

Buffelgrass Invasion and Mitigation in the northern Sonoran Desert

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Southern and central Arizona are on the verge of losing the Arizona Upland of the Sonoran Desert, the ecological backdrop for two large cities (Tucson and Phoenix) that host major universities, a profitable tourism industry with world-class resorts, multiple national and regional parks, and award-winning conservation efforts. Invasion by *Pennisetum ciliare* (buffelgrass) and other non-native grasses threatens to transform this mostly fireproof and diverse ecosystem into an impoverished and flammable savanna. Risks to biodiversity include not just rare and endangered species, but also to more dominant and iconic ones like the saguaro. There are obvious compromises to conservation efforts. Simple purchase and setting aside of “pristine” desert is no longer effective without the resources needed to manage invasive grasses and associated wildfires. Likely impacts to basic ecosystem services, including food webs, nutrient cycling, and the transport, supply and quality of water and sediment, remain virtually unstudied. Economic impacts include market-based costs (e.g., decreased property values in infested and increasingly fire-prone areas, losses in tourism revenues with a decaying ecological backdrop, and escalating weed control and fire suppression budgets across all jurisdictions) as well as nonmarket based costs not easily expressed in dollar terms (i.e., aesthetic values). Urban areas now have to plan growth, development and protection of public safety around a fast-evolving fire risk.

We must choose between saving the desert or resigning ourselves to these novel and combustible grasslands. What decisions must we make, who makes them, and how will they be implemented across complex physical and cultural landscapes? The Arizona state government has declared buffelgrass a noxious weed, and in Pima County, local governments are drafting ordinances to encourage utilities, developers, and private landowners to control it on their properties and right-of-ways. A non-profit organization, the Southern Arizona Buffelgrass Coordination Center (SABCC: see www.buffelgrass.org), was established in late 2008 to coordinate across the public and private sectors. Control efforts have accelerated, culminating in treatment of >2000 acres on public lands and right-of-ways in since 2008. Public awareness and participation is on the rise. Over 100 volunteers pull buffelgrass each month in the Tucson area and similar volunteer efforts are under way in Phoenix. A data management system for mapping, monitoring and tracking treatments and their success is now available. A vulnerability and risk assessment was recently completed for the Tucson area, and is being integrated into a state-and-transition, decision analysis framework parameterized for habitat suitability, invasion rates, dispersal dynamics, and treatment costs and effectiveness. Congressional field hearings focused on buffelgrass invasion on federal lands were held in Tucson on April 10, 2010. If the federal government, by far the largest landowner in the state, allows buffelgrass to overrun suitable habitat on its lands,

mitigation efforts will be compromised on other adjacent public and private lands. An interagency mitigation and planning effort across 5 different federal agencies and 14 federal units is under consideration, pending a funding request to Congress.