



Research Brief for Resource Managers

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National Park Service Guidance for Invasive Plant Management Planning

Dingman, S., S.R. Abella, M. Frey, P. Budde, and T. Hogan. 2018. *Invasive plant management planning: technical considerations. Natural Resource Report NPS/NRSS/BRD/NRR—2018/1820. National Park Service, Natural Resource Stewardship and Science, Fort Collins, CO. 84 pp.*
<https://irma.nps.gov/DataStore/Reference/Profile/2257574>

In 2009, it was estimated that 216 analyzed units managed by the National Park Service (about half of the 400 national park units) contained 3,700 non-native plant species.¹ While many of these species are minimally abundant and may remain relatively innocuous, hundreds of the species are already harming native ecosystems and many of the currently innocuous ones could become invasive in the future. Observed effects of the harmful invaders have included, but are not limited to, competing with native plants, lowering the quality of forage available to native animals, “detouring” pollinators away from pollinating native plants, altering soils, and changing fuels.

The California deserts region illustrates management challenges non-native plants pose. A 2010-2011 inventory of 1,223 sites (each 0.1 ha) in Death Valley National Park and Mojave National Preserve found that 80% of the sites contained at least one non-native plant species.² Furthermore, the most abundant species were non-native annual grasses, associated with production of hazardous fuels and increased fire activity detrimental to native desert shrublands.

Management Implications

- Between 2005 and 2018, 78 national park units developed invasive plant management plans
- National guidance is provided for new and updated invasive plant management plans that meet federal standards
- Incorporation of adaptive management trials is useful for identifying treatments effective in specific situations, including under changing conditions



Red brome and cheatgrass non-native grass fuels in Joshua Tree National Park (photo by S.R. Abella, 2017).

Recognizing the risks posed by non-native plant invasions, interest in developing invasive plant management plans has been increasing. Between 2005 and July 2018, the National Park Service performed environmental assessments and impact statements for invasive plant management

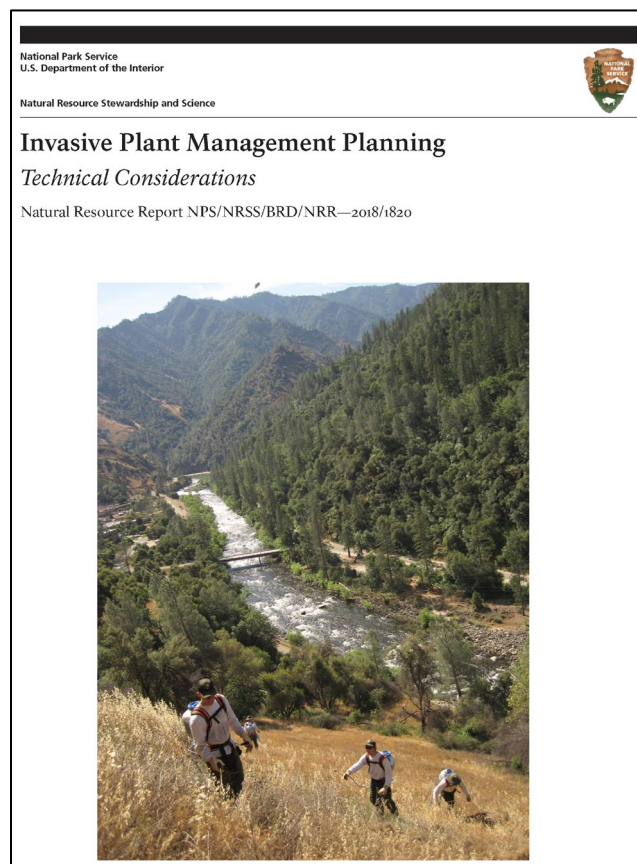
in 78 national park units. To assist with developing future or updated invasive plant management plans, the National Park Service issued a summary guidance document in December 2018 (Dingman et al. 2018). This document synthesizes management plans developed since 2005 to provide templates.

The document then provides guidance and references to assist with developing a general framework common to invasive plant plans. For example, when developing treatment strategies, plans should generally incorporate key principles of invasion ecology and the ecological traits of the invaders and native species. Illustrating a key invasion ecology principle where treating infestations when small is crucial for effectiveness and cost-efficiency, most infestations smaller than 0.1 ha in California could be successfully eradicated. In contrast, infestations larger than 1 ha were rarely eradicated and treatment costs skyrocketed. Similarly, traits of plants, like seasonality of growth, can influence several management plan components, such as which treatments are authorized in plans.

In addition to providing an overview of ecological and biological components of plans, the document summarizes administrative aspects of developing and implementing invasive plant management programs. For example, the document provides guidance on special considerations for planning areas that include designated Wilderness, prioritization protocols for “site-led” and “invasive species-led” schemes for optimally allocating limited resources for treatments, and example annual work plans for invasive plant programs such as purchasing supplies that meet federal requirements. Applicable federal laws are also reviewed, such as the 2000 Plant Protection Act and the 2016 Executive Order 13751, Safeguarding the Nation from the Impacts of Invasive Species.

A recurrent theme in the guidance document and in existing park-specific plans is the need for adaptive management approaches to be built into plans and utilized during ongoing invasive plant management. This is particularly true in the current environment of rapid global change factors (e.g., invasions by multiple non-native

species simultaneously, droughts, and climate change) and rapid local changes, such as severe fires within parks. Severe fires can drastically change the nature of park-specific treatment needs for invasive plants. Moreover, treatments that reduce invasive plants under certain conditions might require adjusting for success in other conditions. Making treatment activities into monitored management experiments provides information valuable for identifying where and when candidate treatments are most ecologically and cost effective.



Guidance document by Dingman et al. available in the public domain from the National Park Service Integrated Resource Management Applications website.

References and further reading:

- ¹Allen, J.A., C.S. Brown, and T.J. Stohlgren. 2009. Non-native plant invasions of United States National Parks. *Biological Invasions* 11:2195-2207.
- ²Abella, S.R., et al. 2015. Status and management of non-native plant invasion in three of the largest national parks in the United States. *Nature Conservation* 10:71-94.