WILDERNESS EVALUATION

Teanaway - 617048

75,164 acres

OVERVIEW

History

The area was inventoried and analyzed under the Alpine Lakes planning process in 1980. Management direction for this area is currently being directed by the Alpine Lakes Area Land Management Plan. The area was identified as an inventoried roadless area in the 1990 Wenatchee National Forest Land and Resource Management Plan.

The 2006 inventory removed approximately 6,658 acres from previous inventory due to nonconforming uses such as road construction and logging and private land; 4,746 acres were added to the previous inventory as they met the criteria for a potential wilderness area (PWA) as described in Forest Service Handbook (FSH) 1909.12, Chapter 70. The table chart depicts the 1990 Wenatchee National Forest Land and Resource Management Plan direction for the 2006 potential wilderness area.

Table 1--Management area percentages (rounded)

Wenatchee National Forest LRMD					
FS_PEN	GF	RE2A	RN1	SI1	ST2
1%	13%	3%	1%	78%	3%

Location and Access

The area is within Kittitas County and Chelan County, and lies within the Cle Elum and Wenatchee River Ranger Districts. The PWA is adjacent to the Alpine Lakes Wilderness. The primary access is by the North Fork Teanaway Road which bisects the area and terminates within three-quarter mile of the wilderness boundary. Other roads access the perimeter of the area: from the Cle Elum Valley, from the West and the Middle Forks of the Teanaway, and from the Stafford Creek, Iron Creek, Jack Creek and Shaser Creek Roads. The area is criss-crossed by numerous trails including West Fork and Middle Fork Teanaway Trails, Yellow Hill Trail, Johnson Medra Trail, Boulder DeRoux Trail, Beverly-Bean, Standup, Miller Peak, Iron Bear, Three Brothers Trail, Negro Creek Trail, and County Line Trail, plus several shorter trails.

Geography and Topography

This area is characterized by a complex geologic history. The higher slopes between the North Fork Teanaway River and the Alpine Lakes boundary are made up mostly of serpentine materials and much of the area has bare exposed slopes (little or no vegetative cover). Between Lake Cle Elum and the North Fork Teanaway River, the high ridges are

primarily made up of sandstone of the Swauk and Roslyn formations and basalt of the Teanaway Basalt formation, allowing for gentle, rolling topography. Elevations range from about 2,400 to more than 7,000 feet.

Current Uses

This area is used for dispersed recreation. It is predominantly classified as the Teanaway Special Area which is protected for its unique and natural conditions. The Eldorado Research Natural Area is also located in this potential wilderness area. It is popular with hikers, horseback riders, mountain bikers and motorcyclists who desire a highly challenging trail experience. Negro Creek trail sees some mountain bike and motorized incursion into the Alpine Lakes Wilderness where it crosses back and forth over the boundary. The Lake Ann and Gallagher Head Lake areas also provide a unique opportunity for high-elevation snowmobiling. Upper Negro Creek is a popular snowmobile play area. The area is also popular for backcountry skiing.

Appearance and Surroundings

The area has a high variety of landforms, vegetation, and rock forms. The area ranges from rounded, broad ridge tops to steep, rocky, rugged ridges. The hillsides and side slopes are steeply broken. The streams have dendritic patterns of drainage. Stream bottom vegetation is dense. Vegetation is sparse near the ridge tops with a broken, open mixed conifer vegetation pattern on the side slopes. The area is primarily viewed as background except from the trails that pass through it. From trails the area is viewed as foreground and middle-ground. The Teanaway River corridor is classified scenic forest in the foreground and middle-ground.

Key Attractions

The main features of this area are Lake Ann, Gallagher Lake, and the line of peaks in the Wenatchee Mountains which makes up the county line between Kittitas and Chelan Counties. These include Iron, Earl, Navaho, and Miller peaks. The extensive trail system and access to the Alpine Lakes Wilderness is a draw to both motorized and non-motorized trail users.

CAPABILITY FOR WILDERNESS

Level of Natural and Undeveloped Environment

This area has been managed under a fire suppression strategy, and the forests in the lower elevations are likely altered from pre-European times. Although motorized use is allowed here, it remains at a relatively low level due to the very difficult trails. The functioning of the natural environment is relatively intact.

Several noxious weed species that have been introduced into the PWA including diffuse knapweed, spotted knapweed, Canada thistle, houndstongue, St. Johnswort, oxeye daisy, Dalmation toadflax, sulphur cinquefoil, and common tansy. Noxious weeds are established along the roads leading to this area.

There are no water-related encumbrances or planned activities within the area.

The Teanaway PWA is impaired by light pollution from the Ellensburg, Cle Elum and Wenatchee areas. A majority of the PWA (98 percent of the PWA) rates a Class 3 on the Bortle Scale. A small portion of the PWA in the northeastern corner (2 percent of the PWA) rates as a Class 4. A Class 3 Rural Sky has some indication of light pollution on the horizon. Clouds may appear faintly illuminated in the brightest parts of the sky near the horizon, but are dark overhead. The Milky Way still appears complex. Light domes from population centers may appear on the horizon (10-15 degrees above horizon). Visual observing is still relatively unimpaired. Time lapse photography could be impaired by light pollution. A Class 4 Rural/Suburban Transition Sky exhibits fairly obvious light-pollution domes over population centers in several directions. The Milky Way well above the horizon is still impressive but lacks all but the most obvious structure. Clouds in the direction of light pollution sources are illuminated but only slightly so, and are still dark overhead. Modest to serious impact to deep sky observing and imaging occurs.

Water quality data is not available for most of the PWA; however, due to the relatively low level of disturbance water quality is assumed to be high. A portion of North Fork Teanaway River is classified by the Washington State Department of Ecology as Category 1, which means the segment met tested standards. A portion of the West Fork Teanaway River is classified by the Washington State Department of Ecology as Category 4a, which means a water cleanup plan is being implemented for that segment.

Level of Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation

Outstanding opportunities for solitude and remoteness can be found many places within the area. There are several peaks and rock cliffs to offer challenges to rock climbers and trailless areas for cross-country enthusiasts. There are also opportunities for winter survival and other wilderness challenges.

This area is most capable of providing trail-related opportunities that involve steep, dry terrain and challenging access. This includes hiking, and expert-level horseback riding, mountain biking, and motorcycling. Winter access is very limited and is mostly suitable for backcountry skiers. The exception is the Lake Ann and Gallagher Head Lake areas, which provide an opportunity for above-timberline snowmobiling.

Some trails within the area have high use levels during the snow free season, where opportunities for solitude are interrupted.

Special Features

This area contains large areas of serpentine soil, which provides habitat for many relatively rare and unusual plant species. The 1,149 acre Eldorado Research Natural Area (RNA), which was established to encompass a serpentine environment, lies within the Teanaway PWA. Habitat types protected by this RNA include: Douglas-fir pinegrass, grand fir/elk sedge woodland, mid-elevation serpentine stream, mountain hemlock/Cascades azalea forest, Pacific silver fir/big huckleberry forest, and serpentine barrens.

This PWA is located in critical habitat for northern spotted owl and the North Cascades Grizzly Bear Recovery Zone (both Cle Elum and Swauk Bear Management Units). There

have been sightings of grizzly bear here, including a class sighting in the late 1980s. This potential wilderness area encompasses significant portions of the Teanaway and Sasse Ridge lynx analysis units and it provides source habitat for lynx, in both lynx analysis units (LAU). It encompasses almost all of the Teanaway late successional reserve (LSR) and a significant portion of the Snoqualmie Pass Adaptive Management Area (AMA), where management emphasis is on the creation and maintenance of late successional forest habitat, including dense mixed conifer forest habitat used by spotted owls. Fourteen known spotted owl locations (breeding pairs) have been located within this PWA.

Historically, the area encompasses a large portion of the old Cle Elum Mining District as well as some spillover from the Blewett Mining District to the east. Mining sites are numerous and include such diverse components as cabins, campsites, equipment, wagon roads, workings, and three known mill sites.

The Teanaway PWA includes several rare plant species: ahtiana lichen (*Ahtiana sphaerosporella*), Thompson's pincushion (*Chaenactis thompsonii*), clustered lady's slipper (*Cypripedium fasciculatum*), Brewer's cliffbrake (*Pellaea breweri*), and Seely's catchfly (*Silene seelyi*).

Manageability of Boundaries

The north boundary is contiguous with the south boundary of the Alpine Lakes Wilderness on the crest of the Wenatchee Mountains. The remainder of the boundary is a meander line that takes in the Teanaway drainage and the southeastern portion of the Cle Elum drainage, excluding road corridors. The eastern boundary follows sections lines and property boundaries in Negro and Shaser Creeks. Except for the wilderness boundary, the boundaries do not follow clearly defined physical features; nevertheless, due to this area's size and contiguity, most of these boundaries could be managed as wilderness. An exception is the series of small jogs around private land in Negro Creek, which would present management difficulties.

AVAILABILITY FOR WILDERNESS

Recreation

The area has a high value for unroaded types of recreation. Making the area wilderness would eliminate mountain biking and the extensive motorized trail system, however these uses are relatively low in comparison to other nearby areas such as the Manastash and Devils Gulch. The area is popular for horseback riders, and wilderness designation typically has party size limits for stock use that may affect current use. Many of the trails within this PWA directly enter the Alpine Lakes Wilderness. Wilderness designation would preserve the primitive recreation opportunity on these trails.

The Alpine Lakes region attracts tourism to varying degrees. For the central Puget Sound region, Chelan and Kittitas Counties are the first stop on the dry eastside. The Teanaway area provides for a moderate amount car camping in both developed and dispersed sites. Many campers day hike into the Teanaway PWA as a primary purpose of their visit. PWA-based outdoor activities most commonly promoted include summer and winter

hiking, horseback riding, geocaching, wildlife viewing and bird watching, fishing, mountain biking, and cross-country skiing. Tourism brochures and chamber of commerce websites (2008) do not directly promote the Teanaway PWA.

An extensive resort community is being developed in the Cle Elum area with a high likelihood that the residents and guests will recreate on the nearby national forest. If linked to the Washington State population as a whole (IAC SCORP Report, 2002), recreation preferences are likely to favor hiking and nature-based activities (53 percent and 43 percent of the population respectively). Currently, twenty-one percent of the population bicycles (primarily road biking), nine percent of the population recreates with off-road vehicles, and 3 percent participates in equestrian activities (lumping use of developed equestrian centers and backcounty). The National Study on Recreation and the Environment (Cordell, 2004) offers a similar data set for Washington State residents age 16 and older. Of the types of use that could occur in PWAs, 47 percent of the population participates in day hiking, 45 percent visits wilderness or primitive areas, 28 percent engage in mountain biking, 22 percent go backpacking, 21 percent drive off-road, 7 percent horseback ride on trails, and 6 percent go snowmobiling.

All of these activities are on a growth trend and recreational supply both on and off National Forest System lands is limited. Providing a variety of settings for recreational experiences will continue to compliment the tourism marketing strategies of these communities. If this area is designated as wilderness, it is anticipated that visitation is likely to increase due to probable increase in media publicity for certain areas of the PWA.

From a the perspective of providing for regional recreation needs, wilderness designation of this area would provide a clear benefit to those areas currently used to access the Alpine Lakes Wilderness by providing for continuity of experience. For the southern portion of the area the relationship is less clear. Motorized users asserted much effort during development of the Alpine Lakes Plan to keep the area open to motorized use. However, such use is low due to better motorized trail systems nearby. In this light, adding the entire Teanaway to the adjacent Alpine Lakes Wilderness would consolidate and preserve primitive recreation opportunities.

Table 2--Miles of Recreation Trails

Motorized Trails	Non-motorized Trails	Snowmobile Trails
81	59	0

Wildlife

The proposed potential wilderness area provides dense, late successional forest habitat used by the northern spotted owl (threatened), American marten, and potentially Pacific fisher (R6 sensitive). High elevation whitebark pine forest, subalpine parklands, fire-generated brushfields, alpine and low-to-mid elevation meadows, and in the Cle Elum valley, some regenerating clearcuts, provide early successional habitats used by elk, both black-tailed and mule deer, black bear, and very possibly grizzly bear. There is also denning habitat for grizzly bear within the potential wilderness area. There are high-elevation bedrock, cliffs, and talus here that may be used by wolverine--an R6 sensitive

species. Larch mountain salamander (survey and manage) and *Cryptomastix devia* (a survey and manage mollusk) probably occur here in areas where talus and old growth intermingle. This potential wilderness area also encompasses summer and winter range areas, kidding areas, and ridgelines that function as migration and travel corridors for a resident mountain goat herd.

The Teanaway PWA is an extremely important area for wildlife on the Cle Elum Ranger District, due to its high diversity of habitat, low road density, and the relatively high amount of security habitat (and core area for grizzly bears) that it now provides (compared to the adjacent Cle Elum valley and Swauk watersheds). However, recent roading and harvest on private lands adjacent to the potential wilderness area have reduced security habitat along its southern and western fringes. As an LSR, there is a need here to increase security habitat, and the effectiveness of late successional forest habitat, by reducing the density of roads and motorized trails in accordance with the Forest LSR Plan. High-use motorized trails are located along most ridgelines and streams on the west side of the PWA, leaving few areas here that are free from noise disturbance and secure for wildlife.

Winter motorized disturbance is a growing concern in this potential wilderness area. Expansion of snow machine use beyond the groomed trail system has resulted in substantial new disturbance and snow compaction in high elevation cirques, alpine areas and ridgelines, throughout this potential wilderness area and within and adjacent to the current Alpine Lakes Wilderness boundary. Resident winter wildlife would benefit strongly from reduction or elimination of groomed trails in sensitive areas, and/or confinement of snow machine use to an approved trail system and approved play areas.

Each PWA provides varying levels of habitat for focal wildlife species. To help evaluate the habitat that this area provides, the following information was provided: the focal species emphasized in the area, the amount of habitat for each focal species, the priority ranking for the habitat (based on conservation assessments and recovery plans), and the proportion of the total habitat available on the Forest that is within the PWA.

Table 3--Availability of habitat for federally listed Threatened and Endangered wildlife species and R6 Focal Species.

Wildlife Species	Acres Habitat	Habitat Priority Ranking (1=high, 2-mod, 3=low)	%Total Forest Habitat In Evaluation Area
Grizzly bear	51,000	1	4
Canada lynx	2,253	3	3
Wolverine	49,109	2	4
American marten	12,854	3	3

A key issue relative to the sustainability of wildlife habitats is the identification of the amount of dry forest that is in a late-successional habitat area (LSHA). LSHAs that occur in dry forests can be at high risk of high severity wildfire, insects and disease that reduce the sustainability of the late-successional habitats. Active management such as prescribed fire and thinning may be needed to restore these habitats and enhance their sustainability.

Table 4--Acres of dry forest habitats that are present within the evaluation area and also within a Late Successional Habitat Area

Late Successional Habitat Area	Acres of Dry Forest
Snoqualmie Pass AMA	Approx. 6,700

Water and Fish

The proposed 73,604 acre Teanaway PWA contains portions of seven subwatersheds; Blewett, 5,330 acres in the 38,376 acre sub-watershed; Ingalls Creek, 149 acres in the 47,977 acre subwatershed; upper Cle Elum, 9,052 acres in the 97,597 acre subwatershed; lower Cle Elum, 2,312 acres in the 44,230 acre subwatershed; North Fork Teanaway River, 29,964 acres in the 60,790 acre subwatershed; Middle Fork Teanaway, 25,344 acres in the 45,953 acre subwatershed; and Swauk Creek, 1,451 acres in the 63,911 acre subwatershed.

The U.S. Forest Service manages the following percentage in each subwatershed: Blewett (73 percent); Ingalls (73 percent); upper Cle Elum (99 percent); lower Cle Elum (51 percent); North Fork Teanaway (65 percent); Middle Fork Teanaway (58 percent); and Swauk Creek (75 percent).

Stream reach conditions in the Ingalls Creek, upper Cle Elum, North Fork Teanaway, and Middle Fork Teanaway subwatersheds that respond to natural and human-caused disturbances were evaluated as fair**.** This rating was assigned because collected stream data values were lower than expected values measured in high functioning stream habitat elsewhere on the Okanogan and Wenatchee National Forest. Subwatershed vegetation conditions were somewhat altered from expected natural forest conditions; analyzed road effects were moderate. Vegetation condition and road effects considered cumulatively were rated fair. When vegetation condition and road effects were combined with measured stream responses to summarize overall subwatershed conditions, these subwatersheds were rated fair**.**

Stream reach conditions in the Blewett subwatershed that respond to natural and human-caused disturbances were evaluated as fair because collected stream data values were lower than expected values measured in high functioning stream habitat elsewhere on the Okanogan and Wenatchee National Forest. Subwatershed vegetation conditions were altered from expected natural forest conditions; analyzed road effects were substantial. Vegetation condition and road effects considered cumulatively were rated poor. When vegetation condition and road effects were combined with measured stream responses to summarize overall subwatershed condition, this subwatershed was rated poor**.**

Swauk subwatershed received the lowest rating of all Okanogan and Wenatchee National Forests subwatersheds. Stream reach conditions in Swauk subwatershed that respond to natural and human-caused disturbances were evaluated as poor because collected stream data values were lower than expected values measured in high functioning stream habitat elsewhere on the Okanogan and Wenatchee National Forest. Subwatershed vegetation conditions were altered from expected natural forest conditions; analyzed road effects were substantial. Vegetation condition and road effects considered cumulatively were rated poor. When vegetation condition and road effects were combined with measured stream responses to summarize overall subwatershed condition, this subwatershed was rated poor**.**

Vegetation manipulation, dam construction, and existing road effects have substantially reduced the ability of the Lower Cle Elum subwatershed to function similarly to unmanaged watersheds. When compared against unmanaged subwatersheds in good condition on the Okanogan-Wenatchee National Forest, vegetation condition has changed substantially from expected condition and road management effects are substantial in the Cle Elum subwatershed. Considering changes in vegetation and road density in combination, Cle Elum subwatershed was rated poor. Stream reach data has not been collected in sufficient quantity for analysis; therefore, watershed condition and response have not been evaluated.

Many reaches in the Teanaway watershed (5^{th} HUC) and mainstem lower Cle Elum River (6^{th} HUC) were designated as critical habitat for steelhead by the National Marine Fisheries Service in January 2006. The West Fork and Middle Fork Teanaway Rivers provide habitat for spring Chinook and steelhead, as well as resident rainbow and westslope cutthroat trout. Standup and Stafford Creeks provide habitat for steelhead, rainbow and westslope cutthroat trout. Miller and Bear Creeks are populated by rainbow and cutthroat trout, and hybridization between the two species is very common in this system.

The Teanaway is the most important watershed for steelhead and salmon production in the upper reaches of the Yakima River subbasin (a "watershed" as used here describes a 5^{th} Hydrologic Unit Code (HUC), and is made up of several 6^{th} HUC subwatersheds. The Yakima Steelhead Recovery Plan (in draft) identifies the Teanaway River as Critical Habitat for the recovery of Mid-Columbia steelhead. Steelhead recovery will depend on maintenance and improvement of current watershed conditions in the Teanaway watershed.

There are no water related encumbrances or planned activities within the area at this time.

The Teanaway PWA has two water source protection areas that provide water to community water systems: Cashmere Water Department, 1,390 acres; and the Cle Elum Water Department, 3,534 acres. It also has a water source protection area of 302 acres that contributes to a transient, non-community water system for the Salmon La Sac Campground

Range

Portions of the Corral-Fortune Sheep and Goat, and the Stafford Cattle and Horse Allotments are within this area. These allotments are currently vacant.

Table 5--Percentage of Grazing Suitability Areas and Current Allotments

Percent Area Suitable for Cattle Grazing	Percent Area Currently in Cattle Allotments	Percent Area Suitable for Sheep Grazing	Percent Area Currently in Sheep Allotments
2	0	13	0

Vegetation and Ecology

Most of the timbered area is along stream bottoms and north slopes. Past fires and shallow soils contribute to the open areas dominated by shrubs including ceanothus, bitter cherry, willow, and numerous forbs and grasses. Many of these open areas are gradually being encroached upon, primarily by Douglas-fir and grand fir. Subalpine fir and lodgepole pine are common at higher elevations.

Generally, the priority for restoration treatments occurs within the wildfire urban interface (WUI) or within the dry and mesic forest groups. The dry and mesic forest groups occur on approximately one quarter of the PWA. Because WUI is approximately 17 percent of the PWA, the prohibition on restorative treatments if designated wilderness is also a concern.

The Healthy Forest Restoration Act (HFRA) authorizes direction to implement fuel reduction projects in the WUI. The HFRA prohibits authorized projects in wilderness areas.

Timber Harvest Suitability

The underlying criteria for determining timber harvest suitability are found in the Forest and Rangeland Renewable Resources Planning Act of 1974, 36CFR219.12, and Forest Service Handbook 1909.12, Chapter 60.

For the Colville and Okanogan-Wenatchee National Forests, the general criteria for timber suitability that will be used for timber harvest suitability are:

- Is it forest land (10 percent crown cover minimum, productivity >20 ft^3/ac/yr).
- The area has not been withdrawn from timber harvest or production.
- Soil, slope, or other watershed conditions will not be irreversibly damaged (based on soil attributes for erosion, instability, or compaction potential, slopes >65 percent, and certain land types)
- Reforestation can be assured within five years (lack of shallow soils, low frost heave potential, low surface rock, plant community type, certain land types, and elevation <5,500 feet)
- Economic and technologic viability (<0.5 miles from existing transportation system, species value or condition, volume availability, logging systems)

In consideration of all the criteria for determining timber harvest or timber production suitability and not just the fact that harvestable species can grow at a specific location, it appears this PWA does not have conditions that pass all the criteria. The main criterion for failure is that unacceptable resource impacts would likely occur due to road construction activities. This does not preclude helicopter operations that could fly material over sensitive areas to adjacent road systems. However, in most if not all cases helicopter logging and the associated expenses (such as manual slash treatments) would not be an economically viable option.

Table 6--Stand data percentages

Suitable for Timber Harvest	Forest Groups		WUI	
0%	Parkland	5%	Total WUI	17%
	Cold Dry	9%	WUI in Dry and Mesic Forest	27%
	Cold Moist	60%		
	Mesic	14%		
	Dry	9%		
	Non-forest	3%		

Fire

Annual fire occurrence is low to moderate; generally ignited by lightning. Fuel loadings are light to heavy but broken by streams and bare ridge tops.

Insects and Disease

The Wilderness Act of 1964 allows for the control of insects and disease, but taking such actions in wilderness is rare. Forest Service wilderness policy (Forest Service Manual 2324.11) directs the agency "to allow indigenous insect and plant diseases to play, as nearly as possible their natural ecological role". Policy also directs the agency to "protect the scientific value of observing the effect of insects and disease on ecosystems and identifying genetically resistant plant species", and finally, "to control insect and plant disease epidemics that threaten adjacent lands or resources."

A portion of this PWA is comprised of a parkland forest group and is known to support stands of whitebark pine. Due to a combination of anthropogenic causes (introduced white pine blister rust, global warming, and fire suppression leading to high severity wildfires) coupled with predation from native mountain pine beetles, whitebark pine stands are at risk across their range. These whitebark pine stands are of inherent value as a plant community, for providing important habitat for wildlife including the federally listed grizzly bear, and for their aesthetics in contributing to the social setting. Wilderness designation would limit restoration options for these stands. Manipulations would only be considered in order to protect the composite wilderness resource, and only as a last resort to preserve naturalness at the expense of trammeling.

The low elevation grand fir, Douglas-fir stands in Miller, Standup, and Stafford Creek were heavily defoliated by western spruce budworm in the 1970s. In 1975, a trial aerial spraying was conducted using Fenitrothion in this area. This was unsuccessful in killing the budworms present. However, trees were already weakened and bark beetles finished killing trees in several of these drainages. Mistletoe is also common in the Douglas-fir, with root rot killing both grand and Douglas-firs. The spruce budworm returned in large numbers in early 2000, and is presently causing extensive mortality in portions of the Middle Fork and North Fork drainages, while also spreading throughout the area. The long-term scenario is uncertain.

The Wenatchee Service Center has analyzed data produced by the 2007 aerial survey in order to provide land managers with a summary of forest insect activity in particular areas.

The primary damaging agent detected was western spruce budworm. Western spruce budworm prefers to feed on grand fir and Douglas-fir, but will also feed on spruce, subalpine fir and western larch. About 4,700 acres of defoliation were mapped. This is less extensive than the defoliation mapped in 2006 or 2005. Cold weather in late spring this year may have killed some of the new larvae. It should be noted that defoliation makes it difficult to detect other damaging agents, such as tree-killing bark beetles. It is highly likely that successful attacks by bark beetles were initiated on host trees this year, as the stress of repeated defoliation makes the trees more susceptible. Since 2003 there has been about 30 percent mortality in overstory grand fir as a result of repeated defoliation and drought (Mehmel 2006).

Indirect control through silviculture is the most effective way of reducing budworm impacts over the long term. Stands with a large percentage of preferred host species will support an outbreak longer than stands with less host species. Multi-storied stands will also sustain outbreaks longer than single-storied stands, since they will provide dispersing larvae with readily available food and shelter from predators. Direct control with pesticides may be appropriate in certain areas where important resources could be lost if host trees are defoliated.

Subalpine firs killed by western balsam bark beetles and grand firs killed by fir engravers were mapped on over 1,000 acres in the North Fork Teanaway below Eldorado Creek. These bark beetles attack host trees that are stressed by drought or other damage. Heavy defoliation in the Teanaway area has increased susceptibility to bark beetles.

Two pockets of whitebark pine killed by mountain pine beetles were mapped in the vicinity of Earl Peak. Mountain pine beetle can attack and kill many species of pines, but is most closely associated with lodgepole pine. Research indicates that a warming climate may improve the success of mountain pine beetles in high elevation ecosystems where whitebark is the dominant pine (Logan and Powell 2001).

Threatened, Endangered, and Sensitive Plant Species

The Teanaway PWA includes several sensitive plant species including Ahtiana lichen (*Ahtiana sphaerosporella*), Thompson's pincushion (*Chaenactis thompsonii*), Brewer's cliffbrake (*Pellaea breweri*), clustered lady's slipper (*Cypripedium fasciculatum*), and Seely's catchfly (*Silene seelyi*). A number of these are endemic species.

Noxious Weeds

A number of noxious weed species that have been introduced into the PWA including diffuse knapweed, spotted knapweed, Canada thistle, houndstongue, St. Johnswort, oxeye daisy, Dalmation toadflax, sulphur cinquefoil, and common tansy. Also, noxious weeds are established along the roads leading to this area, and a few locations along the trails.

Minerals and Soils

This area is primarily underlain by Tertiary sedimentary rocks; however, the south 20 percent is also underlain by Tertiary basalt and the northern 20 percent is underlain by both Mesozoic ultramafic rocks and volcanic rocks of pre-Tertiary age. This area has not been studied in detail by the U.S. Geological Survey or the U.S. Bureau of Mines. Available information, however, indicates the area has reported occurrences of copper, iron, nickel,

chromium, cobalt, gold, and silver. The area lies within the Cle Elum-Blewett mining districts and within the Blewett nickel-iron province. Even though present activity appears to be essentially non-existent, the Northwest Mining Association has indicated that in their opinion the area contains, in addition to numerous small occurrences, "major" potential for future mineral development of the following known deposits.

- Cle Elum River iron-nickel deposit (Section 2 and 3, T. 22 N., R. l4 E.)
- Negro Creek iron-nickel deposit (Section 8, T. 22 N., R. l6 E.)

Based on historic activities and available information on the mineral potential of the area it appears that any gold related activity (the most likely mineral activity) would be relatively small scale. Nickel-iron-chromium related activities would depend on improvements in extractive technology and on major changes in the worldwide supply/demand environment for these commodities. The area does have a potential for the occurrence of deep-seated deposits, but this mineral potential of the area has not been adequately explored.

Bureau of Land Management recordation data (October 8, 2004) indicates that 579 lode mining claims and 28 placer claims have been located within or immediately adjacent to the area. However, all but two placer claims have been abandoned. The degree to which the now abandoned claims were explored or developed is not precisely known. However, all were considered small scale operations: most of the claims had no measurable surface disturbing activities. Activities on the remaining two placer claims are considered relatively insignificant in terms of their surface impacts.

A large portion of the area is classified by the U.S. Geological Survey as being "prospectively valuable" for oil and gas resources; oil and gas leases that had been issued during the 1980s have been terminated. The area is not classified prospectively valuable for any other leasable commodity.

Roughly 60 percent of the area is composed of soils that have formed in the Swauk and Roslyn sandstone parent materials. These soils range in texture from sandy loam to sandy clay loam. They usually become sticky and plastic when wet, and the surface often becomes very slippery even during light rains About 15 percent of the area is made up of the very hard sandstone and volcanic parent materials. Soils that have formed in these materials tend to be non-sticky and non-plastic. They usually are not slippery and have good bearing strength. Serpentine soils make up about 11 percent of the area. They are chemically unbalanced, so most vegetative types do not do well on them. These soils tend to be very erosive. Except for the serpentine soils, they are all moderately productive. Most are well drained and moderately deep.

Cultural and Heritage Resources

Prehistoric use of the Teanaway PWA was likely. Annual huckleberry picking expeditions by native peoples were made into the country above Paris Creek and Salmon La Sac as late as the 1920s, and hunting and huckleberry gathering were common in the Teanaway (particularly around Koppen Mountain). Intensive field survey would be required to determine prehistoric site distributions. Historically, the area encompasses a large portion of the old Cle Elum Mining District as well as some spillover from the Blewett Mining District to the east. Mining sites are numerous and include such diverse components as

cabins, campsites, equipment, wagon roads, workings, and three known mill sites. The area was also used for sheep grazing between the late 1800s and the 1920s. Some of the herder's camps from this time-period are identifiable by carvings on nearby trees. Finally, the area includes the former sites of the Jolly Mountain Lookout (1936-1968) and the Teanaway Butte Lookout (1935-1968), the Stafford Lookout (1935-1966) and the Three Bothers Lookout (1934-1966). Unless a site has been determined to be ineligible for the National Register, it is managed as a significant site until such a determination is made. Cultural sites are protected by law; however, a wilderness designation or a roadless designation would afford additional protection to cultural sites from ground disturbing activities.

Land Uses and Special Uses

There is a special use permit in effect for the Eldorado Research Natural Area. An outfitter-guide who provides guided horseback rides from a base camp is operating in this area under a permit. If the area is designated as wilderness the group size would likely be reduced, affecting this outfitter's operation.

The Teanaway Potential Wilderness Area falls entirely within lands ceded to the U.S. Government under the Yakama Treaty. Indian tribes hold rights reserved under treaty and recognized in statutes, executive orders, and policies. Generally, these included rights to fish at usual and accustomed grounds and stations, the right to hunt and gather on open and unclaimed lands, the right to erect temporary houses to cure fish, and the right to pasture horses and cattle on open and unclaimed lands.

Private Lands

There are no private lands within the area. There are miscellaneous private lands along the southern and eastern boundaries of the area. These private lands are currently in timber production, but may be developed at some point in the future. Management of those private lands is not dependent on national forest access through the PWA.

NEED FOR WILDERNESS

Location and size of other wildernesses in the general vicinity, and distance from area and population centers:

This area is adjacent to the Alpine Lakes Wilderness (362,789 acres), and the Norse Peak Wilderness (52,180 acres), William 0. Douglas Wilderness (168,232 acres), and Goat Rocks Wilderness (107,018 acres) are also nearby. The greater Seattle metropolitan area is within two hours of this area.

In ranking this PWA for its potential to provide a high quality wilderness recreation setting it ranked as high due to adjoining the Alpine Lakes Wilderness. Many trails entering the wilderness pass through this PWA enroute. The area is reasonably accessible from the Cle Elum area. The PWA provides high quality scenic destinations that would attract wilderness users. In addition, interconnected trail systems would facilitate both day trips and overnight use. The area is also known for supporting educational field trips due to the unique serpentine geological formation that supports unusual plant communities.

Present visitor pressure on other wildernesses, trends, and changing patterns of use:

Use patterns remain flat overall in nearby wildernesses. Day hiking is up slightly in the past few years, while overnight use, both backpacking and horse packing are down slightly. Hunting has declined substantially in the past decade. Use remains high in some portions of the Alpine Lakes Wilderness. Use increases closer to the Cascade crest in the William O. Douglas and Goat Rocks Wildernesses, and in several areas on the west side of the crest.

Extent to which non-wilderness lands provide opportunities for unconfined outdoor recreation experiences:

This area, as with many non-wilderness areas in this vicinity, provides high opportunities for unconfined recreation, including ORV-related activities. The Teanaway PWA is popular with highly skilled motorcycle riders, as well as horsemen and hikers. It is valued by those seeking a respite from the crowded areas in the wilderness, as well as parties too large to be permitted in wilderness. Other nearby potential wilderness areas that provide high quality opportunities for unconfined recreation include the Manastash, Devils Gulch, and Thorp Mountain.

The need to provide a sanctuary for those biotic species that have demonstrated an inability to survive in less than primitive surroundings or the need for a protected area for other unique scientific value or phenomena.

Wildlife

The Teanaway PWA provides habitat for species that require primitive surroundings; northern spotted owl, Pacific fisher, Canada lynx, American marten, grizzly bears, and wolverines. In dry forest 6,700 acres of the PWA has late successional habitat. For this area, a higher priority wildlife issue is the need to restore dry forest habitats for the northern spotted owl, and reduce the risk of habitat being burned in high severity fires. Active management, such as prescribed fire and thinning, may be needed to restore these habitats and enhance their sustainability, and would not be compatible with wilderness designation. The wildlife sustainability index is 80.6 (a high relative ranking, but exclude dry forest LSR) and the habitat connectivity index is 55.6 (also high relative ranking).

Fish

Several native species in the interior Columbia River Basin have demonstrated an inability to survive in less than primitive surroundings, especially the bull trout. In addition to habitat changes on National Forest System lands, other factors off forest such as hydropower generation, hatchery programs, harvest, and changing ocean conditions further challenge the persistence of some far-ranging native species. Broad-scale assessments have demonstrated a positive correlation between unroaded areas and persisting native fish stocks. Often, assessments like these don't differentiate between wilderness and roadless areas; rather they combine the two into an "unroaded" category. These assessments show current strongholds (most secure and robust populations) are dependant on wilderness and

roadless areas. Some of the more resilient native fish populations in the Interior Columbia Basin are located in unroaded areas on National Forest System lands.

For the Okanogan-Wenatchee National Forest PWAs were assigned an aquatic ranking based on federally listed and sensitive fish species that are sensitive to human disturbances. A high ranking was assigned when listed fish species occur in the PWA or when ecological process including high quality water help sustain listed fish species downstream of the PWA. All other PWAs are ranked low. This PWA is assigned a high ranking based on these factors.

Rare Plant Species

An analysis was completed to prioritize which PWAs would contribute the most to providing refugia for those plant species on the species of interest/species of concern (SOI/SOC) list. The analysis ranked three factors. The first factor, the total number of sites occurring within the PWA, ranked as high for this PWA. The second factor, which also ranked as high for this PWA, examined the degree of rarity of any SOI/SOC species present, and also recognized the importance of individual PWAs in supporting a high incidence of populations relative to Washington state as a whole.

PWAs are generally unsurveyed for rare plants due to a relative lack of projects occurring in these areas. Thus an additional factor examined the potential for the PWA to support SOI/SOC species. Based on databases, first the SOI/SOC plant species were identified that are present within a five-mile radius of the PWA, but are not known to occur within the PWA. Then the PWA was analyzed to see if the potential habitat for these species occurs within the PWA. Based on this analysis, this PWA ranks as high.

Finally, a composite score was assigned to each PWA based on combining each of the rankings described above. This PWA ranks overall as high priority for preserving rare plant refugia with a wilderness designation.

The Teanaway and Alpine Lakes Adjacent PWAs have the highest concentrations of endemic plant species of the PWAs in the planning area. A large portion of the Teanaway PWA has a serpentine geological strata that supports unique plant communities. Serpentine formations are relatively unusual within our region.

Ability to provide for preservation of identifiable landform types and ecosystems:

This area represents the East Cascades ecoregion according to Bailey's Ecoregion Classification System. This ecoregion type is well represented in existing wilderness lands in the Cascade Range.

An analysis compared vegetative cover types that are under-represented in wilderness on the National Forest System in Region 6 with those same cover types present in the PWA. Large-scale cover types were available through existing data layers and represent approximately 18 percent of the vegetative cover of this PWA (approximately 13,640 acres). These types include forb lands, non-alpine meadows, and ponderosa pine. Taken as a whole, the contribution of underrepresented vegetation types ranks as moderate for the portion of this area with underrepresented cover types, but as high for the number of acres that are represented within this PWA relative to the other PWAs in the planning area. In

fact, this PWA ranks fourth for providing underrepresented vegetation cover types for the entire planning area.

Some under-represented cover types fill microhabitats such as riparian areas or perched water tables. Such finer scale cover types represented in this PWA include abundant amounts of cottonwood, and sparse amounts of red alder and quaking aspen.

In particular, the forb land, non-alpine meadow, alpine meadow, and cottonwood cover types would make a significant contribution within the eastern Washington planning area.