New Seed Collection Zones Are a Mid-Level Descriptor of Seed Origin for the Eastern United States

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Abstract

This paper provides a brief overview about the Eastern Seed Zone Forum and the new seed-collection zones that were developed for the Eastern United States. A detailed description of the zones and their development has been published in the *Journal of Forestry* (Pike et al. 2020). This paper was presented at the 2019 Joint Annual Meeting of the Northeast and Southern Forest Conservation Nursery Associations (Atlantic City, NJ, July 23–25, 2019) and at the 2019 Annual Meeting of the Intertribal Nursery Council (Tulsa, OK, June 12, 2019).

Overview

In 2015, the U.S. Department of Agriculture, Forest Service assembled a team called the ESZF (Eastern Seed Zone Forum) to develop seed-collection zones for the Eastern United States. As part of that effort, a webinar series was held in 2018, and a Seed Zone Summit was held in May 2018 in Lexington, KY. The team then developed a new map of seed-collection zones for the 37 Eastern States by combining two layers: plant hardiness zones (USDA ARS 2012) and eco-regions (Cleland et al. 2017). In total, 245 unique seed collection zones were created (figure 1). The seed zones are denoted by continuous colors on the map, and are sequentially numbered. The latest version of the map, the archived webinar series, and other resources are available at: www.easternseedzones.com. A full description of the methodology and map development has been published in the *Journal of Forestry* (Pike et al. 2020). A list of the seed collection zones by county can be downloaded directly from the Arc GIS map page, accessible at the website, to facilitate sorting and utility by nurseries, land managers, researchers, and other users.

The seed-collection zones were intended to be used for trees and plants to define seed origin. The zones are relatively large, and therefore may serve as a mid-level descriptor of seed origin to help seed collectors, dealers, and nurseries that commonly move plant material among States. This system may be too coarse for gene conservation purposes, where collectors may rely on GPS coordinates to pinpoint the origin of plant material or seed.

For most purposes, the State and numeric seed-collection zone can be used to describe a seedlot's origin. For example, seed collected in Carlton County, MN, (zone 7) would be labeled as MN-7, and could be lumped with other Minnesota counties in zone 7 (e.g., Itasca, Aitkin, and Cass Counties). Douglas County, WI, is also in zone 7, but this seed would be designated as WI-7. Some seed collectors may decide to maintain separate seedlots by county or include additional provenance information to meet their needs. Nurseries may decide to lump seed from several different zones into one nursery bed, or they may decide to split by State, depending on their nursery practices and logistical needs.

Common garden studies remain the gold standard for determining how far to move seed from, or within, any particular seed-collection zone. For species that have not been field-tested, limiting seed movement within a seed collection zone or between adjacent seed collection zones is a reasonable, general guideline. Seed-transfer decisions for improved seed are based on progeny tests at multiple locations; for recommendations, consult with the improvement program staff that established and analyzed the progeny tests.

The next phase of this project will include a summary of best practices for seed transfer of the most commonly planted species (workhorse species) in the Eastern United States. A team of geneticists will

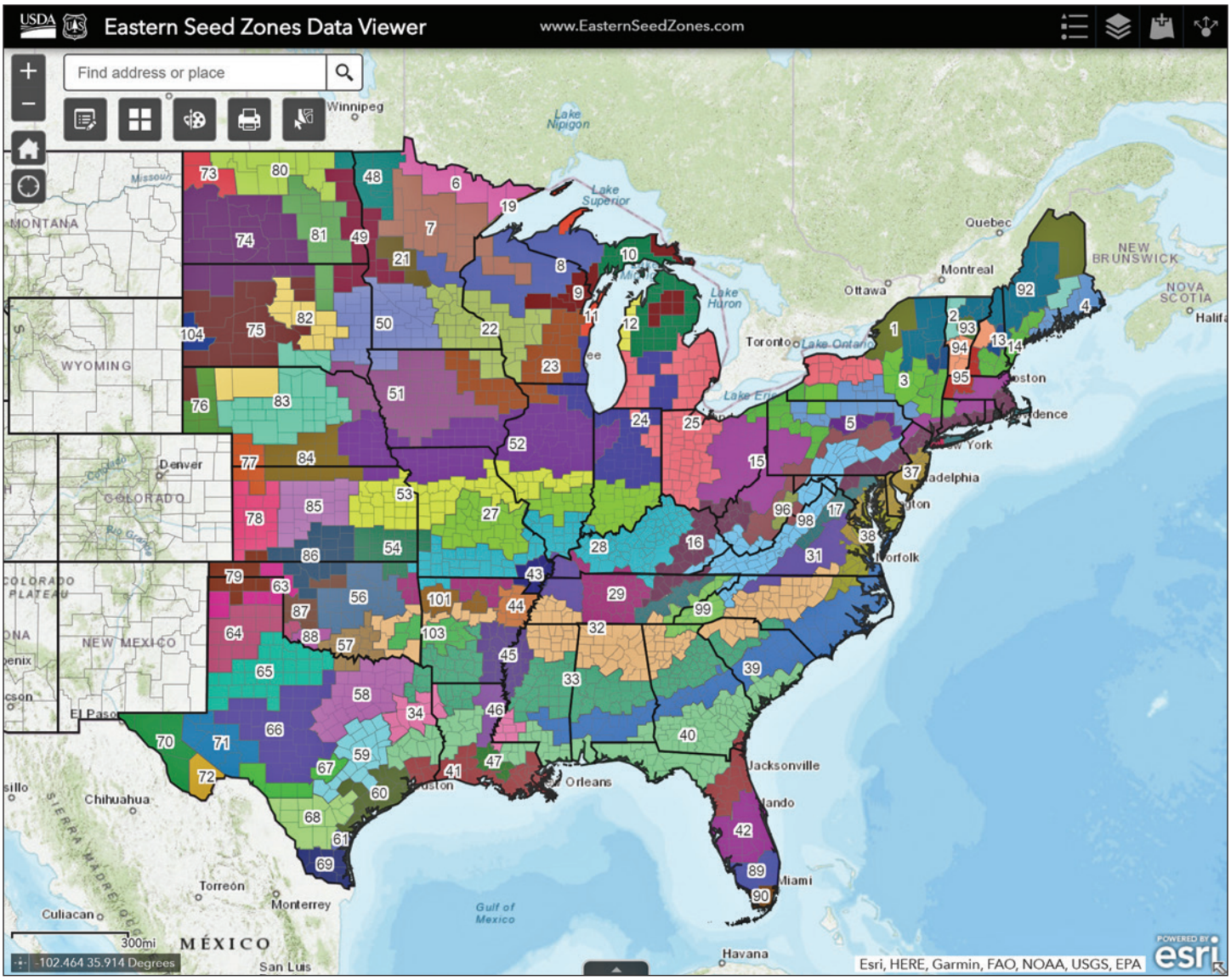

Figure 1. Latest version of the Eastern Seed Zone Forum map, version 2.2, available at www.easternseedzones.com.

review the literature of common gardens (with a particular focus on provenance trials), and make general seed-transfer recommendations for these workhorse species. This information will be compiled into a document for nursery workers and seed collectors.

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