Taylor's Checkerspot Butterfly
(*Euphydryas editha taylori*)

5-Year Review:
Summary and Evaluation

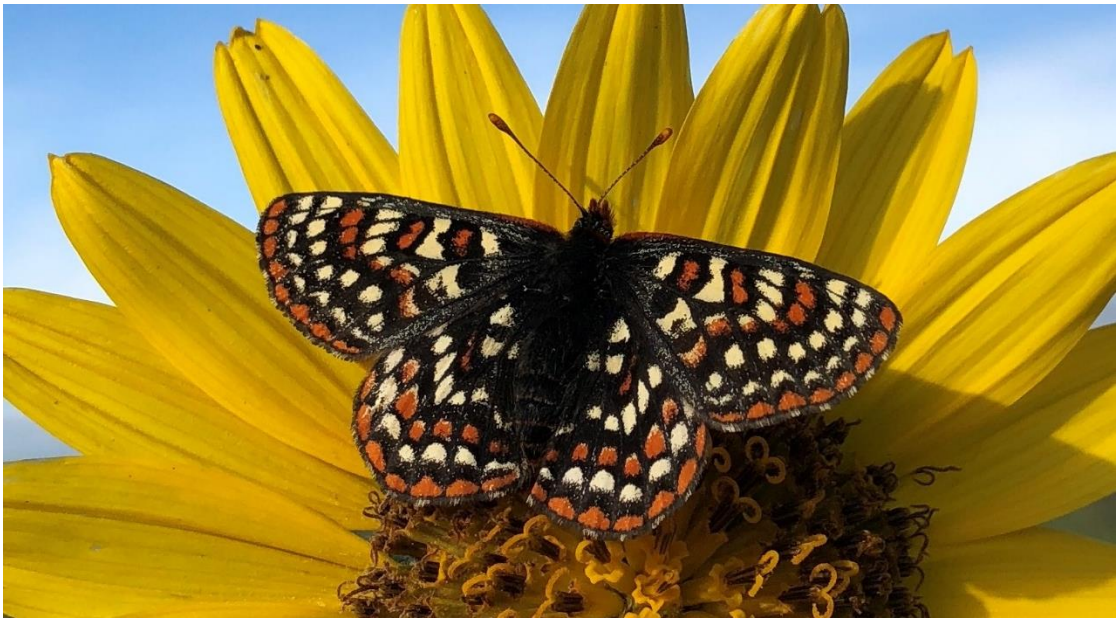

Photo of Taylor's checkerspot butterfly on plant: Dan Grosboll/U.S. Fish and Wildlife Service/2018

U.S. Fish and Wildlife Service
Washington Fish and Wildlife Office
Lacey, Washington

August 2024

5-YEAR REVIEW
Taylor's checkerspot butterfly (*Euphydryas editha taylori*)

GENERAL INFORMATION:

Species: Taylor's checkerspot butterfly (*Euphydryas editha taylori*)
Date listed: November 4, 2013
FR citation(s): 78 FR 61506
Classification: Endangered
Critical habitat: No critical habitat designated
Current Recovery Priority Number: 3C

This recovery priority number is indicative of a species with a high degree of threat and a high potential for recovery.

BACKGROUND

Methodology used to complete the review: In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a 5-year review is to assess each threatened and endangered species to determine whether its status has changed and it should be classified differently or removed from the List of Threatened and Endangered Wildlife and Plants. Public notice of this review was given in the *Federal Register* and a 60-day comment period was opened on June 11, 2019 (84 FR 27152-27154). Data for this review were solicited from interested parties through this *Federal Register* notice as well as on our Washington Fish and Wildlife Office website. We requested information from all parties responsible for the conservation of the species (e.g., Federal and state agencies), researchers who work on or have worked on Taylor's checkerspot butterfly, and other conservation partners who may have expertise in the species. Additionally, to support this review and recovery documents for the species, we developed a species biological report (SBR) (Service 2024, entire) and requested review and input from species experts across the range. The SBR represents our evaluation of the best available scientific and commercial information, including species ecological needs, factors influencing the species, and the current condition of the species. Independent peer reviewers and partner representatives reviewed the SBR before it was used as the scientific basis to support our 5-year review decision-making process.

FR Notice citation announcing this status review:
USFWS. 2019. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews for 91 Species in Oregon, Washington, Hawaii, and American Samoa. 84 FR 27152. June 11, 2019.

REVIEW ANALYSIS

Updated Information and Current Species Status

Since the 2013 listing of Taylor's checkerspot butterfly, a variety of conservation-related actions have occurred across the range of the species. These actions have influenced the recovery strategies for the species and built a foundation of information or agreements that will benefit the species in the future. Taylor's checkerspot butterfly populations, habitat, and recovery areas are spatially complex and interact at multiple scales. The following information is summarized from the SBR, with additional information and data for the years after 2022, which were not included in the SBR, also incorporated into our review and status assessment.

Research and Monitoring

Research and monitoring efforts have advanced our understanding of Taylor's checkerspot butterfly distribution, habitat use, habitat characteristics, biology, genetics, and impacts to the species due to various management practices. At the time of listing, it was known that this species is dependent on early successional herbaceous vegetation, but research has refined the application of prescribed fire as well as the best methods for controlling encroaching woody vegetation. In addition, evidence from monitoring at Graysmarsh and Joint Base Lewis-McChord (JBLM) indicates that the abundance of one of the Taylor's checkerspot butterfly's host plants, narrowleaf plantain (*Plantago lanceolata)*, is reduced when there is no off road or road adjacent vehicle disturbance. When working with federal and non-federal partners, this information has helped minimize potential impacts to the species and increase the effectiveness of management actions.

The Service has supported several Taylor's checkerspot butterfly research efforts with Washington Department of Fish and Wildlife (WDFW). These research projects have advanced our understanding of Taylor's checkerspot butterfly genetics (Severns, Bower, and Potter 2013), host plant use (Haan 2017), and oviposition host plant preference (Aubrey 2013), although there is still a lot of information about the butterfly that is unknown. In Washington, Taylor's checkerspot declined precipitously in most populations between 2020 and 2023 (Table 1). The South Puget Sound Recovery Region declined the most, likely due to large declines in the butterfly's most used oviposition host, *P. lanceolata*. WDFW monitored several populations and portions of one population complex using distance sampling (Linders 2023, pp. 23-24) and other populations using index methods (Potter and Gill 2021). JBLM monitors the distribution of Taylor's checkerspot on the accessible parts of the base and funds the WDFW population monitoring. In the North Salish Sea recovery region, Olympic National Forest monitors several small balds on U.S. Forest Service lands, and a private landowner is monitoring the population at Graysmarsh (Scagliotti and Langski 2022, Robinson 2024). This monitoring information will be helpful in identifying trends over time (Table 1).

The two Taylor's checkerspot populations in Oregon at Fitton Green Natural Area and Beazell Memorial Forest appeared stable in 2020 (Ross 2020, p. 16) but Fitton Green has declined precipitously from an estimated peak population of 1162 adults in 2015 to 77 in 2023. Additionally, Fitton Green formerly consisted of three occupied areas but by 2020 only one remained. At Fitton Green Natural Area, the population may be subject to extirpation in the near future due to declining habitat quality. The Beazell Memorial Forest complex appears robust at over 700 butterflies spread across 3 subpopulations for the past 9 years, but its limited abundance and distribution make it vulnerable to local disturbances such as wildfires (Ross 2022). One Beazell subpopulation was extirpated in 2018 and has not recolonized.

Threats Analysis (Threats and Conservation Measures)
When analyzing factors influencing the species, we distinguish between factors that have negative impacts (threats) and those that have positive impacts (conservation measures). Additionally, we consider whether the impacts are of a scope and magnitude where they have population-level effects.

Threats: At the time of listing, the primary threats to Taylor's checkerspot butterfly included habitat loss, degradation, and fragmentation (Factor A), which resulted in the remaining populations of Taylor's checkerspot butterfly being mostly small and isolated from each other. Factors D and E were also determined to be threats to the species since existing regulatory mechanisms were inadequate to address and reduce threats (Factor D), and loss of genetic diversity, effects of weather events and climate change, pesticide application, and recreation activities (Factor E) threatened viability into the future (78 FR 61451).

Habitat loss continues to occur through conversion to incompatible uses, particularly agricultural and urban development, successional changes to prairie habitat, and the spread of invasive plant species. Reduction in the quality and quantity of habitat reduces population densities and abundance by limiting the number of diverse microsites and connectivity to other suitable habitat. Continued isolation may contribute to low genetic diversity and low reproductive success.

Commercial, military, and recreational use of occupied sites continues and impacts the species through direct and indirect mortality, while effects from climate change continue and will likely increase variation in key habitat characteristics, potentially causing a mismatch in timing between the needs of Taylor's checkerspot butterflies and the characteristics of the host plants upon which they depend (e.g., for larval or adult food resources). There are no new threats to the species to assess in this review.

Conservation Measures: Multiple conservation actions for Taylor's checkerspot butterfly have been completed or initiated since the species was listed in 2013. These include efforts such as permitting of three Habitat Conservation Plans (HCPs) in the species range, and substantial planning of several other HCPs including municipal and programmatic plans. HCPs are intended to accommodate economic development by minimizing and mitigating impacts and providing conservation measures to benefit species and their habitats long-term. Multiple grants have facilitated the acquisition of several hundred acres of conservation lands and/or easements within the species range. Two Safe Harbor Agreements, which are voluntary agreements involving private or other non-federal property owners whose actions contribute to the recovery of species, have been developed, one at Graysmarsh in Clallam County, Washington, and one at Crestmont Farm in Benton County, Oregon.

In 2019, Thurston County, Washington, the county with the most non-federally owned potential suitable habitat in the South Puget Sound recovery region, added criteria prioritizing projects with benefits to species listed under the Act to the rating system for their Conservation Futures Program (Thurston County 2024). This land preservation program allows willing property owners to sell property or development rights to a qualified conservation organization, and with this change in rating criteria, Thurston County anticipates many more properties with habitat for

listed species to qualify for funding in the future, which will likely benefit Taylor's checkerspot butterfly.

Several Department of Defense (DoD)-related actions have been initiated since 2013 that will set the stage for Taylor's checkerspot butterfly conservation in the coming years. These include a framework Biological Opinion (Service 2021) to enhance the JBLM Army Compatible Use Buffer Program and south Puget Sound Sentinel Landscapes Program by providing military mission flexibility through the conservation of Taylor's checkerspot butterfly habitat off-installation. Nationally, the Service and DoD are also initiating the DoD-Service Conservation Policy Initiative (Initiative). As a product of that Initiative, the Service and JBLM are developing the DoD and Service Conservation Pilot Project which, when implemented, will provide greater assurances for both military training flexibility and recovery of endangered species, including for Taylor's checkerspot butterfly populations located on JBLM. This will likely be completed in 2024.

Translocation involves moving individuals to new locations for conservation purposes and is an essential tool for this species. Translocation includes reintroduction (returning a species to a location where it previously existed), population augmentation (adding individuals to an existing but depressed population), as well as moving individuals to a location where the species may or may not have been extant in the past but contains suitable habitat. Taylor's checkerspot butterflies have been reared in captivity since 2003, and captive rearing is currently used to facilitate reintroduction and population augmentation at suitable sites, mostly in the South Puget Sound recovery region and increasingly in the Willamette Valley recovery region and in the British Columbia portion of the North Salish Sea recovery region. Previous reintroduction had been considered successful as of 2021 at Scatter Creek Wildlife Area in Washington, but declining population numbers beginning in 2021 caused the Service and WDFW to use captive reared individuals to augment the population in 2022 and 2023. Translocations at Range 50 on 91st Division Prairie on JBLM appear to have been successful in reestablishing the subpopulation. Translocations are underway at Tenalquot Prairie in Thurston County, Washington, and 13th Division Prairie in Pierce County, Washington. The 13th Division Prairie reintroduced population data indicate that the population at the 13th Divisions Prairie is expanding to adjacent areas with suitable habitat. Reintroduction attempts at two sites within the South Puget Sound Region, Training Area 7S and Glacial Heritage Preserve in Washington, have likely been unsuccessful for unknown reasons. Smaller scale experimental translocations have occurred in Benton County, Oregon in the Willamette Valley recovery region, and from Denman to Hornby Island, British Columbia in the North Salish Sea recovery region.

Summary: Since listing, no additional threats to the species have been identified. The Service and partners continue to implement conservation measures to improve habitat conditions and increase the amount of suitable habitat for the species, and the use of captive rearing remains essential for augmentation and reintroductions across the species range. Partners continue to monitor and research Taylor's checkerspot butterflies and their habitats, and this information will continue to inform management.

Recovery Criteria

The Service's criteria for downlisting and delisting in the draft recovery plan (Service 2022a) are driven by the vision for the recovery of the species. Population complexes must be resilient, a sufficient number of population complexes must be distributed across the range of the species to provide redundancy, population complexes must maintain representative genetic and ecological diversity, and suitable habitat that can support all life stages must be conserved. The draft recovery plan includes criteria for downlisting, and criteria for delisting. The downlisting criteria are (1) at least nine population complexes have been reestablished or identified within the range of Taylor's checkerspot butterfly, with a minimum of four population complexes in the North Salish Sea Recovery Region, three population complexes in the South Puget Recovery Region, and two population complexes in the Willamette Valley Recovery Region, (2) each population complex in Downlisting Criterion 1 will demonstrate a moderate to high level of resiliency for at least 5 years, and (3) sufficient high-quality habitat has been protected with long-term management commitments to support the population complexes necessary to achieve Downlisting Criteria 1 and 2.

The delisting criteria are similar to the downlisting criteria but require additional resilient population complexes across the species range with resiliency of those complexes demonstrated over a minimum of 10 years. The delisting criteria are (1) at least 12 population complexes have been reestablished or identified within the range of Taylor's checkerspot butterfly, with a minimum of 4 population complexes in the North Salish Sea Recovery Region, 3 population complexes in the South Puget Recovery Region, 2 population complexes in the Willamette Valley Recovery Region, and an additional 3 population complexes anywhere within the species' range, (2) each population complex in Delisting Criterion 1 will demonstrate a moderate to high level of resiliency for at least 10 years, and (3) sufficient high-quality habitat has been protected with long-term management commitments to support the population complexes necessary to achieve Delisting Criteria 1 and 2.

Currently there are 14 population complexes that may be extant, although none are currently considered to be resilient, and three of the 14 are likely nearing extirpation. Monitoring of the Graysmarsh site detected two adults in both 2023 and 2024, zero adults were detected at the Graywolf site in 2023, and there have been no detections since 2019 at Training Area 7S on JBLM. Partners are working to refine surveying and monitoring methods to ensure that resiliency of populations can be effectively measured and tracked over time. Translocations, including reintroductions, augmentations, and assisted colonization facilitated by the captive rearing programs, continue to help sustain resiliency in existing population complexes and are integral to increasing the resiliency and number of population complexes over time. The Service and partners also continue working to restore and conserve habitat, and to ensure commitments for ongoing protection and management for the benefit of the species and prairie habitats.

Synthesis

The species has low resiliency due primarily to the poor condition and limited extent of suitable habitat and remnant habitat threatened by non-native and weedy native plants that compete with host plants. Redundancy is constrained by lack of suitable habitat necessary to support the development of metapopulation structure in population complexes across the species' historical range. The species occupies a small, constricted portion of its historical range which we infer to adversely impact genetic diversity and therefore representation. The nearly extirpated

Graysmarsh site is the only population in that genetic and ecotype group. Other genetic and ecotype groups are represented by multiple populations, but no population or population complex is currently considered resilient. Together these factors reduce species' viability by constraining overall population size and cohesion and increasing susceptibility to stochastic environmental, demographic, and genetic fluctuations.

After reviewing the best available scientific and commercial information, we conclude that Taylor's checkerspot butterfly (*Euphydryas editha taylori*) remains an endangered species. The species' viability is low due to its low resiliency, redundancy, and representation, and risk of extinction remains high because of limited ability to withstand stochastic and catastrophic events and its inability to naturally recolonize sites where it previously occurred because suitable habitat is limited. None of the criteria for downlisting have been met, and recent data indicate that the species status is declining. Although some progress has been made in conserving the species' habitats and minimizing take, the evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and analysis of the status of the species in our original listing review remains an accurate reflection of the species' current status.

RESULTS

Recommended Classification:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist (*Indicate reasons for delisting per 50 CFR 424.11):*
____ Extinction
____ Recovery
____ Original data for classification in error
_X__ No change is needed

New Recovery Priority Number: No change

RECOMMENDATIONS FOR FUTURE ACTIONS

In addition to the actions and activities specified within the Taylor's checkerspot butterfly draft recovery plan and recovery implementation strategy (Service 2022a; 2022b), these actions will help address knowledge gaps and facilitate recovery:

- Perform research to determine the genetic structure within and among populations of Taylor's checkerspot butterfly.
- Identify and evaluate additional locations and necessary restoration actions to establish population complexes in the North Salish Sea and Wilamette Valley recovery regions.
- Perform experiments to understand the relative importance of different host plant species for larval development.
- Develop and implement a monitoring strategy across the range of Taylor's checkerspot that will reflect progress towards recovery goals.

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Table 1. Adult monitoring across the range of Taylor's checkerspot 2015-2024.

North Salish Sea Recovery Region population complex and populations	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Denman Island (Working Group)	35	154	34	1	NA	NA	NA	10		
Helliwell Park[2]						74	>145			
Oyster Bay					14	NA	NA	20		
Dan Kelly-Eden Valley (WDFW)	452	711	339	411	694	492	344	89	71[1]	171[1]
Graysmarsh (Graysmarsh biologist)	463	165	250	300	51	NA	106	66	2	2
Olympic National Forest Dungeness (USFS)	565	348	73	298	491	518	557	329	191[1]	
Olympic National Forest Gray Wolf (USFS)	35	NA	1	2	3	NA	11	1	0	
South Puget Sound Recovery Region population complex and populations	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
13th Division Prairie (WDFW/JBLM distance transects)[2]				268	685	2875	398	81	2[1]	358[1]
91st Division Prairie (WDFW/JBLM distance transects)	5758	4702	8236	23067	25286	11358	NA	51	29[1]	65[1]
Scatter Creek Wildlife Area (WDFW distance transect estimates)[2]	220	1463	2394	4188	5998	4842	730	345	83[1]	376[1]
TA7S (WDFW/JBLM distance transect estimates)[2]	235	NA	NA	NA	57	NA	NA	NA	NA	NA
Tenalquot Prairie (WDFW distance transects)[2]						16	9	3	1[1]	125[1]
Willamette Valley Recovery Region population complex and populations	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Beazell Memorial Forest (Dana Ross)	1254	2730	773	1243	1085	916	1148	2176	705	
Fitton Green-Cardwell Hill (Dana Ross)	1162	675	252	155	260	250	167	187	77	

[1] Combined peak single day on transect counts.

[2] Translocated populations.

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW OF TAYLOR'S CHECKERSPOT BUTTERFLY

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist (Indicate reasons for delisting per 50 CFR 424.11):
____ Extinction
____ Recovery
____ Original data for classification in error
_X__ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: N/A

FIELD OFFICE APPROVAL:

BRADLEY THOMPSON

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Date: 2024.08.28 09:39:43 -07'00'

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