

The Natural Areas Journal Invasive Species Compendium: An Offering to Aid in Your Work and a Call to Action

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The Natural Areas Journal Invasive Species Compendium: An Offering to Aid in Your Work and a Call to Action

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The Natural Areas Association (NAA) is a community of practitioners and scientists focused on the management of ecologically significant landscapes with the intent to protect biodiversity in perpetuity. The *Natural Areas Journal* covers a wide range of topics important to those of us concerned about these special places. What is a natural area? Natural areas are defined by NAA as terrestrial and aquatic habitats that harbor native rare species or natural communities that are ecologically significant for the protection of biodiversity. The term ecologically significant natural landscapes is used to include those lands and waters that harbor natural areas qualities but are not referred to as natural areas by the managing entity. It is an inclusive definition that expands our concept of natural areas. One of NAA's great strengths is making practical information that can be applied directly to the work that we do available to practitioners. We hope you find this to be a useful resource that helps to inform your work.

Since the beginning of my career in the early 1990s, the awareness of the threats posed by invasive species to natural areas, the species that inhabit them, and the ecological processes that maintain the communities they encompass has grown. The challenges to successful management have also grown and are complicated by increasing disturbance and habitat fragmentation, continuous species introductions and spread of those species, and the impacts of climate change.

The NAA offers this Invasive Species Compendium as a resource for practitioners who face these challenges as they work to protect and manage natural areas.

This compendium brings together peer-reviewed articles from the *Natural Areas Journal* that were published from 2015 through 2024. These articles provide practical information on addressing invasive species, are written by those who work within this community, and offer a forum for dialog and sharing within this community of practice.

The articles are organized by the following themes:

- The effectiveness and impacts of treatment strategies including manual, chemical, and habitat manipulation;
- The impacts of invasive species on native species and ecological processes; ecological tolerances and limitations on dispersal, recruitment, and survival of invasive species;
- Conducting and assessing the success of post-management restoration;
- Understanding the relationship between wild fire and invasive species in natural areas;
- Early detection of and rapid response (EDRR) to newly detected invasive species; and
- Strategies for protecting natural areas and species of concern from the impacts of invasive species including monitoring and condition assessment to inform action.

Although these articles cover topics essential to effective natural areas management, other critical topics are either underrepresented or not included among the articles submitted to the *Natural Areas Journal*. A number of these were also highlighted at the 2024 Natural Areas

Conference Invasive Species Roundtable discussion that was organized to focus on progress made in the arena of invasive species management and issues that persist in control of these species.

I am listing a handful of these topics based on my experience that has been gained through a long career. My aim is to encourage our community to share their knowledge and lessons learned with others through NAA's forums. Practitioners need guidance on prevention and EDRR. Preventing the introduction and establishment of invasive species and finding newly introduced species and rapidly eradicating them are the most effective ways to avert the damage they cause. Prevention and EDRR save time, money, other resources, and the natural areas we are engaged in protecting.

How do we prioritize our management efforts so that we can be most effective? This includes changing focus or strategies when time, energy, and resources have been invested in the management of invasive species but success eludes us.

How do we manage invasive species that are already well established and that threaten natural areas, the species that inhabit them, or the ecological processes that maintain native plant and animal communities? For those ubiquitous invasive species, biological control agents may be the best alternative to reduce their impact on natural areas. Over the years, changes have been made in the process of proposing suitable biocontrol agents before introduction. Significant research is conducted over many years on these organisms. Results and conclusions of that research go through panel reviews before they are released.

How can we build and maintain collaboration and coordination partnerships? Collaboration and coordination are powerful tools and even essential. As we know, invasive species do not respect boundaries. Prevention, EDRR, and active invasive species management cannot be successful if they are not coordinated. Learning how to manage in the face of climate change impacts is also a very real struggle for many of us. We can no longer comfortably look to the past to set targets and trajectories for our management actions.

Taking climate change impacts into account, how do we know when to continue our efforts or direct the change to some new condition that is still acceptable to us as conservationists? Can we manage natural areas to increase their resilience in the face of climate change? Finally, when, if ever, can a native species be treated as invasive under climate change? This is a question that has been circulating within the invasive species management community for years. The National Park Service dubs it a "gnarly issue," one that is complex and challenging to address.

There are ongoing efforts to fill some of these voids. They include a Department of Interior focus on development of EDRR infrastructure funded through the Bipartisan Infrastructure Law. One product of this national effort includes a central hub for EDRR data and knowledge (<https://siren.fort.usgs.gov/home>). Resist-Accept-Direct frameworks (RAD) have been developed to help natural area managers make informed and strategic management decisions in the face of the continuous change that we are currently facing. Based on my experience there is also more coordination and collaboration going on than most practitioners are aware of, but those stories and lessons learned are not getting out to broad audiences who need this information for successful management.

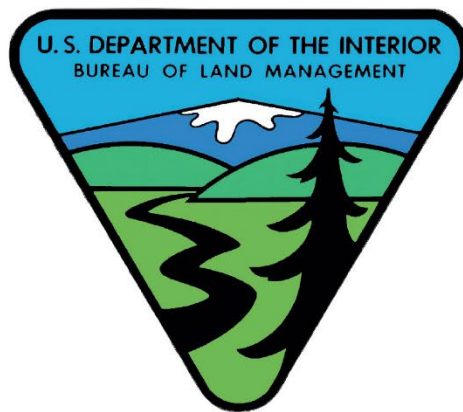
Native species as invasive species that need to be managed is a particularly tricky issue. Examples of controlling native species to manage natural areas and native plant communities have recently been published within the *Natural Areas Journal* ([McAninch et al. 2024](#)). Other

management examples outside of NAA forums are high profile and contentious such as control of barred owl populations in Oregon to protect the federally threatened northern spotted owl.

Some of these topics are controversial and challenging to broach, but they are all significant to this community. We need to hear more about all of them and others not addressed or underrepresented within the NAA forums. This is a call to action to natural areas practitioners and researchers to contribute to this community of practice by helping to fill some of the knowledge gaps, keeping your colleagues abreast of emerging issues, and continuing to provide important information and lessons learned through your work and research to ensure that NAA continues to be the conduit for information and resources that supports you in your work.

Submitting articles to the *Natural Areas Journal* is but one avenue to share information within the NAA community. Likely you are thinking that you don't have the time to write an article for a peer-reviewed scientific journal. The NAA offers other options to busy natural areas managers. You can contribute your knowledge through "Stewardship in Action" pieces. NAA staff interview practitioners like you and they write your story. NAA sponsors webinars to facilitate sharing what you know or allow you to bring forward the work of others. NAA hosts a Facebook page to engage natural area practitioners and initiate discussion. Do you have suggestions of other ways to gather much needed information from busy natural areas practitioners? Please share your ideas by contacting Lisa Smith (lsmith@naturalareas.org).

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