

Addressing Invasive Species Concerns within a Municipal Policy Framework

Stephen Deal

Environmental resilience at the local level begins with good stewardship. The term stewardship is defined simply as the “careful and responsible management of something entrusted to one’s care.”¹ Cities and towns cannot maintain a high level of respect and appreciation for the environment if they do not first promote the proper conservation of land under their direct supervision and care. Although cities are primarily perceived as engines of economic wealth and opportunity, many cities also serve as primary landholders by creating parks and recreation facilities for local citizens to enjoy. As a major landholder, a city has a responsibility to steward those resources in a way that best benefits the public while also maintaining the integrity of the natural environment.

One critical, but easily overlooked, aspect of good natural stewardship is invasive species management. An ecosystem cannot be considered healthy or functional if it is overrun by an invasive species. If left unchecked, an invasive species can destroy the delicate balance within an ecosystem and undermine the capacity of a natural system to buffer itself from other natural stressors such as drought or temperature change. So while invasive species may not be a core concern for city policymakers, good stewardship necessitates that cities develop basic strategies to curb the presence of invasive species in order to maintain a high level of environmental performance within the public spaces managed by city governments.

Invasive Species in Park Management

As the urban footprint continues to expand into sensitive natural areas, many cities have embraced a more active role in land conservation by opting to acquire additional parkland. For example, the largest city park in America, South Mountain Preserve in Phoenix, totals 16,094 acres, which would rival many state parks in its scope and scale.² Also, a 2011 survey conducted by the Trust for Public

Land determined that America’s 100 largest cities manage more than 1.5 million acres of land in total. Such numbers show that municipal governments are key stakeholders in developing better stewardship practices. A key factor in developing better stewardship practices is the removal of invasive species. Estimates from the U.S. Fish and Wildlife indicate that invasive species cost the United States more than \$120 billion in damages each year.³

Realizing the important role cities have in local conservation, in March 2019 the Natural Areas Conservancy, of New York City, conducted a survey of urban forest managers to determine what the primary areas of concern were in their day-to-day decision-making.⁴ One of the biggest areas of concern cited by urban forest managers was invasive species. Conservation of native species ranked as the top factor in urban forestry decision-making as 61% of respondents said that it was one of the top three factors they consider. Conversely many of the management techniques used within urban parks and forests were devoted to the removal of invasive species or planting and encouraging the growth of native species. Of forest managers surveyed, 66% said that they engaged in invasive understory species removal on an annual basis and it ranked as the most frequently used practice in municipal park management. 50% of survey respondents also noted that they engaged in invasive tree removal on an annual basis.

One basic strategy city governments can engage in is developing basic guidelines for invasive species management in city parklands. One city that has done this is Madison, Wisconsin, which posts their invasive species management techniques to the city parks website.⁵ In Alabama, the City of Auburn’s Urban Forestry program maintains an invasive species removal webpage, which lists plant species of concern in the city and notifies residents of city projects that prevent the spread of non-native plants.

Visitors to the webpage can also learn about how to volunteer for invasive species removal and can visit other websites such as Alabama Cooperative Extension to learn more about invasive species affecting the region.

Regulatory Oversight to Address Invasive Species

In addition to managing public parks, cities also employ development regulations that govern the natural appearance of private developments and the public realm. A number of cities have developed new landscape regulations and oversight to curb the spread of invasive plants. One notable example of this is the City of Fayetteville, Arkansas. In 2015 Fayetteville passed a city ordinance that established a list of 18 invasive plants that could not be used in new construction and development.⁶ The city's website identifies the 18 invasive plants in question and recommends appropriate plant selections for trees, shrubs or ground cover. In Alabama, the City of Orange Beach modified its beach and dune preservation ordinance to discourage invasive plants species within the protected dune area. Orange Beach prohibits the installation of any vegetation in the primary dune system with the exception of a few plant species explicitly mentioned within the ordinance.⁷ These actions ensure that critical coastal habitats remain ecologically sound and viable.

One interesting regulatory approach that local governments have employed to tackle aquatic invasive species is developing an Aquatic Invasive Species (AIS) Prevention Plan. This type of planning initiative has been spearheaded by state and local government agencies in Minnesota where there are 692 waterways that are infested by at least one invasive species.⁸ In response to this policy dilemma, the 2014 Minnesota legislature set aside \$10 million for counties to spend to combat invasive species and another \$4 million is available through the nonprofit Initiative Foundation. In light of this new legislative initiative, local government officials in St. Louis County partnered with Minnesota Sea Grant to develop a plan to regulate and manage aquatic invasives. The plan is twofold: first, it will define actions that may be employed to prevent the spread of invasive species and second, it will guide the prevention response developed by St. Louis County for aquatic invasives.⁹ The 45-page plan is structured around seven broad action items.¹⁰ These seven action items serve as the backbone of a comprehensive action table which lists all the local projects and policy actions the county will pursue with regards to aquatic invasives.

In addition to the action table and list, the plan also has comprehensive descriptions of the 23 different aquatic invasive species found in the county.

Since the passage of the plan, the county has developed a multi-pronged approach of adaptation projects, research, and educational outreach. In 2017 St. Louis County awarded funds to an invasive species research project to determine what boat gear is most likely to spread the spiny water flea, an invasive species found in 24 lakes in St. Louis County.¹¹

Invasive Species Management in Aquatic Environments

The problems associated with invasive species though are not simply confined to terrestrial habitats; marine environments can easily be disrupted by the presence of invasive species as well. In some respects invasive marine species may be more problematic than those found on land as there aren't as many barriers to disrupt the movement of marine organisms across different aquatic ecosystems.

Consider the case of the lionfish, which has become a major problem in the Gulf of Mexico. Originally native to the Indo-Pacific Oceans, the lionfish is a popular species with saltwater aquarium owners due to its striking appearance.¹² However, when a number of lionfish escaped their artificial confines and entered the Gulf of Mexico it didn't take long for lionfish to establish itself at the expense of other species. Lionfish eat "a belly full of baby sport fish and lobster" in just a few minutes, making it a threat to the livelihood of charter boat captains and shrimpers.¹³ Thankfully a number of organizations have developed novel and creative ideas aimed at containing the spread of lionfish.

Orange Beach has hosted numerous tournaments and awareness events aimed at reducing the impact of the lionfish. In 2019 the Coastal Conservation Association of Alabama and the Poarch Band of Creek Indians sponsored two lionfish spearfishing tournaments and each provided prizes of \$10,000 to be awarded based on pounds of fish. The biggest haul was 279 pounds.¹⁴

In the case of lionfish there is one additional weapon people can deploy to stop the spread of this species and that is their stomach. Lionfish are edible and safe for human consumption, which is why the Alabama Seafood Marketing Commission has marketed the fish for table fare. Chefs in Orange Beach created a group to focus on edible, but underutilized, flora and fauna within the Gulf fishery.¹⁵ The group, Nuisance, Underutilized, Invasive, Sustainable,

Available, through Noble Culinary Endeavors (NUISANCE) hopes to expand the Gulf seafood palette to include edible invasives such as lionfish.

Conclusion

The difficulty with invasive species is that it is a multifaceted problem requiring many different stakeholders and management techniques. Different invasive species often require different approaches to removal or containment, so it is important that cities develop a set of strategies that are appropriately tailored to the different invasive species encountered within a given area. Conversely cities must also develop ordinances that prevent the further spread of invasive species and discourage the introduction of exotic flora and fauna that may become invasive in the future. By incorporating these strategies into local planning procedures and the development review process, cities can not only curb the negative spillover effects associated with invasive species they can also become better stewards of the natural assets they preside over. 🐟

Stephen Deal is the Extension Specialist in Land Use Planning for the Mississippi-Alabama Sea Grant Legal Program.

Endnotes

1. Merriam Webster, *Stewardship* (Jan. 9, 2020).
2. The Trust for Public Land, *2011 City Park Facts* (2011). Other cities have larger parks within city limits – Anchorage, El Paso, and New Orleans – but they are managed by the state or federal government.
3. U.S. Fish and Wildlife Service, *The Cost of Invasive Species* (Jan. 2012).
4. Amanda Hurley, *America’s Management of Urban Forests Has Room for Improvement*, Citylab (March 25, 2019).
5. City of Madison, *2019 Invasive Vegetation Management* (Jan. 9, 2020).
6. City of Fayetteville, *Invasive Plants and Native Alternatives*, City of Fayetteville (Jan. 17, 2020).
7. City of Orange Beach, *Article VI. - Beach and Dune Protection and Preservation*, Municode (Nov. 3, 2015).
8. John Myers, *Battle against invasives goes local*, Duluth News Tribune (Jan. 24, 2015).
9. Saint Louis County, *Aquatic Invasive Species* (2018).
10. Marte Kitson, Douglas Jensen & St. Louis County Planning, *Aquatic Invasive Species Prevention Plan*, Saint Louis County (May 12, 2015).
11. St. Louis County Planning and Community Development, *Update Report: Aquatic Invasive Species (AIS) 2017-2018 Funded Projects* (Jan. 2019).
12. Dennis Pillion, *How invasive lionfish became unstoppable in the Gulf of Mexico*, al.com (Aug. 2017).
13. Kimberly Blair, et al., *Invasive Species are Threatening our Ecosystem*, Pensacola News Journal (Dec. 12, 2014).
14. David Rainier, *Spearfishers cash in on Lionfish money*, City of Orange Beach (Oct. 18, 2019).
15. Alabama Gulf Seafood, *Chef Brody Olive on the State of Lionfish on Alabama’s Gulf Coast*, Alabama Gulf Seafood (Oct. 31, 2019).



IN SUM.

A Summation of the Facts and Figures of Interest in this Edition

★	Number of native species expected to be destroyed by zebra mussels:	140
★	Amount of grant to control giant applesnails in the Pascagoula River Marsh:	\$836,000
★	Number of eggs from a mature lionfish annually:	2,000,000
★	Pounds of lionfish caught by winner of 2019 Orange Beach lionfish derby:	279
★	Number of days for giant salvinia to double its mass:	4