

# Commercial trade of federally listed threatened and endangered plants in the United States

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**EXCERPTS HELPFUL FOR UNDERSTANDING “ASSISTED MIGRATION”**  
*posted by TorreyaGuardians.org for public education. (Bolded type has been added.)*

**ABSTRACT:** The commercial trade of propagated listed plants is a common but controversial ex situ conservation approach for rare plant species. We investigated the Internet trade of plants protected under the U.S. Endangered Species Act to determine their availability for interstate (i.e., regulated) commerce. We identified 49 listed plant species that were available via the Internet, with less than 10% of vendors having obtained the required federal permit. The lack of permits among vendors suggests that sellers are unaware or ignore regulations. Illegal trade undermines both the permitting process and conservation efforts of the U.S. Fish and Wildlife Service to ensure that commercial propagation aids the long-term survival of listed species. Furthermore, in addition to supplying a demand for plant collections and landscaping, commercial trade could provide a source of plants for deliberate species introductions, including assisted colonization—a debated conservation strategy that involves moving species to new environments to mitigate for habitat loss and climate change. Given the potential costs and benefits associated with trade, the challenges suggest that a collaborative approach between agencies, nurseries, and plant collectors is needed to regulate the trade of listed plants. In regulating commercial trade, policymakers and conservation biologists may want to consider potential risks and benefits of private efforts to recover species.

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## **U.S. regulations of endangered plant commerce**

The U.S. Endangered Species Act (ESA; 16 USC §1531 *et seq.*) does not prohibit intrastate commercial sales of listed plants, the transport and transplant of privately owned listed plants or destroying listed plants in areas not under Federal jurisdiction (McMahan 1980; Campbell 1988; Falk & Olwell 1992; McDonald 1996). In other words, **a listed plant could be purchased in one state and then transported to another state without violating the ESA, so long as the plant was taken from and planted on property not under Federal jurisdiction, such as private property. Furthermore, the ESA does not prohibit an individual from giving listed plants as a gift to someone in another state so long as a change in plant ownership is not in the pursuit of gain or profit.** However, any violation of a state law in the process of purchasing,

transporting, or transplanting plants would trigger additional violations of the ESA and Lacey Act (16 USC §§3371–3378).

Federal law does regulate interstate commerce of both cultivated and wild-collected listed plants — a permit is required before selling a cultivated plant in interstate commerce. Offering a listed plant for sale in interstate commerce also requires this permit, but an exception is provided: advertising a plant for sale in interstate commerce without a permit is permissible and not considered an offer for sale providing a warning is given that “no sale may be consummated until a permit has been obtained” from FWS (50 CFR §17.61 for endangered plants & §17.71 for threatened plants); though “seeds of cultivated specimens of species treated as threatened shall be exempt from all the provisions of §17.61, provided that a statement that the seeds are of ‘cultivated origin’ accompanies the seeds” (50 CFR §17.71). In 1977, the U.S. Fish and Wildlife Service (FWS) published an extensive statement in the U.S. Federal Register explaining the regulations, which were a compromise between a full ban on commercial trade and no regulation, summarized as follows:

The Service recognizes the beneficial and educational aspects of activities with seeds and cultivated plants, which generally enhance the propagation of the species, and therefore would satisfy permit requirements under the Act. The Service intends to monitor the interstate and foreign commerce and import and export of endangered and threatened plants in a manner which will not inhibit such activities, providing that the activities do not represent a threat to the survival of species in the wild (USFWS 1977).

**The FWS recognized the potential benefits of commercial trade, including reducing collecting pressure on wild populations, creating reservoirs for reintroduction and restoration, and encouraging the survival of species germplasm in cultivation** (USFWS 1977). Thus, federal regulations do not prohibit commercial trade, but do require that sellers of cultivated listed plants and seeds from endangered plants apply for a \$100 permit from the FWS (50 CFR §17.62 & §17.72; [www.fws.gov/forms/3-200-55.pdf](http://www.fws.gov/forms/3-200-55.pdf)). The permit requirement helps to ensure that interstate commerce contributes to the species’ recovery by enhancing propagation or survival (50 CFR §17.62 & §17.72), which can be as active as providing plants for restoration, or as passive as promoting appreciation of the species through consumer education (USFWS 1977).

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Hybridization has been important (1) for the ecology and evolution of plants, (2) as a source of economically important plants (e.g., crops and ornamentals), (3) for biodiversity and unique community interactions, and (4) as a catalyst for speciation in other organisms; conversely, **hybridization also poses risks to rare plant species** including (1) introgression that reduces genetic diversity, (2) reductions in fitness due to outbreeding depression, (3) contaminating ex situ gene pools for future reintroduction or restoration, and (4) reduced legal protection (Whitham & Maschinski 1996; Soltis & Gitzendanner 1999; Allendorf *et al.* 2001; Guerrant *et al.* 2004). Generally, the conservation value of hybrids increases as a function of time since the hybridization event (Travis *et al.* 2008).

In the United States, interstate commerce and trade involving natural or anthropogenic hybrids of listed plant species is unregulated. As a matter of policy, **the FWS considers the intentional hybridization of listed species to be contrary to the purposes of the ESA unless necessary to**

**preserve genetically viable populations** (library.fws.gov/IA Pubs/esa permits.pdf), though there are no restrictions in the ESA or FWS regulations to discourage the creation of hybrids to avoid compliance with the permit requirements for interstate commerce.

The FWS does not view cultivated hybrids as a threat to wild Tennessee coneflower “because planting of (hybrid) individuals is not allowed on public and state owned property where wild populations occur” (76 FR 46646). However, one protected Tennessee coneflower population lies within fragmented habitat bordered by private property, including housing developments in an area where the hybrid is sold (Figure 2). Any private planting of hybrid plants believed to be Tennessee coneflower within pollinating distance of wild populations could pose a risk of cross-pollination.

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**Assisted colonization is the intentional movement of a species or genotype to a location outside of its documented native range where the species could survive under current or future climate and land-use scenarios (Hunter 2007); assisted colonization has also been referred to as assisted migration (McLachlan *et al.* 2007) and managed relocation, with variations and definitions discussed by Schwartz *et al.* (2012).**

Assisted colonization has been proposed as a specific management option to move species with poor dispersal abilities to disconnected habitats, subject to **changing climate**, and land use (Hoegh-Guldberg *et al.* 2008; Richardson *et al.* 2009).

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Although most efforts remain in the proposal stage for a variety of plants (*e.g.*, Vitt *et al.* 2010), **assisted colonization has been carried out by (1) governments and scientists as a last resort for species preservation [e.g., Virginia round-leaf birch (*Betula uber*) planted on public land and distributed commercially for landscaping in the United States (Shirey & Lamberti 2010)]; (2) by scientists during climate change adaptation experiments [e.g., understory forest herbs purchased from southern France and planted in Belgium (Van der Veken *et al.* 2012)]; and (3) by private citizen groups [e.g., Torreya Guardians].**

**In the United States, the structure of the Endangered Species Act, coupled with inadequate funding for endangered plant conservation, has encouraged citizens to undertake plant conservation, especially for charismatic plants threatened by climate change.** For example, the **Torreya Guardians** have obtained plants and seeds of Florida torreya (*Torreya taxifolia*), and moved seedlings and saplings to the southern Appalachian Mountains, outside of the species’ historic range (McLachlan *et al.* 2007; [www.torreyaguards.org](http://www.torreyaguards.org)). The population of *T. taxifolia* declined by 98% during the last century due to disease and poor recruitment, making restoration in its historic range difficult (Schwartz *et al.* 2000). **The Torreya Guardians argued for moving *T. taxifolia* northward where it may have thrived during the last peak interglacial because its current range is restricted by human-caused extinctions of seed dispersers** (Barlow 2009). Establishing experimental populations of *T. taxifolia* through assisted colonization was discussed by conservation biologists over 20 years ago (Falk 1990), but never materialized. However, public and private organizations took measures to conserve *T. taxifolia* and study why it was declining in the wild (Affolter 1997). Specifically, the Center for Plant Conservation (<http://www.centerforplantconservation.org>) led an extensive effort to document

locations of all known plants and coordinate ex situ conservation in botanical gardens to ensure survival of the species (USFWS 2010b). **In contrast to accepted ex situ conservation practices (Haskins & Keel 2012), the Torreya Guardians established private experimental populations on the property of cooperative landowners to help preserve the species outside of its historic range because of its decline, lack of federal funding, and the availability of privately owned and commercially available plants and seeds.**

Finally, **under U.S. federal law, citizens who move a listed plant are not constrained by the same assessment process as the federal government—their actions are legal under the ESA without a review of their plans** (Figure 1; McDonald 1996).