Taylor's Checkerspot Habitat Inventory and Surveys

Olympic National Forest

Final Report
for the
Interagency Special Status Sensitive Program

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INTRODUCTION

Taylor's checkerspot butterfly (Euphydryas editha taylori) was historically found on grassland habitats from southeastern Vancouver Island to northwestern Oregon, including at least 37 locales in Washington State (Stinson 2005). The historic range in Washington State included San Juan County, Whidbey Island, south Puget Sound, and north Clallam County along the Strait of Juan de Fuca. As of 2004, the subspecies was restricted to one known population in British Columbia, two small population complexes in the Willamette Valley, Oregon, and a small scattering of 10 populations in Washington, including the north Olympic Peninsula (Clallam County) and south Puget Sound (Pierce and Thurston Counties). Most populations in Washington support no more than a few hundred individuals, and several are extremely small and may be on the verge of extinction. The subspecies is Washington State endangered and US Forest Service sensitive, and a federal candidate for endangered status.

Project Background

Most known and potential Taylor's checkerspot sites in Washington were surveyed 2003-2004, including several sites on the north Olympic Peninsula in Clallam County, where four populations were confirmed (Stinson 2005). Historic sites in Clallam County included balds, coastal bluffs, and estuarine grasslands along the Strait of Juan de Fuca. There were no known extant or historic populations at more inland, higher elevation habitats within Olympic National Forest (ONF).

In May 2007 Taylor's checkerspots were detected at Three O'Clock Ridge in the Dungeness River watershed within Olympic National Forest by a former Washington Department of Fish and Wildlife (WDFW) butterfly surveyor. In May 2008 ONF and WDFW biologists returned to confirm a small population. The butterflies were in dry-site balds (rocky openings on slopes surrounded by forest) about 3000' elevation.

Several additional sites of this habitat type occur on the national forest. ONF biologists recognized the need to survey potential habitat for this sensitive species and to determine if other occupied sites occur on the Forest, and in 2008 applied for ISSSSP (Interagency Special Status Sensitive Species Program) funding. The Forest received funding for Tayor's checkerspot habitat inventory and surveys (2009-2010), and this report documents the results of this two-year effort.

Project Objectives

The primary objectives of the project were to: (1) locate and survey suspected sites of Taylor's checkerspot on Olympic National Forest; (2) identify potential habitat on the Olympic National Forest; and (c) survey suspected and potential sites. A secondary objective was to train Olympic National Forest wildlife staff on: (1) detecting and

identifying the Taylor's checkerspot and other butterfly species; (2) butterfly survey techniques/ protocol; and (3) proper butterfly handling techniques.

METHODS

Identification of Potential Habitat

The first step of the project was to identify potential Taylor's checkerspot habitat on Olympic National Forest. This was done primarily in 2009. We searched for potential grassland habitats, forest openings and balds similar to the habitat where the subspecies was found on the Forest in 2007/2008. The process included using aerial photos and GIS, and field visits to potential sites. Information from ONF, WDFW and Washington Department of Natural Resources (DNR) Natural Heritage Program was used to locate potential grassland habitats. We focused on the northeast end of the Forest, closest to the historic range of the subspecies (Clallam County), including the Dungeness, Quilcene, and Dosewallips watersheds. The Duckabush and Hamma Hamma watersheds, further south, were also checked using airphotos.

Some sites (Bear Mtn and Upper Dungeness) were added to the list after surveys began in May 2009, after further realizing potential habitats within managed stands (as opposed to natural balds).

A list of the identified potential habitat sites was developed. The sites surveyed are listed below and in Table 1.

1) **Three O'Clock Ridge Lower**– This site was located in the Middle Dungeness watershed. The areas surveyed included roadsides, openings within managed stands (clearcutt in 1960s), and a series of rocky balds below the road. Taylor's checkerspots had been detected at this site in 2007 and 2008.

2) **Three O'Clock Ridge Upper**– Middle Dungeness watershed. The site included open rocky areas along the ridge above the road.

3) **Middle Dungeness** –Middle Dungeness watershed. The site included a series of balds east of the Dungeness River, across the river from Three O'Clock Ridge.

4) **Upper Dungeness** – Upper Dungeness watershed. The site included the roadsides and openings within managed stands (clearcut in the 1960s). There were three harvest units adjacent to the road containing openings.

5) **Dirty Face Ridge** – Upper Dungeness watershed. The site included rocky openings along a ridge and extending down from the ridge. A trail runs through the site.

6) **Gold Creek** – Middle Dungeness watershed. The site included balds in steep forested terrain.

7) **Bear Mtn (Upper Schmith Knob)** – Middle Dungeness watershed. The site included a rocky bald at the top and small rocky openings through a managed stand (clearcut in 1969). The surveyor first called it Upper Schmith Knob in 2009, but was renamed to "Bear Mountain."

8) **Schmith Knob** – Middle Dungeness watershed. The site was a historic homestead with open, flat grassy meadow.

9) **Pat's Prairie –**McDonald Creek watershed. The site consisted of flat, grassy openings within forest.

10) **Green Hill** –Lower Dosewallips watershed. The site included natural openings with rock outcrops, seeps, and a diversity of native plants.

11) **Hamma Hamma –** the Hamma Hamma watershed. The site included steep rocky balds near Lena Creek.

12) **Gray Wolf –** Gray Wolf watershed. The site was natural openings and balds along a trail.

Surveys

Potentially suitable habitat at the sites, including balds and other forest openings, were surveyed for butterflies. A survey protocol specific for Taylor's checkerspot was not available; therefore methodologies outlined in the survey protocol for the Mardon Skipper (Seitz et al. 2007) and in the Taylor's checkerspot species fact sheet were used, as well as technical advice from experienced WDFW and DNR butterfly surveyors.

Surveys were done under appropriate conditions during the survey period (see below). The survey period was established as May 9 – June 22, which is a little later in the year than lower elevation sites.

Butterfly surveys consisted of systematically and slowly walking (where safe to do so) areas of potentially suitable habitat searching for adult butterflies. In some cases, butterflies were counted from a vantage point, if it was too steep to walk. During surveys, all butterfly species were documented if possible; however search efforts were focused on locating Taylor's checkerspots. Binoculars were used when butterflies are perched to view wing patterns for identification. Butterflies were netted for identification, if needed. When possible at least one photograph of a Taylor's Checkerspot showing clear view of the wings was taken for identification purposes at each survey area where they were observed.

The ONF acquired a WDFW scientific collection permit to collect vouchers for the purposes of species verification and documentation of new populations. Collected specimens were apparent males and from populations where greater than 20 individual butterflies were observed.

Survey Conditions and Time of Day

Surveys were conducted under all the following conditions:

1. Ambient air temperature greater than 55˚F (13˚C). Above 60˚F (16˚C) preferred.
2. Time between 1000 and 1700.
3. Sunshine is sufficient to cast a distinct shadow. No surveying during rainy weather.
4. Wind should be on average below 10 miles per hour or below Beaufort Scale 5 (small trees in leaf beginning to sway).

Number of Survey Visits

Each site received one survey during the survey period, except for the sites which had detections. The sites which had 1-4 butterflies detected in 2009 had one additional visit in 2010. The three sites with high counts/ populations had more visits, in order to get a more accurate count and to further document the flight period. All surveys were conducted by FS biologists or contractors or WDFW biologists.

Survey Documentation

The following forms and maps were completed for *each* survey:

(1) Taylor's Checkerspot Survey Form; including site name, survey date and time, elevation, aspect, legal location, latitude and longitude coordinates of site, weather conditions, # Taylor's checkerspots observed and behavior, plant species used for nectaring or egg-laying, and survey notes;

(2) Butterfly Species Checklist (Species of all butterflies observed);

(3) Aerial photograph or topographic map showing Taylor's Checkerspot locations and area surveyed.

Site Descriptions/ Plant Surveys

One Site Description Form was completed for each survey area. This included the following:

1. Describing the characteristics of the site, including the dominant plant species; presence of rock outcrops, wet areas, and invading sapling trees; any threats or disturbance to the site, such as trampling, the presence of invasive plants; the number and approximate sizes of openings (such as balds or prairies) in the survey area; and surrounding vegetation.
2. Listing potential larval host plants and nectar plants present at the site. (An initial checklist was developed before surveys. This list of nectar plants was lengthened after surveys began.)

RESULTS AND DISCUSSION

Taylor's Checkerspot Detections

A total of 12 sites/ survey areas were surveyed 2009-2010. Six sites were surveyed both years, and six were surveyed for one year. Approximately 300 acres suitable habitat (open and semi open habitats) total were surveyed.

Taylor's Checkerspots were observed at seven of twelve sites surveyed (Tables 1, 2, Figures 1, 2). Three sites (Three O'Clock Ridge Lower, Upper Dungeness, and Bear Mountain) had substantial numbers of Taylor's checkerspots. The highest numbers of adults observed in one day were 69 at Three O'Clock Ridge Lower, 157 at Upper Dungeness, and 61 at Bear Mountain. Upper Dungeness and Bear Mountain were newly discovered Taylor's Checkerspot populations found in 2009. Prior to 2009, the only known Taylor's checkerspot site on Olympic National Forest was at Three O'Clock Ridge Lower.

Four sites (Dirty Face Ridge, Mid Dungeness, Gold Creek, and Three O'Clock Ridge Upper) had 1 to 4 individual Taylor's checkerspot butterflies detected. The butterflies at these sites were probably dispersers from near-by populations. Three O'Clock Ridge Upper was adjacent to (above) the Three O'Clock Lower site, and the one individual detected likely was from the population below. The habitat at 3 O'Clock Upper is less suitable due to being more open and barren and having fewer host plants. This site was dropped after 2009 from the list of potential habitat and further surveys. The name of the site below has become "Three O'Clock Ridge" (without "Lower").

Dirty Face Ridge site had one Taylor's checkerspot detected in 2009 and one in 2010. The sightings were at 4800' and 4400' elevation, respectively, which are very high locations for the subspecies. However, this site probably does not support a population. The sightings were likely individuals from a population to the west (Upper Dungeness or Three O'Clock Ridge) which are within 3.5 km (2.2 mile) across the drainage. (The Upper Dungeness site can be seen from Dirty Face Ridge.) The site thermal dynamics at Dirty Face Ridge may not be suitable for Taylor's checkerspots. Potential nectar and host plants were not as abundant at this site as the other occupied sites such as Upper Dungeness.

Mid Dungeness site was across the river from 3 O'Clock Ridge. The individual(s) observed at this site likely dispersed from the 3 O'Clock Ridge population. The site has some host and nectar plants, but not in high abundance. The site may not be suitable for Taylor's checkerspots, due to having a northwest to north aspect and being a cooler site.

Gold Creek had some individual(s) detected in 2009. The largest bald appeared potentially suitable with a mixture of nectar and host plants. However, the site was searched well in 2010, and no butterflies were detected, so it was concluded that there

was no core population at Gold Creek. The site was 2.9 km (1.8 mile) from Bear Mountain, the nearest population.

Taylor's checkspots were not detected at five sites surveyed. Pat's Prairie and Schmith Knob were not considered suitable habitat, lacking larval host plants, and were dropped from further surveys after 2009. Green Hill had potential host plants present, but possibly there were no Taylor's checkerspots at this site due to the distance and isolation from other populations. Green Hill was botanically a pristine site and contained a diversity of plant species; the site had less bare ground compared to the occupied sites.

Lena Creek Bald site contained some nectar plants but may not be suitable due to lack of host plants and being very steep without warm "steps". The Gray Wolf site had both potential nectar and host plants, and ideally should have had additional survey visits. Unfortunately, additional survey visits to this site were not completed due to bad weather conditions.

Flight Season

The dates of adult Taylor's checkerspot detections ranged from the first week of May to the third week of June (Table 2). The flight season was at least 48 days at Upper Dungeness, 39 days at 3 O'Clock Ridge, and 38 days at Bear Mountain. Unfortunately, it was difficult to obtain good counts during much of the peak season in 2010 (second half of May and early June) due to unfavorable weather conditions. The high count at Bear Mountain was in mid May, 3 O'Clock Ridge in mid May, and Upper Dungeness mid May and late June. Upper Dungeness had an unexpected high count late in the season (June 22).

Behavior

Taylor's checkerspots were observed nectaring on 15 different plant species (Table 3). Copulation was observed at Three O'Clock Ridge Lower in 2009 and at Upper Dungeness in 2010. Egg laying was observed on roadside plantain (*Plantago lanceolata)* at Three O'Clock Ridge. Puddling behavior was observed at Upper Dungeness. Basking, flying and nectaring were common behaviors. Adults (probably males) were occasionally observed flying high, over the treetops.

Other Butterfly Species

Twenty other butterfly species were noted during the surveys (Table 1, 4). Brown elfins, Sara's orangetips, and spring azures were especially common, and seemed to be particularly associated with rocky, open balds. Each of these three species was detected at eight or nine of the 12 sites surveyed.

Habitat

Habitats used by Taylor's checkerspots included rocky, open balds within natural forest, roadsides, and openings within managed stands containing a mixture of potential host and nectar plants. Taylor's checkerspot populations at Three O'Clock Ridge Lower, Upper Dungeness, and Bear Mountain were found in openings in managed stands (figures 3-5). These stands were clearcut and broadcast-burned in the 1960s, but portions of the stands regenerated poorly and have remained open. The sites have shallow soils and rock outcrops. Although the sites are on steep rocky slopes, they contain "steps" which may be important for the butterflies. Taylor's checkerspots were detected in road corridors, especially at Upper Dungeness and Three O'Clock Ridge. The roadsides may be important to the butterflies for dispersing, nectaring, and even oviposition on roadside plants. Table 1 shows site descriptions, including the potential host and nectar plants recorded at each site.

The openings at the three sites with populations are being encroached by trees and shrubs. Bear Mountain is especially a small site and threatened by encroaching trees and shrubs. Invasive plant species were noted at almost all the sites, which may be threats to checkerspot habitat. Other potential threats include recreationalists (hikers or dispersed campers) and vehicle traffic. A crushed adult and a post-diapause larva have been found on the road.

The elevation of recorded Taylor's Checkerspots detections ranged from 1500 to 4800 feet. The three sites with populations were about 2500-3200 feet elevation, with SE or SW aspects.

Next Steps

The next logical steps include developing site management plans for the three sites where populations were confirmed, and initiating habitat restoration/ enhancement efforts. The site management plans would include a schedule for management actions, such as removal of encroaching trees and shrubs, invasive plant control, road management, and possibly host plant transplanting or seeding. Habitat management could also include creating suitable habitat in adjacent areas and connecting habitats.

A lot was accomplished in two years, including gaining valuable knowledge about habitats used by Taylor's checkerspots, occupied sites, and the flight season within Olympic National Forest. However there is much to learn about the sites, and additional information is needed to develop management actions. There is only minor information on larval plant use and the timing of larvae activity. Fortunately, we initiated larval surveys (not using ISSSSP funding) in 2010. Pre-diapause larvae was observed in *Castilleja* at Bear Mountain, June, and post-diapause larvae was observed at Bear Mountain and Three O'Clock Ridge in March 2010. Additional larval surveys are needed to gain more knowledge on the timing of larval activity, host plant use and what specific portions of the sites are used by larvae.

Additional information is also needed on the timing of the adult flight season, oviposition locations, pupating, and the extent of the populations. More information is needed about the flight season at Upper Dungeness in particular. It is important to continue monitoring the known sites to answer these questions and gain information necessary for habitat management.

ACKNOWLEDGEMENTS

Ann Potter was involved with this project from the beginning. She helped identify potential habitats, provided information about historic sightings, and supplied information from Washington State DNR about potential habitats. She gave input for the initial survey protocol, including the survey period, and helped develop the initial potential host and larval plant list. In addition she provided information regarding potential experienced surveyors.

Stewart Wechsler conducted many of the surveys in 2009. He provided much of the needed information for the Site Descriptions and identified many of the plants at the sites.

Victoria Bennett conducted many of the surveys in 2010. She collected valuable information on butterfly behaviors and possible core areas of the sites.

Other surveyors besides myself included Betsy Howell, Kurt Aluzas, Cheryl Bartlett, Bill Yates, and Anita McMillan.

Susan Piper, Wildlife Program Manager for Olympic National Forest, submitted the funding proposal and supported the project activities all the way.

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Table 1. Taylor's Checkerspot Survey Areas: Site Descriptions, Plants, and Butterfly Species Observed, Olympic National Forest, 2009-2010.

Site Name - 6th Level Watershed	Elev-Aspect	TACH ?	Potential Host Plants	Potential Nectar Plants	Site Description	Other Butterflies Observed	Other Notes
3 O'Clock Ridge Lower Middle Dungeness Watershed	2200-3100 SE	Y 69	*Castilleja hispida, Collinsia parviflora, Plectritis congesta, Plantago lanceolata*	*Berberis aquifolium. B. nervosa, Cerastium arvense, Eriophyllum lanatum, Fragaria vesca, F. virginiana,, Lomatium utriculatum, L. martindalei, Plectritis. congesta, Sedum spathulifolium, Zygodemus venenosus, Cryptantha intermedia, Taraxacum officinale, Phlox diffusa, Arctostaphylos Columbiana*	Series of small rocky balds descending along minor ridges down from road surrounded by 250+ yr old conifer forest. Plants include mosses, lichens, *Festuca* sp., *Lomatium* spp, Orchid (*Calypso bulbosa*) , *Viola* ., *Juniperus* sp., *Rosa gymnocarpus, Holodiscus discolor*. This site also has managed stands along the road clearcut in 1960s, containing openings with mixture of potential nectar and host plants, on steep rocky slope with "steps." Roadsides also used by TACH.	Sara's orangetip, brown elfin, spring azure, two-banded checkered skipper, margined white, hoary anglewing, green anglwing. anglewing sp., Caifornia.tortouiseshell, pale swallowtail, silvery blue, moss' elfin, mourning cloak. cabbage white, W. tailed blue	Threats: Invasive plants, encroaching conifers, hikers, vehicle traffic. Road and trail go through area.
3 O'Clock Ridge Upper Middle Dungeness Watersehd	3100-4800 SE	Y 1	*Castilleja. hispida, Collinsia. parviflora, Plectritis congesta, Penstomon. ovatus, Plantago lanceolata*	*Berberis aquifolium. B. nervosa, Cerastium arvense, Eriophyllum lanatum, Fragaria vesca, F. virginiana,, Lomatium utriculatum, Plectritis. congesta, Sedum spathulifolium, Zygodemus venenosus, Cryptantha intermedia, Taraxacum officinale, Phlox diffusa, Erysimum arenicola, Arctostaphylos columbiana*	A ridge from ~3000-4800' elevation; with small openings & semi-open areas at bottom; more contiguous opening towards top. Open areas have a lot of exposed bedrock, with moss, lichen, *Festuca*, kinnikinick (*Arctostaphylos uva-ursi*), *Juniperus* and other dry-site plants. A mixture of potential host and nectar plants present but not as abundant as down below at 3 O'Clock Ridge Lower.	Sara's orangetip, spring azure, anise swallowtail, painted lady	Non-native present plants including Cheat-grass (*Bromus tectorum*)

Site Name - 6th Level Watershed	**Elev-Aspect**	**TACH ?**	**Potential Host Plants**	**Potential Nectar Plants**	**Site Description**	**Other Butterflies Observed**	**Other Notes**
Mid Dungeness Middle Dungeness Watershed	2500-3800 NW	Y 1-3	*Castilleja. hispida, Collinsia parviflora, Plectritis congesta,*	*Berberis aquifolium. B. nervosa, Eriophyllum lanatum, Fragaria vesca, F. virginiana,, Lomatium utriculatum, Plectritis. congesta, Sedum spathulifolium, Arctostaphylos columbiana*	Series of steep rocky balds above the river in 250+yr forest. Plants include Juniper (*Juniperus communis),* Oceanspray (*Holodiscus discolor*), kinnikinick *(Arctostaphylos uva-ursi*), wild onion (*Allium* sp.) *Festuca* sp., yarrow (*Achillea millefolium*), mosses.	Sara's orangetip, brown elfin, spring azure, anglewing sp.	Hikers, encroaching conifers. Gold Creek trail goes through area.
Upper Dungeness Upper Dungeness Watershed	2700-3200 SE	Y 157	*Castilleja. hispida, Collinsia parviflora, Plectritis. congesta Plantago lanceolata*	*Berberis aquifolium. B. nervosa, Cerastium arvense, Eriophyllum lanatum, Fragaria vesca, F. virginiana,, Lomatium utriculatum, L. martindalei, Plectritis congesta, Sedum spathulifolium, Zygodemus venenosus, Cryptantha intermedia, Taraxacum officinale, Phlox diffusa, Valeriana scoulei,, Arctostaphylos Columbiana*	The site consists of open /semi-open areas in 3 managed stands clearcut in 1960s extending down from road. There is also a natural rocky area above road. Three openings exist within the clearcuts where checkerspots were observed. The middle opening had the highest density of checkerspots. The openings are on rocky, steep slopes but contain flat "steps." The roadsides also used extenstively by TACH. Site has high plant diversity, including a mix of potential nectar and host plants. Surrounding forest 250+ yrs old.	Sara's orangetip, brown elfin, spring azure, two-banded checkered skipper, anise swallowtail, arctic skipper, W tailed blue, silvery blue, hoary anglewing, green anglewing, satyr anglewing, mourning cloak	Threats include recreationalists / dispersed campers and hikers, vehicle trafftic. Road goes through site. Trailhead at end of road. Invasive plants present. Encroaching conifers and shrubs in the openings.
Dirty Face Ridge Upper Dungeness Watershed	3300-5000 W-SW	Y 1	*Castilleja hispida, Collinsia parviflora,*	*Berberis aquifolium. B. nervosa, Eriophyllum lanatum, Fragaria vesca, F. virginiana, Phlox diffusa, Erysimum arenicola, Valeriana scouleri Lomatium. martindalei*	Ridge with series of open to semi-open dry talus slopes running downhill to west from ridge in old forest. Plants include shore & white pines (*Pinus), Rosa* sp., Oceanspray (*Holodiscus discolor*), kinnikinick *(Arctostaphylos uva-ursi*), *Juniperus communis, Rhododendron macrophyllum*, wild onion (*Allium*).	Sara's orangetip, spring azure, brown elfin, W. tailed blue, California tortoiseshell	Hiking trail goes through site. Approx 25 ac surveyed; 25 more acres habitat not surveyed due to weather.

Site Name - 6th Level Watershed	**Elev-Aspect**	**TACH ?**	**Potential Host Plants**	**Potential Nectar Plants**	**Site Description**	**Other Butterflies Observed**	**Other Notes**
Gold Cr Middle Dungeness Watershed	1500-2300 SW	Y 1-4	*Castilleja hispida*, *Collinsia parviflora*, *Plectritis congesta*,	*Berberis aquifolium.*, *Eriophyllum lanatum*, *Fragaria vesca*, *F. virginiana* , *Plectris congesta*, *Sedum sp.*, *Zygodemus venenosus*, *Cryptantha intermedia*, *Erysimum arenicola*, *Arctostaphylos columbiana*	Series of steep rocky balds surrounded by mature forest. Moss, *Festuca*, and *Rosa* sp., Oceanspray (*Holodiscus discolor*) present. Largest bald had greater abundance of potential nectar and host plants.	Sara's orangetip, spring azure, brown elfin	Invasive plants include oxeye daisy & field veronica; Steep, difficult terrain.
Bear Mtn Middle Dungeness Watershed	2400-2700 SW	Y 61	*Castilleja. hispida*, *Collinsia parviflora*, *Plectritis congesta* *P. ovatus*, *Plantago lanceolata*	*Berberis aquifolium.* *B. nervosa*, *Eriophyllum lanatum*, *Fragaria vesca*, *F. virginiana*, *Plectritis congesta*, *Sedum spathulifolium*, *Taraxacum officinale*, *Arctostaphylos columbiana*	Bald at top extending down steep hillside in managed stand. Stand was clearcut 1969 and contains openings with a mix of potential nectar and host plants, including an abundance of *Castilleja*. Other plants include *Rhododendron macrophyllum*, kinnikinick *(Arctostaphylos uva-ursi*), Ocean spray (*Holodiscus discolor*). Surrounding mature forest about 90 yrs old.	Sara's orangetip, brown elfin, spring azure, two-banded checkered skipper, ochre ringlet, mourning cloak, hoary anglewing,	Nonnative plants include Oxeye daisy and Hairy Cats-ear. Encroaching conifers is a big threat to checkerspot habitat. Roosting adults observed in Kinnikinick.
Schmith Knob Meadow - Middle Dungeness	1500 Flat	N	*Plantago lanceolata*	*Malus* sp., *Berberis* sp, *Fragaria vesca*, *F. virginiana*.	Old homestead site with former pasture containing nonnative grasses, about 15 acres.	Spring azure, satyr anglewing, mourning cloak	
Pats Prairie McDonald Creek Watersehd	2900 Flat	N		*Berberis nervosa*, *Fragaria virginiana*	Series of 3-4 open areas with wet soil, with a variety of conifer saplings. Other plants include *Vaccinium spp.*, *Festuca* grasses, salal (*Gaultheria shalon*).	Sara's orangetip, brown elfin, satyr anglewing, faun anglewing, margined white, mourning cloak	

Site Name - 6th Level Watershed	**Elev-Aspect**	**TACH ?**	**Potential Host Plants**	**Potential Nectar Plants**	**Site Description**	**Other Butterflies Observed**	**Other Notes**
Green Hill Lower Dosewallips Watersehd	2000 South	N	*Castilleja hispida, Collinsia parviflora, Plectritis congesta*	*Berberis aquifolium* *Cerastium arvense* *Eriophyllum lanatum* *Fragaria vesca* *F. virginiana* *Lomatium utriculatum,* *L. martindalei,* *Mimulus* sp. *Zygodemus venenosus* *Arctostaphylos Columbiana*	Series of rocky balds surrounded by mature 80 yr old conifer forest. The balds are covered with adiversity of plants, including *Racomitrium* sp. (Rock Moss), *Festuca* grasses., Onion (*Allium crenulatum*), Ocean spray (*Holodiscus discolor*), kinnikinick *(Arctostaphylos uva-ursi*). Scattered small seeps present.	Brown elfin, spring azure, two-banded checkered skipper, California tortoiseshell	Almost no bare soil compared to occupied sites. Pristine site, very few non-native plant species.
Gray Wolf Lower GrayWolf Watershed	3200-4300 SE	N	*Castilleja hispida, Collinsia parviflora Plectritis. congesta*	*Berberis sp.,* *Fragaria sp.* *Lomatium utriculatum* *Malus sp.* *Phlox diffusa* *Plectritis congesta* *Sedum sp.* *Valeriana scouleri* *Zygodemus venenosus* *Arctostaphylos Columbiana*	Small bald mid slope on SE facing ridge, with rock outcrops, shallow soils and many potential nectar plants. Also one south facing rock outcrop.		Trail goes through, but first bald is relatively undisturbed. The 2nd opening has social trails bisecting the habitat. No weeds except one apple tree.
Lena Cr Bald – Mainstem Hamma Hamma R.	1000-1500 South	N		*Fragaria sp.* *Mimulus* sp.	Rocky bald with shallow soil, covered with moss and other plants, such as monkeyflowers (*Mimula* sp.) strawberry (*Fragaria* sp.), *Viola* sp. Other balds in area in steep terrain and inaccessible.	Sara's orangetip, Two-banded checkered skipper	1992 DNR survey found *Castilleja sp.*, *Eriophyllum lanatum, Plectritis congesta*

Table 2. Taylor's Checkerspot Surveys, Olympic National Forest, 2009-2010.

Site Watershed	Survey Dates	# TACH	Notes
Bear Mtn	15 May 09	41	Butterflies detected throughout openings incl rocky bald at top. One voucher collected. Stewart first detected 1 adult at this site on 9 May.
	7 May 10	1	Adults just emerging.
	12 May 10	61	Observed virtually none at top bald.
	5 Jun 10	42	Most (30) were at top bald. Roosting in kinnikinnick.
	12 Jun 10	5	Concluded season at end.
3 O'Clock Ridge	16 May 09	25	Surveyed East roadside balds. Observed mating.
	17 May 09	25	Continued previous day survey. Surveyed roadside habitats & balds below trailhead. Specimen collected.
	25 May 09	69	High concentration (42) in N large bald near trail; also along road.
	28 May 09	47	Road transect.
	10 Jun 09	18	Road transect.
	12 Jun 09	33	Searched balds and road. One butterfly examining *Plantago* along road.
	6 May 10	3	Searched road and balds.
	11 May 10	48	Identified "core area" in managed stand where most were observed. Few in balds.
	12 Jun 10	7	Road transect. 5 males, 2 females. Observed oviposition on *Plantago.*
	13 Jun 10	10	Searched roadside & core area for eggs. Found 2 egg patches on *Plantago.* Concluded end of flight season.
Upper Dungeness	28 May 09	50	Road transect. Newly discovered population. Voucher specimen collected.
	31 May 09	35	Searched western portion of site. Not complete visit due to weather.
	10 Jun 09	24	Road transect.
	14 Jun 09	48	Not complete visit. Continuation of 5-31visit. Highest density in middle opening. Specimen collected.
	6 May 10	2	Road transect
	13 May 10	93	Found searching males in west opening; core area in middle and none in eastern opening. Mating observed.
	14 Jun 10	34	Surveyed core area. Appeared to be end of season.
	18 Jun 10	34	Road transect
	22 Jun 10	157	Road transect
3 O'Clock Ridge Upper	17 May 09	0	Searched ridge up to 4800'.
	12 June 09	1	
Mid Dungeness	30 May 09 14 May 10	1-3 0	Searched series of balds. Observed adult 1 mile from 3 OCR core area. Concluded that the balds may not be suitable due to NW – north aspect.
Gold Cr	24 May 09 17 May 10	1-4 0	Searched balds. Adults 1.8 mi from Bear Mtn population Found small sections w/ suitable habitat. But concluded no core population. Did not detect any adults, not even in vegetation.
Dirty Face Ridge	13 Jun 09 8 June 10	1 1	1 male captured @ 4800'. Site is 2.3 mi from Upr Dung; 2.1 mi fom 3OCR site. 1 adult found at 4400' and flew over trees towards Upr Dung.
Pats Prairie	23 May 09	0	Wet meadow.
Schmith Knob meadow	9 May 09	0	Old pasture.
Green Hill	22 May 09	0	Largest balds surveyed. Other smaller openings were not surveyed due to not finding TACH in the best habitat & good conditions.
Gray Wolf	7 June 10	0	Got cloudy. Found meadows along trail w/ host and nectar plants.
Lena Cr bald	13 May 10	0	Surveyed Lena bald. Steep, mossy. Could not locate other balds.

Table 3. Plants on which Taylor's Checkerspots were observed nectaring, ONF, 2009-2010.

Scientific Name	Common Name	Site where Nectaring was Observed
Arctostaphylos Columbiana	Manzanita	3 O Clock Ridge Lwr, Bear Mtn
Berberis sp.	Oregon grape	Upper Dungeness, 3 O'Clock Ridge Lwr
Cryptantha intermedia	Large-flowered cryptantha	3 O'Clock Ridge Lwr, Upper Dungeness
Eriophyllum lanatum	Woolly Sunflower	3 O'Clock Ridge Lwr, Upper Dungeness
Erysimum arenicola	Sand-dwelling Wallflower	3 O'Clock Ridge Upper
Fragaria sp.	Strawberry (unidentified sp.)	Bear Mtn, 3 OC Ridge Lwr, Upper Dungeness
Fragaria vesca	Woodland Strawberry	3 O'Clock Ridge Lwr
Fragaria virginiana	Wild Strawberry	3 O'Clock Ridge Lwr
Leucanthemum vulgare	Oxeye Daisy	Upper Dungeness
Lomatium utriculatum	Spring-Gold/ parsley	3 O'Clock Ridge Lwr, Bear Mtn, Upper Dungeness
Phlox diffusa	Spreading Phlox	3 O'Clock Ridge Lwr
Plectritis congesta	Sea Blush	3 O'Clock Ridge Lwr, Upper Dung, Bear Mtn
Sedum spathulifolium	Broad-leaved Stonecrop	3 O'Clock Ridge Lwr, Upper Dungeness
Taraxacum officinale	Common Dandelion	3 O'Clock Ridge Lwr, Upper Dungeness
Trifolium repens	White clover	3 OC Ridge Lwr
Valeriana scouleri	Scouler's Valerian	Upper Dungeness

Table 4. Other Butterfly Species Observed during Taylor's Checkerspot Surveys, Olympic National Forest, 2009-2010.

Scientific Name	Common Name
Anthocharis sara	Sara's Orangetip
Carterocephalus palaemon	Arctic Skipper
Celastrina argiolus echo	Spring Azure
Coenonympha tullia ssp.	Ochre Ringlet
Euphydras editha taylori	Taylor's Checkerspot
Everes amyntula anyntula	W. Tailed Blue
Glaucopsyche lygdamnus columbia	Silvery Blue
Incisalia augustinus	Brown Elfin
Incisalia mossi mossi	Moss' Elfin
Nymphalis antiopa antiopa	Mourning Cloak
Nymphalis californica	California Tortoiseshell
Papilio eurymedon	Pale Swallowtail
Papilio zelicaon zelicaon	Anise Swallowtail
Pieris marginalis marginalis	Margined White or Mustard White
Pieris rapae	Cabbage White
Polygonia faunus	Faun Anglewing or Green Anglewing / Comma
Polygonia gracilis zephyrus	Zephyr Anglewing or Hoary Anglewing/Comma
Polygonia satyrus	Satyr Anglewing/ Comma
Polygonia sp.	Anglewing / Comma (unidentified sp.)
Pyrgus ruralis	Two-banded Checkered Skipper
Vanessa cardui	Painted Lady

Figure 1. Photo of Taylor's checkerspots mating, Three O'Clock Ridge, ONF.

Photo by Stewart Wechsler

Figure 2. Photo of Taylor's checkerspot specimen, ONF.

Photo by Karen Holtrop

Figure 3. Photo of Taylor's Checkerspot Habitat, Bear Mountain Site, Olympic National Forest.

Photo by Karen Holtrop

Figure 4. Photo of Taylor's Checkerspot Habitat, 3 O'Clock Ridge Site, Olympic National Forest.

Photo by Victoria Bennett

Figure 5. Photo of Taylor's Checkerspot Habitat, Upper Dungeness Site, Olympic National Forest.

Photo by Stewart Wechsler