



This PDF file is a digital version of a chapter in the 2005 GWS Conference Proceedings. Please cite as follows:

Harmon, David, ed. 2006. *People, Places, and Parks: Proceedings of the 2005 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites*. Hancock, Michigan: The George Wright Society.

© 2006 The George Wright Society, Inc. All rights reserved. This file may be freely copied and distributed for noncommercial use (including use in classrooms) without obtaining further permission from the GWS. All commercial uses of this file require prior permission from the George Wright Society.

The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions and policies of the U.S. government, any of the other co-sponsoring or supporting organizations, or the George Wright Society. Any mention of trade names or commercial products does not constitute an endorsement by the U.S. government, any of the other co-sponsoring or supporting organizations, or the George Wright Society.



P.O. Box 65
Hancock, Michigan 49930-0065 USA
1-906-487-9722 • fax 1-906-487-9405
www.georgewright.org

Native Plant Restoration at Stones River National Battlefield

John Vandevender, U.S. Department of Agriculture–Natural Resources Conservation Service, Alderson Plant Materials Center, P.O. Box 390, Alderson, West Virginia 24910; John.Vandevender@wv.usda.gov

Stones River National Battlefield is located in south-central Tennessee on the outskirts of the city of Murfreesboro. Historically, this park is the location of the first major battle in the Union’s effort to divide the Confederacy by mounting an eastward-moving campaign through the South to the Atlantic Ocean. The battle fought here between December 31, 1862, and January 2, 1863, ranged over 4,000 acres, of which 10–12% is preserved within the current Stones River National Battlefield. Many battlefield accounts of the difficult terrain exist, especially of the cedar thickets, cedar brakes, and rock ledges and outcroppings that presented major obstacles to the movement of troops and equipment.

Cedar glades, another component of the battlefield terrain, are also mentioned in battlefield records. Figure 1 is a vintage photograph that is fairly representative of cedar glades in the area circa 1862.

Today, cedar glades at Stones River are typically represented by the scene in Figure 2. The transition from the previous scene to this has occurred primarily through cessation of farming the land.

Other typical battlefield scenes include period artillery pieces such as cannons, boardwalks and signage in key interpretive areas within the park, earthwork embattlements, and monuments.

Figure 1. Cedar glades, circa 1862. Photo courtesy of Stones River National Battlefield natural resources staff.



In addition to its historic importance, Stones River National Battlefield is also ecologically significant. Stones River is one of the top twenty-six calcareous glades in Tennessee and one of the top 40 glades in the Southeast. Calcareous glades of the southeastern United States contribute to the biodiversity of the region through their unique habitat and the species that colonize that habitat. In Tennessee, the Division of Natural Heritage has found that 10% of the Tennessee-listed rare plants are found in limestone glades. A glade is identified as an open area of relatively shallow, often rocky soil surrounded by cedar woods. Some examples of rare taxa that inhabit Stones River glades are *Echinacea tennesseensis*, Tennessee coneflower, and *Talinum calcaricum*, limestone fameflower. Other non-listed endemics include *Erythronium americanum*, trout lily; *Cardamine concatenata*, five-parted toothwort; and *Trillium cuneatum*, toadshade.

In 1995, the natural resources staff at Stones River conducted a vascular plant inventory of the calcareous glades of the battlefield. This inventory established a vegetative baseline for monitoring vegetative changes within the Stones River glades. The data also provided information about the direction of change for major glade indicators with the increase in woody (that is, cedar) cover. Population trends for major glade indicator species have declined with increasing cedar cover.



Figure 2. Typical present-day cedar glade. Photo courtesy of Stones River National Battlefield natural resources staff.

Using these findings, the natural resources staff at Stones River has developed and is implementing an invasive species control plan. Exotic invasives are being controlled primarily through use of labor to cut or dig the offending plants. Native invasives, such as the red cedar, will likely be controlled through cutting and/or controlled burning. However, the degree of complexity associated with the glade indicator species population trend is greater than the complexity of the invasive species control issue.

Thus, Stones River National Battlefield opted to enter into an agreement with the U.S. Department of Agriculture–Natural Resources Conservation Service Plant Materials Center in Alderson, West Virginia, to produce seed and/or seedlings of some 20 species of glade indicator plants in order to preserve and/or improve cedar glade floristic authenticity. Plants are produced by the plant materials center from Stones River-ecotype seeds and used to establish seed production fields within the park. Seed harvested from these fields will then be used to enhance floristic authenticity within the park's calcareous glades. A brief description of this process follows.

The process begins with collection of native plant seed within the park confines from plants such as *Andropogon ternarius*, splitbeard bluestem (Figure 3).

Figure 3. *Andropogon ternarius*, splitbeard bluestem. Photo courtesy Alderson Plant Materials Center.



Once harvested, seed is transported to the plant materials center where it is conditioned and stored in a temperature- and humidity-controlled environment until planting.

Seed conditioning typically utilizes specialized equipment to separate vegetative debris from seed. Conditioning is performed to improve seed handling and/or germination characteristics.

Upon removal from climate-controlled storage, seed is planted in individual cells. After planting, the flats or trays may be placed cold storage for stratification if needed or directly into a greenhouse environment if stratification is not required. Once placed in the greenhouse, seed is subjected to controlled temperature, lighting, and moisture regimes to ensure optimal germination. Plants remain in greenhouse conditions until an extensive root system has developed. Plants are then returned to Stones River, where they are used to establish permanent seed production fields.

At Stones River, transplanting is accomplished by using a mechanized transplanter that is propelled with a small farm tractor. Hand labor is used to remove the seedling plugs from the greenhouse trays and load them into the transplanter. Field preparation prior to transplanting typically involves use of a contact herbicide to remove existing vegetation and tillage, followed by plowing and disking to prepare the soil to ensure optimum transplant root-to-soil contact.

Figure 4 shows well-established seed production fields that should serve the native plant restoration needs of Stones River Natural Resources staff well into the future. With proper management and care, fields such as these should remain productive indefinitely.

Other species that are being increased for Stones River include *Solidago nemoralis*, gray goldenrod; *Lespedeza violacea*, violet lespedeza; *Forestiera ligustrina*, upland swamp privet; *Symphotrichum drummondii*, Drummond's aster; and *Eragrostis spectabilis*, purple lovegrass. In 2004, the Alderson Plant Materials Center produced approximately 20,000 seedling plugs of 12 Stones River-ecotype native plants. The Stones River native plant restoration project is scheduled to continue for at least three more years.

In summary, the Stones River National Battlefield native plant restoration project promotes sustainability of local plant ecotypes, ensures circa-1862 floristic authenticity within the park, minimizes genetic shift, and improves knowledge of propagation techniques for several native species.



Figure 4. Typical seed production field at Stones River National Battlefield. Photo courtesy of Stones River National Battlefield natural resources staff.