Flora of the Wild Sky Wilderness

by Philip Zalesky

High in the treeless zone of the Wild Sky Wilderness resides the mountain massifs of Gunn Peak (6240'), Merchant Peak (6113'), Mt. Townsend (5405'), and Mt. Baring (6125'). All of these being the outcropping of the Index igneous, granitic batholith. What makes these alpine areas treeless? Snow and ice blasted by the winds, cold temperatures on rock and soil, long enduring snow pack, and other winter demands making for a short growing season. We also find in this area "discontinuous arrays of geological evolution."

Retired University of Washington professor Arthur Kruckeberg, noted botanist and geobotanist, describes the geo-botanical agents creating the evolution of plant life in just this type of mountainous, discontinuous arrays. In his recent book, Geology and Plant Life: The Effects of Landforms and Rock Types on Plants, Kruckeberg states that land forms interfacing with rock types provide the diversity creating the basis for plant evolution. Land forms would include mountains. Without discontinuous arrays of geology through land forms and rock types, you will not get evolution.

In a lecture for North Cascades Institute's Naturalist Retreat at Sun Mountain Resort, Kruckeberg said he would bet a flat world, which he calls surface homogeneity, would demonstrate a planet with nothing other than sand and bacteria. Or as he more delightfully questions, "Would life in any degree of diversity have evolved on a global billiard ball?" "The fundamental concept is that the North Cascades from Snoqualmie Pass to the Canadian border is a jumble, a complex of geological phenomenon that is still defying geologists." Plant life diversity represents itself well in these rugged mountains of the North Cascades including mountain areas of the Wild Sky Wilderness.

Dominating the terrains south of Snoqualmie Pass are young volcanic rocks from lava flows and vulcanism on Mount Rainier, Mount Adams, Mount St. Helens. According to Rowland Tabor and Ralph Hauge, Geology of the North Cascades, north of Snoqualmie Pass the volcanic rock has been mostly eroded away leaving rugged metamorphic and igneous rock formations exposed. According to Kruckeberg, this would encourage finding more of our rare and unusual plants north of Snoqualmie Pass. More plant mass, however, occurs south of the pass with its more volcanic-type soils and lower mountains.

And the closer we get to the border of Canada with its geologic jumble of mountains the greater would be the number of unusual plants. "Manifesting again the effect of complex geology creating local habitats." More plants south of Snoqualmie Pass would be found, but fewer of the rare and out of the ordinary plants. Isolation, rock-type soils, and stress, according to Kruckeberg, in the higher, rugged, treeless terrain in the north plays an evolutionary role in creating new species.

High country such as the mountains of the Wild Sky Wilderness is where these out of the ordinary and rare plants prevail. This would be true even though the forests of the lower reaches would have fuel for more tonnage of plant life from photosynthesis. Kruckeberg suggests that wet, lush, and forested areas would not have the diversity created by the interface of rocks, treeless slopes, and high mountains.

Three local individuals, Elroy Burnett, Bob Hubbard, and Mildred Arnot, have hiked extensively around much of the Wild Sky area with an eye toward identifying the plants and understanding the plant communities. All three have done inventory work for the Forest Service and National Park Service. Burnett in particular has done quite a bit of work surveying for rare and endangered plants, mosses, and lichens including helping to assemble reference collections for the National Park Service, Forest Service, and the University of Washington. While Hubbard went to college to pursue a degree in forestry, he also fell in love with botany and entomology along the way. He discovered that all three intermeshed beautifully.

Arnot has been a botanizing friend of Burnett for many years and has the discerning eyes that many botanists only dream of - eyes, according to her two friends, "that can spot the almost vaporously vague differences that separate similar species of difficult-to-key genera. (like Carex, a genus, according to Hitchcock and Cronquist's, *Flora of the Pacific Northwest*, with 134 different species in it in the Northwest.)" Burnett, Hubbard,

and Arnott have also worked with Washington State Parks to put together a list of plants (over 300 species) found around the area of the Index Town Wall, a scenic cliff and rock climber destination located above Index town. The Town Wall was recently incorporated into a 1300 acre new state park called "Forks of the Sky State Park.

If we were to journey with Hubbard, Burnett, and Arnot, this journey will take us through the forest zones from the valley bottoms near Index with its elevation about 500 feet to the subalpine parks of Gunn Peak and Mt. Townsend. As one travels upward in elevation the composition of the vegetative communities "...almost inevitably changes with some species dropping out and others persisting." This universal effect was explained by Kruckeberg to Hubbard once, referring to a slope above a trail where he met him. There are many plants which have been found up high, but not down low, and a few plants with extremely wide elevation distributions. "Composition of vegetation almost inevitably changes with some species dropping out and others persisting to the ridge at the upper contours of the slope."

In an interview with Hubbard in Index he had these comments about diversity from the North Fork Skykomish valley floor beyond Index:

> "Where it is uniformly forested, you'll also find less diversity in plant communities under the trees; it is the diversity of site conditions which creates and maintains a diversity of plant species. Under dense conifer stands there may be no green plants on the forest floor at all, due to the deep shade. Under mixed conifer/deciduous stands more light penetrates, and more plants can take advantage of it. Under deciduous stands like alder or maple forests even more sunlight penetrates, and a veritable hodgepodge of plants can find good living conditions.
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> In meadows, along roadsides and river gravel bars, the sunlit environment is friendly to even more plants, the ones which can't make it in partial shade. It is the harshest environment which seems to have the most rare and endangered plants associated with them: the acidic bogs, the thin, rocky soils of high elevations, and nutrient-challenged soils of certain rock types, such as serpentine. Forest cover - even the botanically-diverse forest cover of old growth - tends to "round off" environmental extremes; under the trees the winds are muted, the light is dimmed. The temperature doesn't get as hot during the day nor the cold at night, when compared with open ground. The soils are deeper, and being shaded, don't dry out as fast or as much as the shallower, droughtier soils of open ground. Very few of the state's rare and endangered plants are specifically associated with old growth forests, when compared to marginal or harsh habitats."

Professor Kruckeberg in his *The Natural History of the Puget Sound Region* says the drainage of the Skykomish River affords a superlative example of micro-habitats over minimal horizontal distances. "Slope and compass exposure create particular environments that define the character of the plant cover."

So from this elevation from 500 feet to 2000 feet, generally considered the Western Hemlock zone, what might our trio find for us if we journey with them? From the town of Index itself and up the North Fork Skykomish River the trees are mostly second growth trees but go to stands of 80-years old predominating with an abundance of Big-leaf maple, Black cottonwood, and Red alder. In places pure stands of conifers reside, although there are mostly mixed stands of conifers. In the North Fork a population of Alaska yellow cedar is found at an unusually low elevation (600 feet) near the mouth of Lewis Creek. At the same elevation an occasional Grand fir and Spruce can be spotted. Western hemlock abounds with Douglas fir, but Pacific silver fir is the most likely true fir to be found on the valley floor.

Old growth forest between Troublesome Creek and Garland Hot Springs provides additional low elevation plant variety. Many shade tolerant plants can be found here, and in similar old growth found between Garland Springs and Goblin Creek. Some of the Douglas firs in these groves are quite large and ancient. One Douglas fir after coring was found to be about 700 years old and another near Silver Creek cored out at 800 years of age. Large and monstrous old Western red cedar are found in this old forest. Now we start seeing more Pacific yew while up in the sunlit out-croppings an occasional Shore pine and very occasional Western white pine with the more common forest trees may be discovered.

In the moist, shady coniferous forest is found a saxifrage, Youth on Age (*Tolmiea menziesii*), which flowers wild are more beautiful than its houseplant counterpart. Near Garland Hot Springs in the North Fork Skykomish River area, Round leaved rein-orchids (*platanthera orbiculata*) have been found by Hubbard at 1,800 feet elevation under old growth trees. Also, Micki McNaughten, doing a plant survey for the Forest Service

in 1998 and 2000, found two populations of the species in the Salmon Creek area. These were found when researchers scouted out Spotted owl in old growth. Hubbard tells us this unusual plant species was listed by the Forest Service as a Survey and Manage species, but may also be listed by the state of Washington. Basal leaves of the Round leaved rein orchid are flat on the ground. Rein refers to strap shaped lip and spur.

While still on the lower reaches of our journey, we turn to Elroy Burnett and Mildred Arnot to look at the diversity within plant communities at lower elevations near Index of 500 feet to 2,000 feet. Index Town Wall outside the city of Index provides us our representative look at what may be found elsewhere in the Wild Sky Wilderness at similar elevations. Botanizing around the Town Wall of Index is not an easy accomplishment. Yet for a period of several years, the Town Wall has had a fascination for Burnett and Arnot. They made forays into various habitats of the town wall and adjoining hillsides. They returned every couple of weeks throughout the growing season to catch early, middle, and late appearing plants and later, the mosses and lichens.

Nowhere in this area, they believe, have so many species of plants been so thoroughly identified. This they completed in 1994 while working on the creation of a state park on the western outskirts of the city. The list of plants identified by Burnett and Arnot have been considerable. On the Index Town Wall and adjoining hillsides the vascular plants, sedges, grasses, and likens being identified have been numerous. They have keyed out 129 species of flowers, 14 species of trees, 5 species of vines, 26 grasses, 12 ferns, 51 species of mosses, and 171 species of lichens by Burnett. Both Burnett and Hubbard consider their botanical shortcoming to be sedges and rushes. They extol the expertise of Arnot on these species. Arnot has identified 20 species of sedges and rushes on the Town Wall area.

Burnett tells us his specialty is lichens. At the time of submission of the report to the Washington State Parks and Recreation Commission studying the 1500 acres for a park, Burnett had identified 27 species of lichens as being on the rare list for the state of Washington. Many of these lichens have since been de-listed. On that list would be Blood whiskers lichen (*Chenotheca cf ferruginea),* Broadleaf tarpaper lichen *(Collema nigrescens),* Catpaw lichen *(Nephroma resupinatum*), Dogpaw lichen *(Nephroma laevigatum)*, and, not listed as rare, but interesting in name, Dr. Seuss tree lichen (*Microcalicium ahlneri*).

Throughout the Wild Sky, one may come across a number of plant species of interest. At mid elevation Micki McNaughten has encountered Gnome plant (*Hemitomes congestum*). To encounter this species involves luck. Never listed as a rare plant, it has been placed on the state of Washington monitor or watch list. Found deep in coniferous forests Gnome plant is the only plant in its genus in western North America. It is sometimes confused with Fringed pinesap (*Pluericospora fimbriolata*) which is also found in similar heavy-shaded habitats. Found hiding underneath Devil's club (*Oplopanox horridum*) in moist areas is a rare bedstraw (*Galium kamtchaticum*), although more usual to find in the Madder family in this area would be a more common Tall-rough bedstraw (Galium asperine).Its fruits and stems are covered with hooks to snag on animals for dispersal. Along with species of huckleberries, Devil's club, whose spiny stems produce horrible, infecting wounds, is a vexing, common understory in wet sites in the forest.

At least one rare plant has been reported in the vicinity of Lake Isabel. This plant Asplenium-leaved goldthread (*Coptis aspleniifolia)*, a member of the fern family and according to C.L. Hitchkok and A. Cronquist in *Flora of the Pacific Northwest*, only three known populations inhabit the Cascades. Hubbard's mentioning of this situation to the Forest Service some years ago may have helped thwart an effort to lower the level of the lake to service a proposed small hydroelectric project. The fluctuating lake levels would have dried out the goldthread's habitat and possibly killed the largest and most healthy population of this plant in the state.

Sitka valerian (*Valeriana sitchensis*) is an abundant plant throughout the Wild Sky Wilderness, but its relative Scouler's valerian (*Valeriana scoulaeri*), an unusual plant, has been found by Burnett only on the Wallace River. Another rather unusual plant, Alpine bog swertia (*Swertia perennis*), a member of the gentian family, has been keyed out at Twin Lakes and Poodle Dog Pass at the western edge of the wilderness. It is usually found along the Alaskan coast, so it is unusual to find it in the Washington Cascades.

Jeffrey pine, a common California tree, is typically associated with serpentine derived-soils. Burnett has found serpentine out-croppings at Red Mountain and Red Gulch near Elk Creek at the western edge of the wilderness so there is a chance of finding Jeffrey pine here. Jeffery pine is one of the indicator species for serpentine. Ponderosa pine seldom grows on serpentine and its rock soils, for there is not sufficient minerals

to support lush growth. Serpentine rock, a special area of Kruckeberg's expertise, is a classic example of his theory about rock types and soils, created from the rocks, influencing plant species and plant communities.

Kruckeberg was encountered at Teanaway on a trail that heads toward Mt. Stuart. He pointed out some stretches of serpentine and noted that minerals in the rock and resulting soil were primarily iron, magnesium, and silica - a combination not conducive to growing plants. This combination results in dwarfism and reduction in leaf size. However, there are plants, such as Jeffrey pine, that seem to have an affinity for it. For example Buckwheat (*Erigonum pyrolaefolium*) is common on serpentine, but it is also found elsewhere. Some plants, such as Buckwheat, would be local species, but Kruckeberg's research has pointed out significant differences- a racial differentiation - in the species to indicate that these plants were not emanating from local plants. They may come from more distant floral elements and in some instances a mile or so away.

Kruckeberg pointed to one fern, Shasta holly fern (*Polystichum lemmoni*), which is exclusively found in the Pacific Northwest only on serpentine. Asked how this fern could be found so widespread, Kruckeberg pointed out that airborne spores do the trick. To this he states Beijerinch's Law "Everything is everywhere, but the environment selects." This fern regenerates from the spores, and as he noted, so do a couple of other ferns regenerate on serpentine. These, however, can be found on other soils, too. The answer as to why and how endemic floral seeds spread and regenerate on serpentine from distant places is still unanswered.

In our journey above 2,000 feet we drive to the trail head to Barclay Lake. From Barclay Lake's east end we turn north. Hubbard and Burnett must find a way north to Eagle Lake and Mount Townsend on a remnant trail climbing through the Pacific Silver Fir Zone. We have moved from the creek bottom and Barclay Lake traversing toward the high meadows. As we go up in elevation we find plant life more stressed, since plant life must respond to environmental conditions.

Along this trail to Barclay Lake, if we look closely, we might find a few rare species of lichens - the interestingly named lichen Tickertape bone (*Hypogymnia duplicata),* a species that occurs primarily on Hemlocks and Silver firs and *(Lobaria linita),* a leaf lichen on mossy rock and trees and *(Pseudocephallaria rainierensis).*

Also, in the same zone during a similar study by Micki McNaughten for the USFS were areas particularly rich in the terrestrial orchid family. Fairy slipper (*Calypso bulbosa),* Coral root orchids *(Corallorhiza maculata),* Western coral root (*Corallorhiza mertensiana*), Rattlesnake plantain (*Goodyera oblongifolia),* Northern bog orchid *(Platanthera hyperbore),* and Heart -Leaved Twayblade (*Listera caurina).* Several of these plants have lost their photosynthesis independence.

Some other rich finds in this zone by McNaughten were Leathery grape fern (*Botrychium multifidum,),* Gnome plant (*Hemitomes congestum*), and Tiger lily (*Lilium columbianum*). Another uncommon flower found by McNaughten on the north-facing slopes of Salmon Creek was Mountainbells (*Stenathium occidentale*). In this elevation in coniferous forests are often found Indian pipe(*Monotropa uniflora*) and Pinedrops (*Pterospora andromeda*). These two grow in decayed vegetable matter and are notable for their lack of chlorophyll.

Avalanche paths are common throughout the Pacific Silver Fir Zone and the Mountain Hemlock Zone. Travelling through these on the Barclay Lake to Eagle Lake trail, one can find a number of sunlight-loving plants. These vertical gashes of non-forested vegetation with their dense thickets of Slide alder (*Alnus sitchensis*) will usually have associated plants such as vine maple, huckleberry, serviceberry, and thimbleberry. On talus slopes and around outcrops Oregon boxwood (*Pachystima myrsinites)*, Mountain huckleberry (*Vaccinium membranaceum)*, Alaska huckleberry (vaccinium alaskaense), Small flowered penstemon (*Penstemon procerus*), Cinquefoil (*Potentilla gracilis*), Phlox (*Phlox diffusa*), Yarrow (*Achillea millefolium*) and the often weedy Pearly everlasting (*Anaphalis margaritacea*)may occur.

Water loving herbs such as members of saxifrage family, Yellow willow-herb (*Epilobium luteum*), Monkey flower (*Mimulus guttatus*), and Bluebells (*Mertensia paniculata*) occur along the edges of Eagle Lake and undoubtedly other lakes - Sunset, Sims, Fourth of July and several little ponds that support fish. These lakes along with Eagle Lake form a string over the other side of Townsend Mountain having been explored by Burnett in his fishing days. The number of small lakes in the Wild Sky is surprising. Also, these plants may be seen on the bog area east of Eagle Lake along with grasses and low shrubs, willow, Labrador tea (*Ledum groenlandicum*), and Bog laurel (*Kalmia microphylla*). Here, too, one might find Arrowleaf groundsel (*Senicio triangularis*), Elephant head (*Pedicularis groenlandica*), Marsh marigold (*Caltha biflora*), Arnica (*Arnica latifolia*), Shooting stars (*Dodecatheon jeffreyi*), Foam flower (*Tiarella trifoliata*) and Trillium (*Trillium ovatum*).

Other vegetation also struggles while surviving in dwarf condition. In traversing the slopes of Townsend Mountain (5936') from Eagle Lake (3888'). A transition of Mountain Hemlock and sub alpine zones is encountered where small gnarled and deformed trees endure by facing into the wind. In this sub-alpine transition zone, severe conditions affect all the plants including mountain heather species, spiraea, lupines, penstemon, and alpine grasses. These have been known to evolve biotic mechanisms for the severe life conditions. This is consistent with Kruckeberg's theory on effects of landforms and rocks on plants.

The upper parts of the Mountain Hemlock Zone - sometimes referred to as the Krumholtz - are clumped and scattered openings creating subalpine parkland. At Stone Lake prior to arriving on the Eagle Creek trail to Eagle Lake, the trees consist of three interspersed, isolated, and mixed stands of conifers - Sub-alpine fir, Alaska cedar, and especially Mountain hemlock. Eagle Lake is set in a great example of this parkland. We expect to find here Sitka mountain ash (*Sorbus scopulina*), low Shiny-leafed spirea, and huckleberry species. The low Blue huckleberry is scientifically well-named (*Vaccinium deliciosum*) and lives up to its promise.

High elevation alpine botanical expeditions made by our pair illustrate Kruckeberg's theories on plant life diversity, rock forms interfacing with complex geological land form phenomena producing rare and unusual plants. Hubbard once climbed to the high meadows of Heybrook Ridge west of Gunn Peak finding 60 species of blooming plants and 95 total species of plants. This is a great variety of flora to find on any single day's hike. This represented a climb of 3,000 to 4,000 feet out of the bottom of Barclay Creek valley.

In the 1950s a Navy plane crashed on nearby Merchant Peak. After that event the Navy established a camp and training area including a flag pole near Gunn Peak. The camp no longer exists, but they left a still visible, but overgrown, trail reached first by crossing the creek below the Barclay Lake trailhead and then veering toward the slopes left of a prominent waterfall. Hubbard observed the high mountain floral displays at the peak of their flowering. We will probably see many of those plants as we climb to the edge of the Mountain Hemlock Zone and into the parkland that follows.

With this elevation gain we have encountered different types of vegetation revealing major micro-environmental differences. In coming through the Mountain Hemlock Zone we may observe the bent and crooked trees called Krumholz facing the prevailing direction of the winds. Eventually we come to the edge of the upper montane forest, or timberline.

Finding Moss campion (*Silene acaulis*) will now be our search and challenge - a flower of elegant pink whose flattened leaves and stems make it look like a moss and a cushion plant. If we are to find Moss campion, we must climb to the highest rocky slopes of Gunn Peak and look in the rocky crevices and cracks. To find this shy little flower will make the journey worth the effort.

First, we must break through the forests of Mountain Hemlock, Subalpine fir, and Alaska red cedar. Openness under tree canopy and other shrub cover widens, making increased plant and wild flower observations constant. The growing season up here is short and to survive many plants adopt a low cushion like form. Dwarfism is another strategy for coping with the cold. Many plants have evolved tiny leaves and tiny flowers. Tolmie's saxifrage (*Saxifraga tolomiei*) provides a good example. In this same area within the understory, dominating are members of the sunflower, rose and heather families. This is a place where we may find Bear grass (*Xerophyllum tenax*) and among the shrubs the tasty Black mountain huckleberry (*Vaccinium membranaceum*).

We need to observe this sub-alpine zone with its high sloping meadows and open spaces to see if there are seedlings of alpine fir and mountain hemlock starting to invade. It happened before in the early 20th Century caused by warming of the planet.

As we pass into the sub-alpine zone a thousand or more feet below the summit of Gunn Peak, one of our first obvious observations is a tufted evergreen shrub or heather. The dominant species of heather is a White mountain heather Cassiope (*Cassiope mertensiana*) in some places and Pink Mountain heather (*Phyllodoce empetriformis*) in others. If we have arrived early after the spring melt, we should find Trilliums (*trillium ovatum*), Spreading phlox (*Phylox diffusa*), and David's penstemon (*Penstemon davidsonii*)sprawled in abundance about this alpine garden as well as white flowered Sitka valerian (*Valeriana sitichenis*).

Some of the subalpine beauties we may discover within the Mountain Hemlock transition zone may be Alaska harebells (*Campanula lasiocarpa*), Mountain artemisias (*Artemisia trifurcata*), and various members of the sunflower family. While Elephant's head (*Pedicularis groenlandica*) is also found near streams at lower elevations, its close relative Bird's-beak lousewort (*Pedicularis orinthohyncha*) with its purple upper lip is typically found at

high elevations. For some reason or other Glacier lilies (*Erythronium grandiflorum*) have been found in only one isolated spot in the Wild Sky Wilderness on Ragged Ridge near the Kromona Mine.

Wild flowers, insects, and Rufous hummingbirds are part of the complex network of this subalpine ecosystem. When we spot Red columbine (*Aquilegia formosa*), we immediately look for the hummingbird, for this is his favorite source of mountain nectar. Looking for this swift-avian-flying bullet is not easy. Often it buzzes you to alert you to its presence. With a red pack, red kerchief, or red hat, they will usually spot you and sometimes even when you are climbing on a widespread snowfield or glacier. The flower of the Red Columbine fails to be attractive to insects, since the flower is odorless with deep tubes. The ecosystem provides exclusivity for the Rufous hummingbird. What is he doing at this elevation? It is hard to know other than going where food is provided. He is most likely a migrant, since the male Rufous hummingbird begins heading in July for his winter home in Mexico across the Cascades and even the Rockies. His migration route in spring takes the Rufous up the Pacific Coast and not into the mountains.

Other flowers we should look for among the many in the subalpine zone include Sitka valerian (*Valerian sitchensis)*, Common harebell or Bluebells-of-Scotland (Campanula rotundifolia), Alpine lupine (*Lupinus lepidus lobbii*), Fleabane (*Erigeron pergrinus*), Cliff paintbrush (*Castilleja rupicola*), Windflower (*Anemone occidentalis*), and one of the more common flowers of the subalpine zone, Diverse-leafed cinquefoil (*Potentilla diversifolia*). Kruckeberg informs us that there are 50 species of lupine in North America. "Once you have a structure function that works well in nature, then you will get countless variations of it. This is part of the Darwinian evolutionary success story." What applies to lupines also applies to composite flower heads, leading to a wide variety of composites occurring above timberline.

The alpine and rocky summit areas of Gunn Peak showcase the floral and plant vitality of the Wild Sky Wilderness, illustrating Kruckeberg's thesis regarding geological land forms and flowers. Evolution is at work. As we climb into the high alpine zone just beneath the peak with its talus and rock outcropping all the way to the summit, we find more plant species, some of which are unusual and rare. Among the loose rock, scree, or talus may be found David's penstemon species, (*Penstemon davidsonii*). In dense mats, dwarfed and prostrate to the ground, is the most characteristic alpine shrub, Common juniper (*Juniperus communis var. montana*), whose variations are the only Juniper found circumpolar around the northern hemisphere.

Two other common denominators of the alpine are Partridge foot (*Luetka pectinata*), a low mat-like plant, and the wide ranging Sitka Valerian (*Valeriana sitchensis*). Alpine speedwell (*Veronica wormskjoldii*) has been found by Burnett in the high alpine meadows and rocky slopes. Found near the summits of the peaks of the Wild Sky are two unusual plants, Alaska harebell (*Campanua lasiocorpa*), and Sagewort (*Artemisia trifucata*) The latter found by Burnett on the top of Mt. Index. This latter find is an unusual discovery with its frequency of identification being rare.

Even here in the final summit area dwarfed plants may persevere on a rock lip or crevice filled with soil created mostly from eroding rock. We look for the Moss campion (*Silene acaulis*), our favored goal, in the crevices and cracks of Gunn Peak's final 200 feet of rock. Some botanists believe moss campion was continuously widespread until it was forced into refuges above the mountain glacial ice. If not the Moss campion, then a Purple mountain saxifrage (*Saxifraga oppositifolia*) with its flowers and matted branches trailing over the high cliffs and rocks. Two penstemon species are also crevice plants, (*Penstemon rupicola and p. davidsonii*). Persevering here, also, it is possible to find species such as asters and fleabane. Arctic willows may become an unexpected surprise when their flowers appear in dense mats into the upper reaches of the Alpine zone of Gunn, Merchant, Baring, and Townsend.

The Wild Sky Wilderness provides a diversified mosaic and cornucopia of plant life. The discoveries and words related here in no way attempt to be definitive. Elroy Burnett, Bob Hubbard, Mildred Arnot, and Micki McNaughten have done wonderful botanical and extensive studies of the area. They would be the first to tell you the story is not over, not even theirs. There are many discoveries to be made. This stands to reason, for this is an area that qualifies under Arthur Kruckeberg's theory of how land forms (mountain rock types in particular) help shape the plant life of this area. As Kruckeberg would point out, plants persists and evolve in just this type discontinuous array of mountainous landforms we find in the Wild Sky Wilderness.

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