Collaborative Partnerships and Invasive Species Management: Filling the Voids in Management

Thesis

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Abstract

Prior research on collaborative approaches has occurred extensively in relation to watershed management. However, such an analysis has yet to be conducted on the role collaborative partnerships play in managing invasive species. The management of invasive species had largely been carried out by state and federal wildlife agencies in a more centralized, top-down fashion, just as efforts to address specific watershed issues had been done prior to the adoption of collaborative management methods. As invasive species are becoming progressively established in native habitats, more novel approaches - including collaborative partnerships between public, private, and non-profit entities - have been sought to prevent and mitigate ecological disturbances. One of the various questions this study seeks to answer is to what degree do these collaborative institutions influence the policies formulated and implemented at various levels of government to combat the spread of invasive species, and what determines this effect? Through document analysis and semi-structured interviews with officials from two collaborative partnerships in the Great Lakes and Florida, the above questions will be explored so as to contribute to the existent knowledge of collaborations and to offer how collaborations may be used more effectively in the future to manage invasive species.
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Introduction: Invasive Species and Our Scientific Understanding

Today our society is inundated with calls to address a myriad of different environmental issues: climate change, pollution, habitat destruction, etc. One might consider these the principal environmental issues of our time, given the degree to which a vast portion of society sees them as problematic. Another issue of increasing concern to society, especially heading into the future, is that of invasive species (Sharp et al., 2011). Invasive species are generally defined as non-indigenous flora and fauna whose presence in a newly introduced ecosystem poses, or is likely to pose, an ecological threat to the native habitat, the economy, or harm human health (U.S. Fish and Wildlife Service, 2013). President Clinton’s 1999 executive order on invasive species, citing the above definition, formally recognized the threat of invasive species as being deserving of national attention and the resources of the Federal Government, and mandated the creation of the National Invasive Species Council (Exec. Order No. 13112, 1999).

This Council is a conglomeration of the Departments of Interior, Agriculture, Commerce, State, Defense, Transportation, Homeland Security, Treasury, and Health and Human Services, along with two other non-departmental agencies – the Environmental Protection Agency and the U.S. Agency on International Development - and is charged with fulfilling directives set forth in the National Invasive Species Management Plan of 2008. These 87 directives, defined as “performance elements”, each fall under one of the five management “arms” of the plan: prevention, early detection and rapid response
control and management, restoration, and organizational collaboration. It is the final “arm” of this plan (i.e. organizational collaboration) that will be focus of this study, with the understanding that the four other focuses are implemented to a certain degree, though not exclusively, via the last.

The extent to which invasive species have caused harm to native ecosystems and to human society has been greatly disputed on philosophical grounds, in part due to the inability to refine the ambiguity of terms like “harm” and “naturalized” among scientists (Sagoff, 2005) and the a priori use of words that illicit pernicious views towards a particular group of species without sufficient empirical justification (Sagoff, 2005; Larson 2005; Colautti and MacIsaac, 2004). However, in spite of these disagreements concerning the usage of appropriate terminology and the quality of the available empirical evidence on invasive species’ impact, extensive resources have been dedicated at the federal, state, and local level to controlling and preventing the incidence of invasives. Though the true extent of harm has been difficult to express in monetary value, Pimentel et al (2005) concluded that invasives were responsible for nearly $120 billion in environmental damage each year in the United States, including control costs. One can look at cases involving the Burmese python and other constrictor species in southern Florida, Zebra Mussels in the Great Lakes, or Asiatic Carp throughout the rivers of the Midwest and Southern United States to see instances in which various levels of government have, and are currently, formulating policies and allocating resources to effectively mitigate these species’ environmental and human impact. These efforts have transpired in a conventional regulatory regime, whereby management is facilitated by one or more agencies in a top-down fashion with an emphasis on prevention and control.
Prevention and control - the two basic ways in which impact can be reduced (Olson & Roy, 2005) - are carried out at different levels of government and are accompanied with various costs and benefits. Prevention, while favorable because of the tendency to forgo costs to agricultural damage, human recreation, and the control costs that would ultimately have to be paid, is still extraordinarily expensive to implement. In addition, a preventative approach typically places constraints on the import and/or transport of commodities and services that are beneficial (Olson & Roy, 2005), thereby making it a politically contentious solution. Control obviously seeks to curb the harm committed by invasives once they are established to some extent, but usually after some harm has already been realized. The realization of harm by the public and wildlife managers may be important in rallying support for control methods and not being as politically volatile as preemptive action.

Preventative action disseminating from a top-down, centralized authority like the federal government is sometimes utilized, especially given the large scale over which the federal government holds jurisdiction. One of the more stringent preventative mechanisms that the federal government currently holds is the ability for the Secretary of the Interior\textsuperscript{1} to list a species as “injurious” under the 1900 Lacey Act if a species in question is determined to be “injurious to human beings, to the interests of agriculture, horticulture, forestry, or to wildlife or the wildlife resources of the United States” (16 U.S.C. 3371–3378). After a period of data gathering by the U.S. Fish and Wildlife Service and opportunity for the public to comment has passed, a final determination of

\textsuperscript{1} Secretary of Commerce may have the authority to list when species are marine in nature and the Secretary of Agriculture is understood to have primary jurisdiction over the listing of invasive vegetation and noxious weeds.
whether to list a species as “injurious” is made. If the decision is made in the affirmative, then import and interstate transport of the species listed as “injurious” is prohibited (Fowler et al., 2007). However the effectiveness of the injurious rule, which essentially “black lists” a species once a certain amount of harm has already occurred, has been questioned. This invites the question of what other alternative mechanisms of management should be explored in the event that such formalized and centralized approaches are deficient in preventing and controlling invasives.

The lack of effectiveness of prevention and control is partly due to an incomplete understanding of invasive impact in terms of ecology. The extensive knowledge gap that still exists in how to predict negative impacts of invasives and the probability that they will occur in specific habitats frustrates the accurate determination of risk the species poses (Simberloff et al., 2005), and consequently what the appropriate management response (i.e. prevention, control, etc.) should be. For instance, Rodewald (2012) discusses the mixed effects that invasive honeysuckle (Lonicera spp.) has had on bird populations throughout eastern North America: honeysuckle is beneficial in that it provides additional nesting substrate for “generalist” bird species, but that honeysuckle also leaves nests particularly vulnerable to predation in the forest understory. Aside from the notion that honeysuckle is not a species of high priority to managers, what approach are managers to take against other invasives, plant or animal, whose ecological merit is two-fold? These are conversations that are still ongoing within the scientific and management communities.

In spite of the lack of consensus among scientists regarding the true ecological and economic impact of invasive species, wildlife management agencies remain alarmed
at the risk that invasives pose to native habitats, especially those containing endangered and/or endemic species. This may be come as a surprise considering the long history of introductions by humans for agricultural or recreational use, or to enhance species richness (Schlaepfer, 2011). Even today, wildlife managers find themselves involved in a perpetual effort to halt illegal fish stocking, especially in the western United States where stocking lakes with non-native species like bass (*Micropterus* spp.), northern pike (*Esox lucius*), and yellow perch (*Perca flavescens*) for recreational fishing is common (Johnson, 2009).

Nevertheless, ecologists and conservation biologists have been especially interested in the threat that invasives pose to endangered native species and the role that invasives have played in actual cases of extinction. Extrapolating the effect of invasives on extinctions relative to habitat loss and other threats is difficult though, and has hardly yielded accurate and useful generalizable conclusions (Gurevitch and Padilla, 2004). This has not precluded a cautious stance from being assumed by scientists and conservationists alike, especially given that empirical evidence supports the notion that some invasives have had a deleterious effect on natives at the population level (Ricciardi, 2004). The U.S. Geological Survey, for example, concluded that the Burmese python (*Python molurus bivittatus*) and eight other constrictor snake species\(^2\) would likely prey on endangered birds and mammals in southern Florida after conducting a risk assessment in 2009 (Reed and Rodda, 2009), a claim later substantiated by Dove *et al* (2011) when 5

bird species (four listed as ‘species of concern’ ³ and one listed as ‘federally endangered’⁴) were discovered in the digestive tracts of captured Burmese pythons.

While there is much scientific uncertainty surrounding invasive species’ true and specific impacts, and the overly-generalized biological descriptors of invasives has impeded our predictive capacity of establishment/dispersal (Marchetti et al, 2004), the effort taken to combat the introduction and spread of invasives has been certain and robust. So with still a great deal of uncertainty and an obvious and aggressive management approach, what are we to make of this seemly paradoxical worldview of invasives? Daniel Simberloff, a leading ecologist on invasive biology, puts the larger controversy of invasives into perspective: There is “widespread scientific and public recognition that introduced species cause great environmental harm in many forms…[but] it would be cheaper and easier in the short term to say there was not scientific consensus and we should delay regulation” (Simberloff, 2005). He goes on to explain that such reasoning not only fails to provide sound justification for non-action, but that it is both incorrect and dangerous (2005).

The role of conventional, top-down management methods by wildlife agencies has been previously mentioned and largely evident in invasive species management today. As the 2008 National Invasive Species Management Plan calls for, and as will be examined in the following section, new management approaches are beginning to take shape that deviate from the traditional, centralized management regime. Organizational collaboration, specifically through collaborative partnerships, will be explored and

³ Little Blue Heron (Egretta caerulea), Snowy Egret (E. thula), White Ibis (Eudocimus albus), and Limpkin (Aramus guarauna)
⁴ Wood Stork (Mycteria americana)
analyzed to determine to what degree their makeup, operations, and effects align with the existent knowledge about collaborative partnerships that has been accumulated up to this point.
Ecosystem Management: The Foundation of Collaborative Partnerships

In the presence of newly realized environmental threats and the acknowledgement of varying interests in the effort to address these threats, natural resource management experienced a shift from the more conventional “command and control approach” of the mid-20th century (Koontz & Bodine, 2008) to one more representative of a “bottom-up” orientation accounting for a multitude of stakeholders. This approach has become referred to by many names, but “ecosystem management” has come to be used consistently across many management fields. Perhaps the assortment of nomenclature used stems from differentiated understandings and lack of agreement of what ecosystem actually is (Grumbine, 1993; Gilmore, 1997; Rigg, 2001). Nonetheless, the inclusion of various stakeholders highlights the integrative and holistic approach of many entities working in collaboration with one another, as opposed to the individualized domains that forest, water, mineral, and wildlife agencies operated under previously in the “administrative state” (Koontz & Thomas 2006).

Such a style was observed within individual agencies as well. The Forest Service, for example, found itself taking into consideration the needs of various stakeholders, not solely the forestry profession, when making decisions after the passage of Multiple-Use Sustained-Yield Act of 1960 (Leach, 2006). By 1994 other federal environmental agencies like the Bureau of Land Management, the National Park Service, and the U.S.
Fish and Wildlife Service had begun to implement practices reflective of ecosystem management (Koontz & Bodine, 2008), most notably collaboration.

The exploration of collaborations as an effective mechanism to address ecological, social, and economic issues within an environment was not due solely to the departure from the top-down governance structure, but a recognition of the inherent complexity surrounding many environmental issues. The ability to respond to the dynamic complexity of some ecosystems is predicated on the deviation away from a centralized, organizational structure to one where responsibilities and less formalized decision-making are distributed among numerous agencies on the ground (Koontz and Bodine, 2006). Through collaborations, a group of stakeholders typically deliberate to build a consensus and an actionable plan to yield results (Margerum, 2011). However, a consensus in collaborative management tends to be more accurately understood less as a decision that everyone agrees with, but more as a decision that everyone can live with (Magerum, 2011). Determining the common interests among stakeholders is not only challenging in and of itself, but can be more taxing when dynamic human environments and changing expectations are considered.

Grumbine (1994) has acknowledged other features of ecosystem management, and specifically how these features are manifested in collaborative relationships. The hierarchical element, or lack thereof in some cases, and cooperation among governing institutions are undoubtedly crucial aspects of collaboration and have already been alluded to. Related to these features is the scope of management as it pertains to understanding ecological boundaries. Under an ecosystem management approach, political boundaries cannot be solely relied upon to delineate the realm of a collaborative
partnership’s focus, as natural systems are not confined to such constructs (Schlager and Blomquist, 2008). Decisions about appropriate parameters of an ecosystem are then brought to the forefront. However, any boundary that is established, even if physical features of a natural landscape are taken into consideration, will ultimately be a product of a human determination (Schlager and Blomquist, 2008).

This study will involve a case study approach in order to provide a descriptive and analytical understanding of the organizational structure and the operational characteristics of two specific collaborations involved in invasive species management. Moreover, of particular interest is the degree to which internal and external factors have affected these collaborations ability to influence invasive species policy. In addition, the decision-making processes employed by these partnerships may have effects on organizational outcomes and ability to achieve objectives. It is the intention of this study to add to our existing theoretical understanding of collaborative processes, but also to explore ways in which invasive species collaborations may be similar or different to collaborative watershed efforts. Invasive species are a growing priority among management agencies, and an understanding of the level of involvement on the part of partnerships may offer insight into how they may be better utilized in the future to meet management objectives.
Collaborative Partnerships and Their Impacts on Invasive Species Policymaking

Collaborations – The Literature’s Description of the Policymaking Role

As was mentioned previously, in the past few decades public institutions have moved away from individual resource management to a broader and more integrated approach of managing ecosystems. Such a shift towards an ecosystem management approach has facilitated the introduction and more frequent use of collaborative decision making (Imperial 1999) as a mechanism of integrating multiple interests, values, and priorities. With the involvement of a multitude of stakeholders, the potential arises for actors to form partnerships, whereby their coordination and inter-organizational relationships generate policy outcomes (Imperial, 1999; Margerum, 2011) or influence policy-making. Policy pertaining to wildlife, which includes invasive species, typically emanates from the state level. However, the federal government has also sought to address wildlife issues through statues and administrative rulemaking, especially in the event that wildlife issues “transcend state boundaries” either through natural or human-assisted migration (Freyfogle and Goble, 2009).

Our understanding of the process by which policy is produced through collaborative mechanisms is hardly clear and solidified, but rather dynamic and subject of much debate. Moreover, the influence of technical experts, who have a propensity to make up a sizable portion of a natural resource-related partnership’s membership, is often
complicated by numerous features that naturally distinguish policymakers from scientists. Pannell and Roberts (2009) state that while technical experts are fully aware of the complexity and caveats of issues, policymakers prefer information and solutions that are simple and straightforward. Related to this point is the observation that scientists tend to have a narrower scope of specialization, while the nature of a policymaker’s job requires the consideration of a broader range of factors in the interest of the populace they represent (Pannell and Roberts, 2009). This begs the question of what factors associated with the larger political environment may impede or facilitate the consideration of recommendations from technocratic actors.

Given that collaborations are characteristically inclusive and seek to account for the variety of interests that an issue may involve, citizen participation is an important aspect of the collaborative process, and also for this case, the policymaking process (Koontz, 2002). If citizen participation is something that is desired in collaborative processes, it is imperative to understand the organizational opportunities that exist for citizens to become engaged and the current capacity of that engagement. After all, opportunities that are advertised as pathways for citizens to participate in governance or processes that affect governance are not always fulfilled, but instead may be illusory and relegate citizens to positions with little clout (Arnstein, 1969). Grumbine (1994) also contends that shifting more towards local decision-making, where trust is fostered and communication pathways are kept open, is pivotal to incorporating citizens into collaborative processes.

Little knowledge has been gleaned from how collaborative partnerships operate to specifically address the issue of invasive species, as the vast majority of information
about natural resource collaborations is based on watershed management and forest management. The overall objective of this study seeks to address to which extent collaborations influence invasive species policymaking. This question is asked with the understanding that collaborations can fall into one or more general typologies as Margerum (2011) describes - distinct in organizational structure, membership, objectives, and processes. Such a framework offers a general sense of what collaborations focus their efforts on and how they go about achieving these efforts.

With this in mind, specific interest lies in a more specific question: are the partnerships in these two cases involved in activities or behaving in manners that are generally understood to influence the development of policy (i.e. legislative outreach, lobbying, awareness campaigns, etc.)? Activities such as these represent factors internal to a partnership, or ones that they have primary control over. However, do external factors (i.e. political events, government funding, other organizational behavior, etc.) constrain or enhance these partnerships’ influence, and how so? Koontz and Bodine (2008), in their evaluation of collaborative processes in the U.S. Bureau of Land Management and the U.S. Forest Service, recognize factors both internal (i.e. organization structure, organizational culture, etc.) and external (i.e. legal systems, political factors, etc.) to a partnership as important determinants of partnership implementation. Hence the relative presence and importance of internal and external factors will help provide insight into how collaborations are able to affect policymaking.

The importance of collaborative planning factors both within a partnership and the contextual environments that they operate in has been documented relative to watershed management and farmland preservation (Koontz, 2003). Koontz (2003)
describes how collaborative planning is effected by determinants within the scope of a partnership’s control (i.e. diversity of interests, membership profile, decision-making processes, and resources) and by situational factors (i.e. existing laws/regulations, presence of pre-existing networks, level of concern, etc.). Many of these factors are also relevant to invasive species management, as there seems to be some degree of variance among many of these variables when considering how collaborations manage invasive species.

Finally, if we understand citizens to be players in the formulation and implementation of policy – in the various ways that they can be in a democratic system– what is their role in these partnerships and do they actually leverage power to affect policy as occupiers of those partnership roles? Answering these questions, especially with Arnstein’s framework for understanding participatory characterizations (1969), will allow for a more accurate understanding of how invasive species collaborations operate in the realm of policymaking today.

Expectations at the beginning of the study for the collaborations’ impact on policy were fairly general and rooted in two assumptions. Drawing on the assumptions that partnership actors would (1) find the presence, spread, and potential establishment of invasives as problematic and (2) that current laws and administrative policies are perceived to be inadequate in effectively mitigating the impact of invasives, it was expected that partnerships, including the cases examined in this study, would generally seek to change the status quo by advocating for specific policies at the state and federal level. This would especially pertain to voids in management that collaborations felt would need to be filled to improve current prevention and control strategies. There was
not an expectation going into the study of which of the two partnerships would have a greater influence and why, as the gathering of data related to organizational structure, process, and citizen engagement – all elements that would inform such a determination - had not yet commenced.

Case Histories

Florida Invasive Species Collaboration

The Florida Invasive Species Partnership (FISP) was formally established in 2008 from two preceding organizations with narrower focuses. In 2001, the Florida Invasive Species Working Group was created to address the issues of invasive species on public lands. Involved in this effort were federal and state agencies who sought to develop a single plan for managing invasive species in the state. Then in 2006, this working group expanded its scope to address invasives on public land and private land, and was appropriately renamed the Private Land Incentive Group. As a part of readjusting their scope of emphasis and promoting invasive management on private property, the group endeavored to build partnerships between public land managers, resource managers, and private land owners/managers. The shift ultimately culminated in the renaming of the organization once again in 2008 into the Florida Invasive Species Partnership in order to reflect the collaborative focus of the group.

FISP’s core group is made up of representatives from 19 signatory agencies and non-profit organizations who agree to the prescribed resolution stating FISP’s mission and objectives (Appendix A, Figure 6). Though FISP exists statewide, the partnership
also has 17 Cooperative Invasive Species Management Areas (CISMAs) that exist on a more localized level (Appendix A, Figure 7). These CISMAs are largely self-governing and self-supporting, but fall under the general framework and objectives set forth by FISP. It is at the CISMA level where other local entities (i.e. citizens, businesses, water management districts, watershed groups, city governments, county commissions/councils, etc.) become most involved with the collaboration.

**Florida Invasive Species Partnership (FISP)**
2 Co-Chairs, 19 Signatory Organizations

**17 Cooperative Invasive Species Management Areas (CISMAs)**

Variable in...
- Number of Participating Organizations
- Type of Participating Organizations
- Emphasis on Type of Invasive (Plants vs. Animal)
- Leadership Structure

**Figure 1. Structural Organization of the Florida Invasive Species Partnership**

These CISMAs also are largely self-determining in regards to the specific invasive species they wish to concentrate their efforts on. A CISMA located in the northern portion of Florida will not address the spread of exotic python species as much as its southern counterpart would be expected to, largely due to the current geographic range of those particular species. Also, a CISMA’s resources for addressing plant invasives as opposed to animal invasives is variable as well, depending on the extent of the threat posed by a species and what technical resources (i.e. human expertise, specialized equipment, etc.) are available to the CISMA. The activities of the CISMA’s
The Great Lakes Regional Initiative

The Great Lakes, the largest and most sophisticated network of lakes in the United States, has long been threatened by invasive species. It was the threat of invasive species to the Great Lakes specifically that compelled the passage of the National Aquatic Invasive Species Act (NAISA) in 1996 (Pub. L. No. 104-332), which was written and introduced by Ohio Congressman Steve LaTourette from what was, at the time, the 19th Congressional district – a district that bordered Lake Erie. The law expired in 2002, however, leaving managers and lawmakers struggling to devise solutions to address the perpetual problem of invasives in the Great Lakes region.

Recognizing that the Great Lakes faced a number of threats in addition to invasive species (i.e. habitat loss, toxic pollutants, nonpoint sources, etc.), President George W. Bush issued an executive order on May 18, 2004 establishing a regional collaboration “of national significance for the Great Lakes” (Exec. Order No. 13340, 2004). The order called for the creation of the Great Lakes Interagency Task Force, a nine-member body made up of the Secretaries from the Departments of State, Interior, Agriculture, Commerce, Health and Human Services, Transportation, Homeland Security, the Chairman of the Council of Environmental Quality, and the Secretary of the Army (Sec. 3, Exec. Order No 13340). The Task Force would be the primary administrative entity and charged with establishing the Great Lakes Regional Working Group – a collection of

seem only to be expanding as information on best management practices (BMP’s) and new educational and awareness opportunities are disseminated among CISMA's at monthly conference calls and statewide FISP meetings twice a year.
managers and technical experts responsible for drafting comprehensive action plan with recommendations to address targeted threats, including invasive species.

In 2005, the eight individual Strategy Teams that made up the Working Group, commenced with their respective issue areas. Like its seven counterparts, the Invasive Species Strategy Team worked throughout a six-month period researching and drafting language that would ultimately be submitted to the Collaboration’s Executive Committee, subsequently to be combined with draft reports from the other seven teams. The document, entitled GLRC Strategy to Restore and Protect the Great Lakes was unveiled to the public at Summit I on July 7, 2005, which also marked the beginning of the 60-day period open for members of the public to comment on the proposed draft. Six different meetings were also held in five states during this time to solicit feedback from the public. After this period ended, revisions were made to the Strategy before final submission and released at Summit II in December, 2005, in Chicago, IL.

Since the release of the Strategy, what has transpired in terms of implementing the Collaboration’s recommendations has been variable. As it pertains to the specific actors within GLRC involved in invasive species, members of the Executive Committee endorsed the creation of the Aquatic Invasive Species Rapid Response Initiative in 2007.

The primary objective of this mandate was to devise a federal Communication Protocol, allowing for a more uniform and effective response by the multitude of agencies involved to an initial invasion from an aquatic non-native species. The Protocol was discussed at three conference calls among GLRC sub-committee members leading up to a July, 2008 mock exercise in Pennsylvania. Other advances were greatly limited
due to limited to no funding for fulfilling the five recommendations (Appendix A, Figure 9) set forth in the Strategy's Invasive Species section. This may be due partly to the Interagency Task Force reporting to President Bush in October, 2005 that is it had not endorsed the GLRC’s Strategy and had “serious concerns with the direction of the GLRC's draft strategy, and strongly urge the GLRC to focus on improving the efficiency
and effectiveness of existing programs…” (The Great Lakes Interagency Task Force, 2005). Such a conclusion by the President’s Cabinet effectively stifled any possibility of fully implementing the Strategy’s recommendations and/or acquiring sufficient appropriations to support large-scale restoration action.

Among actors outside of the GLRC, much has developed on a larger scale. After President Bush left office in early 2009, President Barack Obama reorganized the federal government’s approach to restoring the Great Lakes. After renaming the effort the “Great Lakes Restoration Initiative”, and condensing the total number of issue areas from eight to five, President Obama secured more than $1 billion to fund restoration initiatives in the Great Lakes from FY’s 2010-2012 (Congressional Research Office, 2012). The program has taken on a different organizational structure than its previous version under the Bush Administration, with the EPA being the central allocating authority for federal funds that state and local entities apply for.

*Approaches and Methods*

A case study approach was adopted in order to examine factors determining a partnership’s level of influence on invasive species policymaking at the federal and state level. Such an approach was adopted in order to gain the most insight into the phenomenon, especially those that may occur on a more local level (Miles and Huberman, 1994), in each respective case. Admittedly these cases are quite different in their structure and scale. However, there are also a number of similarities between the two cases that merit a comparable examination. Both of these cases were chosen because of the relatively high concentration of invasives in those areas and the rich amount of
information available to examine management approaches. In addition, both cases involve geographical areas that the federal government, along with the respective state government(s), has been extensively trying to conserve for decades, with the GLRC addressing the Great Lakes and FISP involved extensively in the Everglades. Finally, both Florida and the Great Lakes Basin experience a high level of commercial transport – a common vector of invasive introductions and spread – with the Great Lakes connected to the St. Lawrence River and Florida containing the Port of Miami and Miami International Airport. While quantitative methods and advanced statistical analysis may provide data supporting the presence of more succinct correlational relationships, the case study approach allows for the exploration of variables unique to invasive species collaborations unaccounted for in existent collaboration literature.

Data gathering for both the Florida Invasive Species Partnership (FISP) and the Great Lakes Regional Collaboration (GLRC) involved analysis of 775 pages of documentation and semi-structured interviews with 15 stakeholders from both partnerships. Interviews of partnership participants took place from November, 2012 – March, 2013, occurred via telephone and lasted from 1-1.5 hours. Documents for both cases primarily included partnership action plans – the 2005 Strategy for the GLRC and the Framework that had preceded it; for the FISP case - action plans from 9 of the 17 CISMAs that had completed one. As for an overall statewide action plan, FISP does not have an approved or published plan, so gathering data for FISP’s statewide activities relied more heavily on interviews and the information concerning the partnership’s statewide operations referenced in the CISMA action plans.
In the FISP case, observations were taken during two conference calls among state and local (CISMA) partnership participants held on a monthly basis. The topics of discussion of 45 past conference calls were also available for study in the form of PowerPoint presentations, but observational data related to participant interaction obviously could not be gathered in these instances. Data from conference call minutes was especially valuable in observing what events and work was taking place among the 17 CISMAs pertaining to political outreach or policy advocacy.

In the case of the GLRC, meeting minutes from eight stakeholder conference calls held from November, 2007-November, 2009, as well as video footage from the first in-person meeting after the final release of the GLRC’s *Strategy*, were studied. The action plan of the 2010 Great Lakes Restoration Initiative (GLRI) and related documentation was also examined, in spite of it being a descendant of the GLRC and not of direct focus of this study, to gauge the affect that the preceding body had on the development of the GLRI.

To determine the extent of policy influence that FISP and GLRC had in their respective situations, the action plans of each partnership were closely examined for explicit language denoting a commitment or intent to reach out to lawmakers or other federal/state agency personnel with administrative authority. Federal and state agencies or legislative bodies, rather than local governing bodies, were given precedence in this search. This is due to the former group having primary authority over wildlife policymaking, and any substantive policies regarding invasive species management are likely to precipitate from the state or federal level (Freyfogle and Goble, 2009). Information gathered during semi-structured interviews provided the frequency under
which partnership actors had testified in front of legislative bodies or participated in events in an attempt to lobby state or federal lawmakers in regards to invasive species policies.

Analyzing Collaborative Partnerships and Their Effect on Policymaking

Analysis of Florida Invasive Species Partnership

Nine of the seventeen CISMA in the FISP case had completed action plans, and of those nine, five included language indicating political outreach and advocacy. All of these mentions concerned the advocacy of local public officials, none at the state or federal level. The remaining four CISMA’s with action plans and the other eight CISMAs without action plans provided no suggestions of lobbying policymakers in mission statements or other documentation. Information gathered from semi-structured interviews reinforces this observation, with all respondents reporting that minimal to no testimony had been given to state or federal legislative bodies on the issues surrounding invasive species. In addition, no individuals solely representing the partnership at either the CISMA or FISP level had lobbied lawmakers in person or through writing. Such events that did occur took place almost exclusively during the National Invasive Species Awareness Week (NISAW), but focused more on general awareness with little attention given to specific policy solutions for managing invasives.

External conditions and factors played a secondary role in FISP’s absence of policy influence, relative to the internal factors discussed immediately above. No reliance by policymakers was placed or has been placed on FISP to provide specialized guidance
on the issue of invasive species. While there were studies conducted by the earlier version of FISP (i.e. the 2005 working group of Florida Technical Committee) on the effectiveness of private land incentive programs, there are no current studies that FISP is or has recently been involved in to provide technical information to decision-makers at the state or federal level. The only apparent condition external to FISP that would presumably place it in a position of policy influence is the increasing salience of the invasive species problem in Florida, but given that FISP’s own priorities seem to be masking and/or avoiding policy advocacy, the impact of this external condition is weakened.

At more localized scale, FISP’s actors present an interesting, and slightly different approach to its state level activity. Political outreach and relationships have been fostered extensively at the local level. Nearly all of the CISMA’s have official partnerships with county or city municipalities within their geographic scope, and these interactions have been pivotal for the partnership in acquiring permission to treat invasive vegetation on public lands. In addition, interviewees contend that considerable effort has been devoted to encouraging local governing bodies to target invasives more aggressively and to promote the propagation of native flora in local development projects. Though these relationships are valid and integral to fostering social capital (Coleman, 1988), these interactions have not had broader influences on invasive species policy, primarily because they are limited to their respective localities and have not compelled any broader federal or state action. This does not mean however, that policy influence from these relationships is impossible, especially if the degree to which local governments insert themselves into invasive policymaking strengthens in the future.
<table>
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<tr>
<th>Membership Type</th>
<th>Florida Invasive Species Partnership</th>
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<td>Partnership Activities</td>
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<td>Education/Awareness</td>
<td>Interagency Communication</td>
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<td>Information Sharing (BMP’s)</td>
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<td>High – State and Federal</td>
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Table 1. Summary of Results for the Florida Invasive Species Partnership and the Great Lakes Regional Collaboration
In regards to citizen involvement, participation by lay people – non-technical, non-agency individuals - is principally concentrated at the local CISMA level. Involvement from citizens is most prevalent from the interactions with FISP-CIMSA representatives as it pertains to accessing funds through land incentive programs. It is at the local level that citizens may become involved in CISMA-sponsored workdays where volunteers assist in clearing away invasive vegetation like Brazilian pepper (*Schinus terebinthifolius*), coral ardisia (*Ardisia crenata*), and climbing fern (*Lygodium microphyllum*) in targeted areas. CISMAs regularly hold informational workshops on invasive flora and fauna for citizens as well, and schedule local Pet Amnesty Days – days where citizens can responsibly surrender unwanted exotic pets. In spite of activity at the local level on the part of citizens related to awareness and education, analysis of documentation and interview responses reveal little to no citizen involvement in any of FISP’s activities that may have a substantial effect on invasive species policymaking.

**Figure 3. Florida Invasive Species Partnership’s Policy Influence on Various Levels of Government**

Thickness of the arrows denotes relative strength of influence. The shaded arrow reflects influence that was strong, but not an influence that is associated with invasive species policymaking.
Analysis of Great Lakes Regional Collaboration

Evaluation of GLRC documentation, including the 2004 Framework and 2005 Strategy, indicated upfront a clear intention to inform policy makers. The GLRC Framework (2004) states that “it [GLRC] will develop a Great Lakes Restoration and Protection Strategy to inform future implementation of programs and funding throughout the region”. Moreover the Strategy (2005) describes how “actions identified by the Strategy Teams highlight the highest priorities recommended by the Teams for early implementation”. Responses from interviewees confirm this aim, with one individual explaining that “[future] expenditures would be hard to justify without a document”, referring to the Strategy’s relevance in guiding budgetary decisions at the federal level (Interview 6, January 7, 2013). Given that President Bush’s Executive Order established the GLRC in order to “coordinate and make recommendations on how to implement the policies, strategies, projects, and priorities of the Task Force” (Exec. Order No. 13340, 2004), it’s apparent that the Collaboration was instilled with substantial political power in the early stages of this effort, an external element absent from the FISP case.

In terms of actual policy influence, the results are variable. On the Federal level, little influence was projected in the short-term with the Bush Administration’s unwillingness to provide more than $586 million in new federal funding for programs (Invasive Species Strategy Team, 2004) as outlined in the recommendations. As was mentioned previously, it was the Interagency Task Force’s explicit expectation for state and federal agencies to use current resources more efficiently - not new sources - which supported their non-endorsement of the plan (The Great Lakes Interagency Task Force, 2005). However, in the longer term, not only did the GLRC’s Strategy “provide a
framework for the Action Plan” of President Obama’s Great Lakes Restoration Initiative (GRLI), but the “extensive planning and collaboration that was done by the Task Force…in development of the GLRC Strategy” allowed for a funding plan to be put forth for FY 2010 (*Great Lakes Restoration Initiative Action Plan*, 2010) in which $475 million was secured for that year. Approximately 16% of this total allotment for FY 2010 was appropriated exclusively for invasive species prevention and control (Hedman, 2012). This funding, and funding appropriated for the GLRI in subsequent fiscal years, is distributed by the Federal EPA to governments and organizations that apply for grants to fund their restoration strategies.

Influence was not only limited to the federal level, but also extended to the state management planning and decision-making. Ohio, Michigan, and Wisconsin all developed state action plans after the passage of publication of the *Strategy* in 2005. The first state to pass an action plan after the GLRC’s *Strategy* was Wisconsin, whose *Great Lakes Restoration and Protection Strategy* (2006) “provide(s) the necessary specifics to help support and implement the recommended action items” in the GLRC. Wisconsin was then followed by Ohio’s *Lake Erie Protection & Restoration Plan* (2008), which was intended to “provide a statement of what Ohio is doing to implement the *Great Lakes Regional Collaboration*” and Michigan’s *MI-Great Lakes Plan* (2009) that “complemented the GLRC by providing specific direction within Michigan”.

Interviewees reported the federal funding under the GLRI has allowed for many of the recommendations put forth initially by the GLRC to be implemented. One Michigan agency official who worked with the GLRC said that a recent informal assessment conducted by a cohort of original *Strategy* writers “showed that half of the
recommendations had been implemented, half had not, and a very small percentage were no longer relevant anymore” (Interview, January 29, 2013). No published documentation related to this analysis is available though. Considering all of the above information, GLRC had extensive influence on the development of federal invasive species policymaking in the Great Lakes region in that it laid the foundation for the fully funded GLRI in 2010. It also had profound effects for interstate collaborative efforts among state agencies who had not previously operated in a coordinated fashion in their early detection and rapid response operations.

![Diagram](image.png)

**Figure 4: Great Lakes Regional Collaboration's Policy Influence on Various Levels of Government**

Thickness of the arrows denotes relative strength of influence.

*Discussion: Examining the Collaborative Impact on Policy*

The differences in policy influences among the two partnerships reveal both expected and unexpected results. It is not surprising that the GLRC had a greater degree of influence given the circumstances under which it was created. By issuing the 2004
Executive Order, President Bush explicitly delegated authority to study and produce a series of recommendations for further restoration of the Great Lakes, including the prevention and control of invasive species. It was also the expectation that this inter-organizational effort among federal and state agencies would be collaborative in nature while devising these recommendations, and would foster a more perpetual culture of collaboration among participating actors in managing invasive species beyond drafting the actual *Strategy*. This expectation was confirmed by a participant who was involved in the GLRC Invasive Species Strategy Team: “Subsequent collaborative relationships developed from the initial creation of the GLRC, which went on to have a direct link to and influence policies taking shape at the state level” (Interview, January 29, 2013).

However, the collaborative culture that the GLRC seemed to have fostered early on among state governments and organizations soon faded as GLRI funding for control efforts soon became “top-heavy”, with the EPA becoming the primary “gatekeeper” that “considered the priorities of the federal government first” (Interview, January 7, 2013).

Given the obvious policy-making authority that was extended for this effort, and considering the extent to which federal and state environmental agencies were involved in drafting prescriptive documentation, the GLRC is clearly representative of a “policy collaborative” (Margerum, 2011). In spite of the GLRC’s recommendations not initially being adopted, a changing political environment at the federal level ultimately ushered in funding for some of the recommendations, and thus their implementation. Also, GLRC’s association with preexisting political coalitions like the Council of Great Lakes Governors and the Great Lakes Congressional Task-Force – both founded in the mid-
1980’s – may have assisted in the transformation of recommendations to actual funded programs.

On the other hand, FISP - seeing that they had virtually no policy influence at the state or federal level and focused on building relationships with local governing bodies to advance their EDRR operations – was much more of an “action collaborative”.

Margerum’s (2011) description of an action collaborative emphasizes the extent to which the organization is focused on implementing strategies that may have been devised at an earlier point in time, and also the degree to which technical experts are relied upon to facilitate this implementation. Moreover, interviewees substantiate this operational focus by promoting the group’s dedication EDRR, and education and outreach, and improved information management. Some participants also stated FISP was not an “advocacy organization” (Interview, November 13, 2012), that policymaking wasn’t “the purpose (of FISP) right now”, and a reluctance to engage in a policy-related process may be due to how young the organization is (Interview, January 14, 2013). Still another member cited that the abundance of agency personnel in FISP might create a conflict in their home agencies if FISP were to advocate for specific policy approaches (Interview, March 6, 2013). Clearly there are conscious determinations within FISP that are precluding it from making a broader policy impact. Finally, the landowner incentive programs that FISP pushes to encourage local private and public landowners to take proactive action against invasives associates it with, in this respect, “organizational collaborative” typology (Margerum, 2011).

Citizen participation was of great interest in this study primarily because government decision-making can hinge on the degree to which potential policy solutions
will be considered legitimate and accepted by the people, especially in the area of environmental management (Irvine & Sansbury, 2004). However, the nature of citizen involvement is undoubtedly as critical as its intensity. Countless cases depict how citizens have “participated” or “been involved” in a process, when in reality this involvement is largely non-influential - as with some advisory boards (Arnstein, 1969) or when citizens are simply subjects to government “education” (Irvine & Sansbury, 2004).

While FISP had a great deal of local participation in its CISMA sponsored events (Interview, January 14, 2013), citizens were more often recipients of education/awareness of the partnership’s initiatives than engaged drivers. However, citizens who were landowners and utilizing the landowner incentive programs through FISP’s assistance took on a greater level of responsibility and effectiveness in FISP’s efforts. In these regards, citizens in the case of FISP could reside on Arnstein’s “Ladder of Citizen Participation” (1969) at a lower tiered “informing” level (when being educated about invasive species), or a higher tiered “partnership” level (when involved in the landowner incentive program) where engagement is more complex and the citizen retains more authority. Land ownership seems to be a particularly unique variable in the level of decision-making authority that a citizen may have. Though not measured or explicitly explored in this study, it’s likely that the ownership of land confers a greater deal of leverage upon citizens in that they are the granters of access to collaborative participants with technical skills seeking to “treat” invasives on effected property.

In regards to the GLRC, citizen participation was extremely limited, based on the highly technical work that the working groups were engaged in throughout the formulation of the recommendations. Given that there were open meetings and an
opportunity for public comment after the release of the first draft of the Strategy, citizens resided more on the “informing” and “consultation” rung of Arnstein’s (1969) Ladder. This classification stems from the fact that the opportunity to be heard was made available to the public, however no system was in place beyond that to ensure that input was fully integrated into decision-making.

Citizen participation in both cases have, or had in the case of the GLRC, the potential to be much more substantial. It could very well be possible that a greater degree of citizen influence in invasive species policymaking is occurring through pathways other than the collaborations, as citizens could choose to appeal directly to policymakers at any level of government, forgoing any participatory action through a collaborative body like FISP or the GLRC. This would be more expected to be the case at a local level, where citizens feel that local officials would be more responsive to their needs. This possibility could further be related to a recent shift towards a more aggressive approach of invasive prevention and control by some local municipalities, whereby ordinances regulating specific activities associated with invasive dispersal or possession of specific species are becoming more common. After all, cities or local jurisdictions could be compelled to take stronger action if their primary sources of revenue (i.e. recreational fishing, boating, beaches, parks, etc.) are compromised by the presence of invasives.

Considering the previous mention of internal and external factors that are integral in understanding how partnerships’ collaborative processes play out (Koontz and Bodine, 2008; Koontz, 2003), there is little doubt that such factors are pertinent to a collaboration’s influence on invasive policymaking. Invasive species abundance is prolific in both cases, however the level of concern and involvement among members of
is inconsistent between the two. FISP handles issues involving mainly terrestrial flora and fauna that the public experiences on a day to day basis as opposed to the largely submerged, aquatic invasive species that the GLRC largely was dealing with. This brings us back to the external factor of “level of concern”, and how citizen participation was much higher in FISP, especially among landowners who are increasing exposed to invasive species.

Conclusion and Future Considerations

Initial assumptions regarding the likelihood that invasive species collaborations would seek to affect policymaking were partly accurate. Both collaborations, despite the ongoing debate surrounding the true ecological impact of invasives among some in the scientific community, considered invasives problematic and deserving the attention of managers, citizens, and policymakers alike. However, only one of the cases – the GLRC – intentionally sought to provide policy recommendations after its creation by executive order. FISP showed no clear desire to affect policy, but rather to concentrate its efforts on ground-level, EDRR operations and public awareness. The lack of FISP’s desire to influence policy, while surprising and intriguing given the extent of invasive incidence in Florida, underscores the notion that collaborations do believe they can impact invasive management in ways other than policy advocacy.

The analysis of both the FISP and GLRC collaborations shows variable influences on invasive species policymaking at the state and federal levels, and which factors were largely determinants of the that influence. Overall, FISP had low policy influence, but the causes of this were largely internal to the organization in that priorities and resources
were deliberately steered away from policy advocacy. In contrast, the GLRC had high policy influence, with external determinants (i.e. delegated authority, political environment, etc.) playing a more dominant role relative to factors within the scope of the partnership. In both partnerships, citizens were more recipients of information and observers of the technical actors driving the partnerships, rather than bearers of authority and decision-making.

Though FISP had no impact on state or federal policy, it has formed a sufficient network of mutually beneficial relationships at the CISMA level with local municipalities, which has facilitated the effectiveness of its targeted EDRR initiatives and the landowner incentive programs. Though not as pertinent to policy formulation, such relationships are pivotal to the action-oriented identity that FISP has sought to foster among its members and to securing the attention of concerned citizens throughout Florida. Not to mention, these networks taking hold at the local level have the potential exert influence that is policy oriented in the long term, as concern of invasive species grows more salient at a smaller scale.

On the other hand, the GTRC was instrumental in affecting policy at both the state and federal level, mostly due to the political authority that was initially delegated to it at the GLRC’s creation. Likewise, the association between technical actors within the GLRC working group and state and federal public officials was stronger, thus enabling the eventual funding that would be necessary for implementation. The GLRC also demonstrates how broader political environments external to the partnership can be a key determinant of policy influence, as the Strategy’s recommendations were not as influential until the change of Presidential administrations in 2009.
So what substantive understandings stem from these conclusions regarding internal/external determinants of influence and citizen involvement? Moreover, what can these understandings provide for future collaborations with aspirations of influencing policy? First and foremost, this analysis illustrates that if collaborations do seek to affect policymaking related to invasive management, prioritization or some degree of concerted effort by actors within the partnership is imperative. This dedication may be reflected in the text of action plans or mission statements and/or observable in the activities that the partnership engages in that are related to advocacy. If this internal factor is not fulfilled, little else remains for the partnership’s potential to influence policy, as members will direct their attention to other efforts. To a great extent, (Margerum’s) typologies matter, and are indicative of a collaboration’s internal propensity to affect policy. They simply aren’t a descriptive tool, but the organizational and operational characteristics on which the typologies are built can explain how influential a partnership is likely to be to decision-makers.

Secondly, the importance of external conditions cannot be underestimated. Even if collaborations \textit{do} seek to influence policymaking, there is no guarantee that their efforts will be realized if (1) their input is not solicited or sought out by policymakers, (2) the political landscape is not amiable to their appeals, or (3) they have not been granted political authority to make recommendations (as was the case in the GLRC). This requires collaborations to recognize the significance of factors beyond the scope of their direct control and the value in taking strategic action in preparing to successfully operate in a (sometimes) dynamic political atmosphere. Such action could include forging
relationships with policymakers and building diverse coalitions that withstand changes in political regimes.

While the FISP and GLRC cases have provided valuable insight into the collaborative nature of these groups and their tendency to influence policy related to invasive species, there are certainly still questions that remain. One area of future exploration lies in the individual motivations, on the part of an organization or citizen, to become involved in a partnership. Partnerships can be diverse in stakeholder interest, so the initial motivations behind participation and what members perceive the conflict to be could be insightful in really understanding how collaborations will choose to become involved in the management of invasives. Prior studies of participation in Ohio watershed collaboratives suggests there may be similarities in member participation; in fact some of those partnerships included invasive species removal in their list of activities related to improving the ecosystem conditions in the watershed (Koehler and Koontz 2008). In addition, with invasive ecology being a dynamic phenomenon, especially when human behavior is accounted for, how will collaborations adapt their organizational structure and priorities to manage invasive species effectively? More research is needed in the area of invasive species collaborations to fully understand how our society will utilize new and diverse management regimes to confront the threat that many non-native species pose.
Policy Report

The issue of invasive species, having captured the attention of scientists and public managers for decades, is just now coming to the forefront of the public’s attention. This may be due to the greater frequency of stories in the media related to particularly "telegenic" species. Images of thousands of Asian carp hurling themselves out of the water or massive pythons being captured in the Everglades seem to instill a sense of curiosity in individuals, if not concern. Nonetheless, what still remains to be determined is how best to prevent and control the introduction of non-native flora and fauna so that such species do not reach the point of becoming established, and potentially harmful to ecosystems, our economy, and/or human health. Clearly no one “silver bullet” solution exists. Not only does this stem from a strong theoretical understanding that invasives have a set of key phenotypic traits (Whitney and Gabler, 2008) that allow for successful proliferation and potential ecological dominance, but that proposed solutions to control their spread and establishment can fail to account for an impact that is latent in effect (Simberloff, 2005).

Much of the literature on invasives and the solutions recommended to mitigate their impact still rely heavily on action taken from national, centralized institutions. This is most true, and appropriately so, for solutions that seek to prevent introductions of non-natives into nature. Given that a voluminous portion of invasives are introduced via the exotic pet trade and interstate commerce, agencies in the federal government would
naturally be looked to take appropriate action given that these areas are their legal prerogative. Currently the Lacy Act, passed in 1900, seeks to control the import and transport of wildlife that is or may potentially be “injurious to the health and welfare of human beings, to the interest of forestry, agriculture, and horticulture, and to the welfare and survival of the wildlife or wildlife resources of the United States” (50 CFR 16.3). Adding a species to the “injurious list” is a determination made by the Secretary of the Interior, but only 23 formal “injurious” designations\(^5\) have been made in the Act’s 113 year history (U.S Fish and Wildlife Service, 2012), lending it to be characterized as largely ineffective and in need of revision (Folwer \textit{et al.}, 2007). Much of the difficulty in labeling a species as “injurious” stems not only from the absence of a risk assessment system under which to confirm the certainty or likelihood of harm, but the resistance posed from interest groups in the exotic pet industry that contend that such prohibitive action would come at a heavy price, economically.

It’s possible that invasive species collaborations could provide some impetus to reform the Lacey Act so that imports of non-native species are more heavily scrutinized and that more thorough risk assessments are conducted on a regular basis. Investing into a screening system such as this would be costly up front, but would be economically sensible given the upwards of $35 billion in costs and losses realized in the United States each year as a result of invasives and associated animal diseases (Jenkins, 2012). It is circumstances like these in which a policy collaborative, similar to the GLRC, could be called upon to gather pertinent data and make thoughtful recommendations about how to best devise and implement a system. Given the level of contention surrounding

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\(^5\) This count does not include the listing of the Starling (1900), House Sparrow (1900), or Myna (undetermined), which were all formally listed and then later removed for unspecified reasons.
preventative action, it would also prudent to include representatives of private industries (i.e. exotic pet industry, commercial shipping businesses, etc.) who feel particularly affected by, but under-consulted in, the current debate surrounding preventative mechanisms. By finding a set of solutions that all or most stakeholders could agree too, this may minimize efforts to stall implementation that so much preventative solutions have experienced in the past several years.

Even more can be said for collaborations that seek to make an impact in terms of early detection and rapid response, or overall control of invasive species. Given that EDRR’s success is largely contingent on time and resources, invasive collaborations have the opportunity to play an invaluable role in building an extensive network of individuals and organizations that can quickly identify an affected area and subsequently move resources to treat that particular location. FISP has sought to operate in such a manner, but has also endeavored to create a more permanent sense of awareness about invasives among the public. Their sponsorship of working days and pet amnesty days not only generate substantive outputs in the way of controlling invasives and preventing future introductions, respectively, but these practices are crucial to fostering a sense of responsibility and ownership among members of a community. Activities like these are truly representative of an action collaborative because of their focus on local action and collaboration, and allow citizen involvement to be utilized to a greater potential.

More steps are required in connecting the public to the issue of invasive species however. After all, not every citizen is able, or desires, to capture or lethally remove an invasive from the habitat, much like has been occurring in southern Florida with the issuing of special hunting permits and the holding of hunting contests to curb the spread
invasive pythons. Nor does every case call for such action to be taken. Moreover, with the awareness that is raised about invasives, practical tools need to be employed to facilitate their reporting to a common database, allowing for information to be accessed across jurisdictions so that appropriate actors can respond. Enhancing information management technology not only improves the sharing of information, but it can allow citizens to be drivers of invasive species management, and as a result, actual partners rather than passive absorbers of information or observers of decision-making.

Instituting or enhancing a central information management system for tracking invasive prevalence is something that states should explore more vigorously. Such a database could be created in a more cost-effective manner by relying heavily on collaborative organizations to maintain the system, just as FISP has done in conjunction with the University of Georgia’s Center for Invasive Species and Ecosystem Health. Figure 5 offers an image of what the visual interface of FISP’s Early Detection and Distribution Mapping System looks like to a user, be it an agency manager or a lay

**Figure 5. An example of the visual interface of the Florida Early Detection and Distribution Mapping System** (Image generated through Google Maps at http://www.eddmaps.org/florida/)
citizen. By having the ability to visually witness invasive distribution through this lens, the concept of invasive species not only becomes more accessible, but the personal impact that a citizen can have on management becomes more salient through a system’s self-reporting capabilities. Management would no longer seem to fall solely within the domain of wildlife managers, but create a sense that citizens are integral agents in initiating rapid responses.

From a policy standpoint, a balance must certainly be struck to the extent that citizens are involved in invasive management though. This may seem paradoxical given the previous discussions on the importance of fostering legitimate citizen involvement in collaborative processes. However, devising a system that gives citizens more responsibility in early detection and rapid response must be accompanied with limitations and proper monitoring in order to assure public safety. Simply put, control methods employed by citizens must be sanctioned by state or federal wildlife agencies and rooted in an underlying scientific understanding of invasive ecology. In the absence of such assurances, the risk of a management system heavily reliant on citizens disintegrating into an unaccountable “free for all” becomes more likely, especially if a “by whatever means necessary” mentality is adopted in curbing invasive expansions. Aside from this, it then begs the question of what sociological questions related to humans’ perception of wildlife arise, specifically as it pertains to the necessity of a particular species.

The potential for collaborations to make an impact on preventing the introduction and controlling the spread of invasive species is expansive. The two cases of FISP and the GLRC demonstrate how collaborations have provided an alternative framework under which to manage wildlife (and the natural environment in general), as opposed to the
centralized, top-down, administrative regime that has been so apparent since the beginning to mid-20\textsuperscript{th} century. This is not to say that the conventional approach has been totally abandoned, as state and federal governments still see wildlife management as their primary prerogative. However, there has been acquiescence in allowing more diverse interests among stakeholders to be considered in decision-making. This complies with the premises espoused in ecosystem management, whereby social and economic needs are integrated into decision-making, in addition to ecological needs. While it is unlikely that an ideal, one-size-fits-all organizational and operational profile will be determined for a partnership, given the innate heterogeneity of natural and social systems, more research can be done - and should be done - to find how collaborations can fill the management voids that will undoubtedly come and go as society determines how to better mitigate the impact of invasive species.
Conclusion

The collection of knowledge we’ve gathered about natural resource collaborations is extensive, but still very limited in terms of invasive species. While this study did not discover any particular organizational or operational characteristics of invasive species partnerships significantly distinguishing them from other collaborations that focus on watershed and forest management describes in the literature, it was obvious, from these cases, that invasive collaborations are still very much trying to find their way forward and solidify their establishment for the long term. After all, participants from both FISP and GLRC alluded to the uncharted waters that their respective organizations were operating in. At the same time however, what their own partnerships were seeking to do was not to revolutionize the way management is practiced for invasives, but simply to find the most effective mechanisms for preventing and controlling invasive species. Members of the GLRC mentioned that such a collaborative restoration effort as the one that they were involved in was unprecedented. In addition, a number of FISP officials mentioned that the partnership was not about “reinventing the wheel” (Interview, November 13, 2012; Interview, March 6, 2013) but instead sought to enhance capabilities proven to be effective and contribute to the improvement of other practices being still being evaluated.

The analysis shows that invasive species partnerships’ effects on policymaking are quite variable. A stronger association exists between influence on policy and partnerships representative of policy collaboratives and a weaker association occurring
for collabortives fitting the organizational or action typology, when Margerum’s criteria are applied. However, these conclusions are limited in generalizability because only two cases were closely considered for this study and the inherent uniqueness of collaborative partnerships should restrain one from relying on a few cases as model for the mass. After all, there very well may be action collaboratives that have an extensive degree of influence on policymaking or policy collaboratives that have no policymaking effect when the same internal or external factors that were examined in this study are considered. Recognizing this reinforces the proper consideration of a comprehensive set of factors – outside and inside the realm of a collaboration’s control – in determining the extent of a collaboration’s effect.

Lingering questions, in addition to those raised in the conclusion of the policy section, really involve where and how the research occurs from this point forward. Aquatic invasive species management is quickly evolving with enhanced preventative and control technology such as eDNA detection and Light Transmission Spectroscopy (LTS) being used by scientists and managers. Then again, hunting has been relied upon as the only available control mechanism for some invasive species, like the exotic python species in Florida as other, more systematic, practices are perfected. All in all, what remains to be seen is the manner in which collaborations will be utilized to fill the actual or perceived voids in invasive management. Will improved technology allow managers to operate with more autonomy given their expertise and a higher degree of scientific certainty? This is unlikely, especially in the long term. A number of cases, like the failed 1997 effort to purge northern pike (Esox lucius L) from California’s Lake Davis with the
use of rotenone⁶ (Nieves, 2002), illustrates citizens’ insistence in being involved in decision-making, regardless of the level of confidence that managers may have.

Invasive species collaborative partnerships, in their varied forms and functions, will continue to play an important role in the future of invasive management, especially as vectors of dispersal become increasing diversified. Recognizing that a greater level of responsibility rests in citizens as it pertains to exotic pet possession, recreational activities, agriculture and horticulture, and commerce, offers the opportunity for collaborations to become pivotal players in framing the issue of invasive species to the public and providing pathways for citizen action. Whatever specific role that invasive species collaborations happen to occupy, be it drivers of policy or agents of invasive response, it’s clear that they will continue to be explored in the near future as an alternative to the strict administrative governance, and continue to fill a void in management.

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⁶ Rotenone is a chemical mildly toxic to humans and commonly used in insecticides, but has also proven to be effective in killing fish at appropriate concentrations. The use of rotenone in the Lake Davis case in 1997 failed in controlling pike due to other natural factors that undermined its effect, but more importantly, it was applied without informing the citizens of surrounding communities who depended on the Lake for drinking water and other recreational activities. A second application of rotenone occurred in 2007 after additional outreach and education occurred.
Works Cited


Johnson, Brett M., Robert Arlinghaus, and Patrick J. Martinez. "Are We Doing All We Can to Stem the Tide of Illegal Fish Stocking?" *Fisheries* 34.8 (2009): 389-94.


Lacy Act, The , §§ 16-3371-3378 (1900).


Appendix A: Supplementary Information

Figure 6.

The Florida Invasive Species Partnership Resolution and Signatory Members
(Florida Invasive Species Partnership, www.floridainvasives.org)

The undersigned recognize that invasive, non-native species can cause considerable damage to Florida’s lands and waters, including native plant and wildlife habitat, farmland, forests, water resources, and scenic vistas.

WHEREAS, the undersigned recognize that if landowners and land managers, both public and private, wish to achieve long-term success in controlling and reducing the threat of invasive, non-native species in Florida, it is critical to:

- Form collaborative relationships with all stakeholders.
- Focus on comprehensive management of invasive species, including prevention, early detection/rapid response, control, applied research and outreach.

THEREFORE, the mission of the Florida Invasive Species Partnership is to improve the efficiency and effectiveness of preventing and controlling invasive non-native species through partnering to increase communication, coordination and use of shared resources in order to protect wildlife habitat, working agricultural and forest lands, natural communities and biodiversity in Florida.

THEREFORE, we, the members of the Florida Invasive Species Partnership, declare that it is our desire to work together to protect Florida’s lands and waters by furthering the following goals and objectives:

Goals:

- Encourage voluntary partnerships to increase effectiveness and decrease costs of comprehensive invasive species management;
- Encourage the development, implementation and sharing of new and/or innovative approaches to address the threat of invasive species; and,
- Provide tools and resources that enable the development of unified approaches, bridging the gap between private landowners and land management agency invasive species efforts.
Objectives:

- Promote and participate in partnerships and collaborative efforts to address invasive species on statewide, regional and local levels (i.e., Florida Invasive Species Partnership and Cooperative Invasive Species Management Areas);

- Establish and maintain an interactive website at www.FloridaInvasives.org, providing information to address and resolve problems relating to invasive species and serving as a central repository for invasive species partnership efforts;

- Develop and maintain a database of existing incentive programs that can be used for invasive species management on public and private lands; and,

- Provide targeted outreach and training for invasive species management in Florida, including the use of innovative approaches.

The undersigned partners recognize that the commitments made herein are aspirational only and do not constitute binding legal commitments to program projects or expenditures.

U.S. Fish and Wildlife Service
USDA Natural Resources Conservation Service
U.S. Army Corps of Engineers
National Park Service
Association of Florida Native Nurseries
Florida Department of Transportation
Florida Department of Agriculture and Consumer Services
Florida Department of Environmental Protection
Florida Fish and Wildlife Conservation Commission
Florida Federation of Garden Clubs
Florida Wildflower Foundation
University of Florida
The Nature Conservancy
Florida Exotic Pest Plant Council
Florida Native Plant Society
Audubon of Florida
Southwest Florida Water Management District
Suwannee River Water Management District
Center for Invasive Species and Ecosystem Health at the University of Georgia
Figure 7. **Cooperative Invasive Species Management Areas within the State of Florida**
(Image from Florida Invasive Species Partnership, [www.floridainvasives.org](http://www.floridainvasives.org))

![Map of Florida showing Cooperative Invasive Species Management Areas](image)

Figure 8. **Great Lakes Declaration: Protecting and Restoring the Great Lakes through a Regional Collaboration of National Significance** – (GLRC Declaration, 2004).

We, the Conveners of the Great Lakes Regional Collaboration, established on December 3, 2004, in Chicago, Illinois, in acknowledgement of Executive Order 13340 signed by President George W. Bush on May 18, 2004:

1. Recognize that the Great Lakes are an international treasure which contain about 20 percent of the earth’s fresh surface water, support the culture and life ways of native communities, provide drinking water to millions of people, and form the backbone for billions of dollars in shipping, trade, fishing and recreation;

2. Recognize that the Great Lakes Water Quality Agreement of 1978, as amended by protocol signed November 18, 1987, the Convention on Great Lakes Fisheries of 1954, and other regional multi-jurisdictional agreements with Canada, commit the United States and Canada to restore and maintain the chemical, physical and biological integrity of the Great Lakes ecosystem, including the adoption of common objectives and cooperative programs;

3. Recognize that while there has been progress in restoring and improving the health of the Great Lakes ecosystem, there are still tremendous threats to the physical, biological and chemical integrity of the ecosystem;
4. Note that citizens, as well as many federal, state, and local agencies, Tribes, elected officials, and stakeholder groups, including the environmental nongovernmental organizations, industry groups, and the agricultural community, serve a vital role in protecting the Great Lakes ecosystem;

5. Acknowledge that numerous multi-governmental and non-governmental stakeholder networks have demonstrated a long history of effectively collaborating on a variety of complex regional and local ecosystem protection and restoration efforts; and

6. Affirm the need for leaders in the region, including Great Lakes Governors, federal agency heads, Members of the Great Lakes Congressional Delegation, Great Lakes mayors and Tribal leaders, building upon the extensive regional efforts to date, to collaboratively work together and with the Great Lakes community toward a common goal of protecting and restoring the Great Lakes ecosystem in order to address the new and continuing challenges and ensure a healthy ecosystem for future generations.

Hereby, consistent with the laws applicable to our respective jurisdictions, pledge our support for the development of a widely understood and broadly supported strategy including actions to further protect and restore the Great Lakes ecosystem through the Great Lakes Regional Collaboration process.

Figure 9.

**Recommendations Set Forth the in Great Lakes Regional Collaboration’s Strategy, Invasive Species Section** – (GLRC Strategy, 2005).

1) Ship and barge-mediated introductions and spread of AIS in the Great Lakes should be eliminated, through the immediate promulgation of environmentally protective standards for ballast water, and the implementation of effective ship-board treatments and management measures.

2) Federal, state, and/or local governments must enact measures that ensure the region’s canals and waterways are not a vector for AIS, including full federal funding of the Chicago San-Ship Canal barrier and the sea lamprey control program.

3) Federal and state governments must take immediate steps to prevent the introduction and spread of AIS through the trade and potential release of live organisms.

4) Establish a Great Lakes Aquatic Invasive Species Integrated Management Program to
implement rapid response, control, and management programs and assess the effectiveness of those programs.

5) Federal, state and tribal agencies, academic institutions and other organizations should receive adequate support to conduct and evaluate cost-effective AIS vector-specific outreach and education programs. These programs should focus on behavior change and responsibility of resource users.

Figure 10.

**Survey Instrument: Semi-Structured Interview Questions**

*Individual Involvement*

1. How long have you worked with this group?

2. How did you become involved with this group?

3. What is your role in the partnership? What responsibilities do you have?
   a. How many meetings have you attended?
   b. Are these responsibilities shared by others or are they exclusive to your role?

4. What were your expectations for this partnership coming in and were they realized?

*Organization’s Profile*

5. Describe the general organizational structure of partnership (i.e. public/private orgs., # of orgs., committees/subcommittees, etc.).

6. What are the most important issues related to invasive species that the partnership seeks to address (i.e. communicating risk, preventative measures, rapid response, data availability, etc.).

7. How is it determined who or what organizations are permitted to join the partnership?

8. Are there any characteristics that are especially desirable for prospective groups or individuals?
9. What are the types of resources available to the partnership (financial, human, academic, etc.) and where do these resources come from?
   
   a. What resources are the most valuable?

   b. Are there any particular resources held by some partnership members that other members do not have?

Partnerhood Decision-making

10. How is decision-making authority distributed across the partnership? How is it determined what endeavors the partnership undertakes or what goals it sets.

   a. Is decision-making consensus based?

11. How are responsibilities delegated within the partnership specifically?

   a. Does any one person or group have authority to delegate?

12. Any issues of contention?

Public Policy Influence

13. To what extent does the partnership’s work influence government decision-making at the federal, state, and local level?

14. How often do partnership officials or members meet with government officials at the federal, state, and/or local level?

15. Have you or anyone else you’re aware of in the partnership testified at any federal or state committee hearings, or spoken to local boards?

16. Are there any public events, sponsored or unsponsored by the partnership, which partnership members participate in?

17. Has the partnership affected the scale at which invasive species are discussed? Why or why not?

   a. Specific instances -

Can you recommend anyone else who I can speak to in the partnership?