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Survival and Genet Growth and Development of Field-Planted Giant Cane (*Arundinaria gigantea*) over Time in Southern Illinois

J.J. Zaczek,^{1*} S.G. Baer,² J.L. Hartleb,³ W.W. Brendecke,⁴ J.E. Schoonover,¹ K.W.J. Williard,¹ and J.W. Groninger¹

¹Department of Forestry and Center for Ecology and ²Department of Plant Biology and Center for Ecology, Southern Illinois University, Carbondale, Illinois 62901

³United States Fish and Wildlife Service, Puxico, Missouri 63960

⁴United States Forest Service, Prairie City, Oregon 97869

ABSTRACT The drastic loss of giant cane (*Arundinaria gigantea*)-dominated communities (canebrakes) in southeastern North America has spurred great interest in habitat restoration. We report on two giant cane restoration studies that investigate the effects of collection source, rhizome propagule morphological characteristics and type (greenhouse-grown containerized stock plants or bare rhizomes), site, and time on genet survival and growth. Survival over the two studies (after three and five years) differed by propagule collection source, was marginally greater when planting older containerized stock, and varied between sites. Although field survival tended to be somewhat greater for greenhouse-grown containerized stock in comparison to bare rhizomes, overall survival was similar for both stock types when accounting for mortality of planted rhizomes in the greenhouse. The number of culms, their height, and spread of the genets increased over time and differed by planting stock type in each study. At Becca's Tract, cane genet growth ranged from a mean of 1.4 ± 0.1 culms that were 41.7 ± 1.8 cm tall with essentially no spread after the first growing season to a mean of 80.6 ± 7.6 culms that were 99.8 ± 2.8 cm tall with a spread of 212.1 ± 19.6 cm after five years. Giant cane rhizome sections initially grown in a greenhouse or planted directly in the field can be used to establish canebrakes in a framework that is operationally feasible for large-scale restoration.

INTRODUCTION Giant cane [*Arundinaria gigantea* (Walt.) Muhl.] is one of three native North American species of cane that are members of the Bambusoideae division of the grass family Poaceae (Simon 1986, Triplett et al. 2006). It is a species that once formed extensive monotypic stands or "canebrakes" throughout portions of the southeastern United States (Marsh 1977, Brantley and Platt 2001). Canebrakes, once commonly found in floodplains, are maintained by periodic disturbance, especially occasional fire and high winds, which reduce woody competition and encourage canebrake uniformity and vigorous new growth (Hughes 1966, Gagnon et al. 2007, Gagnon and Platt 2008). However, changes in land use and disturbance regimes have greatly reduced canebrakes to less than

2% of historical levels (Noss et al. 1995; Platt and Brantley 1992, 1997). Consequently, canebrake habitat is now considered critically endangered and merits restoration (Platt and Brantley 1997, Platt et al. 2001).

The drastic reduction of cane has negatively impacted a variety of wildlife species including 23 mammals, 16 birds, four reptiles, and seven invertebrates that are known to utilize canebrake ecosystems for food, shelter, or reproduction (Smart et al. 1960, Platt et al. 2001). Giant cane stands are unique and critical habitat for animals. Canebrakes are important for the rare Swainson's warbler (*Limnothlypis swainsonii* Audubon), the endangered (likely extinct) Bachman's warbler (*Vermivora bachmanii* Audubon), six unique species of *Lepidoptera*, and other species (Remsen 1986, Thomas et al. 1996, Platt et al. 2001). Canebrakes, which naturally grow

*email address: zaczek@siu.edu