

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Plant Abstract

Element Code: PDSCR0D1J0

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE



NAME: *Castilleja kaibabensis*
COMMON NAME: Kaibab Paintbrush, Kaibab Indian-Paintbrush
SYNONYMS: *Castilleja flava*, *Castilleja confusa*
Holmgren (1973) considers *C. confusa* a taxonomic synonym of *C. miniata*.
FAMILY: Scrophulariaceae

AUTHOR, PLACE OF PUBLICATION: N. Holmgren, Bull. Torrey Bot. Club 100 (2): 83-93. 1973.

TYPE LOCALITY: V.T. (DeMotte) Park, Grand Canyon Highway (Ariz. 67), Kaibab Plateau, four miles south of Kaibab Lodge and about one mile north of the Park border, Coconino County, Arizona.

TYPE SPECIMEN: HT: NY. N.H. and P. K. Holmgren 4682, 7 Aug 1970.

TAXONOMIC UNIQUENESS: One of fourteen species of *Castilleja* occurring in Arizona (Lehr 1978).

DESCRIPTION: Herbaceous perennial, 15-30 cm (6-12 in.) tall, with 1 to few stems that are usually unbranched. Stems and leaves with dense, bristly, reflexed hairs throughout, but more so around the flowers. Leaves are 2-4 cm (0.8-1.6 in.) long, linear, entire, and rarely 3-lobed distally. Yellow to reddish-orange bracts yellow to reddish-orange, composing a large portion of the flower stalk, are narrow-lanceolate to lanceolate with paired narrow lateral lobes departing just above the middle. The surfaces of the bracts are covered with gland-tipped hairs overlain by longer, spreading non-glandular hairs; the bract margins are villose, entirely colored except for a greenish base. The calyx is 2-2.7 cm (0.8-1.1 in.) long, four parted, slightly more deeply cleft abaxially (in front) than adaxially (in back); the segments 4.0-7.5 mm long, linear to narrow-lanceolate, acute. The corolla is 2.2-3.0 cm (0.88-1.2 in.) long; the galea is 8.0-14.0 mm long, densely glandular puberulent on back and glabrous on the membranous, colored margins. The lower lip is much reduced, dark green with short teeth; the tube is 1.3-1.9 cm (0.5-0.8 in.) long. Anthers, usually remain included within the galea after anthesis, the upper pair 2.5-3.5 mm long and the lower 2.0-3.0 mm long. The stigma is 0.2-0.6 mm thick. Capsules are 8.0-12.0 mm (0.32-0.48 in.) long, the seeds numerous about 2.0-2.5 mm long (Reichenbacher 1986).

AIDS TO IDENTIFICATION: Two yellowish flowered *Castillejas*, *C. integra* and *C. kaibabensis* can be found in the meadows of the Kaibab Plateau. Careful examination is the only way to distinguish the two species. The bracts of *C. integra* are often, though not always, entire (no lobes), while *C. kaibabensis* almost always has divided bracts with fairly acute-tipped lobes. The calyx of *C. integra* is more deeply cleft in back than in front. *C. integra* has white, wooly-hairy stems; and the corolla is larger (2.9-5.0 cm (1.2-2.0 in.)). The leaves of *C. kaibabensis* are more oppressed than *C. integra*.

ILLUSTRATIONS: Line drawing of habit, bract, calyx and corolla (Holmgren 1973: p. 88).
Color photo of specimen (*In* http://scisun.nybg.org:8890/searchdb/owa/wwwcatalogrenz.detail_list?this_id=2428798)
Color photo (Maschinski *in* http://ridgwaydb.mobot.org/cpcweb/CPC_ProfileImage.asp?FN=820a)
Color photo (Warren *in* http://www.nps.gov/grca/resources/low-res_plant_guide_2.pdf)
Black and white drawing (Cronquist et al. 1984)
Line drawing and color photos (Falk et al. 2001)

TOTAL RANGE: DeMotte Park, Pleasant Valley, Upper Little Park and other smaller nearby parks on the Kaibab Plateau, Coconino County, Arizona.

RANGE WITHIN ARIZONA: See "Total Range."

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous perennial.

PHENOLOGY: Flowers early in July; fruits and/or flowers produced until late August at end of growing season.

BIOLOGY: Flowers pollinated by bumblebees and/or hummingbirds throughout the growing season. Fruit capsules develop and release numerous seeds through a split dorsal suture. Pollination ecology or seed dispersal mechanisms unknown.

Found on xeric sites within meadows, relatively free from competition with forbs and grasses. Readily colonizes disturbed sites; an early to mid-successional species.

HABITAT: Fine silts and clays to rocky gravelly meadow soils derived from weathered Kaibab limestone, on low rounded ridge tops and small knolls; populations occur in driest most exposed sites in the open meadows.

ELEVATION: 8,200 - 9,000 feet (2500 - 2745 m).

EXPOSURE: All

SUBSTRATE: Thin soils derived from weathered Kaibab limestone, usually of coarse silts and clays to rocky gravelly soils and limestone/sandy-loam soils on low rounded knolls and ridges; less often on fine silt soils.

PLANT COMMUNITY: Subalpine meadows/Rocky Mountain Montane Grassland.

POPULATION TRENDS: Stable. Many hundreds of thousands of plants occur in a 5-6 mile stretch of DeMotte Park. Landscape assessments of the general abundance of this species are probably inaccurate due to the yellow color of *Castilleja integra*.

SPECIES PROTECTION AND PRESERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[3C USDI, FWS 1993]
[Category 2 USDI, FWS 1983]
[Category 1 USDI, FWS 1980]
[PTN-T USDI, FWS 1975]

STATE STATUS: None

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)
Forest Service Sensitive [USDA, FS Region 3 1990]

MANAGEMENT FACTORS: This species is endemic to the Kaibab Plateau, occurring in an area of only about a dozen square miles (Reichenbacher 1986). Grazing is the most significant threat to this species.

CONSERVATION MEASURES TAKEN: Protected within Grand Canyon National Park. Kaibab National Forest has prohibited all off-road traffic in meadows adjacent to Highway AZ 67. Forest Plan establishes that livestock utilization in these meadows shall not exceed 30% (however, utilization probably exceeded this level in most years).

SUGGESTED PROJECTS: Additional surveys outside of the immediate DeMotte Park area, are needed.

LAND MANAGEMENT/OWNERSHIP: USFS - North Kaibab Ranger District, Kaibab National Forest; NPS - Grand Canyon National Park.

Virtually the entire Kaibab Plateau is within a single allotment--Central Summer Allotment. The allotment management plan is quite old (as of 1992) and a revision of the AMP is not scheduled.

The re-alignment of Highway AZ 67 in the mid 1980s required re-seeding disturbed areas with a native seed mix which was to include *C. kaibabensis*; however, this was not accomplished as part of the road re-alignment.

SOURCES OF FURTHER INFORMATION

REFERENCES:

- Center for Plant Conservation (CDC). CDC National Collection Plant Profile, *Castilleja kaibabensis*. http://ridgwaydb.mobot.org/cpcweb/CPC_ViewProfile.asp?CPCNum=820. Accessed: 8/20/2003.
- Cronquist, A. et al. 1984. Intermountain Flora. Volume 4. The New York Botanical Garden, Bronx, New York. Pp: 494-495.
- Falk, M. et al. 2001. Arizona Rare Plant Field Guide. Published by a collaboration of agencies and organizations. Pages unnumbered.
- Holmgren, N.H. 1973. Five new species of *Castilleja* (Scrophulariaceae) from the intermountain region. Bulletin of the Torrey Botanical Club 100: 83-93.
- Kearney, T.H. and R.H. Peebles. 1942. Flowering plants and ferns of Arizona. United States Department of Agriculture. Misc. Publ. 423.
- Kearney, T.H. and R.H. Peebles. 1964. Arizona flora. University of California Press, Berkeley, California. Pp. 790.
- Lehr, J.H. 1978. A catalogue of the flora of Arizona. Desert Botanical Garden, Phoenix, Arizona. p. 138.
- Machinski, J. Available: http://ridgwaydb.mobot.org/cpcweb/CPC_ProfileImage.asp?FN=820a.
- NatureServe Explorer: An online encyclopedia of life [web application]. 2003. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: <http://www.natureserve.org/explorer>. (Accessed: September 3, 2003).
- New York Botanical Garden. NYBG Specimens detailed results. Accessed: 8/20/2003. http://scisun.nybg.org:8890/searchdb/owa/wwwcatalogrenz.detail_list?this_id=2428798.
- Phillips, B.G. 1993. T&E sensitive species summary, Kaibab National Forest, Arizona.
- Reichenbacher, F.W. 1986. Status report. Unpublished report submitted to U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 21 pp.
- USDA, Forest Service Region 3. 1990. Regional Forester's Sensitive Species List.
- USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.
- USDI, Fish and Wildlife Service. 1975. Threatened or Endangered Fauna or Flora. Federal Register 40(127): 27831.
- USDI, Fish and Wildlife Service. 1980. Endangered and Threatened Wildlife and Plants; Review of Plant Taxa for Listing as Endangered or Threatened Species. Federal Register 45(242): 82495.

USDI, Fish and Wildlife Service. 1983. Endangered and Threatened Wildlife and Plants; Supplement to Review of Plant Taxa for Listing; Proposed Rule. Federal Register 48(229): 53647.

USDI, Fish and Wildlife Service. 1993. Plant Taxa for Listing as Endangered or Threatened Species; Notice of Review. Federal Register 58(188): 51156.

USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa That Are Candidates for Listing as Endangered or Threatened Species; Notice of Review, Proposed Rule. Federal Register 61(40): 7596-7613.

Warren, K. A Field Guide to the Special Status Plants of the Grand Canyon. Available: http://www.nps.gov/grca/resources/low-res_plant_guide_2.pdf. Accessed: 8-20-03.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

Mark Egger - Seattle, Washington (M.S. thesis on *Castilleja*).

Reggie Fletcher - Regional Ecologist, USFS Region 3, Albuquerque, New Mexico.

Frank W. Reichenbacher - Southwestern Field Biologists, Tucson, Arizona.

ADDITIONAL INFORMATION:

Castilleja was dedicated in 1781 to honor Domingo Castillejo, a botanist of Cadiz, Spain, and *kaibabensis* means of or from the Kaibab.

Revised: 1990-12-28 (SR)
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1992-09-14 (BKP)
2003-09-12 (AMS)

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