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Virtual visits to widely differing locations in the world this month.

From the United States of America, Robert Barnard treats us to a visit to one of his favourite places in California while Frazer Henderson introduces us to the Isle of Eigg - a small Scottish island where few Scots have visited.

It's shocking how often one's own homeland is the least visited and "abroad" is the destination most often chosen!

Shown below is an example of a fine Scottish view, taken from the SRGC Forum: Arduaine Garden is a National Trust for Scotland garden situated in mid-Argyle on the west coast of Scotland almost between Oban in the north and Lochgilphead in the south. The 20 acre garden is "....dwarfed by the immensity of the landscape, a vast expanse of coastline, sky and sea, with isles of all sizes scattered to the horizon...." Some of these provide the only shelter to the west where the next stop is the coast of Labrador nearly 3,000 miles away. Your Editor must confess she has never visited there. Mea culpa.

From one of the look-outs in the garden can be seen the Sound of Jura shooting away just left of centre with a very hazy view of the island of Jura on the horizon. The mountains to the right-hand horizon are the southern mountains on the island of Mull. Photo David Nicholson.

Cover image: A view of the Rocky Basin by Robert Barnard.

Outside the Cabin Door; 60 Years of Plants in the California Sierras

Robert Barnard, text and photos.

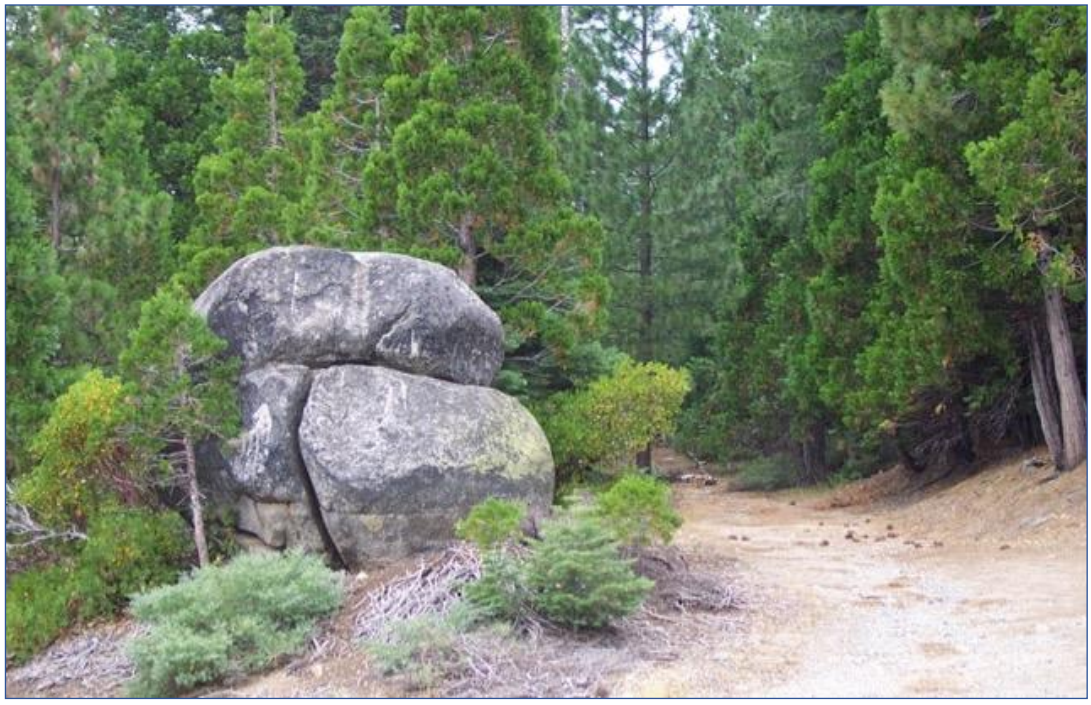
During the early 1960's my father obtained a lot near Gerle Creek in the Northern Sierra Nevada Mountains of California where our family built a cabin. At this time, the building site was located at the edge of "the wilderness", a vast old growth forest of ancient conifers bordered by the Rubicon River on the west and north, and the primitive dirt track of Wentworth Springs Road to the south and east. Here massive Sugar Pines, *Pinus lambertiana*, towered above the forest floor. Incense Cedar, *Calocedrus decurrens*, Jeffrey Pine, *Pinus jeffreyi*, and White Fir, *Abies concolor*, also grew to immense size.

Rocky Basin

Cabin Gerle Creek

It was a long drive to our family cabin: during this time period Highway 50 was predominantly a two-lane road from Sacramento into the Sierra Nevada Mountains. At the Riverton junction with Highway 50, in the canyon of the South Fork of the American River, Ice House Road departed from Highway 50 and twisted its way slowly up the grade to the top of Peavine Ridge, cresting at Windmillers Ravine 1,400 feet (427 metres) above the canyon floor. Here the two-lane paved road continued past Ice House and Union Valley Reservoirs before rising to a summit at Robbs Saddle, then descending the northeast slope of Robbs Peak to the South Fork of the Rubicon River. Upon crossing the South Fork bridge, the pavement ended and a coarse corduroy gravel road continued up to Loon Lake where construction of an extensive hydroelectric project for the city of Sacramento continued. About a mile from the South Fork bridge, stood two enormous boulders 15 feet high one on top of another like a perfect trail marker made for giants. Here Wentworth Springs Road, a narrow dirt track consisting of two tyre tracks, led off through the forest toward Gerle Creek and Wentworth Springs beyond.

Turn off, marked with large boulders.



In those early days, Wentworth Springs Road twisted through the forest for about 3 miles before reaching Gerle Creek. At this point the road branched, straight ahead the road crossed Gerle Creek and entered Airport Flat, so named in 1931 for the remote U.S. Army Air Corps training station located at this site. It was not much of a training station, as it consisted of two small wooden barracks and a few additional outbuildings. The right branch of the road continued on to Wentworth Springs.

Gerle Creek

The original log bridge across Gerle Creek, built in 1927, washed out during the winter of 1951-52. When our family first arrived at Gerle Creek, the first lane of a new concrete bridge, completed in 1963, stood next to the ford in Gerle Creek. At the time we had no idea that the government had big plans for the region and things were going to change very dramatically and very quickly. The “wilderness” forest contained an immense supply of valuable old growth timber which the corporate lumber companies were eager to exploit. As we started construction of our wilderness cabin, the second lane of the concrete bridge was added, a mobile asphalt plant was erected at Airport Flat, and paved roads were constructed and lateral timber access roads were cut throughout the heavily forested ’wilderness”. These changes were very far reaching and would have a very profound long-term impact on the flora of this region.

During these early days of construction of our family cabin, I became acquainted with Rocky Basin indirectly when visiting the old bunkhouse located at Francis Cow Camp at the western edge of Rocky Basin and hiking trips to Francis Lake perched on the northeastern ridge above the Basin. Francis Cow Camp was originally a working livestock operation dating back to the 1870’s. The now defunct remnants of the original Francis Cow Camp site were situated

a mile or so up the original Wentworth Springs Road from the Gerle Creek Bridge at Airport Flat. The Francis Cow Camp bunkhouse was located near the lower end of Rocky Basin about 1/4 mile from the confluence of Rocky Basin Creek with Gerle Creek. During the early 1960's the bunkhouse was still standing and may have been in use occasionally. Much of the kitchen and other rooms were still intact, however vandalism was a frequent occurrence. During the early 1960's the bunkhouse stood in a semi meadow-like site with mid-sized widely spaced Incense Cedar growing among the meadow grasses and native wildflowers. Dense stands of Lodgepole Pine, *Pinus contorta* subsp. *murrayana*, grew behind the bunkhouse and blocked the view of the extensive pasture/meadowland and natural ponds beyond the bunkhouse. These meadows were actively used for livestock grazing for 80 or more years. The livestock grazing strongly influenced and altered the ecology of the meadow habitats and the Rocky Basin in general.

Although not in the Basin proper, Francis Lake is an integral part of the Basin's ecosystems. Francis Lake is located in a bowl perched halfway up the northeastern ridge at the upper corner of Rocky Basin. This small lake forms the headwaters of Rocky Basin Creek, which flows down the ridge to the meadowlands below, terminating at Gerle Creek.

Much of the upper portion of this ridge consists of a roof pendant of metamorphic rock, which significantly influences the type of flora found in the upper rim of the northeast basin.

Francis Lake, early Spring.

During the 1990's the owners of Francis Cow Camp had all the valuable timber on the property logged and the now highly degraded property was eventually sold to the U.S. Forest Service in 2011. Before the U.S. Forest Service acquired the property, the logging roads cut into the property were open routes for off-road vehicles (ORV), which facilitated an accelerated degradation of the meadowland habitats. By 2017 the Forest Service had finally blocked access to the sensitive parts of the property by ripping the access roads with a deep chisel on a Caterpillar tractor. In addition, relatively small Lodgepole Pine were cut and the logs placed every 20 feet across the access roads to further discourage unwanted ORV activity. Unfortunately, by the time the ORV traffic terminated, a number of very sensitive sites were completely denuded of vegetation.

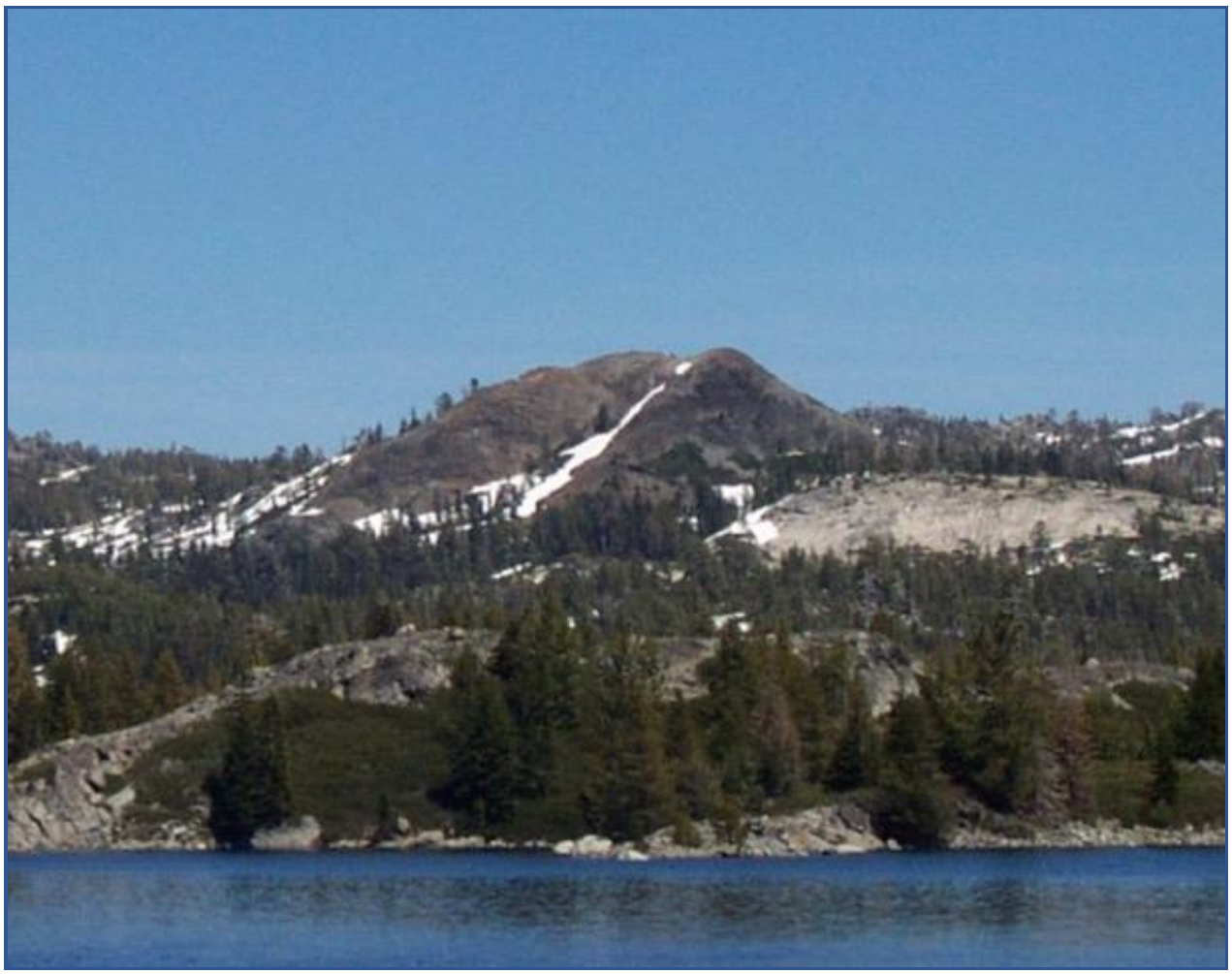
Once the Francis Cow Camp property became public, an extensive botanical survey and the recording of site-specific climatic data became possible. The meadowlands of the Basin, situated at an average elevation of 5,500 feet (1,676 metres), are located at the confluence of two distinctive Sierra Nevada Life Zones.

Here the Upper Transition Life Zone merges with the Canadian Life Zone creating a situation where plants of both Life Zones can be found mingling and mixing with each other in ways rarely seen in the Sierra Nevada Mountains. In addition, the basin is located near a low point in the Sierra Nevada range. Here the movement of pollen, seed and the migration of plant species are enhanced by this low east-west gap in the Sierra Nevada range. Not surprisingly, an incredible diversity of plant species can be found in this relatively small area.

The continental influences on Rocky Basin are strongly tempered by the relatively warm moist air masses moving west to east across the area from the Pacific Ocean. The average annual temperature in the basin is 45.69 F (7.61 C). During the winter months, December to the end of March, the average temperature is 32.48 F (0.27 C). Being a cold air basin, extreme wintertime low temperatures can drop to -2 F (-19 C) or lower. Most precipitation falls in the form of snow from November through April and totals 59.79 inches (1,518.67 mm) annually. Winter snow cover is generally reliable, averaging 170 snow cover days per season. During extremely cold snowy seasons, up to 217 snow cover days have been recorded with snow cover persisting well into the spring months. Climatic changes have caused a dramatic decrease in the number of snow cover days over the past 20 years. Winter seasons with as little as 121 snow cover days are not unusual now. Inconsistent snow cover is having a marked impact on the flora in Rocky Basin. Summers are hot and dry. The average summertime temperature, June to the end of September, is 59.70 F (15.39 C).

Extreme daytime high temperatures during the summer months can reach 95 F (35 C). There is a pronounced thunderstorm season during May and June, however thunderstorm activity is possible during all the summer months. Precipitation from summertime thunderstorms can be heavy but is generally brief. Precipitation totals from these thunderstorms are generally light.

The geologic history of the region has strongly shaped the ecosystems and the associated flora within Rocky Basin. 50 million years ago during the late Jurassic, the building of the extensive Sierra Nevada Batholith began. Regionally, plutons (fluid rock that cooled underground) pushed toward the surface where erosion eventually exposed the cooled and solidified granodiorite rock (intrusive igneous rock), which now dominates the Basin's landscape. Squeezed between the granodiorite plutons in the northeastern corner of the basin are roof pendants of metamorphic rock, created from subducted sedimentary and volcanic rock from ancient Sierran Seas of 542 to 65 million years ago. This metamorphic rock supports unique flora not seen in other parts of the basin. Starting 30 million years ago, extensive volcanic activity began in the California region. Brown Mountain, an exposed and eroded basalt plug is a prominent local landmark.



Brown Mountain

Remnants of Mehrten Formation andesite, although not found within Rocky Basin, are quite common and scattered throughout the region. These geologic features are part of the volcanic activity that started 5 million years ago during the early and mid-Pliocene. The glacial events that started 1 million years ago brought successive periods of glacial advances and retreats, which scoured the basin with glacial ice. As the last period of glaciation ended about 17,000 years ago, the retreating glaciers left exposed sheets of polished rock, and glacial erratics of granodiorite and metamorphic rock scattered throughout the basin. In addition, in pockets scoured out by the glaciers, numerous natural ponds and small lakes formed as the glaciers retreated. All these events profoundly shaped and influenced the flora found in the basin today.

Today when approaching Rocky Basin from the southwest, one encounters the light-dark, “salt and pepper” landscape typical of the high country of the Sierra Nevada Mountains. It is a light-dark tapestry of light coloured barren granite rock intermixed with scattered stands of conifers or high elevation chaparral. The top of the southwest ridge is a thermal belt where scattered stands of California Black Oak, *Quercus kelloggii*, are mixed with Incense Cedar, and Lodgepole Pine. This landscape is very dry during the summer with thickets of high elevation chaparral scattered throughout the barren outcroppings of granodiorite. At this altitude the high elevation species dominate the chaparral landscape. Huckleberry Oak, *Quercus vacciniifolia*, Mountain Whitethorn, *Ceanothus cordulatus*, and Greenleaf Manzanita, *Arctostaphylos patula* are the type species of this chaparral plant community. Less common is Arching Ceanothus, *Ceanothus arcuatus,* a low growing evergreen species, which is often seen sporadically in these chaparral habitats.

Ceanothus arcuatus

Immediately to the north a boulder strewn granite ridge rises sharply above the surrounding countryside. The lower portion of this ridge is

briefly forested with California Black Oak, Lodgepole Pine, and White Fir. A thick undergrowth of Creambush, *Holodiscus discolor* var. *discolor* and other chaparral species, carpet much of the steep bouldered slope. On the steepest portions of this ridge, immense colonies of *Heuchera rubescens* are found wedged between rocks and larger boulders.

Heuchera rubescens

This is near the low elevation limit for this species. It is also very unusual to find this species growing abundantly in such large colonies. On small rocky benches carved out of the steep slope, the mat-forming Bear Buckwheat, *Eriogonum ursinum* var. *ursinum*, can be found growing. This species has pale creamy yellow flowers and striking pale grey-green highly tomentose foliage.

In the early spring, the white goblet-shaped flowers of *Calochortus leichtlinii* with their dramatic dark nectary blotch dot these benches among the Bear Buckwheat. Much later during mid-summer, Lemmon's Keckiella, *Keckiella lemmonii*, a small shrubby close relative of Penstemon, shows its brown-yellow flowers.

Calochortus leichtlinii

In the spring at the base of this ridge, where there is exposed bare mineral soil, a whole range of annual and perennial species can be found. Here superb specimens of the annual *Diplacus torreyi* are frequently seen. At this location, specimens of this species are generally larger growing and more floriferous than other examples of this species found throughout the basin.

Diplacus torreyi

During the early spring, the whitish-green inflorescences of the perennial *Juncus chlorocephalus* are seen rising above the bright green quill-like foliage. Immediately after snow melt, the locations of this species are easy to spot by the radial patterns left by the previous season's dried foliage flattened against the barren soil. By mid-summer multitudes of California Willowherb, *Epilobium foliosum*, fill this site carrying a myriad of small white flowers. Bulbous species, too, occupy these semi-bare mineral earth sites. Umbels of the yellow flowered *Triteleia ixioides* var. *scabra* are scattered throughout this area. By mid-summer all traces of this species have vanished with only the dormant bulbs safely resting below the soil's surface.

Directly to the north overlooking the basin, an exposed granite outcropping provides habitat for many xeric plant species. In the early spring, One-Sided Bluegrass, *Poa secunda* subsp. *secunda* is the first Poaceae species to commence blooming.

Poa secunda subsp. *secunda*

At this time *Phlox diffusa* (above) which fills many of the rock crevices, produces dense masses of brightly coloured pink flowers.

Sharing the crevice spaces, the succulent grey-green rosettes of Sierra Stonecrop, *Sedum obtusatum*, produce pink-cream flower clusters held above the tightly arranged rosettes of succulent foliage. Here small rock ferns emerge from the crevices. Lace Lip Fern, *Myriopteris*

gracillima (formerly known as *Cheilanthes gracillima*), produces small, stiff, bright green fronds that contrast intensely against the pale granite rock. By mid-summer the green fronds shrivel and turn brown as dry conditions, high temperatures, and intense solar radiation affect the site. The fronds of Bridge's Cliff-Brake, *Pellaea brigesii*, are grey-green and are much more durable to the extremes of summer. As the season progresses, the bright orange-red flowers of Frosted Paintbrush, *Castilleja pruinosa*, appear. The frosted pubescent grey foliage of this perennial species contrasts dramatically against the brilliantly coloured flowers.

Castilleja pruinosa

By mid-summer, California Needle Grass, *Stipa occidentalis* var. *californica* becomes the dominant Poaceae species in bloom. *Eriogonum wrightii* subsp. *subscaposum* is a late blooming species, which produces myriads of very small white flowers held above the intensely silvery-grey dense set foliage.

The steep north-facing slope that descends to the meadowlands below is forested with widely spaced stands of White Fir. Here Sierra Gooseberry, *Ribes roezlii* var. *roezlii,* and Bitter Cherry, *Prunus emarginata*, form a large portion of the scattered understory chaparral plant community. The perennial herb Spreading Dogbane, *Apocynum androsaemifolium,* is most noticeable during the mid to late summer months when their pink flowers and fruits are at

their peak. During the early spring in open sunny locations, the bright yellow daisies of Lambstongue Groundsel, *Senecio intergerrimus* var. *major* can be seen with their often twisted and up-rolled petals. Upright clumps of California Brome*, Bromus sitchensis* var. *carinatus*, can also be found growing in these sunnier sites. The low growing perennial *Kelloggia galioides*, with its tiny pink flowers, enjoys growing in shadier locations and is often seen growing near the white flowering Douglas' Catchfly, *Silene douglasii* var. *douglasii.* Upright in growth habit, Wallflower, *Erysimum capitatum* var. *capitatum*, displays bright yellow to orange-yellow flowers in the early spring. Near the base of the slope, a dense thicket of Lodgepole Pine is filled with an undergrowth of Western Bracken Fern, *Pteridium aquilinum* var. *pubescens.* By mid-summer, the thickets of Bracken Fern stand 4 feet tall (1.2 metres) and create a treacherous obstacle as they hide the many fallen logs and twisted branches from view with their dense ferny canopy.

Meadow

Upon leaving the Lodgepole Pine thicket, the first of many meadows opens into view. Recent historical events since the ending of the Little Ice Age have profoundly altered the flora of these meadow ecosystems. During the Little Ice Age, 1300 to ~ 1850, forest growth was slowed considerably by the cooler temperatures. By the end of the Little Ice Age, during the 1850's when European immigrants first arrived and started to settle in the region, many of the

meadows were open and ringed by very large, widely spaced conifers such as Incense Cedar and Sugar Pine. In other parts of the basin stands of large widely spaced conifers were carpeted beneath with meadow flora and very little shrubby undergrowth. Tree ring analysis of the remaining stumps from the conifers logged off the site during the 1990's indicated that many of these trees were already 150 years old by the 1850's.

Extensive livestock grazing occurred in these meadows starting in the1870's. Although grazing pressures on the meadow ecosystems were often intense, a significant portion of the meadow flora remained intact and the ecosystems as a whole remained relatively stable. Removal of the larger timber during the 1990's and the damage to the soil created by the heavy logging equipment severely altered the meadow ecosystems.

In addition, when logging ended in the basin during the late 1990's the site was left open providing easy access for ORV activities which led to accelerated destruction of the already severely damaged meadow ecosystems. By the time the U.S. Forest Service purchased the property in 2011 and began to protect the basin, many areas were denuded of plant life and dense thickets of young Lodgepole Pine had filled much of the meadow ecosystems. Between 2011 and 2020 the U.S. Forest Service began efforts to restore the damaged ecosystems. In the meadows, the surviving meadow flora filling the sunnier open spaces between the rapidly encroaching Lodgepole Pines was diminishing. However, in 2020 Forest Service crews cut and limbed the young Lodgepole Pines in the meadow and left the debris in place. This disrupted the delicate balance of water flow of the spring snow runoff through the meadow leading to an increase in anaerobic soil conditions and subtle but quite noticeable shifts in the surviving meadow flora toward species tolerant of seasonal waterlogged conditions. In addition, the removal of the large conifers and the young encroaching Lodgepole Pine vastly altered the surface energy budget of the meadow ecosystem creating a very chaotic and unstable ecological situation. Currently the meadow is in a state of flux as the flora of the ecosystem moves toward a new state of equilibrium.

Where Rocky Basin Creek skirts the northwestern corner of the meadow, thickets of Mountain Alder, *Alnus incana* subsp. *tenuifolia,* form a dense screen of vegetation hiding the creek from view. In the spring the large, lush, upright leaves of California Corn Lily, *Veratrum californicum* var. *californicum,* form striking clumps scattered in the light shade of Lodgepole Pine before their aged, tattered, insect eaten leaves collapse into dormancy late in the summer. Out in the open meadow many of the original moist meadow species such as the

blue flowered *Viola adunca* subsp. *adunca* intermingle with the intense yellow flowering *Erythranthe primuloides* that carpet the ground.

Viola aduna subsp. *adunca*

In the early spring spikes of pink and white flowers emerge from the low growing Rough Hedgenettle, *Stachys rigida* var. *rigida* scattered among the other moist meadow species. For an extended period during the spring and summer, the yellowed rayed flowers of *Helenium bigelovii* and the dome-shaped umbels with white flowers of *Perideridia parishii* subsp. *latifolia* brighten the meadow landscape.

In the few locations where small Lodgepole Pine still stand, Leather Grape-fern, *Sceptridium multifidum* (left) with dense leathery fronds can be found in their light shade.

On hummocks of drier ground, the deciduous shrub *Spiraea splendens* is often seen. The flat-topped clusters of brilliant pink flowers of this species are produced abundantly, making a striking sight when this species is in bloom during the spring. Throughout this meadow, California Oatgrass, *Danthonia californica,* is among the taller growing grass species that dominate the meadow ecosystem.

Danthonia californica

Approaching the northeastern flank of the meadow complex, the soils are seasonally flooded and anaerobic. Densely packed clumps of Dense Rush, Scirpus diffusus, and Sword-leaved Rush, Juncus ensifolius, thrive in this anaerobic niche. Enjoying moisture but not tolerant of extremely anaerobic conditions dense colonies of Narrow-leaved Lotus, Hosackia oblongifolia var. oblongifolia, edge the large patches of Dense Rush and Sword-leaved Rush. In the spring the Lotus blooms abundantly with masses of yellow and white pea-shaped flowers.

At the head of the seasonally hydric portion of the meadow, the U.S. Forest Service constructed a relatively new seasonal wetland pond. During the logging operations of the late 1990's, this site was used as a logging deck where cut timber was stacked before being loaded onto logging trucks and transported to the mill.

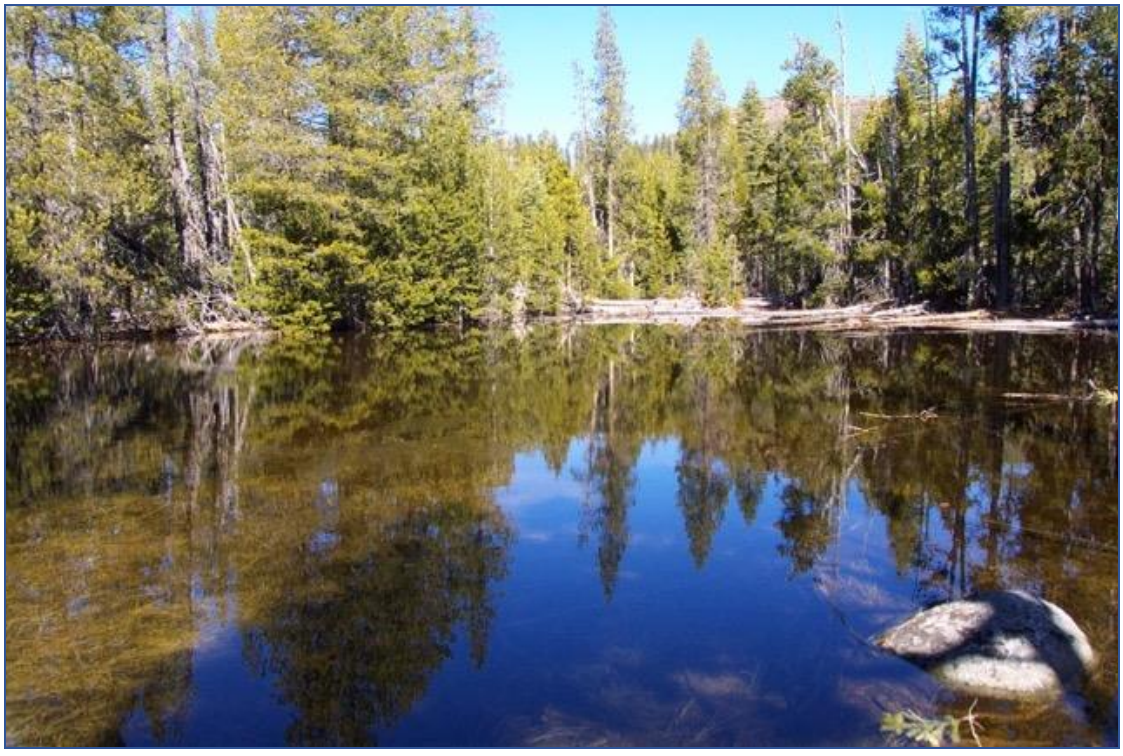
Lower pond

When the logging was completed, the abandoned logging deck became a popular site for ORVs. During the spring when the logging deck site was flooded, the ORVs were drawn to the site where they were driven in circles through the mud and water that accumulated in the shallow depression of the logging deck. This resulted in the creation of a large depression that was completely denuded of vegetation and severely compacted. After 2011 when ownership of the property was transferred to the U.S. Forest Service, the ORVs were excluded from the property and restoration of the damaged ecosystems could begin. The Forest Service quickly made simple modifications to the site and transformed this severely damaged site into a seasonal wetland pond. Revegetation and recovery at the site have been slow but is being allowed to advance at nature's natural pace.

From the northeastern corner of the newly created seasonal pond/wetland, the old logging access road cuts through dense stands of Lodgepole Pine accompanied with an impenetrable undergrowth of Bracken Fern, *Pteridium aquilinum* var. *pubescens.* The old roadbed now serves as an effective trail. Rough Bent Grass, *Agrostis scabra* is colonizing the once bare mineral soil. Pacific Panic Grass, *Panicum acuminatum* var. *fasciculatum*, White-flowering Hawkweed, *Hieracium albiflorum*, and Creeping St. John's Wort, *Hypericum*

anagalloides, are some of the perennial species now filling the open habitat niches along the trail. A few annual species, such as the colourful magenta flowered *Diplacus torreyi*, bloom abundantly during the spring.

Hypericum anagalloides



Pond

After a short distance an almost perfectly round natural pond, a relic from the last Ice Age, appears to the north through the Lodgepole Pine forest. During the spring and early summer when the pond is filled with snowmelt water, Inflated Sedge, *Carex vesicaria*, rings the perimeter of the pond with its coarse grass-like foliage emerging from the standing water. Near the centre of the pond, a small stand of Western Rush, *Juncus occidentalis*, conspicuously pokes above the water's surface. As summer progresses, the water in the pond eventually evaporates and drains away. At this time the once flooded bed of the pond rapidly springs into growth with a dense carpet of the perennial *Potentilla flabellifolia*. This species produces myriads of small yellow flowers through much of the summer season.

Potentilla flabellifolia

A short distance to the northeast beyond the natural pond, granite terraces gently slope upward to the southeast toward the lower rim of the basin. Here the open granite expanses are littered with glacial erratics. Where there is soil, it is often shallow and frequently topped with a coarse granite grus. Seams in the granite support isolated stands of Incense Cedar, Jeffrey Pine, the occasional Sierra Juniper, *Juniperus grandis*, and a few chaparral species such as Huckleberry Oak, *Quercus vacciniifolia,* and Arching Ceanothus, *Ceanothus arcuatus*.

The open granite expanses are a harsh environment. During the summer, solar radiation is intense, the skin temperature of the soil can be extremely high and the soil is exceedingly dry. Only the most adaptable plant species endure in this environment. The annual, Slender Bird's Beak, *Cordylanthus tenuis* subsp. tenuis, with its almost thread-like grey-green linear foliage, is well adapted to this environment and grows abundantly. Woolly Violet, *Viola tomentosa*, with its small bright yellow 'pansies' and densely tomentose grey-green foliage, enjoys the quick drainage of the coarse rocky soil. This species prefers growing in the light shade of the few coniferous trees that dot this landscape and becomes dormant during the hottest and driest parts of the summer.

Viola tomentosa

Two onion species also thrive in this environment. Red Sierra Onion, *Allium obtusum* var. *obtusum*, blooms in the early spring with umbels of white flowers that are held very tightly near the soil surface. Dusky Onion, *Allium campanulatum,* is found abundantly throughout the Sierra Nevada Mountains and holds its umbels of generally pale pink flowers a bit higher above the soil than Red Sierra Onion. Although never seen abundantly in this habitat, many other perennial species find a niche in this harsh environment. Frosted Buckwheat, *Eriogonum incanum,* with its bright yellow flowers and small grey tomentose leaves and the

dwarf Naked Buckwheat, *Eriogonum nudum* var*. deductum*, with its upright flowering spikes of white flowers, are seen among the rocks and granite grus. A member of the Apiaceae Family, *Cymopteris terebinthinus* var. *californica,* with lacey green foliage and umbels of small yellow flowers, is seen blooming in the early spring as upright inflorescences of Sandberg's Bluegrass, *Poa secunda* subsp*. secunda* begin to open. Hardly noticeable against the granite grus and rocks is Jewelweed, *Streptanthus tortuosus*, a small growing species with purplish, blue-green foliage and inconspicuous urn-shaped flowers.

To the north, after crossing the rocky, dry expanse, a dense thicket of tall coniferous trees rises along the banks of Rocky Basin Creek. Here a mixture of Incense Cedar, and White Fir, form a welcoming shade from the intense summertime sun and heat of the rocky terraces left behind. Approaching the creek, thick stands of Bracken Fern, *Pteridium aquilium* var. *pubescens*, impede one's progress. Along this section of the creek, the banks are incised, and large pools of water linger in the shade, well after the high water flow from snow melt runoff end during the summer and autumn months. Along the shaded moist rocky banks of the lingering pools, Marsh Speedwell, *Veronica scutellata*, with its small blue flowers, and yellow flowering Straight-beaked Buttercup, *Ranunculus orthorhychus* var. *orthorhychus*, can be seen blooming among the thickets of Creek Alder, *Alnus incana* subsp*. tenuifolia* and the fern-like foliage of Common Horsetail, *Equisetum arvense*. Dispersed along the creek bed,

stands of Bigelow's Sneezeweed, *Helenium bigelovii,* and Arrow-leaf Groundsel, *Senecio triangularis*, bloom with their yellow-rayed flowers throughout the spring and summer. Probing deeply to find lingering moisture, the yellow flowered Musk Monkeyflower, *Erythranthe moschata* (above) forms small compact colonies on the upper sides of the incised creek channel.

Emerging from the north side creek bed, the creek side forest floor is more open. The shrubby Purple Flower Honeysuckle, *Lonicera conjugialis*, and *Spiraea splendens* are seen intermittently in this transition zone between the creek side riparian habitat and the large meadow complex to the north. Trail Plant, *Adenocaulon bicolor*, fills much of the open forest floor; their deep green arrow-shaped leaves contrasts prominently against the dark forest duff. Here too White Flowered Hawkweed, *Hieracium albiflorum*, finds a niche among the colonies of Trail Plant. In this shaded forest, *Maianthemum racemosum* quietly blooms with its panicles of white flowers, followed by bright red fruits in the autumn. Before emerging to the north side meadow complex, dense stands of Thimbleberry, *Rubus parviflorus*, with their bold lobbed foliage are seen with colonies of Fendler's Meadow Rue, *Thalictrum fendleri* var. *fendleri.*

Thalictrum fendleri var. *fendleri*

The north side meadow complex consists of a long narrow chain of meadows that occupy a large portion of the north central basin. Before the large timber was removed from the basin during the late 1990's, widely spaced mature Incense Cedar and White Fir bordered this open meadow complex to the south along Rocky Basin Creek. Forested rocky slopes rose to the north. Once the large timber was removed, much of the disturbed and highly altered meadow ecosystem became choked with young, dense stands of Lodgepole Pine. There are

still open remnants of the meadow complex; however, without intervention the original meadow complex will soon become a forest of these pines.

A significant variable governing the flora of the northern meadow complex is soil moisture. In some locations the water table can be quite close to the surface. Here the presence of Bluejoint Reed Grass, *Calomagrostis canadensis* var. *canadensis*, and Narrow-petal Trillium, *Trillium angustipetalum*, two indicator species, signal that an abundant perennial supply of water is near the surface of the ground. *Trillium angustipetalum* is generally found growing in shaded sites near the bases of invading Lodgepole Pine.

Trillium angustipetalum

Calomagrostis canadensis var. *canadensis* grows both in full sun and partly shaded locations. In these remaining open wetland, meadow sites *Camassia leichtlinii* subsp. *suksdorfii* with its star-like blue flowers can be seen growing with Golden-eyed Grass, *Sisyrinchium elmeri,* and Idaho Blue-eyed Grass, *Sisyrinchium idahoense* var. *occidentale*. The white flowered Macloskey's Violet, *Viola macloskeyi*, carpets the ground between the dense mats of *Carex* and short meadow grasses in the remaining open wetland meadow habitats.

Camassia leichtlinii subsp. *suksdorfii*

A majority of the remaining meadow complex is relatively dry and is now choked with Lodgepole Pine. Where the encroaching pines have not yet densely colonized, Goosefoot Violet, *Viola purpurea* subsp. *purpurea* finds a home in these seasonally dry niches. Very interesting natural hybrids, where Viola purpurea subsp. purpurea has crossed with Viola tomentosa and/or possibly Pine Violet, *Viola pinetorum* subsp. *pinetorum*, can be found in these drier niches. Sadly, the encroachment of the pines is rapidly altering many of the sites where these hybrids are found, and they are now drying off.

On slightly higher ground on the meadow margins, shrubby species such as Bitter Cherry, *Prunus emarginata,* are quite commonly scattered about in clearings and among other shrubs such as *Ceanothus cordulatus*. Along the meadow margins, very early in the spring as the winter snow melts, Western Buttercup, *Ranunculus occidentalis* var. *ultramontanus*, can be found blooming with its small bright yellow buttercup flowers. This species is frequently found in seasonally moist areas near the flowing waters of the spring runoff. As spring progresses, a succession of wildflowers begin to bloom among the scattered clumps of Wild Oat Grass, *Trisetum projectum*, that dominate much of the semi-mesic meadow habitat. Small mats of Gray's Lupine, *Lupinus grayi,* and the smaller Stool Lupine, *Lupinus lepidus* var. *sellulus,* with their two-toned lavender and white flowers, and hairy grey-green palmate leaves are frequently seen.

Lupinus grayi

Lingering later into the early summer, Ragged Daisy, *Eurybia integrifolia,* can be found blooming with its twisted lavender rayed petals. The saucer-shaped lavender pink flowers of Glaucous Checker Mallow, *Sidalcea glaucescens*, also linger late into the season. Three-toothed Horkelia, *Horkelia tridentata* var. *tridentata* with its small white flowers is often unnoticed, yet this species is an integral part of the seasonally dry-mesic meadow flora in this area.

Wyethia mollis

On somewhat higher ground, colonies of Woolly Mules Ears, *Wyethia mollis*, prefer the slightly drier terrain. This species produces large, striking clumps of upright woolly leaves and large heads of bright-yellow rayed flowers. A number of bulbous species also prefer this slightly elevated terrain. Death Camas, *Toxioscordion venenosum* var. *venenosum* is frequently seen. Less common and a species generally associated with lower elevation habitats is Common Soap Root, *Chlorogalum pomeridianum* var. *pomeridianum*.

On higher rocky slopes on the northern margin edge of the dry meadow habitats, *Doellingeria breweri* with its yellow discoid flowers is found blooming throughout the late spring and into the early summer. The rare annual species *Phacelia stebbinsii* is also found in this elevated rocky habitat, sharing space with Doellingeria and early blooming grasses such as *Poa*

secunda subsp. *secunda*. In other locations the lavender flowering annual *Phacelia quickii* can also be found. *Phacelia stebbinsii* and *Phacelia quickii* are very similar in general appearance; however, they are never found growing in conjunction with each other and there are no indications that the two species hybridize with each other.

Doellingeria breweri

Navarretia leptalea subsp. *leptalea*

In open disturbed areas, many annual species form large carpets of showy flowers in the spring and early summer, Bridge's Gilia, *Navarretia leptalea* subsp. *leptalea,* is one of the most common. This species produces a myriad of small magenta flowers for many weeks in the spring and into the summer as moisture in the upper levels of the soil persists. In drier locations low growing sheets of the annual Spanish Lotus, *Acmispon americanus* var. *americanus*, produce small two-toned pink and white pea-shaped flowers.

Populus tremuloides

To the east beyond the meadow complex, in a dense stand of Lodgepole Pine where Rocky Basin Creek flows through a rocky constriction, there is another small pond or pool. Here one of several small groves of Quaking Aspen, *Populus tremuloides*, can be found. There is evidence that Quaking Aspen were much more abundant in the basin during the waning days of the Little Ice Age (mid 1800's). It is likely during this time period that many of the aspen were cleared from the meadow margins to expand the existing grazing land. When livestock grazing in the Basin started to diminish in the 1960's Lodgepole Pine aggressively colonized much of the meadowland in the basin, leaving many vastly altered ecosystems and fewer sites where Quaking Aspen could flourish.

Upstream from the Aspen Pond is a fairly large expanse that was likely another open meadow system sometime in the past. Starting in the 1980's extensive logging on the upper slopes above this site generated a great deal of slash and logging debris. Much of this slash and debris washed down the slopes during the spring runoff events, covering most of this site with a thick layer of wood debris many feet in depth. Today very little plant life can be found at this site. Both Lodgepole Pine incursion and careless logging practices have severely altered some ecosystems in the basin to the point where they have become biodiversity deserts. These trends are of great concern, as the Basin still possesses a great deal of floral biodiversity.

The far upper reaches of the basin become increasingly rocky and rugged. Here the environment is much more pristine, and the undisturbed habitats are very stable. During the early spring, the white cup-shaped flowers of *Heserpchiron pumilus* can be found filling moist rocky crevices. In this region, this species is generally associated with higher elevation Life Zones. On the highest slopes surrounding the basin many eriogonum species can be found. *Eriogonum lobbii*, which is fairly common at much higher elevations in this region, can be found growing in the metamorphic rock formation at the upper limits of the basin. This is yet another example of how species from higher or lower elevation life zones merge in the basin and frequently comingle with one another.

Eriogonum lobbii

Lewisia nevadense

West of the northern meadow complex are several seasonal drainages where high elevation species often mix with lower elevation species in the vernally moist meadow remnants. Along one sandy bar, the large white cup-shaped flowers of Sierra Lewisia, *Lewisia nevadense* can be found blooming with Wild Hyacinth, *Triteleia hyacinthina*. This is yet another example of how species from higher or lower elevation life zones can merge in the basin and frequently comingle with one another. Nearby large colonies of the annual Five-spots, *Nemophila maculata*, (left) can be found carpeting the ground in the springtime.

From this point westward to the dirt and gravel Wentworth Springs Road, there is a remnant of old growth forest with massive Sugar Pine, *Pinus lambertiana*, mixed with mature Jeffrey Pine and Lodgepole Pine. Seasonal watercourses traverse this site, providing ideal habitat for many interesting plant species. During late May, shortly after the winter snow melts, *Viola sheltonii* (right) can be found blooming in the dry shade, sheltered by the tall conifer canopy.

Blooming a few weeks later, the yellow flowering *Viola lobata* subsp. *lobata* also enjoys this vernally moist, summer dry shaded habitat. This forested habitat is fairly open at ground level with relatively few shrubby species. It is easy to spot, shortly after snowmelt, some of the early spring blooming orchids such as Snow Plant, *Sarcodes sanguinea* and Summer Coralroot, *Corallorhiza maculata* var. *maculata* (left).

Once Wentworth Spring Road is reached near the northwest corner of the basin, it is a fairly short hike back to Rocky Basin Creek. Another viola species, *Viola bakeri* with small bright yellow flowers is found growing in the open shade of the tall conifers. This is near the low elevation limit for this Viola species in this region. Emerging from thickets of shrubby Huckleberry Oak, *Quercus vacciniifolia,* a few isolated plants of the clove-scented, white flowering *Lilium washingtonianum* subsp. *washingtonianum* can be seen blooming in early July.

Lilium washingtonianum subsp. *washingtonianum*

Deer enjoy browsing on the native lilies, thus the best specimens of *Lilium washingtonianum* are often found growing in thickets of shrubby species such as Huckleberry Oak protecting them from the deer. Before commercial logging began in the area during the mid-1980's, tens of thousands of Washington Lilies could be found blooming on the south facing forested slopes above the basin. Unfortunately, conditions have changed radically, and such sights are not seen today.

At the southern border of the basin, the Wentworth Springs Road crosses Rocky Basin Creek on a concrete bridge completed in 1937. This was part of the new road alignment to eliminate the need to ford Gerle Creek at Airport flat and again at Rocky Basin Creek to gain access to the Franicis Cow Camp property. With the new alignment, Wentworth Springs Road remains on the southeastern bank of Gerle Creek. From this concrete bridge to Gerle Creek, Rocky Basin Creek is a deep slow-moving creek lined with Willows, *Salix* species and Mountain Alder, *Alnus incana* subsp. *tenuifolia*. In places dense, stands of Common Horsetail can be seen. Moisture loving perennial species such as *Senecio triangularis* line the moist soils along the bank of the creek. Thickets of Red Osier Dogwood, *Cornus sericea* subsp. *sericea*, form an impenetrable undergrowth along sections of the creek.

Much of the former Francis Cow Camp site from the concrete bridge to the confluence with Gerle Creek has never been protected from ORV traffic or unregulated camping. The habitats in this portion of the basin are highly degraded. Battered Lodgepole Pine, scrub, and invasive species dominate this area where the plant life has not been reduced to bare earth or gravel.

Lilium parvum

On the opposite side of Wentworth Springs Road, near the site where the Francis Cow Camp bunkhouse once stood, is an access trail to the meadow complexes to the east of Wentworth Springs Road. Here dense stands of *Pinus contorta* subsp. *murrayana,* have also invaded the once open forest/meadow habitat that once surrounded Francis Cow Camp. Much of this forested area is seasonally hydric and ideal habitat for the yellow flowering Stream Violet, *Viola glabella*. Where there are openings in the tree canopy, Sierra Tiger Lily, *Lilium parvum,* can be found blooming with its outfacing bell-shaped orange flowers in late June through July. The Tiger Lilies often share space with Gray's Lovage, *Ligusticum grayi* which is appreciated for its lacey pinnately compound foliage and umbels of small white flowers. In areas where there is more sun and soil conditions are drier during the summer months, the tiny white flowering *Calochortus minimus* grows abundantly. There are a few dry, sunny openings along this section of the trail. From mid-summer into autumn, the strong mint-like scent of the annual Mountain Bluecurls, *Trichostema oblongum,* can be detected well before the plants are seen.

Calochortus minimus

Returning to the concrete bridge, Wentworth Springs Road climbs the southwestern ridge back to where this outing began. Here in this dry habitat *Arctostaphylos nevadensis* spills down the rocky slope frequently accompanied with the thorny evergreen *Ceanothus cordulatus.* Nearing the starting point of this outing near the top of the ridge, colonies of Smooth Beak Sedge, *Carex integra*, can be found colonizing seasonally moist sites on the open forest floor.

Gerle Creek Cabin

At the crest of the ridge, we have returned to the point where we began this botanical outing. It is a short hike back down Wentworth Springs Road to our Gerle Creek cabin. Here we can rest after a long day botanizing. The panorama from the front deck overlooking the surrounding forest is a pleasant and peaceful setting in which to review the day and discuss the plants we have seen. Our mountain ecosystems are in a constant state of flux from season to season, year to year. Each outing is unique. Plants come, go, and evolve; there is always something new to see that may have been missed on previous outings. These mountain ecosystems are part of our heritage and need to be preserved and protected for all future generations.

Thank you for allowing me to share my beloved Sierra Nevada Mountains with you.

An Sgùrr: A short photographic-essay by Frazer Henderson.

An Sgùrr, a sphinx-shaped pitchstone inselberg, is the most prominent geological feature on the isle of Eigg. This image is taken looking westwards to the monolith.

Eigg lies to the west of the Scottish mainland some six miles from Arisaig. It is a constituent of the Small Isles which also comprise Rum, Muck and Canna. There is a frequent ferry service from Mallaig and the island has accommodation (camping, bed & breakfast etc) and services for visitors. It is only about five miles long, north to south, and three miles wide so all parts are easily accessible by foot.

On the shoulders of the 393 metre high monolith is an array of plants, some rare, some less so, some interesting and some, quite frankly, worthy of being over-looked.

Bryophytes are prominent, as one might expect on the west of Scotland with its damp oceanic climate, indeed a thorough survey was conducted by the British Bryological Society in 2015, see here.
As I have no great knowledge of mosses and liverworts I decided to restrict myself to identifying the superficially similar but unrelated – as they are pteridophytes - clubmoss and spikemoss species.

Diphasiastrum alpinum (Alpine clubmoss)

Selaginella selaginoides (Lesser clubmoss) which despite its common name is in fact Britain's only spikemoss.

Huperzia selago (Fir clubmoss)

A few specimens of *Hymenophyllum wilsonii* (Wilson's Filmy Fern) can be seen in a damp underhang on the eastern side of the rock which makes photography very difficult hence the poor quality of the picture. It was only the veined leaves which ensured that I didn't overlook them as being yet another moss species.

Hymenophyllum wilsonii: The fern is in the centre of the photograph.

Other fern species were present with perhaps the common *Cystopteris fragilis* (Brittle bladder-fern) being the most interesting if not the most attractive.

Rhodiola rosea is not considered to be a true saxatile but here it is growing within a moss bed, no doubt its roots well-anchored, for it is in a precarious situation in an underhang. Its relative *Sedum anglicum* was also present in small numbers in rock fissures.

Chrysoplenium oppositifolium, the opposite-leaved golden saxifrage, is a fairly common European plant of shade and damp. Here it has seeded within moss in a damp flush in a shaded underhang. Indeed, the underhangs protected by the intense rays of the sun appeared to hold quite a selection of plants.

An Sgùrr looking east has a different profile with a more gradual incline obscuring its monolithic mass.

The yellow, starry flowers of bog asphodel added some brightness to a flora which was predominantly green. The specific epithet in its scientific name, *Narthecium ossifragum*, actually translates as ‘Bone-breaker’. The name arises because folk used to believe that the plant caused brittle bones in livestock whereas it is, in fact, an indicator of calcium-poor pasture.

Salix herbacea, the least willow, is, as its common name implies, a very small willow. It is adapted to survive in arctic and subarctic environments but can be found at low altitudes near the coast. It is probably one of the smallest woody plants. The plant is dioecious and the specimen shown with its red catkins is female (male plants have yellow catkins).

The common juniper, *Juniper communis*, is also found on the shoulders of An Sgùrr. Again, another prostrate tree in view of the climate. Here it is with *Erica cinerea*, Bell heather.

Heather is a significant food plant of the caterpillar of the small emperor moth, *Saturnia pavonia*, which, with its lime green and pink colouration, is reminiscent of something from the Pop Art era.

The magpie moth, *Abraxas grossulariata*, despite being common, was another attractive find on the day.

Looking north from An Sgùrr to Loch nam Bàn Mòra and the distant Cuillins of Skye. The loch holds significant numbers of the attractive Water lobelia, *Lobelia dortmanna,* and just beyond the loch near the beach is a rock face with the saxifrage Grass of Parnassus, *Parnassus palustris*.

(Loch nam Bàn Mòra translates as 'the loch of the powerful [or big!] women'.)

And finally, no review of a Scottish island would be complete without a posed picture of a local resident.

[Frazer Henderson is a geographer and amateur botanist with a particular interest in the flora of the Tien Shan but is not averse to exploring other areas of potential interest.]