Potter pers. comm.).

Mardon skippers have been recorded incidentally at JBLM-AIA during monitoring for Taylor’s Checkerspot from 2012-2021 (Linders unpub. data, Olson & Linders 2010, Linders 2012, Steele 2021). Table 3 shows counts of mardon skippers at the peak of the flight period on JBLM-AIA site R50 and R76 (Linders unpubl. data). There is a slight upward trend from 2018; however, numbers were much lower than historical observations. For example, prior to 2009 at R76, which was the most densely occupied area of the JBLM-AIA, 100/day were typically observed compared to <5/day more recently (M. Linders, pers. comm.). Like Scatter Creek WLA, the mardon skipper is in a precarious state at JBLM-AIA. JBLM-AIA is a multiple use area (e.g., military training activities) with limited opportunities for grassland restoration. Mardon skipper numbers remain far below their potential given the vast expanse of apparently suitable habitat (M. Linders, pers. comm., R. Gilbert pers. comm.).

**Table 3.** Peak count of mardon skippers<sup>a</sup> at JBLM-AIA from 2012-2020 (Linders unpubl. data).

Site/Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>R50 Peak Count</b>	29	9	14	18	4	12	58	106	143
Survey length (m)	9850	9850	9850	9850	9850	9850	9850	9850	9850
Survey area (ha)	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6	24.6
<b>R76 Peak Count</b>	35	1	6	8	0	4	7	24	24
Survey length (m)	8400	8400	8400	8400	8400	8400	8400	8400	8400
Survey area (ha)	42	42	42	42	42	42	42	42	42

<sup>a</sup>Data taken while conducting distance sampling for Taylor’s checkerspot, so numbers should be seen as rough estimates and likely are underestimated because mardon skipper was not the target species.

## FACTORS AFFECTING CONTINUED EXISTENCE

### Adequacy of Regulatory Protection

**Sites on federal lands.** In 2012 the U.S. Fish and Wildlife Service published a 12-month finding on a petition to list the mardon skipper under the Endangered Species Act (USFWS 2012). They found that the listing was not warranted because increased survey efforts from 2000-2011 dramatically increased the number of known sites, predominantly on national forests. The majority (76%) of the sites throughout the species' range occur on federal lands managed by the USFS, BLM, NPS, and USFWS, as well as tribal lands owned by the Yakama Nation (17%). However, even though the mardon skipper was not federally listed, it is recognized as a USFS Region 6 Sensitive Species and a BLM Special Status Species. As a result, it is considered and addressed during the planning and implementation of USFS and BLM land management activities. The USFS and the Oregon/Washington BLM office established the Interagency Special Status/Sensitive Species Program (ISSSSP) to facilitate the conservation and management of rare species on federal lands (<https://www.fs.fed.us/r6/sfpnw/issssp/>). This interagency collaboration focuses on regional-level conservation approaches for Sensitive and Special Status Species.

The Joint Base Lewis-McChord Integrated Natural Resources Management Plan (JBLM INRMP) calls for monitoring efforts for several rare butterflies including the mardon skipper, and while there are no specific conservation plans for the mardon skipper, the broader management strategies aimed at reducing Scotch broom and other invasive species lead to increases in suitability of habitat for mardon skipper (JBLM INRMP 2019). Mardon skipper habitat on JBLM-AIA is being maintained incidentally through fires ignited during military training, and large areas of habitat are relatively protected from development and off-road vehicle use due to the presence of unexploded ordnance. JBLM cooperates in an interagency effort to restore and maintain prairie habitats for the mardon skipper and other prairie species on sites currently unoccupied by mardon skipper. With some conservation measures in place, the limited protections on Department of Defense and other federal lands are not adequate to prevent decline due to the multi-use factors that occur at these sites (e.g., damage by ORV's, invasive species, high-frequency fires, forest encroachment).

**State, county, and city protections.** Mardon skipper is listed as a State Endangered species and protected by state law. Therefore, it is unlawful to hunt, possess, maliciously harass, or kill mardon skippers or to maliciously destroy their eggs (RCW 77.12.020, RCW 77.15.130). All state-listed species are also Priority Species in WDFW's Priority Habitats and Species program (PHS; WDFW 2008). The PHS program is considered best available science and is used by local jurisdictions to guide development of critical areas ordinances to conserve PHS-listed species and habitats. County and/or municipal critical area ordinances require environmental review and habitat management plans to protect the species from development proposals in areas that have a primary association with the species. Jurisdictions generally consult with WDFW, and may impose conditions on development to avoid, minimize, and mitigate impacts to PHS species. The federally endangered Taylor's checkerspot (*Euphydryas editha taylori*) is included in Thurston County's HCP and overlaps in distribution with mardon skipper, and there may be some indirect conservation benefits. However, these protections are not adequate to prevent extirpation in the south Puget Sound, in part due to habitat alteration that preceded protections, and the multiple interacting factors that increase mortality of small, isolated populations.

## Factors Affecting Populations of the Mardon Skipper

Mardon skipper populations face a variety of threats and factors affecting populations, including conifer and shrub encroachment, invasive species, grazing by domestic livestock (sheep and cattle), off-road vehicle (ORV) use of meadows, prescribed and natural fire, recreation (including camping), pesticides, issues related to small population size, and climate change. Sources of the different threats may differ by region, while there are some threats common to all regions. Mardon skippers are not migratory, and sites are isolated, so recolonization of extirpated sites is unlikely or very limited. Many populations at one or more sites are small and at risk of extirpation due to fluctuations of weather, food supply, wildfires, normal demographic fluctuations, and human disturbances. Balancing the requisite prairie disturbance with fire or mowing, endangered species management, and invasive plant invasion control must be done with a very deliberate and careful approach (Schultz 1998, Schultz & Crone 2008, Schultz et al. 2011). Below we provide a few examples of the major threats across the species' range with special attention to populations that occur in Washington.

**Habitat loss and degradation.** Historical grasslands in western Washington (~73,000 hectares) have been reduced by about 91% and only 2-3% of what remains are still dominated by native species (Hall et al. 1995). In addition, Foster (2010) shows that forest succession over the past 60 years has reduced mardon skipper meadow habitat to a few isolated patches ranging in size from 2 to 8 ac (0.8 to 3.2ha). The loss of meadow, prairie and grassland habitats are a central concern for mardon skipper recovery. See *Habitat Status* section above for further information regarding habitat loss and land use conversion.

**Invasive Species.** Invasive plants have dramatically altered the ecological function of Pacific Northwest prairies (Dunwiddie & Bakker 2011). Woody shrubs, including Scotch broom and non-native grasses, especially tall oatgrass, bentgrasses (*Agrostis*), and sweet vernal grass (*Anthoxanthum odoratum*) have invaded most extant south Puget Sound prairies. Similarly, invasive plants are a key threat. Uncontrolled, these plants dominate native prairie vegetation and change vegetation structure and soil conditions. Early blue violet, a key nectar resource, is likely reduced in south Sound prairies from historical abundance due to competition with a variety of non-native invasive plants, including hairy cat's ear (*Hypochaeris radicata*) (Hays and Johnson 1998) and introduced grasses and shrubs (McCorkle et al. 1980).

**Forest encroachment and fire suppression.** Mardon skippers avoid densely forested habitats and forest edges and trees during oviposition, and are assumed to have limited dispersal abilities (Runquist 2004, Beyer & Black 2007; Beyer & Schultz 2010). Conifer encroachment occurring on many of the meadow and grasslands sites in the Puget Sound and particularly in the Cascades has greatly reduced open meadow habitat, connectivity, and dispersal corridors (Tveten 1997, Roland & Matter 2007, Kogut 2008, Black et al. 2010, Beyer & Schultz 2010, Fallon & Hatfield 2013, Schmidt 2015, St. Hiliare 2017). Decrease in fires, grazing, forest edge, and climate change are possible factors influencing significant establishment of trees (Franklin et al. 1971). One estimate found that 39% of the original south Puget Sound prairie habitat has transitioned to Douglas-fir forest (Tveten 1997).



**Prescribed and wildfire.** Both prescribed and wildfires affect mardon skipper. Prescribed fire is a common and important management tool to maintain vegetation structure and composition that can have benefits (e.g., increased habitat quality) and costs (e.g., mortality) (Schultz and Crone 1998). However, small, isolated populations of sedentary insects like the mardon skipper are likely highly vulnerable to fire (Dana 1991, Schultz & Crone 1998, Warren et al. 1987). While important for habitat connectivity, habitat and invasive species management, large scale wildfires can cause decline and negatively impact mardon skippers. For example, mardon skipper numbers dropped at the South Unit of Scatter Creek following a large fire at the site in August of 2017 (Figure 3). Large-scale wildfires in recent years in the southern Cascades have also likely decreased mardon numbers, but surveys are needed to determine if mardon skippers have re-colonized these sites post fire (V. Harke, pers. comm.)

**Meadow damage by off road vehicles (ORVs).** Many of the meadows in the Cascades are accessible by ORV's (quads and four-wheel drive trucks) via spur roads or openings between roadside trees (Figure 4, Kogut 2008, Keller & Vilella 2021). Vehicles also drive up closed spur roads, wood tracks, or even the Pacific Crest Trail and other linear features to access the meadows and points beyond. These sites are relatively remote, and enforcement of closures is difficult. Mardon skipper eggs, larvae, pupae, and adults are likely killed by recreational activities such as ORVs (Potter et al. 1999, Blackburn et al. 2021). ORVs can also destroy habitat and plants, and potentially alter hydrologic regimes, which in turn can alter plant composition and vegetative structure. These activities can also damage native host plants and aid the dispersal of invasive non-native species deep into forestlands (Rooney 2005). Black et al. (2010) noted that off road vehicle damage may have led to the extirpation of two sites in Oregon, and they noted damage from ORVs at several other sites.

**Military training on JBLM-AIA.** The closed, undeveloped nature of the JBLM-AIA, coupled with the frequency of low-intensity fires, has in some areas maintained significant patches of mardon skipper habitat. However, the frequency and type of use in the JBLM-AIA has changed over time. Over the past two decades, changes in military training needs have led to the development of new roads, and training and target structures (M. Linders, pers. comm.). Increased fire frequency and earlier fire timing (e.g., in June) mainly due to climate warming (see *Climate Change* section below) are also likely threats to mardon skippers and their habitat (R. Gilbert, pers. comm.).

**Livestock grazing.** Unmanaged cattle grazing can negatively affect skipper habitat, resulting in the loss of nectar sources and larval food plants, introduce invasive plants, and can destroy eggs, larvae, pupae and adults, as well as increase nutrient loads which favor invasive grass species. Intensive grazing has been an issue at many mardon skipper sites in the Cascades (Kogut 2008, Black et al. 2010).

Well managed grazing may be beneficial in certain instances. For example, St. Hiliare (2017), noted that when cattle were excluded or restricted from two mardon skipper sites, a build-up of thatch resulted which can choke out short grass species and change the vegetation community; at those sites some degree of livestock grazing was desirable. For grazing to have a minimal impact on the mardon skipper, the combination of timing, intensity, and duration must be found that is best suited for the specific ecology of

the butterfly. In some sites the correct solution may be to eliminate grazing, while in other sites some grazing may be beneficial (J. St. Hiliare, pers. comm.).

**Pesticides/Herbicides.** Pest control is an integral part of intensive forest management. BTK (*Bacillus thuringiensis* var. *kurstaki*), a bacterium which is lethal to butterfly and moth larvae when ingested, has been used as a lepidopteran-specific insecticide but has also been shown to have detrimental impacts on non-target lepidopteran species (Whaley 1998). It is used to treat defoliators such as Douglas-fir Tussock Moth (*Orgyia pseudotsugata*), Western Spruce Budworm (*Choristoneura occidentalis*) and Gypsy Moth (*Lymantria dispar*) (Bai et al. 2009). Several of the southern Washington Cascade mardon skipper sites are in areas where applications of BTK were used on state, tribal, and private lands to control spruce budworm outbreaks in the late 1990's (Potter et al. 1999); however, in the last 10-15 years BTK hasn't been used in forest districts where mardon skipper occurs (pers. comm. J. Bernatowicz, J. Jakubowski, G. Kohler) so is not considered a current threat. The use of herbicides requires careful consideration when applied in or near occupied skipper sites (Russell and Schultz 2010). Roads are used as dispersal routes for this species, serving to connect occupied or other potential grasslands or meadows. Roadside spraying of herbicides for maintenance may impact nectar food sources or altering the vegetative structure making conditions unsuitable for mardon skipper dispersal but it is currently unknown the degree to which herbicides are a substantial threat to the species.

**Climate change.** A recent study that examined population trends in over 50 butterfly species across the western United States showed a clear decline in butterfly densities that correlated with warming and drying landscapes (Forister et al. 2021). Overall, they found single-brooded species like the mardon skipper to be more susceptible to decline. It is likely that mardon skipper and its habitat will continue to be affected by climate change in several key areas such as changes in annual precipitation and temperature.

Climate models predict an increase in winter precipitation, decline in snowpack, and a decrease in summer precipitation in western Washington (Littell et al. 2009, Mote & Salathé 2009). Temperature changes will likely disrupt plant and butterfly phenology (Kharouba & Vellenda 2015). Both temperature and precipitation changes may lead to timing mismatches between mardon skipper, host plants, and food plants, and may affect overwintering survivorship. Early senescence and/or low recruitment of plants will likely adversely impact nectar resource and host plant availability during mardon skipper flight period and larval life cycle. Also, drier conditions are likely to favor invasive grasses that thrive in warmer, drier site conditions.

There is some evidence that Scatter Creek WLA and JBLM-AIA sites are experiencing warmer summer temperatures in combination with less precipitation, which is likely affecting the availability and/or timing of nectar plants and host plant survival, resulting in increased fire frequency. For example, fire frequency has increased at JBLM-AIA in April and May due to lower-than-normal rainfall in the early spring compared to historic patterns (R. Gilbert, pers. comm.) In addition, erratic precipitation and a historic 20-year drought have likely reduced germination and seedling survival of host plants (e.g., fescue) and increased annual invasive grasses that further alter fire regimes (M. Linders, pers. comm.). Climate change may also affect the mardon skipper populations in montane meadow habitats in higher elevations. The prevalence of wildfires,

insect infestations, disease epidemics, and drought-induced dieback of forests are all potential climate change impacts and may fundamentally alter forest composition and land cover (May et al. 2018).

Loss of snowpack in montane meadows may also negatively impact mardon skipper populations. Declining trends of snowpack are observed across all months, states, and climates, but are largest in spring in the Pacific states, with faster losses in milder climates like the Cascades (Mote et al. 2018). Loss of snowpack may lead to temperature instabilities and affect survivorship of larvae that overwinter in their natal hostplant tufts (K. Van Norman, pers. comm.)

***Illegal collecting.*** Illegal trade of listed, protected, and rare butterflies sometimes occurs. However, there is currently no evidence that overcollection is a threat to the mardon skipper.

## MANAGEMENT ACTIVITIES

***Habitat protection and restoration.*** Mardon skipper habitat management in the southern Washington Cascades populations has included conifer removal projects and placement of boulders to block off-road vehicle access, more closely monitoring grazing and building exclosures to exclude cattle from some mardon skipper sites, and spot treatment of invasive plants (e.g., Kogut 2008, Foster 2010, Jakubowski 2015, Wainwright 2016, St. Hiliare 2017). The USFS developed site management plans for the southern Washington Cascades sites that outline threats to habitat/populations and actions needed to address them (e.g., St. Hiliare 2017). As a regional priority, USFS and BLM continue to focus on monitoring and conservation efforts to reduce threats for the mardon skipper, including removal of encroaching conifers and shrubs, invasive plant treatments, and limiting recreation activities (e.g., OHV) in sensitive areas.

The Joint Base Lewis-McChord INRMP calls for monitoring of the mardon skipper and other rare butterflies, but there are no specific conservation plans focused on mardon skipper. However, other management activities such as the control of invasive plants increase habitat quality for mardon skipper (JBLM INRMP 2019). WDFW has been conducting habitat restoration at the Scatter Creek WLA to protect and enhance mardon skipper populations. Ongoing efforts include prescribed fire, direct seeding of native species, mowing, and herbicide control of Scotch broom and exotic grasses and forbs (Hays 2010). However, this site has experienced severe declines in habitat quality over the last decade because of a catastrophic fire in 2017 and the lack of resources needed to adequately address the scale of restoration and management needed. WDFW is also restoring once-occupied habitat at West Rocky Prairie WLA and is working with Washington Department of Natural Resources (WDNR) to restore and evaluate habitat at Mima Mounds Natural Area Preserve for potential reintroduction. Ongoing habitat management efforts are funded by grants from the Recreation and Conservation Office and Competitive State Wildlife Grants.

***Research.*** In addition to work on developing monitoring methods (Potter & Olson 2012, Hatfield et al. 2013), research has been conducted to document mardon skipper habitat characteristics and plants needed as larval hosts and for nectar at various sites and across regions (Hays et al. 2000, Hays 2010, Beyer 2009, 2012, Beyer & Schultz 2010, Henry 2010, Henry & Schultz 2012). Runquist (2004) marked 238 mardon skippers in a California population to document movements. The effect of prescribed burns on mardon skipper numbers

was investigated by the Xerces Society before and after the Coon Mountain prescribed burn on Forest Service land in California (Black et al. 2013). WDFW is working with partners to investigate the genetic structure among mardon skipper populations across its range, as there remains uncertainty about appropriate subspecific taxonomy.

***Captive breeding.*** WDFW worked with the Oregon Zoo to conduct methods testing for captive oviposition and rearing of mardon skipper in the south Puget Lowlands from 2004-2009. Important species recommendations and techniques were developed to improve husbandry success (Linders 2007, Andersen et al. 2009). However, an abundant source population will be important for further methods refinement. Due to funding and logistical constraints the captive rearing trials ended, but lessons learned can provide a useful starting point for future efforts if it is determined that captive rearing should be used as a conservation strategy to increase mardon skipper population size.

***Conservation planning and partnerships.*** With dedicated funding from the Interagency Special Status Species Program (ISSSP), the Forest Service/BLM have formed the interagency Mardon Skipper Work Group, which meets annually to share information and ideas and to plan future conservation work for the mardon skipper. Partners in conservation of mardon skippers include the U.S. Forest Service/Bureau of Land Management ISSSP, U.S. Fish and Wildlife Service, Xerces Society for Invertebrate Conservation, Center for Natural Lands Management, Ecostudies Institute, Washington Recreation and Conservation Office, Joint Base Lewis-McChord, Gifford Pinchot National Forest, Wenatchee-Okanogan National Forest, Washington Department of Natural Resources, Conboy National Wildlife Refuge and the Yakama Nation.



## CONCLUSION AND RECOMMENDATION

Although many additional mardon skipper sites, including a few large populations, have been found in the southern Washington Cascades since state listing (Potter et al. 1999), the south Puget Sound prairie population that represents a significant portion of its range has declined severely, and its status is precarious. Though some populations in the southern Cascades are robust compared to the declining south Puget sound populations, most southern Cascade populations are small, fragmented and face several threats. Washington defines “Endangered” to mean any wildlife species native to the state that is seriously threatened with extinction throughout all or a significant portion of its range. Given that the south Puget Sound populations represent a significant portion of its range and the threat of extinction in these few remaining areas is high, it is recommended that the mardon skipper remain listed as endangered in Washington.

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The references that are cited in the *Periodic Status Review* for the mardon skipper are categorized for its level of peer review pursuant to section 34.05.271 RCW, which is the codification of Substitute House Bill 2661 that passed the Washington Legislature in 2014. A key to the review categories under section 34.05.271 RCW is provided in Table A.

**Table A. Key to 34.05.271 RCW Categories:**

<b>34.05.271(1)(c) RCW</b>	<b>Category Code</b>
(i) Independent peer review: review is overseen by an independent third party.	i
(ii) Internal peer review: review by staff internal to the department of fish and wildlife.	ii
(iii) External peer review: review by persons that are external to and selected by the department of fish and wildlife.	iii
(iv) Open review: documented open public review process that is not limited to invited organizations or individuals.	iv
(v) Legal and policy document: documents related to the legal framework for the significant agency action including but not limited to: (A) federal and state statutes; (B) court and hearings board decisions; (C) federal and state administrative rules and regulations; and (D) policy and regulatory documents adopted by local governments.	v
(vi) Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under the processes described in (c)(i), (ii), (iii), and (iv) of this subsection.	vi
(vii) Records of the best professional judgment of department of fish and wildlife employees or other individuals.	vii
(viii) Other: Sources of information that do not fit into one of the categories identified in this subsection (1)(c).	viii

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**APPENDIX A.** Examples of mardon skipper nectar resources across the species range (Newcomer 1966, Hays et al. 2000, Hays et al. 2002, Hays 2010, Potter & Fleckenstein 2001, Haggard 2003, Beyer and Black 2007, Blackburn et al. 2020, Sabin 2021, M. Linders, WDFW, unpubl. data, A. Potter, WDFW, unpubl. data).

Scientific Name	Common Name
<i>Achillea millefolium</i>	Yarrow
<i>Anaphalis margaritacea</i>	Pearly everlasting
<i>Armeria maritima</i>	Sea thrift
<i>Balsamorhiza deltoidea</i>	Puget balsamroot
<i>Calochortus</i> spp.	Sego Lily
<i>Calochortus subalpinus</i>	Mariposa lily
<i>Collinsia</i> spp.	Blue-eyed Mary
<i>Camassia quamash</i>	Common camas
<i>Castilleja</i> spp.	Paintbrush
<i>Eriophyllum</i>	Oregon sunshine
<i>Erigeron peregrinus</i>	Wandering fleabane
<i>Erysimum capitatum</i>	Wallflower
<i>Eurybia conspicua</i>	Western showy aster
<i>Fragaria virginiana</i>	Strawberry
<i>Hieracium</i> spp	Hawkweed
<i>Lilium columbianum</i>	Tiger lily
<i>Lomatium utriculatum</i>	Fine-leaved desert Parsley
<i>Lupinus lepidus</i>	Prairie Lupine
<i>Penstemon</i> spp.	Penstemon
<i>Plectritis congesta</i>	Seablush
<i>Plagiobothrys figuratus</i>	Fragrant popcorn flower
<i>Phlox diffusa</i>	Phlox
<i>Potentilla</i> spp.	Potentilla
<i>Prunella vulgaris</i>	Self-heal
<i>Saxifraga integrifolia</i>	Wholeleaf Saxifrage
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed-grass
<i>Trifolium longipes</i>	Long-stalked clover
<i>Trifolium repens</i>	White clover
<i>Vicia americana</i>	American vetch
<i>Vicia sativa</i>	Common vetch
<i>Ranunculus occidentalis</i>	Western Buttercup

# WASHINGTON STATE STATUS REPORTS, PERIODIC STATUS REVIEWS, RECOVERY PLANS, AND CONSERVATION PLANS

## Periodic Status Reviews

2021	Ferruginous Hawk
2021	Humpback Whale
2021	Gray Whale
2021	Stellar Sea Lion
2021	Greater Sage-grouse
2020	Mazama Pocket Gopher
2019	Tufted Puffin
2019	Oregon Silverspot
2018	Sea Otter
2018	Pygmy Rabbit
2017	Sharp-tailed Grouse
2017	Fisher
2017	Blue, Fin, Sei, North Pacific Right, and Sperm Whales
2017	Woodland Caribou
2017	Sandhill Crane
2017	Western Pond Turtle
2017	Green and Loggerhead Sea Turtles
2017	Leatherback Sea Turtle
2016	American White Pelican
2016	Canada Lynx
2016	Marbled Murrelet
2016	Peregrine Falcon
2016	Bald Eagle
2016	Taylor's Checkerspot
2016	Columbian White-tailed Deer
2016	Streaked Horned Lark
2016	Killer Whale
2016	Western Gray Squirrel
2016	Northern Spotted Owl
2016	Greater Sage-grouse
2016	Snowy Plover
2015	Stellar Sea Lion

## Conservation Plans

2013	Bats
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## Status Reports

2021	Oregon Vesper Sparrow
2019	Pinto Abalone
2017	Yellow-billed Cuckoo
2015	Tufted Puffin
2007	Bald Eagle
2005	Mazama Pocket Gopher, Streaked Horned Lark, and Taylor's Checkerspot
2005	Aleutian Canada Goose
1999	Northern Leopard Frog
1999	Mardon Skipper
1999	Olympic Mudminnow
1998	Margined Sculpin
1998	Pygmy Whitefish

## Recovery Plans

2020	Mazama Pocket Gopher
2019	Tufted Puffin
2012	Columbian Sharp-tailed Grouse
2011	Gray Wolf
2011	Pygmy Rabbit: Addendum
2007	Western Gray Squirrel
2006	Fisher
2004	Sea Otter
2004	Greater Sage-Grouse
2003	Pygmy Rabbit: Addendum
2002	Sandhill Crane
2001	Pygmy Rabbit: Addendum
2001	Lynx
1999	Western Pond Turtle
1996	Ferruginous Hawk
1995	Upland Sandpiper

Status reports and plans are available on the WDFW website at:  
<http://wdfw.wa.gov/publications/search.php>