Cultivation of peyote: a logical and practical solution to the problem of decreased availability

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ABSTRACT

The progress toward and impediments to legally protected cultivation of *Lophophora williamsii*, commonly known as peyote, are elucidated. Recent increases in the ceremonial and medicinal consumption of peyote are inferred from published data and personal observations of the authors. The conservation-based rationale for peyote cultivation is that the predictable shift in the primary mode of production from the current unsustainable harvesting of wild peyote in habitat to regulated cultivation of peyote, either in situ or under glass, would provide alternative supplies of peyote for current and future use by the Native American Church. Such a change in the principal peyote production system from wild-harvesting to cultivation would logically reduce the harvesting pressure on the peyote populations that survive the intense overharvesting inherent in the present system. We summarize current and evolving aspects of the regulatory environment and emerging perceptions regarding the need for U.S. federal regulations that would provide legal certainty for individuals involved in the adoption of cultivation of culturally acceptable peyote on an economically viable commercial scale.
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In this paper our objective is to provide a multidimensional snapshot of the interrelated cultural, regulatory, economic and biological factors that currently affect individuals in the U.S. who are considering embarking upon the long-term enterprise of legal cultivation of *Lophophora williamsii* (Lem. ex Salm-Dyck) J.M. Coult. (Cactaceae), hereinafter referred to as peyote. Our standing in these matters stems from our research on the conservation biology—and, inevitably, the economic botany—of peyote (Terry 2008a–c; Hulsey et al. 2011; Terry et al. 2011, 2012; Kalam et al. 2013); additionally, many of the facts and ideas presented here are based on our own personal observations.

For the sake of economy of space and the specificity of our subject, we are intentionally omitting here vast amounts of the important background information on peyote, which would include the spiritual, medicinal, and other cultural uses of this remarkable plant. For general background on such topics we would refer the reader to previously published works (e.g., Schultes 1938; La Barre 1975; Stewart 1987; Anderson 1996; Trout 1999). At this point we must illuminate an irony: There are over a thousand publications on the broad subject of peyote *consumption*. But there is not a single publication devoted to peyote *production* on an industrial scale, for the purpose of increasing the availability of the plant for the myriad of known cultural uses. In light of the alarming rate of decimation of the wild peyote populations—which are currently the *only* sources of peyote for human consumption—alternative sources

of peyote for human use are urgently required. Cultivation is the most obvious and the most readily achievable means of alternative production of peyote. Our hope is that the widespread adoption of responsible peyote cultivation by cultural groups that benefit from the use of peyote, particularly the highly decentralized, geographically scattered, heterogeneous set of entities known collectively as the Native American Church (NAC), will offer the wild populations of peyote some degree of respite from the pressures of intense overharvesting to which they are currently subject. That would allow the recovery of the wild populations, both in terms of population size and in terms of average individual size within the populations (Terry et al. 2012). Cultivation would also serve as a source of seeds of known geographic origin and juvenile plants derived from such seed, which would be suitable for augmentation of depleted populations and reestablishment of populations at sites where peyote was known to occur historically but is currently considered to be extinct.

DIMINISHING AVAILABILITY OF PEYOTE

Almost no one was thinking seriously about the need for cultivation to supplement the supply of peyote in 1970, as peyote was still relatively abundant in habitat and peyote harvesters were relatively few—even including the amateur Hippie harvesters who invaded the peyote habitat in the Texas Borderlands in the late 1960's, seeking peyote as a means of consciousness expansion or spiritual revelation as described by Huxley (1954). To be exact, discussion of peyote scarcity in the literature did not begin until George Morgan sounded the alarm—based more on prescience than on actual data—in his doctoral dissertation (1976). But as time went on and the decline of natural populations of peyote in the U.S. became more clearly and widely perceived, Morgan's voice was joined by those of cactus botanists such as Anderson (1995), Powell and Weedin (2004), and Terry (2008a–c), echoed by a plethora of articles in the popular press (e.g., Cobb 2008, de Córdoba 2004, Franks 2007, Gator 2007, Moreno 2005, Olsson 2001, Robledo 2006, Sahagun 1994, Weissert 2010) lamenting the shortage of harvestable peyote. The decline of accessible populations of mature plants suitable for harvesting for ceremonial use by the NAC was compounded by an explosive growth in the membership of the NAC accompanying the passage of the American Indian Religious Freedom Act (AIRFA) Amendments of 1994 (Prue 2013). Ironically, while certain groups within the NAC are acutely aware of the current reduced availability of peyote as the sacrament for NAC ceremonial use (MT, pers. obs.), a small but recent survey found that none of the rank-and-file NAC members interviewed was aware of any shortage of peyote (Williams 2012). Interestingly, all of the survey interviewees who were aware of a shortage were either members of the NAC leadership or a licensed peyote distributor.

An important clarification is that peyote is not universally and consistently scarce throughout its geographic distribution. There are numerous populations that are perfectly healthy, as determined by a high frequency of full-sized adult plants (as well as juveniles), but such populations in the U.S. are located either behind locked gates and high fences that are patrolled to discourage trespassing, or in such remote or physically inaccessible locations that the peyote there is effectively protected from harvesting by sheer distance and/or difficult terrain. Where peyote is scarce is precisely where the peyote harvesters have easy access (MT & KT, pers. obs.), which is a problem whose adverse effects fall most directly on the NAC.

The level of threat from other potential impacts on wild populations of peyote also needs consideration. Loss of habitat through land development is the most significant element (Anderson 1995) but also the most difficult to control. Peyote has many medicinal uses at the folk level, among both Indians and ordinary rural Mexicans. Throughout the geographic range of peyote and beyond, the home use of tinctures of crushed fresh peyote in isopropyl alcohol as a topical treatment for rheumatic pains associated with muscular fatigue is ubiquitous (Terry 2008b). That home remedy is now being produced commercially by what appears to be a cottage pharmaceutical industry with online distribution of ostensibly peyote-based products called *pomadas de peyote* (Fig. 1). Analytical work is in progress to

determine whether such products actually contain peyote, and if so, how much (MT, pers. obs.). Sales of such products, which are sold online and in open markets in the streets of Mexican cities, are difficult to quantify. If the sales reach a level compatible with industrial-scale production of the *pomadas*, that would constitute another major cause of unsustainable harvesting of peyote from wild populations.

It is worth noting that all of the threats to native populations of peyote, from agricultural practices and urban sprawl to harvesting for religious use or medicinal use, are additive and appear to be increasing wherever peyote is not actively protected from such threats.

IMPORTATION OF PEYOTE AS A "QUICK FIX" FOR REDUCED AVAILABILITY: AN EXPENSIVE RED HERRING

Leaders of the Native American Church of North America (NACNA), facing what they perceive as a severe reduction in availability of peyote for consumption as the irreplaceable sacrament in the religious ceremonies of their membership, have been continually seeking solutions to the U.S. peyote shortage since the late 1970's, mainly in the form of unsuccessful attempts to obtain concurrent regulatory approval from the Mexican government and the U.S. government for the importation of peyote from Mexico into the U.S. (Emerson Jackson, pers. comm.; MT, pers. obs.). From our perspective, the high regulatory hurdles which have prevented success in this exercise are located on the Mexican side of the Border, embedded in the regulations and policies of three quite separate agencies:

(1) Controlled substances (including peyote) are regulated by the *Departamento de Estupefacientes y Psicotrópicos*, the Department of Stupefacients and Psychotropics (DSP). In our first-hand institutional experience, the DSP was not at all comfortable with the idea of issuing an export permit (to MT) for even gram quantities of peyote for scientific research, whereas, in contrast, the U.S. Drug Enforcement Administration (DEA) issued MT an import permit for 200 g of Mexican peyote for population genetic research with apparent ease (Permit No. 3289, 5 Nov 2002). We prefer not to contemplate the apoplexy that could have been engendered in the DSP by the NACNA's proposal that the Mexican government allow the export of **ton** quantities of peyote from Mexico to the U.S. for ingestion.

(2) Endangered and threatened species (which means all Mexican species of the family Cactaceae, including peyote) are regulated by the *Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT)*, the Secretariat of Environment and Natural Resources, one of whose duties is to promulgate and enforce national regulations to implement the International Convention on Trade in Endangered Species (CITES), of which both Mexico and the U.S. are signatories. In accordance with CITES, there is a Mexican federal regulation listing all known endangered and threatened species of Mexican cacti and their classifications in regard to their risk of extinction and priority of regulatory attention, originally published as NOM-059-SEMARNAT-2002, and most recently updated as NOM-059-SEMARNAT-2010. In this regulation, the species *Lophophora williamsii* is placed in a risk category that contains very few species; that category prescribes that the species is "*subjeta a protección especial*" (subject to special protection). This classification of peyote suggests that it is not considered endangered by SEMARNAT, but that it is considered to be at greater risk than most of the non-endangered species in the Cactaceae. That classification by SEMARNAT would surely raise red flags of regulatory caution in response to any proposal from a foreign entity, such as the NACNA, to increase the rate of exploitation of Mexican populations of peyote for the sole purpose of exportation to the U.S.

(3) Indigenous Mexican peoples who traditionally use peyote would be expected to have the support of the *Comisión Nacional para el Desarrollo de los Pueblos Indígenas (CDI)*, the National Commission for the Development of the Indigenous Peoples. Much depends on whether the Mexican indigenous groups are sufficiently well connected with the government to voice their concerns to CDI, and whether they perceive that the wild-harvesting and export of massive quantities of peyote from Mexican territory

may jeopardize their own future access to peyote. But it is at least reasonable to assume that the CDI would place a higher priority on maintaining the availability of peyote to Mexican indigenous peoples than on solving the problem of reduced availability of peyote for non-Mexican indigenous groups who face a dwindling domestic supply from their own peyote populations.

The preceding considerations are historically important because of the negative bearing they have had on any considered efforts to explore cultivation of peyote in the U.S. The seductive goal of persuading the Mexican government to allow the exportation of Mexican peyote to the U.S. for NACNA ceremonial use has been a perennial red herring in NACNA politics. Time will be required for (1) establishing the U.S. regulatory parameters for cultivation and (2) climbing the technical and financial learning curve to establish large-scale cultivation of peyote. Both will need to occur before cultivation can replace the overharvested South Texas populations as the primary source of sacramental peyote for the NAC.

THE LEGAL AND REGULATORY ENVIRONMENT IN THE U.S.

The challenges inherent in initiating peyote cultivation in the U.S. were exacerbated by the enactment of the Controlled Substances Act (U.S. Congress 1970) and the DEA regulations that were subsequently adopted in the iterative process of implementing the legislation. The crux of the problem was that the primary purpose of the Controlled Substances Act (CSA) was to control the use of drugs, and in the case of the substances relegated to Schedule 1, to eliminate such use if possible. Schedule 1 is the CSA drug category containing what may be considered the most stringently forbidden drugs, defined as those with "no currently accepted medical use in the United States, a lack of accepted safety for use under medical supervision, and a high potential for abuse" (U.S. Congress 1970). For better or for worse, peyote was swept into Schedule 1 along with hallucinogens such as LSD. That meant that the policy makers at DEA were primarily tasked with making peyote **difficult** to obtain **— not** with ensuring that the Native American Church (whose members were exempted from the prohibition on peyote use, per 21 C.F.R. § 1307.31) would be able to obtain **enough** peyote as time went on. Indeed, the most direct translation of the horticultural phrase "cultivation of peyote" into the regulatory language of Title 21 of the Code of Federal Regulations is "manufacturing [a] controlled substance" (Drug Enforcement Administration 2013).

In 1994, Congress created more helpful language, specifically in reference to the cultivation of peyote. The American Indian Religious Freedom Act (AIRFA) Amendments of 1994 clarified that the law "does not prohibit such reasonable regulation and registration of those persons who cultivate, harvest, or distribute peyote as may be consistent with the purposes of this Act." The legislative language also made it clear that among "the purposes of this Act" was that of providing "adequate and clear legal protection for the religious use of peyote by Indians." So there is no impediment to the cultivation of peyote at the legislative level. The only component lacking is at the regulatory level. That is where DEA regulations are needed to create the appropriate regulatory structure that will provide "adequate and clear protection for the religious use of peyote by Indians." In order to comply with the intent of this language of the statute, it is incumbent upon DEA to take into account the fact that "the religious use of peyote by Indians" is compromised by the reduced availability of peyote. That fact leads directly to the logical conclusion that the reduced supplies of wild-harvested peyote must be augmented with peyote produced by regulated cultivation undertaken by registered persons.

Then why has no one petitioned DEA to promulgate the appropriate regulations, negotiated between interested NAC members and DEA, to enable cultivation of peyote in accordance with AIRFA 1994? Well, in fact, someone has, but the negotiations were not productive (MT & KT, pers. obs.). When the next petition for regulatory relief in the form of peyote cultivation is submitted to DEA, a concerted and timely effort will be required of both DEA and NAC if negotiations aimed at the time-sensitive promulgation of the needed regulations are to be successful.

Another possibility is that, if the DEA is too slow to respond to NAC needs expressed in petitions for regulated cultivation of peyote, the populations of peyote in the U.S. will become so decimated that the U.S. Fish and Wildlife Service (USFWS) will be legally obligated to step in to regulate peyote as a threatened species under the Endangered Species Act (ESA) (U.S. Congress, 1973). In that event, the ESA calls for interagency consultations with other interested government agencies, and that would mean that the DEA would be required to consult with the USFWS, and it does not take much imagination to predict that an alternative to the current system of wild-harvesting of peyote—viz., cultivation—would be at the top of the agenda.

Yet another possibility is that DEA will delay the process of promulgating the regulations until it makes itself irrelevant to the development of cultivation of peyote by the NAC. One major tribe has already taken the decision to cultivate peyote on tribal land — that is to say, on land which is governed by the tribe as a sovereign nation, and which is largely protected from U.S. regulatory interference (particularly in matters of Indian religion) by the veil of national sovereignty (MT, pers. obs.).

Cultivation seems to be an inevitable undertaking in the future of the NAC if they envision a long-term future for the religious use of peyote. Delaying implementation of cultivation compounds their challenges due to the lag time involved prior to the first large-scale harvest in a sustainable production stream. We estimate that the developmental lag time to full-scale production of culturally acceptable peyote will be on the order of 10 years. The sooner that task can begin, the simpler the future will be for everyone involved, from the level of the average NAC member participating in ceremony to the regulator involved with creating an acceptable regulatory framework.

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Figure 1. A *pomada de peyote* (commercial "peyote" ointment for topical application), as sold openly in the public markets of Mexico. It remains to be determined whether such products actually contain any components of *L. williamsii*.