

**Cactus Conservation
in the U.S.-Mexico
Borderlands:
Case Studies**

Martin Terry

Cactus Conservation Institute

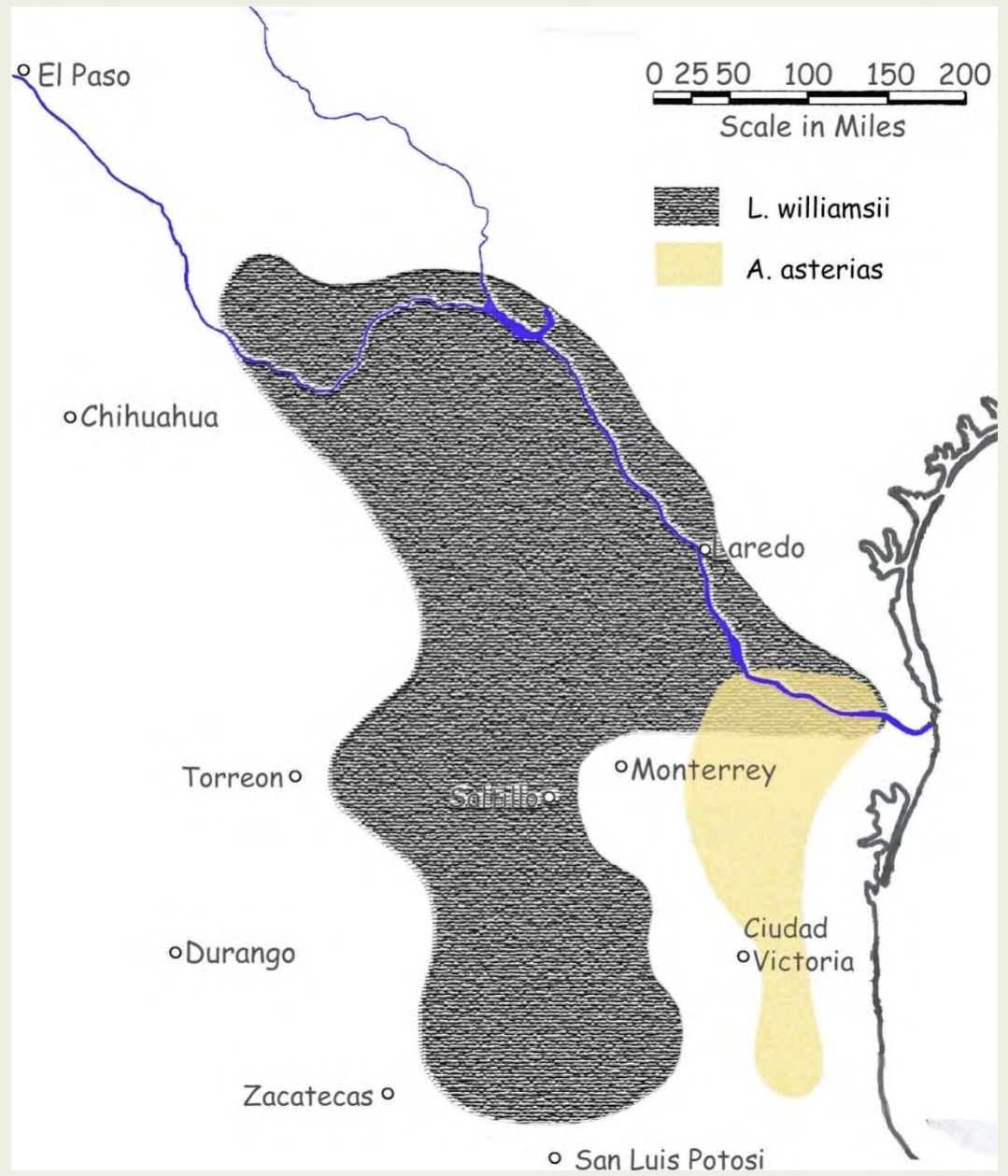
Two Vulnerable Species

Astrophytum asterias



Lophophora williamsii





Similarities: *A. asterias* & *L. williamsii*

- Small, hemispherical, spineless cacti
- *L. williamsii* – often has eight ribs.
- *A. asterias* – always has eight ribs.

Two *L. williamsii* with eight ribs



A. asterias: always eight ribs?



Valued by collectors



Medicinal use of *L. williamsii*



Conflicting National Legislation

- Controlled Substances Act (CSA) of 1970 banned the use, possession, and sale of *Lophophora williamsii*, which is legally classified as a hallucinogen in Schedule 1. A drug is put into Schedule 1 if the Drug Enforcement Administration (DEA) determines that it has a high potential for abuse and has no accepted medical use.
- Religious use of *Lophophora williamsii* by native Americans only is protected by an exemption to the CSA.

Conflicting National Legislation

- Food, Drug and Cosmetic Act. The Food and Drug Administration (FDA) regulates pharmaceutical compounds according to the central criteria of safety and efficacy, based on scientific evidence. If you wanted to obtain FDA approval for therapeutic use of a drug found in *Lophophora williamsii*, you would need to conduct medical research to generate the scientific data. But human research protocols with Schedule 1 drugs are difficult to get approved due to DEA

Irrelevant National Legislation

- The Endangered Species Act (ESA) of 1973 is of no help in protecting native populations of *Lophophora williamsii*, as the latter is not (yet) an endangered species.
- One of the unintended consequences of the Controlled Substances Act is that – at least in theory – the general prohibition of possession and use of peyote discourages harvesting from wild populations by non-native Americans.

Anthropogenic Threats
to
Lophophora williamsii

Religious use of *L. williamsii*



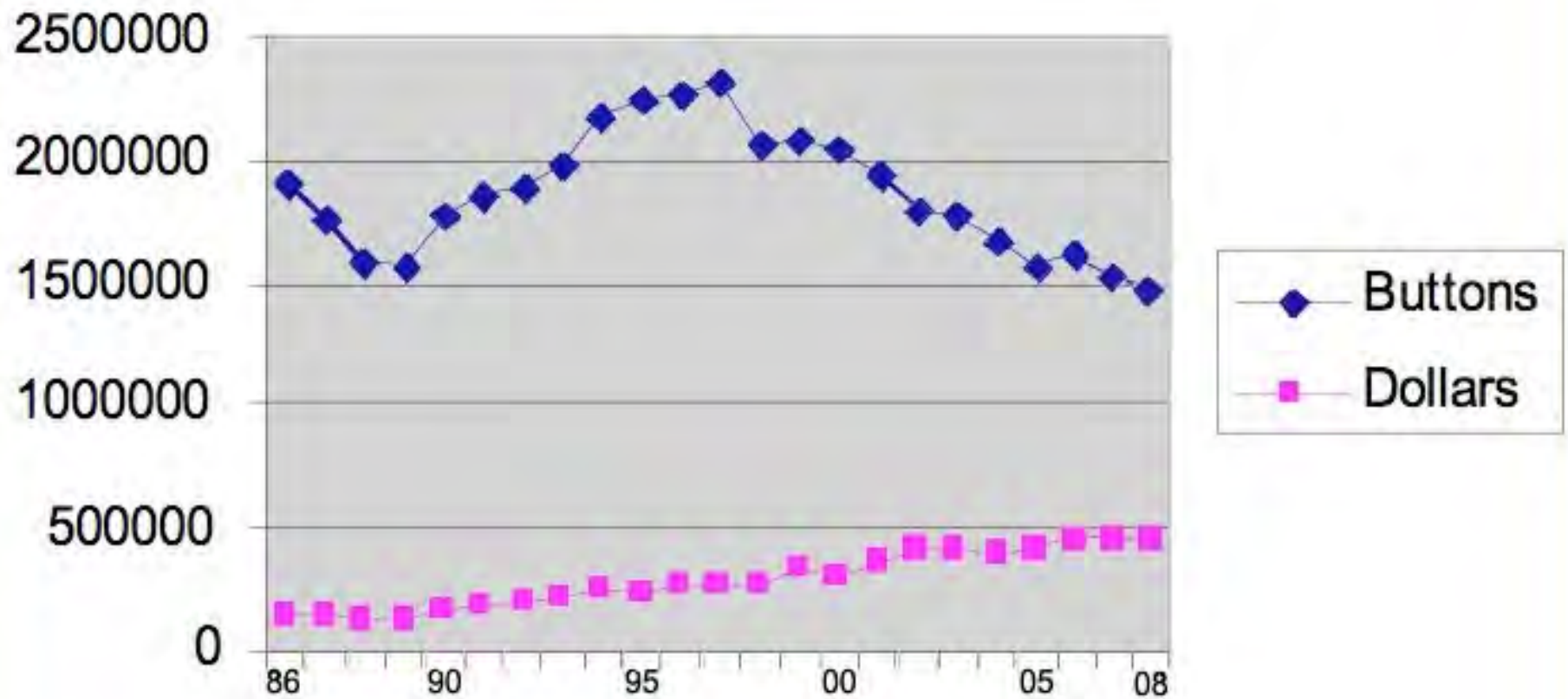
Religious sale of *L. williamsii*



Wholesale religious commerce



DPS Annual Peyote Sales Data



Years 1986-2008

The Problem of Diminishing Returns

- NAC membership: Unknown.
250,000-400,000 members?
- Demand for peyote exceeds the supply.
- Demand appears to be increasing while the supply is decreasing.

The Problem of Diminishing Returns

- Peyote occurs only on the periphery of Texas, along the Mexican border. Commercially harvestable quantities occur only in four counties: Starr, Zapata, Webb and Jim Hogg. This small area of habitat in the South Texas borderlands supplies the peyote needs of the NAC across the entire continental United States and Canada.

The Problem of Diminishing Returns

- The DEA-registered distributors of peyote are under pressure to harvest as much peyote as possible to satisfy their NAC customers.
- The result is that the distributors return to harvest previously harvested populations too soon – before the newly regenerated buttons are mature.

The Problem of Diminishing Returns

The results of harvesting too frequently:

- (1) Average size of harvested buttons decreases, which results in consumption of greater numbers of buttons to achieve the desired psychic effect. (Vicious circle.)
- (2) Seed production of plant population decreases, so that harvested plants are not sufficiently replaced by seedlings.
- (3) Some harvested plants never grow back. (Harvest-related mortality.)

Peyote Scarcity is Not Geographically Ubiquitous

- Many ranchers exclude peyote harvesters from their ranches and actively protect their peyote populations from poachers.
- Where peyote is protected from harvesting, the populations are healthy.
- But this fact does not help the NAC or the peyote distributors.

Possible Solutions

- Better harvesting techniques through education
 - (1) Most harvesting by DEA-registered peyote distributors and their usual employees is performed correctly and sustainably (cutting the button off at ground level to promote regrowth).
 - (2) Some harvesters cut too deep on the underground part of the stem or into the root, rendering regrowth unlikely or impossible.
 - (3) Others are digging up entire plants by the roots, eliminating any possibility of regrowth.
 - (4) Behavior modification is a long-term process.



Possible solutions

- **Increasing peyote yield in natural habitat**
 - (1) Involves using conventional agricultural techniques, e.g., supplying optimal amounts of water, shade and nutrients (fertilizer), to increase kg of peyote produced sustainably per hectare per year (or lb/acre/year).
 - (2) No regulatory approval required
 - (3) Low-tech, low-cost inputs
 - (4) High cost of land is a major impediment.
 - (5) Natural habitat is geographically

Possible Solutions

- Greenhouse cultivation of peyote

(1) Requires regulatory approval by DEA, and this means creating new policy. At least one petition for greenhouse cultivation by a Native American Church is currently under consideration by DEA.

(2) Requires acquisition of a greenhouse and following a learning curve to optimize greenhouse horticultural production.

Possible Solutions

- Greenhouse cultivation of peyote
 - (3) Requires no huge investment in land.
 - (4) Security in a greenhouse is easier to maintain than security on rural land in South Texas.
 - (5) Can be done at any latitude and in any climate.

Possible Solutions

- Greenhouse cultivation of peyote

(6) Would provide NAC groups with the opportunity to supply their own sacrament using techniques that they themselves determine to be in harmony with their religious requirements for their sacrament.

(7) Would make the self-providers independent of the currently permitted sources of peyote that are limited to South Texas.

(8) Would reduce the harvesting pressure on the wild populations of South Texas, allowing the remaining ones to recover.



Natural Threats
to
Astrophytum asterias



































Is the legislation working?

- National legislation (such as the ESA) and international conventions (such as CITES) are intended to protect endangered plants from extirpation by commercial collectors.
- But the same legislation makes it technically illegal for cactus growers to produce and sell endangered species grown from the seed of cacti that have been in cultivation for many generations. Is that helping to protect the remaining wild populations of the species?



QUESTIONS?
COMMENTS?