ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDAST8H1C0
Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Packera franciscana* (Greene) W.A. Weber & Á. Löve
COMMON NAME: San Francisco Peaks Ragwort, San Francisco Peaks Groundsel, San Francisco Groundsel
SYNONYMS: *Senecio franciscanus* Greene (E.L. Greene, Pittonia 2: 19. 1889)
FAMILY: Asteraceae

AUTHOR, PLACE OF PUBLICATION: (Greene) W.A. Weber and Á. Löve, Phytologia 49(1): 47. 1981.

TYPE LOCALITY: USA. Arizona. Mt. San Francisco, 3658 m.

TYPE SPECIMEN: HT: US-47604. E.L. Greene s.n., 10 July 1889. IT: NY.

TAXONOMIC UNIQUENESS: Approximately 64 species in genus *Packera*, 9 occurring in Arizona. Members previously included in the genus *Senecio* but were divided out based on chromosome numbers, morphological characters, and molecular phylogeny.

DESCRIPTION: A dwarf alpine perennial, 3.0 to 10.0 cm (1.2 to 4.0 in.) tall, in tufts to 7.6 cm (3 in) wide. Stems generally arise singly from the upturned ends of creeping rhizomes, or sometimes loosely clustered. Leaves are alternate, grayish green, and edged in reddish purple; oval to roundish, downy, crinkly, and toothed; to 5 cm (2 in) long. Basal leaves obovate, petiolate and deeply dissected; stem leaves usually reduced to bracts. Phyllaries, petioles, involucre bracts, and undersurface of leaves are reddish-purple. Small yellow flowers heads about 1.0 cm. (0.4 in.) wide, borne singly or up to six in a compact cluster, with each containing 8 to 13 yellow ray flowers. Seeds are glabrous.

AIDS TO IDENTIFICATION: General vegetative appearance of *P. franciscanus* is somewhat similar to that of *Heuchera versicolor* f. *pumila*. On closer inspection it is obvious that leaf blades of *Heuchera* are subcordate and very shallowly lobed and toothed, while leaves of *Senecio* are obovate and deeply lobed (Phillips, 1980).

ILLUSTRATIONS:
Line drawing of plant in flower (USFWS).
Color photo of Holotype Collection (United States National Herbarium)
Line drawing (Falk, Jenkins et al. 2001)
Color photos of plant and habitat (Sue Rutman/FWS, *in* Falk, Jenkins et al. 2001)

Color photo (Lewis Epple, *in* A.O. Epple 1995: pl. 429).

TOTAL RANGE: San Francisco Peaks, Coconino County, Arizona.

RANGE WITHIN ARIZONA: Endemic to the Rocky Mountain Arctic-Alpine Tundra plant community found in the San Francisco Peaks, Coconino County, Arizona.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous perennial.

PHENOLOGY: The growing season is from June to September when the mean air temperature is 48º F (9º C). Flowering occurs from mid-August to mid-October, fruits mature from mid-September, and the plant becomes winter-dormant in October (USFWS 1983, Trock 2006).

BIOLOGY: A composite, the San Francisco Peaks groundsel is a member of the Asteracea family that grows low to the rocky ground where it is found. Reproduction is primarily vegetative by mat-forming rhizomes although sexual reproduction also occurs from mature achenes. "Frost action and gravitational movement break up the clones, the separate plants further spreading before breaking up, etc., in a continual cycle. Total ground-cover by the groundsel rarely exceeds 10 percent, and is generally between 2 percent and a trace. Soil moisture seems to be the dominant limiting factor. Fruits mature in mid-September to early October. The plants enter winter dormancy by mid-October. Plants in more protected areas produce more flowers and fruits than do those in exposed sites" (Johnson 1990). "The species occupies a minimum of 325 acres within the approximately 1,200 acres of alpine habitat, 74 different locations supporting the species have been found in the tundra. *Senecio* was common on every major peak above 11,400 ft" (Phillips 1993). As indicated above, this species is adapted to natural soil movement due to frost action and gravity on the steep slopes of the Peaks.

HABITAT: A primary succession species in alpine fellfield within the alpine tundra on volcanic cinder talus slopes on the San Francisco Peaks (USFWS 2010).

ELEVATION: 10,900 - 12,300 ft. (3322 - 3752 m).

EXPOSURE: *Packera franciscanus* grows in exposed, sunny situations, on moderate slopes of 20% to 60%, with NE to NW aspects (45-315 degrees). The largest populations and greatest densities occur on slopes of 30% with aspects ranging from S to W (180-270 degrees) (Fowler and Overby 2016).

SUBSTRATE: Volcanic cinder talus slopes, on fine to medium grain soils, and very gravelly sandy loams; the pH is around 6.6.

PLANT COMMUNITY: Rocky Mountain Arctic-Alpine Tundra, usually just above southwestern montane spruce-fir or bristlecone (*Pinus aristata*) forests. The vegetation is of low stature (less than 30 cm) and sparse, characterized by herbs and grasses, occasional shrubs and dwarf trees at timberline. Associated plants include: *Abies lasiocarpa* var. *arizonica* (corkbark fir), *Agropyron scribneri* (spreading wheatgrass), *Arenaria lanuginose* (sandwort), *Bromus ciliatus* (bromegrass), *Carex* spp. (sedge), *Cerastium beeringianum* (mouse-ear chickweed), *Cystopteris fragilis* (fragile bladder fern), *Festuca ovina* var. *brachyphylla* (fescue), *Helenium hoopesii* (sneezeweed), *Heuchera versicolor* (alum root), *Penstemon whippleanus* (Whipple's beardtongue), *Picea engelmannii* (Engelmann spruce), *Pinus aristata* (bristlecone pine), *Poa* spp. (blue grass), *Ribes montigenum* (gooseberry currant), *Taraxacum* sp. (dandelion), and *Thalaspi montanum* var. *fendleri* (wild candytuft). (USFWS 1996 draft).

POPULATION TRENDS: According to the USFWS in 1983, there were "approximately 5,000 individuals occurring in discrete patches in an areas of less than 2.6 square kilometers on the San Francisco Peaks." (CPC, accessed 2004). Fletcher (in Holden et al. 1984), estimates that there are probably greater than 100,000 clones of *Packera franciscanus,* which may be low. Population trends are currently stable, with an observed population density of 3.19 ramets per square meter along a permanent transect, similar to results reported by Phillips and Peterson in 1980 (Fowler et al. 2015, USFWS 2010). In addition to vegetative reproduction via rhizomes, populations have been documented producing and dispersing seed (Fowler et al. 2012).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LT, with critical habitat (USDI, FWS 1983)
[C1 USDI, FWS 1980]

STATE STATUS: Highly Safeguarded (ARS, ANPL 2016)
[Highly Safeguarded (ARS, ANPL 1993, 1999)]

OTHER STATUS: Not Forest Service Sensitive (USDA, FS Region 3, 2013, 1999)
[Forest Service Sensitive (USDA, FS Region 3, 1990)]

MANAGEMENT FACTORS: The most critical threat facing the species is climate change. There is very little potential habitat for the plant to migrate upward in a warming climate scenario, and it is likely the species is vulnerable to extinction due to climate change. (USFWS 2010, Fowler et al. 2012, Fowler et al. 2015). *Packera franciscanus* occurs on a naturally restricted range (range size is reported as 85 hectares (Fowler et al. 2015)) that is vulnerable to increased recreational pressure as the human population of Flagstaff expands.

The plants are locally common along a narrow saddle that connects two mountain-tops in the San Francisco Mountains. The area is heavily used for recreation and the unstable talus-slope habitat is easily disrupted. In general, Alpine tundra habitats are very sensitive to human activities. The off-trail hiking and climbing in these fragile alpine tundra areas is a threat to the species' existence, and needs to remain undisturbed. In addition to the threat from human disturbance, their unstable habitat is subject to avalanches in the winter.

CONSERVATION MEASURES TAKEN: Trail closures and alternate trail routes in tundra areas have been implemented by the Forest Service. A single trail has been designated that takes hikers through *P. franciscana* habitat, effectively eliminating off-trail summer hiking in habitat (USFWS 2010). Additional trail construction has routed summer hiker traffic away from the plants. Limited access and an interpretive program implemented at the top of the chairlift in the summer have been effective in preventing hikers from accessing the sensitive alpine tundra. A long term monitoring program was implemented in 2008 (USFWS 2010).

SUGGESTED PROJECTS: Expand San Francisco Natural Area to include *Packera franciscanus* habitat. . Research is needed to study the ecological requirements, life history characteristics, and biotic factors of *P. franciscanus*.

LAND MANAGEMENT/OWNERSHIP: USFS - Coconino National Forest.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

Tina Ayers – Curator, Deaver Herbarium, Northern Arizona University, Flagstaff, Arizona.

T.M. Barkley – Department of Biology, Kansas State University, Manhattan, Kansas.

Reggie Fletcher – US Forest Service, Region 3, Albuquerque, New Mexico.

James F. Fowler – Ecologist, Rocky Mountain Research Station, Flagstaff, Arizona.

Greg Goodwin – US Forest Service, Coconino National Forest, Flagstaff, Arizona.

Carolyn Hull-Sieg – Research Plant Ecologist, Rocky Mountain Research Station, Flagstaff, Arizona.

Barb Phillips – Zone Botanist, US Forest Service, Flagstaff, Arizona.

James Rominger – Retired NAU Professor, Flagstaff, Arizona.

ADDITIONAL INFORMATION:

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