Mogollon Hawkweed
(*Hieracium brevipilum*)

Status Report
Section 6, Segment 23
Prepared for U.S Fish & Wildlife Service, Region 2
By Robert Sivinski, NM Forestry Division
30 October 2009

TAXON HISTORY

Few southwestern plant taxa are as enigmatic as *Hieracium brevipilum* E.L. Greene. The vernacular name 'Mogollon hawkweed' refers to its initial discovery in Mogollon Mountains of southwestern New Mexico in 1881. There are presently no accurately identified *H. brevipilum* specimens in any New Mexico or Arizona herbarium, so local botanists are completely unfamiliar with it.

The type specimens of *H. brevipilum* were collected in 1881 by Henry Hurd Rusby in the Mogollon Mountains of New Mexico and given to Edward L. Greene for identification. The specimen labels made by Greene give a collection locality as "Mogollon Mountains" and offer no other clue about the population location in that vast range of mountains. Greene distributed Rusby's specimens with a proposed name '*Crepis erythrosperma n. sp.*'. Yet when Greene published the new species he named it *Hieracium brevipilum* (Greene 1882) and *Crepis erythrosperma* became a nomen nudum that was never published. Greene apparently had been in contact with Asa Gray who must have informed him that his new species was a *Hieracium* and not a *Crepis*, and also told him that Cyrus G. Pringle had recently collected the same plant in Arizona. Greene repeated Gray's report of the Arizona collection in his publication; however, Pringle's Santa Rita Mountain specimen cannot be considered a syntype or paratype of *H. brevipilum* for two reasons: 1) it is clearly a specimen of *Hieracium fendleri* Schultz-Bipontinus, and 2) Greene apparently relied on Gray's 'report' and had not seen this misidentified specimen before his publication of *H. brevipilum*.

Shortly after Greene's publication of *H. brevipilum*, Asa Gray's treatment of North American *Hieracium* reduced *H. brevipilum* to variety *mogollense* within *Hieracium fendleri* (Gray 1884). In this same publication, Gray mistakenly referred to Greene's distribution of specimens under the name '*Hieracium erythrospermum*' inadvertently making an illegitimate name from Greene's nomen nudum of *Crepis erythrosperma*.

Robinson and Greenman (1904) included *H. brevipilum* in their revision of the Mexican and Central American species of *Hieracium* simply because they thought this New Mexican species would eventually be found south of the United Sates border. They maintained it as the species *H. brevipilum* as did Wooton and Standley in their 1913 flora of New Mexico, which reduced Gray's variety *mogollense* to synonymy. Both Kearny and Pebbles (1951) and Martin and Hutchins (1981) inexplicably returned to calling this plant *H. fendleri* var. *mogollense* A. Gray in their floristic treatments of Arizona and New Mexico respectively. Most recently, John

Strother's 2006 *Hieracium* treatment for the Flora of North America favored the species name *H. brevipilum*.

This status survey located only two collections of Mogollon Hawkweed in nationally significant herbaria and no specimens in southwestern regional herbaria. There have been only two collections from the Mogollon Mountains, the 1881 type and another 1927 collection. No living botanist has seen a population of this plant growing in its type locality habitat – where ever and whatever that may be.

DESCRIPTION

Mogollon hawkweed belongs to the Asteraceae (Aster Family) and to the Cichorieae (Chickory Tribe) of that family. The Cichorieae is characterized by heads (capitula) that contain only ray flowers and the plants exude milky sap from broken leaves or stems. Hawkweeds are herbaceous perennial plants; usually with leafy stems; an involucre with two series of phyllaries; and pappus of bristles in two or more series. The most recent technical description of *Hieracium brevipilum* from Volume 19 of Flora of North America (Strother 2006) is as follows:

Plants 25–65 cm. **Stems** proximally piloso-hirsute (hairs 1–3+ mm), distally stellate-pubescent and stipitate-glandular. **Leaves:** basal 3–6+, cauline 3–6+; blades oblanceolate to lanceolate, 35–120 × 10–18+ mm, lengths (2–)4–10+ times widths, bases cuneate to truncate (± clasping), margins entire, apices obtuse to acute, faces usually piloso-hirsute (hairs 0.5–1.5+ mm), sometimes glabrous. **Heads** 6–10+ in ± paniculiform arrays. **Peduncles** stellate-pubescent and stipitate-glandular. **Calyculi:** bractlets 5–8+. **Involucres** campanulate to cylindric, 10–11 mm. **Phyllaries** 9–13+, apices ± acuminate, abaxial faces stellate-pubescent and stipitate-glandular. **Florets** 15–25+; corollas ochroleucous, ca. 8 mm. **Cypselae** urceolate, 5–6 mm; **pappi** of 50–60+, white to stramineous bristles in 2+ series, 5–6 mm.

This status survey found only two specimens of Rusby's type collection for *H. brevipilum*. The holotype is specimen NDG-065759 in Greene's personal herbarium collection at Notre Dame University in Indiana and there is an isotype in the Gray Herbarium at Harvard (Figures 1, 2 and 3). These type specimens have piloso-hirsute peduncles and phyllaries, which Greene described as "long peduncles, which together with the involucre, are bristly hairy and glandular" (Greene 1882). The long, spreading, non-glandular hairs on the phyllaries of *H. brevipilum* (Figures 3, 5 and 6) are very important in distinguishing this species, but are not mentioned in Strother's 2006 Flora of North America description. Future descriptions of this species should include this characteristic pubescence.

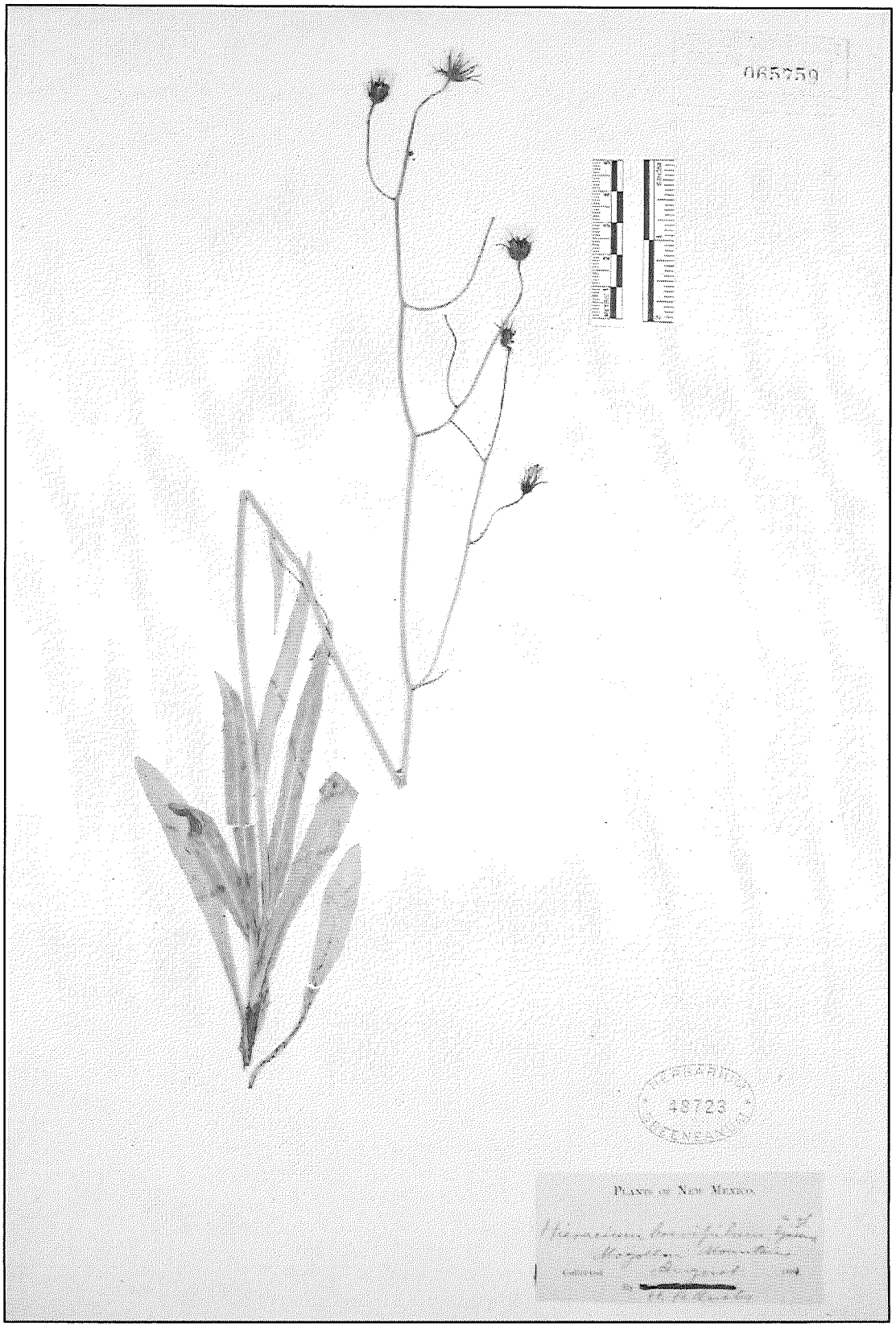

Figure 1. Holotype of *Hieracium brevipilum* at Notre Dame University. Digital scan by Barbara J. Hellenthal, Curator, Greene-Nieuwland Herbarium (NDG).

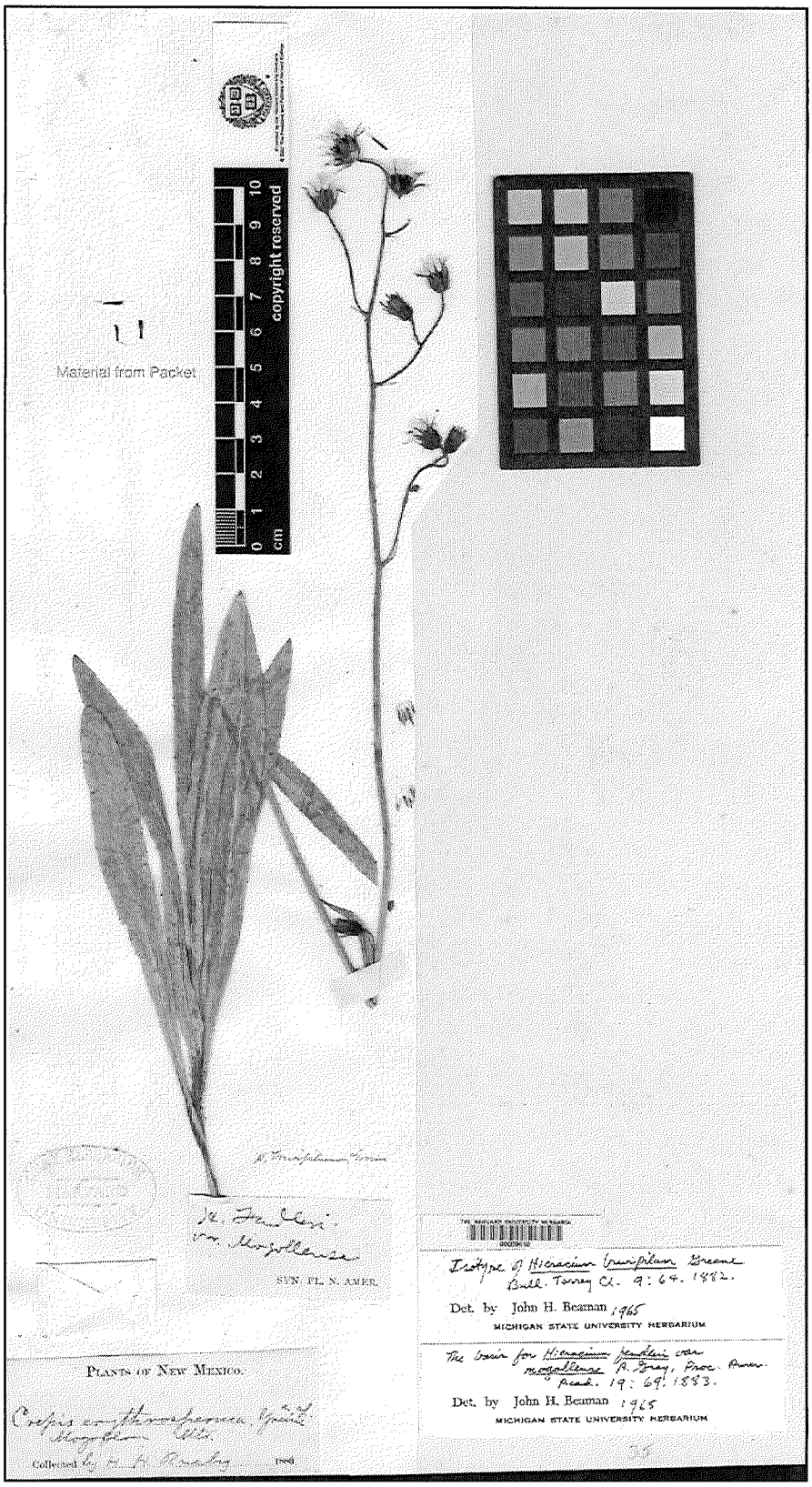

Figure 2. Isotype of *Hieracium brevipilum* at Gray Herbarium (G). Digital scan provided by Brian Franzone, Harvard University.

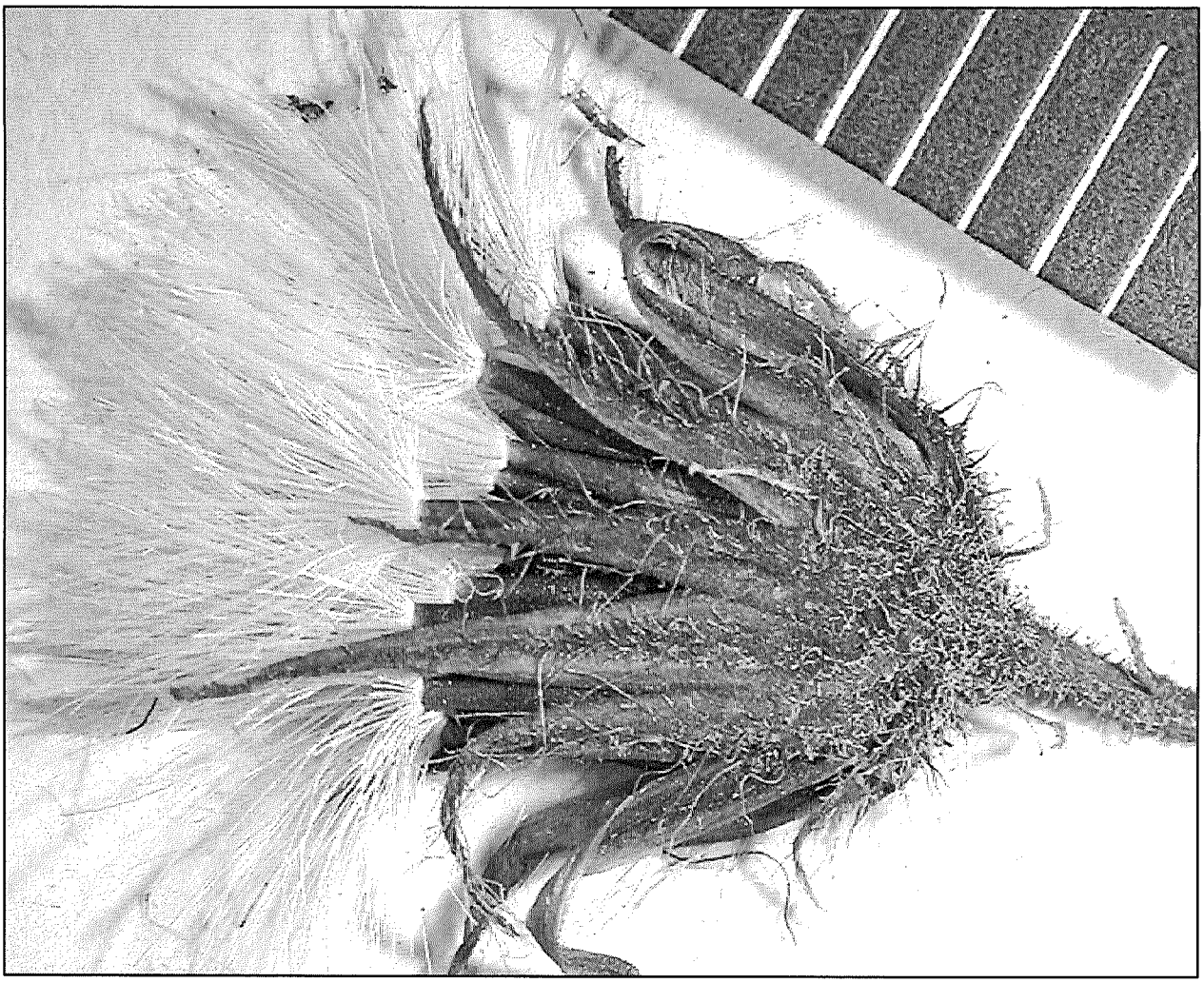

Figure 3. Phyllary pubescence of *Hieracium brevipilum* holotype. Photo by Barbara J. Hellenthal, Greene-Nieuwland Herbarium (NDG).

SIMILAR SPECIES

Hawkweed species are usually very variable and difficult to taxonomically circumscribe. Several European species are known to be apomictic, which isolates individual variants and leads to a proliferation of taxonomic names (Beaman 1990, Tucker et al. 2003). The southwest North American *Hieracium* species have not been studied for presence of apomixis or hybridization, but their relative rarity and the geographic isolation of most populations may, in itself, be responsible for the complex variation found among taxa represented in herbarium collections. Few specimens of *H. brevipilum* exist, so its variability is not well understood.

There are four other hawkweed species within the Mogollon/White Mountains region that are sympatric with *H. brevipilum*, two of which are quite similar. *Hieracium carneum* is the most dissimilar with pinkish flowers and nearly glabrous upper leaves and stems. *Hieracium fendleri* is also very dissimilar with few or no stem leaves and basal rosette with leaves rarely more than

four times longer than wide and often purplish on the lower surface. When one or two stem leaves do occur on *fenderi*, they are small and bract-like or may be larger and tapered to a narrow base. The other species have conspicuous stem leaves with broader, more or less clasping bases. Their leaves are green, narrowly lanceolate or oblanceolate, and four to twelve times longer than wide. *Hieracium fendleri* is the most common hawkweed of the region and usually blooming in late spring to mid-summer, though occasional individuals may still be in flower by late summer. The other species are relatively rare and strictly late summer blooming. Table 1 shows the salient characteristics for distinguishing species of the Mogollon/White Mountains region.

Hieracium brevipilum is most similar in appearance to *Hieracium abscissum* Lessing (syn=*Hieracium rusbyi* E.L. Greene) and *Hieracium crepidispermum* Fries (syn=*Hieracium lemmonii* A. Gray). From *H. abscissum* it is distinguished by its longer (5-6 mm) cypselae, white pappus, and long, non-glandular hairs on the phyllaries. *Hieracium abscissum* has smaller heads and shorter (2-3 mm) cypselae with tawny pappus. Strother (2006) describes *abscissum* as having piloso-hirsute phyllaries, which contradicts Beaman's (1990) in-depth study of this predominantly Mexican species. Both Beaman's description and illustration of *abscissum* (Beaman 1990) lack long non-glandular phyllary hairs.

Hieracium crepidispermum phyllaries have stipitate glands and sometimes a few short, non-glandular hairs (especially distally), but also lacks long-pilose hairs on the involucre (Figure 4). *Hieracium brevipilum* phyllaries have stipitate glands and long-pilose hairs. It also has somewhat larger, more campanulate heads and more open panicle with longer peduncles than *crepidispermum*, but this comparison is based on very few *brevipilum* specimens. Both species have cypselae in the 4-6 mm range and bright white pappus. *Hieracium lemmonii* of Arizona and New Mexico was distinguished by its pale and sparse involucre pubescence (Figure 4), but has been made a synonym of *H. crepidispermum* (Beaman 1990), which more often has blackish phyllaries with dark stipitate glands.

In comparing these three species, the only unique characteristic separating *brevipilum* from both *abscissum* and *crepidispermum* is its long-pilose phyllary hairs.

The long, pilose hairs on most *H. fenderi* plants and the few *H. brevipilum* specimens are distinctly amber-colored. However, *fendleri* pappus is usually tawny while *brevipilum* pappus is white. Hair color variants and atypical *fendleri* plants with whitish or sordid hairs and pappus are sometimes misidentified as other taxa. Asa Gray's reduction of *H. brevipilum* to variety *mogollense* of *H. fendleri* is probably the result of his seeing a *fendleri* specimen with whitish pappus, which is characteristic of the *brevipilum* type collection. A few other atypical *H. fendleri* specimens from Arizona with whitish or sordid pilose hairs and pappus have subsequently been misidentified as *H. fendleri* var. *mogollense* or *H. lemmonii*.

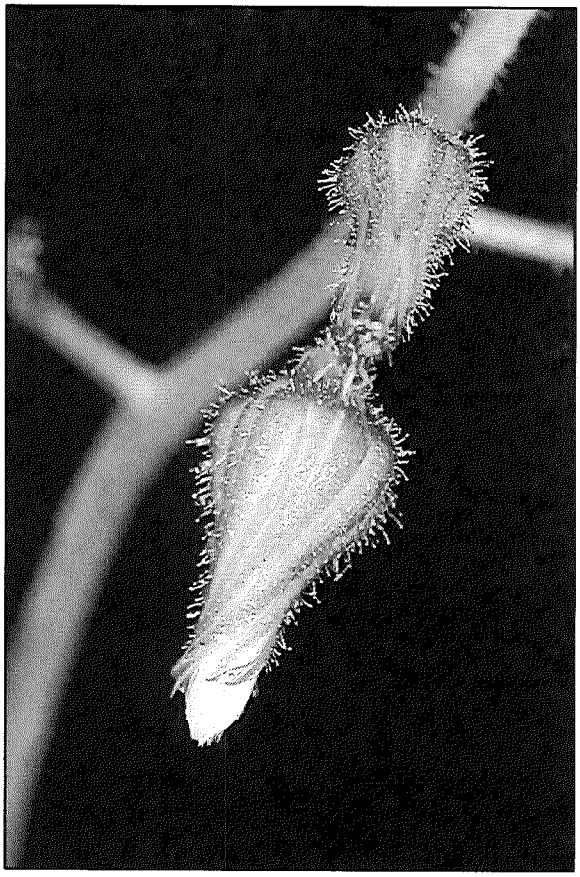

Figure 4. Stipitate glands on involucres of *Hieracium crepidispermum*, San Francisco Mountains, Catron County, NM.
Photo by Russ Kleinman

Almost nothing has been recorded about the habitat of *H. brevipilum*. Only a single Mogollon Mountains specimen label indicates "grass slope... 10,000 ft." In contrast, *H. crepidispermum* usually grows in relatively mesic and shaded valley bottoms and along stream edges (Strother 2006, personal observations). An unusual *crepidispermum* collection with very large leaves comes from a "grassy south-facing slope, 9,000 ft.", which would be a drier habitat. *Hieracium abscissum* habitats are pine-oak woodlands or openings in pine forests (Beaman 1990, Strother 2006).

HISTORIC COLLECTIONS

Four New Mexico herbaria (NMC, NMCR, SNM, UNM) and the Arizona State University Herbarium (ASU) were visited and searched for specimens of *H. brevipilum*. Other regional and national herbaria with Internet accessible databases were also consulted for specimens and when found were borrowed or digital images received. Only two historical collections of *H. brevipilum* could be found for this status survey. They are:

No. 1: New Mexico, Mogollon Mountains; H.H. Rusby; 1881. (ND, G)

This is the type collection of the species and the specimen labels have no other locality, time or habitat information.

No. 2: **New Mexico**, Mogollon Mountains, Center Baldy, grass slope near Apache Cabin, 10,000; E.B. Babcock No. Hort. 2080. Grown in greenhouse, Berkeley, 1927, from roots collected on 6/27/1927. Compared with cotype in Gray Herb.! (UC – three sheets)

This collection label contains enough information to place the species at very high elevation in what is now the Gila Wilderness Area. Apache Cabin is at Apache Spring (N33.298344° W108.638642°), which is about 1 mile ENE of Center Baldy (N33.303274° W108.638642°). The summit of Center Baldy is 10,529 feet, so this collection likely occurred along the pack trail between Center Baldy and Apache Cabin. Babcock wrote on his collection label that he had seen (!) the Gray Herbarium type specimen of *H. brevipilum* and it compared favorably with his own specimen. These UC specimens were borrowed and examined for this status report and, indeed, are a very close match for the *H. brevipilum* type collection. Unfortunately, the Babcock collection was not located until after the current growing season so the site was not revisited for this status survey.

NEW LOCATIONS

While searching the NMC herbarium an *Hieracium* specimen was found that has some characteristics of *H. brevipilum*, but does not completely conform to the type specimens in comparison. This specimen is:

New Mexico, Catron County, Mogollon Mountains, Indian Creek Canyon, Gila National Forest, 20 miles N of Mogollon. Canyon floor with grassland along creek bottom, ponderosa pine on SE-facing slope; 8,200 ft. White pappus; yellow ray flowers; cypselae 4.5-5 mm. 27 Aug 1967. W.J. Hess 1410 (NMC).

The collection location on this specimen label has an obvious location error since Indian Creek is about 10-12 miles due west of the Town of Mogollon. Indian Creek was revisited for this status survey and the following collection was made from a very similar population:

New Mexico, Catron County, Mogollon Mountains, Indian Creek Canyon near cabins, N33.40455° W108.61758° (WGS 84); 8,220 ft. Gently sloping S-facing hillside just above valley bottom; grassy openings in sparse ponderosa pine forest with *Muhlenbergia montana, Leibnitzia lyrata, Koeleria macrantha, Achillea millifolium, Agastache pallidiflora, Penstemon virgatus, Hieracium fendleri*. Locally common; corolla yellow; pappus bright white. 12 Aug 2008. R.C. Sivinski and T. Lowrey 6912 (UNM).

The Indian Creek population compares favorably to *H. brevipilum* by its leafy base and stems with narrow lanceolate or oblanceolate leaves; relatively long peduncles; piloso-hirsute and glandular phyllaries; long (nearly 5 mm) cypselae; and bright white pappus (Figure 5).

Figure 5. *Hieracium* cf. *brevipilum* at Indian Creek, Mogollon Mountains, NM.

It differs from the type specimens of *H. brevipilum* by a dense floccose pubescence of small stellate hairs on the peduncle and lower part of the involucre, white (instead of fulvous) pilose involucres hairs, and nearly columnar cypselae. The cypselae are slightly gibbous below the middle and could be called narrowly urceolate, but they are not as broad below the middle as the type of *H. brevipilum.* The Indian Creek specimen at NMC is currently labeled *H. abscissum*, but that species has shorter (2-3 mm) cypselae with tawny pappus and lacks long-pilose hairs on

the phyllaries. *Hieracium crepidispermum* has longer (4-6 mm) cypselae with white pappus, but also lacks piloso-hirsute involucres, has more densely hirsute lower stems, and usually occurs in more mesic habitats. Therefore, the most favorable comparison among the available taxa for the Indian Creek population is with *H. brevipilum*.

The Indian Creek population differs from the recent Flora of North America (FNA) description of *H. brevipilum* (Strother 2006) by possessing piloso-hirsute phyllaries and lemon yellow instead of ochroleucous flowers. This FNA description may be more appropriate for variations within *H. crepidispermum*, which do have pale yellow flowers and lack piloso-hirsute phyllaries.

Numerous other areas and various habitats in the Mogollon and San Francisco mountain ranges of New Mexico were searched by road during this status survey. No additional populations similar to the type of *H. brevipilum* were located. The vast Gila Wilderness Area has not yet been thoroughly surveyed for this species.

INACCURATE LOCATIONS

Greene's (1882) description of *H. brevipilum* mention's a report from Asa Gray of another collection of this plant by Pringle from Arizona. Greene had not seen the Pringle collection before his publication, but apparently obtained a duplicate specimen at a later time because there is one in his personal herbarium at Notre Dame University. The Pringle collection is misidentified and obviously a specimen of *Hieracium fendleri*. Greene must have eventually known the true identity of Pringle's Arizona collection because he mounted Pringle's misidentified specimen on the same herbarium sheet with one of his own *H. fendleri* specimens from New Mexico (Figure 6).

Kearny and Peebles (1951) cited a specimen of *H. fendleri* var. *mogollense* from the White Mountains of Arizona and Strother also used this collection as the basis for an Arizona distribution of *H. brevipilum*. The label for this specimen (at UC) is:

Arizona, Apache County, White Mountains, about 10 miles south of McKay's Peak; 31 Aug 1948; F.W. Gould 5004 w/ M.E. Robinson.

This very imprecise locality description is about 5 miles southeast of the Town of Whitewater. The only other relevant information provided by the label is a late summer blooming date.

This specimen was also borrowed and examined for this status report. Its large, urceolate cypsela and white pappus are similar to the type of *H. brevipilum*. It lacks, however, the long pilose hairs on peduncles and phyllaries and therefore, cannot be distinguished from *H. crepidospermum*.

POTENTIAL THREATS

The only definitely known location of *H. brevipilum* sensu stricto is a remote part of the Gila Wilderness Area of New Mexico. This population has not been seen since 1927 and needs to be assessed to determine if it is still extant.

If the Indian Creek population is placed with *H. brevipilum* sensu lato, then the species appears to be stable at this location. This population contains numerous individuals and has persisted during timber harvest operations and building a minor road through the habitat. The grassy understory had recently been burned during a forest fire just prior to 2008. The understory vegetation appeared healthy and contained numerous individuals of *H. brevipilum* and *H. fendleri*. No obvious hybrids were found among the plants seen at this location.

CONCLUSIONS

The hawkweed species of the Mogollon rim of Arizona and New Mexico are very variable and can be difficult to circumscribe as species. The three most rare and variable species are *H. brevipilum, H. crepidispermum*, and *H. abscissum*. The latter two have regional synonyms, *H. lemmonii* and *H. rusbyi* respectively, that have been submerged as local variants into more widespread Mexican taxa. *Hieracium brevipilum* remains a viable taxon, but is poorly understood. There are no full and accurate descriptions of this species in the published literature, no specimens in regional herbaria, and the only known population is remotely located in a wilderness area..

A new population that might be *H. brevipilum* is located at Indian Creek in the Mogollon Mountains of New Mexico. It shares some important characteristics with the type of *H. brevipilum*, but has differences that bring into question its true identity. Most recent efforts to revise and describe the genus *Hieracium* in North America (Beaman 1990, Strother 2006) have included only consistently recognizable major species and have not maintained minor variations or intermediate species that are distinguished only by various combinations of common characteristics, such as pubescence type and color. Therefore, if the Indian Creek population is to have a name, it should be *H. brevipilum* and not something new. Yet by admitting such variation into the species, the taxonomic boundaries become more blurred and *H. brevipilum* seems not especially unique. This may be the case for most major species of *Hieracium*.

The status of *H. brevipilum* has not significantly changed. It remains an extremely rare and poorly understood species. This may only be corrected with addition time and effort as field botanists chance upon new populations or visit and assess the historic location for this plant in the Gila Wilderness. Actual field comparisons of populations and habitats may begin to shed some much needed light on this mysterious taxon.

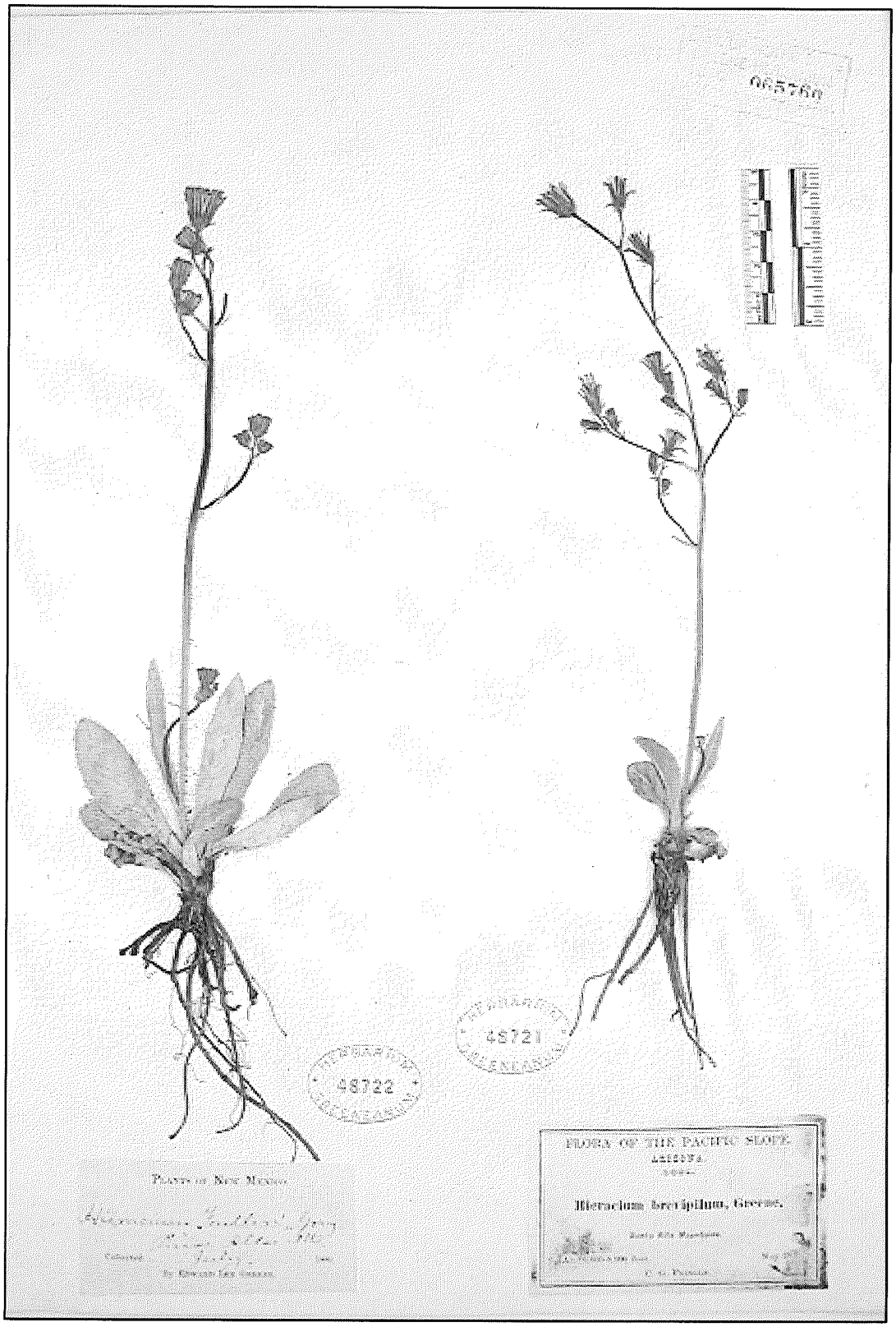

Figure 6. Pringle's misidentified specimen of *H. brevipilum* (right) mounted with Greene's specimen of *H. fendleri* (left). Both are *H. fendleri.* Digital scan by Barbara J. Hellenthal, Curator, Greene-Nieuwland Herbarium (NDG).

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Table 1. Hawkweeds (*Hieracium* sp.) of the Mogollon Rim in Arizona and New Mexico.

	Leaves	Leaf and Lower Stem Pubescence	Upper Stem and Phyllary Pubescence	Cypsela (Seed)	Flower Color	Pappus Color	Blooming
H. brevipilum	Narrowly lanceolate or oblanceolate. Mostly basal, some cauline. Stem leaves somewhat reduced.	Pilose and inconspicuously glandular.	Conspicuously stipitate glandular, long-pilose. Sometimes floccose with small crisped hairs	5-6 mm. Urceolate – especially tapering above.	Greenish yellow or yellow	White	Late summer and early fall.
H. crepidispermum	Narrowly lanceolate or oblanceolate. Mostly cauline. Basal and lower stem leaves similar.	Long-pilose – densely so on lower stem.	Stipitate glandular and sometimes sparsely short-hirsute.	4-6 mm. Urceolate or columnar and tapering above.	Greenish yellow or yellow	White	Late summer and early fall.
H. abscissum	Narrowly lanceolate or oblanceolate. Mostly basal, some cauline. Stem leaves somewhat reduced.	Pilose and inconspicuously glandular.	Conspicuously stipitate glandular and sparsely floccose, especially near the base of the involucre	2.2-3 mm Cylindric or widest near the middle and more tapered at the base.	Yellow	Usually sordid or tawny, rarely whitish	Late summer and early fall.
H. fendleri	Broadly oblong, obovate or spatulate. Mostly basal. Stem leaves (if any) usually small and bract-like.	Long-pilose – densely so on lower stem and moderately so on leaves.	Stipitate glandular, floccose and long-pilose or long hirsute.	4-6.5 mm. Urceolate – especially tapering above.	Yellow	Usually sordid or tawny, rarely whitish	Usually late spring to mid-summer.
H. carneum	Basal oblong-ovate. Stem leaves narrowly lanceolate or oblanceolate or linear.	Moderately pilose on basal leaves. Stem leaves glabrate or glabrous.	Sparsely to moderately short-setose, floccose and stipitate glandular near the base of the involucre.	3-4.5 mm Cylindric – tapered slightly at the base, or columnar.	Pink or whitish	White	Late summer and early fall.