

ENTHEOGENESIS AUSTRALIS

Reference guide for *Lophophora* conservation

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Lophophora williamsii, commonly referred to as peyote, is the most widely known *Lophophora* species. Archaeological evidence suggests *L. williamsii* has been used by First Nations people of the Americas for almost 6000 years (El-Seedi, et al. 2005).

Widespread public knowledge of *Lophophora sp.* is intimately tied to interest in mescaline, the psychedelic movement of the 1960s, and the more recent psychedelic renaissance. However, there also exist large horticultural communities that propagate diverse *Lophophora sp.*, driven by interests in unique and unusual forms of these plants, rather than their psychoactive properties.



Variegated Diffusae hybrid. Photo by Andrew Oliver.

Wild *Lophophora* numbers are in decline and are currently facing potential extinction. Unfortunately, some regional variants, such as *Lophophora williamsii* cv. "Big Bend", have already become extinct in the wild.



L. williamsii cv. "Big Bend". Photo by Keeper Trout.

The primary threat facing *Lophophora* in the wild is loss of habitat due to land clearing, with wild harvest increasingly adding pressure (Trout & Friends, 2015). This issue is in part because *Lophophora* grow slowly (1cm per year or even less), take a long time to reach sexual maturity and produce seed (as long as 30 years in the wild), and grow in limited and harsh environments. Due to these factors, repopulation of wild *Lophophora* is highly unlikely without human intervention.

Distinguishing *Lophophora*

Lophophora species have a natural distribution ranging from northern Mexico to southwestern Texas in the United States.

Currently five species are recognized within the *Lophophora* genus, which can be categorised into two taxonomic groupings or sections, the *Lophophora* and the *Diffusae* (Šnicer, et al. 2009). *L. williamsii* is the only species in the *Lophophora* section, although two different variants are commonly identified relative to their geography in Texas – northern and southern. In the *Diffusae* section there are four species – *L. diffusa*, *L. fricii*, *L. koehresii*, and *L. alberto-vojtchii*.



L. williamsii, northern Texan form. Photo by Keeper Trout.



L. williamsii, southern Texan form. Photo by Keeper Trout.



L. fricii. Photo by Martin Terry.

All *Lophophora* species are somewhat similar in shape, with a flat to convex crown, cone shaped root, and a tendency to grow in clumps. The physical characteristics of Diffusae *Lophophora* species (except for *L. alberto vojtechii*) tend to have a greater number of ribs (up to 21) than *L. williamsii* (up to 13). Diffusae ribs also tend to be undulating, while *L. williamsii* ribs are typically straight. *L. williamsii* skin is often thicker, tougher and darker than the skin of plants in

the Diffusae section. Furthermore, *L. williamsii* are capable of self-pollination, while plants in the Diffusae section require other plants for pollination. A key ethnobotanical difference between *Lophophora* and Diffusae sections is that plants in the former group contain approximately 10-20 times the concentration of mescaline of plants in the latter group.

Conservation strategies

To try and prevent the loss of *Lophophora* species in their natural habitats, several conservation strategies have been identified (Trout & Friends, 2015). These strategies include:

- Propagation and replanting efforts.
- Sustainable harvesting education.
- Regulatory changes to promote cultivation and discourage species removal.
- Land clearing salvage operations (Anderson, 1995).



Cultivated *L. diffusa*. Photo by Martin Terry.



Harvested *L. williamsii*. Photo by Keeper Trout.

Repopulation strategies require careful planning to reduce the risk of altering local population genetics. Replanting genetically different *Lophophora* species and variants within an existing population could cause irreversible ecological changes or can result in catastrophic losses if they do not prove hardy in the new environment. All these strategies require the navigation of complex laws and policies, as not only are these threatened native species, *Lophophora* mescaline content means they are often subject to additional laws targeting illicit drugs. Furthermore, there are indigenous traditions that require the consumption of *L. williamsii*, which have their own complex politics. These politics may oppose *L. williamsii* cultivation or repopulation efforts because these efforts are perceived to imply that people do not have faith in *L. williamsii* to take care of itself (Trout, 2021; personal communications).

There is a consensus within the botanical community that **wild *Lophophora* harvest should be avoided at all costs**. Some perceive an exception for people maintaining indigenous traditions, while others suggest even indigenous people need to change their consumption practices for supply to meet demand. As some people cannot change their harvest behaviours, it is useful to share information about how to reduce the impact of wild *Lophophora* harvest.

Key points include:

- Cleanly cut only crowns from above ground level and avoid removing roots.
- Harvest as infrequently as possible (a minimum of 8-year intervals).
- Avoid removing seed.
- If harvesting with intent to consume, harvest only *L. williamsii*. Other *Lophophora sp.* have a very low mescaline content. Avoid harvesting other *Lophophora sp.* and lookalikes, such as *Astrophytum asterias*.



L. williamsii post-harvest regrowth. Photo by Keeper Trout.



Flowering *L. williamsii* with seed. Photo by Keeper Trout.



Image 9. *L. williamsii* with seed pod. Photo by Keeper Trout.

What can you do to help?

- If you want cactus for mescaline, consider alternative sources of mescaline such as San Pedro cacti (*Trichocereus pachanoi*, *T. peruvianus*, *T. bridgesii*, etc.).
- If purchasing *Lophophora sp.* or related products, avoid plants and plant products sourced from the wild. Influence market preference for cultivated plants and plant products.
- If you possess *Lophophora* plants or seed that are related to a particular geographic region, ensure to label appropriately, and catalogue all available information. Cultivated plants may be crucial to future repopulation efforts, for which plant provenance will be critical.
- [Donate to the Cactus Conservation Institute](#)



L. williamsii flowering. Photo by Jonathan Carmichael.

Harm reduction

It is recommended that people avoid consuming monoamine oxidase inhibitors (MAOIs) alongside mescaline as there is risk of serotonin syndrome, particularly with non-selective and irreversible MAOIs. Ayahuasca and changa both contain MAOIs, so caution should be taken before combining these substances with mescaline. Selective serotonin reuptake inhibitors (SSRIs) should also be avoided for similar reasons, although in some cases they will simply prevent or reduce mescaline effects. To avoid death or illness, before taking mescaline alongside other substances, research your combination. [This guide](#) is a good starting point for reviewing mescaline combination risks.

Like all psychedelics, people consuming mescaline should be in a comfortable mental, physical, and social environment. Avoid consuming alone and fast for a short time before consumption. Mescaline has a reputation for inducing nausea and vomiting. Be prepared for this possibility.

A common dosage of mescaline hydrochloride is between 200-300 milligrams. This is approximately 27 grams of dried *L. williamsii*, or 100 grams of dried San Pedro. When extracted or synthesised, mescaline can take different forms. Dosage differs between mescaline products, so ensure to [calculate accordingly](#).

Legal issues

Importing *Lophophora* plants and seeds into Australia is a federal drug offence. This scheduling is for the entire *Lophophora* genus, not just mescaline containing plants.

In South Australia, the Northern Territory, Western Australia and Tasmania, *Lophophora* may be considered illegal due to container/admixture laws. In Queensland and the Australian Capital Territory, *Lophophora* species are scheduled outright. Reports suggest it is only in Queensland, the Australian Capital Territory and Western Australia where *Lophophora* restrictions are actively enforced. Law enforcement in these latter areas receive *Lophophora* identification training.

The legal context of *Lophophora* species may be different in your country, and typically differs between states. Before buying, selling, growing or consuming these plants, ensure to review the local laws relevant to you.

Emergency assistance

In Australia, you should always call 000 in the case of an emergency. If you think someone has taken an overdose, made an error with medicine or been poisoned, call the Poisons Information Centre on 131 126.

References

Anderson, F. (1995). The 'peyote gardens' of south Texas: a conservation crisis? *Cactus and Succulent Journal*, 67, 67-73.

El-Seedi, H., De Smet, P., Beck, O., Possnert, G., & Bruhn, J. (2005). Prehistoric peyote use: alkaloid analysis and radiocarbon dating of archaeological specimens of *Lophophora* from Texas, *Journal of Ethnopharmacology*, 101(1-3), 238-242. <https://doi.org/10.1016/j.jep.2005.04.022>

Šnicer, J., Bohata, J., & Myšák, V. (2009). The Littlest *Lophophora*, *Cactus and Succulent Journal*, 81(6), 294-300. <https://doi.org/10.2985/015.081.0606>

Trout, K. & Friends (2015). *Sacred Cacti Botany, Chemistry, Cultivation & Utilization* (4th ed.). Mydriatic Productions. <https://troutsnotes.com/sacred-cacti/>

Further reading

Klein, M., Kalam, M., Trout, K., Fowler, N. & Terry, M. (2015). Mescaline concentrations in three principal tissues of *Lophophora williamsii* (Cactaceae): Implications for sustainable harvesting practices, *Haseltonia*, 20, 34-42. <https://doi.org/10.2985/026.020.0107>

Terry, M. & Trout, K. (2013). Cultivation of peyote: a logical and practical solution to the problem of decreased availability, *Phytologia*, 95(4), 314-320.

Terry, M., Trout, K., & Williams, B. (2015). When cultivation of a religious sacrament equals manufacturing a controlled substance: Effects of the absence of adequate regulatory structure on the conservation of peyote. In J. Daniels (Ed.), *Advances in Environmental Research* (pp. 71-96). Nova Science Publishers.

Trout, K. (2019). Some thoughts about the word "poaching". Cactus Conservation Institute. https://cactusconservation.org/wp-content/uploads/2020/03/Trout_2019_Peyote-poaching.pdf

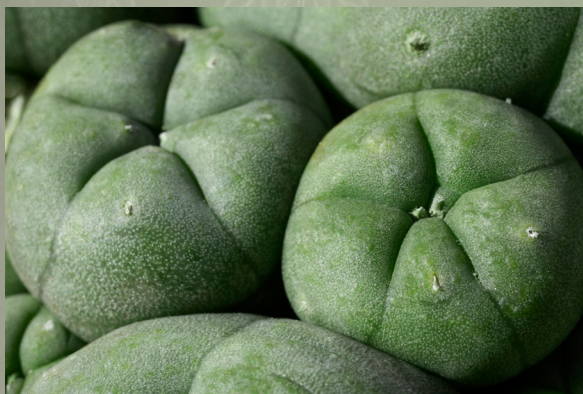


Image 12. *L. williamsii* pup. Photo by Jonathan Carmichael.

Glossary

Convex	Rounded on top.
Undulating.	Moving smoothly up and down.
Provenance	Origins of.

Disclaimer

This document cannot cover all information regarding this diverse area of study. This document is only a starting point and should be used in conjunction with other evidence concerning ethnobotanical plants, fungi and related compounds.

Ethnobotanicals have risks and benefits and should always be treated with caution and respect. Some practices and ideas associated with the use of ethnobotanicals are embedded in cultural and religious traditions.

Research, due diligence, and caution are essential. Ensure to understand local laws, traditions, and sustainability before working with any ethnobotanicals.

Who we are

Entheogenesis Australis (EGA) is a charitable, educational organisation established in 2004. We provide opportunities for critical thinking and knowledge sharing on ethnobotanical plants, fungi, nature and sustainability.

We also encourage gardening and the conservation of plants, fungi and seeds that have a traditional relationship with humankind. We aim to celebrate culture, science, art, politics, and community around medicine plants through our conferences, workshops and resources.

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