



Arizona Agave Delisting Questions & Answers

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What is the Arizona agave?

Arizona agave (*Agave arizonica*) was first described in 1970 as a unique species from specimens collected in the New River Mountains of central Arizona. The 8 to 14-inch diameter and 12 to 16-inch tall succulent sprouts a flower stalk up to 13 feet tall. Fewer than 100 plants are known in the wild. Most are on the Tonto National Forest and a few on private lands, in chaparral and juniper grasslands in Gila, Yavapai and Maricopa counties between 3600-5800 feet in elevation. The Service now knows that the plant described as Arizona agave is actually a hybrid of Tourney's agave and the golden-flowered agave.

Why was this plant listed as endangered?

When the Arizona agave was added to the list of endangered species in 1984, it was believed to be a unique species. Historically 19 populations were known from the Tonto National Forest. At the time of the final rule that number had decreased to 13. Fewer than 100 plants were known from the wild, and it was thought that any loss of habitat would endanger the species. The majority of Federal land that was occupied by the species was subject to authorized livestock grazing. Livestock grazing was thought to have a negative effect on the species due to cattle trampling plants, eating flowering stalks, and modifying the habitat of the species. This agave is quite attractive and was believed to be threatened by collectors seeking to cultivate the species for commercial trade. The low numbers of Arizona agave individuals known at the time of listing was of concern because of the increased likelihood of small populations going extinct from natural stochastic events. Reproduction was known to be low, and there were very few young plants.

Why has the Service removed the Arizona agave from the Endangered Species Act's list of threatened and endangered species?

Since 1985, a growing body of evidence led to the determination that the succulent – found only where the range of Toumey's agave (*A. toumeyana* var. *bella*) and the golden-flowered agave (*A. chrysantha*) overlap and able to reproduce only by budding/cloning (unable to produce viable seed) – is indeed a hybrid of the two parent-species. Controlled experiments on the reproductive limitations of the Arizona agave conducted at the Desert Botanical Garden in Phoenix confirmed that the plant is a hybrid. Hybrid plants do not qualify for protection under the Act. The term "species", as defined in the Act, includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species or vertebrate fish or wildlife *which interbreeds when mature*. Arizona agave does not meet this definition because it is not known to interbreed outside of confinement (*in situ*).

What actions led to the removing this plant from the list of threatened and endangered plant species?

In 1985, a year after Arizona agave was listed, the USDA Forest Service petitioned us to delist Arizona agave because of its hybrid status. We convened a peer review panel to assess all the taxonomic and ecological information on Arizona agave. On June 12, 1986, we announced that delisting was unwarranted at that time. The Desert Botanical Garden, in Phoenix, initiated ecological studies of Arizona agave in the late 1980's through 1994. They conducted numerous surveys on the Tonto National Forest, collected seeds in situ, conducted experimental crosses in situ and ex situ, and started an ex situ collection. DBG's work has shown that Arizona agave can produce viable seed; however, some of those germinated seeds produced plants resembling Arizona agave while others did not. DBG also conducted controlled crosses of Toumey's agave (*A. toumeyana* var. *bella*) and the golden-flowered agave (*A. chrysantha*). The seeds produced from this cross resulted in Arizona agave plants. These results support the hypothesis that Arizona agave is a hybrid.

Once delisted, what other protections in place for the Arizona agave?

The Arizona agave will continue to receive limited protection under Arizona Native Plant Law, A.R.S., Chapter 7, Section 3-901, which prohibits collection except for scientific or educational purposes under permit.

Once Arizona agave is removed from the list of endangered plants, how will land management practices be affected?

Federal agencies which permit, carry out or fund projects or programs will no longer be required to consult with the Fish and Wildlife Service, under section 7 of the Endangered Species Act, to avoid impacts to Arizona agave. Land management practices of private landowners will not be affected.

Have other Arizona species been removed from the Endangered Species list?

Yes. Species can be removed for three different reasons;

- 1) they can be recovered and no longer need the protections afforded under the Endangered Species Act (such as the 1999 recovery and delisting of the American peregrine falcon (*Falco peregrinus anatum*)),
- 2) new information about the status or threats to the species can lead to delisting (such as the 1993 delisting of the Tumamoc globeberry (*Tumamoca macdougallii*) as a result of the discovery of additional populations in Mexico, or this delisting of the Arizona agave due the determination that it is a hybrid), and
- 3) a species that is determined to be extinct (no listed Arizona species have gone extinct).