ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDAST4N0Z2
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Helianthus niveus* ssp. *tephrodes* (Gray) Heiser
COMMON NAME: Algodones Dunes Sunflower, Algodones sunflower, dune sunflower, desert sunflower
SYNONYMS: *Helianthus tephrodes* Gray, *Viguiera tephrodes* Gray, *Viguiera nivea* Gray, *Viguiera sonorae* Rose and Standley
FAMILY: Asteraceae

AUTHOR, PLACE OF PUBLICATION: *Helianthus niveus* ssp. *tephrodes* (A. Gray) Heiser, Mem. Torrey Bot. Club 22(3): 43. 1969. *Helianthus tephrodes* A. Gray, Report on the United States and Mexican Boundary … Botany 2(1): 90. 1859.

TYPE LOCALITY: Mineral del Monte, Colorado Desert, California, USA.

TYPE SPECIMEN: HT: NY-179119 (alsoGH-8827 reported as type). A.C.V. Schott 64, 30 Oct 1855. Collection notes on NY collection states "Collection Number probably 64".

TAXONOMIC UNIQUENESS: The species *niveus* is 1 of 62 in the genus *Helianthus*. *Helianthus niveus* has three subspecies: *niveus, canescens*, and *tephrodes*; USDA PLANTS database (2002, 2004) reports 2 subspecies. "*Helianthus niveus* ssp. *tephrodes* is intermediate between two other subspecies, *H. niveus* ssp *canescens* and the typical subspecies. *H. niveus* shows some similarities to *Viguera*, but is clearly a *Helianthus*, and is regarded as the most primitive of the genus *Helianthus*, and may have given rise to all the North American sunflowers. Hybrids have been secured between *H. niveus* and all three sections of North American sunflowers." (DBG 2000).

DESCRIPTION: A silvery-white, semi-shrubby perennial (sometimes annual or facultative ephemeral), from a stout tap root, erect or decumbent, 0.5-1.5 (2) m (1.5-5.0 [6.6] ft.) tall. The stems and leaves are whitish, with sericeous - villous pubescence. Large leaves alternate, deltoid, entire or serrate, 3-7 cm (1.2-2.8 in.) long, 2.5-4.0 cm (1.0-1.6 in.) broad. In inflorescence, the phyllaries are not greater than the disk; the central chaff scales are glanrous or fine-appressed-hairy. The solitary flower heads have a reddish-purple disc 1.5-2.5 cm wide; ray flowers are yellow. Achenes are mottled black and pale tan, 4-8 mm long, densely villous with long hairs, and a pappus of 2-3 long awns and several squamellae.

AIDS TO IDENTIFICATION: The thick, woody stem and dense pubescence differs this large sunflower from other in the genus. Its giant growth form is apparently an adaptation to burial by moving sand.

ILLUSTRATIONS: Line drawing of complete plant. (Heiser et al. 1969: Fig. 2)
Color photo of type collection (NYBG, Accessed 10/22/2003, http://scisun.nybg.org:8890/searchdb/owa/wwwcatalogrenz.detail_list)
Color photo (Dean Taylor 1996, *in* CalPhotos http://elib.cs.berkeley.edu/cgi/)
Color photo (Accessed 10/22/2003 from http://www.glamisonline.org/piersons_milkvetch/images/sunflower.gif)
Color photo (Lynda Pritchett-Kozak, CPC #2200 *in* http://ridgwaydb.mobot.org/cpcweb/CPC_ProfileImage.asp?FN=2200a)
Line drawing (Cal. Dept. Fish & Game, Accessed 10/22/2003, http://www.dfg.ca.gov/hcpb/cgi-bin/read_one.asp?specy=plants&idNum=128)
Line drawing of species (Jaeger, 1940 reprint 1988: Pl. 683)
Color photo (in http://www.wildflower2.org/NPIN/Plants/Details.asp)

TOTAL RANGE: This taxon is restricted to areas of shifting dunes in southwestern Arizona, southeastern California (Algodones Dunes), to northwestern Sonora (Gran Desierto) and Baja California, Mexico.

RANGE WITHIN ARIZONA: Yuma dunes, Yuma County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Perennial, sometimes annual, subshrub or forb/herb.

PHENOLOGY: Clusters of large, bright yellow daisy-like flower heads are produced from March to May, and again from October to January.

BIOLOGY: A common adaptation among psammophiles (plants restricted to active dunes) such as *Helianthus niveus* ssp. *tephrodes*, are large seeds containing abundant food reserves. Psammophile seedlings can emerge from depths as great as 14 cm (5.5. in). (Van der Valk, 1974 *in* Bowers 1996). Extremely tolerant of moving sand, *H. n.* ssp. *tephrodes* grows rapidly to avoid being buried. The dense leaf hairs help the plant to control evaporation from the leave surface, slowing down water loss. They also help to regulate the temperature of the leaf by blocking out some of the light and heat within the environment, aiding in photosynthesis. (Dice & Sebasta 1999). Their seeds require scarification for germination.

In the summer, temperatures in the dunes commonly exceed 110º F, while rarely dropping below freezing in the winter. Humidity in the dunes is low, generally between 10 and 20

percent. Annual rainfall comes in the form of late summer thunderstorms or light winter rain, and averages around 2 inches. (Dice & Sebasta 1999).

HABITAT: Sand dunes or sandy flats of the Algodone Dunes. The Algodone sunflower inhabits primarily the interior portions of the dunes at the bases along the sides of large dunes. The Algodones Dunes vary in width from three to six miles across, and at various points, the crest of the dune system may rise 300 feet or more above the surrounding desert floor. (Dice & Sebasta 1999).

ELEVATION: Below 700 ft. (214 m). Localities in Arizona around 300 ft. (92 m); collected between 270 – 385 ft. (82-117 m).

EXPOSURE: Open.

SUBSTRATE: Sandy

PLANT COMMUNITY: Dunescrub; Creosote Bush Desertscrub; Colorado Desert flats. Associated species include: *Ephedra trifurca* (Long-leaf Mormon tea), *Eriogonum deserticola* (desert eriogonum), *Oenothera deltoides* (Large-desert evening-primrose), *Palafoxia arida* (Spanish needles), *Pholisma sonorae* (sand food), and *Tiquilia plicata* (fan-leaf tiquilia) [CPC, 2003].

Dominant plants in the central, active portion of the Algodone dune field include: *Astragalus magdalenae* var. *peirsonii* (Peirson's milk-vetch), *Croton wigginsii* (Wiggin's croton), *Eriogonum deserticola*, *Palafoxia arida* var. *gigantean* (giant Spanish needles), and *Panicum urvilleanum* (desert panic-grass). On stable marginal dunes, dominance is shared by *Ambrosia dumosa* (white bursage), *Croton wigginsii*, *Ephedra trifurca*, *Larrea tridentata* (Creosote bush), and *Psorothamnus emoryi*. On rocky or gravelly substrates near the dune field, dominants include: *Cercidium floridum* (blue paloverde), *Fouquieria splendens* (Ocotillo), and *L. tridentata*. (Bowers, 1996).

POPULATION TRENDS: Not well known. In California, the status in 1999 was declining. Desert Botanical Garden has approximately 5,000 field-collected seeds in storage (DBG 2000).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[Category 2 (USDI, FWS 1993)]
[Category 2 (USDI, FWS 1990)]
[Category 2 (USDI, FWS 1985)]
[Category 2 (USDI, FWS 1983)]
[Category 2 (USDI) FWS 1976)]

STATE STATUS: None
OTHER STATUS: Not Forest Service Sensitive in AZ (USDA, FS Region 3 1999)
[Forest Service Sensitive (USDA, FS Region 3 1990)]
Endangered (State of California, 1979)

MANAGEMENT FACTORS: Threats include off-road vehicle use, and development of dunes for agriculture, roads and housing. Currently, the Bureau of Land Management is monitoring populations at Algodones Dunes in California. Management needs include focusing on enforcing laws regarding illegal off-road vehicular use and initiate planning strategies that allow for plant conservation (CPC, 2003).

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Research is needed to understand abiotic/biotic influences on population dynamics. Also, additional seed collections are needed.

LAND MANAGEMENT/OWNERSHIP: BLM – Yuma Field Office; Private

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

ADDITIONAL INFORMATION:

Dice and Sebasta (1999), report "the name "Algodones" derives from Spanish and English corruptions of the name of the Yuman tribe that once dwelt on both sides of the Colorado River in the vicinity of the nearby delta and the dunes. The name is not from the Spanish algodon, or "cotton" as some have thought."

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