



NDF Workshop  
**WG 3 – Succulents and Cycads**  
**CASE STUDY 7 SUMMARY**  
*Carnegiea gigantea*  
Country – **Mexico**  
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## **SAHUARO (*CARNEGIEA GIGANTEA*) IN MEXICO**

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This project is the first phase of a monographic study of sahuaro, an emblematic species of the Sonoran Desert included in CITES Appendix II. We studied 16 populations throughout the distribution range of the species and assessed the basic demographic parameters, as well as the geographic variation in morphological traits. We found large levels of variation and conclusive evidence of episodic recruitment probably related to El Niño years. Study of the structure of dead individuals allowed the calculation of potential harvestable volumes, minimum harvestable size and other use-related parameters. When linked to a social and economic database from a field survey, we discovered that sahuaro usage is concentrated along the border with the USA and along the coast of Sonora. We also found that demand quickly depletes of their dead wood any population. The removal has unknown effects on the ecosystem dynamics. Through simulation, we modeled the time to replenish the population after harvesting, finding that the return time is usually very long; between 10-50 years.

Wild sahuaros are heavily used throughout their range. Native cultures, particularly in northwestern Sonora and southern Arizona, used to harvest their edible fruits. The wooden ribs are also used locally for many construction purposes, from light fencing to furniture. Trade in live wild specimens is carried in a small scale, mainly for ornamental purposes. These are usually limited to plants 1-3 m tall. Harvest of dead ribs for commercial purposes has increased since the 1990s. A big market for these is present in the southwest states of the USA, and by USA citizens living in México. The demand of ribs has provoked the

disappearance of dead individuals in most populations, and it even has led harvesters to illegally cut sahuaros within biological reserves. The price that high quality ribs fetch has led to the deliberate killing of sahuaros for later harvesting. We have gathered strong evidence of extraction of live individuals from several populations.

Given the sparse distribution of populations, the discontinuous recruitment, the slow growth rate, the minimum size of harvestable individuals, and the important, but not yet scientifically studied, role of dead sahuaro skeletons, it is recommended not to grant export permits of dead sahuaro ribs. Other forms of export that are non-detrimental and can be granted include the export of glasshouse grown individuals from wild produced seeds, or the export of wild fruits and their derivatives. In both cases, the effect of such wild recollection has no apparent detrimental effect on populations, particularly when considering that: i) Only an exceedingly small proportion of the large production of seeds ever enters the population, and ii) Historically the harvest of fruits was probably much higher (probably for hundreds of years) and geographically extensive. In summary, it is not possible to make a positive NDF for ribs, but it is possible to do so for trade based on the harvest of wild seeds and fruits, including their derivatives. Given the slow recovery, the little yield, and the landscape value for the species, it is recommended to keep it within CITES Appendix II, and to include it within the Norma Oficial Mexicana NOM-059-ECOL-2001 under the special protection category.