

**TAXONOMY OF THE *PYROCOMA CARTHAMOIDES* COMPLEX
(ASTERACEAE: ASTEREAE)**

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ABSTRACT

Plants previously included in *Pyrocoma carthamoides* are characterized by leafy bracts subtending the heads and sterile ray flowers (or rays absent) with narrow, erect lamina shorter to slightly longer than the involucre — including *P. carthamoides* sensu stricto, *Pyrocoma cusickii* (A. Gray) Greene, ***Pyrocoma cascadia* Nesom, sp. nov.**, ***Pyrocoma acrophila* Nesom, sp. nov.**, and ***Pyrocoma ptilota* Nesom, sp. nov.** *Pyrocoma radiata* and *P. subsquarrosa*, which produce more conspicuous (but sterile) ray florets, have sometimes been treated as conspecific with *P. carthamoides*. *Pyrocoma insecticuris* also has features suggesting that it is closely related, though the heads mostly lack prominently subtending leafy bracts, and *P. bennettensis* Nesom (parapatric with *P. insecticuris*) is a segregate of *P. carthamoides* sensu lato. Two other mainly Idahoan species are described by Ertter (2025): *P. boiseana* and *P. ponderosana*. All of these species are from the northwestern USA. A key to these species, distribution maps, brief descriptions, and photos of representative specimens are provided.

Pyrocoma carthamoides has been recognized in recent accounts (e.g., Bogler 2006; Giblin et al. 2018) as comprising three varieties — var. *carthamoides*, var. *cusickii*, and var. *subsquarrosa*, each of the northwestern USA. *Pyrocoma radiata*, from along the Oregon/Idaho border, historically also has been included within *P. carthamoides* but recent taxonomists have treated it as a distinct species. Plants of this group are characterized by (a) ray flowers sterile (or absent) and with narrow, erect ligules shorter than the involucre and inconspicuous or else slightly longer than the involucre, (b) foliaceous bracts immediately subtending the heads, and (c) long, glabrous achenes. *Pyrocoma radiata* has erect ray corollas but they are longer and more conspicuous. The present study evaluates concepts and ranks of taxa in this group and recognizes previously undescribed species. Two additional species are newly described by Ertter (2025; *P. boiseana*, *P. ponderosana*) and another by Nesom (2025b; *P. bennettensis*).

Pyrocoma liatriformis and *P. scaberula* (Nesom 2025a) are narrow endemics essentially sympatric with the *carthamoides* group sensu stricto that have features suggesting that they are closely related, including sterile ray florets, although the ligules are longer and more conspicuous and foliose bracts subtending heads are generally absent. The ray florets lack a style and the ovaries do not fill or expand. The achenes of these are shorter and hairy and both have a tendency to produce glands. *Pyrocoma insecticuris* (Nesom 2025b) is similar in its lack of subtending bracts but in its variability approaches the morphology of *cusickii*-like populations to the north and it may prove to be inseparable member of the *carthamoides* group.

In most species of *Pyrocoma*, vascular bundles of basal leaf petioles (proximal portion) are conspicuous as persistent clusters of parallel fibers. These persistent fibers are not present in species of the *carthamoides* group sensu lato and, with the sterile ray florets (or their absence), is interpreted here to suggest that they comprise a single clade. A few other species with prominent, fertile rays (e.g., *P. integrifolia*, *P. crocea*, the *P. hirta* group) also lack the persistent leaf fibers.

Key to the species of the *Pyrrocoma carthamoides* complex

1. Ray flowers clearly evident on at least some heads (unless eaten by insects), conspicuously exceeding subtending phyllaries; central Idaho and adjacent Oregon, E to Montana and Wyoming --- stems erect to ascending-erect, mostly 15–50(–90) cm tall, usually more than 1.5 times as long as basal leaves; heads often more than 2 per stem and/or more than 25 mm wide (pressed); phyllaries often in overlapping, unequal series. [*Pyrrocoma bennettensis* might key here]
2. Foliage subglabrous except for ciliate margins; ray flowers exceeding involucre by 5–15 mm, bright yellow; inflorescence bracts often absent or at least shorter than the subtended involucre; plants to 90 cm tall.
3. Basal leaves to 50 cm long and 20 cm wide; heads 25–40 mm wide; in and around upper Snake River Canyon of northeastern Oregon and adjacent Idaho ***Pyrrocoma radiata***
3. Basal leaves to 30 cm long and 5 cm wide; heads 20–25 mm wide; south-central Idaho ***Pyrrocoma insecticruris***
2. Foliage ± scabrous-hispidulous; ray flowers exceeding involucre by ≤ 7 mm, usually pale yellow; inflorescence bracts conspicuous, at least some longer than and partially obscuring subtended involucre; plants to 50(–70) cm tall.
4. Leaves narrowly oblong, margins evenly spinulose-serrate with narrowly acute, sharply acute teeth; south-central Montana and adjacent Wyoming ***Pyrrocoma subsquarrosa***
4. Leaves broadly oblong to obovate, oblanceolate, or spatulate, margins entire to sparsely dentate-spinulose; western and central Idaho, Oregon.
5. Remnant fibers of the basal leaf petioles persistent; southwestern Oregon ***Pyrrocoma acrophila***
5. Remnant fibers of the basal leaf petioles not persistent; Idaho, northeastern Oregon. ***Pyrrocoma boiseana*, *Pyrrocoma ponderosa*** (see Ertter 2025)
1. Ray flowers not evident (few or absent or not exceeding subtending phyllaries); southern British Columbia and northwestern Montana, south through western Idaho and Oregon to northeastern California and northern Nevada --- stems and foliage ± scabrous-hispidulous; inflorescence bracts conspicuous, at least some longer than and partially obscuring subtended involucre and often longer than subtended internodes; heads 1–2(–4) per stem.
7. Heads hemispheric, 2–3.5 cm wide; phyllaries in series of unequal length (strongly graduate), broadly oblong to obovate; pappus bristles thickened at the apex; north of Blue Mountains in Oregon to British Columbia, east across northern Idaho to northwestern Montana --- heads rarely more than 2 per stem ***Pyrrocoma carthamoides* sensu stricto**
7. Heads ± campanulate or turbinate, 1.5–2 cm wide; phyllaries subequal in length, lanceolate; pappus bristles not thickened at the apex; south of Blue Mountains in Oregon, south to northeastern California and northern Nevada.
8. Ray florets consistently present, ligules about as long as the involucre or slightly longer ***Pyrrocoma bennettensis***
8. Ray florets absent (*P. cascadia*, *P. ptilota*, *P. cusickii*) or sporadically present without evident ligules (*P. cusickii*).
9. Heads 1–2(–4) per stem; stems prostrate to ascending; Blue Mts of Oregon, southeastern Washington, and adjacent Idaho, S to northeastern California and northern Nevada ***Pyrrocoma cusickii***
9. Heads (1–)2–6 per stem, evidently racemoid to subspicate; stems ascending-erect to erect; southwestern Oregon and northern California.

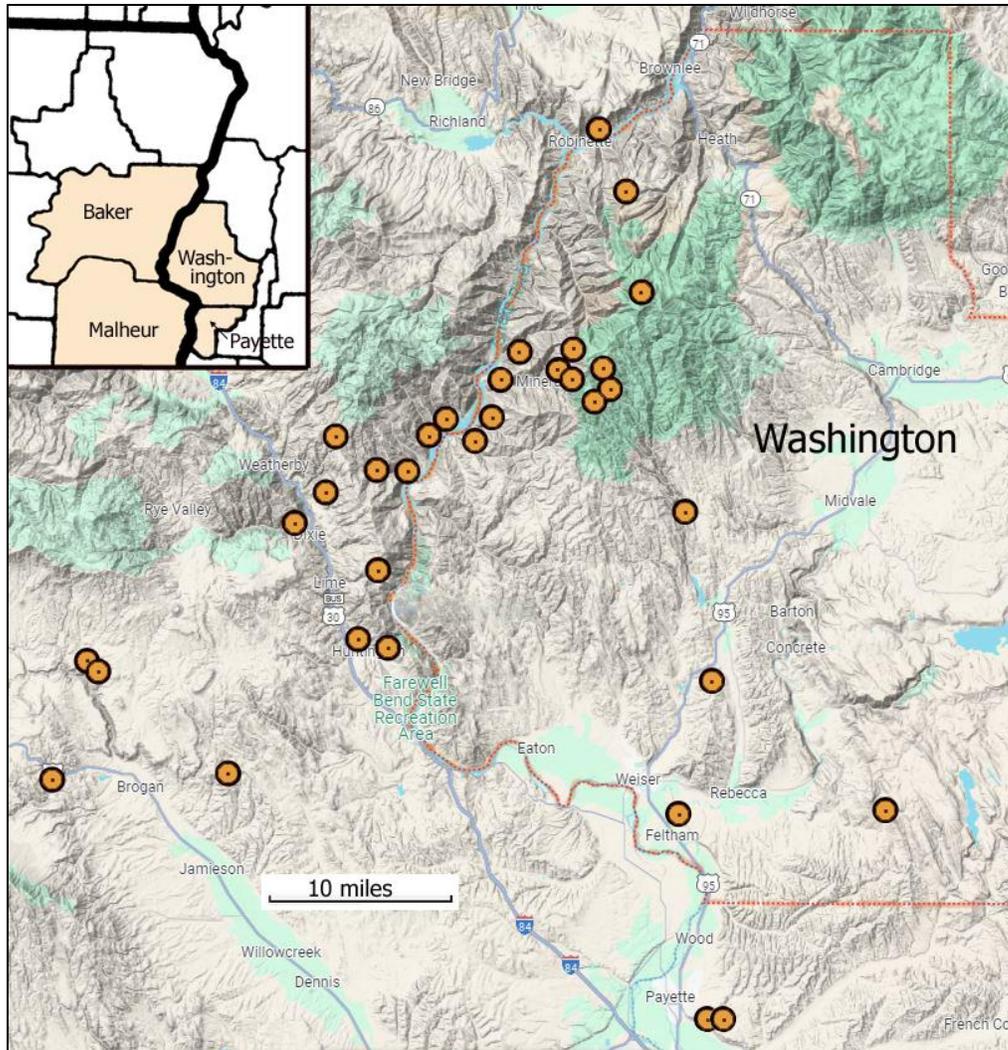
10. Phyllaries in 3(-4) series, indurate proximally, inner 17-20 mm long; disc corollas 10-13 mm long **Pyrrcoma ptilota**
 10. Phyllaries in 2-3(-4) series, completely herbaceous, inner 12-14 mm long; disc corollas 7-9 mm long **Pyrrcoma cascadia**

1. PYRROCOMA RADIATA Nutt., Trans. Amer. Philos. Soc. ser. 2, 7: 333. 1840. *Haplopappus carthamoides* var. *maximus* A. Gray [nom. et stat. nov.], Syn. Fl. N. Amer. 1, pt. 2: 126. 1884. *Haplopappus carthamoides* subsp. *maximus* (A. Gray) Hall, Publ. Carnegie Inst. Wash. 389: 102. 1928. *Haplopappus radiatus* (Nutt.) Cronq., Vasc. Pl. Pacif. N.W. 5: 223. 1955. **TYPE: Oregon.** [Protologue: "Plains of Oregon, near Walla-Walla"; label: "Wahlamet plains"], no date [Aug 1834], *T. Nuttall s.n.* (holotype: BM; isotypes: GH, K). Cronquist [et al.] 1994 noted that the locality is probably near Huntington in Baker County. The protologue locality is correct, the label mistaken, because *P. radiata* does not occur in the area of the Willamette ["Wahlamet"] River, visited by Nuttall at the end of August 1834 (Nesom 2025a).

Stems 1-6 from the base, 40-90 cm tall, erect to ascending-erect, glabrous **Leaves:** basal long-petiolate, blades broadly elliptic to obovate, 10-50 cm long, 4-20 cm wide, margins entire or undulate, occasionally spinulose-serrate, eciliate; cauline becoming smaller and sessile distally, margins entire or sharply spinulose-serrate, faces glabrous. **Heads** 1 or usually 3-12 in short, open corymbiform arrays. **Involucres** 20-32 mm high, 2.5-4 cm wide. **Phyllaries** in 5-6 series, ovate-oblong, subequal in length, glabrous, venation often apparent, margins entire with a narrow but distinct scarious rim, apices green, spreading. **Ray florets** sterile, 20-40, ligules erect, 6-12 mm long, longer than the involucre and conspicuous. **Disc corollas** 10-15 mm long. **Achenes** 6-11 mm long, 4-angled, glabrous. **Chromosome number**, $2n = 36$ (Anderson et al. 1974; Mayes 1976; counts from Baker Co., Oregon).

Flowering June-August (-September). Dry ridges and rocky slopes, grass-sagebrush or other shrubs, gravelly stream terraces; (2600-) 3300-5700 (-7500) feet. Endemic to the southern end of the Snake River canyon in Oregon (Baker and Malheur cos.) and Idaho (Washington Co.). Idaho Fish & Game (<https://idfg.idaho.gov/species/taxa/56113>) indicates that the species occurs in Payette County, but a voucher from there has not come to light.

Numerous conservation studies have been made of *Pyrrcoma radiata* (Kaye et al. 1990; Kaye & Meinke 1992; Mancuso & Moseley 1993; Moseley & Mancuso 1994; Kaye 2002; Petix et al. 2016).



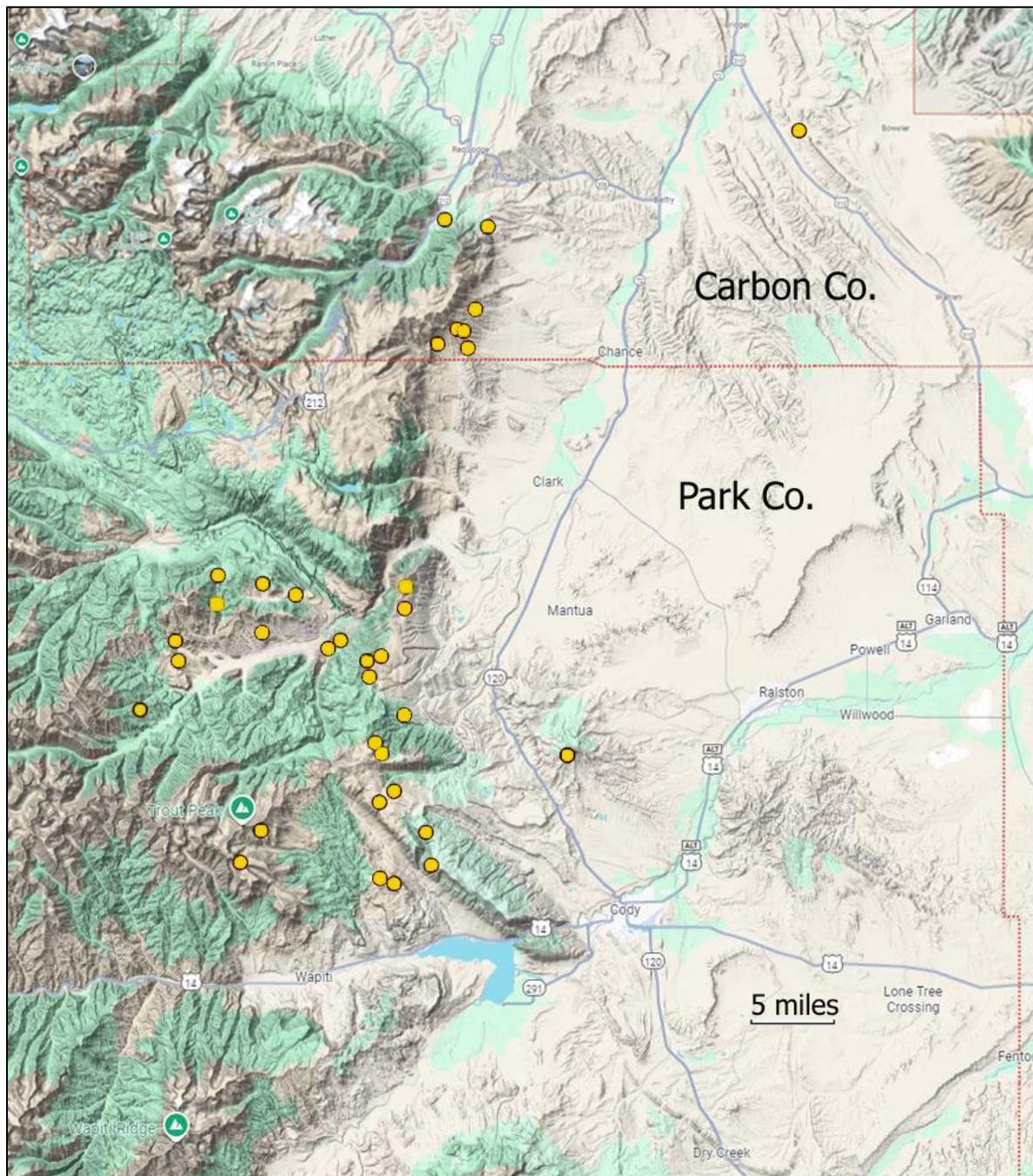
Map 1. Distribution of *Pyrocoma radiata*. Washington (red outline), Payette, Baker, and Malheur counties.

2. PYRROCOMA SUBSQUARROSA Greene, *Erythea* 3: 22. 1895. *Haplopappus carthamoides* subsp. *subsquarrosus* (Greene) H.M. Hall, Publ. Carnegie Inst. Wash. 389: 104. 1928. *Pyrocoma carthamoides* var. *subsquarrosa* (Greene) Brown & Keil, *Phytologia*. 73: 57. 1992. **Type:** Wyoming, Park Co.: Sunlight Basin, 5 Sep 1893, *J.N. Rose* 334 (holotype: US; isotype: UC)

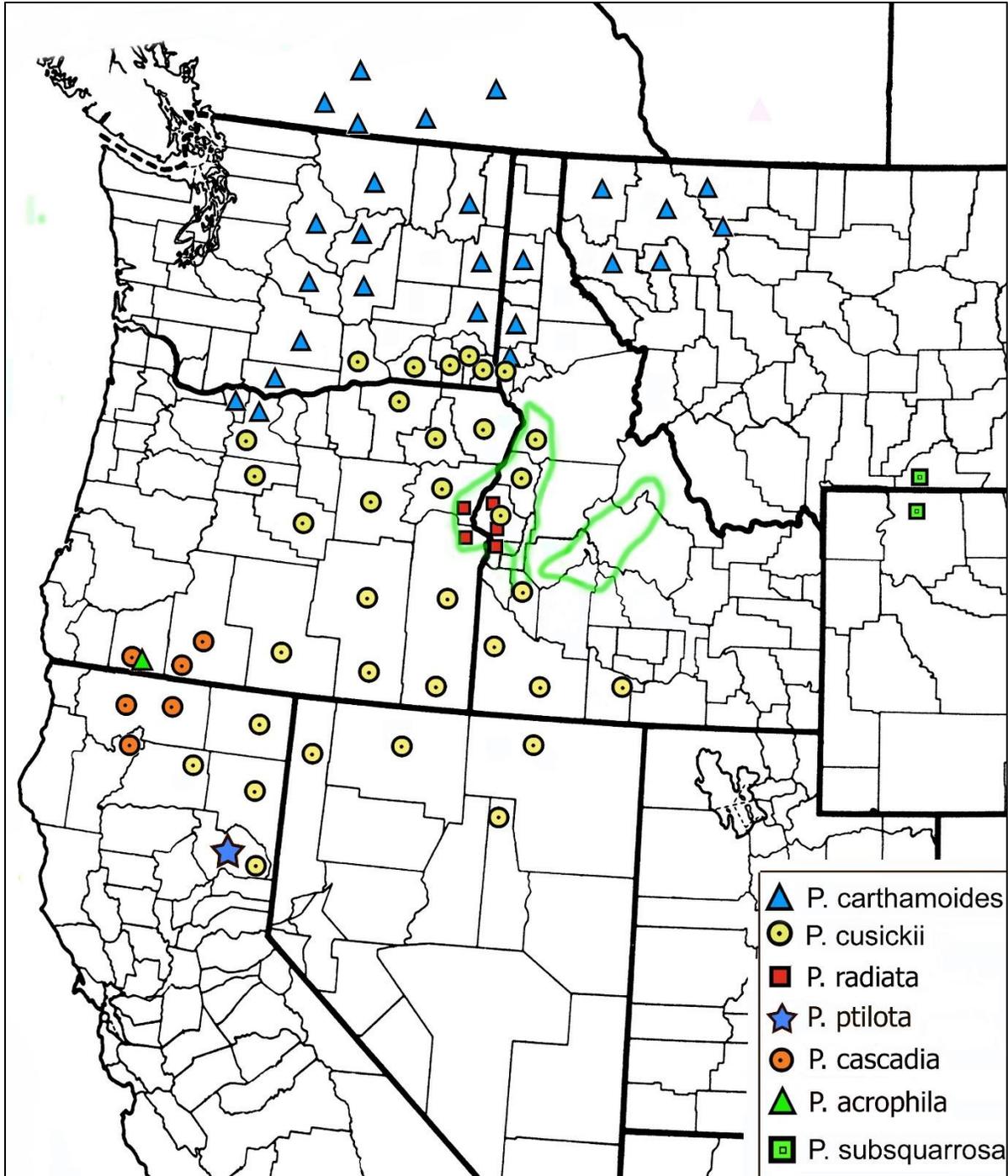
Stems 1–4 from the base, 100–250 cm tall, erect to ascending-erect or decumbent, sparsely cobwebby-pubescent. **Leaves:** basal narrowly oblong-lanceolate, 8–20 cm long, 1–2.5 cm wide, margins evenly spinulose-serrate with narrowly acute, sharply acute teeth, cauline becoming smaller and sessile distally, margins spinulose-serrate, faces tomentulose when young, glabrescent and becoming glabrous. **Heads** 1 or 2–4 and racemoid to subspicate. **Involucre** ca. 17 mm high, 20–25 mm wide. **Phyllaries** in 3–4(–5) series, loosely imbricate and subequal in length, puberulent, outer narrowly lanceolate, spinulose-margined, inner oblong, entire-margined, cuspidate from truncate apex. **Ray florets** 12–25, sterile, corollas 10–13 mm long, ligules linear, erect, 2–7 mm long, longer than the involucre. **Disc corollas** 9–12 mm long. **Achenes** 8–10 mm long, glabrous. **Chromosome number** not reported.

Flowering July through August (–September). Grassy slopes with scattered *Artemisia* spp. and *Ericameria nauseosa*, sometimes with scattered *Pinus flexilis*; 5500–7200 feet.

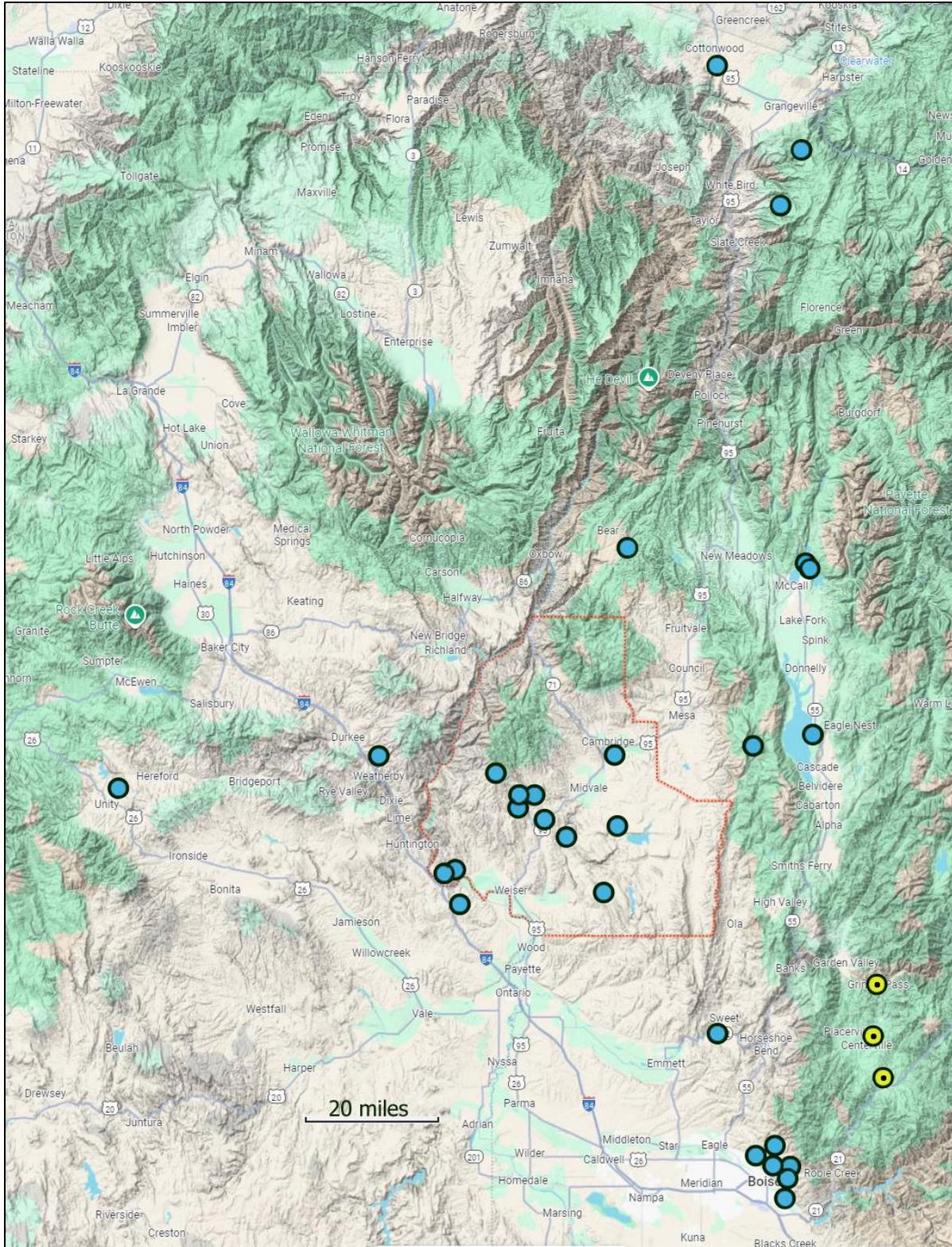
Pyrocoma subsquarrosa is endemic to Carbon Co., Montana, and adjacent Park Co., Wyoming. It has been treated as conspecific with *P. carthamoides*, beginning with Hall (1928), and apparently no one since has critically considered its taxonomy — but its morphological distinction and geographic disjunction provide rationale for its recognition at specific rank. Lesica (1995) prepared a detailed report on the morphology, distribution, biology, and ecology of the species and its conservation status in Montana, updated by Beatty et al. (2004). And see the Wyoming Field Guide <<https://fieldguide.wyndd.org/?species=pyrocoma%20carthamoides%20var.%20subsquarrosa>>.



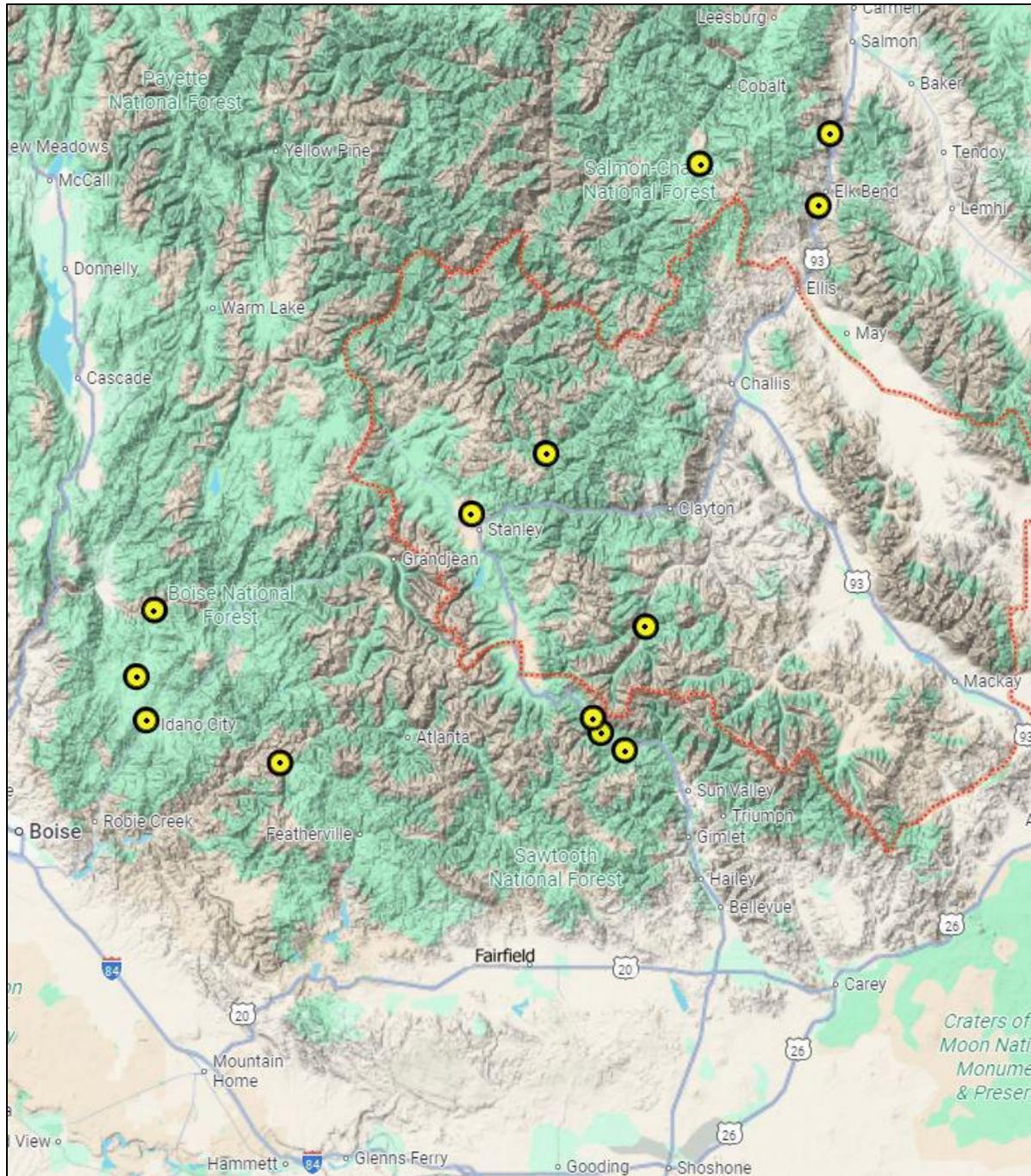
Map 2. Distribution of *Pyrocoma subsquarrosa*. Carbon Co., Montana, and Park Co., Wyoming.



Map 3. Distribution of *Pyrocoma carthamoides*, *P. cusickii*, *P. radiata*, and *P. subsquarrosa*, also including newly described *P. ptilota*, *P. cascadia*, and *P. acrophila*. Areas outlined in green include plants with rays more prominent than in typical *P. cusickii* and not considered as that species (see Ertter 2025). Maps 4 and 5 show the detailed distribution of collections that constitute these eastern and western segments of the *cusickii*-like plants.



Map 4. Distribution of *Pyrocoma* aff. *cusickii* — WESTERN segment. These localities include the two species segregated by Ertter (2025, this issue) as *P. boiseana* and *P. ponderosa*. Washington Co., Idaho, is outlined in red. Yellow symbols are Boise County localities for the EASTERN segment, from Map 5. Vouchers for map points are cited.



Map 5. Distribution of *Pyrocoma* aff. *cusickii* — EASTERN segment. Custer Co., Idaho, is outlined in red. Vouchers for map points are cited.

Pyrocoma* aff. *carthamoides-cusickii, WESTERN segment (Map 4). **IDAHO. Ada Co.**: Shaw Mtn Road E of Boise, dry foothills along road, 22 Jul 1973, *Ertter 378/3* (CIC); Polecat Loop Trail SSE of trailhead, foothills on N side of Boise, ca. 3400 ft, 24 Aug 2010, *Ertter 20555* (SRP, UC); Hillside to Hollow Reserve in Boise foothills, N-facing slope on Who Now Loop, 43.6536° N 116.213° W, ca. 3050 ft, 17 Jul 2019, *Ertter & DiNicola 23456* (SRP); Crestline Trail in foothills ca. 2 air mi NE of downtown Boise, 43.6362° N 116.1686° W, ca. 3280 ft, 3 Jul 2024, *Ertter 25578* (SRP); Old Pen Trail in Boise foothills due E of Idaho Botanical Garden, 43.60129° N 116.15575° W, N-facing slope of heavy clay, burned in 2016 and now dominated by *Taeniatherum caput-medusae* and other non-natives, ca. 2850 ft, 13 Jul 2024, *Ertter*

25581 (SRP + 3 duplicates); Peggy's Trail in foothills ca. 5 air mi N of downtown Boise, +/- NE-facing slopes at N end of main ridge, ca. 3345 ft, 14 Jul 2024, *Ertter & DeBolt* 25583 (SRP); trail from Miller Gulch Trailhead ca. 4 air mi NNE of downtown Boise, N-facing slope above path, 43.6754° N 116.1783° W, remnant patches of cryptogamic crust not yet completely taken over by non-natives, ca. 3460 ft, 17 Jul 2024, *Ertter* 25585 (SRP); Boise foothills ca. 3.5 air mi NE of downtown Boise, SE end of Corrals Trail, crest of N-facing ridge above trail, 43.656° N, 116.150° W, shrub-steppe, ca. 3675 ft, 4 Aug 2024, *Ertter* 25588 (SRP + duplicates); 8th St Extension/Sunset Peak Road ca. ½ road mi above lower parking lot for Hulls Gulch Interpretive trail, N-facing slope above roadcut, foothills ca. 4 air mi NE of downtown Boise, +/- intact shrub-steppe with well-developed cryptogamic crust, 43.6522° N 116.1394° W, ca. 4070 ft, 5 Nov 2024, *Ertter* 25650 (SRP). Adams Co.: Payette Natl Forest, ca. 20-25 air mi NNW of Council, Forest Rd 123, ca. 1.5 mi E of jct with Forest Rd 143, above Fawn Creek, 45.00929° N, 116.60152° W, open slope below road, 4914 ft, wet spring running down slope, with adjacent dry, lithosol sagebrush plateau, with *Pinus ponderosa*, *Artemisia rigida*, and *Allium tolmiei*, 30 Jun 2014, *Gilman et al.* 2014-032 (ID); NNE of Potato Knob below Payette Natl Forest Rd 214, ca. 15 air mi SE of Council, 44.5545° N, 116.257° W, semibarren volcanic field, 5680-5800 ft, 16 Jul 2000, *Nelson & Handley* 50792 (ID). Gem Co.: Sweet [ca. 43.97 N, 116.32 W], in the lava rock, 3500 ft, 14 Aug 1911, *Macbride* 1635 (ASC, ID, MO, MONT, NY, US, UTC, WS-2 sheets). Idaho Co.: Boise Natl Forest, "Cotton Wood" [ca. 46.047 N, 116.35 W], open gravelly hillside, 3000 ft, no date, *Grandjean* 286 (UTC not seen); Delmage Ridge in Skookumchuck Creek drainage, 9.7 mi E of Hwy 95 along Nez Perce Natl Forest Rd 2025, grass/forb community on open ridge with shallow soils over basalt, 45.7211894 N, 116.1718361 W, 4480 ft, 8 Jul 1995, *Sondenaa & Laughlin* 177 (ID); Clearwater Mtns, 9 mi S of Grangeville along Grangeville-Salmon Rd #221, near Cayuse Meadows, 45.8379867 N, 116.0893382 W, large basalt-scab opening adjacent to mixed conifer forest, 5000 ft, 23 Jul 1996, *Sondenaa* 362 (ID). Valley Co.: Ponderosa State Park, North Loop Road, 44.956° N, 116.0767° W, basalt outcrop soils, 5240 ft, 14 Aug 1982, *Duft* 1268 (CIC); Osprey Overlook at N end of peninsula in Payette Lake, Ponderosa State Park ca. 4 air mi N of downtown McCall, open conifer forest on isolated summit of fused basalt, 44.962° N 116.081° W, ca. 5250 ft, 26 Jul 2024, *Ertter & Grant* 25586 (7 duplicates); eastern shore of Cascade Reservoir on Sugarloaf Peninsula, 8 km N and 1 km W of Cascade, 4900 ft, 9 Jul 2004, *Yensen* 04142 (CIC) 04161 (CIC), 04163 (CIC). Washington Co.: Weiser River 30 mi NE of Weiser, 23 Aug 1941, *Christ* 12904 (ID, WS); ca. 7 mi SE of Midvale, ca. 1 mi N of the W end of Crane Creek Reservoir, relatively undisturbed *Artemisia*, *Purshia*, *Agropyron*, 3380 ft, plants up to 5 dm tall, 1 Jul 1992, *Mancuso* 680 (ID, OSC); ca. 10 mi N of Weiser, summit of Thousand Springs Creek Road, ca. 1 mi E of Hwy 95, 44.39047° N, 116.86364° W, 3200 ft, *Artemisia tridentata*, *Agropyron spicatum*, *Balsamorhiza sagittata*, 2 Jul 1992, *Mancuso* 682 (OSC); ca. 3 mi E of Olds Ferry, ca. 1 mi N of Indian Head Mtn, Dead Indian Ridge, 44.289° N, 117.144° W, E-facing, gentle slope, degraded volcanic substrate, 3360 ft, *Artemisia tridentata*, *Agropyron spicatum*, *Bromus tectorum*, *Balsamorhiza sagittata*, 6 Jul 1992, *Mancuso* 683 (OSC); ca. 0.5 mi S of the summit of Indian Head Mtn, ca. 3 mi ESE of Olds Ferry, S-facing slope, mostly *Bromus tectorum*, 2900 ft, up to 25 cm tall, 6 Jul 1992, *Mancuso* 684 (ID); just E of the NW end of Mann Reservoir, ca. 12 mi N of Weiser, 2920, scattered *Purshia* and *Artemisia*, 2920 ft, 11 Jul 1992, *Mancuso* 704 (ID, OSC); Sage Creek drainage, ca. 0.3 mi E of Fairchild Reservoir, *Agropyrum spicatum* community, 3840 ft, plants to 7 dm tall, 13 Aug 1996, *Mancuso* 1546 (ID); Idaho Almaden Mine ("Nutmeg Mtn") ca. 10 mi due E of Weiser, 44.246 N, 116.703 W, 3600 ft, 15 Jul 1986, *Packard & Ertter* 86-186 (CIC, UC); 18 air mi W of Cambridge, 1/2 mi S of Monroe Butte, 44.506 N, 117.030 W, shallow, coarse stoney basalts, 5400 ft, harsh, xeric scab with scant vegetation, *Agropyron spicatum*, *Poa sandbergii*, *Balsamorhiza sagittata*, 8 Sep 1993, *Riley* 2706 (CIC-PYNF, OSC); Hixon Sharptail Grouse Preserve, 15 mi N of Weiser, 1/4 mi E of Fairchild Reservoir, 4 mi N of Mann Creek Reservoir, open shrub-steppe with a few scattered conifer trees, W-facing slope, in a slight swale in deeper soils, blooming just after *Haplopappus radiatus* in the area, 3800 ft, 17 Aug 2005, *Tuason* 457 (ID); Hixon Sharptail Grouse Preserve, 15 mi N of Weiser, 1/4 mi E of Fairchild reservoir, 4 mi N of Mann Creek Reservoir, open shrub-steppe with a few scattered conifer trees, middle and lower 1/3's of E-facing slope, 3850 ft, in deeper soils and swales in patches often with *Haplopappus radiatus* but slightly more mesic in habitat, 26 Aug 2005, *Tuason* 479 (CIC, ID, WTU [prev. det. as *P. scaberula*]). OREGON. Baker Co.: Denny Flat, [44.4701614° N, 118.1427126° W], habitat="ARTRW8/POSE," 3800 ft, 25 Jun 1998, *Button* V-566 (CIC-ValeBLM); 30 mi N of Ontario, SE of Durkee, 44.5772839 N, 117.4130045 W,

3600 ft, *Artemisia tridentata* subpp. *tridentata* habitat, 25 Aug 1989, *Rosentreter 6252* (CIC). Malheur Co.: Malheur County Land Exchange parcel SM 38, between Moore's Hollow and Snake River, 44° 12' 32.9" N, 117° 06' 13.5" W, S-facing ash barren otherwise surrounded by sagebrush, 2800 ft, 3 Jun 1997, *Mansfield 97-34* (CIC).

Pyrocoma aff. cusickii, EASTERN segment (Map 5). **IDAHO**. Blaine Co.: 15 mi NW of Ketchum, along Baker Creek near Wood River, [ca. 43.83 N, 114.62 W], dry meadow, 6300 ft, 30 Jul 1941, *Cronquist 3508* (IDS); Phantom Hill area, along Hwy 75 ca. 3 mi N of SNRA headquarters, on both sides of hwy but primarily on E side at foot of Phantom Hill, [ca. 43.785 N, 114.494 W], very dry, flat location near intermittent streambed, 6500 ft, 21 Jul 1994, *Haberle s.n.* (ID); Smoky Mtns, basin of Big Wood River valley bottom, ca. 0.5 air mi NW of Prairie Campground, ca. 5.2 mi N along Hwy 93 from jct with Prairie Creek Rd, ca. 700 ft SSW off highway, 43° 49' 07.7" N, 114° 36' 16.4" W, seasonally moist weak drainage of *Artemisia tridentata vaseyana*-*A. arbuscula*/*Festuca idahoensis* basin near *Pinus contorta* forest edge, with aster, native bunchgrasses, 6935 ft, rays few-17/head, disc corollas 12-14 mm long, heavily grazed historically, currently a major sheep driveway, hundreds of plants, 2 Aug 1994, *Popvich 4025* (BBLM, CRMO, IDS). Boise Co.: Boise Basin, 4 air mi NW of Idaho City, [ca. 43.88 N, 115.91 W], common understory plant in open *Pinus ponderosa*-*Pseudotsuga menziesii* forest, Aug 1996, *Bjork 2837* (ID); S of bend in road to Pioneer Cemetery on W side of Idaho City, 43.8285° N, 115.8410° W, revegetated old dredge tailings in open ponderosa pine forest with scattered *Purshia tridentata*, ca. 3940 ft, 13 Sep 2024, *Ertter & Davis 25630* (SRP); 2 mi W of Lowman (jct Hwy 21), dirt road from Lowman to Garden Valley, [ca. 44.06 N, 115.81 W], 27 Apr 1983, *Semple et al. 2000* "2n=6II + 1 supernumerary, this population from buds" (MO; dups also at WAT, MT, RM, JCS, as cited on the label). Custer Co.: Germania Creek area, E fork of Salmon River, 44.0369 N, 114.4606 W, 29 Jun 1973, *Judd 73-67* (SRP); opposite Markles Store in Stanley, 6200 ft, 7 Jul 1935, *Smith 71* (IDS) and *Smith 85* (UTC); West Fork Yankee Fork Trailhead 8.0 mi N of Sunbeam, 44.3705° N, 114.7448° W, with *Senecio serra*, *Drymocallis* sp., *Penstemon* sp., *Dasiphora fruticosa* and *Pedicularis* sp., 6407 ft, 18 Jul 2010, *Smith 9082* (CIC). Elmore Co.: Roaring River Research Natl Area, 43.726 N, 115.470 W, 6440 ft, 14 Jul 1982, *Steele 1505* (BOIS). Lemhi Co.: Sheephorn Mt Lookout, SW of Salmon, E-facing slope along subalpine ridge S of lookout, 44.8826° N 114.09119° W, rocky loam soil, 8159 ft, 16 Jul 2021, *Corbin et al 2014* (SRP, glabrous, short stems, rays present); N-most reach of Silver Creek, hillside just N of creek, Salmon River Mts 28.8 air mi NW of Salmon, 44.93544° N, 114.35701° W, xeric soil within shrub-steppe vegetation, SW aspect, rhyodacite geology, 6313 ft., 10 Aug 7643, *Irwin 7643* (ID); Rattlesnake Creek area ca. 5 mi from Salmon River above Williams Lake off Hwy 93, roadside embankment, 15 Jul 2001, *Schwartz & Davis 278* (IDS).

3. PYROCOMA CARTHAMOIDES Hooker, Fl. Bor.-Amer. 1(6): 307, plate 107. 1833. *Haplopappus carthamoides* (Hook.) A. Gray, Proc. Acad. Nat. Sci. Philadelphia 15(3): 65. 1863 [1864]. *Aster carthamoides* (Hook.) Kuntze, Rev. Gen. 1: 317. 1891. **TYPE**: [Protologue]: "North-West coast of America," *D. Douglas s.n.* (holotype: K; isotypes: BM, G-DC, NY). Figure 1.

Pyrocoma rigida Rydb., Bull. Torrey Bot. Club 27: 624. 1900 [not *Pyrocoma rigida* Phil., 1858]. *Haplopappus rigidus* Blank., Sci. Stud. Montana Coll. Agric., Bot. 1: 100. 1905. *Haplopappus carthamoides* subsp. *rigidus* Hall, Publ. Carnegie Inst. Wash. 389: 103. 1928. *Haplopappus carthamoides* var. *rigidus* M. Peck, Man. Pl. Oregon, 712. 1941. **TYPE**: **Idaho**. Kootenai Co.: Granite Station, sandy places, 29 Jul 1892, *J.H. Sandberg 785* (holotype: NY; isotypes: BM-2, CAS, F-2, GH, K, PH, RSA).

Pyrocoma erythropappa Rydb., Bull. Torrey Bot. Club 27: 624. 1900. *Haplopappus carthamoides* subsp. *erythropappus* (Rydb.) Hall, Publ. Carnegie Inst. Wash. 389: 105. 1928. *Haplopappus carthamoides* var. *erythropappus* (Rydb.) H. St. John, Fl. S.-E. Washington, 455. 1937. **TYPE**: **Idaho**. Nez Perce Co.: Clear Water, no other collection data, *H.H. Spalding s.n.* (holotype: NY; isotype: GH). Figure 2.

The printed label says "Oregon", which is the territory in which Rev. H.H. Spalding's mission was established in 1836, on the Clearwater River at the mouth of Lapwai Creek; this is now in Nez Perce Co., Idaho.

Stems 30–50 cm long, erect to ascending or decumbent-ascending, minutely sparsely tomentose, eglandular. **Leaves:** basal oblanceolate to spatulate-oblanceolate, 5–20 cm long, blades 1–2 cm wide, old petiole bases not persistently fibrous, margins entire to spinulose-serrate, cauline 6–12, oblanceolate, gradually reduced in length distally, faces sparsely puberulent to glabrate, eglandular. **Heads** usually 1, rarely congested-racemoid and 2–3(–4) on peduncles 0.5–4 cm long, immediately subtended by leaflike bracts often longer than the involucre. **Involucres** 20–35 mm wide (pressed). **Phyllaries** in (3–)4–5 series, loosely appressed, oblong-obovate, green-herbaceous except at the very base, unequal to subequal in length, inner series 14–20 mm long, margins usually scarious, entire to shallowly to deeply spinulose-serrate, apices acute and often apiculate, occasionally recurved, faces minutely hirsutulous to sparsely strigillose with short, tightly appressed hairs, eglandular. **Ray florets** absent or few, sterile, corollas 9–12 mm long, ligules erect, linear-oblong, shorter than or equalling the involucre. **Disc corollas** 10–11 mm long. **Achenes** 5–6.5 mm long, glabrous; pappus bristles apically thickened and dilated. Figure 3.

Chromosome number, $2n = 12$ (Kamiak Butte, Whitman Co., Washington — Semple 1980; S of Tieton River, near Lost Lake, Yakima Co., Washington — Semple 1985; Latah Co., Idaho — Mayes 1976, Whitman Co., Washington — Mayes 1976; Mt. Kobau, near Keremeos, British Columbia — Taylor & Brockman 1966).

Flowering (June-) July through August (-September). Openings and open pine and pine-fir woods, rocky summits, ridges, slopes, meadows, and drainages, slide areas, gravelly clay, hard-packed clay, roadsides, old roadbeds; (1250-) 2000-3600 (-5400, -?6000) feet.

Pyrocoma carthamoides is recognized by its erect, villous stems, hispidulous leaves and phyllaries, and large, usually single heads with oblanceolate-obovate, somewhat loosely appressed phyllaries of unequal length, but variation in involucre morphology is considerable. Plants of *Giblin* 7687 (WTU) near Cash Prairie in Yakima County have unusually small involucre.

As noted by Cronquist (1955), plants of *Pyrocoma carthamoides* from along the Columbia River gorge in Wasco and Hood River counties, Oregon, have spinulose-margined phyllaries. The type collection by David Douglas was made in that area.

4. PYRROCOMA CUSICKII (A. Gray) Greene, *Erythraea* 2: 59. 1894. *Haplopappus carthamoides* var. *cusickii* A. Gray, *Synopt. Fl. N. Amer.* 1(2): 126. 1884. *Haplopappus carthamoides* subsp. *cusickii* (A. Gray) Hall, *Publ. Carnegie Inst. Wash.* 389: 104. 1928. *Pyrocoma carthamoides* var. *cusickii* (A. Gray) Kartesz & Gandhi, *Phytologia*. 71: 60. 1991. **TYPE: Oregon.** Union Co.: holotype GH 8654 label: "Union Co., Eastern Oregon, Cusick 1887," no other collection data; GH isotype 8655 label: "Oregon. Union Co., Cusick June 1883." **Other labels:** Sterile, heavy soil, 3-4000 ft, or 3-5000 ft, May and/or June, [1877-1880], *W.C. Cusick 445* (holotype: GH 8654; isotypes: F, ?GH 8655, NY, OSC-ORE, US, YU-2 sheets). It is not clear whether GH 8654 or GH 8655 should be regarded as the holotype — in any case, they are the same species.

Stems 10–15(–35) cm, mostly decumbent-ascending, puberulent, eglandular. **Leaves:** basal spatulate-lanceolate, 5–20 cm long, 10–20 mm wide, old petiole bases not persistently fibrous, margins dentate-spinulose, teeth mostly above the middle, 5–10 per side, cauline 3–6(–8), oblanceolate to narrowly oblong-lanceolate or oblong-oblanceolate, faces minutely puberulent to glabrescent, eglandular. **Heads** 1–2(–3) on peduncles 1–3 cm long, immediately subtended by 1–3 leaflike bracts often longer than the involucre. **Involucres** 15–20(–30) mm wide (pressed). **Phyllaries** in 3–4 series, loosely appressed, oblong-lanceolate to narrowly lanceolate-triangular, green-herbaceous except at the very base, equal to subequal or unequal in length, inner series 14–16 mm long, margins entire to serrate- or serrulate-spinulose, without a scarious rim, apices acute, outer and outermost longer than the inner and bract-like. **Ray florets** absent or ca. 2–6 and sterile, corollas erect, linear-oblong, mostly 1.5–3

mm long, shorter than the involucre, pale yellow. **Disc corollas** 9–12 mm long. **Achenes** 5–8 mm long, glabrous; pappus bristles apically acute. Figures 4-8.

Chromosome number, $2n=12, 24$ (Kaye et al. 1990).

$2n = 12$ Wallowa Co., locality and vouchner not known.

$2n = 24$ Malheur Co.: Along Mahogany Gap Road, ca. 11 mi W of Hwy 95, 43.14034° N, 117.1986° W, alkali flats, 28 Jul 1989, *Kaye 1049* (OSC).

Flowering June through September. Pine forest, sagebrush scrub, dry slopes, openings in pine and mixed hardwoods forest, lava fields; 2950–9200 feet.

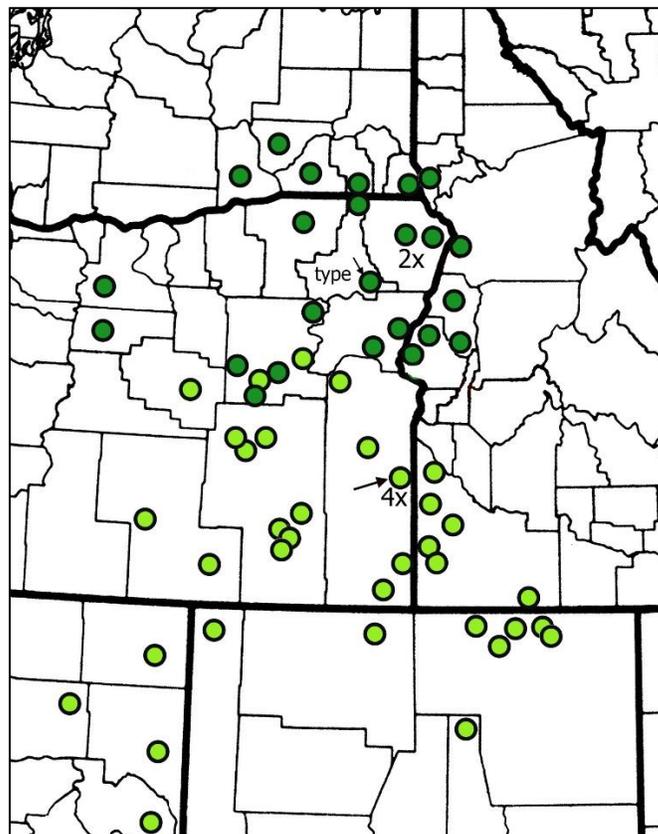
Pyrrhoma cusickii has been considered conspecific with *P. carthamoides*, but the two are allopatric and distinct in morphology. Compared to typical *P. carthamoides*, plants of *P. cusickii* have shorter and more decumbent-ascending stems, the involucre have lanceolate, loosely appressed phyllaries of subequal length, and the pappus bristles are apically acute. In his description of *Haplopappus carthamoides* sensu lato, Hall (1928) noted that ray florets are "entirely wanting" on some plants. This has been repeated in subsequent descriptions and confirmed in our observations.

Where the ranges of *Pyrrhoma cusickii* and *P. carthamoides* come into close contact (Wasco Co., Oregon, Map 1), intermediates have not been observed.

P. cusickii - Warm Springs Indian Reservation, sandy grassy slopes, 10 Jun 1925, *Gorman s.n.* (COLO); barren slopes near The Dalles, 6 Jul 1935, *Thompson 11,879* (US).

P. carthamoides - Ortlely Hill, 7 mi W of the Dalles, 4 Jul 1938, *Baker 921* (ID).

Two morphological "phases" can be delimited within *Pyrrhoma cusickii* (Map 6).



Map 6. Morphological "phases" of *Pyrrhoma cusickii*. The localities of diploid (2x) and tetraploid (4x) chromosome counts are shown.

The northern phase: Stems from this area average longer, with a tendency for single heads, and leaves often are entire. Includes the type of *P. cusickii*.

The southern phase: Plants from this area are shorter and more decumbent, with narrow leaves that are more likely to be serrulate. Multiple heads are common. In cytological studies by Kaye et al. (1990), a sample of *P. cusickii* from the Wallowa Mountains (voucher not found) was diploid ($2n=12$), while that from Malheur County (*Kaye 1049-OSC*) was tetraploid ($2n=24$).

5. PYRROCOMA PTILOTA Nesom, **sp. nov.** **TYPE: California.** Plumas Co.: E side of Forest Road 27N54, ca. 5.5 mi (air) NW of the Boulder Creek Work Center at Antelope Lake, along a poor logging road NE of a small branch of Lights Creek, 40.2086° N, 120.7121° W, yellow pine forest, dry, bare, gravelly clay soil, 5976 ft, common, normal size plants, 10 Aug 2005, *L. Ahart 12306* (holotype: JEPS; isotypes: CHSC, RSA). Figure 18.

Similar to *Pyrrocoma cusickii* in its heads immediately subtended by foliaceous bracts and lack of ray florets but stems erect from the base, cauline leaves relatively unreduced and mostly longer, and heads usually in a spike or short-peduncled raceme. The epithet ("feathered") alludes to Plumas County ("plumas," feathers), which was named for the Feather River. As in *Pyrrocoma cusickii*, the ray flowers of *P. ptilota* (and *P. cascadia*, below) are either completely absent or sterile and undiscernible without opening the opening the involucre. Heads in each tend to be in a spike or narrow raceme and each has a relatively large and clearly bounded geography.

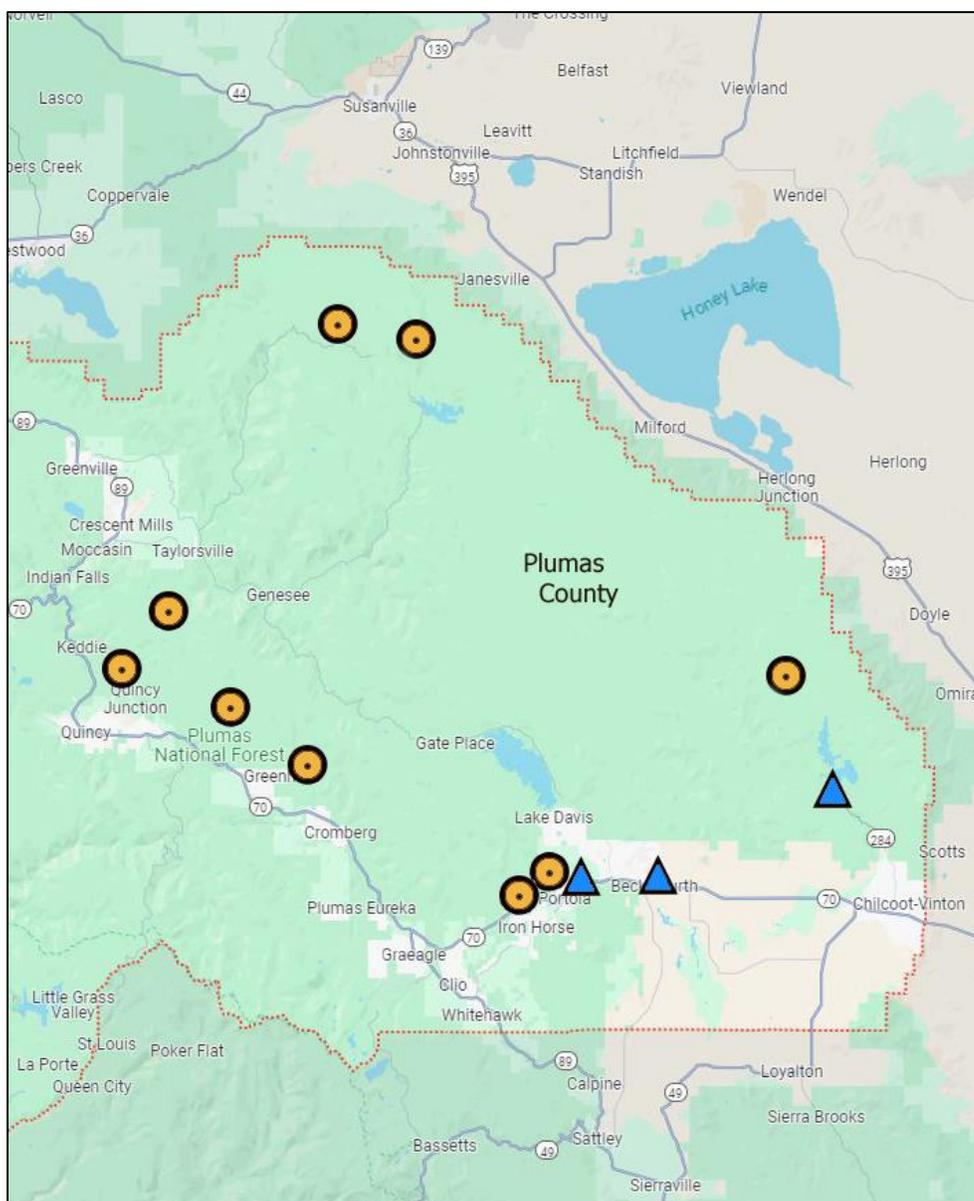
Stems erect from the base, (13–)20–30 cm, evenly and densely puberulent, eglandular. **Leaves:** basal persistent, narrowly oblanceolate, 12–17 cm long, blades 14–20 mm wide, minutely puberulent-hirtellous, eglandular, margins entire to shallowly serrulate or denticulate, cauline evenly distributed, little reduced in size up to the heads, not clasping or subclasping, margins entire or with a few small teeth. **Heads** 1 or usually 2–6 in a spicate (to short-pedunculate-racemoid) inflorescence, each immediately subtended by a narrow leaf-like bract longer than the involucre, peduncles 0.1–1(–2.5) cm long. **Involucres** 12–15 mm wide (pressed); phyllaries narrowly oblong to narrowly oblanceolate and apically acute to acute-attenuate with a sharp, indurate apiculum, in 3(–4) series of equal to subequal length, inner 17–20 mm long, green-herbaceous except white-indurate at the base, evenly and densely puberulent, eglandular, margins entire. **Ray florets** absent. **Disc corollas** 10–13 mm long. **Achenes** ca. 7 mm long, glabrous; pappus bristles apically acute, not thickened. Figures 17–28. **Chromosome number** not reported.

Flowering July through September. Ridge tops, alkaline flats with silver sage and saltgrass, openings in manzanita, sagebrush, borders between sagebrush and Jeffrey pine, dry yellow pine woods; 4500–7500 feet.

Additional collections. California. Plumas Co.: Portola, 39° 48' 57.7" N, 120° 28' 37" W, large opening on vernal moist volcanic scabland, ca. 4940 ft, 28 Jun 2002, *Clifton 38,204* (RENO); Mount Hough Road, Quincy Quad 681 9461 44 27 639N [39.981 N, 120.87 W, 2 air mi NE of Quincy Jct], openings in manzanita, ca. 4800 ft, 25 Jul 2004, *Clifton 43,078* (RENO); near Diamond Mtns, Susanville Quad, 40° 18' 15" N, 120° 39' 23" W, ridge top, NE aspect, 7448 ft, 4 Aug 1980, *Clifton 47,128* (PUA); 2.5 mi from Quincy Jct on road to Mt. Haugh, 4100 ft, 11 Jul 1967, *Howell 43297* (CAS); N end of Sierra Valley, moist alkaline flat with silver sage and saltgrass, 4800 ft, 18 Aug 1982, *Schoolcraft 907* (ELH); ca. 3 air mi N of Spring Garden, NE corner of jct of 25N42 and 401 (E and above Squirrel Creek), NE corner of road junction, 39.931389 N, 120.785278 W, yellow pine forest, dry woods, 4500 ft, with *Crepis pleurocarpa*, *Stephanomeria lactucina*, *Goodyera oblongifolia*, 21 Jul 1981, *M.S. Taylor 4082* (CHSC); Diamond Mtns, Last Change Creek N of Frenchman Lake, along Forest Rd 25N70 about 0.4 mi E from County Rd 176, 39.9986 N, 120.21012 W, border of large *Artemisia arbuscula*-*Purshia tridentata*-dominated flat and adjacent *Pinus jeffreyi* forest, 5660 ft, 12 Jul 2001, *Taylor 17,832* (JEPS).

A specimen labeled as collected in Lake Co., Oregon (Round Grove [ca. 30 mi WNW of Lakeview on Hwy 140], 8 Aug 1897, *Mrs. R.M. Austin 1607-US*, Fig. 0) is unambiguously *Pyrocoma ptilota*. Mrs. Austin collected and sold botanical collections from California and Oregon — from 1865, she lived in Plumas and Modoc counties (biographical summary and reference in Wikipedia, and see biographical notes in Ertter & DiNicola 2025), and it seems probable that the *Pyrocoma* collection was made in Plumas County, mislabeled as from southern Oregon.

***Pyrocoma cusickii* in Plumas County.** Middle Fork Feather River, Portola Quad 722 587E 44 10 266N [39.8148 N, 120.4008 W], sparse yellow pine forest, slight slope in gravelly soil, ca. 4865 ft, 15 Jun 2002, *Clifton 37993* (RENO); Portola, 4850 ft, 25 Sep 1961, *Howell 36957* (GH); Portola, 4800 ft, 17 Jun 1962, *Howell 37716* (CAS); E side of 24N01 (Frenchman Lake quad) on a side of Frenchman Lake, 0.8 mi S of Salmon Egg Shoal, 1.0 mi S of jct 24N01 and 25N11 at N tip of Frenchman Lake, ca. 13 mi NW of Chilcoot, open bare areas in sagebrush scrub, ca. 5700 ft, 25 May 1981, *M.W. Taylor 3950* (CHSC). Plants in these collections are typical *P. cusickii* without evidence of intergradation with *P. ptilota*.



Map 7. *Pyrocoma ptilota* (circles), all collections, and *P. cusickii* (triangles) in Plumas Co., California.

A collection from Modoc County has tall erect stems (15-25 cm high) and long leaves (up to 29 cm long) like *P. ptilota* but solitary heads — it is identified here as a variant of *Pyrrocoma cusickii*.

Warner Mts., Cottonwood Creek, arid W slope under *Artemisia tridentata*, 5500 ft, 12 Aug 1935, Wheeler 3827 (CAS, LL, POM, RSA).

6. PYRROCOMA CASCADIA Nesom, **sp. nov.** **TYPE: California.** Siskiyou Co.: Sterling Mtn, Soda Creek, 41.966° N, 122.796° W, open rocky E ridge, 3500 ft, 29 Jun 1934, L.C. Wheeler 2830 (holotype: CAS; isotypes: DS, LL). Figures 11, 12.

Similar to *Pyrrocoma ptilota* in its spicate inflorescence; different in its more densely hirsutulous stems, shorter involucre with fewer phyllaries (phyllaries in 2–3(–4) series vs. 3(–4) series, without an indurate basal portion, inner 12–14 mm long vs. 17–20 mm long), shorter disc corollas (7–9 mm long vs. 10–13 mm).

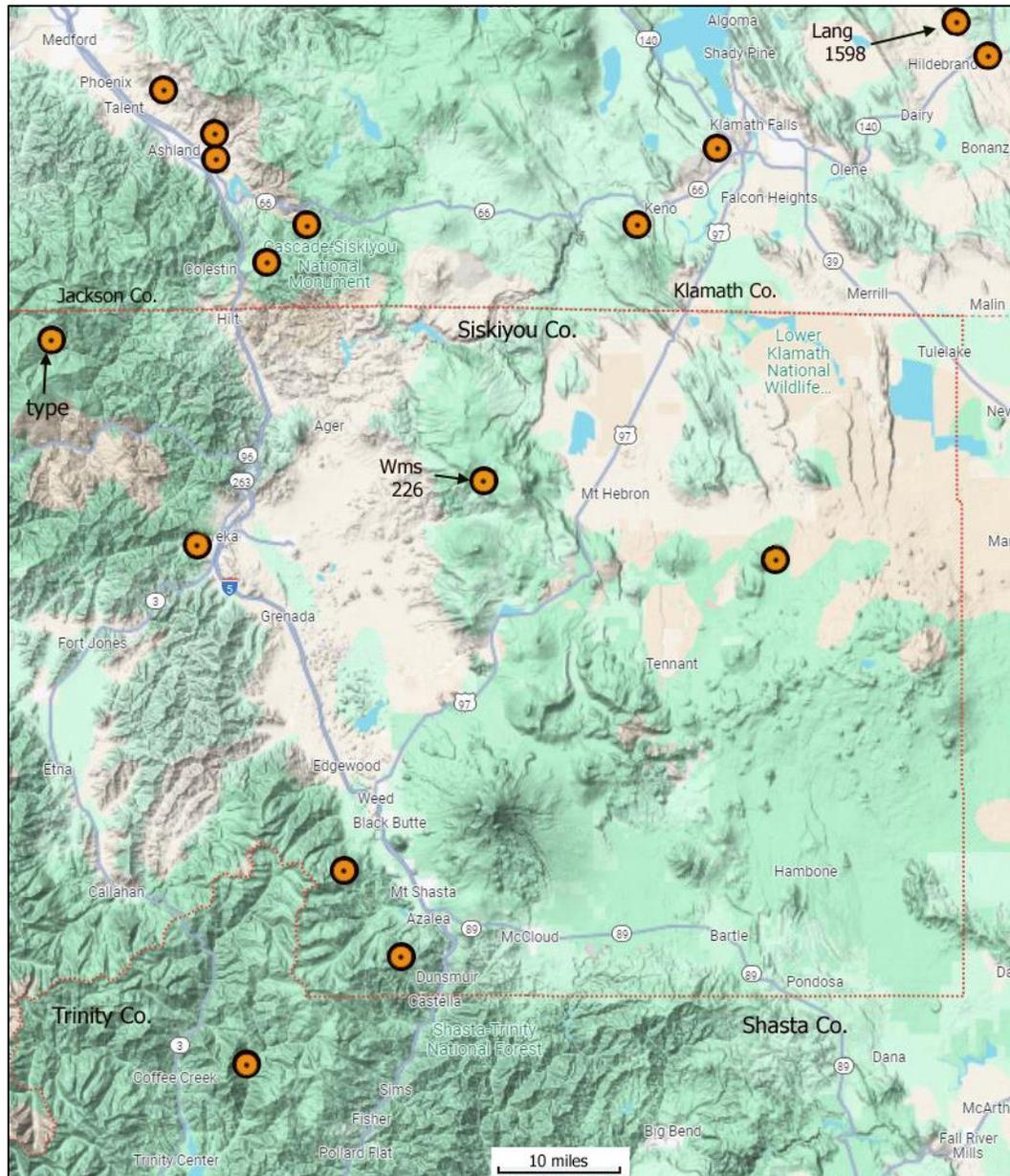
Stems erect from the base, (15–)20–35 cm, evenly puberulent-hirsutulous. **Leaves** basal and cauline, without a distinct basal rosette, basal 5–9 cm long, narrowly oblanceolate, attenuate to a petiolar region 1/4–1/2 the leaf length, sometimes not persistent, without persistent fibrous remains, blades 3–10 mm wide, puberulent-hirtellous to glabrate, eglandular, margins spinulose-apiculate to shallowly serrulate, cauline mostly linear-oblanceolate to narrowly oblong-oblanceolate or narrowly elliptic-lanceolate, evenly distributed up to the heads, hardly reduced in size from the basal, not at all clasping or subclasping. **Heads** (1–)2–4, spicate or subspicate to racemoid on peduncles 1–3 cm long, from distantly separated nodes, each immediately subtended by a narrow leaf-like bract subequal in length to the involucre. **Involucre** 12–15 mm wide (pressed), immediately subtended by 1–3 leaf-like bracts slightly longer than the phyllaries; phyllaries narrowly oblong-lanceolate, in 2–3(–4) series of nearly equal length, oblong with a broadly lanceolate apex, inner 12–14 mm long, upper 3/4 green-herbaceous, puberulent, eglandular, margins without a hyaline rim, entire to spinulose-dentate. **Ray flowers** absent. **Disc corollas** 7–9 mm long. **Achenes** glabrous; pappus bristles apically acute, not thickened. Figures 11-16. **Chromosome number** not reported.

Flowering (May–) June through August (–September). Dry slopes, ridges, openings in pine woods and in *Arctostaphylos* chaparral, open meadows, rarely over serpentine; 3600–6000 feet.

The spicate inflorescence of *Pyrrocoma cascadia* is similar to that of *P. ptilota*, but the two are distinct in geography and morphology. Plants with only a single head identified here as *P. cascadia* (e.g., Williams 226–Fig. 16, Lang 1598; Map 6) have an aspect similar to *P. cusickii*, but they are regarded here as populational variants needing further investigation. Similarly, variants in typical *P. cusickii* often have more than one head (*P. ptilota* variants also sometimes have a single head. Allowing for this variation, *P. cascadia* and *P. cusickii* are allopatric. Popovich 4019 (SRP) from just west of Paisley in Lake County has relatively short involucre and perhaps is a *cascadia-cusickii* intermediate.

Additional collections. CALIFORNIA. Siskiyou Co.: Near Forest House, close to the town of Yreka, 41.73075 N, 122.695694 W, evergreen conifer forest, just off ridge, gravelly soil mostly of serpentine, 3599 ft, 30 Jun 1978, Clifton & Ground 1659 (PUA); Shasta Region, Castle Lake Trail, 41.23 N, 122.35 W, 18 Aug 1900, Congdon s.n. (UC, on same sheet with the other Congdon collection); Mt. Eddy, 41.32 N, 122.48 W, 18 Aug 1900, Congdon s.n. (UC, on same sheet with the other Congdon collection); Klamath Natl Forest, NE side of Sharp Mtn, 41.714° N, 121.751° W, "Eastside Pine" association, 12 Sep 1991, Steiger s.n. (KNF); Siskiyou Mts, Soda Creek, Sterling Mtn, open rocky E ridge, no date, Wheeler 2830 (CAS, DS); Klamath Natl Forest, Goosenest District, Martin's Dairy, 41.80034 N, 122.19938 W, open meadows, with *Calochortus greenii*, 6000 ft, 28 Jul 1987, Williams 226 (KNF). Trinity Co.: N of Bonanza King Lookout, summit of ridge, immediately above N headwaters spring of Scorpion Creek, 41° 06' N, 122° 36' W, bare soil in opening of otherwise dense *Arctostaphylos patula* chaparral, 1700 m, 17 Jul 1994, Hrusa 11898 (CDA). **OREGON.** Jackson Co.: Near Talent, on the hills, 22 Jul 1902, Cusick 2901b (WS); Ashland, 25 Jul 1887, Howell 745 (WILLA);

near Ashland, dry slopes, 22 Aug 1916, *Peck 2680* (OSC); Ashland, dry field, 14 Jul 1913, *Peck 2685* (WILLU); Green Springs Summit, Jul 1954, *Pengelly 1543* (SOC not seen). **Klamath Co.:** Potter Mill, open meadow in ponderosa pine, clay, 4200 ft, 9 Jun 1957, *McLeod 1543* (SOC); SW of Sprague River, meadow, 15 Jul 1988, *Lang 1598* (OSC); Hwy 40, 3 mi N of turnoff to Bonanza, 10.2 m N of Dairy, 42° 20' 28" N, 121° 24' 01" W, ponderosa pine and mixed hardwood, rocky flats near ephemeral stream, volcanic soil, 1530 m, 12 Jul 1993, *Schmidt et al. 1017* (TEX); Klamath Falls, 2nd St. Hill, 2 May 1937, *M.K. Small 468* (SOC).



Map 8. Distribution of *Pyrocoma cascadia*. Jackson and Klamath cos., Oregon, and Siskiyou and Trinity cos., California. Arrows point to collections with monocephalous stems.

***Pyrocoma cusickii* in Lake Co., Oregon.** Warner Mtns, Desert Lake, 24 Jun 1941, *Leach s.n.* (OSC, RENO); Warner Range, 1900 m, 25 Jul 1896, *Coville & Leiberg 43* (US); ca. 15 air mi W of town of Paisley, Fremont Natl Forest, foothills of E side of Cascade Mtns, "Winter Ridge" tableland,

several hundred yards E on Road 450 from jct with Road 28, 42.7099° N, 120.8287° W, rocky, dry sage-grass opening in *Pinus ponderosa/contorta* park-like forest, dry, shallow, rocky soil, lightly grazed, with *Poa*, *Sitanion hystrix*, *Artemisia tridentata*, *Linanthastrum*, *Danthonia unispicata*, 2013 m, hundreds of plants, 13 Jul 1994, *Popovich 4019* (SRP).

7. PYRROCOMA ACROPHILA Nesom, **sp. nov.** **TYPE: Oregon.** Jackson Co.: Dry sunny summit of Siskiyou, above the Inns, Oregon-California line, 11 Jul 1930, *L.F. Henderson 12681* (holotype: OSC). Figures 24-28.

With the aspect of *P. cascadia*, especially in its open-spicate inflorescence, but the involucre wider (16–20 mm vs. 12–15 mm), phyllaries fewer (in 2–3 series vs. 2–3(–4) series), ray florets present (vs. absent) with erect corollas slightly longer than the involucre, cauline leaves opposite to subopposite, subclasping (vs. alternate, not at all clasping), and remnant fibers of the basal leaf petioles persistent (vs. not persistent). Similar to *Pyrrocoma* variants of central Idaho in its spicate inflorescence of few heads, ray florets with erect corollas, opposite to subopposite leaves, wide involucre (16–20 mm and 15–25(–30) mm), and phyllaries of subequal length; different in its persistent fibers of the basal leaf petioles (vs. fibers absent), shorter involucre (inner phyllaries 12–14 mm vs. 15–20 mm) and fewer phyllaries (2–3 series vs. 3–4 series).

Stems erect from the base, 9–22 cm, evenly puberulent-hirsutulous, eglandular. **Leaves** without a distinct basal rosette, sometimes none of the basal persistent, basal 5–11 cm long, narrowly oblanceolate, attenuate to a petiolar region 1/4–1/2 the leaf length, fibrous remnants of petiole bases persistent, blades 5–12 mm wide, puberulent-hirsutulous, eglandular, cauline oblanceolate to oblong-oblanceolate, 3–6 cm long, evenly distributed up to the heads, hardly reduced in size from the basal, distinctly subclasping, proximal and medial opposite to subopposite, margins spinulose-apiculate with 4–8 pairs of teeth. **Heads** 1 or 2, proximal widely separated, lateral sessile to subsessile (peduncles 1–3 cm long), each immediately subtended by a narrow leaf-like bract subequal in length to the involucre. **Involucre** 16–20 mm wide (pressed), immediately subtended by a leaf-like bract equalling or slightly longer than the phyllaries; phyllaries narrowly oblong-lanceolate, in 2–3 series of equal to subequal length, oblong-lanceolate with a lanceolate-triangular apex, inner 12–14 mm long, upper 3/4 green-herbaceous, puberulent, eglandular, margins without a hyaline rim, entire or those of the outer spinulose. **Ray flowers ca.** 16–20, sterile (presumably), corollas 10–12 mm long, erect, slightly but conspicuously longer than the involucre, not coiling, 0.5–1 mm wide. **Disc corollas** 8–10 mm long. **Achenes** glabrous; pappus bristles apically acute, not thickened.

This collection from Jackson County is from just north the California border and within the geographic range of typical *Pyrrocoma cascadia*. Collections of *P. cascadia* have been made in the area of the type locality, but morphology suggests that *P. acrophila* is closely related to the variants in central Idaho — it hardly could be interpreted as a populational variant of *P. cascadia*. *Pyrrocoma acrophila* is particularly unusual among the permutations of morphological expression in the *P. carthamoides* group in its retention of the fibrous remnants of petiole bases, a feature otherwise not seen in the other taxa.

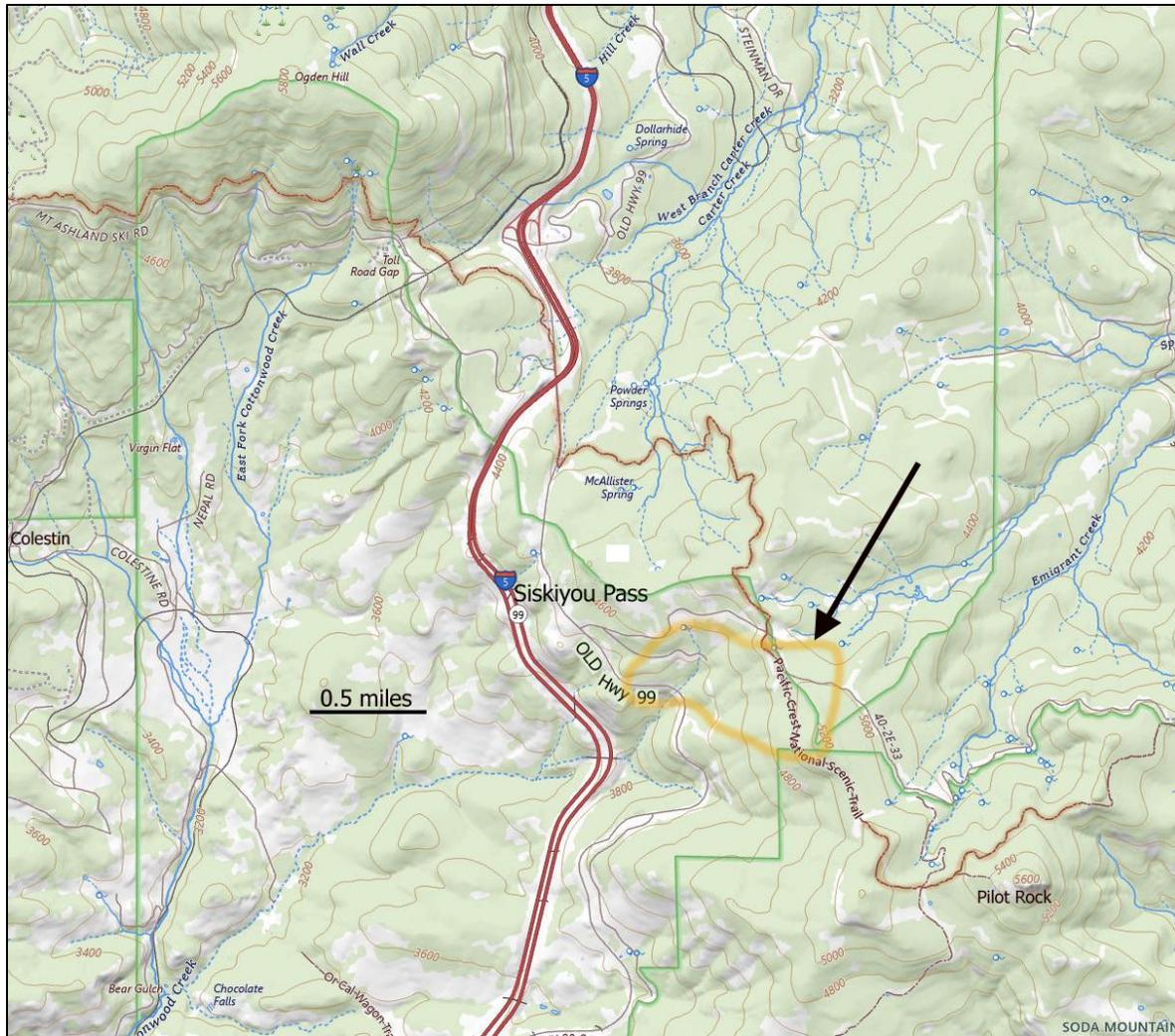
Henderson's locality description puts him in the area of Siskiyou Pass just north of the California border. The "Inn" and the "Inns" in Henderson's reference apparently were to the Summit Ranch Lodge (on the west side of the highway, old Hwy 99, with cabins and restaurant,) and the Siskiyou Camp (on the east side of the highway, with guest cabins and the main building, Siskiyou Inn, adjacent to the summit gas station) – Photo 1. He made various collections in that area in June and July 1930, with representative locality data below.



Photo 1. Siskiyou Summit in the 1930's, looking north-northwest — Summit Ranch Lodge on left (west side), newly constructed Richfield Beacon service station on right (east side), (<<http://livinggoldpress.com/siskiyou.htm>> from a postcard). The tower is the Richfield Beacon.

Siskiyou Mts; between the two Inns
 Siskiyou summit, above Inns
 Ridge of the Siskiyous, above the Inns, near Co line
 Siskiyou Ridge far above Inns, near Cal. line.
 Rocky tops of Siskiyou Mts., far above Inns and highway
 Top of Siskiyous, near the Inns
 High exposed ridge of Siskiyou Mts., far above Inns
 Summit of Siskiyou Mts, near Inns
 Summit of Siskiyou Mts., above The Inns
 Siskiyou Inn, near summit of Siskiyou Mts.
 Along a shady creek, N side of Siskiyous, below Siskiyou Inn

N slope of Siskiyou Mts, just below summit and Inn
 Siskiyou Camp, 6 mi. from Cal. line
 Near the Siskiyou Inn, in Siskiyou Camp, elev. 4000 ft.
 North and below Siskiyou Camp
 North of Siskiyou Camp
 Hill north of Siskiyou Camp, below
 North of Siskiyou Camp, elev. 4500 ft.
 Along the mill-road, north and below Siskiyou Camp
 Sunny banks of a mill north of Siskiyou Camp, elev. 4500 ft.
 Subshade of a mill, north of Siskiyou Camp



Map 9. Siskiyou Pass and the area from which Henderson likely made the collection of *Pyrocoma acrophila*. The Pacific Crest National Scenic Trail (orange line) passes through the open rocky habitat, as marked by the arrow, which is unusual in the area.

ACKNOWLEDGEMENTS

Much gratitude for assistance during study at IDS, MO, PH, SRP, TEX, US, UTC, and WIS, to Tom Kaye for additional information on his earlier studies (including chromosome numbers) in the genus, Jim Strickland (IDFG) for information on *P. radiata* in Payette Co., ID, and John Semple for a digital copy of the Taylor & Brockman paper. Many thanks to Oregon historians Ben Truwe and Jeff LaLande for information on the history of Siskiyou Pass. From its beginning, Barbara Ertter made constructive contributions and edits to the manuscript.

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Figure 1. *Pyrocoma carthamoides*. Detail from *Douglas s.n.* (BM). Isotype.



Figure 2. *Pyrocoma carthamoides*. Detail from holotype of *Pyrocoma erthropappa*, Spaulding s.n. (NY).



Figure 3. *Pyrocoma carthamoides*. Yakima Co., Washington, Giblin 7687 (WTU).



Figure 4. *Pyrocoma cusickii*. Garfield Co., Washington, Fertig 34018 (WS).



Figure 5. *Pyrocoma cusickii*. Idaho Co., Idaho, Sondenaar 362 (ID).

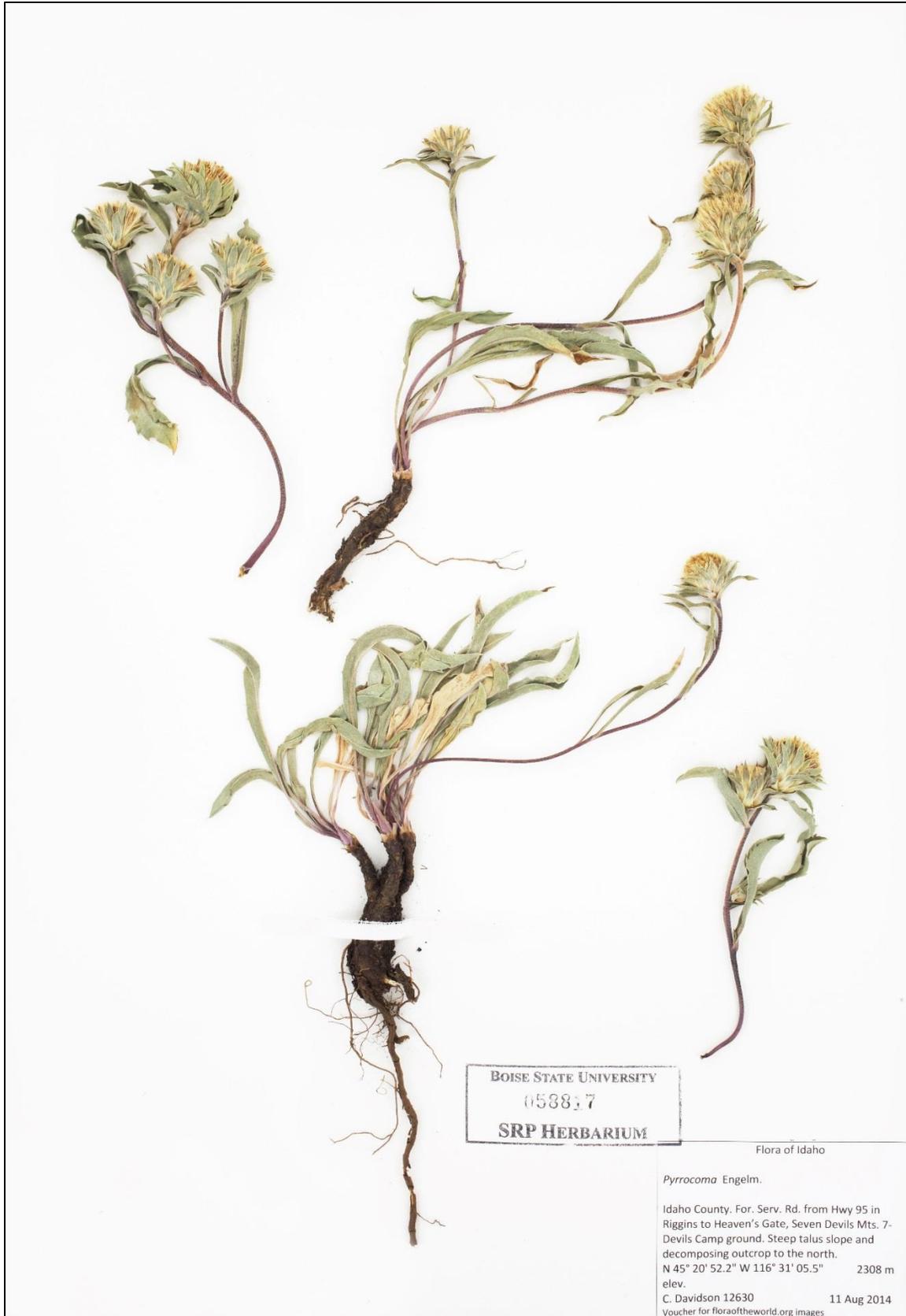


Figure 6. *Pyrocoma cusickii*. Idaho Co., Idaho, Davidson 12630 (SRP).



Figure 7. *Pyrrocoma cusickii*. Adams Co., Idaho, Gilman 2014-032 (ID).



Figure 8. *Pyrocoma cusickii*. Eureka Co., Nevada, Tiehm 16447 (NY).



Figure 9. *Pyrocoma cascadia*. Siskiyou Co., California, Clifton & Ground 1659 (PUA).



Figure 10. *Pyrocoma cascadia*. Jackson Co., Oregon, Peck 2685 (WILLU).



Figure 11. *Pyrocoma cascadia*. Siskiyou Co., California, Wheeler 2830 (CAS). Holotype.



Figure 12. *Pyrocoma cascadia*. Siskiyou Co., California, Wheeler 2830 (DS). Isotype.



Figure 13. *Pyrocoma cascadia*. Jackson Co., Oregon, *Howell 745* (OSC). Arrows = flowering nodes.

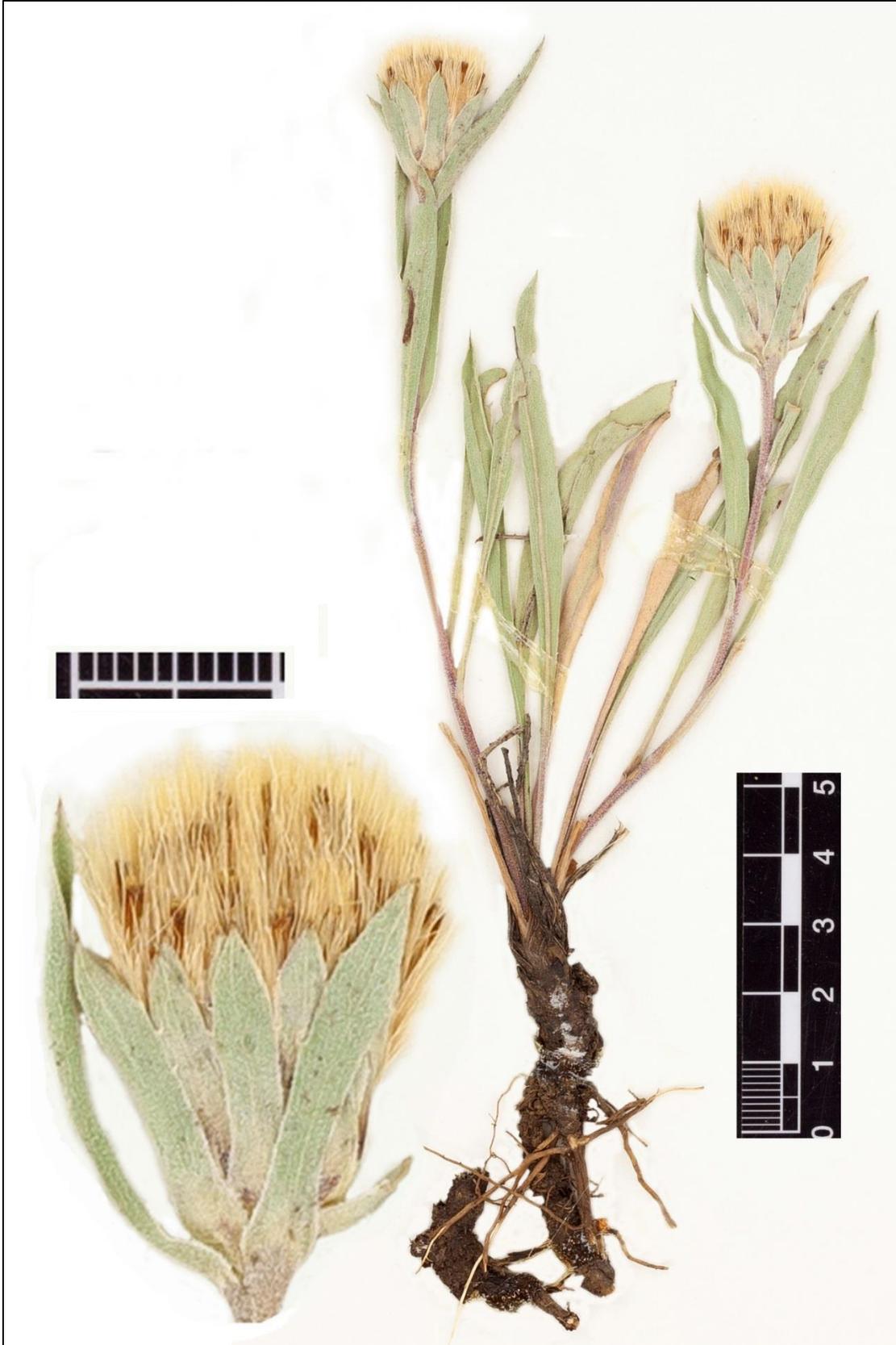


Figure 14. *Pyrocoma cascadia*. Siskiyou Co., California, Wheeler 2830 (CAS).



Figure 15. *Pyrocoma cascadia*. Siskiyou Co., California, Steiger s.n. (KNFY).



Figure 16. *Pyrocoma cascadia*. Siskiyou Co., California, Williams 226 (KNFY).



Figure 17. *Pyrocoma ptilota*. Plumas Co., California, Taylor 4082 (CHSC).



Figure 18. *Pyrocoma ptilota*. Plumas Co., California, Ahart 12,306 (CHSC). Isotype.



Figure 19. *Pyrocoma ptilota*. Plumas Co., California, Clifton 43078 (RENO).



Figure 20. *Pyrocoma pilota*. Plumas Co., California, Clifton 38204 (RENO).



Figure 21. *Pyrocoma ptilota*. Plumas Co., California, Clifton 24341 (PUA).



Figure 22. *Pyrocoma ptilota*. Plumas Co., California, Austin 1607 (US).



Figure 23. *Pyrocoma pilota*. Detail of Austin 1607 (US).



Figure 24. *Pyrocoma acrophila*. Jackson Co., Oregon, Henderson 12681 (OSC). Holotype.



Figure 25. *Pyrocoma acrophila*. Details from the holotype.



Figure 26. *Pyrocoma acrophila*. Details from the holotype.



Figure 27. *Pyrocoma acrophila*. Details from the holotype.



Figure 28. *Pyrocoma acrophila*. Details from the holotype.