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Covers:  Front: APS photo contest entry. First place photograph in the “Penstemons in a Garden Setting” category. This picture of a chance penstemon hybrid was taken by David Nelson 2010 in his backyard in Richland, Washington. An article describing the hybrid, authored by David Nelson, is included in this issue of the Bulletin (page 18).

Back: APS photo contest entry. Second place photograph in the “Penstemons in a Garden Setting” category. This picture of *Penstemon speciosus* was taken May 18, 2008 by John Weiser. The plant was located in his garden in Sparks, Nevada.
**Penstemon Spotlight**

*Penstemon montanus*

**Name History:**

The species name, *montanus*, was coined by Edward Lee Greene, a renowned botanist at the University of California, Berkeley in the late 20th century. The name means “mountain penstemon”, a reference to its high elevation habitat. Another common name is “cordroot penstemon”, reference to its long, thick, supple taproot that allows the plant to flex and twist without injury as its preferred talus substrate seasonally sloughs and slides.

**Taxonomy:**

Subgenus: *Dasanthera*

Two subspecies exist:

- *montanus*
- *idahoensis*

**Identifying Characteristics:**

Numerous stems arise from a branched caudex that is often buried in talus. The stems are upright to prostrate, 5 to 8 cm (2 to 8 in) long and glandular-pubescent. Both sterile and flowering stems are produced on the same plant.

Leaves are completely cauline and reduced at the base. They are sessile, serrate (entire in ssp. *idahoensis*), obovate to ovate in shape, and 1.5 to 3.5 cm (0.6 to 1.4 in) long and about half to one-third as wide. The leaves are dark green to grayish-green, slightly glaucous and glandular-pubescent (less so in ssp. *idahoensis*).

Inflorescences are racemose, somewhat crowded, and produce two flowers per node. Corollas are relatively large, 2.6 to 3.3 cm (1 to
1¼ in) long, keeled on top, and bearded on the 2-ridged palate. Color ranges from lavender, through light purple, to light blue.

The staminode is small and slender, included, and glabrous or short, white-bearded. The fertile anthers are densely white-wooly, dehisce full length, and become opposite and explanate. The anther cells are small, 1.1 to 1.6 mm long.

**General Description:**

*Penstemon montanus* is a diminutive mountain plant that tends to develop a loose mounding form. Unlike most species in the *Dasanthera* subgenus, the plants are entirely herbaceous and die back to the ground in winter. The plants produce no basal leaf mat. Stems tend to be upright, spreading, or prostrate (especially during bloom, due to the weight of the flowers), small in diameter, non-woody, and flexible.

The leaves are toothy or smooth, depending on the subspecies. They are peculiar in appearance, being small, dark green to gray-green, somewhat fleshy, slightly glaucus, and appearing crystalline due to shiny glandular hairs. Often the bottom sides and margins of the leaves are reddish in color.

Flower color is variable. Subspecies *montanus* tends to produce flowers with pink, lavender, or pale purple flower, while *idahoensis* produces light purple to light blue flowers. The corollas are large and have the keeled, ribbed form typical of *Dasanthera* species (See plant picture in Plate 1).

**Period of Bloom:**

At high elevations, *Penstemon montanus* blooms in July and August. Flowers develop much earlier, late May or early June, at lower elevations. Bloom period is typically 4 to 5 weeks. In the garden, plants may rebloom later in the summer.
Origin:

*Penstemon montanus* is found at high elevations in the Northern Rocky Mountain region, including the states of Idaho, Montana, Utah, and Wyoming (See map). Subspecies *montanus* is found throughout the range of the species. Subspecies *idahoensis* is restricted to western reaches of the mountains of south-central Idaho, north of the Snake River plain.

Habitat:

*Penstemon montanus* is an alpine plant, usually growing in talus or rocky slopes near or above tree line. Some populations are found at lower elevations, usually on steep north-facing slopes. This species is often found growing in unstable substrate where competing plants have difficulty establishing a foothold. Documented habitat elevation is 1,500 to 3,300 m (5,000 to 11,000 ft) with most populations found at the upper end of this range (See habitat picture in Plate 2).

Where to See It:

One of the most accessible populations of *Penstemon montanus* ssp. *montanus* is found on the north face of Sunset Cone at Craters of the Moon National Monument in Idaho (near the group campground opposite US Hwy 93 from the visitor’s center). In Montana, a drivable population exists on the Beartooth Highway (US Hwy 212), approximately 4 miles east of Cooke City Montana near the Montana/Wyoming border. Near Provo, Utah, you can find this subspecies above 2,700 m (9,000 ft) along the Primrose Cirque hiking trail on Timpanogos Peak. During the post-conference tour of the 2007 meeting in Idaho, APS members
discovered a large population of subspecies *montanus* on a rocky slope along Trail Creek Road about 10 miles north of Sun Valley. *Penstemon montanus* ssp. *idahoensis* tends to be much more difficult to access due to its concentration in remote areas of Idaho’s mountainous backcountry. According to records in the Consortium of Pacific Northwest Herbaria database, it is possible to drive (gravel roads) fairly close to two sites where this subspecies is located. The first is hillsides around and above Big Roaring River and Trinity Lakes. You can access this area by driving north from Mountain Home, Idaho to Anderson Ranch Reservoir, through Prairie and to Big Roaring River Lake campground (30 mi. NE on Hwy 20; 29 mi. NE on FH 61, 15 mi. NW on Forest Rd. 172; 3 mi. S on Forest Rd. 129). GPS coordinates for one documented discovery site in that area is 43.525 N, 115.451 W. A second accessible population is referenced to Lick Creek Summit. Get there by driving out of McCall, Idaho to the northeast on Lick Creek Road for a distance of approximately 12 miles (GPS coordinates: 45.042 N, 115.933 W).

**Culture:**

Cultivation of *Penstemon montanus* is considered to be moderately difficult. However, the beauty of this species is its own reward for success. Lindgren and Wilde reported that optimal conditions for mountain penstemon include planting into a gritty or gravelly substrate on a north slope or in a crevice garden. Supposedly, ssp. *montanus* is easier to maintain in cultivation than is *idahoensis*.

In 2007, the author planted individuals of ssp. *montanus* collected from two locations (Lemhi and Pioneer Mountains, Idaho) in evaluation plots at Aberdeen, Idaho. Under conditions of heavy, alkaline soil and limited irrigation, the plants have grown well for four years, flowered heavily, and experienced no decline or death.
Protection Status:

*Penstemon montanus* is not considered rare or endangered within any portion of its native range.

Sources:


Penstemon Spotlight is authored by:
Dr. Stephen Love, University of Idaho
Report on the 2010 APS Annual Meeting, Northwest Colorado

Mike Kintgen, Littleton, Colorado

Early June is typically an ideal time to observe the special Penstemons of Northwest Colorado (Moffat County). One of the coldest and latest springs in the last two decades caused much concern for the planning team for this past year’s annual meeting. Luckily by the end of the meeting every species that had been in bloom previous years had been spotted and photographed by at least a few Penstemaniacs.

Northwest Colorado was picked due to a rather unique set of species centered in NW Colorado, NE Utah and SW Wyoming. *Penstemon acaulis*, *Penstemon angustifolius* ssp. *vernalensis*, *Penstemon gibbensii* (not in flower in June) *Penstemon pachyphyllus* v. *mucronatus* (*P. mucronatus*), *Penstemon scariosus* subsp. *cyanomontanus* and *Penstemon yampaënsis* are all centered or endemic to the area mentioned above. *Penstemon fremontii* and *Penstemon humilus* have wider ranges although *P. fremontii* is not nearly as widespread as *P. humilus*.

Moffat County is point of confluence for many of the floral regions of the western US: the Great Basin, Colorado Plateau, Rocky Mountains and Great Plains floras mix and mingle to form an interesting assembly of plants. Elevations range from 5,000 - 9,500 feet giving visitors the opportunity to observe desert scrub, grassland, montane shrubland, montane forest and riparian plant communities. Substrates include sandstones, limestones, igneous basalts, hardened volcanic ash, and river cobble, further adding to the range of habitats for plants.

*Penstemon yampaënsis* was probably the highlight for many participants, but *P. scariosus* subsp. *cyanomontanus* was also a highlight as the Colorado Natural Heritage Program had not had visual conformation of this taxa for twenty years. This was a great example of how the American Penstemon Society can help agencies monitor rare or endangered plants.
The meeting officially kicked off Friday night with dinner and two presentations. Erin Robertson from the Center for Native Ecosystems gave a talk on the ongoing struggle to list the rather rare and threatened *Penstemon grahamii* on the Endangered Species List. *P. grahamii* is native a little bit to the south and west of our meeting area. Mike Kintgen also gave a short preview of the Penstemon species we would see during two days of field surveys and explained the routes of offered field trips (See Plate 3).

A wide range of field trips was offered in an attempt to give people the best opportunity to observe the flora of Moffat County. Longer field trips were offered on Saturday going almost as far as the Utah border and briefly entering Wyoming. Two self guided trips were offered near Craig for those that didn’t want to go out Brown’s Park and central Moffat county.

The first field trip was along Moffat County Road 10, allowing participants the opportunity to go as far as they wanted. Some of the Penstemon highlights along this route were *Penstemon fremontii*, *Penstemon pachyphyllus v. mucronatus*, *Penstemon scarisous var. cyanomontanus*, and the best populations of *P. yampaënsis* (See Plate 4). *Castilleja chromosa*, *Townsendia incana*, *Purshia tridentata*, *Sedum lanceolatum* and numerous other wildflower species rounded out the field trip.

Two trips were offered to Lookout Mountain in the central part of Moffat County. The short trip left directly from Craig and crossed the never-ending sagebrush steppe in which leader Mike Bone from the Denver Botanic Gardens found many treasures to share with participants. Highlights included *Penstemon caespitosus*, and *Fritillaria atropurpurea*. The longer trip went through Brown’s Park, Irish canyon, and the Vermillion Basin via State Hwy 318 and County Roads 10N, 67 and 4. The longer trip provided opportunities to observe rock art, and an all white population of *Lewisia rediviva* before ending up on top of Lookout Mountain. I think I can safely say that Lookout Mountain was the highlight for both trips. Vast views of northwest Colorado, southern Wyoming along with great wildflowers made for a memorable spot. Cushions of white *Phlox hoodii*, *P. muscoides*, and *Crypthantha caespitosa* mingled with
magenta *Astragalus spatulatus*, and the yellow daisies of *Tentranuris torreyana* and *Stenotus acaulis*. Orange lichens on the rock help round out the natural rock garden. Sadly due to the cold spring *Penstemon pachyphllus v. mucronatus* was not able to add its blue or lavender flowers to the picture. *Castilleja chromosa* in shades of yellow, orange and pale red added to the roadside on the way up Lookout Mountain.

Neighboring Diamond Peak in far northwest Moffat County was another interesting area to explore. Participants here were treated to the first flowers of *Penstemon humilus*, mixing with bright red *Castilleja chromosa*, and the yellows of *Balsamorhiza hispidula*, *Tetraneuris torreyana*, and *Stenotus acaulis*. Further up the mountain vast stretches of *Arctostaphylos patula* and multitudes of cream to palest yellow *Pediocactus simpsonii* greeted Penstemoniacs at the starting point for a quick hike to the summit, or a more leisurely stroll near the parked cars. Those willing to climb to the summit were able to see a dwarfed population of *Penstemon scariosus* that may be named a new variety or subspecies. Unfortunately it does not bloom until early to mid July. Masses of pink *Dodecatheon (Primula) pulchellum* and *Lewisia pygmea* in varying shades of pink and white rewarded those that walked a way up the road.

In opposition to years past, a van was rented for ten or so individuals who didn’t want to drive or wanted an even more social situation than carpooling. The first day the van covered both Lookout Mt and Diamond Peak before heading back to Craig via 318 through Brown’s Park. The second day it covered Moffat County Road 10. Feedback was very positive on the van.

Participants wandered back to Craig at various times on Saturday but from what I can tell everyone seemed happy with the first day’s tours. Due to the long trips on Saturday no evening program was planned for Saturday night and dinner was left to individuals.

Due to my Germanic need for order we met again at 7:30 a.m. on Sunday to do the shorter field trips. To encourage everyone to be punctual I remember offering coffee and illicit substances to those who were not morning people. Diamond Peak and the long loop to
Lookout Mountain were not offered to allow participants time to get back and clean up for the Banquet. One field trip was offered on Sunday by me to visit a population of the rare *Penstemon giffbessii* and *Eriogonum tumulosum* at the Gates of Lodore in Dinosaur National Monument. It proved an interesting change from some of the other trips as it visited some of the driest areas along with some plants only found within the monument.

Sunday’s field trips seem to please every Penstemaniac, and the evening program by Susan Specman-Panjabi of the Colorado Natural heritage program on the rare, endangered, and threatened Penstemon of Colorado was a nice ending to what was a great annual meeting with good weather, great flowers, and pleasant company.
The Near-Penstemons – A Lovely Group to Grow

Ginny Maffitt
Sherwood, Oregon

Are you puzzled over the reason that *Keckiellas*, *Nothechelones* or *Pennellianthus* have been 'shoved' out of the Genus *Penstemon*? Yet, their seeds are offered in the penstemon exchange. These and a few other plants have 'almost a penstemon' status and it is fascinating to understand why they were separated into their own genera.

Have you grown any chelones? The amusing turtle-head flowers bloom most of the summer and love boggy, clay soils. Or have you seen the tiny chionophilas with up-tilted lips high in the Rockies? The single-species genus *Nothechelone nemorosa* has long, flexible stems that peek out from forest openings in the Cascade Mts.; you would swear it's a penstemon. The one Asian near-penstemon is fuzzy on all parts and is still called penstemon by the Japanese. All of these were once labelled penstemons, but now stand alone within their own genera—many are worth growing.

In the words of Dr. Andrea Wolfe of Ohio State University and an APS member, “One of the defining characteristics for *Penstemon* is an epistaminal nectary. *Chionophila* also has this character, but the rest of the genera in *Chelonea* have a nectary disc. The chromosome number for *Pennellianthus* is n=20, whereas *Penstemon* is n=8. These characters in addition to the molecular results clearly show that *Pennellianthus* is a genus that is not sister to *Penstemon*. There is no doubt at all from the molecular results combined with morphological and cytological characters.”

Carrying that premise further, it is appropriate to conclude that *Chelone* and *Nothechelone*, etc. likewise botanically separate from penstemons.

One of the most comprehensive studies of plants in the Tribe
Cheloneae (now named Scrophularieae) was done by Richard Straw of the Department of Botany at California State College in Los Angeles. His work, “A Redefinition of *Penstemon* (Scrophulariaceae)” was published in Brittonia 18: 80-95, Jan.-March 1966. That magazine isn't lying around in most homes, but can be found on an internet library service called J-Stor (accessed only by subscription), and accessed by searching on any of the genus names discussed below.

The Tribe Scrophularieae (Dr. Straw called it Cheloneae) is a subdivision of Family Scrophulariaceae, or possibly Family Plantaginaceae which has recently been substituted by botanists who follow chromatic studies. Other tribes in Family Scrophulariaceae are *Antherothamnus, Nathaliella, Oreosolen, Scrophularia* and *Verbascum*. North American members of Tribe Scrophularieae are currently the Genera *Chelone, Chionophila, Collinsia, Keckiella, Nothochelone, Penstemon, Russelia, Tetranema, Tonella* and *Uroskinnera*. This also includes the Asian-growing *Pennellianthus* (Straw named it Leiostemon). Since it, theoretically, can be grown in North American, it will be included in the discussion. Dr. Thieret added *Tetranema* and *Uroskinnera* in Central America in 1954, but since they don't grow here, won't be discussed at this time. Several other genera have been added since his paper appeared: *Collinsia, Russelia* and *Tonella*. All of these appear to have evolved within approximately the same time frame from common stock according to Dr. Straw.

To picture this organization:

**FAMILY: PLANTAGINACEAE** (formerly SCROPHULARIACEAE)

**TRIBES: ANTHEROTHAMNUS, NATHALIELLA, OREOSOLEN, PLANTANGINACEAE** (formerly SCROPHULARIEAE and CHELONEAE), VERBASCUM

**GENERA in PLANTAGINACEAE:** *CHELONE, CHIONOPHILA, COLLINSIA, KECKIELLA, NOTHECHELONE, PENNELLIANTHUS, PENSTEMON,*
Dr. Straw hypothesized that the Scrophularieae Tribe originated with a “Proto-Cheloneae” plant arising in the Early Tertiary period (now called Paleogene) somewhere in Siberia near the Pacific coast. It's progeny spread across the Siberian land bridge through Alaska, Canada, and the Northern states to the Atlantic seaboard. This occurred over a period from 65 to 23 million years ago (mya). The world was 2-3 degrees C. warmer than at the present time and was nearly all forested, including Alaska which had palm trees. The separation of the “proto-Cheloneae” into more defined elements occurred in the Mid-Tertiary period (now called Neogene) which would begin from 23 mya. to the present. It's subdivision, the Miocene Age from 23-5.3 mya, began with cooling into the ice ages which forced plants and animals to migrate further south. Fairly modern birds and animals existed. Three prehistoric segregates from the early Cheloneae plants appeared along coastal Asia, then the West and East coasts of North America. Next with a shift to summer-dry climatic types, the Keckiellas appeared in California, and lastly with development of a new type of nectary, Penstemons and Chionophilas appeared, centered in the Rocky Mountains.

Here is a run-down of genera present in North America (one from east Asia) that are the closest relatives to penstemons and growable in temperate climates:

Genus Chelone has four species: obliqua, lyonii, glabra, and cuthbertii. They thrive in damp, clay soils that would kill a penstemon. They are perennials that form gradually widening clumps and bloom over several months. They make good cut flowers. The 'turtle-heads' all have a closed corolla mouth with a hooded upper lip. The lower lip is raised and bearded. The corolla is glabrous (hairless), and large, from 25-40 mm (1-1 1/2”) with wooly-pubescent anther sacs. The leaves are toothed, broad to 160 mm (6+) long and ½ to ¼ as wide, though C. glabra's leaves are lanceolate. These perennial plants can be 1 meter (39”) tall, growing in swampy, soggy areas. The leaves are glabrous. The
inflorescence is a spike, short and leafy. Each cyme is one-flowered. The calyx is 6-9 mm (<1/2”) long with ovate lobes and bracts which overlap the calyx.

**C. cuthbertii** is found in North Carolina and southeast Virginia. Its flowers are a deep violet-purple; the staminode (false stamen) is also purple. The flowering stem is bare, showing above the leaves.

**C. lyonii** is found in the mountains of western North Carolina, nearby South Carolina, Tennessee and Virginia. Its corolla is red-purple and the lower lip has a bright, yellow beard. The staminode is usually white. Leaves are ovate, finely toothed, narrowing abruptly to a 1-2 cm (1/2-1”) stem.

**C. obliqua’s** flowers are also red-purple and the lower lip has a yellow or greenish beard. It is found in southern Minnesota to Indiana and south to northern Mississippi, southwest Georgia, South Carolina and north along the coast to Maryland. It has 3 poorly defined varieties (See Plate 5).

**C. glabra** is distinguished by lanceolate leaves that narrow at the base with 5-20 mm long stems and white flowers, tinged purple or yellow-green at the outer ends. The lower lip has a white beard; the staminode is green. Unlike the other species, the calyx is ciliate with a fringe of marginal hairs. It occurs in the eastern US, mainly south of the Great Lakes and south to northern Alabama and North Carolina coast. In Canada, it's found from southern Manitoba and northeast to Newfoundland (See Plate 6).

Genus **Keckiella** is another member of the Plantaginaceae family occurring mostly in California, and barely into Oregon, Nevada and Arizona. It needs cultivation like a penstemon in well-drained, rocky soil and mostly sun. It has seven species ranging in size from 46-183 cm (18-72”) with a range of colors and flower sizes.

**K. antirrhinoides**, the snapdragon keckiella, is a 1 m (3’) tall perennial with clusters of 8-10 cm (3-4”) flowers. Growing in interior S. CA, west of the interior mountains it thrives in part shade, good drainage, minimal summer water and tolerates cold to
0 degrees F, an unusual trait for this genus. It is considered fragrant and attracts hummingbirds. Subspecies *antiirrhinoides* and *ssp microphylla* which spreads into much of AZ and southeastern NV have been recognized (See Plate 7).

**K. breviflora**, the bush or gaping keckiella is light pink with an open throat. Found from 0-2,680 m (0-8858’), it grows in many plant communities from forest, subalpine and valley grassland. Two varieties have been identified as v. *breviflora* (CA and western NV) and v. *glabrisepala* (CA and western NV) (See Plate 8).

**K. cordifolia**, the climbing or heart-leaf keckiella is found in northern and southern CA coast and coastal mountain areas. It is found from 0-1,190 m (0-3937”) and sports shiny, red, narrow-petalled flowers ranging from pale orange to deep scarlet. They are glandular and hairy, 2.5 cm (1”) long and 1/3 as wide (See Plate 9).

**K. corymbosa**, the redwood keckiella, likes the coastal mountains of central and northern CA. It is narrowly erect, 18” tall with red to orange to deep pink flowers. It has grown about 5 years in my Pacific Northwest (averaging 914 mm or 36” rainfall) garden and bloomed well (See Plate 10).

**K. lemmonii**, Lemmon's keckiella, is found in southwestern OR and northern CA in coniferous forests and chaparral in coastal and inland mountain ranges. It may extend into the High Sierras of NV as well. It grows unbranched stems to 127 cm (50”) tall. Flowers are dull purple or purple brown to 1.9 cm (3/4”) and leaves can be 5 cm (2”) long. It bloomed well in my garden this year (See Plate 11).

**K. rothrockii**, Rockrock's keckiella or the San Jacinto Mts. keckiella is found in deserts and mountains of southeastern CA and adjacent NV at elevations of 1,890-3,180 m (6230-10,498’). It grows in sagebrush and woodland communities and is 46 cm (18”) tall. Flowers are 1.9 cm (3/4”) long and are brown to yellow. It has two varieties, v. *jacintensis* and v. *rothrockii* (See Plate 12).
**K. ternata**, the scarlet keckiella is found in chaparral and woodlands in mountains of southern CA and Baja CA. This shrub can reach a height of 2 m (6’) with leaves in whorls of 3 and 2.5 cm (1”) long flowers (See Plate 13).

**Nothochelone nemorosa** makes up a single species genus and bears nectary glands on a disk below the ovary instead of on minute glandular hairs beside the ovary (Dee Strickler: *Northwest Penstemons*). Known as the woodlands beardtongue, it ranges from Vancouver Island, BC south along the coastal mountains of WA, OR and CA. It has several unbranched stems to almost 1 m (3’) long and a 3.8 cm (1 1/2”) corolla that is pale pink below and bright pink above and somewhat glandular. It needs well-drained, sloping soils and little or no summer water (See Plate 14).

**Pennellianthus frutescens** is an Asian species first placed in Genus *Penstemon*. Although Japanese botanists sometimes still refer to it as the latter, Dr. Wolfe maintains it is separate because it is not a sister to penstemon (chromosome number is n=20, while that of penstemon is n=8). It also has the epistaminal nectary, corresponding to the previously described genera (excepting *Chionophila*). Found near famous Mt. Fuji in Japan and on the Kamchatka Peninsula, Okhotia, north and south Kurils and south Sakhalin Islands, it grows in volcanic cinders. It is considered a common species there. It is about 13-15 cm (5-6”) tall with multiple flowers per stem, all quite fuzzy. Flowers vary from white to lavender and pale pink. The author has two one-year old plants flourishing (under winter cover) after years of seed failures (See Plate 15).

**Chionophila** is the only other genus in Tribe Chelonea with an epistaminal disk making it the closest relation to Genus *Penstemon*.

**Chionophila jamesii**, the Rocky Mountain snowlover, grows about 5 cm (2”) tall with linear, thickened leaves almost as long as the plant is high. It is found in alpine areas of CO and WY. Cultivation success is unknown. Flowers are white and secund (one-sided)
along the stem (See Plate 16).

*Chionophila tweedyi*, Tweedy's snowlover is found in ID and MT. A common understory plant growing at 2,270-2,720 m (7500-9000'), it inhabits subalpine and open woodland communities. The pale lavender flowers are arranged in a loose raceme numbering 4-10. These are about 1 cm (2 ½”) long and horizontally flattened with out-reaching petals. There is no cultivation data.

A caveat to the cultivation of these plants is the difficulty of collecting them in the wild. Most grow in protected lands. They also have extensive root systems to be able to survive in dry, rocky soils and do not survive transplantation. It is important to check that seeds come from reputable sources in order to protect rare plants listed by state and federal agencies. Do enjoy them using your cameras; some have very few photos online, so share your good ones!
An Unexpected Hybrid of *Penstemon strictus* in the Garden

Dave Nelson, Richland, Washington

**Introduction**

Several specimens of *Penstemon strictus*, which had originally appeared in 2008, started to bloom in early summer of 2010 among the argillite slate sections of our main back yard patio. Among these eight blue-to-purple blooming plants was a more robust (likely hybrid) individual with red to pink blooms (see Front Cover). This plant is within 10 to 25 ft of more than 75 *P. strictus* plants that are being used as hosts for several species of *Castilleja* (paintbrush). Due to the very dry conditions of the Mid-Columbia Basin, plants in the yard have been separated and placed into specific eco-systems (heat, light, water). Of the 10 penstemon species in the yard, only five may be close enough (next to or within 20 ft) of any *P. strictus* plants to be potential contributors to the color phenotype or hybrid form of this offshoot. The remainder are >75 ft from *P. strictus* and separated by the house structure. Those within 25 ft of the main patio (and their quantity) are: *P. eatonii* (12), *P. speciosus* (10), *P. hirsutus* (3), *P. palmeri* (2) and *P. pinifolius* (1). Of these five, only *P. palmeri* is not directly adjacent to or admixed within a group of *P. strictus*. Obvious hybrid contributors, such as *P. barbatus*, are not within 400 ft of the main patio. Other penstemon species within a range of 75-200 ft are: *P. ovatus*, *P. serrulatus*, *P. fruticosus*, *P. cardwellii*, and *P. rupicola*.

**Description of Hybrid**

Unfortunately, my photos from 2007 - 2008 did not include the specific section in the slate patio where the plant appeared, so it’s difficult to establish its true age. From my experience with *P. strictus*, however, the hybrid plant must have appeared in early 2008 as a very small plant in the slate patio. I make this
assumption due to the small plant with a single spike (about 12 in) with pink campanulate flowers noted in photos taken in 2009. I took little notice of the plant until late May 2010 when it burst forth with considerable vigor and 17 spikes of campanulate flowers (see Plate 17). The spikes were 12-18 in (30 – 45 cm) long and their flower arrangement appeared to be a thyrse with 3 pairs of cymes in 3 verticillasters (Lindgren and Wilde, 2003). Each cyme had 3-5 flowers, produced on pedicels. The campanulate flower was pink with faint red guidelines, and averaged a length of 1.5 in or 3.8 cm. The basal leaves were lanceolate and identical to those of *P. strictus*, but also quite similar to those of *P. speciosus* (lanceolate to oblanceolate). The basal leaves were generally 6 in (15 cm) long and 1 in (2.5 cm) wide. The basal width of the 2010 plant was 13 in (33 cm).

**Discussion**

The closest source of seed for the hybrid during 2008 was within a grouping including *P. strictus* and *P. eatonii* (see Plate 18); that is 15 ft from the plant of interest. The other penstemons that were rather close to the hybrid include: *P. speciosus* (20 ft), *P. hirsutus* (20 ft), *P. palmeri* (25 ft), and *P. pinifolius* (20 ft). Both *P. strictus* and *P. speciosus* are within the subgenus Habroanthus, section Glabri, while *P. eatonii* is within Habroanthus, section Elmigera. Thus, there is genetic similarity sufficient for potential hybridization. *P. palmeri* (subgenus Penstemon, section Peltanthera), *P. hirsutus* (subgenus Penstemon, section Penstemon), and *P. pinifolius* (subgenus Penstemon, section Fasciculus) do not have as much genetic similarity as the prior three. However, as is known by hybrid specialists, procedures exist to cross such barriers.

Although it is assumed that one parent of this hybrid is *P. strictus*, it is also possible that *P. speciosus* may be more than slightly involved. In particular, *P. speciosus* has shown pink or near pink color form in nature (NARGS, 2010) or the garden (Darrach, 2009); whereas *P. strictus* does not appear to form other than blue
or purple flowers. Regardless, the basal leaves of *P. speciosus* and *P. strictus* are quite similar (lanceolate to ovate and narrow oblanceolate, respectively) (Cronquist et al., 1984). The basal leaves of *P. eatonii* are elliptical to broadly obovate. The hybrid inflorescence is somewhat similar with the 3 species; all bearing a thyrse configuration. The basal leaves of *P. hirsutus*, *P. palmeri*, and *P. pinifolius* are all quite different from those of the hybrid. The corolla (flower tube) of the hybrid is wider than that of *P. strictus* and more like *P. speciosus*. However, *P. palmeri* shows a closer corolla match, especially with a wider corolla and pink coloration.

A question arises concerning the distribution of seeds from *P. strictus* and its movement to the germination point in the slate patio (15 to 25 ft away). I can suggest gold finches, *Spinus tristis*, since at least 15 spend summers in the yard. Seed from *Erigeron speciosus* has been transferred to areas at least 40 ft from the seed source. The major pollinator for spring blooming penstemons appears to be bumblebees, but hummingbirds, particularly black chinned (*Archilochus alexandri*) and calliope (*Stellula calliope*) join them by late June. Hummingbirds are particularly numerous in late July due to the *Agastache* hybrids near the penstemons. We also have a number of honeybees in the yard due to nearby orchards. The bloom time for the hybrid in 2010 was approximately mid-May through late June. An attempt was made to root several spike cuttings in August 2010. Unfortunately, the plant was suffering with powdery mildew and the mist propagation terminated the cuttings experiment. The plant will be treated with elemental sulfur in the spring to control this problem. Cuttings or root division will be attempted once this fungal problem is in check.

Several hybrids involving *P. strictus* are commercially available, but most are blue or purple. These include ‘Midnight Blue’ (Paghat’s Garden, 2010), ‘Prairie Dusk’, a cross between ‘Flathead Lake’ and *P. strictus* (Lindgren and Wilde, 2003), and ‘Bandera’ (Smith, 2009). However, there are a number of pink or
red hybrids which involve *P. strictus* to some extent. These include several crosses between ‘Flathead Lake’ and *P. strictus* (Nold, 1999). The work published by Way and James (1998) must also be mentioned for its listing of hybrids. Unfortunately, most data concerning hybrids is not available due to commercial necessity or natural obfuscation. *Penstemon eatonii* is not mentioned often in hybrid literature. However, it does form wild hybrids with *P. centranthifolius* (Wilson and Valenzuela, 2002). My literature and web searches did not find references for the inclusion of *P. speciosus* within hybrids. In order to identify the contributors to a hybrid, such as the current one presumably based on *P. strictus*, one will need to utilize genetic marker technology (Wolfe et al., 1998). Obviously, this is a complex area of study and will require complex methods to distinguish contributors to hybrids of interest. Regardless, the results of any study in this area will be of great interest to gardeners and horticulturists.

**References**


Overview of the Oregon Siskiyou Mountains, 2011 APS Annual Meeting Site

Louise Parsons, Corvallis, Oregon

The 2011 APS Annual meeting takes us to the Siskiyou Mountains, an area famous for serpentine geology and a remarkable flora rich in endemics and species variety. Serpentine is a general term for metamorphosed mantle rock. The term has an ecological significance greater than geology alone. More broadly this area is known as the Klamath-Siskiyous, a dense complex of rugged mountain ranges.

Geography and Geology of the Siskiyou Mountains: The Siskiyou Mountains are an unusual east-west oriented range located in the southwestern corner of Oregon and adjacent California (See Plate 19). Their relatively tall stature and proximity to the Pacific coast create an environment with plentiful rainfall. High rates of precipitation, accompanied by serpentine soils, results in an unusual ecology wherein many locally endemic plant species have evolved.

Serpentine parent rocks are ultramafics, meaning that they are rich in magnesium, iron, and heavy metals such as nickel, chromium, and cobalt. The distinct green color of serpentine rock is caused by reduction of iron. These older rocks have undergone cycles of metamorphism and are subsequently de-roofed by erosion of overlying sediments. Serpentine is part of a distinct association or assemblage of rocks called ophiolite suites or ophiolites. In addition to serpentine, we find metasediments (a generic term for those rocks in the assemblage that lack characteristics that would otherwise name them), slate, and a more primitive mantle rock called dunite.

Serpentine areas appear as shreds of rocks and their associated soils with a somewhat linear trend. They are remnants of oceanic
crust that are leftover from the collision and subduction of plates. Some of the shreds are so fragmented that original linear character is lost. Subduction is a tectonic process driven by density differences and convection. In a nutshell, a converging, denser, oceanic plate dives beneath a more buoyant continental plate that it encounters. As this occurs, shreds of island arc and oceanic sediments that are not completely subducted (carried under) remain.

Oxidation and possibly a warmer climate in the past have produced a characteristic red soil in much of the area. The soil's chemical characteristics are of botanical interest. High temperatures in the mantle allowed magnesium to dominate calcium in the molecular structure of key minerals as they formed. Additionally soils lack more typical quantities of nitrogen, potassium, and phosphorus. Relative abundance of magnesium and iron and less silica yields fewer clay minerals in Siskiyou soils. Clay minerals act as cation sandwiches that deliver mineral nutrition to plants. Lean soil chemistry may also preclude many invasive species, allowing unique plant communities to thrive. Additional factors contribute to plant diversity. The Klamath-Siskiyou region has been spared catastrophic volcanism and widespread glaciation in recent geologic time. The region is commonly regarded as a meeting ground for species originating in adjoining bioregions.

Thus these assemblages, which tell only a part of the Siskiyou geologic story, bring both physical and geochemical variety. We will observe other, more recent, chapters. On Mt. Ashland for example, we find an exposed batholith, which is a massive intrusion that is apparently associated with the Sierra batholith. More mafic than batholith granites of the Sierras, intrusive rocks on Mt Ashland are a dark grey, fine-grained, rock called diorite. Both diorite and surrounding baked sediments have a distinctively chippy rock cleavage that provides excellent scree habitat for mat-forming Penstemon davidsonii v. davidsonii and eriogonum species.
Within ophiolites, botanical areas can be classified according to moisture levels. As botanist-geologist Arthur Kruckeberg (2002) has detailed, seasonal moisture and drainage patterns are an equally strong determinant for unique plant communities. Diverse environments range from dry, rocky meadows, such as those we will see on Dutchman Peak, to areas of near-continuous flow of water beneath a substrate. Darlingtonia fens are an outstanding example of the latter. Folding and faulting are an intricate part of the mixed-up geology. Faults and natural terraces provide conduits for water in rocks that are otherwise poor aquifers. Springs and seeps provide niches for Maidenhair ferns or lush, wet meadows with delphiniums, orchids and lilies. Besides plants, there is remarkable variety in bird species. For example four members of the chickadee family coexist. A sharp birder might notice three chickadees --black-capped, mountain, and chestnut-backed and oak–titmouse practically in the same tree. This is a birder's paradise because of the unparalleled variety of trees (especially conifers) and shrubs.

**Penstemons in the Siskiyou Mountains:** Literature gives relatively little mention of penstemons in serpentine areas. This is a subject ripe for study. Sharp-eyed Ginny Maffitt, APS Membership Marketing Chair and resident of Sheerwood, Oregon, found about a dozen species in the course of our preliminary trips. Endemic or otherwise, this is more than is generally reported in the literature. Safford et. al (2005) list four Penstemon species strongly-associated with serpentes. *Penstemon azureus v. azureus* is listed in California as a "strong indicator" of serpentine ecology. *P. filiformis* is listed as a "broad endemic" *P. parvulus* is listed as both broad endemic and a strong serpentine indicator and *P. purpusii* is listed as a strong indicator. (Safford, P. 36, appendix of data). In our observations in preparation for the meeting, none of these species were entirely restricted to serpentine soils in the Siskiyous.

The greatest numbers of penstemon species are found in areas with non-serpentine rocks, typically metamorphics associated with
serpentine and exposed intrusives. (See a photograph of the Siskiyou penstemon, *Penstemon anquineus* in Plate 20). Fortunately penstemons demonstrate their typical affinity for roadsides and are very accessible for viewing. The most numerous and diverse penstemon species are found outside of famous, but remote, botanic study areas that are richest in endemics. More detailed studies of Siskiyou penstemons would tell an interesting story about evolution, adaptations, and colonization. When Ginny Maffitt spotted *P. deustus v. suffrutescens*, including a pink-flowered form, immediately I wondered how its occurrence reflected a unique evolutionary history.

**Field Trips:** Planned routes take us up Mt. Ashland, the highest peak in the Siskiyous and Dutchman peak. Expect to enjoy splendid scenery. Enjoy views of Mt Shasta, a Fuji-like volcano to the east and rugged scenery in all directions. Weather is usually kind. However as with mountainous areas anywhere, it can change rapidly. Besides commonsense items such as water, lunch, jacket, raingear, and stout shoes or hiking boots (hiking will be optional), you may want sunscreen and insect protection. A magnifying glass and/or a hand lens is useful for viewing flower and foliage details. I like to carry both, as the field of view is so small with a hand lens alone. If you like to birdwatch, by all means bring a pair of binoculars. If we are lucky we might find a Calliope hummingbird, the smallest North American bird.

**Areas in the vicinity (but outside the scope of the APS Meeting) to visit.** You may wish to add some extra time to visit botanically-famous areas such as Darlingtonia (Cobra plant) fens. Eight Dollar Mountain Road provides best access to a Darlingtonia fen with a boardwalk trail and interpretive site. Darlingtonia make up for a lack of nitrogen in their environment by catching bugs, especially ants, in the downward-facing hairs of “pitchers” that are equipped with digestive fluids. Rough & Ready Botanical Wayside, located about 5 miles south of Cave Junction on Highway 199, has a large number of accessible rare serpentine endemics. Note that many are spring-blooming. However if we have an early summer and do
not find it within the meeting areas, *Penstemon azureus* might still be in bloom at the lower elevation of Rough and Ready. Summer bloom may include silky balsamroot (*Balsamorhiza sericea*), Howell's microseris (*Microseris howellii*), Western senecio (*Senecio hesperius*), and Howell's mariposa lily (*Calochortus howellii*), to name a few. (Borgias, 1994)

**Lovely to see, but can you grow them?** Given even moderately dry summers, many serpentine endemics are highly adaptable in the garden and widely-available in cultivation. *Dicentra oregana*, a parent of cultivars such as *D. x 'Langtrees'* is quite robust in my garden of rich alluvial soil derived from intermediate (rather than ultramafic) volcanics. *Aspidotus densa* (*Cheilanthes siliquosa*) and *Adiantum aleuticum. v. subpumillum* have been residents here for twenty years. *Lewisia cotyledon*, sometimes called “the darling of the Siskiyous”, is another twenty-plus year resident, highly adaptable in pots, troughs, or rock gardens. Lesser-known *L. leana* is equally amenable to cultivation. Lewisias are available at many nurseries. They are easy from seed and frequently listed on seed exchange lists (e.g. North American Rock Garden Society). Cobra plants are available in the trade for the carnivorous plant enthusiast who can provide for their unique needs. Local gardens and nurseries have nearly all of the penstemon species that we will observe.

The Siskiyou Mountains will charm and intrigue you. Please come join your APS friends and colleagues for a wonderful meeting this summer July 8-10. See the APS web site for details and registration forms.

**Annotated References**


is a splendid summary of decades of botanical work by the author and many other scholars. While numerous geologic realms are covered, these is an emphasis on serpentine regions.

Safford, H.D., Viers, J.H., and Harrison, S.P., *Serpentine Endemism in the California Flora: A Database of Serpentine Affinity*. Madrono, Vol. 52, No. 4, pp. 222–257, 2005. Article makes sense of detailed statistical work. The results of this evaluation, which rank species, are provided in an extensive appendix. Refines attempts by previous researches to evaluate degrees of endemism and reaffirms many of the probable causes.
Plate 1: Flowering plant of *Penstemon montanus ssp. montanus*, a high elevation species from Montana, Idaho, Wyoming, and Utah. Photograph was taken in 2007 along Trail Creek Road northeast of Sun Valley, Idaho. (Photograph courtesy of Stephen Love).

Plate 2: Rocky scree habitat of *Penstemon montanus ssp. montanus* at an elevation of 8,000 feet near Trail Creek Summit in central Idaho. (Photograph courtesy of Stephen Love).
Plate 3: APS president Val Myrick photographing bitterroot during the field trip into Irish Canyon. This was one of many marvelous tour stops had during the 2010 APS Annual Meeting in northwestern Colorado. (Photograph courtesy of Stephen Love).

Plate 4: *Penstemon yampaensis* is a species locally endemic to northwestern Colorado and adjacent Utah. This specimen was photographed in Irish Canyon during one of the 2010 Annual Meeting field tours. (Photograph courtesy of Mike Kintgen).
Plates 5-8: Flowers of four “near penstemon” species: *Chelone obliqua* (top, left) photograph courtesy of Ginny Maffitt; *Chelone glabra* (top, right) photograph courtesy of Tom Barnes, University of Kentucky; *Keckiella antirrhinoides* (bottom, left) photograph courtesy of Robert Potts @ 2001 California Academy of Sciences; *Keckiella breviflora* (bottom, right) photograph courtesy of Gladys Lucille Smith @ California Academy of Sciences.
Plates 9-12: Flowers of four “near penstemon” species: *Keckiella cordifolia* (top, left) photograph courtesy of Christopher Christie (CalPhotos database); *Keckiella corymbosa* (top, right) photograph courtesy of Ginny Maffitt; *Keckiella lemmii* (bottom, left) photograph courtesy of Sheli Wingo (CalPhotos database); *Keckiella rothrockii* (bottom, right) photograph courtesy of Steve Matson (CalPhotos database).
Plates 13-16: Flowers of four “near penstemon” species: *Keckiella ternata* (top, left) photograph courtesy of Lynn Watson (CalPhotos database); *Nothochelone nemarosa* (top, right) photograph courtesy of Ginny Maffitt; *Pennellianthus frutescens* (bottom, left) picture courtesy of Wikimedia Commons (http://species.wikimedia.org/wiki/file:Penstemon_frutescens_(200707).jpg; *Chionophila jamesii* (bottom, right) picture courtesy of Bob Skowron.
Plate 17: Closeup of the flowers of a chance campanulate penstemon hybrid reported by David Nelson after it appeared in his garden in Richland, Washington.

Plate 18: *Penstemon strictus* and *Penstemon eatonii*, two potential parents of a chance hybrid reported by David Nelson in his garden in Richland, Washington.
Plate 19: View of the Siskiyou Mountains and Mount Shasta from the lookout tower atop Mount Ashland, Oregon. (Photograph courtesy of Ginny Maffitt).

Plate 20: Siskiyou beardtongue (*Penstemon anguineus*), one of the unique plant species endemic to the Siskiyou Mountains of southwestern Oregon and Northern California. (Photograph courtesy of Gary Monroe).
Plate 21: *Penstemon grahamii*, a species endemic to northeastern Utah and northwestern Colorado. This species is the subject of intense conservation efforts by the Center for Native Ecosystems. (Photograph courtesy of Steve Hegji).

Plate 22: Typical northeastern Utah habitat for the rare and endangered species *Penstemon grahamii*. This plant grows almost exclusively on oil shale bearing substrate that is at risk for development. (Photograph courtesy of Steve Hegji).
Plate 23: Penstemon germination and production project conducted by the FFA and science students at Burlington, Colorado High School. Pictured from front to back are, Lisa Brewer (Master Gardener and project leader), Wyatt Durham, Cody Gay, Ashlin Stolz, and Wyatt Dobler. (Photograph courtesy of Linda Langelo).

Plate 24: APS photo contest. First place winner in the “Penstemons in a Natural Setting” category. This picture of *Penstemon flowersii* was taken by Stephen Love July, 2010 in agricultural scabland near Randlett, Utah.
Plate 25: APS photo contest. Second place winner in the “Penstemons in a Natural Setting” category. This picture of *Penstemon dolius var. dolius* was taken by Gary Monroe in 2006 at River Valley, Nevada.

Plate 26: APS photo contest. Third place winner in the “Penstemons in a Natural Setting” category. This picture of *Penstemon pumilus* was taken by David Cammack in 2010 in central Idaho.
Plate 27: APS photo contest. Third place winner in the “Penstemons in a Garden Setting” category. This picture of *Penstemon procerus* was taken by Barrie Porteous in his garden at Muskoka, Ontario.

Plate 28: APS photo contest. First place winner in the “Penstemaniacs at an Annual Meeting” category. This picture of Truel West was taken by Stephen Love on Diamond Peak during the 2010 Craig, Colorado APS Annual Meeting.
Plate 29: APS photo contest. Second place winner in the “Penstemaniacs at an Annual Meeting” category. This picture of Ginny Maffitt, Gerald Klingaman, Loraine Yeatts, and Libby Wheeler was taken by Val Myrick on Lookout Mountain during the 2010 Craig Colorado APS meeting.

Plate 30: APS photo contest. Third place winner in the “Penstemaniacs at an Annual Meeting” category. This picture of Andrea Wolfe was taken by Ted Kipping at Chihuahua, Mexico during the 2009 annual meeting.
Protecting Endangered Penstemons

Andrea West
Center for Native Ecosystems
Denver, Colorado

The Center for Native Ecosystems applied for and received an APS Special Projects grant for 2010-2011. This article is, in part, a report of the work associated with the grant. Mention is also made of the Center’s mission, philosophy, and historical conservation emphasis related to Graham’s penstemon. (APS Editor)

Colorado, like elsewhere across the West, faces the daily tension between maintaining pristine landscapes and keeping up with booming development. Public land management decisions are made every day that leave native species to fend for themselves with no formal protection. This is precisely where the Center for Native Ecosystems steps in. Center for Native Ecosystems (CNE) is a Denver-based nonprofit organization dedicated to conserving and recovering the native species and ecosystems of the Rocky Mountain region. For their staff of ten biologists, policy experts, and conservation advocates, protecting native species and ecosystems is not just an ascetic hobby; it is a necessary act in order to preserve the natural heritage and iconic landscapes of the West for future generations.

Graham’s penstemon (Penstemon grahamii) is a focal species for the Center for Native Ecosystems team because of its highly imperiled status (see plant in plate 21). Boasting delicate purple flowers and a fiery orange staminodes, this lovely penstemon has adapted to some of the toughest conditions around. Found on sparsely vegetated outcrops at 4,600 to 6,700 feet, the flower grows only in northeast Utah’s Uinta Basin and adjacent Rio Blanco County, Colorado. The penstemon’s specialization in growing on nutrient-poor oil shale substrate was once its best trick to surviving its harsh environment. Now, the rare wildflower’s preference for oil-soaked soil has put it squarely in the crosshairs.
of petroleum extraction. Nearly three-quarters of Graham’s penstemon habitat is on land managed by the Bureau of Land Management (BLM), an agency that refers to the Uinta Basin as “Utah’s oil patch” (see habitat photo in plate 22).

First recognized in 1975 as “in danger of disappearing”, Graham’s penstemon was put on the Endangered Species Act candidate list. Unfortunately, status as a candidate species affords no formal protections and since 1975 the penstemon’s range has experienced a drastic increase in oil and gas exploration and drilling activities. In 2008, the national Endangered Species Coalition released a report titled “Without a Net: Top Ten Wildlife, Fish and Plants Most in Need of Endangered Species Protection,” and included Graham’s penstemon as an honorable mention.

With threats piling up and the Graham’s penstemon still wallowing on the Endangered Species Act candidate list, the Center for Native Ecosystems petitioned the U.S. Fish and Wildlife Service in 2002 to reconsider protecting the Graham’s penstemon on an emergency basis. After four years of deliberating, in January 2006, the Service agreed that the little penstemon deserved Threatened status (one step below “Endangered”). However, in December 2006 the Service mysteriously and abruptly reversed course, claiming that documented threats to Graham’s penstemon no longer existed. Again, Graham’s penstemon remained without formal protection.

Armed with scientific proof that these threats were very real indeed, the Center for Native Ecosystems challenged the ruling in 2008. Currently, the Service is still deliberating on whether or not they will extend formal protections to Graham’s penstemon. While awaiting a final ruling on the case, the Center for Native Ecosystems works to protect the penstemon from other looming threats including oil shale and tar sands experimentation and development, off-road vehicle traffic, livestock trampling, and climate change. With generous support from the American Penstemon Society, the group has nominated Areas of Critical Environmental Concern to protect key penstemon habitat in the
Vernal BLM Field Office (Utah) and proposed that the penstemon’s habitat be withdrawn from oil and gas leasing on BLM lands in northwest Colorado and northeast Utah. Learn more about their work to protect Graham’s pentsemon and see photos at http://nativeecosystems.org/species/plants/grahams-penstemon.

In the eleven years the Center for Native Ecosystems has stood watch over the Southern Rockies landscape, no native species has gone extinct. A single mantra guides their work: extinction is not sound stewardship. They believe in a collaborative approach to conservation, incorporating diverse partners and a variety of tactics to protect the rare and imperiled species that inhabit the stunning landscapes of the Rocky Mountain West. At Center for Native Ecosystems, no species is too great or too small, and their measure of success is based on finding as many ways as possible to save one little penstemon from being lost forever. Learn more about the group and join their efforts to protect rare penstemons and other at-risk species at http://nativeecosystems.org.
Burlington High School Students Learn About Penstemons in Conjunction With School Curriculum

Linda Langelo, Lisa Brewer, Jessie Gramm, and Melissa Blandford
Burlington, Colorado

Colorado State University Extension, Golden Plains Area was awarded an American Penstemon Society Special Projects Grant for the 2010-2011 year. The objective for this current APS grant funded project is twofold: first, teach FFA (Future Farmers of America) and science students at Burlington High School about principles of propagation, greenhouse management, botany, beneficial and pest insects, and water conservation; second, teach the students to successfully grow 12 penstemon species from seed and transfer the plants to sites that include a native plant demonstration garden and a downtown median in Burlington, Colorado.

Project practice is to incorporate botanical instruction into student’s current curriculum through lessons, questionnaires, and hands-on tasks (See photograph in Plate 23). Education opportunities are provided to two FFA classes and one science class at Burlington High School. The first instructional step is to provide a botany lesson that includes descriptions and discussion on the parts of a flower and pollination. We then introduced the students to the unique flowers of penstemon. A vocabulary list was sent prior to each class that we teach so the students can be introduced to terms with the hope that this will increase their understanding and knowledge. We want to be able to help reinforce the vocabulary through usage. The second step was to teach about seeds and germination with the focus of propagating penstemon seeds.

As part of the project, student knowledge is evaluated. Following each lesson, students within each class completed a questionnaire to test comprehension of information provided in the lesson taught that day.

As part of the learning experience, the students were organized into teams within each of the three classes. Each team chooses a penstemon species for their germination and propagation experiment. The groups are
required to do some of their own research about the species they propagate. The students are asked to find out what the flower looks like, where they grow best, any specifics about germination and any other information about that species they can find. Then each team reports on their species to the class.

Following each report, the students begin their hands-on lesson of germinating and growing the penstemons. Next spring the plants will be transferred to one of two different locations. One is a native plant demonstration garden located at a historical agriculture museum in Old Towne in Burlington. The second location is a median strip on Rose Avenue (Highway 24) in downtown Burlington. We acquired permission from the City Council to plant the median as a demonstration site as part of considerations for utilizing natives to replace the annuals bedding plants currently in use. In addition to testing penstemons for use in landscaping, this will provide effective demonstration of sustainable gardening practices that reduce water, fertilizer, pesticides and general overall care to maintain healthy plants for a growing season.

The students are learning to propagate and grow the following penstemon species and cultivars:


Two of the students from the Burlington Future Farmers of America wrote about their impressions of this project and what they will do with the knowledge they are gaining with this project.

“Hello, my name is Melissa Blandford. I am a 16 year-old Junior at Burlington High School. I plan on attending a four year college and majoring in Elementary Education or Music Education with a minor in musical theatre.

I have had very little experience in plant science until this year. I had the opportunity to help Lisa Brewer plant native penstemons in a Highway 24 island, for an experiment for use of native plants in landscaping. I was impressed with the way they
took off and looked so natural. In past years I have also helped landscape a Plant Select garden by the Kit Carson County Carousel in which there were penstemons and other native plants.

This penstemon project has taught me some interesting new facts about native plants. One of the most useful things I’ve learned is how water efficient native plants are. Another thing I was amazed with is how many different varieties of penstemons there are. A specific species that I have researched is Penstemon digitalis, also known as “Husker Red.” It is a great native plant because it can withstand the cold temperatures of winter. The Husker Red is a tall white flower with maroon leaves which is how it got its name.

Learning about native plants can be useful in the future. When I’m older and am planning my own garden I can use my penstemon knowledge to better create a native garden. I can make my garden full of vibrant colors and be more water efficient. This knowledge will also be useful in our FFA Greenhouse. I will be able to pass along information about penstemon to freshman Greenhands who will take over care of the greenhouse after I graduate.”

“My name is Jessie Gramm I am 18 years old and a senior at Burlington High School. After high school I plan on going to Black Hills State University and majoring in physical therapy.

I had some experience with plants before this year but not really any with native plants. This summer I had an opportunity to help plant a couple different kinds of native plants and penstemons on an island in the middle of Highway 24.

What surprised me about the penstemons species was their ability to grow in sandy soil and very little water. Another thing that surprised me about penstemons was the fact that they can grow in many different climates and in just about every kind of landscape you can imagineable.
Learning about native plants could be useful in the future when I am old and retired and have a garden of my own then I could use what I learned in my Ag classes and apply it to my garden and make it more water efficient with native plants. I will also be able to use this knowledge in the FFA greenhouse and help make it more efficient. The stuff that I learn I will be able to hand down to the future managers of the greenhouse.”

*Linda Langelo is a CSU Extension Horticulture Program Associate; Lisa Brewer is a Colorado Master Gardener; Jessie Gramm and Melissa Blandford are students at Burlington High School.*
Germination Protocols for Rare or Endangered Penstemons
Cindy Newlander, Denver Botanic Gardens
Denver, Colorado

Denver Botanic Gardens received an APS Special Projects grant for the period 2010-2011. This article is a progress report for the first six months of the project. (APS Editor)

The objective of this project is to collect seeds of rare and threatened Penstemon species of Colorado and to determine the most reliable protocol for germinating each species. Additionally, research will determine differences in germination between newly collected seed lots and older lots in a process to test for seed dormancy issues.

Through the first six months of this project, we collected seed of several rare species found in Colorado, including Penstemon penlandii, P. harringtonii, and P. gibbensii. We learned that it was a difficult year to collect seed of some Penstemon species due to animal browsing of the plants in various locales.

We have obtained seeds of additional species from We have collected seeds for 4 species in 2010 and recalled species from the National Center for Genetic Resources Preservation (NCGRP) and from Alplains. Species acquired and the collection years include P. debilis (1997 & 2003), P. grahamii (2001, 2008), P. retrorsus (1995), P. degeneri (1989), P. penlandii (1990, 1995), P. scariosus var. albifluvus (1988, 2006), and P. gibbensii (2009). From seed lots held at the Denver Botanic Gardens, we added P. amphorellae, a species native to Mexico.

Some of the seeds are still being cleaned. Once this task is complete, germination protocols will be evaluated for the 16
accessions of 9 total species, beginning with the 60-day cold stratification treatment. Data will be collected and analyzed and results reported in the *Bulletin of the American Penstemon Society*. Plants produces during the evaluation process will be maintained and ultimately planted into the gardens. Unused seeds from collection activities, left over after evaluations, will be accessioned and sent to NCGRP for safeguarding.
Contest Procedures

This article summarizes the results of the 2010 American Penstemon Society photo contest. Photographs, with penstemons as subjects, were solicited in three categories:

**Penstemons in a Natural Setting:** includes pictures of penstemons growing as wildflowers *in situ* in their natural environments.

**Penstemons in a Garden Setting:** includes pictures of cultivated penstemon hybrids and species in garden situations.

**Penstemons or Penstemaniacs at an Annual Meeting:** includes pictures of penstemons and/or APS members during an annual conference.

Three APS volunteers judged the photographs for visual appeal and technical quality. The top three photographs within each category were determined based on a composite of the judge’s votes. The nine winning photographs are printed in this issue of the Bulletin. Winning photographers are awarded monetary stipends or substitution of society membership fees.

2010 Contest Results

These three APS members graciously served as judges in 2010:
Barbara Lewis – Littleton, Colorado
Hugh MacMillan – Sedalia, Colorado
Dale Lindgren – North Platte, Nebraska

Twenty-five total photographs were submitted in 2010, including 13 in the Natural Setting category, 7 in the Garden Setting category, and 5 in the Annual Meeting category. The top three winners in each category were:
Penstemons in a Natural Setting

First Place
Photographer: Stephen Love
Residence: Aberdeen, Idaho
Species: *Penstemon flowersii*
Location: Randlett, Utah, 2010
(See photograph in plate 24)

Second Place
Photographer: Gary Monroe
Residence: Reno, Nevada
Species: *Penstemon dolius* var. *dolius*
Location: River Valley, Nevada, 2006
(See photograph in plate 25)

Third Place
Photographer: David Cammack
Residence: Condon, Oregon
Species: *Penstemon pumilus*
Location: Idaho, 2010
(See photograph in plate 26)

Penstemons in a Garden Setting

First Place
Photographer: David Nelson
Residence: Richland, Washington
Species: *Penstemon* hybrid
Location: Personal garden, 2010
(See photograph on front cover)

Second Place
Photographer: John Weiser
Residence: Sparks, Nevada
Species: *Penstemon speciosus*
Location: Personal garden, 2008
(See photograph on back cover)

Third Place
Photographer: Barrie Porteus
Residence: Richmond Hill, Ontario  
Species: *Penstemon procerus*  
Location: Personal garden, Muskoka, Ontario  
(See photograph in plate 27)

**Penstemeniacs at an Annual Meeting**

**First Place**  
Photographer: Stephen Love  
Residence: Aberdeen, Idaho  
Detail: Truel West @ Craig, Colorado, 2010  
(See photograph in plate 28)

**Second Place**  
Photographer: Val Myrick  
Residence: Sonora, California  
Detail: Ginny Maffitt, Gerald Klingaman, Loraine Yeatts, and Libby Wheeler @ Craig, Colorado, 2010  
(See photograph in plate 29)

**Third Place**  
Photographer: Ted Kipping  
Residence: San Francisco, California  
Detail: Andrea Wolfe @ Chihuahua, Mexico, 2009  
(See photograph in plate 30)

**Upcoming 2011 Contest**

Many thanks to those who took the time to submit photographs for the 2010 APS photo contest. Requests for entries for the 2011 contest will go out in the fall APS newsletter. If you are a penstemon lover, please look through your archives or take some shiny new photographs in preparation for the upcoming 2011 contest.

*Editor’s Note: I am a little embarrassed by the fact that I coordinate the APS photo contest and simultaneously had two of my photographs win first place (totally unexpected). I assure you that the contest procedures utilize unbiased judges who never know the source of the photographs. Hopefully this is not a point of concern. Stephen Love*
Call for Proposals – APS Special Projects Grant Program
Barbara Lewis & Lynn Ackerman

For the third year the American Penstemon Society (APS) will be funding one-year Special Projects with outcomes designed to protect endangered species of penstemons, and/or promote the understanding and appreciation of penstemons in the wild or the garden.

Note: Applicants must be members of the American Penstemon Society. Applicants may join in order to submit a proposal. For information about the application process or to join APS, access the website at: www.apsdev.org.

Examples of projects favorably considered for funding:

1. Efforts to protect and preserve natural populations of penstemons, especially endangered species.
2. Development of practical horticultural information, including cultivation, germination and garden placement.
3. Projects to enhance connections and communication between and among APS members; for example, establishing a regional group, organizing a regional meeting, sponsoring a plant sale, or developing Power Point presentations for use by members, gardening organizations, or schools.
4. Botanical or horticultural research projects that result in improved cultivation protocols for penstemons; for example determining the effect of pre-emergent herbicides on penstemons (adults or seedlings), finding effective ways to amend soils, or better defining moisture requirements for selected penstemons.
5. Enhancing enjoyment of penstemons; for example expanding the photo library on the web, developing a booklet describing recommended hikes within a specific
geographical area, or writing an annotated bibliography of relevant books.

6. Producing user-friendly identification tools, such as a penstemon species identification keys for specific locales.

7. Completing studies on penstemon ecology; for example improving understanding of pollinators or interactions of penstemons with other plants and animals.

8. Establishing or enhancing access to penstemon display gardens; for example designing and installing a student-managed garden, compiling a list of botanical gardens and/or private gardens open to visitors, or designing and erecting signage in established gardens to explain the genus penstemon.

9. Liaise with nurserymen to encourage and enable them to expand their penstemon offerings (plants and seeds); for example design an informational booklet to educate nurserymen and their customers.

10. Develop print or electronic media for the lay person which interprets and reports recent and important botanical information about penstemons and explores the implications for the penstemon gardener; for example interpretation of scientific papers that use DNA analysis to establish species relationships.

These are suggestions only and no project of merit will be eliminated because it does not correspond with the examples listed above.

Three to four grants are funded each year. Awards are limited to a maximum request of $1,000. Typically awards range from $250-$1,000.
Grant Timeline and Contact Information

Grant Submission Period  March 1, 2011 – May 31, 2011
Award Announcements     Mid June, 2011
Grant activity period     July 1, 2011 – June 30, 2012
Award payment periods    The first half the award will be sent as close to July 1, 2011, as possible.
                         The second payment will be made January 1, 2012, and is contingent upon receipt of a brief progress report demonstrating reasonable progress.

Where and how to send a grant proposal:

Email with grant as attachment to:
blewis@iriscolorado.com
or
Mail hard copy to:
Barbara Lewis
10918 N Sunshine Drive
Littleton, CO 80125
Members, please cut out and share this form with interested friends and neighbors

American Penstemon Society

Dedicated to the preservation, enjoyment, culture, and knowledge of the beautiful plants that make up the 280 species in the genus penstemon. The Society serves as a medium of information exchange for penstemon lovers worldwide.

WHAT DOES APS DO?

Publications- We publish bi-monthly newsletters and a new annual Bulletin filled with articles about recent field trips, penstemon taxonomy and research, information on cultivating penstemons, new book reviews, or other interesting material for “penstemaniacs.”

Seed exchange- Annually, members donate wild or garden collected seeds to trade with other members. Members can purchase this seed, of numerous common or rare species, for a nominal fee.

Website- www.APSdev.org is our new web-site. In addition to serving as a communication tool for members, it includes pictures, descriptions, and identification keys for penstemon species species maps and locator tools, information about propagation techniques, and many other features for the serious gardener and plant explorer.

Annual Meetings- Every year the Society holds an annual meeting in a new and interesting place. In addition to interesting presentations, the meetings are structured around field trips and botanizing excursions, guaranteed to satisfy the plant lover in both the amateur or professional. Generally, meeting are held somewhere in the Intermountain West of the US where penstemons find their native ranges.
Membership Application

Sign me up-

Name: ____________________________

Address: ____________________________

__________________________________________

Phone #: ____________________________

Email: ____________________________


You can make payment with PayPal at www.APSdev.org.

We do not sell, share or distribute member data in any manner.

Please send the application form and payment to:

Joan and Truel West
APS Membership Secretaries
1050 Camino Rancheros
Santa Fe, NM  87505

Refer questions to:

Joan and Truel West
APS.Membership@yahoo.com
**Growing Penstemons: Species, Cultivars, and Hybrids**

This book, compiled for the American Penstemon Society by Dr. Dale Lindgren and Ellen Wilde, contains descriptions and information on location where found, cultivation tips, name derivation, and classification of all the species of penstemons and information on many cultivars and hybrids. In addition there are definitions and diagrams of basic terms used in describing penstemons, a short history of their being brought into cultivation, and of the American Penstemon Society. There are chapters on growing and caring for them, propagation, and hybridizing. Appendices give recommended penstemons for different parts of the country, lists of species by state, region, and in many National Parks, botanic gardens that feature penstemons, sources for seeds and plants, criteria for judging penstemons in flower shows, and a list of other sources of information on penstemons. It may be ordered from APS Books and CD’s or from Infinity Publishing Co. on line at www.buybooksontheweb.com or toll free (877) buy book (1-877-289-2665).

**The Library**

The Penstemon Library consists of all the Bulletins of the American Penstemon Society published since 1946 and several studies and reproductions of articles about penstemons from various publications, as well as other books on penstemons. To borrow or copy these materials, please contact Stephen Love, University of Idaho, 1693 S. 2700 W., Aberdeen, ID 83210, (208) 397-4181, slove@uidaho.edu.

**Penstemon Publications by Kenneth and Robin Lodewick**

Note: Louise Parsons (address below) is now handling the distribution of the Lodewick publications

*Penstemon Notes* 1991 Miscellaneous notes on the genus $3.00
*Penstemon Field Identifier* A sketchbook of about 260 species $12.00
*Penstemon Nomenclature 3rd Edition 2002* Lists all known botanical names applied to the genus $6.75
*Key to the Genus Penstemon* Covers 271 penstemon species and 15 related species in 5 other genera $9.00.

APS members may obtain the Nomenclature and Key at the same time for $13.75, plus mailing costs for one publication.

US and Canada, add $4.00 mailing costs for the first publication, $1.00 each for any additional. Overseas, add $5.00 for the first publication and $1.00 each for any additional.

Make checks payable to APS and send requests to: Louise Parsons 1915 SE Stone St. Corvallis, OR 97333-1832.