Conservation Action Planning Report for the

South Puget Sound Prairies

The Nature Conservancy of Washington

2007

Draft - For Internal Use Only

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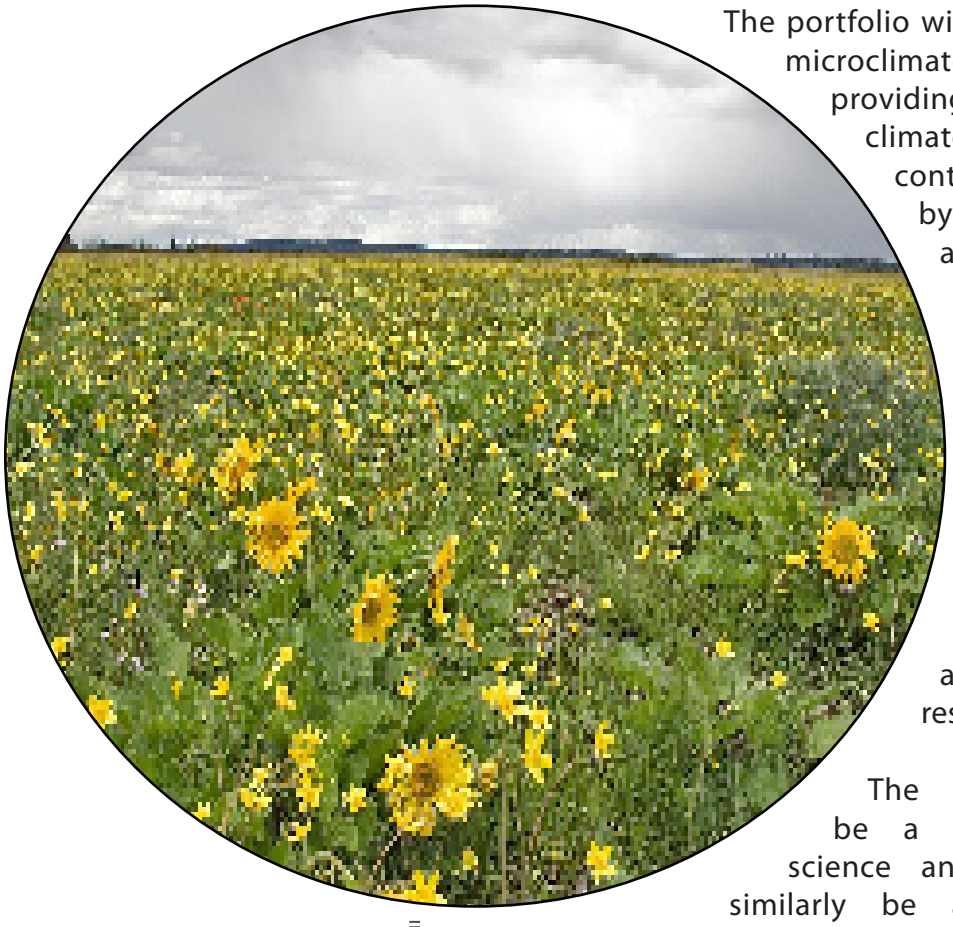
Conservation Vision

Successful conservation of the South Puget Sound Prairies will entail elements of protection, active land management and restoration, and integration of the full suite of partners working within the Willamette Valley - Puget Trough - Georgia Basin Ecoregion.

The portfolio of protected conservation sites will contain a mosaic of habitats that support the full-range of prairie and oak woodland species. This portfolio will be a total of 20 protected sites, including at least six core areas. The core areas of the portfolio consist of protected sites embedded within a mosaic of land-use that complements prairie conservation and the protected conservation sites.



The portfolio will take advantage of the wide-range of microclimates in the South Puget Sound, aimed at providing resiliency to the potential effects of climate change. The South Puget Sound will contribute to the conservation of rare species by promoting and implementing recovery actions throughout their historic range.

Active management of the prairie maximizes the contribution to conservation of all portfolio sites. These management actions are coordinated and integrated across a range of partners and landowners. This integration ensures that information transfer is exemplary, that organizations are linked formally and informally and that sufficient resources are generated for all partners.

The South Puget Sound Prairies will be a primary source for prairie-specific science and restoration techniques. It will similarly be a source concerning the science and conservation for fragmented natural systems.

Prairie conservation in the South Puget Sound will be supported by a community that is actively engaged through a vigorous volunteer program and supports the financial and policy issues that affect prairies.

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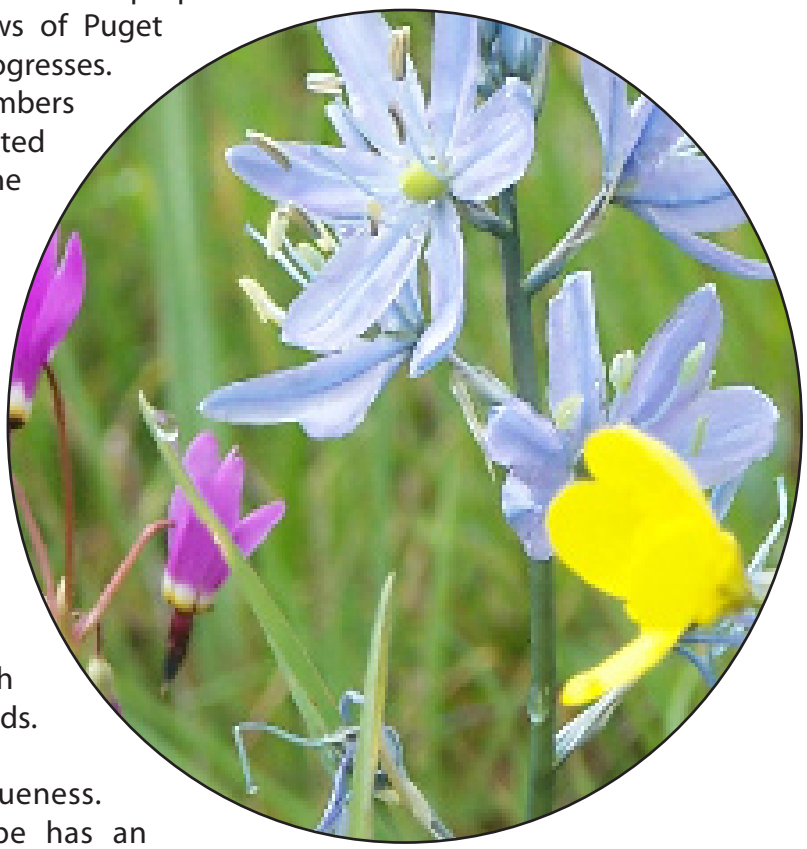
South Puget Sound Prairies

Along the south edge of Puget Sound lies a landscape unusual in the Pacific Northwest. In place of steep mountains and massive, closed canopy forests, are open, rolling grasslands interwoven with oak savannas, pine woodlands, and rich wetlands. The intertwining of these habitats forms a mosaic that supports a rich array of native birds, mammals, flowers and butterflies, some of which are found nowhere else in the state or world.

The prairies of South Puget Sound are underlain with outwash from the retreat of the Vashon Glacier about 11,000 years ago. These gravelly, extremely well-drained soils are a major factor in creating conditions conducive to grasslands and oak woodlands. After glacial retreat, the open grasslands may have been maintained first by harsh conditions, then as conditions and climate became more mesic, about 6,000 years ago, they were likely maintained by fires set by native people to ensure a continuing supply of food. Fire was one of the fundamental processes which helped maintain the structure and composition of the prairies.

Wildflowers are profuse on the prairies, changing from the purples of violets and camas in the spring to the yellows of Puget balsamroot and golden paintbrush as the season progresses. Golden paintbrush is one of the most beautiful members of these prairies and one of the rarest, federally listed as threatened and state listed as endangered. The white-top aster, a federal species of concern, is a northwest endemic plant with its distribution centered in the South Puget Sound Prairies.



About fifty species of butterflies can be found on prairies in the Puget Trough. Seven of those fifty depend on prairies for food and habitat as adults and larvae. Extremely rare butterfly species include the Taylor's checkerspot and the mardon skipper. Both are candidates for Federal listing and are state endangered. Many invertebrates including various moths, butterflies, gall wasps and spiders are found exclusively in association with Oregon white oak, the oak species of these woodlands.

Prairies are special beyond their biological uniqueness. In the Puget Sound area, the prairie landscape has an important role in regional human history. From early native to contemporary society, people have been drawn to prairies, have settled, hunted, and traveled through these open systems because of their unique characteristics of openness, productivity, and difference from surrounding country. The prairies were critical for the Native Americans, generating food and medicine essential for their survival. The flat, sunny, well-drained area was one of the first in Puget Sound to be converted to agricultural and residential uses by European settlers, beginning in the 1830s.

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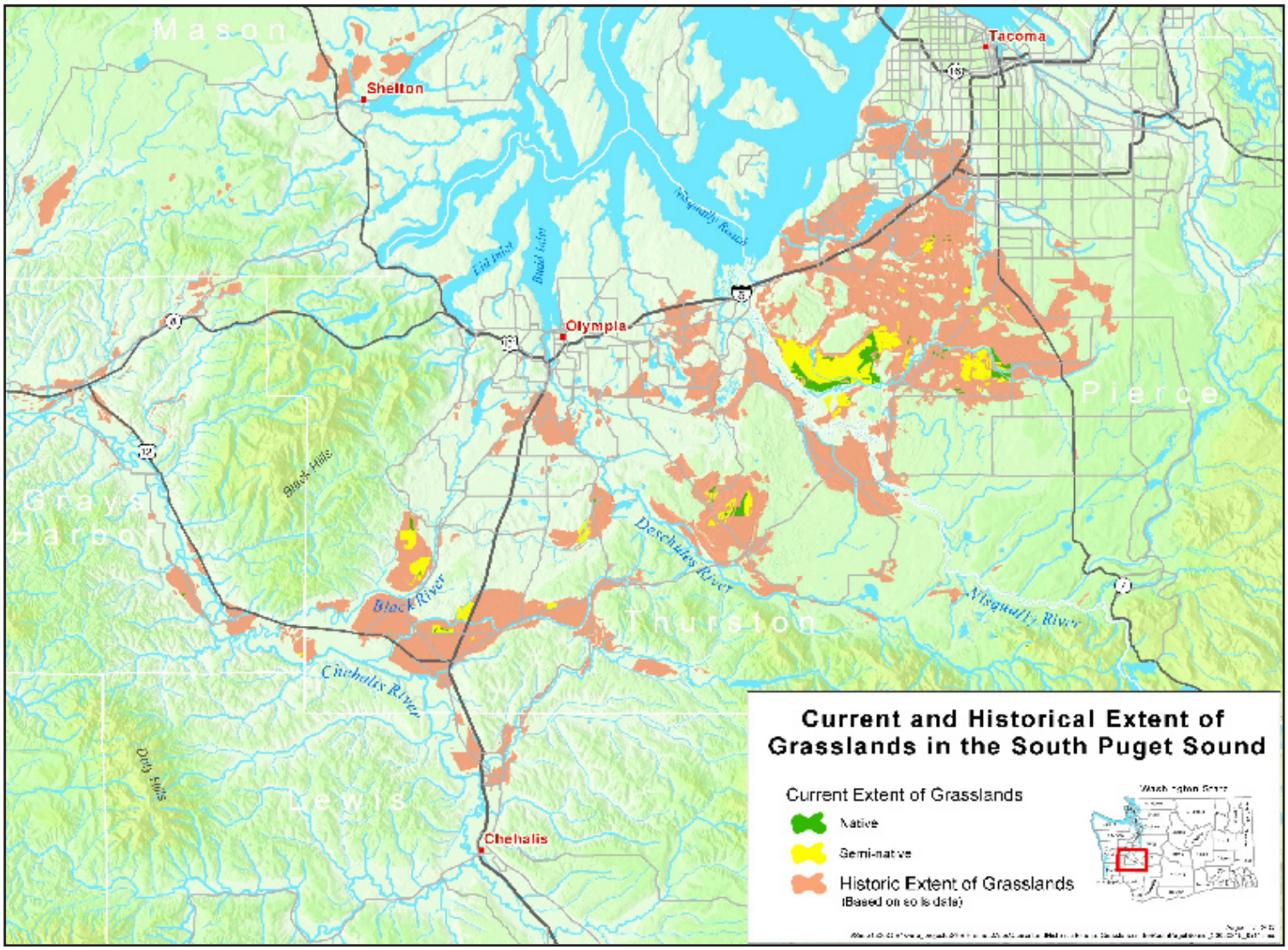
Historic and Current Prairie Extent

The South Puget Sound Prairies are thought to have extended historically from just south of Tacoma down through the Chehalis River drainage southwest of Oakville (Map 1). This region contained several plant community types, but it is thought that prairie or grassland savanna occupied at least 10% of this landscape, roughly 150,000 acres. These prairies are now one of the rarest habitats in the U.S. At least 92% of prairie habitat in the South Puget Sound has been destroyed. It has been estimated that less than 4,000 acres of habitat dominated by native species remains. Another 5,000-7,000 acres of semi-native grasslands remains which is potentially restorable.



This historic landscape was a mosaic of grasslands interspersed with woodlands and wetlands; today it is even further fragmented. The remaining patches of native prairie are, for the most part, small and isolated. Additionally, fire suppression has replaced controlled burns and natural fires. This has allowed weeds and trees to grow unchecked, replacing much of the native landscape with altered incompatible habitats.

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Conservation Goal

The goal of this conservation plan is to clearly identify conservation and management needs of prairies and oak woodlands in the South Puget Sound. Through this effort it became clear that the prairie/oak mosaic is one of the most threatened landscapes in the Pacific Northwest. The long-term survival of this habitat and the species dependent on this increasingly fragmented mosaic, require a public-private initiative focused on active management and protection of the remaining and potential high quality remnants, and a renewed commitment by decision makers to fund such activities.

Focal Targets

Upland Prairie Mosaic

Wet Prairie Mosaic

Woodland & Savanna Mosaic

Species of Concern - Fauna

Species of Concern - Flora

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Upland Prairie Mosaic

The fundamental target of the South Puget Sound Prairie is a mosaic of habitats that includes upland prairies, wet prairies, oak woodlands and savannas, wetlands and streams. Upland prairie is the most recognizable of these habitats and forms a core of the historic landscape. The decline of the prairie mosaic throughout the ecoregion is sufficient to distinguish it as one of the most endangered ecosystems in the United States. While only 3% of the historic grassland remains today in the South Puget Sound, this represents the majority of existing upland grassland in the ecoregion. There are six protected prairie sites dedicated to prairie conservation and covering 3,822 acres in the region. Another five sites and 3,930 acres of prairie habitat are protected by conservation easements or restrictions from environmental impact statements. These, along with other public and private properties that contain prairie resources, provide the best opportunity for upland grassland conservation in the ecoregion.

Upland prairie is essential habitat for a variety of unique plant and animal species, including federally listed and candidate species. This includes such notable species as the golden paintbrush, Mazama pocket gopher, streaked horned lark and Taylor's checkerspot butterfly. These rare species, along with more common species, utilize the low-stature bunchgrass grassland which formed mainly on gravel outwash plains in the South Puget Sound. At many high-quality sites, upland grassland is dominated by the native bunchgrass Roemer's fescue. Other common native grasses include prairie junegrass (Koeleria macrantha), California danthonia (Danthonia californica), and the native sedge, long-stolon sedge (Carex inops). A native red fescue (Festuca rubra) is the dominant grass at other sites. A diverse suite of nearly 100 forb species occurs in upland grassland, though only about 20 species are most frequent. These include common camas (Camassia quamash), white-topped aster (Aster curtus) and Puget balsamroot (Balsamorhiza deltoldea). Few native shrubs occur in upland grassland, with kinnikinnick (Arctostaphylos uva-ursi) the most common. Even in the highest-quality remaining grasslands, non-native species are present with high frequency.

Upland grassland is threatened primarily by habitat conversion, fire exclusion and invasive species. Habitat conversion, especially of degraded, though restorable, upland prairie sites, continues as residential housing replaces the rural landscape of the region. Similarly, fire has been excluded from this habitat as development and agriculture increase. Prescribed burns from Native Americans was a powerful, fundamental force that historically shaped upland grasslands and the entire landscape mosaic. A relatively new and increasing threat to upland grasslands is the invasion of pest plants. Such notable habitat-modifying threats as Scotch broom and tall oat grass are now common, while a suite of new noxious weeds is also trying to become established in upland grassland. Invasion of native Douglas-fir is also a threat, mainly due to fire suppression.

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Wet Prairie Mosaic

In the prairie landscape, wet prairies occur in areas with a seasonally high water table (Chappell, et al. 2004). These wet prairies occupy sites midway along the continuum from dry, upland prairies to permanently saturated wetlands. In the South Puget Sound, wet prairies occur in low-lying sites that are in open topography with few or no firebreaks to isolate them from the historically frequent fires. In the typically permeable, glacial outwash substrates of the region, wet prairies are most likely limited to swales and along low-gradient riparian areas where the surface topography and groundwater table approach each other (Alverson, personal communication) and where local aquitards are present. These wet prairies of the outwash prairies contrast with the wet prairies of the Willamette Valley, in that the latter generally occur on relatively impermeable, clay-rich soils with perched water and historically covered large areas. In some locales at the geographic extremities of the conservation area, conditions similar those of the Willamette Valley create conditions suitable for wet prairies.

In the wet prairies of the South Puget Sound, relatively high site productivity resulted in their rapid conversion to agricultural use, intense grazing pressure from livestock, and/or rapid invasion of dense, woody vegetation in the absence of regular anthropogenic fires. In addition, the hydrology of many sites has been altered by draining, agriculture, roads, recession of the ground water table (due to wells), and lack of fire. As a result, native prairie vegetation in wet prairie habitat has been nearly extirpated in the South Puget Sound.

The original composition, diversity and structure of wet prairie vegetation in the South Puget Sound are largely unknown. However, while some components of the original vegetation may have become extirpated, species in the same or similar habitats elsewhere in the ecoregion provide the best model for reconstructing elements of the original vegetation. The historic flora of wet prairie in the South Puget Sound would likely have consisted of species currently in adjacent habitats. In all cases wet prairies were likely dominated by herbaceous communities, dominated by graminoids with significant forb component. Further refinement of the composition of target communities is a significant strategy for this target.

Interest in wet prairies has increased due to projected use by several rare butterfly species. The mesic characteristic of wet prairies may allow larval host plants of Taylor's checkerspot and other butterflies to have extended dry-season growth periods. This moderation of conditions on upland prairies may provide significant habitat during especially stressful years.

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Woodland and Savanna Mosaic

Oak and conifer woodlands and savanna are a significant component of the habitat mosaic within the South Puget Sound. These habitats offer the structure of trees with an understory ranging from prairies to native shrublands. These characteristics provide habitat components not found in other parts of the mosaic and therefore support an additional array of species. The most prevalent woodland and savanna tree in South Puget Sound is the Oregon white oak (Quercus garryana), though both ponderosa pine (Pinus ponderosa) and Douglas-fir (Pseudotsuga menziesii) form important parts of the overall mosaic.

The majority of Oregon white oak in South Puget Sound remains as an ecotonal species between prairie and Douglas-fir, although oak woodlands and savannas are present (Thysell and Carey 2001). Oaks are able to colonize both dry and seasonally wet sites, resulting in the variety of oak communities encountered in the South Puget Sound (Wilson and Carey 2001). Oregon white oak communities support over 200 native species, including the Washington State 'threatened' western gray squirrel (Sciurus griseus), and state 'threatened' Mazama pocket gopher (Thomomys mazama) (Vesesly and Tucker 2004, Ryan and Carey 1995a, Steinberg 1999).

The Oregon white oak community types in the South Puget Sound have undergone significant decline in both quality and quantity, and are considered 'priority habitat' by The Washington Department of Fish and Wildlife (Larsen and Morgan 1998). The decline of the Oregon white oak mosaic was driven by clearing for agriculture and building, and propagated by fire suppression, resulting in the succession of Douglas-fir (Franklin and Dyrness 1988; Agee 1996). Exotic species such as Scotch broom (Cytisus scoparius) and sod-forming grasses are also decreasing the quality of Oregon white oak communities (Toney et al. 1998). The natural invasion of Douglas-fir into oak habitat, especially in conjunction with fire suppression, is also a major threat to the habitat.

Although Oregon white oak is a common component in conifer stands of South Puget Sound, remaining as a remnant of the prairie-oak mosaic, several other tree species are of conservation interest. Ponderosa pine remains on Fort Lewis as the sole viable stand in the region. Ponderosa pine pinecones are a significant component of the western gray squirrel diet. Other conifer species include the ubiquitous Douglas-fir and lodgepole pine. Douglas-fir matrix habitats are also used heavily by western gray squirrels on Fort Lewis for cavity nesting and dreys. Threats to these conifer habitats are similar to those for oaks, including stands becoming too dense with conifers due to fire suppression and natural recruitment. The range of native and non-native understories also mirrors those for oak woodlands – from native grassland to native and non-native shrublands.

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Species of Special Concern - Fauna

The decline in quantity and quality of habitat in the South Puget Sound Prairies has resulted in a broad suite of rare fauna. These fauna range from invertebrates such as butterflies, to birds and mammals. We have selected a suite of twelve species as a focal target. Several of these species have special legal status, and are state listed as endangered or threatened, or candidates for federal listing. The species are also important indicators of the health and quality of the prairie mosaic. Many of the species in this target have narrow habitat requirements, including requirements that utilize the full spectrum of the habitat mosaic. Others' requirements include broad swaths of open grassland or areas of extremely high-quality habitat, indicators of the health of the habitat mosaic and the South Puget Sound Prairies as a whole. As a single target, the conservation of these species will require a diverse set of strategies and actions, testing the effectiveness of the conservation efforts that affect all species throughout the prairie landscape.

The Mazama pocket gopher, (Thomomys mazama), is a small endemic pocket gopher found only in western Washington, western Oregon and northern California. Pocket gophers are fossorial (living beneath the surface of the ground and adapted to digging) mammals that excavate extensive tunnel systems. Mazama pocket gophers need open meadows, prairie, or grassland habitat with friable soils that are not too rocky. They prefer light-textured, porous, well-drained soils, and do not occur in peat or heavy clay soils (Chase et al. 1982). As of 2006, Mazama pocket gophers are known to exist at 27 locations in western Washington, but many of the populations are very small and isolated due to the loss of habitat. The largest remaining populations are found on Fort Lewis, at the Olympia and Shelton Airports, and possibly in Olympic National Park (Stinson 2005).

Western gray squirrels (Sciurus griseus) have become increasingly rare in western Washington, and are listed as 'threatened' by Washington State. Fort Lewis contains the last known population of western gray squirrels in the Puget Trough (Rodrick 1986). Western gray squirrels are loosely associated with the Oregon white oak woodland matrix habitats, including Douglas-fir and Ponderosa pine. Estimates of population size are difficult, although the population appears to have declined drastically in the last decade (Bayraki et al. 2001). Efforts are currently underway to improve habitat quality, identify population centers, estimate population sizes, identify habitat requirements, monitor distribution and movement, and remove competing eastern gray squirrels (Sciurus carolinensis) in western gray squirrel habitat on Fort Lewis and adjacent lands.

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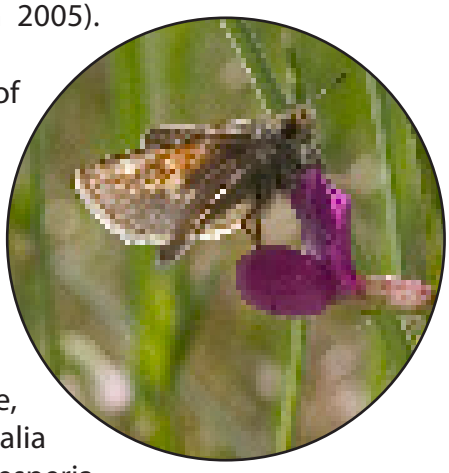
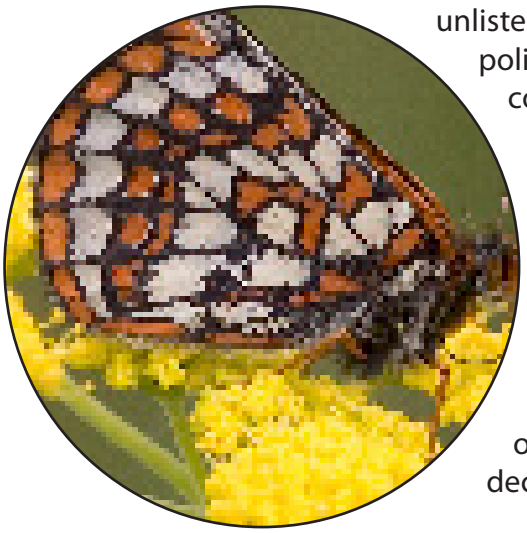
The streaked horned lark (Eremophila alpestris strigata) is a rare subspecies of horned lark, found only in western Washington and Oregon (Stinson 2005). Several hundred acres of sparse, low grassland appear to be needed for successful nesting (TNC 2002). The streaked horned lark may be the most endangered bird in Washington (Stinson 2005). There are only about 800 individuals remaining across its entire range, of which approximately 300 use the South Puget Sound (Pearson & Altman 2005).



There are eight rare prairie butterflies, four of which are listed for state or federal consideration: the mardon skipper (Polites mardon) and the Taylor's checkerspot (Euphydryas editha taylori) are federal candidate and state endangered species; the valley silverspot (Speyeria zerene bremneri) is a federal species of concern and a state candidate species; and the Puget blue (Plebijus icaroides blackmorei) is a state candidate species (WDFW 2006). The four rare, unlisted species are the obscure elfin (Incisalia polia obscura), Oregon branded skipper (Hesperia comma oregonia), Sonora skipper (Polites Sonora siris), and Puget Sound fritillary (Speyeria cybele pugetensis) (Fleckenstein, personal communication). All of these species require reasonably high quality prairie free of tall grasses and shrubs, host and nectar plants, patchy rather than large scale disturbance, site heterogeneity, and many require windbreaks for occasional weather-dependent use. The Propertius' duskywing is a butterfly that lives mainly along the edges of the oak woodlands, relying on the oaks for food (Santa Barbara 2006). It appears to be in decline across our region (Potter, personal communication).



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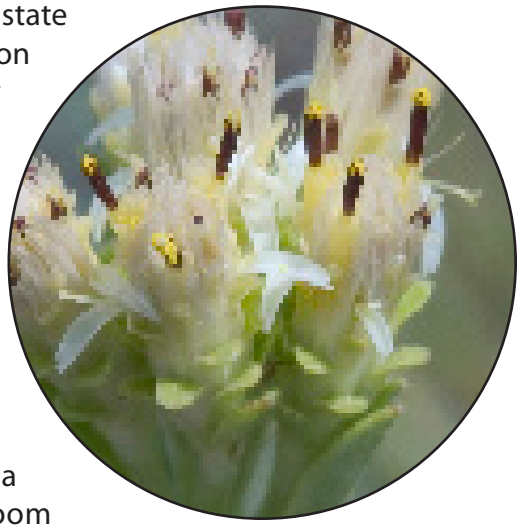
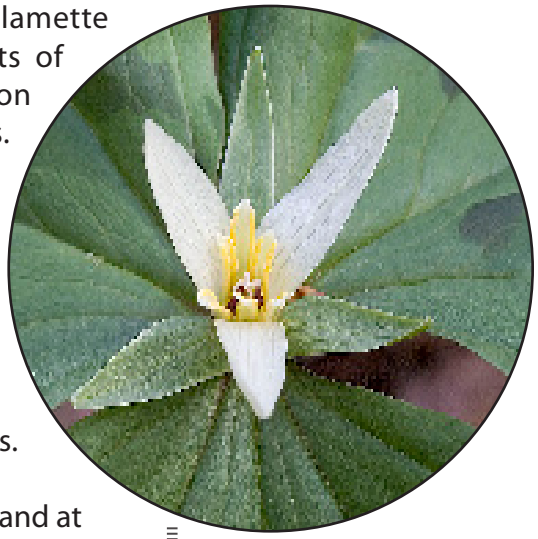
Species of Special Concern - Flora

A suite of diverse plant species is also rare in the South Puget Sound Prairies. Several of these species have been listed as federal or state endangered species. Similar to the rare fauna target many of these species have special habitat requirements and currently, very limited distributions. They act individually as indicators of efforts on specific parts of prairie conservation. Together they form a suite that will require concerted efforts on both habitat and species-specific strategies. The need for this combination of strategies makes conservation of these species especially challenging. The successful conservation of this target will require effective science and on-the-ground conservation, as well as, effective management of scarce resources.



Golden paintbrush (Castilleja levisecta): Federally threatened and state endangered. It is endemic to the Pacific Northwest in open grasslands on glacial soils below 100 meters elevation. Although the plant was originally found at thirty sites from Washington to BC, it now is found at eight sites in Washington and two in Canada. Golden paintbrush can be a parasitic plant, but can survive and reproduce independently. The largest threats to this plant are habitat destruction, habitat fragmentation, fire suppression, succession, and invasive species. Preliminary reintroduction studies are underway, determining the conditions necessary for successful establishment of reproducing populations in the plant's historic range.

White-top aster (Aster curtus): A species of concern for the US Fish and Wildlife Service and a state sensitive species. Aster curtus is a low-growing perennial herb with small white ray flowers that bloom in August and September. It is endemic to the Pacific Northwest, growing in fescue-dominated areas on glacial outwash soils from the Willamette Valley in Oregon to Vancouver Island, B.C. It shares all the threats of Golden paintbrush, and is also active when herbicide application for Scotch broom occurs on the South Puget Sound Prairies.



Small-flowered trillium (Trillium parviflorum): State sensitive species. This plant occurs in moist areas dominated by Garry oak, red alder and/or Oregon ash from the Willamette Valley to Pierce County,WA. The main threats to this species are changes in hydrology, changes in land use, and grazing in some instances. The current populations of Trillium parviflorum are still being studied, but at least two solid populations exist on the South Puget Sound prairie preserves.

Aster hallii (Aster hallii): State threatened species. It occurs on Fort Lewis and at Scatter Creek and is 8-40inches tall, white flowered, prefers dry, rocky soils. Oregon to Thurston County.

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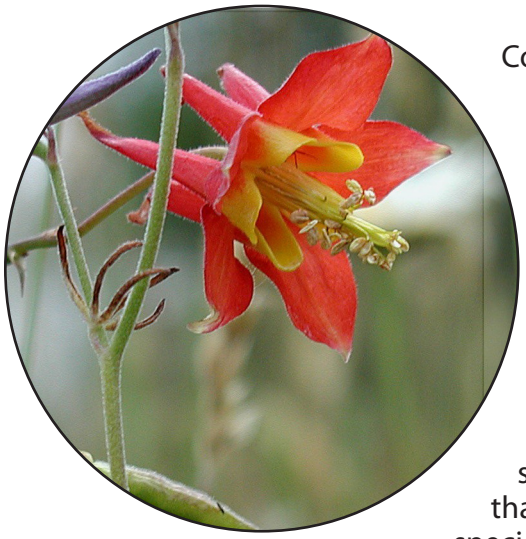
Target Status - Viability



Conservation targets in the South Puget Sound Prairies are generally in fair condition and the overall Project Biodiversity Health Rank is also fair. With some of the largest tracts of prairie in the ecoregion and with multiple protected sites, the landscape context of the targets is fair. Unfortunately, the condition of the community targets, such upland prairie mosaic, is generally poor, with impacts from invasive species, and the effects of fire suppression readily evident. On the positive side, recent active management of these habitats is showing positive results and the trajectory for most sites is positive.

The viability of most rare species is also fair. There are several species, most notably those that are federal candidate species, that have severely declined and are in real trouble, most other rare species are stable though at population sizes that are a concern. Both the rare flora and rare fauna conservation targets rated fair overall.

CONSERVATION TARGETS		LANDSCAPE CONTEXT		CONDITION		SIZE		VIABILITY RANK
		GRADE	WEIGHT	GRADE	WEIGHT	GRADE	WEIGHT	
1	UPLAND PRAIRIE MOSAIC	FAIR	1	POOR	1	-	1	FAIR
2	WET PRAIRIE MOSAIC	FAIR	1	-	1	-	1	FAIR
3	WOODLAND AND SAVANNA MOSAIC	FAIR	1	POOR	1	POOR	1	POOR
4	SPECIES OF SPECIAL CONCERN - FAUNA	FAIR	1	-	1	FAIR	1	FAIR
5	SPECIES OF SPECIAL CONCERN - FLORA	FAIR	1	-	1	FAIR	1	FAIR
PROJECT BIODIVERSITY HEALTH RANK								FAIR

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Threats

South Puget Sound Prairies are threatened by a variety of activities that are currently degrading biodiversity in the region. The most significant threat is encroachment of native and non-native vegetation. This includes the conversion of habitats, such as invasion of Douglas-fir forest into an oak woodland or degradation of habitat including tall oatgrass taking over a fescue grassland. These invasions threaten all protected and private prairie sites and require active management to mitigate the negative effects.

Direct habitat loss is also a significant threat. The fragmentation of prairies through development is a obvious historic legacy. Currently, loss still occurs as private prairies are developed or used for incompatible agriculture or mining activities. Other significant threats have lesser direct impacts on conservation targets, but also affect multiple targets. Some such as military training and inappropriate livestock grazing are limited to only portions of the prairie landscape. Lack of prescribed burning is still a significant threat, though the trend towards greater participation in prescribed burning programs is encouraging.

THREATS ACROSS TARGETS		UPLAND PRAIRIE MOSAIC	WET PRAIRIE MOSAIC	WOODLAND AND SAVANNA MOSAIC	SPECIES OF SPECIAL CONCERN - FAUNA	SPECIES OF SPECIAL CONCERN - FLORA	OVERALL THREAT RANK
PROJECT-SPECIFIC THREATS		1	2	3	4	5	
1	ENCROACHMENT BY NATIVE AND NON-NATIVE VEGETATION	HIGH	VERY HIGH	HIGH	VERY HIGH	VERY HIGH	VERY HIGH
2	HABITAT LOSS	HIGH	VERY HIGH	HIGH	-	-	HIGH
3	LACK OF CONNECTIVITY	-	-	-	VERY HIGH	-	HIGH
4	MILITARY ACTIVITY	MEDIUM	-	MEDIUM	HIGH	HIGH	HIGH
5	LACK OF PRESCRIBED BURNING	MEDIUM	MEDIUM	MEDIUM	-	HIGH	MEDIUM
6	INAPPROPRIATE LIVESTOCK GRAZING	MEDIUM	HIGH	MEDIUM	-	-	MEDIUM
THREAT STATUS FOR TARGETS AND PROJECT		HIGH	VERY HIGH	HIGH	VERY HIGH	VERY HIGH	VERY HIGH

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Conservation Strategies

Conservation strategies for the South Puget Sound Prairies are diverse and numerous. Conservation efforts for these habitats are mature, having evolved over the 20 years that The Nature Conservancy has been working in the region. That said, maturity does not infer that new and innovative strategies are not examined and included for implementation. Conservation strategies will continue to evolve as new information is gained, new threats identified and the program improves.

Conservation strategies are segregated into five broad categories: 1) Protection, 2) Partner Cooperation, 3) Restoration, 4) Rare Species and 5) Ecoregional Approach. While each of these categories is significant in themselves, it will take the complete program to ensure long-term conservation success in the South Puget Sound Prairies. The integration of these strategies with partners and resources to efficiently affect conservation is the biggest challenge for conservation.

Each of these sets of strategies also contains specific objectives which are significant milestones towards successful conservation. Together these objectives delineate an aggressive agenda for prairie conservation over the next five years. Reaching these objectives will result in an improved conservation landscape and an enhanced status to delineate the conservation strategies over the next planning period.

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Protection

Protected prairie sites in South Puget Sound are insufficient to conserve habitat, species and rare species. The current portfolio of sites does not meet the 'minimum dynamic area' for these goals. Therefore conservation efforts are currently limited by the number and size of protected sites. To reduce this limitation additional prairie sites need to be protected and managed for conservation.

Direct acquisition is the primary strategy, especially protection actions that add to current core areas, or create a new core area. Acquisition outside the core areas is also a needed strategy to complete the portfolio. All acquisitions should strive to protect the full mosaic of prairie habitats, especially underrepresented habitats, such as wet prairie, and to integrate prairie protection with freshwater targets wherever possible.

Sites considered for protection need to be evaluated by characteristics beyond current presence of prairie elements. The proven track record of restoration in these systems has broadened the range of initial conditions that should be considered for acquisition. With additional restoration efforts this range could be expanded to pasturelands and agricultural fields. Sites should also be selected to engage the full-range of microclimatic variability in the South Puget Sound. This strategy is extremely important to help counter impacts projected from climate change. Conserving prairies in areas such as the Boistfort and Satsop Valleys is key to taking advantage of the wide-range of rainfall and temperature patterns in South Puget Sound.

Protection strategies should not be limited to those that result in current protection. For priority sites, innovative long-term strategies should be developed and implemented to secure sites for future conservation. This protection strategy may be most useful on 'alternative' sites whose business and ownership plans have defined timelines for usage. Gravel pits would be an example of such a site and ownership plan.

The Conservancy should not be the sole group protecting prairie lands. The Conservancy will actively support protection actions by partner agencies and groups. Creative partnerships, such as the Conservancy assisting with restoration of lands protected by agencies, could help agencies overcome reticence of owning additional prairie lands. The ownership of prairie lands by the Conservancy is also desirable. These lands will provide demonstrations of the full-range of restoration and conservation actions. They will also provide a platform for interpretation to donors and the public.

OBJECTIVES

•Ten prairie conservation sites of at least 500 acres are protected within the South Puget Sound.

•One of the three new protected sites establishes a new core habitat area.

•Five additional small (50+ acre) sites are protected.

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STRATEGIES

•Conduct prioritization analyses of prairies to identify and rank, a) new core areas, b) sites within core areas, and c) sites outside of core areas. Ensure prioritization analysis considers mitigation of effects due to climate change.

•Obtain funding and, as appropriate, partnerships to protect priority sites.

•Investigate and implement alternative funding for protection actions (i.e. county initiative).

•Evaluate and implement, if warranted, a private conservation buyers program with the local real estate community.

•Develop and implement innovative protection techniques, such as a combination of easement and long-term options, to protect priority sites for future conservation. Identify properties where business and ownership models may favor such long-term tactics.

Partner Cooperation

In addition to direct acquisition, working with landowners to increase the conservation values of their lands is critical. Several notable successors with private landowners, such as Mima Corridor, Wolf Haven and Cavness Ranch, have already occurred in the project area. This strategy is especially effective for lands within core areas, though large tracts outside of the core areas should not be ignored. Finally, portfolio of prairie conservation sites can also be expanded by conservation on non-traditional sites. For instance, the restoration of landfills could lead to the establishment of additional prairie sites in the region. Other non-traditional sites to evaluate included reclaimed gravel mining areas and increasing the compatibility of agricultural lands with prairie conservation.

OBJECTIVES

•Within at least three core conservation areas, 50% of unprotected lands are managed for conservation compatability.

•Within all core conservation areas, 80% of oak woodlands, greater than 5 acres, are actively managed for conservation compatibility.

•Develop and implement program to enhance or create prairie conservation values on non-traditional prairie sites such as landfills, gravel pits and agricultural lands - conserve at least two new non-traditional sites.

STRATEGIES

•Continue implementation of Mima Corridor Project to demonstrate and measure the efficacy of conservation of unprotected lands within core conservation areas.

•Develop new protection and restoration techniques to facilitate conservation on lands with a range of use, including agricultural lands.

•Implement incentive program to increase management of private oak stands, larger than 5 acres, within core conservation areas.

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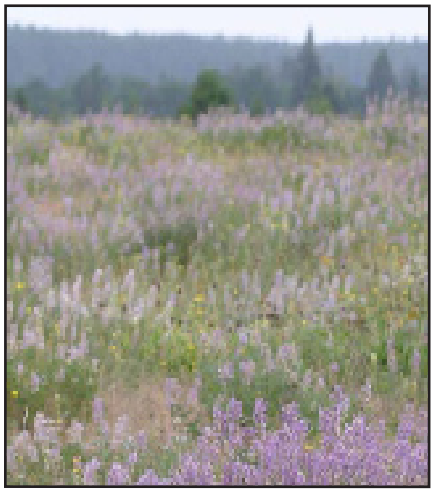
•Conduct trial restoration efforts on Hawk's Prairie and DuPont Landfills to determine if these sites can sustain conservation targets.

•Develop site-specific habitat management plans for all protected sites.



Restoration

Restoration is an integral conservation strategy in the South Puget Sound. Conservation efforts in the past have developed and effectively implemented a suite of restoration techniques that have led to successfully restoring key conservation sites. The implementation of these restoration techniques in a comprehensive and robust manner is critical to enhancing portfolio sites. This is especially important to help maximize the conservation value of the limited number of protected sites. Additionally, these restoration techniques can be continuously improved and expanded, improving the efficiency and effectiveness of restoration efforts. Expansion of restoration techniques can widen the range of habitats that can be restored to prairies. Restoration techniques that can bring back more degraded lands will reduce the acquisition costs for protected prairie sites. Unfortunately, adequate long-term funding for restorataion, and even maintenance, of protected sites is not established. Ensuring that sufficient baseline resources are available to maintain protected sites is critical.

OBJECTIVES

•All protected sites contain high-quality habitat across at least 30% of their extent, with the remaining 70% increasing in quality ranking. All protected sites have functioning natural processes, including prescribed fire.

•No new species of noxious weeds become established in the prairie landscape.

•New restoration techniques allow efficient enhancement of severely degraded habitats to return to high-quality habitat.

•Monitoring programs clearly demonstrate the status of target habitats and species and the efficiency of management and restoration actions.

STRATEGIES

•Implement effective, integrated restoration and pest control programs at all protected and other priority sites.

•Create regional capacity to produce native stock for prairie restoration from stock of local genetic origin.

•Develop site-specific habitat management plans for all protected sites.

•Continue and improve the informal partnership with county weed boards to survey for and treat infestations of new noxious weeds.

•Facilitate the prescribed burning of protected and other priority prairie sites through the development of a region-wide prescribed fire program which engages a wide-range of partners, including local fire chiefs.

•Funding for the basic maintenance of all protected sites is provided from dedicated sources.

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•Develop, with partners, a region-wide monitoring program to measure status of target habitats and species.

•Complete on-going studies delineating composition and distribution of wet prairies in South Puget Sound.

•Develop and implement studies to determine restoration techniques for wet prairies in South Puget Sound.

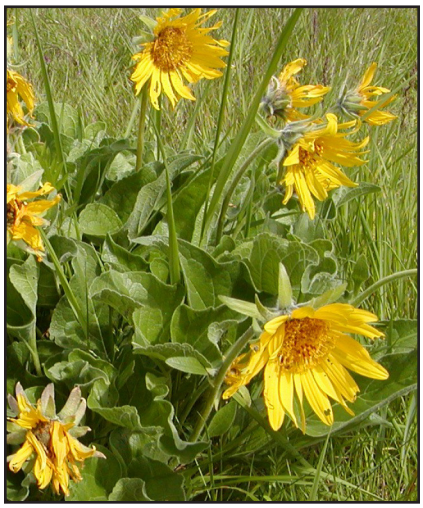
•Strengthen land managment ability of partners to increase flexibility of TNC resources.

Rare Species

Even with effective conservation of the overall prairie habitat several rare species will require additional species-specific actions to maintain and expand their distribution and abundance. This is true for both rare fauna and flora. While the Conservancy will support the full-range of actions needed to conserve these species, the Conservancy does not need to be the leader for all actions. Support for partners, especially WA Dept. of Fish and Wildlife, will be integral to successful conservation of several rare animals. The Conservancy can best assist these efforts by ensuring that habitats for these animals are managed and restored adequately. Similarly, the Conservancy can assist partners with rare flora conservation, though the Conservancy's native plant nursery operation provides resources for a more central role in rare plant conservation. The Conservancy can also assist private landowners and agencies in developing adequate and effective mitigation actions for rare species impacted by development or other actions.

OBJECTIVE

•Target populations of rare flora and fauna are stable or increasing and additional populations are established as agreed through multi-partner strategies for the recovery of these speces.



STRATEGIES

•Coordinate with regional partners to develop conservation action strategies for rare flora and fauna.

•Develop or refine techniques to enhance occupied habitat for rare flora and fauna species and to establish habitat for reintroduction of those species on unoccupied sites.

•Identify threats to flora and fauna of special concern and develop or refine techniques to reduce those threats.

•Develop strategy for emergency conservation actions of flora and fauna of special concern required due to extreme climate events.

•Develop and implement program for rare plant outplantings and monitoring.

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•Support partner actions to enhance current populations and to establish new populations of rare fauna.

•Work with state agencies and private landowners to develop effective mitigation actions for unavoidable impacts to rare species, ensuring that a comprehensive, regional perspective is maintained.

Ecoregional Approach

The South Puget Sound contains some of the largest and best prairie habitats. The prairie conservation community in the region has also developed a working strategy of cooperative conservation. This combination has resulted in both a physical and a political landscape that is positioned for tremendous conservation success. Yet, the long-term conservation of prairies is dependent on successful conservation throughout the ecoregion, not merely in the South Puget Sound. The Conservancy should help facilitate cooperative conservation throughout the ecoregion. This can be accomplished with a program that links entities, transfers information and generates incentives. Such a program will help ensure that lessons learned in the South Puget Sound will be transferred to others and that cooperative efforts are expanded to ensure efficient, effective prairie conservation throughout the ecoregion.

OBJECTIVE

•Prairie conservation efforts throughout the Willamette Valley - Puget Trough - Georgia Basin Ecoregion are conducted cooperatively with link entities sharing information, incentives and other resources freely and effectively.

STRATEGIES

•Link prairie working groups throughout the ecoregion with informal agreement and regular regional field trips and meetings.

•Develop prairie learning network that facilitates information exchange and promotes interactions between cooperative conservation partners.

•Organize and hold regional science conferences that bring together latest information on prairie and woodland conservation.

•Develop "Northwest Coastal Prairies" marketing and outreach program that promotes prairie conservation and brings new attention and resources to prairie conservation throughout the ecoregion.

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Measuring Success

Measuring the success of conservation actions throughout the South Puget Sound Prairies will require multiple factors and techniques. Not only does the health and diversity of community based focal targets need to be measured, but the specific health and trends of rare species is also of interesting. Measuring all of these parameters at all protected areas can be a significant time and resource investment. Balancing the effort and costs required for adequate scientifically-rigorous monitoring with the need for direct conservation actions therefore becomes a significant challenge in developing a practical, useful monitoring system.

Like many other challenging conservation problems in the South Puget Sound, the development of monitoring protocol is being conducted through a cooperative partnership. A group of scientists from an array of partners is currently developing a set of monitoring procedures. This group is seeking to develop procedures that can be utilized at all protected prairie sites, and can be scaled appropriately to private sites as well. We anticipate that the protocol will be tested soon, and implemented widely once those results are evaluated.

Conclusion

The South Puget Sound Prairies encompass some of the most significant conservation lands within its ecoregion, which stretches from British Columbia through the Willamette Valley. The large expanses of grasslands and oak woodlands on Ft. Lewis anchor the region even though these lands are used for military training. Beyond Ft. Lewis, an array of government agencies and conservation organizations has conserved a portfolio of prairie sites. Combined this portfolio offers one of the best opportunities to conserve the variety of plants and animals that is dependent on Northwest Coastal Prairies.

This Conservation Action Plan has summarized the importance of these conservation areas, the threats they face and the strategies to enhance their conservation. Overall the conservation planning process found that the overall status of the targets is fair and that while there are still significant threats to these targets there is a suite of strategies that can alleviate those threats and enhance the targets.

The Nature Conservancy has been helping with the conservation of South Puget Sound Prairies for more than 15 years. Over that time significant gains have been made. Those efforts have also helped create a community of cooperative partners that are poised for even greater conservation. Let us hope that this Conservation Action Plan will contribute to those cooperative efforts and will help drive prairie conservation in South Puget Sound to even greater levels of success.

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