# ARIZONA GAME AND FISH DEPARTMENT
# HERITAGE DATA MANAGEMENT SYSTEM

**Plant Abstract** **Element Code:** PDAST2C060
**Data Sensitivity:** No

## CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

**NAME:** *Chrysothamnus molestus* (Blake) L.C. Anders.
**COMMON NAME:** Tusayan rabbitbrush, Disturbed rabbit brush, Arizona rabbitbrush, stickyfruit low rabbitbrush
**SYNONYMS:** *Chrysothamnus viscidiflorus* var. *molestus* Blake, *Ericameria molesta* (Blake) L.C. Anders.
**FAMILY:** Compositae

**AUTHOR, PLACE OF PUBLICATION:** *Chrysothamnus molestus* (S.F. Blake) L.C. Anderson, Madroño 17(7): 222. 1964. *Chrysothamnus viscidiflorus* var. *molestus* S.F. Blake, J. Wash. Acad. Sci. 30(11): 468-469. 1940.

**TYPE LOCALITY:** Between Williams & Grand Canyon, west of San Francisco Mountain, Arizona, U.S.A.

**TYPE SPECIMEN:** HT: US-1288511. H.M. Hall 11199, 27 Sep 1920. IT: UC-205819.

**TAXONOMIC UNIQUENESS:** A distinct species in a genus of about 13 species. *C. molestus* listed as variety of *C. viscidiflorus* by Kearney et al. (1960), elevated to species rank by Anderson (1964). "*C. molestus* (Blake) L.C. Anderson is the only one endemic to Arizona" (Anderson and Hevron 1993).

**DESCRIPTION:** Perennial prostrate shrub or sub-shrub, several to many stems 10.0-20.0 cm (3.94-7.87 in.) tall. Stems have whitish bark. Leaves crowded on the stems, covered with glandular hairs, rather thick and narrow, 6-12 mm long and about 1 mm wide. Small yellow flower heads borne at stem tips, 5-7 flowers per head, each about 8 mm long. Phyllaries (21-24) about 7 mm long and 2 mm wide, with scarious margins. This species is distinguished by long involucre and glandular achenes. Glandular hairs on the upper half of the achene "are relatively more abundant in the Hevron collections, which also have shorter involucres with fewer phyllaries than do collections from Coconino County ... Hybrids between *C. molestus* and *C. depressus* have been reported where the two are sympatric (Galeano-Popp 1987)" (Anderson and Hevron 1993).

**AIDS TO IDENTIFICATION:** Small linear sessile leaves (about 1 mm wide and 7-15 mm long), which have gland-tipped hairs, and achenes which are glandular. Coarse pubescence on leaves. Yellow flowers borne on heads that usually occur in cymes and are subtended by

involucral bracts, or phyllaries, usually arranged in 4 vertical ranks. Phyllaries are linear-oblong, have scarious margins, and blunt tips. Similar species include *C. depressus* (dwarf rabbitbrush) which has short, acute tipped phyllaries with hairs on the achene, *C. vaseyi* (Vasey's rabbitbrush), and *C. viscidiflorus* ssp. *lanceolatus* (lanceleaf rabbitbrush).

**ILLUSTRATIONS:** Color photo (Joyce Maschinki, *in* CPC at http://ridgwaydb.mobot.org/cpcweb/CPC_ProfileImage.asp?FN=939a.

**TOTAL RANGE:** North central Arizona in Coconino County, and northeastern Arizona in Apache and Navajo counties.

**RANGE WITHIN ARIZONA:** Coconino County from South Rim of Grand Canyon to the Flagstaff area. Hevron reported two disjunct populations on the Navajo Nation (Hopi Buttes and west of Gray Mountain) occurring in "circumstances quite different from the National Forest populations" (Anderson and Hevron 1993).

## SPECIES BIOLOGY AND POPULATION TRENDS

**GROWTH FORM:** Perennial shrub.

**PHENOLOGY:** Flowers August - October. However, evidence exists that plants also reproduce vegetatively with underground stems (Warren 1993). Maschinski (1990) found that this plant has large variety of germination conditions. Cold is not a limiting factor, but moisture may be.

**BIOLOGY:** Frequently found as prostrate and hedged due to grazing. Flowers profusely following stress. Most colonies range in size from less than 1 acre to 5 acres with a few colonies extending to between 25 and 50 acres. Reasonable lifespan for the disturbed rabbitbrush has been estimated at 30 years, but could be much more because of its "...vegetative reproduction via the tillering process and was observed sprouting from buried parts in an area that had been disturbed at least 25 years ago" (Galeano-Popp 1987). Evidence for both sexual and asexual reproduction has been noted. Joyce Maschinski conducted studies at the Arboretum in Flagstaff, concerning the rate of germination after various temperature treatments. The highest germination was observed to be in the spring after cold treatment.

**HABITAT:** Typically found in open pinyon-juniper grasslands on slopes and flats, where periodic fires naturally occur at an interval of every 15-30 years. Seldom found on steep hillsides.

**ELEVATION:** 5,710 - 6,880 ft (1742-2098 m).

**EXPOSURE:** Usually found in open areas.

**SUBSTRATE:** Found exclusively on calcareous soils including soil whose parent material was alluvium derived from Kaibab limestone and soil whose parent material was predominantly basalt. In latter case, plant found growing in accumulations of calcium carbonate due to leaching of precipitates from the basalt and possibly from wind and water deposition. Collected on sandstone silt of broad ravine, and roadside on surface limestone gravel (SEINet accessed 2005).

**PLANT COMMUNITY:** Pinyon-Juniper series of Great Basin Conifer Woodland and Great Basin Shrub-grassland. Associated species include: *Artemisia tridentata* (big sagebrush), *Atriplex canescens* (four-wing saltbush), *Berberis fremontii* (barberry), *Bouteloua gracilis* (blue grama), *Ceratoides* (=*Krascheninnikovia*) *lanata* (winterfat), *Chrysothamnus depressus* (dwarf rabbitbrush), *C. greenei* (Greene rabbit-bush), *C. viscidiflorus* (sticky-leaf rabbit-brush), *Gutierrezia sarothrae* (broom snakeweed), *Koeleria pyramidata* (=*K. micrantha*, junegrass), *Juniperus* sp. (juniper), *Oryzopsis* (=*Achnatherum*) *hymenoides* (Indian mountain-ricegrass), *Pinus* sp. (pine), *Poa fendleriana* (muttongrass), *Purshia stansburiana* (Stansbury cliffrose), *Quercus gambelii* (gambel oak), and *Tetradymia* sp. (horsebush). (SEINet accessed 2005).

**POPULATION TRENDS:** Unknown. NatureServe (2003), reports "extant at 21 locations within Coconino County, Arizona, zero to few of which are protected. (Fed. Register 95-06-30)."

## SPECIES PROTECTION AND CONSERVATION

**ENDANGERED SPECIES ACT STATUS:** None (USDI, FWS 1996)
[Category 2 USDI, FWS 1993]
[Category 1 USDI, FWS 1990]
[Category 2 USDI, FWS 1985]
[Category 2 USDI, FWS 1980]

**STATE STATUS:** None

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

**MANAGEMENT FACTORS:** Threats include: 1) grazing by wild and domestic ungulates (elk, cattle and possibly sheep). "Yearlong rest in a pasture, such as is afforded in a rest-rotation system, would theoretically provide a better situation for *C. molestus* than a deferred system" (Galeano-Popp, 1987). 2) low recruitment in natural populations. Fire is not viewed as an effective means to stimulate shoot or flower production. It is tolerant of prescribed burns after the growing season, enhancing growth of mature plants; spring burns can cause

25% mortality among adult plants (Cobb et al. 1996, *in* CPC 2003). Implementation of research findings is needed to manage the habitat in the most beneficial way.

**PROTECTIVE MEASURES:** Conservation measures have been taken such as surveys conducted on Coconino and Kaibab National Forests and the Navajo Nation. Germination and prescribed fire studies, and scarification study is in progress.

**SUGGESTED PROJECTS:** Continue monitoring use by livestock and wildlife; monitoring reproduction and management of populations; relieve excess grazing pressures where they exist. Continue research to understand why recruitment is low in natural populations, understand the role of disturbance in seedling establishment. Also, undertake research to understand the significance of asexual reproduction as a potential inhibitor of range expansion.

**LAND MANAGEMENT/OWNERSHIP:** BIA - Hualapai Indian Reservation and Navajo Nation; USFS - Coconino and Kaibab National Forests; State Land Department; Private.

## SOURCES OF FURTHER INFORMATION

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**ADDITIONAL INFORMATION:**

Maschinski in 1991 reported that "greenhouse studies at the Flagstaff Arboretum proved that *C. molestus* seeds are capable of germination over a wide range of temperature regimes and soil types" (Anderson and Hevron 1993). A fire ecology study was finished September, 1993. Most important result was mortality data. Fire in spring resulted in 15% mortality with a fall burn producing only 5% mortality. Fire also affected the growth rate with burned plants growing more, if they survived, the following year. However, burned plants did show less flower production (Warren, 1993).

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