

**U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM**

SCIENTIFIC NAME: *Euphydrias editha taylori*

COMMON NAME(S): Taylor's, provincial name = Whulge (A Salish word meaning Puget Sound) or Edith's Checkerspot.

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION (Check all that apply):

Species assessment

New candidate

Continuing candidate

Non-petitioned

Petitioned - Date petition received: 12/11/02

90-day positive - FR date: ____

12-month warranted but precluded - FR date: ____

Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted? YES

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? YES

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded. Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (<http://endangered.fws.gov/>) provides information on listing actions taken during the last 12 months.

NA Listing priority change

Former LP: ____

New LP: ____

Date when the species first became a Candidate: 10/30/01

Candidate removal: Former LPN: ____

A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

F - Range is no longer a U.S. territory.

- ___ M - Taxon mistakenly included in past notice of review.
- ___ N - Taxon may not meet the Act's definition of "species."
- ___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Insect; Nymphalidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Oregon, Washington, British Columbia

CURRENT STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Oregon, Washington, British Columbia

LAND OWNERSHIP:

In Washington State, we have adjusted the occurrence of Taylor's checkerspot butterflies by ownership due to the steep decline in numbers found on Department of Defense's (Joint Base Lewis McChord) to less than 20%. Washington Department of Natural Resources (WDNR) land in south Puget Sound (Bald Hills Natural Area Preserve (NAP)) and the north Olympic Peninsula now constitutes approximately 25%. Forest Service lands on Olympic National Forest contain approximately 25% of the currently known habitat for Taylor's checkerspots. The Taylor's checkerspot butterfly is also known to occur on private lands in the Gray's Marsh area on the Olympic Peninsula (5%). In Oregon, Taylor's checkerspot occur on Benton County, Oregon property (10%) and on a Bonneville Power Administration right-of-way (10%), also in Benton County, Oregon.

The remaining 5% of area occupied by the Taylor's checkerspot butterfly occurs in Canada. Twelve Taylor's checkerspot butterflies were detected for the first time on Denman Island, British Columbia in mid-May, 2005. During surveys conducted on this site in 2007, over 600 butterflies were detected. This location occupies an area of less than 1 ha (2.5 acres) and until 2008 constituted the sole population known from Canada (J. Heron, BC Ministry of the Environment, pers. comm., 2006, 2008). In 2008 an individual butterfly was documented on Vancouver Island in the Courtney-Comox area. This was the first record of the species in this vicinity since 1931 (Page et al. 2009, p. 13). This area is approximately 0.5 km from the population known from Denman Island and may be considered an outlier of the metapopulation on Denman Island. Until more individual butterflies are detected, it is unlikely that this constitutes a population.

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BIOLOGICAL INFORMATION:

Species Description

Taylor's checkerspots are medium-sized, colorfully checkered butterflies with a set of reduced brushy forelegs (Pyle 2002, p. 310). They are orange with black and yellowish spot bands,

giving a checkered appearance. Taylor's checkerspot butterflies produce one brood per year. They overwinter (diapause) in the fourth or fifth larval instar phase and have a flight period as adults of 10 to 14 days, usually in May, although depending on local site and climatic conditions, the flight period may run from late April into mid-June, as in Oregon, where it has normally lasted for approximately 45 days (Ross 2008, p.2).

Taxonomy

Taylor's checkerspot is a subspecies of Edith's checkerspot (*Euphydryas editha*). *Euphydryas editha taylori* was originally described by WH. Edwards (1988) from specimens collected from Beacon Hill Park in Victoria, B.C.. It is one of several rare Pacific coastal subspecies, including the Bay checkerspot (*E. e. bayensis*) from the San Francisco bay area and the Quino checkerspot (*E. e. quino*) from the San Diego region, both are Federally listed as endangered. Three other subspecies are known to occur in Washington, *E. e. beani* in the north Cascades, *E. e. edithana* in the foothills of the Columbian Basin, east of where other subspecies are known, and *E. e. colonia* in the Cascades of Washington and Oregon from the Wenatchee Mountains in Washington to the Siskiyou Mountains in Oregon.

Habitat and Life History

Taylor's checkerspots are known from open habitat dominated by grassland vegetation throughout their range, except for the recently discovered population found in Canada. The recent find in Canada occupies an area that had been clear-cut harvested. In British Columbia, Canada, Taylor's checkerspots were historically known to occupy grassland habitat on Vancouver Island and nearby islands. After 7 years of no detections of Taylor's checkerspots in Canada, the species was detected on Denman Island in May 2005. This became the first record for the species in British Columbia since 1998 (J. Heron, B.C. Ministry of the Environment, pers. comm., 2008; Page et al. 2009, p.1). In Washington, Taylor's checkerspot inhabit glacial outwash prairies in the south Puget Sound region and grasslands and balds on coastal areas of the north Olympic Peninsula (A. Potter, pers. comm. 2004, 2007). The two Oregon sites are found in the vicinity of Corvallis, Benton County, on grassland hills in the Willamette Valley (Vaughan and Black 2002 p. 7; D. Ross pers. comm., 2008, Ross 2008, p. 1)).

Larval host plants include members of the figwort or snapdragon family (Scrophulariaceae), such as paintbrushes (*Castilleja*) and owl's clover (*Orthocarpus = Tryphysaria*), and native and nonnative plantains (*Plantago*) (Pyle 2002, p. 311; Vaughan and Black 2002, p. 8). The recent discovery in 2005 of Taylor's checkerspot in Canada, indicated that new food plants (*Veronica serpyllifolia* and *V. beccabunga ssp americana*) were being utilized by the Taylor's checkerspot larvae (J. Heron, B.C. Ministry of the Environment, pers. comm., 2008). Taylor's checkerspot larvae had previously been confirmed feeding on *Plantago lanceolata* and *P. maritima* in British Columbia (Guppy and Shepard 2001, p. 311); *P. lanceolata* and *Castilleja hispida* in Washington (Char and Boersma 1995, p. 29 & Appendix A), and *Plantago lanceolata* in Oregon (Dornfeld 1980, p 73; D. Ross, Consulting Lepidopterist, pers comm., 2008). Dr. Robert Pyle (2002, p 311) has speculated that Taylor's checkerspot larvae likely fed upon the threatened golden paintbrush (*Castilleja levisecta*) in historic times when both species were more widespread and sympatric in their distribution.

Historical Range/Distribution

Historically, the Taylor's checkerspot was known from more than 70 locations: 23 in British Columbia, 34 in Washington, and 13 in Oregon (The Evergreen Aurelians 1996, p.115; Shepard 2000; Vaughan and Black 2002, p. 6; Ann Potter, Washington Department of Fish and Wildlife, pers. comm., 2003). In the field season summary for North American lepidoptera (1949, p 89) a statement claims abundant distribution of Taylor's checkerspot was known for the south Puget Sound prairies "*Euphydryas editha (taylori)*, as usual, appeared by the thousands on Tenino Prairie". By 1989, Pyle (p. 170) had reported there were fewer than 15 populations remaining rangewide. By fall 2002, only five populations were known to occur with four of these occurring in the south Puget Sound region and one from the Willamette Valley of Oregon. Surveys in 2001 and 2002 of the three historic British Columbia sites had failed to detect any Taylor's checkerspot butterflies (James Miskelly, B.C. Ministry of the Environment, pers. comm. 2005, 2006).

In Washington, surveys have been conducted annually for Taylor's checkerspot butterflies in areas where it is currently known to occur and on prairies where it was historically known to occur. Surveys on south Puget Sound prairies were conducted from 1997 through 2000 by the Washington Department of Fish and Wildlife (WDFW), Washington Department of Natural Resources (WDNR), The Nature Conservancy of Washington, and Joint Base Lewis McChord personnel from their Wildlife Branch. During this time, surveys detected the subspecies on 9 of 17 historic locales. Surveys of 15 of these sites in 2001 and 2002 located Taylor's checkerspots on only 4 in Thurston and Pierce Counties (A. Potter, pers. comm. 2002). One was located on Joint Base Lewis McChord on the eastern edge to the Artillery Impact Area (AIA) and one was known from the North Bald, at the Bald Hills Natural Area Preserve (NAP)).

The other two locations were detected at two other discrete balds (Bald Hill and South Balds) in the Bald Hills area, east of Yelm, WA. Until 2004 about 40 to 50 adult butterflies had been detected at the Bald Hills NAP (D. Grossboll, pers. comm. 2004), but this number has been declining in recent years as habitat has become increasingly shaded and modified by encroaching trees, nonnative grasses and Scot's broom. In surveys conducted in spring 2007, the population at Bald Hills had plummeted to fewer than 5 individuals. Surveys in 2008 and 2009 at Bald Hills detected no butterflies (Potter 2008, Table 1, pp. 3-8; Personal observation by author 2009).

One location in Thurston County (Glacial Heritage Preserve) had 131 adults in 1997 and no Taylor's checkerspots were counted in 1999 or 2000. Annual surveys at Glacial Heritage Preserve have not detected Taylor's checkerspot since the late 1990's (D. Grossball, pers. comm., 2004, Mary Linders, pers. comm., 2006, 2007, 2008, 2009). At a location in Pierce County (Thirteenth Division Prairie - Joint Base Lewis McChord) over 7,000 adult Taylor's checkerspot butterflies were documented in 1997, and by 2000, only 10 individuals were detected and documented. From 2001 through 2008 no Taylor's checkerspots have been detected at this location during the spring flight period (A. Potter, pers. comm., 2003; P. Dunn, TNC, pers. comm., 2006; M. Linders, pers. comm., 2006, 2007, 2008, 2009).

Six historic locales for Taylor's checkerspots were destroyed in the South Puget Sound region when three areas were developed (DuPont, Training Area 7S on Joint Base Lewis McChord, and Spanaway High School, Lakewood), or converted to agriculture (Rock Prairie). In addition, several historic Washington locales are quite old and have general, imprecise locality names on the collection labels (e.g., Olympia 1893; Shelton 1971; Tenino 1929). Some of these site names

may refer to other locales but due to their imprecise records have not been relocated.

Several historic locations on the north Olympic Peninsula were surveyed during Spring 2003 and Taylor's checkerspot butterflies were found to occupy three locations in 2003. One location near the mouth of the Dungeness River had approximately 20 individuals, but from 2006 - 2009, no butterflies have been detected at this location (A. McMillan, pers. comm., WDFW, 2007, 2009). The other locations where Taylor's checkerspot butterflies were known to occur were on grassland balds, with two located east and two located west of the Elwha River. Each of these locations had between 50 – 100 adult butterflies (A. Potter, WDFW, pers. comm. 2004, 2007). These included sites known as Striped Peak and Highway 112, west of the Elwha River on WDNR land, however, neither of these locations has harbored butterflies in searches made in 2007, 2008, or 2009. Other locations at Eden Valley and Dan Kelly ridge, two grassland balds that are being managed in partnership between WDNR and WDFW with funding from FWS, have had butterflies in recent years (A. McMillan pers. comm. 2007, 2009).

The other location where butterflies are known from the N. Olympic Peninsula is an area known as Grays Marsh. The species was found there in 2006 and it has been detected in surveys conducted in 2007, 2008, 2009 and 2010 (D. Hays, letter to Resource Manager for Graysmarsh, 2009). Taylor's checkerspot inhabit approximately 37 acres of estuarine, deflation plain (or back beach), road and farm-edge habitat at this location. Early season counts in 2010 at this low elevation site detected 568 Taylor's checkerspots as a one day maximum count (April 3, 2010).

A new location was also found on Olympic National Forest lands, on 3 O'clock Ridge, also in Clallam County. This location was discovered in 2007 and follow-up surveys were conducted in 2008 by WDFW and Forest Service wildlife personnel. In late May 2008, twelve Taylor's checkerspot butterflies were detected (Karen Holtrop, pers. comm., Wildlife Biologist, Hood Canal Ranger District, Olympic National Forest 2008). The Forest Service has stepped up their survey effort in the Dungeness watershed and in 2009, seven new locations within the area were found to have small numbers of Taylor's checkerspot butterflies. Three of seven locations had one day counts of greater than 40 butterflies, and four locations had very few butterflies, with from 1 to 4 detected in one day counts during surveys conducted in 2009 (U.S Forest Service 2009). We now have 10 sites in Clallam County, although many of the Forest Service sites in the Dungeness watershed are in close proximity and together could be considered a meta-population.

The 13 historic Oregon locales have been surveyed regularly by local Oregon lepidopterists (Paul Hammond, Oregon State University, pers. comm. 2002; Dave McCorkle, Western Oregon State University (ret.) pers. comm., 2002; 2008; A. Potter, pers. comm. 2002; Harold Rice, lepidopterist, pers. comm. 2002; D. Ross, 2005, 2006, 2007, 2008, 2009). Until 2003, just one site, located in Benton County, Oregon, was known to be occupied by Taylor's checkerspot butterflies. In 2004 expanded searches for Taylor's checkerspot were conducted in the Willamette Valley, and a population was detected at the Beazell Memorial Forest. Searches have been conducted annually on suitable habitat within the Willamette Valley and presently (April 2009) two populations are known from Oregon, both in Benton County.

Table 1. Site names and estimates of current abundance for Taylor's checkerspot butterflies. The first year with numbers indicates that this was the year of the first detection. Numbers generally represent peak adult abundance for a one day count. Table 1 begins in year 2000, the year prior to the subspecies being added to the Federal candidate list.

STATE Region and Site	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
WASHINGTON										
North Olympic Peninsula										
Eden Valley							60	100	116	163
Dan Kelly							50	100	61	98
Striped Peak						<5	0	0	0	0
Highway 112						<5	0	0	0	0
Graysmarsh							100	150	186	242
3 O'Clock Ridge								2	12	69
Dungeness sites (new 2009) #										40
South Puget Sound										
Joint Base Lewis McChord						1,052	1,040	504	187	77
Bald Hills NAP						<30	<30	<5	0	0
Scatter Creek *								12	100	48
OREGON										
Beazell Memorial Forest					500	484	150	422	615	760
Fitton-Green **	yes	yes	1,000	750	1,104	1,221	300	600	765	1,000
CANADA										
Denman Island						12	No Report	622	321	No Report
Courtney Comox area (VI)									1	"

- * Taylor's checkerspot were historically known from Scatter Creek, although the numbers shown here are for adult butterflies from translocated larvae.
- Taylor's counts for Joint Base Lewis McChord do not show the precipitous drop in abundance that occurred on 13th Division Prairie between 1997 (~ 7,000 individuals) and 2000, when no (0) butterflies were detected, see text.
- ** Fitton Green, OR was discovered in 1999, early counts are not available, however, butterflies have been present each year since spring 1999.
- # For the purpose of this report, several sites have been combined within the Dungeness watershed that are in close proximity to each other and together likely comprise a meta-population.

Current Range/Distribution

It should be noted that not all locations are monitored on an annual basis, due to constraints in funding, personnel and work priorities. As of April 2009, Taylor's checkerspot butterflies are known to be present from a total of 10 distinct populations, including Canada. Populations are distributed in Washington (7 sites), Oregon (2) and one new location was discovered and confirmed in 2005 in British Columbia, on Denman Island. A single outlier individual butterfly was spotted in the Courtney Comox region of Vancouver Island during 2008 surveys, although this individual was likely a dispersing male from the Denman Island site, located less than 0.5 km distance. It does not constitute a population and was noted here only to denote that individuals do disperse.

In early January 2008, a Taylor's checkerspot workshop was held in Olympia, Washington. Presentations were made by butterfly specialists who had conducted surveys in their respective territories in Oregon, Washington and British Columbia. Surveys were conducted in occupied locations and in suitable butterfly habitat. The population numbers presented in this candidate

assessment are based on the most current population counts and as such constitute the best available science for the Taylor's checkerspot butterfly.

In the course of conducting surveys for another rare butterfly found in Washington, the Island Marble butterfly (*Euchloe ausonides insulanus*), many historic locations for Taylor's checkerspot were surveyed during spring of 2005 through the spring of 2009. The flight periods of both butterflies overlap during late April and May. Both species of butterfly are found on grassland habitat with abundant forbs and grasses. All surveys conducted at historic localities and in potential suitable habitat in North Puget Sound were negative for the Taylor's checkerspot during these surveys.

During the 2007 surveys, the populations known from Joint Base Lewis McChord in the south Puget Sound region had been steadily increasing in butterfly numbers through spring 2007, when counts of Taylor's checkerspots declined from earlier surveys at this location. The apparent improvement in recent years in the butterflies counted on Joint Base Lewis McChord is likely related to the repeated and frequent fires that flare up on habitat used by the butterflies. This area, Range 75/76 on the Artillery Impact Area is where the largest populations have been observed. A careful, focused effort by Joint Base Lewis McChord and WDFW staff has also likely contributed to the improved survey results from this location. Several small and discrete patches of habitat were occupied by Taylor's checkerspot on Range 75/76, although the close proximity of these patches would indicate that one relatively robust (> 1,000 butterflies on one day in 2006) metapopulation is likely present at Joint Base Lewis McChord. Surveys conducted in spring 2007 were reduced from the 2006 count. On May 10, 2007, the day of the single day maximum of butterflies detected on surveys, there were 637 butterflies counted on Range 75/76. This decreased trend in butterfly numbers was observed elsewhere for Taylor's checkerspot in Thurston County during 2007, and for other butterflies such as the Island Marble butterfly in San Juan County, where counts were down 45% from a year earlier. Spring 2008 surveys on range 75/76 were much reduced for Taylor's checkerspot on Joint Base Lewis McChord, the maximum one day count detected fewer than 200 adults, or approximately 37 % of the 2007 count, and less than 18 % of the 2006 count. The population trend for this once robust population of Taylor's checkerspot is declining rapidly. (Randolph 2008 p. 79). By 2009, the maximum single day count had declined to 77 butterflies at Joint Base Lewis McChord (Mary Linders, email report, 2009; Personal observation by author 2009)

A. Potter (2007) reported that the Bald Hills in south Puget Sound were being encroached upon by forests and the amount and quality of the nectar plants has been reduced. Surveys in 2005 and 2006 detected fewer than 30 adult butterflies during surveys (K. McAllister, formerly WDFW Wildlife Biologist, pers. comm. 2006; A. Potter, pers. comm. 2007), and in 2007, fewer than 5 butterflies were detected at the Bald Hills NAP. Multiple visits and surveys conducted at Bald Hills in 2008 and 2009, detected no Taylor's checkerspot butterflies at this site (Potter 2008, p. 2, 2009).

By 2006, on the North Olympic Peninsula, one population plus four historic populations were known to exist. All populations were surveyed in 2006, 2007, 2008, and 2009. The new population is located near Gray's Marsh in the Dungeness River Valley. The other four populations are located on bald habitat on WDNR and private forest lands, two are located west of the Elwha River, in areas known as Striped Peak and Highway 112, the other two locations are east of the Elwha River, and are known as Dan Kelly Ridge and Eden Valley. Several new sites

harboring Taylor's checkerspot have been discovered in the upper Dungeness watershed on Forest Service land. The Forest Service is currently monitoring butterfly numbers at these sites.

In 2006, at the Gray's Marsh (Dungeness River) population, as many as 100 butterflies were detected in a single day however, on most days fewer were observed (A. McMillan WDFW, pers. comm. 2007). During the surveys of spring 2007, 100 to 200 butterflies were detected on peak days. Both larvae and adults have been detected at this site in 2007 and 2008 (A. Potter and A. McMillan WDFW pers. comm., 2007, 2008, 2009, and 2010). The following descriptions were communicated to the author by Anita McMillan, a WDFW regional biologist responsible for this area. On the WDNR lands west of the Elwha River, no butterflies were observed at Highway 112 or the Striped Peak locations in either 2006, 2007, 2008, or 2009 and in previous years the number of Taylor's checkerspot butterflies found at this location generally was fewer than 5 butterflies detected on any single day count. In Eden Valley, up to 60 butterflies were detected on a single day, with usually fewer than 30 detected on most days during the 2006 surveys. During the 2007 surveys, the daily peak counts were greater than 100 individual butterflies observed during multiple visits. In 2008, single day peak counts at this location detected 116 butterflies (A. McMillan, WDFW pers. comm., 2009). On Dan Kelly Ridge as many as 50 butterflies were detected on a single day in 2006. This area is considered large, with a ridgeline road that is greater than 2 miles long with grassland habitat along the road and the south facing slope is interspersed with small balds that support Taylor's checkerspot butterflies. More than 100 Taylor's checkerspot butterflies were detected on single day counts in spring 2007, and approximately 60 butterflies were detected in 2008, with larvae and adults detected along the road corridor and on transects placed across the hillslope. Of 7 new locations known to harbor Taylor's checkerspots on the Olympic National Forest, 3 had maximum day counts of more than 40 butterflies, with the remaining 4 sites having from 1 to 4 butterfly detections in 2009 (USFS 2009, p.5).

The two current Oregon populations are located at a Bonneville Power Administration (BPA) right-of-way known as Fitton Green, and at Beazell Memorial Park, a Benton County Park. In 2006, up to 300 Taylor's checkerspot were detected on a single day (S. Black, pers. comm. 2007). Mr. Black (Executive Director, Xerces Society, *In litt.*, 2007) estimated that as many as 2,000 individuals may be detected at the Oregon sites in any year. For the 2007 survey, Mr. Dana Ross reported (2008) that the numbers for individual day counts had increased for the two Oregon sites. At Fitton Green, the maximum single day count was 660 butterflies; and at the Beazell Memorial Park location more than 425 butterflies were detected. Mr. Ross (2008) reported that he observed 615 and 765 butterflies at Fitton Green and Beazell Memorial Park during 2008 surveys, respectively. Surveys by Mr. Ross in 2009 yielded maximum daily counts of 1,000 and 765 butterflies at Fitton Green and Beazell Memorial Park, respectively.

The last remaining population is known from Canada; it was discovered on Denman Island, British Columbia in 2005. This site is a new location for Taylor's checkerspot, after many years of negative surveys (2001 through 2004) at historic populations in British Columbia (B.C.). The B.C. location was examined by the British Columbia Ministry of the Environment to confirm the presence of Taylor's Checkerspot. Twelve individuals were observed at the site in 2005. Extensive surveys were conducted on Denman Island in the spring 2007 and a total count of more than 620 Taylor's checkerspot butterflies was detected. During spring 2008 surveys, the count was down slightly (524 butterflies detected) from 2007. Surveys are conducted on Vancouver Island and other historic locations (Page et. al., 2009, p IV). A single Taylor's

checkerspot butterfly was detected on Vancouver Island in an area where they had not been observed since 1931. Additional surveys were made in the location of the new detection and only the single butterfly was observed; it is likely that this single adult had dispersed from the Denman Island location approximately 0.5 km distance away. The Denman Island site remains the only location in Canada where Taylor's checkerspot butterflies have been detected in any abundance. We received no reports from Canada sites for 2009.

Population Estimates

Information on population sizes for locations in Washington is based on recent survey information completed for each site. Although recent population estimates are found in the previous section, additional details about each of the known occurrences for Taylor's checkerspot butterflies can be found in the following paragraphs.

In 2003, five sites on the north Olympic Peninsula were surveyed. At three of the five locations the numbers ranged from one to ten individuals. At the other two locations on the Olympic Peninsula, one had 10's of adults and the location at Eden Valley had more than 100 butterflies. By May of 2006, only four populations were known to exist from the north Olympic Peninsula. Taylor's disappeared from one location in the Dungeness River Valley, however, the species was found in 2006 at a location approximately 3 miles east of the Dungeness River, at an area known as Gray's Marsh, a private land parcel. In 2006, adults and larvae were observed and as many as 160 adults were counted. In 2007, the number of butterflies detected at Gray's Marsh was approximately 150 butterflies on any given day (A. McMillan, pers. comm. 2008). Counts in 2010 from Grays Marsh detected 568 butterflies as a single day maximum count. In 2006, at the three locations west of the Elwha River, from 30 to 50 butterflies, were documented at two locations, while at the third location, fewer than 5 individuals were detected. By the time surveys were conducted at these sites west of the Elwha River in 2007, 2008, and 2009, no Taylor's checkerspot butterflies detected were detected at Striped Peak or the Highway 112 balds. At Eden Valley and Dan Kelly Peak, there were multiple site visits made in 2007 and more than 100 Taylor's checkerspot butterflies were detected at each location. At Eden Valley and Dan Kelly Ridge, respectively, day counts detected 116 and 163; and 61 and 98 butterflies during the 2008 and 2009 surveys.

In 2007, on 3 O'Clock Ridge on Forest Service land in the Dungeness River watershed (Olympic National Forest) a small number (2) of Taylor's checkerspot butterflies were detected. This site was surveyed in 2008 by Forest Service and WDFW personnel and they detected 12 adult butterflies. In 2009 a consultant was hired by the Forest Service when they received funding from the Interagency Special Status Sensitive Species Program (ISSSSP) to regularly survey bald habitat on the high ridges within the Dungeness watershed. Surveys were conducted on several balds that contained suitable habitat (Forest Service report, 2009). During 2009, up to 265 acres of suitable habitat were surveyed in 10 distinct survey areas. Adult Taylor's checkerspot butterflies were detected at seven of the ten sites, with a maximum of 69 butterflies detected at the 3 O'Clock Ridge site, three locations had estimates of 40 butterflies detected, and the other sites with butterflies had only 1 to 4 individuals.

All locations in the south Puget Sound region were surveyed in 2006 to 2009. Surveys in the Bald Hill area, on both the private land and the WDNR parcel detected few individuals on any given day at each of the primary balds. Reports indicate that the density and composition of the

nectar plants have declined at Bald Hills and Douglas-fir had invaded and its cover on the balds had expanded, thus shading the butterfly habitat by reducing the cover of native grasses, larval food plants and nectar plants of Taylor's checkerspot. (A. Potter, pers. comm., 2007). The 2007 surveys were particularly intensive, with 134 visits made to the 11 distinct balds found in the vicinity of Bald Hills. At just one of the balds, on one day, only two Taylor's checkerspot butterflies were detected during the 2007 surveys. Multiple visits to this site in 2008 and 2009 detected no Taylor's checkerspot butterflies (Potter 2008, p.2; personal observation by author 2009).

The largest colony within the range of the Taylor's checkerspot butterfly had been documented on Joint Base Lewis McChord during 2005 and 2006 (Mary Linders, WDFW/DOD, DOD 2005, 2006). In May 2005, more than 1,000 individuals were detected on one day and 100s were observed on earlier and subsequent days. In May 2006, more than 1,200 individuals were detected on May 1 and May 4, on other days as many as 100 butterflies were observed (DOD 2005, 2006). Surveys in spring 2007 detected slightly lower numbers than in 2005 and 2006, despite the high survey effort. In 2007, the single day maximum count for Taylors' checkerspot butterflies was 637 on May 10, 2007 (Joint Base Lewis McChord Range and Training Land Assessment 2007). In 2008, detections at Training Area 76 indicated a further decline to 187 butterflies. Butterflies on Joint Base Lewis McChord were found on an area that is frequently burned. Vegetation at this site remains in an early successional stage that is dominated by native grasses and forbs. This Training Area (TA 75/76) was disturbed by Stryker vehicles in January 2009 and during 10 repeated surveys later that spring, just 77 individual butterflies were counted as a maximum daily count.

In Oregon, Taylor's checkerspots are known from two locations, both in Benton County, in the Willamette Valley. Until 2004, the species had been known from just one location in Oregon when a new population of Taylor's checkerspots was discovered in a Benton County Park, known as Beazell Memorial Park. While conducting surveys during 2005, 480 adults were observed at Beazell Memorial Park and over 1,200 were observed as adult butterflies at the second location (Ross 2005). A slight decline for Taylor's checkerspot abundance was detected in 2006, with no more than 300 butterflies observed during 2006 surveys (S. Hoffman-Black Executive Director, Xerces Society, *In litt.*, 2007). Surveys in 2007, indicated an increase for each of the Oregon populations, with 660 butterflies detected at Fitton Green and 427 butterflies detected at Beazell Memorial Park. Ross (2008) reported that he observed 615 and 765 butterflies at Fitton Green and Beazell Memorial Park during 2008 surveys, respectively. Surveys by Mr. Ross in 2009 yielded maximum daily counts of 1,000 and 765 butterflies at Fitton Green and Beazell Memorial Park, respectively. At Fitton Green in 2009, the author and Mr. Ross observed more than 50 Taylor's nectaring on a apple tree that was in full flower. This is the first observation of this phenomena reported for Taylor's checkerspot butterflies.

The recently discovered population in British Columbia was confirmed by the invertebrate specialist for the BC Ministry of the Environment and she reported that 12 adults were observed on Denman Island during 2005 (Page et. al. 2009, p.1). We have no reports from B.C. for 2006 surveys. However, in 2007, surveys detected more than 600 butterflies at the Denman Island location during the entire survey effort. (J. Heron, Invertebrate Specialist, B.C. Ministry of the Environment, pers. comm. 2008). Surveys at this location in 2008, detected 324 Taylor's checkerspots (Page et. al. 2009, p.17). We have no survey reports from Canada for 2009.

Of the 10 locations where Taylor's checkerspot butterflies were detected during 2009 surveys, only four populations had more than 100 butterflies for maximum day counts, these included two populations from the north Olympic Peninsula (Eden Valley and Graysmarsh) and both populations known from the Willamette Valley in Oregon and the Denman Island (B.C.) population. The 2009 survey was the first survey reported from Joint Base Lewis McChord when fewer than 100 butterflies were detected in daily counts. This population known from Joint Base Lewis McChord was known to have greater than 1,000 individuals on two separate days in 2006 but had decreased to approximately 660 butterflies in 2007, less than 200 butterflies in 2008, and only 77 butterflies during 2009. In 2010, the daily counts improved for Joint Base Lewis-McChord with the highest daily count of 352 butterflies. The flight period for 2010 was extended to over 40 days, probably because of the cool, relatively wet spring that kept the food plants in high vigor and emergence of larvae cohorts was staggered over a long time period. The two populations known from the Willamette Valley continued to show slight increases in numbers from previous years, with 760 and 1,000 butterflies detected at Beazell Memorial Park and Fitton Green, respectively, in 2009. We have not received summarized data from Oregon for the 2010 flight season. The translocated population at Scatter Creek Wildlife Area in south Puget Sound, WA increased from 12 to 100 butterflies from 2007 to 2008, and just 48 butterflies were detected at this site during 2009. At Scatter Creek in 2010, the high daily counts were 36 and 40 on two separate surveys on May 9, 2010.

DISTINCT POPULATION SEGMENT (DPS). Does not apply to invertebrates.

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Taylor's checkerspots are threatened by changes in the vegetation structure and composition of native grassland-dominated plant communities (Vaughan and Black 2002 p. 10; Potter pers. comm., 2007, 2008). Native grassland communities have been lost to conversion for agriculture and development for residential and commercial purposes. Threats to grassland vegetation also threaten habitat for the Taylor's checkerspot. Habitat has been degraded and encroached upon by nonnative shrubs, including Scot's broom (*Cytisus scoparius*) and several Washington state listed noxious weeds, such as leafy spurge (*Euphorbia esula*) and knapweed (*Centaureium*) (Vaughan and Black 2002 p. 11). Nonnative grasses, such as tall oat grass (*Arrhenatherum elatus*) in Washington and false brome (*Brachypodium sylvaticum*) in the Willamette Valley of Oregon have become problem grasses and have invaded many sites occupied by Taylor's checkerspot. The largest Taylor's checkerspot population in Washington (Joint Base Lewis McChord Training area 75/76) is currently being encroached by several hundred acres of tall oat grass that will require equipment, herbicides and operators to remove it. While restoration of this site has conservation value for the species, this work may also directly impact the butterfly larvae that inhabit this productive site. Because these are resident butterflies, actions at any time of year may have negative consequences to the larvae.

In January 2009 an incident occurred on Training area 75/76 on Joint Base Lewis McChord that disturbed habitat for Taylor's checkerspot. A training exercise was to take place on established roads and create two paths to a target objective. The training did not occur as was proposed. Approximately 67 acres of prairie were repeatedly traversed by 18 ton Strykers, an 8 wheeled Armored Personnel Carrier and Mobile Gun System. Up to 37.5 acres were ranked as highly

disturbed by DOD staff (2009) with much of this acreage scraped to bare soil. This impact directly affected overwintering, pre-diapause larvae that would have been in the vicinity. Surveys completed during spring 2009 produced one of the lowest counts for Taylor's checkerspot at this location since surveys have been made at this site. The maximum daily count for 2009 was 77 Taylor's butterflies (Joint Base Lewis-McChord Fish & Wildlife Branch 2009, and multiple visits by the author 2009). Prior to the flight season in 2009, the 3 brigades of Strykers were dispatched to Iraq or Afghanistan and the prairies were not trained on during the 2009 or 2010 butterfly flight period. During this time the Training Area (75/76) has recovered somewhat and FWS has closely coordinated with DOD to put specific conservation measures into action regarding vehicle use within this training area.

Prairies in the southern Puget Sound region of Washington have been lost at a rate of approximately 40 hectares (ha) (100 acres (ac)) per year since the 1850s due to the rapid conversion from grassland to Douglas-fir (*Pseudotsuga menziesii*) forest (Kruckeberg 1991, p. 287). Less than 3 percent of the original estimated 60,000 ha (150,000 ac) of pre-settlement grasslands remains (Crawford and Hall 1997, p. 13). In pre-settlement times, prairies were maintained by periodic fires that reduced the rate of conversion to forest by restricting the establishment of Douglas-fir along forested edges with grasslands (Kruckeberg 1991, p. 286). Fires also maintained the native grass and forb-dominated plant communities that had formed on the glacial outwash soils of the south Puget Sound region and Canada.

In addition to the loss of grasslands to conversion to agriculture and other uses and plant succession, these plant communities are faced with degradation of the grassland habitat that remains. As grasslands have been converted, the availability of host plants for feeding and nectaring by larvae and adults has declined.

In summary, Taylor's checkerspots are threatened by changes in the vegetation structure and composition of native grassland-dominated plant communities. These are similar to the threats to the species at the time it was determined to be a candidate species. Since that date (2001) the threat from invasive species and their impacts on native vegetation has become a greater threat. Other threats, particularly, the pressure to develop Taylor's checkerspot habitat has increased in south Puget Sound, the Willamette Valley and at the Denman Island, Canada. Moreover, in the past military training has been compatible with Taylor's checkerspot conservation, however, in 2009, the threat from military training increased and severely impacted the habitat for the largest population of Taylor's remaining in Washington.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Populations of Taylor's checkerspots have declined dramatically during the past decade. We know of no overutilization for commercial, recreational, or educational purpose; however, scientific studies may have negatively affected Taylor's checkerspot populations at a site on the 13th Division Prairie on Joint Base Lewis McChord in Pierce County, Washington (Vaughan and Black 2002). Over 7,000 individuals were observed as recently as 1997, but only 10 adults were observed during surveys in 2000, and no Taylor's checkerspots were observed in 2001 or have been observed since (A. Potter, pers. comm. 2004). In the early and mid-1990s, mark and recapture studies were conducted at this location (Char and Boersma 1995 p. 15). It is difficult to conclude that this factor caused the sharp decline in the population of Taylor's checkerspot on Thirteenth Division Prairie. However, according to McGarrahan (1997), mark, release and

recapture studies of the Bay Edith's checkerspot (*Euphydryas editha bayensis*) was considered a contributing factor in the extirpation of this population from Stanford's Jasper Ridge Preserve.

Collection of butterflies and perhaps the threat of trampling associated with scientific studies continues to be a threat to the species, although it is likely a minor one.

C. Disease or predation.

Currently, there are no known disease or predation factors affecting the subspecies.

D. The inadequacy of existing regulatory mechanisms.

Although there is no Washington State Endangered Species Act, the Washington Fish and Wildlife Commission have the authority to list species and provide protection from direct take. However, a species listing in Washington has no associated habitat protection regulation. State candidate species are under review for listing as Washington State Endangered, Threatened, or Sensitive Species.

The Taylor's checkerspot was designated a candidate species by Washington State in 1991 (A. Potter, pers. comm. 2000; Vaughan and Black 2002). In 2005, the species was recommended to the Wildlife Commission to be included on the Washington State list of endangered species. A status review was completed (Stinson 2005) and the Taylor's checkerspot butterfly was added to the state endangered species list in 2006. Taylor's checkerspot was also identified as a species of greatest conservation need in Washington's Comprehensive Conservation Strategy.

The Washington Department of Fish and Wildlife has developed a recommended approach to protect the Taylor's checkerspot on private property. Their approach is nonregulatory and encourages landowners to engage in cooperative efforts to protect and conserve Taylor's checkerspot habitat. Presently, no Forest Practices Rules have been developed to protect Taylor's checkerspots. Landowners have the option to develop a management plan for the species if it resides on their property, or if landowners chose to not develop a management plan for the species with WDFW, their forest practices application (FPA) will be conditioned to protect this public resource. If this approach does not provide the required protections for the butterfly, then WDFW and WDNR may request the Forest Practice Board to initiate rule making, and possibly, an emergency rule will be developed. (D. Whipple, WDFW Forest Policy Coordinator, pers. comm. 2008).

In Oregon, the FWS coordinated with Benton County, the Xerces Society, and the Institute for Applied Ecology to include the Taylor's checkerspot butterfly in their county HCP. A draft Management Plan for Taylor's Checkerspot Butterfly was completed by Ross (2008). The guidelines set forth in the management plan will assist Benton County in managing their lands in a way that is consistent with protection and conservation of the species. Xerces has also worked with Benton County to develop a Memorandum of Understanding (MOU) for a single private landowner with Taylor's on their property. This MOU allows the private landowner to erect a fence to keep motorcycles and horses from entering their property and trampling the larvae and larval host plants. Xerces also coordinated with Bonneville Power Administration to develop a management plan to cover the species on lands within their power line right-of-way. This management plan specifically targets the removal of invasive plants along the right-of-way.

The Taylor's checkerspot butterfly is ranked as critically imperiled and threatened by extinction by the Oregon Natural Heritage Information Center (2004). The Oregon Natural Heritage Information Center lists the Taylor's checkerspot as imperiled in the state (S1). Oregon has a State Endangered Species Act, which was last updated in 1998. At that time the Taylor's checkerspot was not added to the list and it is currently not listed as an endangered or threatened species in Oregon. Although this species is on the Oregon sensitive species list and is considered critically sensitive, this designation provides little protection (ODFW 1996, OAR 635-100-0040). The "critical" designation indicates a species for which a listing as threatened or endangered is pending or listing as threatened or endangered may be appropriate if immediate conservation actions are not taken. Once an Oregon "native wildlife" species is federally listed as threatened or endangered, it is included as a State listed species and receives some protection and management, primarily on State-owned or managed lands (OAR 635-100-0100 to OAR 635-100-0180; ORS 496.171 to ORS 496.192). The Oregon Department of Fish and Wildlife (ODFW) prepared a draft Comprehensive Conservation Strategy in 2006 (ODFW 2006). The plan is a nonregulatory statewide approach to conservation in Oregon and fulfills a requirement to access two new Federal grant programs. The draft strategy identifies the Taylor's checkerspot as a "strategy species." Strategy species are found in low numbers at few locations and are threatened. They are considered at-risk species. The plan targets conservation actions for the most at-risk species. The strategy generally identifies special habitat needs, limiting factors and data gaps for the Taylor's checkerspot butterfly. It also identifies specific conservation actions needed for the species.

The state wildlife agencies in Washington and Oregon have completed Comprehensive Wildlife Conservation Strategies. Until these strategies are implemented and result in positive on-the-ground conservation actions for the Taylor's checkerspot it remains unclear whether they will improve the conservation status of the Taylors' checkerspot butterfly. The Benton County MOU developed in Oregon between the Xerces Society and private landowners has contributed to reducing the threats to Taylor's checkerspot at this one location. In Washington, the voluntary conservation measures developed in landowner management plans is intended to provide conservation to the species. If a landowner chooses to not develop a site management plan for Taylor's checkerspot butterflies, their application to the Forestry Practices Board will be conditioned to protect the butterfly. These conservation measures have only recently been developed and it will take some time to judge whether they constitute positive conservation benefits for the Taylor's checkerspot.

E. Other natural or manmade factors affecting its continued existence.

The application of *Bacillus thuringiensis* var. *kurstaki* (Btk) for control of the Asian gypsy moth (*Lymantria dispar*) likely contributed to the extirpation of three historic locales for the subspecies in Pierce County, Washington (Vaughan and Black 2002, p. 13). Spraying of Btk is known to have adverse affects to nontarget lepidopteran species (butterflies and moths). Species having a single brood/year, such as the Taylor's checkerspot, are active in the spring and have caterpillars that are active during the spray application period. There is documentation that most lepidopterans are more susceptible to Btk than the target species (Haas and Scriber 1998) (e.g., Asian gypsy moth). Nontarget lepidopterans, particularly the early instar stages of larvae are the most susceptible (Wagner and Miller 1995, p21).

The application of herbicides is usually restricted to a short period of the year. However, if the target species is active at the same time as larvae and adult Taylor's checkerspots, the effect to the butterflies would be adverse. Spraying of Btk still occurs in Pierce County for the Gypsy moths and the threat of herbicide drift onto prairies of Pierce County cannot be discounted. At this time, however, we have no evidence that Btk has been sprayed in any locations where Taylor's checkerspot are known to occur.

Although fire is generally acknowledged to improve the health and composition of grassland habitat, its use on grasslands occupied by at-risk butterflies should be implemented with caution. Fire can improve grasslands by providing a short-term nitrogen addition, which provides a fertilizer effect to vegetation. When butterflies are present on a grassland patch, we recommend that no more than one-third of a site be treated with fire so as to not cause harm to all the resident butterfly larvae or the pupae life form prior to the emergence of adult butterflies.

Foot traffic is a threat to butterfly larvae, as trampling will crush them if they are present underfoot. In areas where larval host plants of butterflies are present we recommend being careful of where people walk, or where military vehicles are driven.

Weather can be a factor in Taylor's checkerspot breeding success. Poor weather conditions, with cool temperatures and rainy weather reduce the number of days in the flight period for several early spring flying butterflies, including Taylor's checkerspot. A shorter flight season reduces the number of ovipositing opportunities for female butterflies, thus affecting the emergence of adult butterflies in the future. Peterson (2010) provided climate and butterfly abundance data that indicated cold winter temperature may effect the timing of butterfly emergence and the size of populations in years when winters are severe.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED:

Some conservation measures have been developed to help protect and conserve the Taylor's checkerspot butterfly. In Oregon, the FWS has collaborated with Benton County, the Xerces Society, and the Institute for Applied Ecology to include the Taylor's checkerspot butterfly in their county HCP. Xerces has also worked with Benton County to develop a Memorandum of Understanding for private landowners with Taylor's on their property. This action allowed a single, private landowner to erect a fence to keep motorcycles and horse from entering the property and trample the larvae and larval host plants. Xerces has also coordinated with Bonneville Power Administration to develop a management plan to cover the species on lands within a power line right-of-way

In the South Puget Sound region of Washington, a Candidate Conservation Agreement with Assurances (CCAA/CCA) is currently being developed for several grassland associated species, including the Taylor's checkerspot. Several agencies, including the Department of Defense (Army and McChord Air Force Base), WDFW, Washington Department of Natural Resources, Thurston County, Port of Olympia, Wolf Haven, the Caveness Ranch and the Nature Conservancy are collaboratively working with the FWS to develop this agreement. The long-term objective of this CCAA/CCA is to improve the overall health of prairie habitat and to produce net benefits (improved numbers and distribution) to the species covered under the agreement. A draft agreement has been completed for two of our partners, the Department and Defense Joint Base Lewis McChord (CCA) and the Nature Conservancy (CCAA).

The FWS is working closely with Joint Base Lewis McChord, in coordination with WDFW, to closely monitor the use of Training Area 75/76 so that future training on this site does not lead to adverse impacts to butterfly habitat and direct loss of Taylor's checkerspot larvae that are found on the site. Together, we have closely assessed the current condition of the area and determined what roads should be blocked from vehicle use to protect Taylor's checkerspot and identified where foot traffic is allowed. The command structure on Fort Lewis has modified Army Regulation 200-1, a guidance document that is required reading for all troops using training areas, including TA 75/76. This document describes specific environmental compliance measures that must be adhered to by all troops. Non-compliance may result in suspension of use of the training area by the brigade members. Violations by individuals may lead to military justice actions. Lastly, FWS and DOD are developing an MOU letter that formalizes the intent of conservation actions on these sensitive training areas (75/76) so each party understands the requirements for use of this site on Joint Base Lewis McChord.

A small private parcel of prairie land was acquired in FY 2005 with funding from section 6 Recovery lands acquisition funds. This 130 acre parcel will contribute to the conservation of several prairie associated species in south Puget Sound and is currently being improved by tree removal, mowing and prescribed fire. These restoration actions will continue to be implemented and monitored at this parcel. When the site is considered to be improved to the point where it would be suitable habitat for Taylor's checkerspot and captive rearing work by WDFW had produced sufficient larvae, the butterfly will be introduced onto this parcel. TNC is currently overseeing management of the parcel and coordinates with FWS on activities that are planned for the parcel.

Another larger piece of prairie land known as West Rocky Prairie, was purchased with partial funding from section 6 Recovery lands acquisition funds and was deeded to the WDFW. This parcel is approximately 750 acres of mounded prairie, wetlands and upland prairie that should provide long term benefit to Taylor's checkerspot butterflies, through translocation of larvae onto the site.

Restoration of grasslands in the south Puget Sound region of Washington has resulted in temporary control of Scot's broom and other invasive plants through the use of herbicides, mowing, grazing, and fire. The Nature Conservancy, with funding from the U.S. Fish and Wildlife Service, has conducted restoration projects on grassland habitat at Joint Base Lewis McChord Military Reservation, Glacial Heritage Preserve, Scatter Creek Wildlife Area, the recently purchased Morgan Property, Wolf Haven, and three WDNR Natural Area Preserves (Mima Mounds, Bald Hills and Rocky Prairie NAP). Specific habitat enhancement actions (tree removal and planting of grasses and forbs) are being conducted at Bald Hills NAP with funding provided by the FWS and DOD. The improvement to prairie and bald habitat in the south Puget Sound will provide direct conservation benefit to Taylor's checkerspot on sites where the species is found (Joint Base Lewis McChord, Scatter Creek Wildlife Area) and other prairie dependent species known to occupy these locations.

In early 2005, several coordinating agencies (FWS (ES and National Wildlife Refuge staff), WDFW, WDNR), Department of Defense (Joint Base Lewis McChord), B.C. Ministry of the Environment staff, Xerces Society and the Nature Conservancy gathered in Olympia, Washington for a two day workshop on Taylor's checkerspot. The current state of the

knowledge information was shared by practitioners and the group developed a matrix that included several management strategies that either could be implemented, or have been implemented for the species. One piece of important experimental work that Joint Base Lewis McChord has funded in cooperation with WDFW is a captive breeding and translocation program for the Taylor's checkerspot. Another highlight of this work was a list of information and research gap needs. Key questions included (1) the use and preference of host plants; (2) the spatial arrangement of sites and how to arrange future acquired sites to reduce risk of extirpation; (3) how Taylor's may have shifted their larval host plant use in areas where the primary host plant (Scrophulariaceae) is not present; and (4) the how, where, when and why Taylor's checkerspot disperses to nearby suitable habitat

In January 2008, a second workshop for Taylor's checkerspot was attended by a large contingent of checkerspot practitioner's. From this workshop, the most up-to-date scientific information available was presented to the group. No final proceedings from this workshop are available at this date. Proceedings from this workshop have been drafted by TNC (Anderson 2008) and the final proceedings are pending availability.

Experimental introductions of Taylor's checkerspot butterflies are being attempted in the south Puget Sound region. Captive rearing of Taylor's checkerspots has been undertaken since 2003 with the support of the Oregon Zoo, and beginning in 2010, the Woodland Park Zoo in Seattle. No releases were made until 2007. Larvae were placed out at three locations in Thurston and Pierce County in March, 2007; at Glacial Heritage Preserve, a Thurston County park, on Joint Base Lewis McChord (Pierce County) and at the Scatter Creek Wildlife area in Thurston County. In late May 2007, up to 30 Taylor's checkerspot butterflies were observed flying at Scatter Creek Wildlife Area. Releases at the other locations did not result in adult butterflies emerging at the site. Based on this early success, an additional 340 larvae were placed out at Scatter Creek Wildlife Area in March 2008. In 2008, over 100 adults Taylor's checkerspot were documented flying (Linders 2008), from a translocation of 325 larvae. In 2009, Linders released over 2248 larvae onto suitable habitat at Scatter Creek South, Scatter Creek North Wildlife Areas and on 13th Division Prairie on Joint Base Lewis McChord. Scientist monitoring these translocated larvae detected only 48 butterflies from 2009 releases and it was thought by many cooperating scientists that inclement weather during the winter months forced the larvae to return to diapause and that we will see them as adults during the 2010 flight season.

During winter and spring of 2010, a total of 2036 post-diapause larvae were released onto restored prairie habitat at Scatter Creek Wildlife Area and Training Area 50 on Joint Base Lewis-McChord in south Puget Sound region. .

Habitat enhancement actions are being implemented at most sites where Taylor's are known to occur and at several locations that have been unoccupied by Taylor's for years. The objective is to improve the conditions so that they may be used by Taylor's in the future. One site that has rapidly declined in habitat quality is now receiving some much needed habitat improvements. This site at Bald Hill NAP removed 1.6 acres of encroaching conifers, controlled shrubs on 2 acres and treated orchard grass on 1 acre during 2008. In addition seed from 13 native grassland species was collected in 2007 and 2008 to be used for seedling production, direct seeding trials and for seed production of one promising larvae food plant, *Plectritis congesta*. Over 3,300 seedling plugs were planted on this site in fall 2008. Results from habitat improvement actions at this site in 2008 and additional trees that were removed in 2009 have improved this site to the

point that it may be used to translocate larvae in the future, when a sufficient source of local Taylor's checkerspot larvae become available.

The Service completed a Spotlight Species Action Plan for the Taylor's checkerspot butterfly in 2009. This plan was developed to identify conservation goals and tasks that are needed to improve this species' conservation over the next several years. This plan can be found on the Service's website at: http://ecos.fws.gov/docs/action_plans/doc3089.pdf The bullets under the section entitled Recommended Conservation Measures, below, highlight some of the actions identified in that plan.

SUMMARY OF THREATS

Active threats to Taylor's checkerspot butterflies include the degradation and destruction of native grasslands by agriculture; residential and commercial development; encroachment by nonnative plants; succession from grasslands to native shrubs and trees; and fire. The application of *Bacillus thuringiensis* var. *kurstaki*, an insecticide used for Asian gypsy moth control likely contributed to extirpations of the subspecies at three locations in Pierce County, Washington. The magnitude of threats to this species is high due to a number of ongoing threats. These threats include the loss of prairies to development or the conversion of native grasslands to agriculture; the threat of vehicle and foot traffic that crushes larvae and larval host plants on roads where host plants have become established, thus acting as a mortality sink at north Olympic Peninsula sites. Other important threats include changes to the structure and composition of prairie habitat brought on by the invasion of shrubs and trees (Scot's broom and Douglas-fir) or nonnative pasture grasses that quickly invade onto prairies when processes like fire, or its surrogate mowing, are not implemented. These changes to prairie habitat threaten Taylor's checkerspot by degrading prairie habitat and making it unsuitable for the adult butterflies and for the production of larvae, because the availability of host plants and likely nectar plants is poor. The threat of habitat degradation is ubiquitous, occurring rangewide. The threats to Taylor's checkerspot butterflies are imminent because they occur simultaneously at all of the known locations for the species. Based on the high magnitude of threats and the imminent nature of these threats we have assigned the Taylor's checkerspot butterfly a listing priority number of 3.

RECOMMENDED CONSERVATION MEASURES

- All current and high priority historic locations for Taylor's checkerspot butterflies should be monitored, preferably annually.
- Sites that have components of native habitat, bunchgrasses and forbs, or the nonnative larval food plant *Plantago lanceolata* should be surveyed for the presence of the species.
- If the species are found to occupy a site, a formal survey or a complete assessment of the site should be made.
- Management actions that improve the amount and distribution of suitable habitat for Taylor's checkerspot butterflies are recommended. Management would include mowing (usually early fall or pre-emergence of larvae in the spring), prescribed burning of patches (but never more than approximately one-third of a given site in any year to conserve eggs and larvae), and judicious use of herbicides are all recommended procedures for improving habitat.
- The acquisition of grassland and bald habitat should be a high priority to conserve Taylor's checkerspot.

- Continue close coordination with DOD at Joint Base Lewis-McChord to improve prairie conditions on all training areas where Taylor’s occupy habitat or where translocated larvae have been placed to reestablish butterflies onto formerly occupied areas.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	<u>Imminent</u>	Monotypic genus	1
		Species	2
		<u>Subspecies/population</u>	<u>3</u> *
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: The magnitude of threats is high due to a number of ongoing threats. These threats include the loss of prairies to development or the conversion of native grasslands to agriculture; the threat of vehicle and foot traffic that crushes larvae and larval host plants on roads where host plants have become established, thus acting as a mortality sink at north Olympic Peninsula sites, and perhaps at the Joint Base Lewis McChord Range 75/76 location. Other important threats include changes to the structure and composition of prairie habitat brought on by the invasion of shrubs and trees (Scot’s broom and Douglas-fir) or nonnative pasture grasses that quickly invade onto prairies when processes like fire, or its surrogate mowing, are not implemented. These changes to prairie habitat threaten Taylor’s checkerspot by degrading prairie habitat and making it unsuitable for the butterfly. The threat of habitat degradation is ubiquitous, occurring rangewide.

Imminence: The threats to Taylor’s checkerspot butterflies are imminent because they occur simultaneously at all of the known locations for the species. Any of the several potential threats could occur at any time, including a permit request to develop prairie habitat or a single period of severe weather at a critical life stage of the Taylor’s checkerspot, which could eliminate the entire subspecies. Changes to vegetation structure and composition occur quickly on prairie habitat and without frequent management (tree removal, fire, mowing, and herbicide) these grasslands may be rendered unsuitable for Taylor’s checkerspot in a short period of time.

YES. Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? **NO**. At this time emergency listing is not warranted partially because of the new populations discovered on the north Olympic Peninsula and in Canada, thus broadening the distribution of the species to three general regions from southern British Columbia and northwestern Washington through the grasslands of south Puget Sound and into the Willamette Valley, Oregon.

DESCRIPTION OF MONITORING

Each year since approximately 2005 all known sites and many historic locations for Taylor's checkerspot have been systematically surveyed to confirm the presence of the Taylor's checkerspot butterfly and to count individuals if the butterfly was detected. In Washington, all known populations and some historic locales of Taylor's checkerspot in south Puget Sound region were surveyed in the spring of 2005, 2006 2007, 2008, 2009 and 2010. In Oregon (Ross 2008, p.1), many locations were monitored during the peak flight period for Taylor's checkerspot, and 2 locations harbor the species. In British Columbia, the species was found on Denman Island in May 2005 during routine monitoring surveys for butterflies at their historic locales. The new location on Denman Island is surveyed intensively for pre and post-diapause larvae and during the adult flight season (Page et. al. 2009, p. IV).

COORDINATION WITH STATES

In Washington, biologists with the WDFW and WDNR and staff from the Xerces Society and Institute for Applied Ecology were consulted during the candidate assessment process and throughout the year on issues associated with Taylor's checkerspot butterflies. Information from the Washington state agencies and Xerces is referenced throughout this assessment. In Oregon, we consulted with the Natural Heritage Information Center (ONHIC 2008) and Xerces Society on the population for Oregon's Taylor's checkerspot. We have also collaborated with Dana Ross from 2005 – 2010 (consulting Entomologist with Institute of Applied Ecology and Xerces Society) who is responsible for monitoring all Oregon Taylor's checkerspot. In 2010, we continue to coordinate with WDFW, Mr. Ross, the Institute for Applied Ecology, and Ms. Tory Bennett, Ph.D., who is conducting post doctoral work on Taylor's checkerspot in Oregon and Washington. Although we reached out to all our conservation partners for this annual notice of review, we did not receive information from Oregon Natural Heritage Information Center or the Xerces Society in 2010.

During spring 2010, WDFW released adult butterflies at the Scatter Creek Wildlife Area in south Puget Pound near Olympia, WA. These adults were developed from captive mated butterflies at the Oregon Zoo. On Earth Day, April 22, 2010, 86 marked adults were released and on May 24; 64 marked adults were released. Follow up surveys were conducted at Scatter Creek following both releases to see how many and where the released butterflies were using habitat. Of the marked butterflies that had been released, less than 10 % were recaptured, indicating that more butterflies are present than would be expected from results of distance sampling, and that new cohorts of emerging butterflies were present over an extended flight season during 2010.

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve:

Carolyn L. Bohan
Acting Regional Director, Region 1, Fish and Wildlife Service 5/18/10
Date

Rowan W. Gould
ACTING
Director, Fish and Wildlife Service October 22, 2010

Concur:

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review: April 30, 2010

Conducted by: Theodore Thomas

Reviewed by: Jodi Bush Date: May 3, 2010
Division Manager, Listing and Recovery, WWFOW

Ken Berg Date: May 3, 2010
Manager, WWFOW