

Taylor's Checkerspot Annual Rangewide Working Group Meeting

November 17, 2021 | Teams Meeting

In Attendance:

Adam Stebbins, *Benton County*; Jennifer Heron, Dawn Marks, *British Columbia Ministry of Environment*; Sanders Freed, *Center for Natural Lands Management*; Sarah Belles, Melissa Habenicht, Nate Johnson, Elspeth Kim, Adam Martin, Erin Mau, *Ecostudies Institute*; Alex Scagliotti, *Graysmarsh LLC*; Matt Blakely-Smith, Carolyn Menke, *Greenbelt Land Trust*; Soledad Diaz, Scott Harris, Tom Kaye, Andy Neill, *Institute for Applied Ecology*; Todd Zuchowski, *Joint Base Lewis-McChord*; Carly Boyd, Kelli Bush, Michelle Klim, *Sustainability in Prisons Program*; Sasha Porter, *Thurston County Conservation District*; Tara Callaway, Cassandra Doll, Dan Grosboll, Zach Radmer, Rich Szlemp, Teal Waterstrat, *US Fish & Wildlife Service*; Ronda Naseth, *Captive Rearing Program Manager for USFWS*; Karen Holtrop, Anne Poopatanapong, *US Forest Service*; Regina Johnson, Noelle Nordstrom, Ben Stein, Brian Turner, *Washington Dept. Natural Resources*; Shelly Ament, Gary Bell, Julie Combs, Wendy Connally, Josh Cook, Mary Linders, Darric Lowery, Anita McMillan, *Washington Dept. Fish & Wildlife*; Kelsey King, *Washington State University*; Andrew Dechaine, Dana Ross

Regulatory Updates

Recovery Planning Status Update - Dan Grosboll, USFWS

The federal draft recovery plan (DRP) for TCB was recently sent to WDFW for their comments. Following review by WDFW, the DRP will undergo additional internal review by USFWS. Once internal reviews are complete, the DRP will go out for public review for all partners and peers to comment. The recovery implementation strategy (RIS) and Species Biological Report (SBR) are under development. The RIS contains more complete details of on the ground recovery priorities and objectives while the SBR is a description of the species, its habitats, and most importantly its current status in the context of recovery planning. All of these documents are guided by the resilience, redundancy, and representation necessary for recovering the species. Mary Linders asked how Oregon entities would fit into the process. Rich Szlemp commented there is no Oregon state legal mandate for the conservation of invertebrates in Oregon and there are no TCB populations on Oregon state lands, so it is unlikely they will provide substantial input. Discussion followed about the importance and purpose of recovery plans.

JBLM Conservation Plan Update- Zach Radmer, USFWS

The current biological opinion for training and land management activities on JBLM (which addresses lark management) will expire in January 2022. JBLM and USFWS are planning to re-initiate consultation to extend the proposed actions another year (January 2023), which should coincide with the completion of new programmatic biological opinion under the Conservation Policy Initiative (Pilot Project). The re-initiation will also address the lack of TCB monitoring on the AIA in 2021.

Since 2015, JBLM and USFWS have been working a Conservation Crediting Program that would trade off-base conservation success for larks, Mazama pocket gophers, and Taylor's checkerspots for establishing areas on JBLM that are free of current and future conservation measures for those species. The framework biological opinion commemorating the program was signed on November 3, 2021. This agreement incentivizes JBLM to make off-base investments in TCB conservation across the range of the species, but particularly in the south Puget lowlands. To earn conservation credits off-base through USFWS, the site must be at least 50 acres in size, support a population of Taylor's Checkerspots, and meet an established threshold for 5 years without augmentation. More credits can be earned in situations where adjacent areas become occupied or where two nearby sites interact. Off-site places must be permanently conserved with conservation easement and must have a management plan and a non-wasting endowment

that funds the management plan into perpetuity before any credits can be spent on-base. JBLM only earns credits according to the portion of success that they paid for (they pay for 50% conservation success; they get 50% of credits).

A copy of the Framework Biological Opinion for the Conservation Crediting Program for JBLM was distributed with the meeting minutes.

In 2020, JBLM was chosen to be a Pilot Project for implementing the Conservation Policy Initiative (CPI) (a sub-project of the DOD - DOI Recovery and Sustainment Partnership). The CPI is intended to explore new regulatory approaches that simultaneously incentivize species recovery and increase training flexibility through the establishment of 'defined conservation commitments'. This Pilot Project would be solidified through a new programmatic biological opinion (and revised INRMP) that would replace the 2017 programmatic biological opinion. The Pilot Project and the Conservation Crediting Program are designed to be complementary. Long story short, JBLM would receive regulatory certainty and flexibility in exchange for an improved status of TCB *both on and off* the installation. Anticipated completion is January 2023. Draft strategies have been made for other species, and a meeting is scheduled to get that process started for the Taylor's Checkerspot. Eventually both Conservation Crediting Program and CPI will be implemented at the same time.

Portland Office Update- Rich Szlemp, USFWS

Range and population size of TCB in Oregon is very low compared to Washington: only about 10 acres in Oregon are occupied by TCB and more TCB individuals are in captive breeding than are out in the wild. It's unclear why the butterflies are not using the suitable habitat available, but there is investment in creating and enhancing more suitable habitat. In conjunction with captive propagation and restoration activities, over 1,000 larvae and pupae were released at Bald Hill last year. However, survival to the adult stage is low and warrants investigation into potential causes (e.g., interactions between TCB and potential predators or parasites). Release cages are being considered since they've been successful with other butterfly species. Mary Linders provided input on potential causes of low TCB establishment (e.g., pupae release strategies for other butterfly species may not work with TCB).

British Columbia Updates

Population Status and Conservation Strategies- Jenny Heron, BC Ministry of Environment

Recovery objectives for TCB continue to include: reduce threats within known TCB sites, establish a self-sustaining population within Helliwell Provincial Park & maintain known populations, survey other potential habitats within TCB range.

Helliwell Provincial Park- Over 2015-2020, work in the main area (left circle on map below) focused on the removal of conifers and vegetation in preparation for the translocation of a new TCB population. More recently, two new areas east of the main area (see map) were selected to begin restoration of TCB habitat (areas were chosen based on historical observations of TCB occurrence within park). Conifer removal was completed with minimal impacts to the habitat and an estimated three hundred stems (30- 40 years old) were removed before native plant installation began. Engaging local groups to foster stewardship of the land has been an emphasis of the program and examples of their involvement include: volunteers growing native plants in their backyards, elementary students planting native vegetation, and volunteers conducting TCB surveys using iNaturalist. UBC student volunteers and K'omoks first nations are among several groups becoming involved with land stewardship.

Garry Oak & Douglas-fir Trees



Larvae were released for the first time in Helliwell Park meadow habitat in 2020; no larvae from the original release were observed. However, captive breeding efforts continue to be successful with 1,300 TCB larvae released on 3 days over 2 weeks by volunteers; post-release monitoring was minimal. Adult surveys were conducted between April and May of 2021 and yielded >145 adult butterfly observations, though there was no observed mating, oviposition, or larvae. Surveys were conducted along a transect route using iNaturalist to document observations. At least one person visited the park on non-rainy days, with separate teams of survey biologists and volunteers collecting data. The need for better methods were highlighted, as after 2 years of releasing larvae there seems to be no reproduction occurring.

Denman Island- A 10 ha butterfly reserve on the island is the focal point of restoration efforts which began in March 2021 and centered on the creation of 10 small ephemeral “wetlands”. The rationale behind creating the wet areas was: 1. to increase the footprint of speedwells, a host plant of TCB which is prone to senescence early in the growing season; and 2. to keep vegetation low and exclude non-native plants like Scotch broom. Additionally, in past surveys the highest number of larvae have been found in the vegetation surrounding roadside ditches and flooded areas such as the pools created by heavy machinery ruts. Wetland construction finished in October 2021 and next steps include establishing plots to monitor butterfly activity (Jan-March 2022) and conducting surveys for TCB (April-June 2022). Ultimately, the hope is for the site to serve as a TCB release site.

Vancouver Island- In 2019, a new record of TCB was reported on Vancouver Island. Survey efforts focused on clearcut areas yielded 14 TCB individuals (survey effort=125km of transects over 47 hours). Jenny noted this low number does not necessarily indicate a population decrease; the survey area contained a fair amount of suboptimal habitat. The animals were found over a large area of logging roads and wet areas in clearcuts as well as airport property containing Gary Oak habitat.

Challenges to Taylor’s Checkerspot conservation are multi-faceted. Public engagement and outreach about the plight of the butterfly are difficult with social distancing restrictions. Recreational use of critical habitat, invasive plants, and deer are ongoing threats. Covid has made maintaining partnerships & building new relationships more difficult. Lack of resources continues to be a hurdle.

Zach Radmer asked how TCB survive wetland conditions. Jenny clarified these areas are small wet meadows rather than true wetlands and the rationale for creating them is to support speedwells (main TCB hostplants) which have been senescing early in the season due to dry conditions. Mary Linders followed up by asking where the larvae diapause. Jenny answered that it is an open question but commented that many larvae are found in roadside ditches. Mary pointed out that the South Sound habitat is on the opposite end of the spectrum with very dry conditions, and we need a better understanding of the timing of wet/dry cycles because TCB likely needs moisture at the right time. Mary also emphasized the importance of understanding host plant population dynamics and how they relate to TCB population cycles. Anita McMillan asked if basking habitat may be a limiting factor and Jenny responded that it probably wasn't, especially in comparison to host plants. Mary asked about survey efforts going forward and will follow up with Jenny at a future date.

Washington State Updates

Population Status Overview- Mary Linders, WDFW

Olympic Peninsula

At Upper Dungeness sites, surveying has been hit or miss depending on the weather, but numbers have generally been good over the past couple of years. On the other hand, numbers were down at lower elevation sites (DK, EV), which mirrored declines in the South Sound.

Anita McMillan chimed in that the 2020 EV survey was probably conducted after peak flight, making these numbers appear worse than the reality on the ground. In 2021 weather conditions were highly variable, and surveys were conducted during suboptimal weather windows. Mary suggested that going forward surveys are extended into suboptimal weather periods to see what the butterflies are doing (are butterflies still active in subpar weather? there's evidence from the South Sound that butterflies may be active in wider temperature windows than we initially thought). Ultimately, the butterflies should drive when surveys are conducted, not our ideas about weather constraints.

Karen Holtrop reported that, though weather conditions were variable, survey numbers were relatively good at UD sites. Numbers were at average or above average, suggesting a steady population. In contrast to surveys at DK & EV (which are point counts) the UD data used modified Pollard Walks. Standardizing monitoring procedure across agencies would be beneficial for comparing population numbers across sites. Good survey numbers are likely a result of both good weather conditions and habitat enhancement efforts. At Gray Wolf, only 11 butterflies were counted, which is cause for concern (as many as 42 have been counted there in the past). Quite a few pre-diapause larvae were found at TOR and UD, where habitat enhancement has been done. A scent detection dog team was used to search for pre-diapause larvae, and several individuals were found in new areas near occupied sites, suggesting an expanding range.

Clallam County Survey Results						
Clallam County USFS Sites (daily or visit high <u>adult</u> counts) <i>Data from 2014-2016 can be found in materials from prior years.</i>						
	2017	2018	2019	2020	2021	Notes
Bear Mountain, USFS	17	39	96	64	62	3 survey visits 2021. High count was the middle one, May 14.
Gray Wolf, USFS	1	2	3	-	11	2 visits. Plus, dog team search found larva confirming oviposition.
Three O'clock Ridge (TOR), total	10	90	105	251	221	2 complete visits. High count May 14.
<i>TOR road</i>	4	3	17	45	18	
<i>TOR clearcut openings</i>	0	2	29	101	98	
<i>TOR balds</i>	6	79	55	102	97	
<i>TOR N.</i>	0	6	4	3	8	Dog team found larvae nearby.
Upper Dungeness (UD) total	46	169	290	203	274	Two complete visits. High Count May 15.
<i>UD Road</i>	14	36	67	61	87	
<i>UD clearcut openings</i>	10	109	198	125	162	
<i>UD Silver Creek</i>	22	24	25	17	9	
<i>UD Maynard Burn Trail</i>	--	--	--	--	16	More adults in 2021 but was not surveyed entirely every year. We will now! Dog Team found larvae.
Clallam County WDNR Sites – Monitored by WDFW (peak single day <u>adult</u> counts <i>with dates</i>)						
Eden Valley	74 <i>May 22</i>	74 <i>May 22</i>	194 <i>May 12</i>	223 <i>May 9</i>	63 <i>May 19</i>	
Dan Kelly Ridge	131 <i>May 26</i>	131 <i>May 26</i>	162 <i>May 11</i>	204 <i>May 7-9</i>	160 <i>May 19</i>	
Clallam County CNLM Site (peak single day <u>adult</u> counts <i>with dates</i>)						
Dan Kelly Ridge – CNLM West	134 <i>May 26</i>	206 <i>May 15</i>	338 <i>May 7</i>	65 <i>May 28</i>	121 <i>May 11</i>	

Clallam County USFS Sites (larvae counts - densities) <i>Data from 2015-2016 can be found in materials from prior years.</i>						
	2017	2018	2019	2020	2021	Notes
Upper Dungeness NE Clearcut	13 (10/ha)	7 (5.4/ha)	6 4.6/ha.)	--		
Bear Mountain	1 (2/ha)	10 20/ha)	28	--		
Silver Creek	6 (30/ha)	6 30/ha)	8	11		

South Puget Sound

Within the Puget lowlands, there is concern about a steep decline in populations across all sites after a peak in numbers in 2018. Range 76 and Range 50 on JBLM were not surveyed due to access issues, but numbers at the other sites were dramatically down. Nate Johnson reported that Range 76 was a bust, but the west side of the impact area (Ranges 53 & 57) appeared to have high TCB abundances (this is anecdotal information from people who did have access to the area).

Mary explained that potential reasons for declining numbers include cumulative weather effects that have impacted all life stages of the Taylor's Checkerspot. Plantain goes dormant in the summer due to drought and usually begins growing again with fall rains, but recent fall droughts have prevented this growth cue. Flooding during larval overwintering may inhibit movement. Warm spells in January are breaking dormancy, while late snow events in late February top-kill host plants, extending the life of the *Plantago* pathogen and shortening larval foraging times. Drought periods in the spring also affect the efficiency of vegetation growth. Frequent and heavy rain in the adult, egg, and early instar phases reduces flight time and causes wash-off of host plants. These complications to the regular life cycle of the butterfly have contributed to its recent decline in population.

> For all survey results in this document – comparisons are only appropriate across lines, not across tables or sites. <						
2021 South Sound Survey Results (Distance estimation - peak single day count and associated single abundance estimate). <i>Transect spacing is 25 m at all sites except R76, where a 50 m spacing is used.</i> (Data from 2014-2016 is available in prior meeting minutes).						
Site, Landowner	Alias	2017¹	2018	2019	2020²	2021³
Range 76, JBLM	R76	582; 3992	2117; 14263	2395; 19435	1004; 5725	NA
Range 50, JBLM	R50	1410; 4244	2862; 8521	1938; 5851	1972; 5633	NA
Scatter Crk So. 1, WDFW	SCS1	717; 2298	1630; 3250	1786; 5484	930; 3741	568
Scatter Crk So. 2, WDFW	SCS2	21; 96	21; NA	76; 514	297; 1101	162
Training Area 15, JBLM	TA15	NA	112; 268	238; 685	1073; 2867	398
Tenalquot Prairie, CNLM	TNQ	NA	NA	NA	16	9
Glacial Her., Thurston Co.	GHP	1; NA	0; NA	NA	NA	NA
TA7S, JBLM	TA7S	1; NA	2; NA	12; 57	1; NA	NA

Captive Rearing and Reintroduction- Mary Linders, WDFW

The Oregon Zoo captive breeding program for Taylor's Checkerspot was closed due to Covid and Mission Creek is operating at half capacity. Additionally, there is limited availability of suitable habitat in which to release butterflies, which is challenging. There is one active release site at Tenalquot, and the TA 15 site may need to be reopened for releases so that progress is not lost. Host plant populations have declined across several sites, making it essential to assess and monitor habitat going forward. See meeting materials for details on operations at Mission Creek and translocation updates.

Captive Rearing (Washington) and Release						
Prediapause larvae release; Postdiapause larvae released; adults released.						
<i>Data from 2014-2015 can be found in meeting materials from prior years.</i>						
Facility	2017	2018	2019	2020	2021	Notes
Oregon Zoo	0; 1163; 66	2194; 424; 116	741; 2709; 214	0; 1204; 0	NA	
Mission Creek	0; 2770; 79	3006; 2912; 211	2514; 3852; 194	0; 5934; 0	0; 3788; 0	

South Sound TCB habitat management notable updates (see meeting materials for complete details)

JBLM- Nate Johnson, Ecostudies Institute

Cross-agency collaboration among WDFW, USFWS, and Ecostudies regarding the management of TA 15 was highly productive. Staff members conducted a site visit together, which allowed all parties to have a similar concept of habitat condition and conversations about how to proceed. A few prescribed burns that were cooler than desirable led to an invasion of Scotch broom across the habitat. The last prescribed burn in the northwestern portion of the site occurred

in 2015 and the partners decided to reintroduce fire there this year, opening an opportunity to boom spray a pre-emergent treatment for *Vulpia* control. With the driest year in the past decade, all native plants were totally desiccated which allowed for a boom spray treatment of in the southern portion of the site (TCB release area) with almost 10 acres of waist to shoulder high scotch broom. Talks with partners increased confidence in management actions. Elspeth mentioned that funding is now available to conduct site visits in South Puget Sound and that a TCB site visit will happen in spring 2022. Todd Zuchowski reiterated that JBLM is committed to employing adaptive management strategies and that habitat assessment efforts will be ramped up going forward. See meeting materials for management updates on other training areas and Johnson Prairie. Maps of TCB survey efforts on JBLM (AIA and TA 15) were distributed with the meeting minutes.

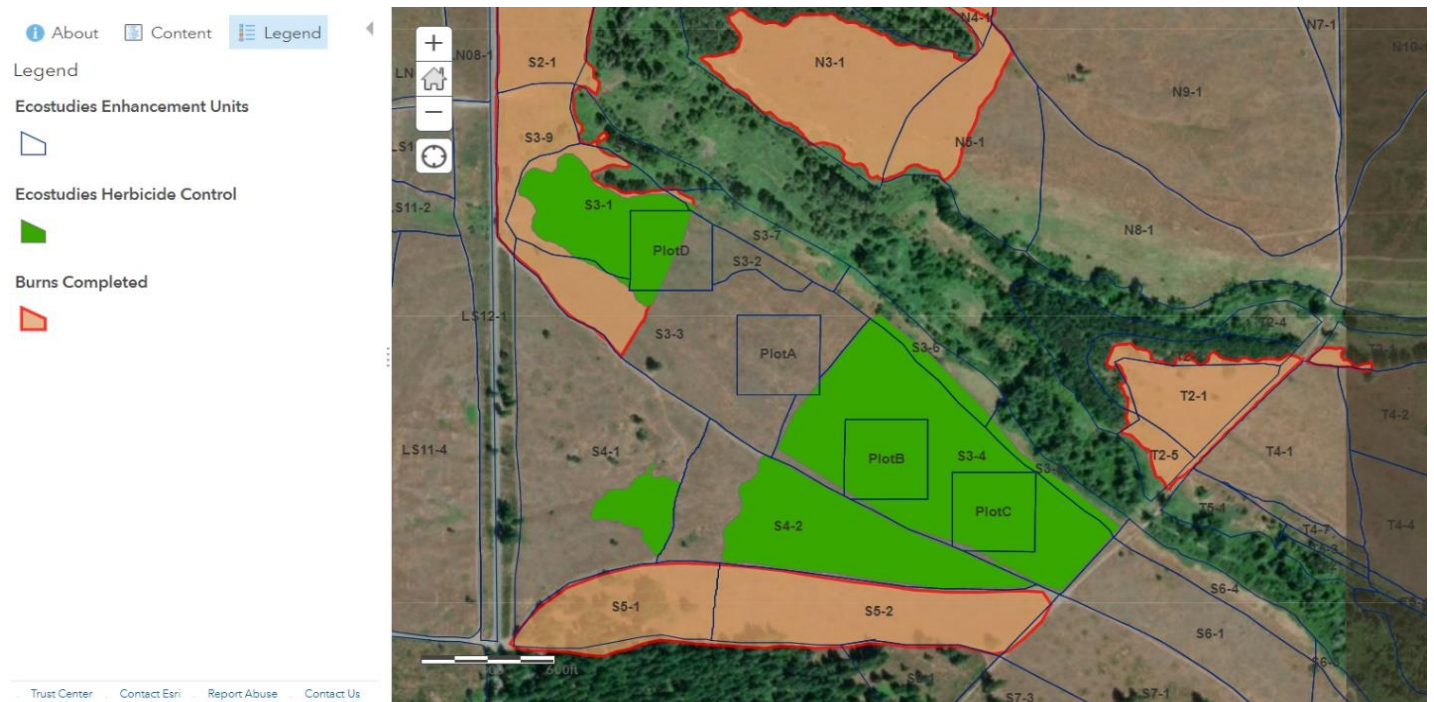


Figure 1. JBLM Training Area 15 habitat enhancements summer, fall 2021.

Violet Prairie, Deschutes Prairie, Glacial Heritage Preserve, Caveness Ranch, Leitner Preserve- Sanders Freed, CNLM
At ACUB sites Violet Preserve and Deschutes Preserve, *Vulpia myuros* has become a major challenge. Research is being conducted on both pre- and post-emergent herbicides, though other alternatives are being explored since reseeding cannot be done until it is controlled. Wolf Haven and Glacial Heritage Preserve continue to be burned and seeded. Caveness Ranch has 90 acres that have been converted from Christmas tree farm to prairie. Golden paintbrush is present on the site and, after more seeding of TCB species, it may be a potential area for release in the future. At Leitner Preserve, fire has not been used in a couple of years, making it difficult to control Scotch broom and conduct successful seedings.

Scatter Creek, West Rocky Prairie- Josh Cook, WDFW

Scatter Creek North is not currently occupied by TCB, though there are stray observations of individuals assumed to have traveled from South Unit despite poor corridor connection. These individuals are being encouraged through habitat enhancements in the area. Prescribed burns went very well this year. Upland prairie plants have been seeded in block K of North Unit. There has been an unusual disappearance of wet prairie habitat in the southern portion of block K, which could cause issues for late-season TCB that utilize wet prairie plant species. *Vulpia* is a problem at the site and

mapping/treatment are being implemented, though *Vulpia* sprouted before herbicide could be applied after prescribed burns. WDFW will be experimenting with modes of control for *Vulpia*, like other managers have noted.

South Unit contained several burn units in 2020 to maintain the prairie in conjunction with mowing control for Scotch broom, herbicide treatments for non-native grass, and seeding. The south-central portion of the unit contains the highest concentration of TCB, with another cluster of butterflies in the northwest area. It would be beneficial to increase the resources in a corridor of connection between the two populations. Abundant nectar resources in wet prairies in the northwestern portion provide a strong draw for the butterflies.

West Rocky Prairie was last burned in 2020 to prepare for the seeding and planting of TCB species. Rapid habitat assessment was conducted to determine where TCB reintroduction will take place. There will not be a burn this year, but hand flaming, seeding, and planting for host plants will be done to improve the habitat as much as possible.

Bald Hill NAP- Regina Johnson, WA DNR

At Bald Hill, flame weeding was conducted, followed by immediate seed/plugging to augment TCB species. Habitat enhancement at Bald Hill is focused on many smaller, strategically placed plots. Plot location is determined by factors such as sun exposure for adequate larval development. *Vulpia* is not posing as big of a problem as other managers have noted. At Mima Mounds, the Scotch broom is looking decent, but tall oatgrass has increased since the start of the Covid pandemic.

Mary Linders commented that she found *Vulpia* all over Bald Hill, but not in high abundances. Nate Johnson asked about the scale at which restoration actions are taking place. Regina confirmed that treatment areas are a few square meters, but there are a lot of them, and they are strategically placed. Nate then asked Mary how that strategy looked on the ground. Mary responded that the areas that were seeded had good densities of plants, but she was concerned about the small scale and, in some cases, that the treatments areas were not in placed with enough sun and warmth for TCB. Also, Bald Hill has a lot of microsites and treatments should go across all microsites to boost resilience of TCB to variable interannual conditions. Nate commented that more conversations should happen surrounding the scale of restoration. Given the limited availability of native seed, JBLM is moving towards restoration on smaller scales and it would be beneficial to have a plan to place those strategically.

See meeting materials for an update on Rapid Habitat Assessment Monitoring in South Sound.

Olympia Peninsula TCB habitat management updates (see meeting materials for complete details)

Dan Kelly Ridge- Sanders Freed, CNLM

On the balds, there is concern of butterflies flowing over the hill into a clear cut area. Work is being done to improve the herbaceous layer by removing trees and shrubs. The area was recently seeded with Taylor's Checkerspot species *Plantago*, *Castilleja hispida*, and several annuals. There is good connectivity between the old roadbed on the west ridge to the DNR balds to the east.

Upper Dungeness, Three O'Clock Ridge- Karen Holtrop, US Forest Service

Habitat enhancement is currently being done at the Upper Dungeness and Three O'Clock Ridge sites. At TOR, work focused on maintaining previous efforts, while at Upper Dungeness there is focus on connecting openings. The intent is not to remove all the trees, but to prune between them to allow passage for butterflies. Continued surveys will assess if the effort is successful as adult animals are found on both sides of the area. Seeding work has also been done and there are currently contracts in the works for increasing seed application. Seeding efforts are done both in areas where Douglas fir have been removed and in areas with a lack of host and nectar plants. Mary Linders chimed in that the

strategy of pruning back bushes/trees to allow passageway creates microsites with different light/temperature conditions which should be good for butterfly movement. Karen noted the need for the rapid habitat assessment protocol and Mary said it should be modified for the Olympic Peninsula, as the metrics are written for South Sound.

WDFW/WDNR Collaborative Efforts at Dan Kelly Ridge and Eden Valley- Shelly Ament, WDFW

Adding to Gary Bell's written updates in the meeting materials, Shelly talked about restoration efforts along the road that goes up to the cell tower at Dan Kelly. Vegetation management along the road is needed, including limbing and removal of small conifers. A crew is working to finish the project by the end of the year.

Timber harvest at Striped Peak is now in the planning phase with intent to open up and seed additional areas to improve habitat for TCB. Eden Valley had limbing work done in areas connecting two balds and it appears to be successful: TCB were observed in the areas in between balds. Gary Bell noted that in some areas where limbing occurred, a large influx of snowberry has come in and outcompeted some lower stature vegetation (including TCB nectaring species). Noelle Nordstrom mentioned that she has questions about the timing of seeding and microsites. Noelle was also wondering why plant community succession is happening so fast at that site (soil chemistry?). Mary Linders mentioned she is wondering about how smoke from wildfires could be affecting seed germination and other consequences of climate change.

Graysmarsh- Alex Scagliotti

Some details about the site cannot be shared due to a nondisclosure agreement. There is a small population of TCB thinly spread over about 15 acres on the northern end of the Olympic Peninsula between freshwater and the beach. This population is the earliest to fly in the area, with several individuals seen within the first few days of April. The property has a few nectar sources with a couple dozen plants that are heavily used (mostly hairy cat's ear). The growth trend of the population is variable with the second lowest count in record occurring two years ago (2019) at 51 individuals, though this number may not have been counted at the peak of activity. In 2021 the peak was 106, showing an increase but it's half as much as the median counts over the past 12 years. *Plantago*'s spatial extent isn't very large at the site, but density is increasing (may be because they were smaller plants). Usability of the plants to TCB larvae is questionable as they are currently very small but will hopefully grow larger in the future. Experimentation of disturbance regimes is occurring to determine what conditions will allow for the highest rate of plant growth. Management of invasive species this year included mowing and herbicide treatments. A small ¼ acre plot was mowed, sprayed, and planted with *Plantago* and will be monitored for success before continuing the same treatment on other marginal habitat areas. Major challenges to this site include invasive vegetation such as woody roses, and long term saltwater intrusion due to sea level rise. Zach Radmer added that they are in year 3-4 with a Safe Harbor Agreement and Alex is doing a great job at his first year on the job.

Tara Callaway joined the meeting to field questions about recovery planning. No questions were raised, but Tara is open to people contacting her in the future.

Oregon State Updates

Population Status Overview- Dana Ross, Freelance Entomologist

At Fitton Green-Cardwell Hill, drought has been detrimental to the amount of available nectar, affecting the adult butterfly flight season. The numbers have dropped since the 2016 count of 1,100 adults but have started to stabilize after a particularly low count of about 200 individuals in 2020. The flight period has condensed over the past few years, typically occurring around April 9 through May 1. The flight peaked at the one week mark this past year, with 112 individuals counted. Crestmont has improved connectivity from the powerline to Big and Little meadows, but the habitat quality in meadows adjacent to the powerline is decreasing. Butterflies are only found in the powerline area,

but not in either of the meadows. Dana thinks efforts should go towards improving habitat in those meadows as they are historic/adjacent habitat that once held strong numbers.

The meadows of Beazell Memorial Forest are looking good. Over a thousand butterflies were spotted, with a longer flight period. They have a higher diversity of microhabitats that makes them resilient to fluctuating weather events. The Middle Meadow has the most butterfly activity. Two weeks into the flight season the peak was counted at 539 individuals. Numbers of total estimated results this year are 1,148, an increase from the 916 counted last year. No observations were made in House Meadow or South Meadow. Restoration is recommended in House Meadow as it has proven to be a stepping stone to peripheral habitat. Habitat in South Meadow has been improved, but no adults have been observed there.

Benton County Sites (adult population estimate)							
	2016	2017	2018	2019	2020	2021	Notes
Fitton Green Natural Area	675	252	155	260	250	167	<i>Low #s. Connectivity increased between Powerline & Big/Little meadows.</i>
Beazell Memorial Forest	2,730	773	1,243	1,085	916	1,148	<i>Population appears to be relatively stable over past several years.</i>

Mary Linders asked how many days the flight season was at Beazell and Dana answered ~43, which is decent for a drought year. Julie Combs asked how annual population numbers were estimated. Dana answered that representative transects were established. The survey path passes through half of the quality habitat, so recorded data were multiplied by two. Surveys were done at least every week during active flight, and as frequently as every three or four days (when weather permitted).

A copy of Dana's 2021 Oregon Taylor's Checkerspot Report was distributed with the meeting minutes.

Oregon TCB habitat management notable updates (see meeting materials for complete details)

Cardwell Hill and Beazell Memorial Forest- Andy Neill, IAE

At Cardwell Hill (also known as Fitton Green) restoration work is underway at 3 meadows, which are on private property. A USFWS recovery grant is being used to assist the landowner with a thinning project to lower the density of trees adjacent to the meadow (with idea to facilitate butterfly movement); thinning went well. Additionally, herbicide treatments have been implemented and TCB native plant materials have been purchased. Additional funding from USFWS is being pursued to continue work.

In Beazell Memorial Forest, work is in progress in the South Meadow to improve habitat for butterfly migration directly to the meadow or for translocation. Treatments included tree removal, weed/grass removal, and seeding. That work ended this spring. A USFWS grant has funded seeding and plant removal in the North and Middle Meadows. Scotch broom is being weed wiped. Non-native grasses are a central problem as well as encroaching shrubs. The Americorps volunteers that usually help were not available this year.

Beazell Memorial Forest- Adam Stebbins, Benton County

Work with partners began in early 2020 to strategically place a weather station near TCB high use areas. Using the ZENTRA system to collect points in 15 minute intervals, these data loggers are monitoring soil temperature, precipitation, ground and surface data, and weather patterns over time. This information will be used to understand long-term climate trends and how those trends affect TCB and other focal species. Elk destroyed wires on the weather station, resulting in a lapse in data.

Mowing, herbicide application, and thinning of Douglas firs along the edge of South meadow have already been done. Currently the site is being monitored for the habitat conservation plan; the data will direct future priorities. Upcoming projects include connectivity for North Meadow and examining how nearby pocket meadows can be connected without negatively impacting TCB. Andy Neill asked about historical conditions of the possible corridor area. Adam answered that there are some areas with sparse larger trees, but many of the conifers were planted and are young. Andy said it looks like the area was originally open, younger trees are likely first generation and there aren't many stumps in there.

The Great Butterflyway- Matt Blakely-Smith, Greenbelt Land Trust

Greenbelt Land Trust has historically focused on Fender's Blue butterfly, but now there is growing attention on TCB. Greenbelt Land Trust currently has a project underway connecting Fitton Green to Bald Hill, which will serve as a corridor for TCB, Fender's blue, and other species such as Oregon vesper sparrow. The first step has been clearing conifers to create open prairie and oak savannah habitat. The second step will be revegetating with TCB nectar species. As far as current butterfly activity, Dana Ross found a few males on Bald Hill a few years ago and Rich Szlemp released a few captive reared TCB. Greenbelt is open to collaboration and input on creating TCB habitat.

Captive Rearing and Reintroduction- Ronda Naseth, Program Manager for USFWS

There were record numbers this year in terms of the number of eggs collected and the number of TCB females that were brought into the program (females were brought in earlier and therefore had more eggs). Once in the lab, UV bulbs were used as there were not many sunny days. Approximately 8,800 eggs hatched, a high number as the actual number of larvae counted at the third instar was about 7,000. The lab is at full capacity and the number of hours that technicians can work has been maximized, so an evacuation lab is being used to rear about 2,000 larvae. Due to dry conditions, pre-diapause release is not a viable option. Ronda expressed concern that they are not preparing larvae well enough for cold conditions (due to logistics at the prison) and by using the pupae cages Rich Szlemp proposed, they could determine if cold shock is a problem (along with predation and other causes of mortality).

Topic Area: Research and Other Projects

Action Plan/RIS Discussion

The captive rearing section of the action plan (Section 3.3B), mentioned expanding the captive rearing programs. Kelli Bush asked if that was still applicable since the Oregon program has grown considerably since the plan was written. Capacity has doubled at Mission Creek, though the Oregon Zoo program was lost due to funding which will be an ongoing challenge moving forward. Elspeth concluded that expansion has happened and is currently meeting needs. It will stay on the action plan and will be addressed in the future to ensure that it is still on track.

Mary Linders voiced concern about host plant viability on many South Sound sites, including Scatter Creek which hosts a large population of Taylor's Checkerspot. Habitat needs to be monitored consistently, as the assessment methods are designed to survey every site at a three year interval. Some sites were surveyed this summer for baseline data, others have not been surveyed since 2016. With dramatic changes since 2016, monitoring needs to be done on a more routine basis in order to discover habitat issues before they reach a critical status. Nate Johnson asked if Mary was able to do the surveys in westside sites in the impact area on JBLM. Mary responded that she has not. Range 50 has not been monitored since 2013. In range 76 a lot more work has been done and she believes that it was last monitored in 2017.

Dan Grosboll echoed Mary's concern about changes in host plant distribution and abundance. Dan emphasized that we need knowledge of what mechanisms are driving the changes. Mary responded that monitoring could document trends

of plant populations over time and help to elucidate mechanisms. Major challenges on the South Sound have come from Covid and lack of funding, along with shifts in habitat quality due to weather events.

Nate voiced concern that native seed capacity is going to be a critical issue in the South Sound area. Elspeth acknowledged seed availability was a growing challenge in South Sound and asked how other regions were faring. Jenny Heron noted that in British Columbia specialized license plate sales increased funds for parks, allowing for successful habitat restoration and no need for additional funding. Wildlife Preservation Canada has fully funded the captive rearing program, so there is no concern there either.

On the Olympic Peninsula (Clallam County), CNLM propagates seeds that are collected within the region. Elspeth communicated that the future of the CNLM seed farm is uncertain, as there have been a lot of changes in staffing and funding. Karen Holtrop noted that Forest Service sites have been good sources of seed over the last few years with genetically local seeds collected from Dungeness. Funding for this effort comes from a FWS recovery grant, the regional office, with other funding possibilities in the future including timber source revenue. Additionally, Regina noted there is a private company in Port Townsend (Inside Passage Seeds) that collects seed from the Hood Watershed, with a small weed ratio in the seed. Nate Johnson shared that all commercial producers are required by state law to get seed tested for weed contamination.

As for Oregon, Andy Neill noted there are ample native seed producers in Benton County. Some specific TCB plants (e.g., *Plectritis*) are in short supply but they can usually be found. Currently there are no *Plantago* seeds, though they will be on the next budget request. Matt Blakely-Smith piped in that many producers are providing bare roots (e.g., *Fragaria*) or bulbs for species that are difficult to establish as seed.

Mary voiced a desire to understand what changes were made to the action plan. Elspeth said she thought there weren't any sweeping changes, but that out of date material was removed. Mary also asked about cross-partner coordination in Clallam County and Oregon. Karen Holtrop said it would be beneficial to have a Clallam County subgroup. Anita McMillan echoed it would be helpful to have more sharing of information and site visits to each other's units in Clallam County. Shelley Ament agreed, invited Sanders Freed up to the Olympic Peninsula, and mentioned that the tribes are interested in habitat improvements and are potential partners going forward. In Benton County, Andy said there is some cross-pollination between Greenbelt Land Trust and IAE. Andy would like to see more collaboration with partners and Carolyn Menke said TCB reintroduction work is relatively new for them and perspective from other groups would be helpful.

Mary mentioned the need for more research and a group to define research priorities. Elspeth confirmed that it was on her list of actions going forward. Mary asked for more information from Kelsey King about the Northwest Climate Adaptation Project. Kelsey said the project explores the adaptive capacity of species of interest in the Pacific Northwest with published literature reviews and reports. This process helps to prioritize species for protection. The Oregon Silverspot and marbled murrelet have already been done, and the Taylor's Checkerspot and western monarch will be included in the future. For more information, see- <https://nwcasc.uw.edu/science/projects/>. Lindsey Thurman is the contact person.