THE CURIOUS CASE OF THE ASIAN CARP
SPATIAL PERFORMANCES AND THE MAKING OF AN INVASIVE SPECIES

By

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ABSTRACT

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The Curious Case of the Asian Carp: Spatial Performances and the Making of an Invasive Species is a theoretical argument for how species are rhetorically made invasive and builds a methodological relationship between actor-network theory and cultural rhetorics. In this dissertation, I speak to scholars of actor-network theory (ANT) and environmental rhetoric (ER). For ANT scholars, I present cultural rhetorics as useful because it marks actor-networks as performing their work by enacting rhetorics. For ER scholars, I argue that ANT offers a meaningful methodology that allows for understanding environmental crises with greater complexity by making an analytical turn toward ontology rather than epistemology.

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CHAPTER 1. INTRODUCTION

"And what we often uncover is not merely the way that nature influences and constrains human actions, but also the way that particular environments shape human intentions."

Linda Nash, "The Agency of Nature or the Nature of Agency?"

What I hope to do with this dissertation is create a series of thought, which hopefully will put us in the space of considering our ontological relationships as these frameworks relate to or potentially displace those of others in the process of public deliberation. So, I begin where most research projects begin, in an archive. Because as Taylor (2003) quite succinctly contends archives and their accompanying repertoires "of selection, memorization or internalization, and transmission" constitute the conduction of "communal memories, histories, and values from one group/generation to the next" (p. 21). Archives do indeed "generate, record, and transmit knowledge" and serve as heuristics whereby we understand the world and our place within it. Not that there is a single origin story for a research project, but my project began in Toronto. The Life in Crisis: Schad Gallery of Biodiversity located in the Royal Ontario Museum is an archive of sorts. Opened to the public in May of 2009, the gallery serves the ROM's mission as an advocate for science in the study of nature. The interactive gallery combines seven ecosystem experiences with approximately 2,500 living and preserved animal specimens.

The Schad Gallery offers a unique platform to engage individuals in the fundamental relationships between nature and humanity albeit through taxidermy,

dioramas and stationary cyberdocents. As a natural history archive, the gallery explores our world's biodiversity and the many factors affecting its survival through three core themes. First, "Life is diverse," which illustrates the astonishing number and variety of species on Earth; second, "Life is Interconnected," which demonstrates how species and habitats are so tightly interwoven that any impact on one of them necessarily affects the whole ecosystem; and, finally, "Life is at Risk," which highlights that the "web of life" is threatening to unravel due to human activities. I have visited the ROM twice in the past year. During my trips to the museum I spent a majority of my time dwelling in the exhibit in an attempt to understand its epistemological aims and conceptions of reality through these three themes. If you take these themes and the accompanying exhibits for what they are, you'll see them as stories that associate people to places, animals to people, the human to the nonhuman. They are indeed socio-technical networks on display. Yet, when we speak of "crisis" or "risk" through the lens of activities and relationships what exactly do we mean? Whose story are we telling? Whose presence is abstracted in these narrative accounts? What actors' intentions are made known? These questions make me think of Thomas King, who writes, "a story told one way could cure, that the same story told another way could injure."

These questions suggest that there should be a certain level of care in the writing of history—especially environmental history. This care comes in the way of taking critical social scientists' regard in recognizing the multiple variables that factor in the production of historical and contemporary environments. Post-constructivist science has had much influence on the sub-discipline of

environmental history within the past ten years. The work of scholars such as John Law, Bruno Latour, and Donald Worster challenged the way environmental historians have recapitulated the nature-culture dichotomy, which has rested agency entirely in the hands of humans. Both actor network theorists (ANT) and ANT-oriented environmental historians have paved the way for a radical alteration of doing history that brings nonhumans into the fold to complicate our understanding of historical events and actors. I am interested environmental historians' ANT-style approach because they engage with complexity by situating their subjects-of-inquiry within larger ecologies. Their fixation with complexity brings human and nonhuman together in a way that position objects as situated within intricate networks to produce composite accounts of either how environmental phenomena occurs or how technical innovation transpires (Law, 1989; Cronon, 1991; Taylor, 1999; Hayden, 2003; Sellers, 2004; Nash, 2005; Allen, 2006; Sutter, 2007; Hoag & Ohman, 2008). For example, Sellers (2004) was concerned with fluoridated water and the seemingly dominant U.S. scientific perspective that drove its use in municipal water supplies around the world. Historians have largely positioned scientists as the central actors responsible for shaping the history of fluoride around the world. For Sellers, this was a problem because it was a one-dimensional history that did not account for the fact that there were people in other spaces whose differing experiences were equally influential in the shaping the use of fluoride. While these perspectives were never dominant, Sellers argues that they are just as important because the dominant American scientific ontology of fluoride would have had to encounter and destabilize others in

order to assume its position. His study of fluoride is a history of a material object shaped by transnational flows of knowledge among groups of experts and the lay public.

In a different vein, historian Taylor (1999) was interested in understanding the historical development of salmon management and the crisis stemming from their modern-day population decline. Popular theories regarding the decline of salmon populations often point to "overfishing" as a cause. His argument, however, is that this popular theory is a one-dimensional view of causality, which excludes space and subsequently the range of different relations people had of salmon. His argument lies primarily and against historians and their practice, which has the tendency to not consider space and place in the construction of their histories—or depict the past "as if people were packed solidly on the head of a pin." Wading through the archives that compose the history of salmon, he uses space to reject "overfishing" as an explanation for decline as he reveals the different relationships people held with salmon through their cultural practices. These geographies are complex in that they mark the story of salmon as not simply about "overfishing." The story is an assemblage of accounts that mixes narratives of economics, racism, nationalism and scientific progress that transpire over a range of spaces. In many ways we might uses these cases as essential reminders of how practices around archives can veil important stories and flatten relationships. This would only highlight the extent to which we, as researchers, have responsibilities not necessarily to our disciplines but also to countless others when working within archival spaces.

Writing histories in this manner is an ontological project that forces us to reconsider the concept of agency as it is practiced along the nature versus culture divide. There has been much interest on the part of environmental historians to document culture's affect on nature, culture's "embrace of nature as naïve reality, and ecology as the ultimate arbiter of that reality" (Dann and Mittman, 1997: p. 292). In the past, there was more emphasis on documenting culture's effect on nature and the sciences' role in knowing nature, but regardless of the sciences presence humans have always served as the actors within environmental histories. Dann and Mittman (1997) have noted that environmental historians have largely assigned mostly "negative agency to human beings." For example, White (1996) provides and exploratory account of the relationship between humans and nature as he documents how the Columbia River came to exist in its present form over time. He does not exclusively focus on humans. Instead he conceives of body and agency as the links between humans and nature. His purpose for doing so was to get away from accounts of knowing nature that "privileg[e] the eye over the hand" (Dann and Mittman, 1997: p. 299). He, however, privileges a confluence of "labor" that makes the Columbia River into an "organic machine," through engineers, fisherman, damworkers, etc. Environmental histories of this caliber unseat Science as the only actor in constructing environmental knowledge and reality. In using this as an example, I am resurrecting the problem of Science standing as the representative figure. Nature can only speak through Science, which to some extent places agency into question because nature doesn't speak on its own accord. Instead, nature exists through arbiters.

Some environmental historians have taken the step to define nature as having agency by positioning nature as a nonhuman actor through Latour (2004), Callon and Law's (1995) understanding of agency (e.g. agency as being dispersed throughout actor-networks rather than self-contained) (Nash, 2005). The biggest roadblock to assigning agency to nature is that the concept of agency in relation to humans has always been tied to cognitive functions that nature lacks. For example, example, one of the primary characteristics that feeds into how we understand agency regards the ability to cognitively think about an act before it takes place. Accordingly, this is what separates us from nature. While nature is dynamic and in some ways can be considered an agent, it just carries out processes as if they are a part of a continuous chain of events (e.g. no thinking is necessary for things to occur). Nash, Latour, Callon and Law's conception of agency moves outside of this definition. They argue that while nature does not act in the way humans act, it does act in ways that influence how organism relate to their environments and each other; thus, agency can only be understood as a linked-social phenomenon that occurs "through practical engagement with the world, not disembodied contemplation" (Nash, 2005 p. 68).[1] Recognizing nature's agency furthers the goal of writing better environmental histories by taking all humans and nonhumans into account for the purpose of building a better story for how knowledge and practices surrounding nature came into existence rather than just a story of the unfolding of reason within the human mind coupled with action.

[1] "And what we often uncover is not merely the way that nature influences and constrains human actions, but also the way that particular environments shape human intentions" (Nash, 2005 p. 68).

Returning to the Schad Gallery, I use this archive as a means to theorize and think through a current project, which is the subject of this dissertation (e.g. What is Asian carp? And how does it materialize as an invasive species?) It is the story of crisis over the loss of biodiversity told through the terministic screen of science that I find peculiar. If we take the theme "Life is Interconnected" as a representation that species interact with each other in complex ecosystems and dig deeply, is science really the only way in which we should/can understand this emergency? One aspect of this crisis, as defined by the exhibit, regards the presence of invasive species within ecosystems. For the most part, we are asked to define invasive species primarily through science and economics, with science having the largest influence. Yet much like Taylor and Sellers, I find myself to be skeptical of these two frames ability to account for the full range of relations that people may have with invasive species. Quite frankly, I am curious if there are other frameworks at play, which are concealed behind scientific and monetary understandings. These ontological positions bear meaningful affordances to how we understand invasibility and make policy regarding it. We must engage with them.

My time within this archive also raises scholarly questions around how environmental rhetoric as a tradition makes knowledge about the world. And so I ask myself, how does someone begin to understand the making of invasive species within the tradition? The answer has been to turn toward texts. This is a result of the fact that our discipline (and the humanities at-large) has been exclusively text-centered. There have been in-roads made with cultural composition theory, which has articulated writing as situated within complex cultural systems. These positions,

however, do not go far enough in that they still treat texts as representatives or containers of culture. There is no discussion of the agentive roles texts inhabit within dynamic environments of multiple networked relations. Sanchez (2005) noted this problem with how composition has made use of cultural theory. The inability to examine writing as networked stems from the field's resistance to move beyond hermeneutical approaches in understanding rhetoric production. The textual approach traps us within a system where meaning is embedded within texts rather than generated throughout the network influencing production. By focusing on text we tend to screen out other important units that contribute to the assembling of a rhetoric. Consider practice as an example. By practice I mean various elements that could be classified as contributing to a rhetoric but cannot immediately be textualized. These are—in-the-act, or embodied cultural performances, situated within institutions and framed by infrastructural elements. The same could be said for material units that are left out of analysis because researchers deem them not to be integral to the production of phenomena that they are focusing on at a particular site.

As a tradition, environmental rhetorics has accessed and studied the relationship between rhetoric and the environment from the standpoint of epistemology. This is to say that explorations in environmental rhetoric have primarily focused on how knowledge functions among stakeholders within environmental debates. There, however, is very little concern for how knowledge becomes policy or procedures that regulate action and transform the land). Here I posit that environmental disputes cannot be solely understood by examining what is

believed or immediately textualized. Instead, environmental rhetoricians should position themselves to consider how multiple knowledges about an object in dispute are the result of multiple realities.

As a corrective, I argue that environmental rhetorics has to rethink the way it understands environmental issues through three methodological recommendations. First, there has to be a reconsideration of subjectivity. This entails moving away from an object-view of texts and adopting an understanding of texts as actors that participate with people and other nonhumans in order to make reality. For example, we might ask questions regarding agency with respect to how texts create spaces? Second, there is a need to engage with the multiple knowledges or realities associated with a particular subject. Rather than producing "flat-world" accounts, environmental rhetoric should engage with complexity to create multi-dimensional accounts of our subjects of study. This would also entail adopting my final recommendation, which regards arrangement and location. This entails engaging with questions of how varying arrangements across disparate spaces coordinate to produce reality in the multiple.

There is a need for environmental rhetorics to engage with complexity and ontology as a means of both understanding the nature of a problem and providing meaningful solutions to that problem. This is not to say that environmental problems are solely an issue of bad communication (this is a nod back to complexity). Instead, this is recognition that communication plays a role and moves rhetoricians closer into the circle of advocacy and engagement. Rhetoric here becomes a deliberative mechanism whereby citizens can do work and enact change

through a deep understanding and reordering the relations that give birth to environmental problems.

Research site: Scope & topic

With respect to this project, I am interested in answering many of the following questions regarding ontology through a study of invasive species—specifically, Asian carp. How is it that something becomes invasive? Where are they invasive? To whom are they invasive? Moreover, how long is it before all stakeholders agree that they are invasive? In short, I am interested in the historical narratives and practices that surround Asian carp as an "introduced species" now labeled "invasive." Asian carp have become somewhat of an issue within the imagined community of the Midwest and Great Lakes region. Yet, the use of the word "invasion" to describe the presence of the species presents an interesting opportunity for historical analysis. At what point did it become politically expedient to use "Asian carp" rather than silver or bighead to describe a group of actors' collective movement through space as "invasion?" Specifically, how was it possible for an ontology to displace another and help to institute a new set of practices around several actors grouped as a single entity?

Overview of this dissertation

In Chapter 2, I introduce a theoretical framework for studying the complexity of environmental problems. Here I oscillate between Actor-network theory and Cultural rhetorics as a means of producing a methodology to re-tool environmental rhetorics. I draw upon the work of ANT scholars such as Michel Callon, Annemarie Mol, John Law and Bruno Latour who each provide a way of documenting and

spatializing the complexity of social situations. I also make use of CR scholars like Angela Haas and Malea Powell who mark rhetorics as emerging from constellated rhetorical traditions and call attention to the researcher's positionality in collecting data and making meaning. I put these theorists in conversation to produce a framework that spatializes environmental problems so that we are not focusing on stakeholders' contestation of knowledge—epistemology—but what knowledge represents—ontology— and the possibilities that come with this shift in attention.

Chapter 3 brings my methodology into sharper focus. Here I introduce the architectonic statement. This term is borrowed directly from Lakota architect Craig Howe's notion of "ethnoarchitectonics," which identifies architectures as bounded spaces that produce reality. Asian carp's invasibility emerges as multiple ontologies (or carptologies) that are the result of the statements (and other networked performances) of human and nonhuman actors like scientists, political agencies, and technical devices. These performances work doubly to render definitions that constitute Asian carps' status as an invader species and maintain the identity of human collectives. Carptologies then are powerful spaces of dependence that actors preserve to advance their essential self-interests. These ontologies also afford actors a position from which they can engage with others on their own terms. To better contextualize the architecture of carptologies, I walk readers through one of many economic controversies that present carp as invasive. It is in this section that I foreshadow a major implication of this study. While actors actively order spatial relations for their self- interests, technical communicators might take notice of

spatial relations and think of alternative ways of arranging space that allow actors to engage with each other rather than against.

In Chapter 4, I depict the many ways Asian carp act and are made invasive through assembled networks of human and nonhuman agents. We cannot always directly see Asian carp as invasive. Instead, we have to untangle the many performances in which carp factor in order to understand the nature of their invasibility. A slightly different Asian carp is performed in each carptology. The final product is an "Asian carp multiple." This is an appropriate description because there is no such thing as an Asian carp. Asian carp starts as at least two separate species; however, they are treated as one. Seeing carp as a single species inhibits our ability to fully understand the multiple ways in which identity is performed and the varied affordances and consequences tied to performance.

In Chapter 5, I trace the ways in which an important piece of legislation passed at the turn of the previous century, the Lacey Act, influences actors' constructing spaces of dependence and engagement. To explore the creation of space, I assembled a case study using letters written to the U.S. Fish & Wildlife Service and interviews with officials from government and non-governmental institutions. These letters were written in response to three public commenting periods regarding the listing of bighead, silver and large-scale silver carp as invasive. I used the letters and conversations to map ontological positions that reveal relationships between human and nonhuman actors. Location on the maps revolves around concerns for economies, human safety, environmental health, and cultural preservation. While the maps illustrate how relations determine identities

for carp and humans, they also indicate spaces wherein environmental policy-makers might re-think the design of policies that govern deliberative civic engagement.

In Chapter 6, I illustrate implications for the use of my framework for environmental rhetoricians. I emphasize that a turn toward ontology affords environmental rhetoricians not only the opportunity for understanding environmental issues with greater complexity but also places us in the position to engage with others and act as advocates in the creation of space. The concern for multiplicity within environmental disputes raises a rhetorical problem. How can we represent and respect the fractional worlds that actors call home while moving toward a singularity that would allow us to best resolve a crisis. If there is one thing that we can say definitively about architectonic statements, it is that they are metaphorical bridges between textual and physical worlds. They are performances of reality. Writing performs reality, but it also has the ability to adjust the relations that produce reality. Here I am actively advocating that we consider ways in which acting rhetorically can make and remake the physical world.

CHAPTER 2. METHODOLOGY & METHODS: TOWARD A CULTURAL ENVIRONMENTAL RHETORICS

I use this chapter as a way of sketching out my approach to solving the problems with environmental rhetoric that I raised in the previous chapter. The most explicit attempt to address complexity within environmental rhetorics has been ecocomposition. As a moment within rhetoric and composition studies' post-process movement, ecocomposition holds that we must take into account the environmental conditions that envelope textual production. Ecocomposition draws primarily from disciplines that study discourse (chiefly composition, but also literary studies, communication, cultural studies, linguistics, and philosophy) and merges their perspectives with work in disciplines that examine environment (these include ecology, environmental studies, sociobiology, and other 'hard' sciences). As a result, ecocomposition attempts to provide a more holistic, encompassing framework for studies of the relationship between discourse and environment" (Dobrin and Weisser, 2002: p. 6). In this sense, ecocomposition itself mirrors ecology (the scientific study of interactions between organisms and their natural environment) since it propels us to inquire into the spaces in which discourse transpires, as most inquiries into these relationships do not explore how discourse and writing are influenced by place (As a contrast, it is also important to note that ecocomposition stops short of exploring how discursive relations constitute and shape the natural world, which is a contribution that my work offers). The post-process movement was interested in moving away from focusing on individual writers' composition processes toward a social constructionist politic that addressed the social forces that surrounded the writing process (Dobrin, 2009).

Ecocomposition frames environment as an important force, so important that environment precedes race, gender, and culture, which ecocompositionists believe are effects of environment. This emphasis on space and place occurs as a result of ecocompositionists believing that most inquires into discourse in rhetoric and composition studies do not consider space as a factor.

Ecocomposition does not engage in Cartesian dualism, which characterizes most of environmental rhetorics. It acts outside of the western rationalist tradition à la Descartes and Sir Francis Bacon that and successfully and erroneously instituted a separation between nature and culture. Ecocomposition's ontological politics acknowledges two meta-spaces that humans occupy—a biosphere, consisting of the Earth and its atmosphere that ensure life, and a semiosphere, consisting of discourse that provides meaning to life in the biosphere. Ecocomposition acknowledges these two spaces as mutually-dependant. The biosphere can be segmented into multiple realms (realities)—political environments, electronic environments, economic environments and natural environments, but analysis of these spaces are rarely seen in relation to each other. This signals that ecompositionists' analyses of environment often fails to engage in complexity that moves beyond sites and make inquiries into how other spaces also affect how a text develops (Drew, 2001 is a notable exception to this). Furthermore, there is another object of analysis that emerges from ecocomposition practice. Humans and texts sit at the center of analysis within ecocomposition accounts.

For me, this is a problem not only because ecology as a discipline is a whole systems approach rather than a study of central figures (see Dobrin and Weisser,

2001; 2002; Marx, 2008 for further examples of this) but also because it cements a constitution that treats humans as subjects and nonhumans as representational objects. Therefore, agency is not seen as a relational effect but rather power possessed solely by people who order environments through discourse and subsequently construct texts that assume the character of being representative of the contexts in which they develop. A good way of thinking about this way of seeing comes from a rather mundane example: *People, not guns, kill people*. The decision to grant subjecthood versus object status depends upon one's political allegiances. Nevertheless, selection of one or the other view presents certain avenues for action. It could be that *guns kill people* as well, but I am more apt to argue that *guns and people kill together* (Sometimes people hear voices in their heads that tell them to kill, but that adds another layer of complexity). This type of example even occurs with respect to environmental controversies: Global climate change is a result of Nature and its processes; People are responsible for global climate change. As with the former example, choosing a subject is an ideological commitment to draft legislation that would curb human activity or leave the problem untouched. A strong commitment toward exploring ontology provides the foundation by which ecocomposition can begin to understand how the "social" functions during composition by documenting the amount of relations that can be said to exist. This presents several questions for consideration—What roles do texts (and other nonhumans) play in creating environments? How do they create environments (or reality) rather than merely being containers of a reality? How do they work in concert with other subjects to create realties? Furthermore, how do these realities

co-ordinate (relate) with others? These questions that profess the more agentive roles that texts and other nonhumans assume highlight that they are not containers (or representatives) of culture. Their identities are one and many. They simultaneously participate with others in the creation of cultures and they are composed of assemblies of other actors at macro and micro levels of abstraction.

The push against containerization in favor of greater subjectivity is nothing new; in fact, it is deeply rooted in a methodological polemic that surrounds rhetorical hermeneutics. In making this statement, I am placing two rhetoric & composition scholars in direct opposition to each other with respect to their work. Mailloux (2006) explored the relations and disciplinary trajectories of English literary studies, speech communication, and rhetoric & composition and raised hermeneutics ("rhetorical hermeneutics" in our case) as a useful method that unites several disciplines under the umbrella of "English studies" because it sustains the same subject-object orientation of the world. Objects (or texts) are representational and exist to be analyzed. The emphasis on a text-centered rhetoric has created a system of analysis wherein people merely read a text, analyze it, and then make claims about rhetoric at-large based upon a document or collection of documents. What this does not account for are the various units that help to make a rhetoric but cannot immediately be textualized (Sackey, 2011; Sackey and DeVoss, 2012). Following, Sanchez's (2005) lead, we need to realize that "the category of writing alone cannot describe the theoretical and cultural situations" that comprise the everyday (p. 9). Therefore, if we want to make claims about rhetoric, then we are

going to have to not focus exclusively on texts as representational units and consider other units that exist in relation to the texts to create meaning as an effect.

Sanchez (2005) has produced one of the most comprehensive and important pieces on composition theory to date. Central to his work regards the question of how can we leverage cultural theory to improve our knowledge of writing and move away from representational theories that displace the act of writing and the speaking-subject from the purview of our research. My reading of Sanchez is that composition theorists have used cultural theory as a packaged set of ideas to be applied to texts rather than understanding it as a discourse that overlaps with composition theory. As a field we have entered a moment where we see and understand writing as being situated within complex cultural systems (Sanchez, 2005); however, our understanding of writing is limited because our faulty reading of cultural theory enables us to treat writing as representative (or containers of culture). Instead Sanchez argues against containerization by deploying Bhabha's essay "The Postcolonial and the Postmodern," in which Bhabha argued that texts are not representative of culture but rather culture is an effect of textual and non-textual practices. Bhabha raises the idea of colonial textuality as it increases the contingency of diasporic ontologies with social marginality, which arise in non-canonical modes and requires that we retool our critical strategies for reading and understanding. Colonial textuality is the space where signifiers of value and power meet, parley and become entrenched within colonial discourse. This negotiation space is where value systems materialize to instruct us to recognize or ignore forms of cultural performance. Bhabha (1994) notes that such marginality "forces us to

confront the concept of culture outside of objets d'art or beyond the canonization of the "idea" of aesthetics, to engage with culture as an uneven, incomplete production of meaning and value often composed of incommensurable demands and practices, produced in the act of social survival" (p 172). While the postcolonial tensions inherent in the case of Asian carp are not the focus of this study, I find that Bhabha provides a thorough map into how culture means. He pushes against the idea of containerization within artifacts and instead asks that we see culture and agency as distributed across networks people, places, and things—as he notes that culture is *transnational* and *translational*.[2] If we extend the idea of "social survival" to rhetoric in general and define rhetoric as social in nature, then this provides credence to the idea that any rhetoric relies upon a complex infrastructure that assembles varying units to mean. The fact that we live in an increasingly networked world (on account of globalization and technological development) requires that we develop a theory of composition that understands the complexity that surrounds the process of writing, the writing subject, the products of writing and how they link together in various ways to create culture or social conditions.

[2] I do not intend to explore this within this chapter or dissertation; however, this is a moment where we can begin to see commonalities between actor-network theory and cultural rhetorics. Although he operates from a different tradition, Bhabha's understanding of *cultural translation* is quite similar to (and may even extend) actor-network theory's conception of *translation* in that it emerges from the notion of hybridity or what happens when multiple cultures interact. For Bhabha, *cultural translation* is a heuristic for theorizing how cultures "are transported, transmitted, reinterpreted and re-aligned through local languages, and more broadly through other cultures with which migrants come into contact, as well as articulating the realities of how individuals on both sides experience and interpret such encounters in the 'contact zones' between different cultures" (Young, 2012, p 156).

Perhaps the aforementioned questions, which I put forth above about how texts (and other nonhumans) function in environmental rhetoric and ecocomposition, are an attempt to answer the call that Dobrin and Weisser issued during their 2009 Conference on College Composition and Communication session. The two presented an address in which they charged that ecocompositionists have done very little to move beyond Cooper's (1986) article on the "ecology of writing." Accordingly, ecocompositionists, despite their understanding of the complexity of writing, still hold true to composition's persistent study of the individual and their text in relation to the system rather than the system itself (Dobrin, 2009; Weisser, 2009). Both Dobrin and Weisser believe that a turn toward systems theory or complexity theory might rescue ecocomposition from focusing solely upon the writer because these transdisciplinary theories are more sensitive toward understanding how social life unfolds more than a borrowed term, turned metaphor (e.g. "ecology").

It might be that there has to be a deep engagement with systems theory, complexity theory or some other theoretical body in order to build a less conservative, more inclusive ontology. This would present a way of researching sites that do more than illustrate how the process of writing are limited to the scene where writing takes place or that texts are stable objects with no agency or that no other nonhuman beyond the writer and the text helps to produce the social scene. What appears to be missing from ecocomposition or environmental rhetoric is a deep engagement with ontology, which would fundamentally alter not only the what of research (e.g. What lies at the center of our research? What should we be

considering?) but also the how (e.g., How do we account for more-than-human participation to produce reliable accounts and possibly bring about better solutions to environmental problems?). The last question exposes my particular allegiance in seeing rhetoric as a useful tool that can aid in public deliberation. Nevertheless, the program, which I have sketched, would be a multi-site, more-than-human, relational and nonrepresentational ontological politic that would bring environmental rhetorics and ecocomposition closer to the type of complexity Dobrin and Weisser request.

Before continuing, I must do an important piece of defining. You have seen me use the word *ontology* in various forms and explain it as it relates to environmental problems. I understand that term has many different applications, as it is deploy within many fields (e.g. computer science and information science). My use of ontology stems from the tradition of metaphysics, which is the study of existence in the world. Ontological studies ask questions such as: *What can be said to exist?* (e.g. humans and nonhumans); *What categories can we sort existence?* (e.g. actors, actants, calculating devices); *How do entities relate to themselves and others to make their own and other's identities?* (e.g. Is identity a product of social activity or is it self-contained within the actor?); or *What bearing does materiality have on defining existence and understanding social relations?* (e.g. Can a non-physical entity exist? If so, how does it perform its existence?). These questions do not encompass the full breadth of ontological projects; however, they do provide a snapshot of the type of intellectual work these projects perform. Another important point of distinction regards another ontological tradition that I am not following. When I use

ontology I am not connecting with the tradition of *object-oriented ontology* (also referred to as "OOO" for short). OOO is incompatible with the methodology that I assemble in this project in that it moves away from anthropocentricity and places things at the center of analysis. Again, I am interested in the study of humans *and* nonhumans working together *or* against each other.

Building a methodology: Bridging ANT and CR, or some considerations from theory

A question remains as to how can we assemble such a methodology for engaging with complexity in the study of environmental rhetorics that Dobrin and Weisser request. The critical step that lies ahead of construction of complex accounts requires that environmental rhetoric make certain methodological considerations. These considerations include:

1. Acknowledging nonhuman subjectivity and the instability of their identities;
2. Attending to place as neither stable nor separate from other locales;
3. Reflecting on how our spatial practices are important because they are meaningful performances of reality that often work to create places;
4. And contemplating and making explicit the role of the researcher plays in ordering an account.

The final consideration is a nod that acknowledges the limitations and consequences of research—our scholarly writing not only performs realities but also executes cultural tasks (White, 1987; Lyotard, 1984; Spivak, 1985). I oscillate between the

traditions of actor-network theory (ANT) and cultural rhetorics (CR), in order to build this ontological program.

ANT is an approach to social theory born out of the sociology of scientific knowledge that uses analysis of networked relations and interactions between human and nonhuman actors as a means of understanding the creation of knowledge within communities, particularly communities of science (Callon and Vignolle, 1977; Callon, 1980; Callon and Law, 1980; Latour, 1987; 2005; Law, 1992). The identities that actors and actants assume within networks emerge via complex negotiations between human and nonhumans where roles are delegated and interests translated. The primary purpose of this method of inquiry regards answering the question, what is the "social?" With this question, scholars like Latour, Callon, Mol, and Law push against traditional sociology, which threats the "social" as a specific domain of reality that only sociologists hold the power to make visible. Accordingly, the social sciences has used the "social" as a lens toward describing any given situation; however, the cost of deploying this within research has brought about the conditions wherein the "social" has very little meaning. In fact, Latour (2005) accused sociology of falling into the trap of using the social to explain the social having said, "A given trait was said to be 'social' or to 'pertain to society' when it could be defined as possessing specific properties, some negative – it must not be 'purely' biological, linguistic, economical, natural – and some positive – it must achieve, reinforce, express, maintain, reproduce, or subvert the social order" (p. 3). Although it has traditionally been treated as a singular unit, the "social" is actually a "trail of associations between heterogeneous entities."

Therefore, what we would call the "social" is not a specific entity like a human or a book; instead, social is used to describe the type of connection that exists between various units. This understanding of social transforms sociology into the study of aggregates that are constantly reshuffled to become something different as events unfold.

CR is a methodological way of understanding rhetoric's relationship to culture through the metaphor of constellation (Mao, 2005; Powell, 1999; 2008; Villanueva, 2004; Haas, 2008). Rhetoric has traditionally been understood and practice along a single trajectory where all cultures and their traditions have been made to fit into a single linear trajectory (Aristotle—present). CR scholarship takes on the politics of symmetry by decentering the narratives that compose a solitary rhetorical genealogy (Agnew et al. 2011). Rather than a one size fits all approach to a rhetorical tradition, rhetoric exists as constellated in the form of traditions. Through the metaphor of constellations, a rhetoric is specific to a culture. This approach begins with a focus on power and its relation to social location. That is, the discipline begins where one stands as a scholar. And with the knowledge of location, one can practice a place into a space. The idea of cultural rhetorics as genealogies is not a step toward discrediting the use Greco-Roman tradition. Instead, it is a way of practicing based upon relational accountability. In discussing indigenous axiology, Wilson (2009) raised the idea that there is a difference between review and critique. This is a useful distinction in discussing cultural rhetorics asymmetry because too often it is easy to fall into the scholarly tradition of critique, which asks that we evaluate a work based upon an epistemological foundation usually believed to be a

benchmark for what is good. Critique allows researchers to completely disregard and discount another's epistemology and believe that their own positions are, at the very least, neutral, and/or, at worst, better. Instead, relational accountability is about creating responsible spaces for scholarly practice that treats the space between people (i.e., their work and/or knowledge) as sacred--where reviewing rather than critiquing is a move to close space and create new relationships with others.

For me, these are both ways of seeing the world and practicing as a scholar. ANT is a way of documenting and spatializing the complexity that emerges during environmental disputes. CR is a means of marking ontologies as cultural, and interrogating data collection practices that point to the researcher's positionality. Both share a concern with describing and accounting - assembling accounts - as opposed to (or at least prior to) evaluating. What follows is an explication of the four elements I listed above, which are integral to a methodology that engages complexity. As mentioned before, this methodology is built entirely from my readings in ANT and CR. You will see me practiced this methodology through the following chapters. I, however, want to use this time to further articulate what each of these components mean.

1. Nonhuman subjectivity & multiplicity

Both CR and ANT are clear in that our understanding of social life can be reduced to the social orders that form its composition. While we can easily attribute the "social" to being an effect of human activity, such a move would be unfavorable. What forms a social scene is the arrangement of people, living organisms, artifacts

and other things that are intricately woven together to produce meaningful relations or what we might call "social life" (Latour, 2005). To elevate humans as the sole agents in any scene immediately reduces the importance of other units that help to make the social happen. In making a case for nonhuman subjectivity, ANT and some human/cultural geography theorists have demonstrated the importance of nonhumans in the production of reality. The notion of a subject-world populated by people and an object-world composed of things is an idea that stems from what we have come to understand as the "modern constitution," which places agency firmly in the hands of people (Latour and Woolgar, 1979; Latour, 1993b; Whatmore, 2001; Latour, 2004).

Much of contemporary theory has not reassessed itself completely to consider extending agency beyond humans as it has moved from modernism to postmodernism. Latour's *We Have Never Been Modern* (1993a), which is chiefly a critique of the idea that we have ever severed a link with the past through an exploration of modernism (e.g. *What is modernism? How did it develop? And what are the effects of its existence?*). For Latour, modernism is largely a political arrangement where "moderns" organize through the practice of "purification," which designates two distinct ontological zones—human and nonhuman. Accordingly, he uses Shapin and Schafer (1985) to argue that the roots of such a practice emerge around the time of Hobbes' and Boyle, who place the knowledge of people within the realm of politics and knowledge of things within the realm of science, respectively. This demarcation ultimately seals who is deemed subject and what is deemed object. Latour, however, argues for a different ontological framework, similar to his

empirical laboratory studies in *Laboratory Life* (1979) and *The Pasteurization of France* (1993b), where there is no such thing as a natural object or a social subject, but instead hybrids (or quasi-objects/subjects) that circulate through networks by way of translation and mediation. His ultimate purpose in rejecting the foundations of modernism (and even postmodernism) was an attempt at creating a political platform wherein humans and nonhumans work together through manufactured collectives. What emerges as important from Latour's earlier work is that it moves away from a critical tradition, which argues that knowledge, justice, power, humans and nonhumans are separate and arranged along a dichotomous scale by offering the idea that these units mean together through relationality.

Callon and Law (1995) both touch upon Latour's position, but go further. For them, the idea of human and non-human agency exists as a bit of a contradiction as it immediately conjures and plays into a Cartesian paradigm, which separates the cultural from the natural and limits the possibility for agentive action on the part of non-speaking subjects (see also Latour, 2004). The hunt for agency often centers upon the roles of agents who perform themselves and intentions as subjects through the manipulation of linguistic systems. Nevertheless, these performances cannot happen without the existence of other networked entities whose presence makes activity happen and mean. For example, a text can do specific organizing work as it can create discretionary spaces for activity amongst a variety of actors. Texts carry their own "logics of action" and can enroll humans and other texts into their fold long after their authors have died (Callon and Vignolle, 1977; see also Winner, 1989; Foucault, 2003; Derrida, 1980). As a corrective to the problem of agency, Callon and

Law introduce the idea of *collectif* as a means of rethinking agency. Now, there is a difference between *collectif* and *collective*. With *collectif*, there is a huge emphasis on relations and actors' heterogeneity, which make up a network and create positions from which an actor or many actors can perform. This portends that agency is an emergent property of relationships rather than contained within speaking subjects. It is important to note that this understanding of subjectivity collapses scale so that a subject is always an individual and a network simultaneously; thus, it makes a case for considering that any actor's identity within networked space is never stable. In fact, Law's (2000) re-conception of network-space positioned nonhuman actors as topologically multiple as they are the intersections/interferences between different topoi (networks and regions) and shifting reconfigurations of relations. This holds that their identities are never stable; in fact, they are fluid or variable, as they exist across spaces. While an actor might retain the same form or shape to the naked eye, as space shifts from one region to another the actor becomes something else. For example, a Haitian composting toilet can be defined as a mechanism for sewage removal, a community-building tool or a resource for local farmers depending upon its network topology. Each of these descriptions depends upon network and Euclidean space simultaneously. It may be best to conceive of non/human identity by way of the actor shuttling back and forth between spaces.

So, what does this extension of subjectivity hold for those falling under the umbrella of environmental rhetoric? The decision to grant subjectivity is always political and often bears a number of affordances and consequences. Consider the case of Mazda recalling nearly 65,000 cars from its Mazda6 line in early March of

2011. Yellow sac spiders were entering fuels systems and nesting in the tiny rubber hoses that connected the fuel tank to the engine. The problem for Mazda (and car owners) was that the spiders' webs caused blockages, which led to cracks in fuel tanks that ultimately led to pressurization and ventilation problems. Cars were exploding. Do we focus on the spiders as a subject and inquire as to how they are getting into fuel systems? Or do we hold that this is merely the result of a design team error; thus, the spiders are an ancillary concern? One question pits entomologists, who argue that spiders are invading vehicles due to an infestation at the Flat Rock, MI plant, against Mazda, which does not see spiders as a problem and is more likely to focus on human error. A solution might be to consider both as contributing to the problem simultaneously rather than arguing for one or the other. This brief case highlights that the selection of topoi is inherently political because these choices make objects, subjects and spaces. Furthermore, these decisions limit what something can or cannot be, which dictates the politics it (and its network) can perform.

2. Place matters

As I noted earlier, place factors heavily within both environmental rhetorics and ecocomposition's frame of analysis. Yet, there are still limitations to how space is understood and this subsequently affects how we might make meaning of what is taking place through our analytical lenses. There is a tendency for researchers to rope-off their sites of study from others. They often fail to move beyond sites of study and inquire into how other sites work to influence what they may seen in the specific environment that serves as the context of their research. Through a study of

space and spatial performance we are offered a window into how spaces are discursively linked. Therefore, my preoccupation with space mandates that we consider the following: *How do spaces link together? How do practices make/maintain/destabilize spaces? How do spaces make/maintain/destabilize practices?* These are the very questions that are and should operate as central to any methodology that looks at relationships between humans and nonhumans as they exist within space and shuttle between spaces.

The idea of multiplicity undoubtedly raises concerns regarding the ordering of sites along arbitrary scales. Assemblage theory and post-structuralism are most helpful in this regard. Schatzki (2002) focuses on the site of the social, which he describes as the specific contexts that define human life and coexistence with various entities. His argument is that site-contexts are composed of a mesh of practices (defined as organized activities) and orders, which are arrangements of entities (e.g. people and artifacts). In fact, this is best characterized as a "site ontology" that shares much in common with the work of Pierre Bourdieu, Ernesto Laclau, and Chantal Mouffe; however, it differs in the sense that Schatzki resists totalization by giving credence to the idea of a fragmented reality and by recognizing the contribution of nonhuman entities in providing substance to the organization of social life. Thus, he places himself more in dialogue with Foucault (*dispositifs*), Deleuze and Guattari (*agencements*) and Latour and Callon (*réseaux*) through his conception of arrangement. Schatzki's usefulness lies in what he offers to the particular methodological considerations I have put forth. He speaks of orders rather than ordering (see also Law, 2002) because he is not so much interested in

the practice of arranging on the part of the observer as much as he is interested in the types of sites that he believes exists simultaneously. From this position emerges a set of methodological corollaries for canvassing social order: 1) recognition of irregularity, 2) toleration of instability, and 3) willingness to document the full range of relations among entities that give structure to social order, which may arrange through 1) causal relations, 2) spatial relations, 3) intentionality, or 4) prefiguration.

3. Practices and performances

The aforementioned questions can be addressed directly through a focus on performance. Networks require the performance of all enrolled actors in order to function. What comprises social life is the arrangement of people, living organisms, artifacts and other things that are intricately woven together to produce meaningful relations. The actors' substantive actions in effect are performances of realities or variable ontologies. Mol (1999) addressed the notion of performing ontologies through her account of ANT's legacy along with other bodies of knowledge in shaping the politics of ontology. In practice, ANT has argued that reality is historically, culturally and materially-situated; therefore, it gives much credence toward understanding how individuals see the world. This leads to the idea of an ontological politics that recognizes multiple ontologies. Still, Mol distinguishes between multiple and plural on account of ANT's ontological politics being informed slightly by perspectivalist and constructivist traditions. In her opinion, perspectivalism did not truly multiply reality; instead, it merely increased our understanding of a situation by recognizing the various standpoints actors inhabit

and how they attempt to represent their positions, which are held in equal value. Constructivism, as another iteration of pluralism, isolates a single truth claim and traces how it becomes fact. What these bodies of knowledge fail to discuss is how other understandings of reality exist as meaningful. Instead, these accounts treat displaced alternatives as immaterial for analysis. Mol's understanding of ontology exists as performance, which lies at the intersection of construction and perspective. The relationship between performance and multiplicity emerges from the idea that reality is manipulated by tools that correspond to various practices and sites. Tools work to create different versions of an object. These versions still relate to each other as part of a network despite their differences. For example, Mol (1999) offers anemia as an example where three performances of anemia (between doctors, patients and tools) emerge (e.g. consultation room, laboratory, pathophysiological). It is easy to see the performances and their modalities as being separate and in conflict, but that is not necessarily the case. Depending upon the situation, specific units exist to bind these areas together.

This is best illustrated in a case study that documents the complex connections between politics and science found within an environmental dispute regarding elephants standing as competing philosophies of nature and how these representations elucidate disputes in science, epistemology, environmental justice, and governance. Thompson's (2001) account of complexity focused on events that surrounded a scientific workshop on elephants that convened in Kenya in 1995 and how these events ultimately affected elephant populations within the Amboseli National Park. At the center of this controversy lay differing groups of

conservationists who each had their own ideas for conserving the elephant population and encouraging biodiversity within the park. Their ideas represent different ontologies of elephants. Each comes with varying complexity and presents their own political ends through the construction of various linkages between academic disciplines (e.g. ecology, conservation biology, zoology), stakeholders (e.g, elephant herds, grass, trees, scientists, Masai people, etc.), political spheres of influence (e.g., local, national, and global) and spaces (e.g. inside parks, outside parks, academic journals and deliberative forums, etc.).

Thompson admits his inability to capture complexity in toto due to his involvement in the situation as an ethnographer. Therefore, he cannot offer to his audience a "symmetrical account" where he provides equal treatment to each side. Still, his understanding of complexity is useful as a methodology because he unpacks ontologies or "iterations of elephants" as they emerge from the competing stakeholders' values that lie at the heart of this dispute concerning conservation and biodiversity. What stands out about this account is that it is not "neat" (Law, 2004). This diverges from what we would deem to be a typical "reductionist narrative account." Instead, it is a narrative of how episodes of technoscientific practice link many spaces, things and people; it is a narrative that invites multivocality. Nevertheless, the lesson that emerges from his work is that documenting complexity requires that we attend to linkages while "avoiding reductionism or holism" so that we have a multidimensional view of a situation (Thompson, 2001, p. 186). Thompson refers to linkages as "ordering devices." These units are important because they are the sinews that hold a world together. Ordering devices can be

published reports, fences, conversations, conferences, and statements. We should essentially understand them as the apparatuses stakeholders use to build their arguments. I, however, see these "units" as locations where conflict/resolution can take place. I shall develop this idea further in the succeeding chapter.

4. The role of the researcher

Like other works written under the banner of cultural rhetorics and actor-network theory, storytelling sits at the core of this methodology. There are two halves to how story factors in thinking about how we as researchers relate to our subjects of study and produce knowledge. First, we have to *disengage* with how we have been trained to understand story. Second, we have to *engage* with not only how we tell story but also how our telling makes us a part of the phenomenon with which we study. As I have said earlier, a study of ontology is about making and being made. I am not asking that people continue the tradition of having a sentence in their work where they list off all of their subjectivities and positionalities. We must go further than that. Instead, I am talking about how people come to a subject. How researchers relate to others. How they become a part of their subjects' lives. How they make things with them. This adds another layer of dimension to scholarship we read as an audience—it is engagement with complexity. A tension also exists in that the academic understanding of story has traditionally been seen in opposition to theory. We have been trained and train others to think that theories help us understand stories, rather than thinking about how stories function with the same explanatory purpose as theory. In fact, theory is often presented in a complicated language in which the writer retains authority "and the power to make decisions on

behalf of others" (Maracle, 1990 p. 11). There is a theory in every story. And as Maracle (1990) quite succinctly articulated, "Words are not objects to be wasted. They represent the accumulated knowledge, cultural values, the vision of an entire people or peoples. We believe the proof of a thing or idea is in the doing. Doing requires some form of social interaction and thus, story is the most persuasive and sensible way to present the accumulated thoughts and values of a people" (p. 3). Stories in many ways are the ties that bind. They help to tie spaces together. They are the in-between areas in networks. They are meaningful moments of engagement with others. The decisions to omit stories are acts of tailoring meaning to suit certain interests. Certainly, we cannot tell every story; however, we should be open to explaining what and why we omit.

I also do not mean to suggest that there is complete authenticity in providing an account. There is a little fiction telling a lived experience. However, when I talk about the seemingly fictional nature of stories connected to lived-experiences, my intent is to not discredit the stories that others provide. I am merely stressing that these experiences take on fictional quality as we (researchers) bound them in ways that we think others might better understand what they mean. I recall King's (2008) story of his father's discovery, specifically when he wrote, "My brother took a long time in telling this story, drawing out the details, repeating the good parts, making me wait" (p. 7). There is an underlying sense of urgency wherein King wants his brother to *get to the story*. Yet, as we know, "get to the story" in many ways is really "leave out the details that are unimportant." I cannot help but think about the possible implications this poses for researchers. How do we decide what is

important and unimportant in telling a story after? What are the responsibilities that stem from constructing stories about people's lives and subsequently their cultures? Here I repeat: "a story told one way could cure, that the same story told another way could injure." In many ways this drives home the responsibilities that come with doing research that environmental rhetoricians must attend—with story come responsibilities.

Methodological precedent

The study of environmental ontology is not without precedent, if we step outside the field of rhetoric and composition. There have also been other studies that have address how subjects cannot be understood as coherent wholes but rather multiple networked assemblages (Law, 1989; Cronon, 1991; Hayden, 2003; Nash, 2005; Allen, 2006). I mentioned Sellers and Taylor's studies in the introduction; however, there exists other compelling scholarship. And many of these studies provide a foundation for how environmental rhetorics can begin to engage with complexity. For some time, environmental historians and environmental justice activist scholars have addressed the multiple forces at-play that help to shape environmental phenomena, but are often omitted from the realm of analysis. This lack of consideration has been the result of selecting certain factors in favor of others or simply not recognizing that there are multiple forces present. For example, Worster (1992) offered a historical study that showed how the transformation of hydraulic and ecological regimes as key in the development of the American West as a powerful seat of empire. His study positioned water and the building of monumental water works as a useful category of historical analysis. In fact a central

tenet was that we cannot study the growth of empire through social evolution without considering ecological change as part of the equation.

Hoag and Ohman (2008) brought to light the forces that shaped both the collection and use of geographical data for hydropower projects in Tanzania's Rufiji Basin. It was suggested that colonial engineers were more focused on exploiting the regions resources rather than creating projects that suited the regions ecology that incorporated local pre-colonial knowledge. Therefore, the understanding of local environmental knowledge has consistently been positioned as historically "colonial." Hoag and Ohman's purpose is to discredit this particular view of history and present another way of understanding the production of local environmental knowledge. They argued that some colonial agents "attempted to understand the region's ecology prior to the implementation of large-scale irrigation and hydropower projects" through surveys that helped to incorporate local knowledge into planning. In their opinion, these agents should not be lumped into the same category as those researchers (defined as "outsiders") who explicitly worked within a colonial model that purposefully excluded indigenous knowledge. Moreover, Hoag and Ohman note that foreign and urban-based researchers and planners also played vital roles in the construction/application of a local environmental knowledge. Therefore, if we want to understand how hydroelectric power developed in the Rufiji Basin, then we are going to have to think about how the knowledge systems from these various groups coalesced.

Popular accounts of the construction of the Panama Canal raise it as a feat of United States ingenuity—that the reason the U.S. was successful where other

countries had failed was our technological prowess. Sutter (2007) was concerned with the overlooked role that entomological workers played in the construction of the Panama Canal, deliberation over U.S. public health policy, and the maintenance of U.S. imperialism. It was initially believed that conditions that created malaria where intrinsic to tropical locations. Scientists believed there was a special synergy between the locations and their indigenous inhabitants (or non-white groups) that protected them from malaria but left White vulnerable. Through the study of mosquito vectors, however, entomological workers were able to determine that rises in malaria resulted from the creation of mosquito vectors as a result of decades of human-related environmental disturbances attributed to attempts to construct a canal. Once this knowledge was available, malaria became a non-issue and construction could proceed. Sutter's account positioned entomological workers as important nodes in the construction of the canal but also advancing U.S. imperialism by making the tropics safer for White people.

What I find interesting is that Sutter's account moves toward offering a better understanding of agency within environmental historical writing. Accordingly, history needs to be understood from a variety of angles in order to paint an accurate account of how the Panama Canal came into existence. Sutter looks at the series of relationships that come to produce an artifact or a set of practices around that artifact. Agency is positioned as relational between nature and humans. It's a discursive relationship and historical writing should account for that. So when providing a particular account, the environmental historian must take care not to frame it as if science/people are controlling nature, but should consider the

extent to which nature affects people and scientific practice. Moreover, historians take care to problematize agency amongst people. In terms of looking at the social relations surrounding the creation of the Panama Canal, "entomological workers" occupy fairly important positions as actors within a complex network. Although they do not have as much perceived influence and power as "imperial actors," their knowledge does have a powerful affect upon how knowledge is transferred and deployed to affect policy and influence technological advancements.

Method

It is difficult to document complexity without knowing the full range of relations that help to make Asian carp. Depending on identity, location and interest, the term *Asian carp* will not render the same understanding. The best means for me to begin the task of spatializing how carp is realized required an archival trace. I started with a scan of news indices. The purpose was to identify events, issues, and actors associated with the Asian carp crisis in any capacity. Since Asian carp is a somewhat popular topic amongst the public within the Mississippi River basin, I searched for articles covering news around this geographical area. This is a concern for place matters, which addresses the multiple ways in which a site is linked to other sites to produce social relations. Here I wanted to pick a particular point that actors assemble around and branch outward toward other sites based upon actor's activities. I specifically search for articles from 1970 to the present. My reason for choosing 1970 was influenced by the fact that several scientific reports place Asian carp's arrival into the United States somewhere between 1970 and 1974. Every one agrees that Silver carp was the first introduced into the US, they simply disagree

when and where they were introduced (especially who introduced them; see Chapter 5). Moreover, I was deliberate in my use of search terms. Asian carp have not always been known as “Asian carp.” Recall my earlier discussion of performance. Here I am concerned with the multiple performances of carp that constitute various realities of the species. My scan of archives showed that term does not emerge in any literature until 2002, which is five years before the United States Fish and Wildlife Service listed silver and bighead carp as injurious wildlife. Therefore, rather than using terms such as *Asian carp*, *invasive Asian carp*, or *invasive carp*, I opted to stick closely to scientific terminology using *bighead carp*, *hypophthalmichthys nobilis*, *aristichthys nobilis*, *silver carp*, and *hypophthalmichthys molitrix*.

I discovered that from the 1970s to 1980s, communities of science and scientists working in governmental organizations were the only bodies to complain about silver carp. This was the same for bighead carp. In fact, fisheries and recreational fishers actually were interested in them both for sport and a food source (Recall my initial discussion of place matters regarding *orders* versus *ordering*. I am not interested in creating a hieracrchy of sites as much as I am interested in getting to the root of what and how many sites exist simultaneously.). Silver carp did not emerge as a problem for boaters until 2001 when they are described as a "nuisance." However, since 1994 when they turned up in the Kaskaskia River, a tributary to the Mississippi, they were affectionately referred to as "Kaskaskia River Dolphins" (Britt, 2001). Nevertheless, something happens in 2002 when a bulk of news stories among all groups (boaters, local and state government agencies, and scientists) begins characterizing them as a problem. This

led to the development of a list of interest groups that aligned stakeholders who were responsible for creating and performing realties of Asian carp. These categories included political interests, scientific interests, recreational interests, and farming interests. This initial archival trace helped not only to establish stakeholders but also directed me to additional archives belonging to Federal and State government agencies and public interest groups. Here the multiple orders begin to solidify into socio-political spheres recognizable, also, for their unique and relatively stable discursive practices.

There was no way for me to know definitively what other sources were out there that would aid in my tracing variable ontologies, so in the next phase of the project, I had to rely heavily upon archival informants who both directed me to sources and constructed paths that helped me make sense of connections with respect to how entities realized carp. Here I am following the most basic of ANT principles by "just follow[ing] the actors" (Latour, 2005, p 237). Therefore, research participants in this project were not treated as data but instead collaborators. This list of agents I generated was rather large. It included a collection of 20 individuals and organizations. I knew that it was near impossible to talk to most of them due to time and availability. Nevertheless, I specifically tried to find individuals and organizations whose names were referenced multiple times by others in media reports or published research (e.g. Kevin Irons at Iowa Department of Natural Resources and Dr. Henry Regier at the University of Toronto). Speaking to all of them was unnecessary at this stage of the project. The purpose of these interviews was to get a sense of how a plurality of stakeholders understood the crisis. This was

an attempt to help me further narrow my frame of analysis in a project that was already quite big in the beginning stages. I conducted a total of seven preliminary interviews. When I spoke with these individuals I tried to get a sense of their level of familiarity with invasive species, their relationship to the Asian carp crisis and their relationship and perception of other actors' roles in the crisis. I used these accounts to structure much of the work in Chapter 4 with respect to outlining multiple performances of Asian carp. I do not intend to suggest that chapter to be a complete sketch of every performance of carp. Instead, it exists only to provide a sense of what multiple performances look like.

Moreover, these discussions were revealing in that they supported things I found during my initial archival trace that pointed to a space wherein I could begin to assemble an account of how carp are made invasive. There was a single connecting thread that traced through several interviews. Each informant in some form raised the Lacey Act and its rulemaking process for determining and listing injurious wildlife as a matter of concern. Their objections to the Lacey Act and the rulemaking process covered questions such as: Is the process a scientific/economic process? How can we characterize the data used to make decisions regarding invasibility? Who/what participates (and who/what remains or is forced to be silent)? How does the process deal with multiple species joined together under a common name? And most importantly, while the rule-making procedure dictated by the Lacey Act most definitely makes a species invasive in a formal manner, are there other elements in the process that indirectly does so as well (i.e., does the existence of the Lacey Act and absence of other controls make matters worse?). This final

question is a bit tricky because it points to the problem that what makes carp invasive has little to do with their physical activity or how we realize them in our worldviews, but more to do with the fact that we are using a hundred-year old document to deal with late 20th century environmental problems that are the result of global capitalism. Therefore, I dedicated a chapter of the dissertation toward investigating the Lacey Act and its accompanying regulatory and legislative procedures.

In order to investigate these questions, I wrote a request under the Freedom of Information Act (FOIA) to the United States Fish and Wildlife Service requesting material not limited to but also encompassing comments and letters written to the agency during three public comment periods regarding bighead, silver, and larger-scale silver carp. The agency responded by sending me 162 letters with attachments that accompanied a few letters (306 pages in total). I did an initial pass of the letters just to get a sense of their content. Thereafter, I did a second pass wherein I tried to characterize each letter in terms of how the carp crisis presents itself as a problem to the writer/organization. I constructed social worlds/arena maps. Social worlds are best understood as "universes of discourse" (Strauss, 1984; Clarke, 2005). These worlds are actor-defined. They are a means of visualizing how actors as individuals or members of collectives act in relation to the social worlds of others, the regimes of practice that come with those worlds, and discourses produced and circulated within them. The analysis and construction of social worlds through mapping requires asking questions such as (Clarke, 2005):

a. What are the patterns of collective commitment and what are the salient social worlds operating here?

b. What are their perspectives and what do they hope to achieve through collective action?
c. What non/humans are characteristics of each world?
d. What is the work of each world?
e. What are the commitments of a given world?
f. How do participants believe they should go about fulfilling them?
g. How does the world describe itself—present itself—in it discourse?
h. How does it describe other worlds within/outside its arena?
i. What actions have been taken in the past and are anticipated in the future?
j. How does this further the social world's agenda?
k. What technologies are used?
l. What are the sites where action happens and is organized?
m. What worlds are not present in relation to those that are present?
n. Are there silences?
o. What controversies emerge between worlds?

The social worlds/arena map documenting commitments to space is the basis for Chapter five. I constructed the maps from 44 letters written during the comment period for listing bighead carp as injurious wildlife. Thereafter, I selected two actors to write cases around. The cases are built in part through my rhetorical analyses of the letters content with respect to how actors talk about carp and through interviews conducted with the actors who wrote the letters. The result was the construction of socio-technical maps that position people, institutions, documents and various other actors at-play in relation to each other to get a sense of what constitutes a reality of carp.

Conclusion/Beginning

In my view, Dobrin and Weisser have issued a challenge for ecocompositionists (and even those interested in environmental rhetorics) to engage with complexity that would move us beyond the writer, their product, and the immediate scene that serves as the context. For me, a possible solution to this problem means a deep engagement with ontology as it relates to methodology.

What I have presented above seeks complexity in a way that requires environmental rhetoric research to be multi-site and nonrepresentational by focusing on the range of relations that exists between humans and nonhumans as they act within and across spaces. This dissertation is part of a long line of theoretical thinking that I have considered from my coursework through my exams. The work that lies ahead centers upon how ontologies come into existence. Here I am researching this from a specific environmental issue—invasive species. How is it that invasive species become invasive? Where are they invasive? To whom are they invasive? Moreover, how long is it before all stakeholders agree that they are invasive? This, in fact, is an investigation into historical ontology. The work that is present here should be seen as a contribution not exclusively to the field of rhetoric and composition but also to the tradition of environmental history, which is best evidenced through the precedent setting works that I highlighted earlier. Like Sutter, Hoag, Ohman and countless others, I am interested in contributing to histories of environment that untangle complexity to bring forth the vital roles in the construction/application of environmental knowledge by multiple agents. If we want to get to the heart of the "what" and "why" of environmental phenomena as they relate to the interests of rhetoric, then we are going to have to think about how such phenomena emerge from the converging of many actors and groups rather than a select few in isolation.

CHAPTER 3. CARPTOLOGIES, PART I: CONSTELLATING REALITIES OF BIOINVASION

Introduction

In the previous chapter, I put forward a theoretical framework for understanding environmental crises through a study of ontology rather than epistemology. This framework, if you remember, presents environmental crises as arenas that contain multiple ontologies and marks these formations as cultural and ripe for rhetorical analysis. In this chapter, I return my analytical focus to my subject-of-inquiry—Asian carp—and its evolving status of invasibility. Such preoccupation stems from the following questions: What is the nature of carp's existence? How many ontological formations can be said to make themselves visible? Where does its identities lay within the subject-object binary? What actors are present and compulsory for existence? When and where does carp exist as an invasive entity? When and where does that identity fall apart? Finally, there is also a deep concern for power. Cultural rhetorics always mark rhetoric as a process of making. And when we make, we are also complicit in creating meaning and value in relation to and at the expense of others. Therefore, in focusing on carp ontologies (carptologies, in shorthand), I also have regard for how power flows through assembled networks to make a single identity assume more authority than others?

In writing this chapter, I am reminded of Shakespeare's tragedy *Coriolanus* on account of its focus not only on power with respect to those who possess, seek, and lack it but also with regard for what is necessary for power to exist—alliances. Sicinius Velutus, tribunus plebis, responds angrily to Coriolanus' contempt for Roman citizens, whom he disconnects from the power he seeks, by asking, "What is

the city but the people?" (Shakespeare, 2002, 3.1.200). Such anxiety for composition parallels the tensions present in discussing Asian carp's identity.

What is Asian carp other than *Asian*? Is it not its nature alone that answers the question of invasibility? It would be simple to reduce identity to a theory of containerization, but that discounts the many non/agentive roles that actors assume in helping carp become *Asian* carp. Agents appealing in favor of either invasibility or non-invasibility provide storied realities based upon networks of various non/human actors that inhabit their worlds and support their epistemes.

In this chapter, I focus on the idea of complexity in environmental controversies. I present an argument of how actors (scientists, political agencies, fisheries and outdoor enthusiasts) perform their identities within civic deliberative forums established by public policy. These performances serve to maintain their identities and render definitions that constitute Asian carps' status as an invader species. Moreover, performances construct a series of spaces that actors preserve for their essential self-interests and spaces that policy-makers can potentially make use of to bridge differences between divergent collectives within the actor-network. My object of analysis is the architectonic statement. The idea for this term is borrowed directly from Lakota scholar Craig Howe's (1995) notion of "ethnoarchitectonics," which rightly identifies architectures as bounded spaces that are productions of reality. I am interested in how these statements build relationships and subsequently worlds that constitute an identity for carp and for humans. The spaces that emerge between the boundaries of these edifices are spaces of dependence and spaces of engagement. The former are spaces that people,

institutions, and collectives establish to secure their identities. The latter are spaces of possibility that actors use for their interests and influence by working with other seats of power. These spaces (or arenas) are iterations of identities for carp (i.e., carptologies). Asian carp is a real actor with a corporeal form, but its material presence is consistently deferred as agents tender varying discursive accounts that shuttle between geographic and textual space.

Still, carptologies also bear consequences for people as well. These architectonic constructions represent distinct worldviews that are tied to material effects. The ability of certain actors to use their definitions to destabilize the definitions of others (and subsequently worlds) bears material consequences (e.g. economic, environmental, preservation of cultural traditions, human health, etc.). Theorizing invasibility is not a rhetorical game; it is an examination of realontopolitik. In attempt to help my readers understand the type of rhetorical work that architectonic statements accomplish, I work with a mini-case that presents two competing economic ontologies of carp. Rather than taking these ontologies as pre-existing entities, I build them from statements contained within public documents. Thereafter, I describe the nature of the spaces that emerge and attempt to provide an alternative ordering of space that might denote another way of performing environmental politics. This serves as a preview for analytical work for the larger case study found in chapter five.

Carptologies

I open with a simple corollary: It is the practices of actors, human and nonhuman, that create geopolitical spaces, maintain them, make connections and

ultimately dismantle them in favor of others. By making this claim I am working from the seemingly divergent but connected disciplines of physical and human geography. Landforms often shape how we move about the world and engage with others, but humans also exert influence that physically and discursively changes the land to affect performance as well. Here I am extending subjectivity to the land as well as its inhabitants to establish a more than human hybrid geography.

Returning to the carp drama, Asian carp is real and unreal, material and immaterial. There is no such thing as "Asian carp." What we understand as Asian carp is at least two separate species—bighead and silver—that have been linked together under a single name. On the other hand, Asian carp is very real. What does not exist as a real singular species in the wild is a political issue that manifest itself as very real in the material world. This dissertation presents the real and imagined ways in which carp emerge as invasive within numerous actor-networks.

When I speak of carpotologies, I am neither asking that we recognize different perspectives of the same thing nor am I stating that we should focus on a dominant or subordinate viewpoint and ask how it establishes itself as truth and others as counterfeit. Such conception of worlds fragments relationships so that worlds exist onto themselves with no connection to others. No matter how hard we may try or believe we are never independent from others. Our worlds often spill over into other worlds at places where we find mutual interest. Here I am concerned with connections, because the nodes that connect worlds provide avenues whereby we can begin to rethink relationships, performances, and develop meaningful strategies to environmental crises. My argument here is that worlds themselves are

connected by boundary subjects and objects (actors), what we might refer to as *spaces of dependence*. The places where worlds come into conflict and become fragile are *spaces of engagement*. Still, it is important to focus on the structures that provide these spaces with their shape before discussing their effects. This helps answer the question, how does carp become invasive to an agent.

Carp occupy physical and textual geographies. What link these individual domains and the spaces within them are what I call "architectonic statements." In his unpublished doctoral dissertation, Lakota scholar and architect Howe (1995) provided an image of architectural design processes as analogous to communication systems. At the core, most communication systems feature the following basic components: (1) sender/s, (2) message/s, (3) receiver/s, (4) system of codes that organize relationships and the medium/s that send and the messages. Howe (1995) wrote:

> Communication takes place when a sender transmits a message by way of some medium to someone. The message refers to something, and the relationship between that something and the message is codified. In the case of tribal architecture, the architecture itself must embody the resultant code. In other words, architecture embodies the code that organizes the relationships between messages and their referents. (p. 34)

Here the meaning of architecture is operationalized to mean not just the façade (form), which is the focus of traditional architectural practice, but the interior spaces (content) and the organizing work they do to create the message and relationships between sender and receiver. Architecture consists of spaces and their defining surfaces. While the built forms (i.e. walls, ceiling, floor) are typically seen as what composes architecture, it is really the spaces that emerge between boundaries

that give meaning to the entire structure. Therefore, Howe's argument about indigenous architectures is that the process of building and the resulting spaces and edifices should represent the worldview (or codes) of a tribal community; this is encompassed in his term "ethnoarchitectonics." Howe's understanding of architecture is useful in theorizing how carptologies are built. Statements are architectonic tools that provide a form for reality. The "ethno" prefix may not matter in all cases regarding carp's invasibility; however, the term in its entirety points to the very real fact that statements are acts of worlding that create identity spaces and room for actors to engage with others.

These identity spaces, or spaces of dependence, are "localized social relations upon which we depend for the realization of essential interests and for which there are no substitutes elsewhere" (Cox, 1998, p. 2). They also delineate the necessary parameters for our material well-being. Yet, in order for spaces of dependence to exist, actors have to protect the conditions for their existence by engaging with other actors. The movement to secure these spaces with other bodies of social power (i.e. government, national press, etc.) takes place within spaces of engagement. In keeping with the metaphor of architecture, any ontology is composed of units that help to provide spaces with meaning. The same units may exist for several actors; however, their arrangement differs from actor-to-actor. This is what gives birth to multiple ontologies.

For example, consider the housing market and how units align or do not align in a network as people seek home loans (Cox, 1998). Several spaces of dependence can unite for an agent in the housing market through the circulation of capital.

Acquiring a home loan is directly attached to one's ability to secure capital in a variety of forms within various spaces of dependence. Capital can be cash-in-hand, a credit score, a house, education, and/or marital status. Some of these forms are stationary, while others are not. The way capital is arranged spatially differs among actors and creates material realities that they have to live within. Still, an individual's arrangement is not independent unto itself as it is networked to the arrangements of others over multiple spaces. One's local neighborhood can serve as a space of dependence, because divergent orderings of capital form micro-geographies that coalesce into a larger space through linkages to different units. Actors engage in scale-jumping (moving from local to global and vice-versa) to construct the networks that compose their identities. Alterations in economic geographies at either macro or micro ends of the scale threaten local relations. Therefore, while spaces of engagement help to secure identity, they are also sites where relations become fragile and denote critical points of intervention. In the forthcoming section, I illustrate how arguments over the construction of barriers create identity spaces for carp and for humans.

The drama of Asian carp's invasibility directly parallels the example concerning capital. The same units might exist for each actor to render varying understandings of carp. Where they differ regards arrangement of the composition. As mentioned earlier, I am interested in the architectonic statement. These statements serve as natural bridges between textual and geographic spaces. This is also a way of tracing relationships to illustrate how worlds emerge as meaningful. It is through architectonic statements that spaces of dependence and engagement

materialize. The focus on space centers upon the rhetorical questions it raises. These questions are both about carp's identity and the affordances and consequences tied to identity. The relationship between spaces of dependence and engagement is a consideration of how actors perform within certain discursive arenas. Yet, in scale-jumping (constructing networks), some actors exercise more control over the tenor of discussion found in deliberative civic arenas. The question that remains, is whether there are alternative ways of building networks that can be composed into technical frameworks that allow actors to engage on equal terms? Focusing on how statements create space is an argument about how carp are made invasive and an argument about scale with regards to how we perform our politics. When we look at these spaces it is easy to see them as disparate or connected in ways that serve individual interests. This does not engage with complexity. My position is that focusing on the spaces that emerge and the ways they are connected provide a means for imagining alternative connections (or ways of performing politics) that bring actors together rather than allowing them to remain in their own arenas of influence. Subjects and objects (…actors), human and nonhuman, material and immaterial all connect worlds; these are the units we should focus upon.

So, how did Asian carp become invasive? Any investigation into the rhetorical construction of an invasive species has to take into account the full range of associations with actors who confer its identity. Discussions of carp's invasibility often focus on their presence within and movements throughout bodies of water. Yet, the story of carp is not simply about carp. We could, in fact, focus on their invasibility as being a self-contained characteristic; however, this would deny the

activity and existence of a host of other actors that either directly come in contact with carp or play some indirect role in shaping its identity. As Eskridge and Alderman (2010) indicated, "The status or identity ascribed to specific organisms is particularly instructive of the moralistic ways in which environmental discourses and metaphors are mobilized" (p. 111). Carps' invasibility is a mobilization of people, things, institutions, and spaces in the form of complex networks that function to conduct specific rhetorical work. This position further suggests that carps' identity as invaders is topologically multiple. Assemblages of different actors will render distinct networks that help to explain how carp emerge as invasive or not. Therefore, it is important to follow the statements of actors, as these statements serve as windows opening onto different realities. The manifestation of these realities and actors' abilities to make their worlds factor more than others in deliberative processes requires consideration as well. Why? Because defining a species as invasive is always about "who is authorized and not authorized to make what kinds of knowledges about whom/what, and under what conditions?" (Clarke, 2005, p. xxv). As a means of providing you with an idea of how statements coalesce to build worlds that denote identities for carp and people, let us turn our attention to a dispute regarding carp's invasibility. This should offer more clarity to the ideas that I have introduced regarding ontology and the complexity of environmental crises.

A separate ecology

Humans and nature have had quite a history in the Chicagoland area. This relationship extends from indigenous Americans who regularly set fires to the tall

grass prairies as a form of land management to the present-day. The most drastic reworking of the landscape came by way of white settler colonialism. The various Europeans who settled around the area saw nature "as a force to be controlled, not an ecosystem to be protected" (Adelmann, 1998, p. 56). In fact, it was settlers' intense hunting of beavers for fashion that not only extirpated the species within Illinois but also helped to create the characteristics of present-day Illinois rivers. The establishment of a viable fur trade altered the populations of beavers, thus reducing the presences of beaver dams. The absence of these dams helped to transform many shallow rivers and streams in Illinois into broader channels. Much of this change can be found in the eastern portion of the state. This objectification of nature is what allowed for the emergence of Chicago as a major industrial center in the Midwest.

It was mostly the technology of the Nineteenth-century that provided the tools that allowed human actors to alter Chicago's natural landscape in order to make room for massive growth (see also Cronon, 1991). Most of these changes involved alterations in hydrology for potable water, waste disposal, and transportation. The Chicago River served dual roles as a sewer and source of drinking water *ab urb condita*. This resulted in many environmental problems, which included periodic outbreaks in cholera (1849, 1854, 1866-67, 1885) and typhoid fever (1885, 1902) (Bacon and Dalton, 1968; Platt, 2002). To combat the spread of disease the Illinois legislature created the Chicago Sanitary District (now The Metropolitan Water Reclamation District) in 1889. The improvement in infrastructure was built to support and ultimately replace the much smaller (and

more polluted) Illinois-Michigan Canal. The plan called for civil engineers to reverse the flow of the Chicago (via Chicago Sanitary and Ship Canal) and Calumet Rivers (via Cal-Sag Channel in 1922) in order to carry wastewater away from Lake Michigan into the Illinois and Des Plaines Rivers (Platt, 2002). These rivers would dump the waste into the Mississippi River, which would eventually dump the waste into the Gulf of Mexico (to view an image of the CWS, please visit: http://media.journalinteractive.com/images/WATERFLOW04G1.jpg).

This technical intervention establishes just a fraction of the ontological universe that frames Asian carp's invasibility in the present. The construction of the various channels created new points of access to Lake Michigan that didn't exist naturally. Two of the most prominent matters of concern regard (1) whether there should be a connection between the Chicago Area Waterway System (CAWS) and Lake Michigan; and (2) whether dismantling the points of entry would have an effect on economies across scale (local to international). The former is a question of science; the latter is a concern for economics. For the time being, let us divert our attention to the issue of economics.

Professors John Taylor and James Roach were commission by Mike Cox, the state of Michigan Attorney General, to assess the impact that ecological separation between the Chicago Waterway System and Lake Michigan would have on Chicagoland and surrounding areas. On February 9, 2010, they release the results of their study titled, "Chicago Waterway System Ecological Separation: The Logistics and Transportation Related Cost Impact of Waterway Barriers." This study was

widely influential among groups who saw closing the Chicago and O'Brien locks as the only solution for keeping Asian carp out of the Lake Michigan and other Great Lakes. The study claimed ecological separation would provide very minimal economic shortcomings for the region (Taylor & Roach, 2010). The Illinois Chamber of Commerce subsequently released reports from three independent economists (Savage, 2010; Schwieterman, 2010; Bronzini, 2010), and a transportation specialist (Kruse, 2010), who they commissioned to study the validity of Taylor and Roach's claims.

Emerging worlds

Consider the following statements: "A barrier at the Chicago Lock will have little effect on shippers on the North and South Branches of the Chicago River. The large majority of cargo to these shippers passes through the CSSC and would be unaffected by the closure of either the Chicago or O'Brien locks" (Taylor & Roach, 2010); and "When choosing a location for a new facility, shippers' choices are highly sensitive to transportation costs. Closing the lock would certainly hurt any industrial development efforts" (Kruse, 2010). These statements raise the CSSC and the hypothetical barriers as important spaces of dependence that also help to create larges spaces that stabilize identities for carp and human collectives. I want to emphasize the fact that spaces of dependence and engagement are not necessarily symbolic theoretical conceptions. Often times these spaces take the form of human and nonhuman actors. Actors' use of architectonic statements to enroll other actors into their networks defines how nonhuman actors (e.g. barriers) should be understood. This process of network-building sets the stage for questions regarding

who has the authority to define, what governs acts of definition, why those performances exist, and whether they are valid.

"Michigan economists," like Taylor and Roach, use the CSSC to seal carp's identity as an invader species. In the absence of this route of transport, carp have no access to Lake Michigan. Their rhetoric seeks to connect various human and nonhuman actors to lessen the importance of the CSSC and subsequently frame it as causing more economic harm if it were to remain open. The most interesting part of their piece is that they paint a picture of invasibility, without really focusing on carp. In fact, the words "Asian carp" appear only twice in the entire 23-page document. This is an assessment of transportation logistics and costs that would be incurred by the Chicago-area and Illinois upon the construction of two physical barriers that would ecologically separate the Chicago-area waterway system from Lake Michigan in order to stop the spread of the Asian Carp. The authors were very strategic in the way of not directly raising carp throughout their study. Framing the debate tightly within the confines of economic space removes concerns for science from the purview of deliberation. Taylor and Roach (2010) ventured into the space of the commercial shipping industry in assembling their network. They recognized that the construction of the barriers would be disruptive to commercial shipping and recreational boating, but their assessment showed that the construction of the barriers and closing of the Chicago and O'Brien Locks would not affect the economy drastically. One notable feature of their study was the authors' use of data from the U.S. Army Corps of Engineers that shows traffic by commercial and recreational vessels has steadily declined since 1994. The data showed that:

> All categories of traffic have been declining over the 1994-2008 period shown in this table. Tonnage is down dramatically from 1.3 million tons to about 100 thousand tons. Recreational vessel traffic is also down significantly from peak years of 1994-95 when levels in the 40,000 per year range were experienced. (Taylor & Roach, 2010, p. 5)

This benchmark year was the most powerful architectonic statement. It helped to set the tone of their argument. It created a space for Michigan economists and other actors, who were concerned with risk Asian carp posed to Lake Michigan, to engage in their own network-building within their spheres of influence to enroll other actors into this ontology (Egan, 2010; Great Lakes United et al., 2010). In fact, this was the one statement that Illinois economists latched onto when assembling their own carptologies. Moreover, Taylor and Roach paired the Corps' data with "publicly available aerial photos" and information from a 2006 Federal Reserve Bank of Chicago Newsletter to paint a picture of an industrial economy in decline as "many former shipping sites [are] now vacant lots or [have been] converted to other non-industrial uses" (Taylor & Roach, 2010, p. 17). This worked to augment their claim that while there will be some impact on the shipping industry from the construction of the barriers and closing the locks, it would not drastically alter the economic environment as the industry has already been in decline. Another notable aspect of this study is that the authors purport that the closing of the locks will spawn job creation within the region. Taylor and Roach (2010) argued that since industries could not rely upon shipping to get their goods from Point A to Point B in the event of lock closure, they would need to build loading facilities and other avenues for the transportation (pipelines, railway, trucking) of goods. So while jobs in the barge industry would decline, they expected an increase in other transportation sectors.

"Illinois economists," and their affiliates, reframed lock closure along the CSSC as presenting more harm than good. They tendered constructions of the CSSC as a vital route of transport and lock closure as presenting major economic *and* environmental concerns. Like Taylor and Roach, they do not focus exclusively on carp; however, their worldview of ecological separation connotes an understanding of carp as "a serious, but manageable threat to the Mississippi and Great Lakes" (Unlock Our Jobs, 2012). Their rhetoric works doubly to re-frame a competing economic understanding of carp as the production of hysterical discourse and turn the public's attention toward spaces that have been screened out of deliberation (see Killingsworth and Palmer, 1995). For example, Unlock Our Jobs, a consortium composed of economists, members of the transportation industry and fish farmers, (2012) described economic arguments for lock closure as "not a solution to the threat posed by Asian Carp, but rather a politically motivated stunt that would result in enormous economic consequences for the region" and point to the fact that the "Illinois Fish and Wildlife Service recently logged 34 days on the water in an exhaustive search for any Asian Carp specimen," but found none "alive or dead." Their rhetoric also makes use of what Lange (1993) termed as processes of vilification and ennobling. This is a rhetorical technique wherein groups characterize their opposition's motives as diabolical in nature while simultaneously presenting their position as righteous and worth consideration. The activities to stop carp materialize as a matter of concern because they would hypothetically destabilize a network of "approximately 19 million tons of agricultural products, building materials, coal and other industrial products and raw materials" valued at

$16 billion per annum (Schwieterman, 2010; Unlock Our Jobs, 2012). In assembling this competing ontology, the actors proffer architectonic statements that structure various economic spaces of dependence.

Each of the Illinois economists connected to Taylor and Roach's use of 1994 as a standard to stabilize their worldview. While these movements to constructed spaces of dependence occur in regional, national and international economic arenas, Illinois economists offered a more "local" rhetoric via statements that constructed spaces of dependence within the city of Chicago itself. As he criticized Taylor and Roach as "intellectually dishonest and manipulative," Savage carefully pointed out that "[Taylor and Roach's] link between transportation investments (or disinvestments) and surrounding land use and land values" was curiously non-existent (Savage, 2010, p. 7; see also Bronzini, 2010). Specifically, they left out of their analysis the existence of recreational industries and allied commercial activities, such as marina services, dining venues, and residential developments (Savage, 2010, p. 2-3). These sections of the Chicago waterfront were particularly important because they were once "unsightly waterways" that the city ignored until increased access drove "redevelopment" (read: gentrification) initiatives. Accordingly, closing the locks would affect an industry that is primarily associated with revitalizing the abandoned industrial properties that surround the riverfronts. These were areas, which Taylor and Roach referred to as "nearly abandoned" and would be unaffected by ecological separation. Schwieterman (2010) and Kruse (2010) echoed many of the concerns that Savage and Bronzini raised concerning Taylor and Roach's methodology and use of statistics; however, they continued

offering statements that framed the economic ontology strictly within the confines of Chicago. This included statements about both how lock closure would dramatically increase interstate traffic around the city and indirectly affect businesses not tied to the water or shipping industries.

Looking forward: Exploring common worlds

I want to take this time to foreshadow an implication that stems from the rhetorical study of carptologies. In the example above, it is best to look at each text and their assembly of statements as interferences that help to produce an ecology of disparate spaces. Still, what value do these interferences hold for environmental rhetoric? The answer lies in their creation of new forms of subjectivity for carp. The concern for multiplicity within environmental disputes raises a rhetorical problem. How can we represent and respect the fractional worlds that actors call home while moving toward a singularity that would allow us to best solve an environmental crisis. If it is one thing that we can say definitively about statements it is that they are metaphorical bridges between textual and physical worlds. They are performances of reality. Writing performs reality, but it also has the ability to adjust the relations that produce reality. Here I am actively advocating that we consider ways in which acting rhetorically can make and remake the physical world. It might be that we need a cultural environmental rhetoric that achieves what Law (2002) termed "fractional coherence." As writers advocate for solutions to environmental problems, they might consider what spaces their statements create for public deliberation. We might venture at another meta-level and ask bureaucrats to consider what spaces their own statements create in writing the policy that

indirectly structures how actors perform in political arenas. There is space to create a sort of "intra-group" homogeneity through what social capital theorists refer to as a "bridging" of social space (Carolan, 2004; Nan, 2002; Granovetter, 1973). This work is mostly accomplished by focusing on the weak ties between actors' or the ignored spaces. Through writing these bridges, actors residing in seemingly separate ontological universes are encouraged to engage in an exchange of ideas and values. Spaces of engagement, when properly arranged, can do things in the world. This, however, only works if we build trust within these connectors between nodes. We have to find ways to coordinate actors' performances (create new spaces of engagement) so that they act with each other rather than within their own spheres of influence.

Within this mini-case example, I am curious as to why actors have to issue their own economic impact statements rather than working together to produce a more coherent document that engages in the complexity of the spaces central to their analyses? Moreover, why are actors so eager to exclude environmental considerations from the purview of economic analyses? While lock closure surely has economic effects, there is no attention provided to environmental concerns, which may include, but is not limited to flooding and reduction of habitat for native species living within the waterway. Flattening complexity through their statements creates the heuristics by which carp emerges as a certain subject "whose seemingly unintended consequences threatens to disrupt all orderings, all plans, all impacts" (Latour, 2004, p. 25). In making this argument about ontology, I am crafting a role

for environmental rhetoric. This is a role that I will explain with greater detail in the final chapter.

Conclusion

As he turns his back to the citizens and politicians of Rome, Coriolanus exclaims, "There is a world elsewhere," a statement that irreverently displaces the ontological foundations of the republic (Shakespeare, 2002, 3.3.132). Much in the same respects I am concerned with other worlds, minus the contempt. In this chapter, I put forth an argument for understanding how actors move through space to create realities and the possibilities afforded by these spatial performances. Through actors' statements worlds that constitute an identity for carp emerge. The decision to focus on statements used to describe carp is important, as language is an "instrument of power" that "shapes distorts and even creates realities" (Harre et al. 1999, ix; MacDonald 2003, 155). The realities that have emerged here are important and worth considering as we seek to answer questions such as: What makes Asian carp invasive? When are they invasive? Where are they invasive? And to whom are they invasive? These are questions that are answered only by focusing on what actors take center stage, how they are connected, and what spaces serve as the foundations for their activities. In Chapter 5, I continue this exploration through an extended analysis of how carptologies emerge from statements generated in response to a request for comments regarding the listing of bighead, silver and large-scale silver carps as invasive under the Lacey Act. One way of labeling carp as invasive stems from procedures dictated by policy. Focusing on the political processes designed to mitigate the effects of invasive species provide insights into

how we might facilitate the manufacture of more constructive relationships among actors performing in different worlds. In Chapter 4, however, I offer a catalogue of the various carptologies worth considering, but cannot be discussed *in toto* due to the limits of this genre.

CHAPTER 4. CARPTOLOGIES, PART II: UNTANGLING COMPLEXITY, MULTIPLE PERFORMANCES

What *is* Asian carp? Answering that question is not as simple as looking at a picture, reading a book or even going fishing. While each of those activities help to construct an identity in the public imagination, the ways in which they are attached and entangled to a cluster of humans and nonhumans ultimately renders different identity formations. There simply is no one answer. What forms a social scene is the arrangement of people, living organisms, artifacts and other things that are intricately woven together to produce meaningful relations or what we might call "social life." To elevate humans as the sole agents in any scene immediately reduces the importance of other units that help to make the social happen. In making a case for nonhuman subjectivity, ANT and some human/cultural geography theorists have demonstrated the importance of nonhumans in the production of reality. The notion of a subject-world populated by people and an object-world composed of things is an idea that stems from what we have come to understand as the "modern constitution," which places agency firmly in the hands of people (Latour and Woolgar, 1979; Latour, 1993; Whatmore, 2001; Latour, 2004). As stated repeatedly, this more than human approach is the basis for which we must interrogate and mark invasive performances.

So, how do we *realize* Asian carp? The first step in answering this question is locating Asian carp's emergent invasibility. This necessitates mapping out the networks that compose the ontological formulations, which give rise to carptologies. Mapping these relations requires that we attend to space and direct our focus to the actors, whose networked performances comprise social life. In theatre, it is

customary to provide audiences with a list traditionally referred to as a *dramatis personae*. This catalog names only those actors who take center stage and makes no mention of those that work behind the scenes to make the production happen. Nevertheless, anyone who attends a production is fully aware that there are an untold number of actors whose offstage presence allows for the show to go on. This includes, but is not limited to: producers, playwrights, directors, scene designers, costume designers, light and sound board operators, makeup artists, and stage managers. Even the audience contributes to this collaborative effort. In this chapter, I provide snapshots of complexity by engaging with the multiple ways in which Asian carp's identity as invader species is enacted. There is no way that I can deal with the entire complexity of this issue *in toto* within the space of this dissertation. Nevertheless, I want to I provide you with a brief picture of some of the actors that make up this drama and the ontologies that emerge as actors perform their obligations to space.

It is important to note that the lines between ontological controversies are not neat. In fact, ontological matters are quite messy—*at least* for researchers. Often matters of concern that are economic bleed into scientific arenas. Sometimes carptologies that emerge around legislative agendas converge with spiritual realms. Documenting complexity will produce these tangled relationships and also call attention to issues that we would otherwise remove from analytical purview, which ultimately play a role in driving the entirety of network dynamics. There is a limit to which we can (and should) flatten worlds to understand the dynamics of the social. Flat ontology replaces ways of understanding how the world works outside of

verticality and horizontality without collapsing the two into a new whole (Marston, Jones, & Woodward, 2005). We should always be mindful of complex and emergent spatial relations. Therefore, while reading these carptologies take into account that no one version exist by itself. Each is linked to other versions in intricate ways to produce an understanding of reality that is "more than one but also less than many" (Law, 2002). With that final statement, I am avoiding the some of the analytical trappings of postmodernism. First, there is a limit to the extent to which we can multiply reality. Furthermore, multiplication is not a game. It is a serious project concerned with getting to the heart of complex cultural issues. What follows is a catalogue of seven ways Asian carp are performed. These enactments include but are not limited too: (1) scientific classification schemas, (2) environmental DNA, (3) the Asian and Asian American community, (4) the language of immigration, (5) economics, (6) Asian carp themselves, and (7) this dissertation. With each of these performances Asian carp is different.

Asian carp as invasive through scientific classification

Foremost, Asian carp is a problem of science. The questions here regard how does science produce ontologies of carp and what are the effects of these ontologies? The terms and concepts relevant to invasion ecology theory enter into public deliberative forums by way of science. As Lien and Law (2010) state about salmon, we can best understand scientific classification of Asian carp as a discourse that enacts carp "in a way that seeks to transcend the specialties of time and space: [science] is a universalising [sic] discourse" (p. 4). To answer the former questions, we must inquire as to how does science shape the conditions of the word "invasive"

as it can be readily applied to carp? With its classification schema, Ecology presents a dominant field of vision that provides us with a universal way of seeing invaders and understanding their performances. Classification schemas exist to simplify the world by bringing order to chaos. Yet, there is a problem with using a term like "invasive" to describe species. A term like invasive (in addition to "transient," "foreign," "alien," "exotic," "nonnative," "non-indigenous," "invasive exotics") "include qualities that are open to subjective interpretation" (Colautti and MacIsaac, 2004, 135). People have *and* build associations between these "scientific" terms with occurrences in the everyday and the rendering of these descriptors outside the realm of science can "cloud conceptualization of the processes they are meant to describe" (Colautti and MacIsaac, 2004, 135; see also Peters, 1991; Pysek, 1995; Shrader-Frechette, 2001). What word is the best word for describing species that are out of place? The use of any of these terms applied to Asian carp bridges the scientific world to x=World in order to build an ontology of carp that differs from another pairing. If you are wondering why I am spending so much time focusing on terminology, it is because the way in which we label actors, even if we already deem them to be invasive, will produce a variety of orderings that carry differing affordances and consequences with there varying hybrid assemblies of nonhumans and humans.

Still, the idea of multiple carptologies tied to Ecology's practice is not simply a result of naming and the emotive responses tied to names; they also arise in light of how we articulate those names in the form of formal definitions. There are several ways to define invasive species. One definition focuses on species whose

activities bear negative biological, economic, and environmental effects because they reside outside their native spaces due to either direct or indirect human activities (NISC, 2006). Another definition targets species who propagate themselves across natural boundaries into new spaces on account of the lack of natural controls (e.g. decline or absence of predator populations). This definition would include species such as the Cattle egret, which is native to Africa but established itself in North America in 1941 due to natural transatlantic migrations. There are also native and nonnative invasive species that have neither negative nor positive impact on natural environments. For example, the ring-necked pheasant is a nonnative species from Georgia (the country, not the state) that was established throughout much of the Rocky Mountain and Western plains states. The animal was so harmless that South Dakotans extended permanent residency to the bird by investing the pheasant as an official state symbol in 1943 (Coates, 2006). A more "fishy" example is the goldfish, which is an *Asian* carp that has wide distribution throughout much of North America but bears no impact on the environment. It is important to note, that while goldfish originate from Asia, they are not part of the grouping that is colloquially known as Asian carp. This exclusion only adds to complexity of understanding carptologies that emerge from scientific classification.

Finally, there are invasive species that are established and cultivated in controlled habitats to suit recreational or economic purposes. For example, the salmon fishery in the Great Lakes is a manmade industry that was built by introducing Chinook salmon into Lake Huron (Payette, 2012a). The purpose of the introduction was to control the Alewife, an invasive species, and to increase

recreational fishing. Still whether you consider the salmon to be a controlled invasive or simply invasive depends on what side of the Straits of Mackinac you live and to what group you claim membership. Performances of Asian carp's identity are parallel to this scientific definition. While bighead carp existed in the wild, until 2010 they were simultaneously raised in controlled conditions in fish farms. Their status as invaders depended heavily upon how stakeholders understood their place within culture and within natural ecosystems.

For example, Iowa ecologists labeling of Asian carp as invasive due to potential threats against native species in Iowa bodies of water competed with Iowa catfish farmers who built stable networks between algae, catfish, bighead carp, and national and international consumer markets. While the scientific application of the term results from their understanding of carp as being "out of place," catfish farmers see carp as "in place" because the mutual ways in which the farmers, catfish and bighead carp benefit each other. This example as an articulation of the concern for definition and the architecture of carptologies, forces us to consider the rhetoricity of the phrases "in place" and "out of place" as denoting divergent notions of nativity. Furthermore, considerations for place and science come with greater complexity. While concerns for naming Bighead carp as invasive within Iowa may be similar to those of Illinois or even Arkansas, other places produce different pairings of actors and ultimately different identity spaces for carp due to changes in environment and scientific uncertainty as to how carp will perform in new environments.

Enacted through eDNA

In microbiology Asian carp's identity as an invader is performed much differently. Here Asian carp exist as quantified microbial and macrobial environmental DNA (eDNA). eDNA comes from bits of an organism such as skin cells, waste products, and feces, which are shed into the environment. Scientists collect this genetic material from living organisms by sampling the non-living environment (soil, air, water) in order to locate species during the early stages of invasion. In August of 2011, the Ohio and Michigan Departments of Natural Resources (MDNR) collected six water samples from Lake Erie. Four of the samples were taken from Sandusky Bay in Ohio waters; two samples were retrieved from Maumee Bay in Michigan waters. In July of 2012, officials from both agencies reported that the samples tested positive for the presence of Asian carp environmental DNA. The four samples from Ohio waters indicated the presence of bighead carp, whereas the samples from north Maumee Bay, in Michigan waters, were positive for silver carp eDNA. Has the invasion already begun? Is it too late to stop Asian carp? MDNR (2012) was quick to point out that while the findings "indicate the presence of genetic material left behind by the species, such as scales, excrement or mucous," they do not conclusively point to "the establishment of Asian carp in Lake Erie." Positive eDNA tests are an indicator of *recent* presence, but this result occurs regardless of whether an organism is dead or alive. Furthermore, there is no saying that macrobial particles did not travel from another local due to the fluidic properties of water. In 2012 alone there have been 80 positive samples of silver carp eDNA identified in Lake Michigan (MDNR, 2012). Yet, the fish have not

been physically seen in Great Lakes waters to date. Two important questions arise: (1) Do we have to see Asian carp for them to be invasive? (2) Do the quantified sample constitute a material form that structures a reality that legitimizes invasion?

Performing Asian carp through eDNA is a way of marking them as physically present and helps to underline their imposing threat. What distinguishes Asian carp performed through eDNA from scientific classification schemas is that carp exist as collections of numerical data derived from trace elements of their bodies. The numbers amass into a collectivity that provides policymakers with a platform upon which they can make decisions. Here carp's eminent threat to the network that composes the Great Lakes is based largely upon the proximity and distance of the eDNA from borders between the lakes and natural and unnatural vectors. Despite the inconclusivity that comes with eDNA, some argue that particles are enough to seal carp's identity and spur action. For instance, in response to several positive eDNA samples acquired from Chicago's North Shore Channel in late September, Henderson (2012) wrote, "The increased rate of detection in distinct places beyond the [Wilmette Pumping Station] implies an increased threat that we cannot ignore." While the Great Lakes, specifically Lake Michigan, materialize as spaces of dependence, eDNA is the keystone in the arch that both makes the pumping station a space of engagement but also stabilizes a network that denotes carp as an invader. Still this is not the only point-of-entry. Human actors also point to positive results near the Chicago Lock & Dam and T.J. O'Brien Lock & Dam, thus enrolling the Wilmette Pumping Station into a larger more rhetorically effective network (see "MRRWG Asian Carp eDNA Surveillance eDNA Monitoring Results"). Collectively

performing Asian carp via these three locations and documenting these performances through writing acts like numbers and maps build carp's materiality and spatializes their invasion to demonstrate why "delay in response is a problem and why more aggressive action that permanently closes pathway [sic] for invasive species must to be taken" (Henderson, 2012).

Performing Asian (American) identity

While ontological constructions of invasibility occur primarily through science, they are also enacted in other spaces to produce different realities. Live carp transported from fish farms pose a particular level of risk as when they are performed by members of Asian and Asian American communities. Bighead carp are food fish for some members of Asian and Asian American communities. The fish were available to be purchased live at markets in major metropolitan areas such as Toronto, Chicago, New York and San Francisco. Toronto, where it has been illegal since 2005 to transport or sell live bighead, black, silver or grass carp, has experienced its own problems. Bighead carp continues to be a popular dish in Chinese restaurants throughout the Greater Toronto area. They were sold live in Asian supermarkets because consumers preferred the taste of fresh fish to the frozen variety (Adler, 2010). Still, within the past two years several supermarkets have been fined for possessing live bighead carp (Hui, 2010; Payette, 2012b). Officials were quick to point out that it was not the market sale that concerned them most, but rather how the fish were transported. The fish often make their way into Toronto on trucks from US fish farms.

The level of concern for transportation as a probable gateway was so serious that it even caused an officer of the Lake Ontario Enforcement Unit to offer as a worst-case scenario the idea of a tractor-trailer careening off a road and landing in a tributary. (Hui, 2010). Several practices are at work here to define carp: selling live carp, consuming live carp, and transporting live carp. I am treating these performances as separate, but they are linked in various ways to create an invasive identity linked to the Asian community. For actors concerned with mitigating carp's invasibility transportation and supermarkets are important spaces of engagement that have an affect on their space of dependence—Lake Ontario. If these networks for selling and consuming carp remain in tact, the large space of dependence (or the networks) that makes Lake Ontario into a meaningful space for various actors is in peril. Therefore, actors deploy a variety of calculating devices in hopes that they might destabilize invasive networks by enrolling actors into the larger networks that compose Lake Ontario. These calculating devices include not only laws that ban transportation, but also routine inspections of markets and fact sheets in Mandarin and Cantonese that warn against the possession of live carp (Adler, 2010). Nevertheless, consuming carp was not the only issue. It was bighead carp's participation in the *hojo-e*, a Buddhist ceremony, which also made Asian carp a matter of concern.

Figure 1. Political cartoon: "Freshwater sashimi." Regional borders hold both physical and symbolic importance. Therefore, it should not be a surprise that the ways in which we talk about "illegal aliens" in the form of people and emergent aliens in the form of flora and fauna are rhetorically parallel as they both raise anxiety with regards to foreign cultural invasions that threaten not only the nation state but how we collectively perform the nation state in a variety of spaces.

On June 23, 2010, the Illinois Department of Natural Resources (IDNR) issued a news release announcing that a 20-pound adult bighead carp was found beyond the electric barrier just a couple miles from Lake Michigan (IDNR, 2010). How did the fish get beyond the barrier? The first plausible explanation was that the barrier, which was designed specifically to keep the round goby at-bay, was in effective at stopping carp. Another explanation was that the fish could have made it into the waters by way of the Des Plaines River, a tributary of the Mississippi River, which is

close in proximity to the Chicago Sanitary and Ship Canal. The Army Corps of Engineers fixed this minor breach in the defense system with a $13 million network of concrete and chain-link barricades to deter fish. There was also the possibility that the fish braved the electrified water and swam beyond the barrier; however, tests on the fish indicated this was unlikely. Researchers at the Southern Illinois University Carbondale Fisheries and Illinois Aquaculture Center analyzed the chemical markers in the inner ear bones of the fish (Garvey, Ickes, and Zigler, 2010). The inner ear bones, or otoliths, "incorporate chemicals into their structure that are unique to the environments in which they live. They have been used in recent years to reconstruct the environmental history of individual fish or fish stocks" (IDNR, 2010). The tests concluded that the fish spent most of its life in the Illinois River and only a small portion in Lake Michigan. This gave evidence to the likelihood that this bighead, in addition to another bighead caught a month earlier in Lake Calumet, may have been placed by human hands. In response to the tests, Assistant Director of IDNR John Rogner suggested either bait bucket transfer or ritual cultural release as vectors that only underscored "the need for the public to be even more vigilant and educated about Asian carp and the importance of not furthering the spread of these invasive species" (IDNR, 2010).

The idea of ritual cultural release troubles policymakers. Asian carp have been discovered in isolated public ponds throughout the Great Lakes region. These carp sightings have been linked to the *hojo-e* ceremony although there is no definitive evidence to support this. Primarily Buddhists in East Asian countries perform the ritual, which originated in Japan. It involves the ceremonial release of

captive animals (birds, turtles, and fish) as an act of compassion in order "to accrue merit for the afterlife" and extend the life of the practitioner (Higbee and Glassner-Shwayder, 2004). It is important to note that there has never been a confirmed account of ceremonial release of bighead or silver carp in the United States; however, some actors were so concerned that they successfully sought to ban the importation and transportation of live bighead carp under the federal Lacey Act via the Asian Carp Prevention and Control Act (Thompson, 2011).

While the real and imagined spaces in which Asian and Asian Americans perform the *hojo-e* ceremony and enact a carp identity serve as their own spaces of dependence, they also exist as spaces of engagement for stakeholders who are foremost concerned with protecting the Great Lakes from Asian carp. Still there is a salient point, which we should consider. What is the role of Asian and Asian American communities within the United States and Canada with respect to participating in decision-making in which their identities are enrolled into networks that cement carp's invasibility? The discussion of carptologies under the lens of invasibility allows certain constructions to take precedence over others. There is a power differential in defining the species as invasive in relation to ritual. I noted earlier that there is no proof of people performing the *hojo-e* ceremony within the Great Lakes region. The idea that this is happening is speculation fueled by actors residing within their own spaces of dependence. There is not a lot of dialogue between communities that would reveal validity to claims of how cultural traditions are practiced or how to best write cultural policy to respect others identities (people *and* carp). Discussions of carp in relation to ritual come from everywhere

except Asian and Asian American communities. There is rhetorical baggage that comes with linking an "Asian" species with and "Asian" ritual to produce an image of invasiveness. A rhetorical read of such network-building exposes actors' spatial performances as not simply about whether ritual can be performed "out of place," but the connection of such performances to larger-circulating discourses of nationalism and racism.

Papers please?: Undocumented immigrants

How does one legally perform Asian carp? As Goldstein (2008) noted, "Invasive species policies speak the language of immigration" (p. 7). One cannot understand legislative performances of carp without taking into account such performances place within preexisting networks that account for the nationalization of nature and the naturalization of nations. To label Asian carp "invasive" or "alien" would connote that plants and animals have citizenship under the law. The problem here is that plants and animals cannot have citizenship because ecosystems neither respect nor acknowledge governments, borders, or "citizens." Legal performances require the Human extension of metaphor to understand nonhuman performance in hybrid networks. Asian carp weakens linkages between people and nonhumans that assemble to produce networks that reinforce the structure of spaces in which citizens perform their sense of *native* American-ness or Canadian-ness. Threats occur as realized or perceived breakdown of national borders due to the illegal movement of foreigners across the border. In legal practice the carp threatens American and Canadian lifeways because of its propensity for violence, competitive

breeding and refusal to assimilate into the *natural* order of things.[3] These characteristics should sounds familiar because they are the same descriptors that anti-immigration groups use to describe non-natives who they perceive as responsible for a host of socioeconomic problems that include but are not limited to poverty, inner city crime, and environmental degradation (Coates, 2006). As a means of mitigating undesirable immigration, the U.S. government has sought legal remedies.

There are roughly thirty laws that deal with exotic species in some capacity. Each law individually and collectively affects how Asian carp is performed to produce an invasive identity. We might consider Executive Order 13112 on Invasive Species, which was signed by President Clinton in 1999 as creating a certain understanding of Asian carp. First, it nullified a pre-existing executive order issued by President Carter, which banned introducing invasive species. *Introduction* was defined as "the release, escape, or establishment of an exotic species into a natural ecosystem;" *exotic species* were understood to be "all species of plants and animals not naturally occurring, either presently or historically, in any ecosystem of the United States;" and *native species* meant "all species of plants and animals naturally occurring, either presently or historically, in any ecosystem of the Untied States" (Executive Order No. 11,987, 1977).

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[3] Violence can be understood in multiple ways. There is economic violence that potentially threatens businesses tied to the Great Lakes. Humans are the direct targets of silver carp who, when agitated by the sound of boat motors, jump out of water and strike boaters. Other animals are also the indirect targets of violence as Asian carp are thought to outcompete them in consumption of limited food resources.

It is important to note that President Carter's Order did not apply to the introduction of exotic species in the event that either the Secretary of Agriculture or the Secretary of the Interior found that introduction would bear no adverse effect on natural ecosystems. This had no affect on carp as they were still viewed as more useful than an economic bane. Carter's intent was to minimize the economic effects exotic species would have on the US. Clinton's Order removed economic indicators as the sole determining factor, as it regarded all species as having the potential of invasibility not just *native* species. *Native* was a designation provided only to those species that were never introduced into U.S. ecosystems. Furthermore, the order defined invasive species as *alien species* whose "seeds, eggs, spores, or other biological material [are] capable of propagating that species, that is not native to that ecosystem […and] whose introduction does or is likely to cause economic or environmental harm or harm to human health" (Executive Order No. 13,112, 1999). More importantly, the Order created and solidified relationships between species and people by providing a list of stakeholders and delegating powers to federal government bodies.

These human actors were listed as "State, tribal, and local government agencies, academic institutions, the scientific community, nongovernmental entities including environmental, agricultural, and conservation organizations, trade groups, commercial interests, and private landowners." Specifically, it enrolled 20 federal agencies, which included the Department of Defense, and created the National Invasive Species Council (NISC) in order to monitor impact, make recommendations for preventing continued migration and coordinate efforts among government

agencies (U.S. General Accounting Office, 2002). Under these conditions, Asian carp became invasive not simply based upon its activity, but in fact its appearance in the US. The act made possible a definition that allowed for other actors to come together in order to mobilize against carp. This is just one example of how a text, as an actor, enrolls others and affects how we understand carp and perform around the species.

Figure 2. Political cartoon: "Which foreigner is a real threat to our way of life?" Another political cartoon that makes use of not only race but also popular notions of how foreigners participate within the economy. For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this dissertation.

Asian carp as an economically invasive construction

Carp like most invasive species manifest as economic performances. I provided a sample of one economic concern in the previous chapter and alluded to an economic relationship between catfish and Asian carp in matters of concern that emerge out of scientific classification schemas. Here I offer another example. On

November 3, 2005, the U.S. House of Representatives Subcommittee on Fisheries and Oceans Oversight held a hearing on the "Growing Problem of Invasive Asian Carp in the Great Lakes and Mississippi River System." The hearing assembled officials from the aquaculture industry to independent researchers. Each of these groups came to offer their opinions on the economic effects of bighead and black carps' presence. As noted earlier, farmed bighead carp are economically valuable when linked to foreign markets for sale and consumption. They also prove valuable when they are enrolled in networks that include catfish. For example, Executive Vice-President for Catfish Farmers of America Hugh Warren (2005) wrote:

> Bighead carp constitute an important aquaculture enterprise in the mid-south. Bighead carp are grown together with channel catfish in ponds, harvested separately from the catfish, and then transported alive to markets in the northern United States and Canada. This can be an important source of revenue for fish farmers during times of low catfish prices.

Catfish farmers decided to import *bighead carp* to eat unwanted elements found in aquaculture tanks in the late 1970s. The relationship between bighead carp and catfish was simple: Carp, a voracious filter feeder, consumed blue-green algae and zooplankton in tanks produced by catfish activity; and catfish subsequently had clean and livable habitats to thrive. But it was not just bighead carp that proved economically valuable. Black carp were also employed as biological control agents for zebra mussels and snails that served as hosts for parasites that are known for killing juvenile fish and causing disease in adult populations of catfish, hybrid striped bass, and baitfish (Conover, Simmonds, and Whalen, 2007; Venable et al. 2000). In fact, catfish farmers readily stocked triploid black carp in ponds and tanks to control trematode infections. Furthermore, black carp were also prized for their

ability to control the yellow grub parasite, which distinctively affects hybrid striped bass. The proposed transportation ban of each carp species was believed to lead to not only the closure of farms but also a loss of $150 million per annum and a loss of jobs (Warren, 2005). Some estimates projected a decrease in profits by 41%, 36%, 31% on small, medium-sized, and large hybrid striped bass farms, respectively. These projections also followed a University of Mississippi study that linked trematode infections to an annual loss of $72 million in catfish production (Wui and Engle, 2004).

The introduction of these species created a network that incorporated university research facilities, federal and state agencies, and private aquaculture operations that rendered carp a nonnative helper species and branded as invasive attempts to redefine carps' subjectivity. The problem for aquaculturists was the conflation between silver carp and other Asian carp species. Industry officials charged that media accounts often confused some carp species, particularly bighead, with silver carp. The press has often failed to make a distinction between reports of carp jumping out of water and injuring boaters from carp raised in fish farms. Reports from media outlets led people to believe that there was very little difference between carp species. They all made their way into the Mississippi River from farms and they all posed a threat. Yet, as Warren (2005) noted, "There has been little aquaculture of silver carp in the U.S. in the last 20 years due to the difficulty in handling and transport and no market demand." This articulation of a single economic danger of carp signals that from the perspective of those in aquaculture (and their opponents) what christens bighead and black carp as invasive have little

to do with the fish themselves and more to do with others' associating them with the activities of silver carp. In considering carp's emergent invasibility one must consider, it is never a single species. In fact, each species will always be understood only in the contexts of other carp species—thus bighead, silver or black carp are considered invasive by network association.

Numbers make Asian carp knowable in a way that visualizes invasion. Lists presenting the tonnage of dead carp resulting from a targeted fish kill serve as economic performances (Chick and Pegg 2001). This is how stakeholders know with certainty whether they are winning or losing against the invaders. Numbers also manifest in the form of maps that portray spatial distributions of known invasive spaces, vectors of invasion, and regions at risk. Some maps are purely hypothetical as they make use of the best evidence available to offer projections; others are productions of relationships between carp and tracking devices (DeGrandchamp, 2003). Whatever form they assume, these nonhuman actors (or calculating devices) often serve as obligatory passage points whose statements cannot be refuted. Human actors enroll them into their fold. Here the purpose of enrollment is to design networks that enact carp as a threat against carptologies that characterize them as economically valuable.

During the space of the hearing held before the U.S. House Subcommittee on Fisheries and Oceans Oversight several numbers were presented as a means of heightening carps' threat. There were architectonic statements such as the "$116 billion-a-year impact" that sportsfishing has on the national economy or references to the Great Lakes fishery, which records revenue of more than "$7 billion annually"

(Barnhart, 2005; Robertson, 2005). These statements are representative of entangled networks of value across multiple scales. They are performative because they are ontological representations of the identity spaces in which stakeholders reside. They are also the sinews that hold different worldviews of carp together (e.g. recreational boaters, economists, and recreational fishers) to render a single network that makes a compelling economic case as to why Asian carp is invasive and necessitates an immediate response to address the matter of concern.

Asian carp acting invasive

To say that Asian carp are performed or enacted raises a problem. As Law and Mol (2008) write, "The English language makes it easy to write sentences that are active or sentences that are passive. But writing somewhere in between 'doing' and 'being done to' is much more difficult" (p. 66). Carptologies are not just the result of human network building. Just because actors' networked performances produce multiple ways of seeing carps' invasibility, this does not mean that carp are unacting subjects. They do act. Still, how does Asian carp agentively aid in its own construction as an invader species? I have listed several different enactments of carp; however, carp act differently with each of these performances. In fact, a more-than-human ontological approach necessitates that we account for the different ways carp act in relation to the ways in which they are performed.

What do I mean by this? Consider the previous example concerning economically invasive carp on the catfish farm. Of the five species that emerged as matters of concern, grass carp's ability to act invasively took center stage. Grass carp like other carp species serve as "valuable management tools" turned actors on the

farm. Grass carp collaborate with farmers to get work done. They spend their time on farms removing vegetation and detritus. What makes them so useful is that they are stocked in a triploid state. Triploid grass carp have been genetically manipulated to have three sets of chromosomes instead of the normal two. This process sterilizes the fish, thus they are incapable of reproduction. Fish farmers and natural resources management officials rely upon this process as an important precaution just in case stocked fish accidentally enter bodies of water outside controlled settings. Carp must reproduce in order to retain their title as economically invasive in this case. The sterilization process is not 100 percent effective. There have been reports of reproduction among grass carp thought to be triploid. Moreover, there is no way to easily distinguish between sterile and viable carp (Robertson, 2005). There are three questions worth considering: First, are grass carp really undergoing sterilization? Next, can grass carp revert from triploid back to their diploid status? And finally, how does one produce certainty in an uncertain network? It is not as if grass carp communicate their intentions or coordinate their activities with us. While the U.S. Fish and Wildlife service does not dispute that sterilization is not completely effective, they have pushed back against claims of fish changing their status (Mudrak, 2011). They point to the fact that there is no experimental or observational data that exists to support the claim of fish changing their status. In fact, they point to studies that downplay risks associated with grass carp (Fuller 2003; Tillitt, 2003). Still, the uncertainty of human actions coupled with the uncertainty of nonhuman acting naturally—or *invasively*—help to make carp invasive.

Conclusion: Making ontology

When I started this chapter I noted that my purpose was to outline different enactments of Asian carp that point to their emerging invasibility in disparate ways. What I did not mention is that this dissertation also serves as a performance of carp. There has to be some form of reflexivity that comes with engaging complexity. If we agree that discourses run through humans and nonhumans alike, can we assume that a researcher on site is unaffected? Law (2002) asked that we make considerations as to what affect the "personal" has within our work. Specifically he wrote, "If we are constituted as knowing subjects, interpellated, in ways that we do not tell, then what are we doing? What are we telling? What are we making of our objects of study? Or, perhaps better, what are they making of us?" (64). In talking about his research on the TSR2 aircraft, Law addresses a predicament that many in technoscience studies often press against as they write accounts—what is the role of the "personal?" Discourses run through non/humans alike; and since this is already recognized by semiotics which is "the study of relations, including the relational formation of the distribution between the knowing subject and the object that is known," then we should readily assume that the subject writing an account about relations is interpellated some way into those discourses (49).

In his research on headhunting in Ilongot culture, Rosaldo (1993) made the case as to why contemporary anthropology should do away with classical ethnographies and their belief in detached observation. The removal of the "personal" has reduced anthropologists' ability to understand and represent aspects of culture. In fact, Rosaldo acknowledges that it is an absence of emotion on the

ethnographer's part that has reduced our ability to understand headhunting as an act of rage tied to processes of grieving rather than simply being a ritual. It took the death of his wife and the ensuing grief/rage for Rosaldo to connect to what the Ilongots had been telling him about headhunting throughout the years. Still, what his case highlights with respect to the researcher documenting complexity is that sometimes our analytical tools have the potential to mask certain aspects of culture. Therefore, we need to attend to the ways in which our tools remove aspects of our bodies when documenting complexity, because such removal affects how we see. We also should be willing to tell the ways our bodies are made (and perform making) in relation to our objects/subjects of study.

My fascination with invasive species actually started almost ten years ago during my senior year of high school. For four years I participated in Envirothon, which is a national high school science competition geared at building an interest in environmental and biological sciences among high school students. The topics of focus include aquatic ecology, soils and land use, forestry, wildlife and special topics (e.g. urban nonpoint source pollution, protection of cultural natural resources, wildfire management). Activities ranged from measuring the dissolved oxygen content of water to identifying animals by their scat and tracks. During my last year of high school, "introduced species and their effect on biodiversity" (or "invasive species) was chosen as the special topic. I have been fascinated with invasive species ever since. Even outside of my high school experience with invasive species, this dissertation makes carp and my identity in other ways. In researching and writing, I try to remain as neutral as possible; however, this does not mean that I do

not have an opinion. Moreover, it also does not mean that people see my research and me as being neutral. Some presume that I have an agenda aligned with those who want to ecologically separate the Great Lakes from the Chicago Waterway System; others see rhetorically investigating Asian carp's construction as a dangerous political activity that rejects science. And some think this project is just ridiculous. Whatever their position, no one ever asks me what I think about Asian carp. Still, my readings and interactions affect how I see and write about the world. I am unsure about how I feel about Asian carp at this point. This ambivalence is largely due to my attending to the complexity of carp's ontological status. In fact, seeing multiple only emphasizes the fact that any policy decision on Asian carp requires hybrid forums that gather multiple ways of seeing carp. I address this issue of making meaningful use of multiple relations in the concluding chapter.

In the next chapter, I trace the ways in which the Lacey Act influences actors' constructing spaces of dependence and engagement. To explore the creation of space, I assembled a case study using letters written to the U.S. Fish & Wildlife Service and interviews with officials from governmental and non-governmental institutions. These letters were written in response to three public commenting periods regarding the listing of bighead, silver and large-scale silver carp as invasive. I used the letters and conversations to map ontological positions that reveal relationships between human and nonhuman actors and revolve around concerns for economies, human safety, environmental health, and cultural preservation. While the maps illustrate how relations determine identities for carp

and humans, they also indicate spaces wherein environmental policy-makers might re-think the design of policies that govern deliberative civic engagement.

CHAPTER 5. (IL)LEGAL ACTS: RULEMAKING AND RULEBREAKING

Prologue

I open with a simple corollary: all rhetoric emerges from and relates to environment. Eves (2012) noted material and conceptual places and their attendant rhetorics factor heavily in the creation of concord and controversy in matters of public deliberation. Accordingly, "rhetorical persuasion (the move toward concord) cannot take place without some sort of shared material space" (Eves, 2012, p. 265). Often space assumes the form of material and intangible sites that occur along a variety of scales. For example, computer technologies present a series of layered spaces. There are the physical architectural and infrastructural forms that come with keyboards and screens. There are also the conceptual networked-information spaces such as the Internet or interfaces where a participant engages with data. Whether we see them as detached or linked, their design facilitates and hampers activity. We might consider as an example Selfe and Selfe's (1994) warning of how software applications often come with embedded politics that negatively structure user experiences within and outside of virtual environments. Here I am interested in the design of technical spaces, whether they be laboratory environments or words on a page, and what concerns for space mean in public deliberation of environmental issues.

Spaces in the physical world unfold onto each other much in the same way that a virtual space like PowerPoint maps onto the space of the classroom. Yet, there is neither a tangible way to order how these spaces relate to each other nor can we say that one space has more influence upon transpiring activity than the other. In

thinking about how spaces are layered in this manner, I am connecting to several scholars who have presented horizontal movement and networks as an alternative means of thinking about spatial relations. Latour (1997) found much interest in networks because their "simple properties" allow us to "get rid of the tyranny of distance" (proximity), "dissolve micro-macro distinction[s]" (size/scale), and like Deleuze (1994), force us to see that "a network is all boundary" as they lack the spatial distinction of interiority or exteriority (inside/outside). More recently, Schatzki (2002) called for us to regard sites as occurrences created via event relations, which appear as agents' activities assemble in a "cluster." Seeing sites as layered in this manner is a way of understanding how "a social site is not roped off, but rather that it inhabits a 'neighbourhood' (sic) of practices, events and orders that are folded variously into other unfolding sites" (Marston et al., 2005 p. 426; see also Delanda, 2006 for another take on social complexity and assembly). We have to be willing to see how activities in one site connect to those of another without readily assuming that one site has more agency than the other or is more independent. This is easier said than done in environmental politics. As I mentioned in Chapter 3, for many reasons sites are seen as disparate and disconnected between stakeholders. The real rhetorical work comes in finding commonalities between them or bridging spaces.

In this chapter, I offer a story of bighead carp. I focus on the design of a legal document and how its design helps to produce two carptologies. Of course there are other worlds at-play, but I am just going to focus on two within the larger ecology of a text in order to produce an account. A text has material properties, but it also

contains many nonmaterial elements (e.g. words, sentences, chapters) that structure the ways actors perform. Texts perform rhetorics and create worlds. Callon (2002) presented writing devices as critical in assembling organizations, "constructing and objectifying services, their consumers, and, more broadly, the collective actions that make it possible to deliver services" (199). In short, he provides an approach to ontology wherein writing devices lie at the "center" as integral components of *how* and *when* infrastructures assemble. While human actors are often credited with inoculating these devices with their own ideologies and purposes, these nonhuman actors assume lives of their own. This raises two salient questions: 1) when it comes to collective action within networks, what is the relationship of a writing device as an individual to the larger coordinated actions (or goals) of other actors that form the collective? And 2) if a writing device can be said to act in rhetorical ways then what considerations must we, as sponsors, make during the activity of writing before dissemination?

I answer these questions by tracing the processes that confer to bighead carp a legal invader status. The central questions here regard when does bighead carp become invasive, who is responsible for such a declaration, and who facilitated the invasion? Specifically, I trace the ways in which the Lacey Act makes spaces of dependence, which allow actors to focus on the conditions of their own material well-being with little-to-no regard for others. To explore the creation of space in a complex environmental problem, I assembled a case study using congressional testimony, letters written to the U.S. Fish & Wildlife Service (Service), and interviews with officials from government and non-governmental institutions. I

used the letters and conversations to construct socio-technical maps that revealed relationships between human and nonhuman actors that revolve around concerns for economies, human safety, environmental health, and cultural preservation. While the maps illustrate how relations determine identities for carp and humans, they also indicate spaces wherein environmental policy-makers might re-think the design of policies that fuel deliberative civic engagement.

I must reiterate that I am providing a fraction of an ontological universe. I had to pick a point in time from where I could tell a coherent story and make sense of how bighead carp is made. The archival paper trail in this chapter ends in December 18, 2003 (the date of the last letter submitted to the Service); however, some might say that bighead carp did not legally become invasive until the United States Congress circumvented the US Fish and Wildlife (Service) and passed the Asian Carp Control Act 2010. I have also make the decision to start the chapter in February 2012 with one of my initial round of interviews, but I venture in time as far as 1900. There are scenes and actors that compose this legislative process, which I have omitted or do not develop for considerations of length and "neatness." Ontological work is messy. For example, parts of this drama map onto the stories of silver and black carp. The interconnectivity of these stories matter to actors as they assemble networks that give meaning to bighead carp. Therefore, this story is neither authoritative nor representative of a single reality, but multiple. What matters here is it offers a window into seeing the emergence of nascent worlds—formations of ontologies, if you will. Nevertheless, I tried to leave intact some

architectonic statements that would allow me the ability to trace associations in order to provide an account of how bighead carp is said to have become invasive.

Dramatis personae

Subjects are not entities onto themselves but rather accumulations of multiple acting and acted upon subjects, assemblages if you will. This means that our approach to understanding environmental controversies via the relationship between identity and space requires a movement from the idea of *a subject* to *a de-centered subject*. One way to counter fixity has been to rely upon the notions of movement and travel (Lowe, 1996; Pezzulo, 2009; Whatmore, 2001). I understand travel as being both a physical and/or epistemological activity tied to conceptions of realities. Travel is the way we shuttle between spaces to perform our identities and build understandings relative to the positions of others. Here I am once again making use of the metaphor of feeling "in/out of place" to denote the strong ties between who we are and where we are located. We make ourselves and things from locations. Therefore, it is impossible to think of place-making without people-making when you take into account the sacred rhetorical triad of identity, place and power. Still, there is a problem with the idea of travel because very little has been accomplished to think about the structures that make mobility difficult. Therefore, in providing this cast of characters, I would like you to keep in mind the socio-material complexities that frame each actor's performance. As stated in Chapter 3, actors may share network elements in their assemblies; however, what is an advantage to one may prove an impediment for another.

The characters in this story are many (see Appendices D-I). The cast includes but is not limited to fish farmers, state and government agencies, trade associations, citizen scientists, Asian carp species (silver, bighead, grass, and black) and writing devices (Lacey Act of 1900, notices of inquiry, and letters, etc.). Their concerns vary with great complexity, but all center on three questions: 1) what should be the legal status of bighead carp? (Specifically, should we list this species as invasive under the Lacey Act?); 2) how do we determine this legal status?; And 3) when can we establish this status?

Dramatis personae (selected actors)

DJS, *a researcher*

Bernard Hansen

Document No. 03-23745, *a notice of inquiry*

John F. Lacey

The Lacey Act

Silver carp

Mike Freeze

MH, *a representative from U.S. Fish and Wildlife Service*

David McLeish

B. Sachau

U.S. Fish & Wildlife Service

44 letters

Bighead carp

John D. Hoskins

Dr. John Teem

This is a legal story of bighead carp.

Act I

Act I. Scene I.

SETTING: East Lansing, MI. Starbucks. Fall 2012.

Microsoft word is open. Donnie sits at his desk with a hot cup of coffee. There is a tennis match on the television in the background. He writes an account of how bighead carp are legally made invasive.

DJS: We can also see invasive species as the result of legislative processes that involve the synchronized mobilization of political entities, which exist on federal, regional, state and local levels of scale. In fact, the most activity has occurred on the federal level through the Congress, the U.S. Fish & Wildlife Service, the Army Corps of Engineers, the Office of the President of the United States and the Supreme Court. Actors on the federal level are tasked with passing legislation and coordinating activities between local, regional and state governmental bodies. Political entities acting within and beyond the federal level can be described as either governmental or non-governmental organization. These include regulatory agencies such as states' Department of Natural Resources, attorney generals, legislative assemblies and governors that exist here in the United States (primarily upper-Midwest) and in the Canadian provinces that border the Great Lakes. Non-governmental organizations include conservations such as the Alliance for the Great Lakes, American Rivers, the Natural Resource Defense Council and members of the business community such as, the Illinois Black Chamber of Commerce, the Missouri Dairy Association and American Water Operators.

One way of making invasive species in the US is rulemaking. Rulemaking is an assemblage of many activities, people, documents, laboratory procedures, and events (to name a few) that are scattered across multiple locations. Its primary purpose is a regulatory effect. Rulemaking makes regulations not laws (USFWS, 2009). A regulation is either a requirement or set of requirements that are put forth by federal agencies. A regulation is intended to have the effect of a law, but it is not a law. Congress passes legislation that authorizes regulations and the President signs regulations *into* law. On a daily basis the Office of the Federal Register (housed within the National Archives and Records Administration) publishes regulations in a running document known as the *Federal Register* (*FR*). *FR* is the official journal of the federal government of the United States. Annually, all the regulations published in a given year are codified in the *Code of Federal Regulations* (*CFR*). The following is an excerpt from *CFR:*

> The U.S. Fish and Wildlife Service (Service) adds the bighead carp (*Hypophthalmichthys nobilis*), a large fish native to eastern Asia, to the list of injurious fish, mollusks, and crustaceans. The importation into the United States and interstate transportation between States, the District of Columbia, the Commonwealth of Puerto Rico, or any territory or possession of the United States of all forms of live bighead carp, gametes, viable eggs, and hybrids thereof is prohibited, except by permit for zoological, education, medical, or scientific purposes (in accordance with permit regulation at 50 CFR 16.22) or by Federal agencies without a permit solely for their own use.

This abstracted architectonic statement does several things. It lists actors of importance; it names spaces; and it dis/connects spaces and actors. If we want to know how bighead carp became legally invasive, we have to move backward from this statement (from the document) and trace the long line of assemblies that

authorize its existence. This necessitates locating the source(s)—the entities responsible for publication *and* authorization.

My trace began with the Service, which is the body responsible for publishing notices regarding invasive species in *FR*. Rulemaking involves a series of notices—notices of inquiry, notices of proposed rules, and notices of final rules. Publication of each of these notices are followed by more writing devices, which are mostly letters but also statistical analysts, news releases, bibliographies, and scholarly publications, to name a few. In order to get a sense of the process, I conducted an interview with an official from the Service who I will refer to as "MH." The purpose of our interview was to get a sense of the rulemaking process with respect to types of solicited information and how the service uses information during their deliberations. During our discussion MH noted that they look for "more science-based/technical-based information" that would help them evaluate issues such as ecological separation and the impact of either bighead or silver carp on the Great Lakes or Mississippi River Basin. One aspect that was clear throughout the interview was that the Service neither actively sought economic data nor went out of their way to consult business interests. In fact, part of our conversation centered on the 2003 Aquatic Invasive Species Summit Proceedings Conference that the Service sponsored with other entities. These entities included representatives on behalf of the State of Illinois, the Army Corps of Engineers and the City of Chicago. In addition, members of the scientific community from within the US and abroad were also in attendance. The Illinois Chamber of Commerce, however, was not a part of the summit.

"We were looking for science-based input at arriving at solutions to the issue of exchange of invasive species between the Great Lakes and Mississippi Basin," MH said when I inquired as to why the meeting excluded economic interests. Still, this statement, which helped to define the reality of invasive species for the Service, conflicts with the fact that he often stated that the issue of invasive species is one of complexity that requires a robust set of solutions in order to mitigate negative effects. The summit produced four recommended action items that were supposed to "deal with the intricacies" of the Chicago Waterway System. All of these solutions were science-based interventions. Here we have an emergence of a world from the standpoint of the Service. Scientific units materialize as authorities in defining invasive actors and determining how to deal with them. Economic analyses are appreciated, but factor very little. Here the chief rhetorical constraints in assembling and maintaining a space of dependence are rhetorical constructions of a public that the Service is answerable to. According to MH, the Service understands the public as being "stakeholders that are interested in technical problems that can be fixed via technical solutions" and whose primary concerns regard "are we doing enough and are we doing it fast enough."

Time matters a great deal. In fact, while the Service operates from a scientific sphere, it is also nested within the space of the federal government, whose bureaucracy (e.g. paperwork, statutes, review processes, etc.) limits its level of engagement with local, state and regional entities outside the federal government. The relationship between space and time presents the question of whether federal intervention through rulemaking is an effective solution or whether states should

have the sole power to make invasive species. Here the guiding document that governs the Service's activities is the Lacey Act. "Our Lacey Act is cumbersome and slow," MH noted with much frustration. "Our process for listing injurious wildlife under the Lacey Act takes years." This was a trend that I noticed across all of my preliminary interviews. Each interview in some form raised the Lacey Act and its rulemaking process for determining and listing injurious wildlife as a matter of concern. These concerns differed among stakeholders with respect to how the document functions in relation to the actions and actors it authorizes. Therefore, in order to get a sense of how this writing device written over 100 years ago affects acting in the present, one has to go back in time.

Act I. Scene II.

SETTING: Washington, D.C. The U.S. House of Representatives. Spring 1900.

The House in Committee of the Whole on the state of the Union, and having under consideration the bill (H.R. 6634) to enlarge the powers of the Department of Agriculture, prohibit the transportation by interstate commerce of game killed in violation of local laws, and for other purposes. The Hono. John F. Lacey, offers a speech entitled, "Let Us Save the Birds." (see supplementary appendix[4] to review document in its entirety)

Rep. Lacey: Mr. Chairman, This bill is one that has attracted a great deal of interest in various sections of the country. Horticulturists, agriculturists, and lovers of birds everywhere, as well as the League of American Sportsmen, and others interested in

[4] Due to the Michigan State University graduate school's guidelines, Appendix E-I cannot be a part of this document because they cannot be formatted according to the rubric. If you would like to have access to these documents, please contact me at donniejsackey@gmail.com

game and the protection of game all over the United States, have been strongly enlisted in its support.

Briefly, the bill provides for a few purposes only. First, it authorizes the Secretary of Agriculture to utilize his department for reintroduction of birds that have become locally extinct or are being so in some parts of the United States. There are some kinds of insectivorous birds and some kinds of game birds, that heretofore were abundant in may localities, which have become very scare indeed, and in some localities entirely exterminated. The wild pigeon, formerly in this country in flock of millions, has entirely disappeared from the face of the earth. Some hopeful enthusiasts have claimed that the pigeon would again be heard from in South America, but there seems to me no well grounded basis for this hope. In some localities certain kinds of grouse have almost entirely disappeared. This bill gives the Secretary of Agriculture power to aid in the reintroduction, which. I think, will prove a useful adjunct to the action of the States which have undertaken the preservation of the native wild birds.

The next purpose in the bill is to allow the Secretary of Agriculture to control the importation of foreign wild birds and foreign wild animals. If this law had been in force at the time the mistake was made in the introduction of the English sparrow, we should have been spared from the pestilential existence of that "rat of the air," that vermin in the atmosphere…

Act I. Scene III.

SETTING: East Lansing, MI. Wanderer's Teahouse. Spring 2013.

Amid the bustling noise of the teahouse, Donnie addresses the Lacey Act and the actors that it has assembled throughout the years. He details how it performs invasibility and establishes spaces for actors.

DJS: In his comments to the House floor, Iowa Congressman John F. Lacey introduced the Lacey Act of 1900. The act reflected Lacey's passion for game birds in his adopted home of Iowa. He was specifically concerned with threats to native bird populations that came through excessive hunting, the introduction of foreign species, and millinery—an industry that used many birds to make hats for women (Anderson, 1995). The Lacey Act, although it was designed to both protect and restore native avian populations, also protected other animals as well. It was a bill

designed to support agricultural interests by protecting those species that were seen to benefit agriculture. In fact, much of Lacey's speech that day focused on how threats to or the eradication of certain species had brought about profound impacts on U.S. agriculture. As an example Lacey cited the French pink, known today as the "French broom," for threatening wheat production in Oregon. He also dedicated a large amount of time to focus on the issue of poaching. The original act sought to remedy the issue of trafficking game ("poaching") between states. States had limited powers to control the number of game killed within their jurisdiction that were then brought to other states. In fact, hunters either would often kill large numbers of game and "fraudulently mismarked [goods] to avoid detection" as they transported them to other states or they would killed game during a state's closed season and mark the game as if they came from another state (Anderson, 1995, p 38).

Regardless of the scenario local and extra-local state laws were powerless to prosecute offenders because only the federal government holds the power to regulate interstate commerce. The act has been amended several times (1969, 1981, 1988, 2003 and 2008) throughout its 100-year history to extend protection to amphibians, crustaceans, fish, mollusks, and plant and plant products. Today it is seen as the nation's premier defense in fighting against nonnative species. The Secretary of the Interior[5] has the sole authority to assert species as "injurious to human beings, to the interests of agriculture, horticulture, forestry or to wildlife or the wildlife resources of the United States" (18 U.S.C. § 42(a)(1)). The authority for

[5] The Department of Agriculture formerly housed the Bureau of Biological Survey, which was a precursor to the U.S. Fish & Wild Life Service. The Service is currently housed within the Department of Interior and carries the sole responsibility of executing the Lacey Act.

listing is conferred upon the Service, which has a clear procedure for listing species as injurious under the Lacey Act. The Service issues a public notice asking for information to determine whether the species is injurious. Once it has acquired enough information "it will issue a proposed rule and conduct a notice and comment proceeding lasting between thirty and sixty days before deciding whether to issue a final rule listing the species as injurious" (Boothe, 2008, p. 415). Violation of the act ranges from fines to prison or both.

The Lacey Act both performs invasibility and creates space for actors' performances. It is a collection of statements that are designed to stabilize the boundaries between nature and culture in order to preserve culture. In addition to what I have written above, the act lists 236 species as injurious wildlife. It also proffers definitions for us to make sense of others and ourselves as we assemble worlds:

> As used in this subsection, the term "wild" relates to any creatures that, whether or not raised in captivity, normally are found in a wild state; and the terms "wildlife" and "wildlife resources" include those resources that comprise wild mammals, wild birds, fish (including mollusks and crustacea), and all other classes of wild creatures whatsoever, and all types of aquatic and land vegetation upon which such wildlife resources are dependent. (18 U.S.C. § 42(a)(2))
>
> The term "fish or wildlife" means any wild animal, whether alive or dead, including without limitation any wild mammal, bird, reptile, amphibian, fish, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, whether or not bred, hatched, or born in captivity, and includes any part, product, egg, or offspring thereof. (16 U.S.C. § 3371(a))
>
> The term "person" includes any individual, partnership, association, corporation, trust, or any officer, employee, agent, department, or instrumentality of the Federal Government or of any State or political subdivision thereof, or any other entity subject to the jurisdiction of the United States. (16 U.S.C. § 3371(e))

In addition to these terms, the act defines *import*, *law*, *plant/s*, *prohibited wildlife*, *State*, *taken*, and *transport*. Here definition works to demarcate oppositional worlds and spaces between human and nonhuman actors. *Wild* is in opposition to domestic, which functions along a long chain of limiting dichotomies (e.g. natural vs. unnatural, nature vs. culture, etc.) that structures how we come to understand the natural world. The discrimination between worlds is defined almost exclusively by physical geography. Still, what may be wild or uncontainable in one region, may be a prized resource in another (e.g. bighead carp in the Mississippi River vs. bighead carp in a fish farm). Taxonomy also poses a quandary when we consider definitions of *fish*, *wildlife*, and *plant/s*. The Lacey Act focuses on species from the animal and plant kingdoms. What are we to do in the case of *Batrachochytrium dendrobatidis*, an *invasive* chytrid fungus that causes the disease chytridiomycosis? This disease has been responsible for dramatic declines and extinctions of amphibian populations within Australian, the Caribbean, and North, South and Central America. *Batrachochytrium dendrobatidis*, however, is a fungus not a plant or animal. The Lacey Act only allows for regulation down to a certain taxa. So how do we deal with *Batrachochytrium dendrobatidis*? It only makes sense to ban all amphibians that carry the fungus (78 FR 56975-56976, September 17, 2010)!

In all of these instances, the Lacy Act controls the relationship between subjectivity and space by linking, creating, and authorizing spaces, actors, and activities. "Injurious wildlife" are not permitted to be imported into or shipped between "the United States, any territory of the United States, the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United

States" unless authorized for use in "zoological, educational, medical, and scientific" spaces pursuant to the "continued protection of the public interest and health" (18 U.S.C. § 42(a)(3)). A species is not wild or injurious if its transportation networks cannot be linked to the US. As innocuous as some of these terms and statements may seem, they each advance particular interests over others. Here science and regulatory agencies have interests in creating and maintaining a quasi- *jus solis* ("right of the soil") and *jus sanguinis* ("right of land") immigration system that includes a pathway to biological citizenship for some, visas for others, and outright entry bans for a few. It is these statements that the Service uses to guide their writing of notices of inquiry.

Act I. Scene IV.

SETTING: The Federal Register – The Daily Journal of the United States Government. July 23, 2003 – September 22, 2003.

The U.S. Fish & Wildlife Service publishes a notice of inquiry. They seek public comment on silver and largescale silver carp in order to make a decision on whether to list these species as injurious wildlife. (see supplementary appendix to review document in its entirety)

Act I. Scene V.

SETTING: The Federal Register – The Daily Journal of the United States Government. September 17, 2003.

After receiving a petition from 25 politicians, the U.S. Fish & Wildlife Service publishes a notice of inquiry. They seek public comment on bighead carp in order to make a

decision on whether to list it as injurious wildlife. (see supplementary appendix to

review document in its entirety)

Document No. 03-23745: The U.S. Fish and Wildlife Service is reviewing available economic and biological information on bighead carp (*Hypophthalmichthys nobilis*) for possible addition of that species to the list of injurious wildlife under the Lacey Act. The importation and introduction of bighead carp into the natural ecosystems of the United States may pose a threat to agriculture, horticulture, forestry, the health and welfare of human beings, and the welfare and survival of wildlife and wildlife resources in the United States. Listing bighead carp as injurious would prohibit their importation into, or transportation between, the continental United States, the District of Columbia, Hawaii, the Commonwealth of Puerto Rico, or any territory or possession of the United States, with limited exceptions. This notice seeks comments from the public to aid in determining if a proposed rule is warranted.

DATES: Comments must be submitted on or before November 17, 2003.

ADDRESSES: Comments may be mailed or sent by fax to the Chief, Division of Environmental Quality, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Suite 322, Arlington, VA 22203; fax (703) 358-1800. You may send comments by electronic mail (e-mail) to: BigheadCarp@fws.gov. See the Public Comments Solicited section below for file format and other information about electronic filing.

SUPPLEMENTARY INFORMATION: On October 16, 2002, the U.S. Fish and Wildlife Service received a petition requesting that bighead carp, black carp, and silver carp be considered for inclusion in the injurious wildlife regulations pursuant to the Lacey Act. The petitioners expressed concern that bighead carp could invade the Great Lakes from the Mississippi River basin, where they are established, through a manmade ship and sanitary canal. The petitioners, 25 members of Congress representing the Great Lakes region, are concerned that bighead carp, because they are voracious eaters, may impact food supplies available to native fisheries in the Great Lakes, which are already struggling against other invasive species. The petitioners also noted that the Great Lakes fisheries are valued at approximately $4 billion, and resource managers have spent decades trying to restore and protect them.

Bighead carp are native to southern and central China. They feed on plankton and prefer large river habitats. They can grow to maximum lengths of about 58 inches and reach sexual maturity at about 21.6 inches. In Asia, bighead carp typically spawn between April and June, and they often migrate upstream to spawn.

Bighead carp were imported into the United States in 1972 by a fish farmer who wanted to use them in combination with other phytoplankton-eating fish to improve water quality and increase fish production in culture ponds (Fuller, et al, 1999).

They have been used in many parts of the world as food fish. Bighead carp have been recorded from within or along the borders of at least 18 States…

This notice is issued under the authority of the Lacey Act (18 U.S.C. 42).

Act I. Scene VI.

SETTING: Lansing, MI. The Foster House. Spring 2013.

Donnie begins the next phase of his trace by focusing on the notice of inquiry (Document No. 03-23745) published by the Service in the Federal Register.

DJS: Document No. 03-23745 is an important actor in making bighead carp invasive. It operates as a gatekeeper through which other actors accomplish their rhetorical work. It is a boundary. If you remember from chapter 3, boundaries are the material and immaterial points between multiple spaces where at social practices, objects and actors are mediated. They manifest in the form of "stuff and things, tools, artefacts and techniques, and ideas, stories and memories" and perform different roles within networks (Bowker and Star, 1999, p. 298). The Service cannot make rules without public comment. The public cannot comment without the notice of inquiry. Bighead carp cannot be declared invasive without these actions. Document No. 03-23745 joins actors residing over disparate spaces and assembles their comments into a useful form that subsequently makes an invader. Document No. 03-23745 is a space of dependence due to its position. Translation occurs through this actor. Callon and Latour (1981) described the process of translation as "negotiations, intrigues, calculations, acts of persuasion and violence thanks to which an actor or force takes or causes to be conferred on itself authority to speak or act on behalf of another actor or force. 'Our interests are the same,' 'do what I want,' 'you cannot succeed without going through me'" (p. 40).

In fact, Document No. 03-23745 facilitates a long line of network-building. Actors perform their roles within their networks through enrollment of other actors. They assemble their carptologies within and around persuasive documents. Still of all the spaces of dependence that emerge in making invasive bighead carp, Document No. 03-23745 might be the most important. What identity performances can it be said to support? Literally, what spaces for performative activity does Document No. 03-23745 and its sponsors (e.g., the Service and the Lacey Act) create and exclude? This question can only be answered by looking at how actors respond to its architectonic statements.

Act II

Act II. Scene I.

SETTING: Arlington, VA. U.S. Fish & Wildlife Service Headquarters. July 16, 2003 – December 3, 2003.

The Service slowly receives letters from the public that offer recommendations on bighead carps' status in relation to the Lacey Act. (see supplementary appendix to review documents in their entirety)

Mike Freeze: I am a private fish farmer that raises bighead carp on my farm, Keo Fish Farm, Inc., and would like to comment on the proposed rule to place bighead carp on the list of injurious species under the Lacey Act. Although I am not surprised, I am disappointed that the Service is once again ignoring their own protocol by proposing to add another fish species to the injurious list without a formal risk assessment as was conducted for black carp […] The negative economic impact of listing the bighead carp as injurious is enormous and will not prevent a single bighead carp from swing up the Mississippi Ricer through the man-made Chicago ship canal and into the Great Lakes […] If bighead carp are listed as injurious, will a commercial fisherman be allowed to harvest bighead carp on the Iowa side of the Mississippi River and transport these live fish to the Illinois side of the river? Can bighead carp harvested in one state be transported live to a processing facility in another state?

B. Sachau: I do not know why it took so long to get this proposal out to people. I also think it is time to put a moratorium on all of the various species of animals that USFW allows to be imported. We need quarantines back. The recent SARs epidemic, as well as potential for foot and mouth, chronic wasting disease, and hemorrhagic disease means that we should stop the import of all birds, mammals or fish for a few years. We are living in terror filled times.

Dr. John Teem: If bighead carp enter the Great Lakes, it will most likely be through the Chicago Sanitary and Ship canal, despite the presence of the electrical barrier (and despite listing of the bighead carp as an injurious species). It may alternatively be argued that bighead carp shipped from the US to Toronto, Canada, may enter the Great Lakes through the live market trade. However, if the supply of bighead carp to Toronto is eliminated from the US, it will simply be substituted with foreign suppliers. Listing of bighead carp will thus have no practical consequence to limiting its spread. Because scientific data regarding the environmental impact of bighead carp on native species is lacking, it is not even clear to what extent these fish pose an environmental threat.

John D. Hoskins: Consequently, we are beginning to encourage commercial fishers and corporate interests to evaluate the profit potential in harvesting Asian carp. If such a capital venture were to occur, transportation of live or dead, harvested fish for processing would be common place along the interstate corridors of the Missouri and Mississippi rivers. Therefore, the proposal to list bighead carp as injurious wildlife poses a dilemma for natural resource managers in Missouri.

David McLeish: I am writing on behalf of the Council of Lake Committees (CLC) to support the listing of bighead carp (*Hypothalmichthys nobilis*) as an injurious species under the Lacey Act. The CLC represents the interests of all state, tribal, and provincial fisheries management agencies on the Great Lakes […] Unless listed as an injurious species, bighead carp will inevitably find their way into the Great Lakes and contiguous waters. The CLC trusts that, once completed, the barriers on the Chicago Ship and Sanitary Canal will block migrating Asian carp from entering our waters from the Mississippi River. Nevertheless, the Great Lakes remain vulnerable to bighead carp invasion through other vectors, such as live transport for food, baitfish and the aquaculture industry—directly, and as contaminants in shipments of other species.

Act II. Scene II.

SETTING: Washington, D.C. 1334 Longworth House Office Building. November 3,

2005.

The U.S. Fish & Wildlife Service has not made a decision on whether or not to list

bighead carp. For many the situation, especially in relation to silver carp, seems dire.

The 109th U.S. Congress' Natural Resource Committee's Subcommittee on Fisheries and Oceans Oversight holds a hearing on the "Growing Problem of Invasive Asian Carp in the Great Lakes and Mississippi River System." The hearing features testimony from representatives of the U.S. Fish & Wildlife Service, International Association of Fish and Wildlife Agencies, Great Lakes Fishery Commission, Wisconsin Commercial Fisheries Association, Catfish Farmers of America, and American Sportfishing Association. They offer their statements. (see supplementary appendix to review documents in their entirety)

Act II. Scene III.

SETTING: The Federal Register – The Daily Journal of the United States Government. September 5, 2006 – November 6, 2006.

The U.S. Fish & Wildlife Service publishes a proposed rule to add all forms of live silver and largescale silver carp to the list of injurious fishes under the Lacey Act. In response to their rule, they receive 116 "pertinent" letters. (see supplementary appendix to review document in its entirety)

Act II. Scene IV.

SETTING: The Federal Register – The Daily Journal of the United States Government. July 10, 2007.

The U.S. Fish & Wildlife Service publishes a final rule that adds all forms of live silver carp (Hypophthalmichthys molitrix), gametes, viable eggs, and hybrids; and all forms of live largescale silver carp (Hypophthalmichthys harmandi), gametes, viable eggs, and hybrids to the list of injurious fish, mollusks, and crustaceans under the Lacey Act. (see supplementary appendix to review document in its entirety)

Act II. Scene V.

SETTING: Washington, D.C. The U.S. Senate. July 9, 2009.

This follows his testimony before the joint hearing of the Subcommittee on Water and Wildlife and the the Subcommittee on Oversight of the Environment and Public Works Committee. The Hono. Sen. Carl Levin, D-Michigan, has introduced the Asian Carp Prevention and Control Act (S. 1421), legislation that would amend the Lacey Act, to prohibit the importation and shipment of bighead carp within the United States. (see supplementary appendix to review documents in their entirety)

Act II. Scene VI.

SETTING: Washington, D.C. White House. Oval Office. December 14, 2010.

In the Background, President Barack Obama signs the Asian Carp Prevention and Control Act as reporters and Council on Environmental Quality Chair Nancy Sutley watches to his left.

Act III

Act III. Scene I.

SETTING: Lansing, MI. Foster House. Spring 2013.

Donnie sits at his computer with Microsoft Word open. He writes a summative analysis of the letters he received from his FOIA request from the U.S. Fish & Wildlife Service. It is freezing in his house.

DJS: Ultimately what made bighead carp invasive was the US Congress and President Obama through the Asian Carp Prevention and Control Act. The legislation added bighead carp to the list of injurious wildlife covered under the Lacey Act. Their actions might seem disconnected from the rulemaking process; however, it

was their frustration with the process altogether that inspired their movement. Still, let us keep our focus on rulemaking. There were several questions that I had regarding Document No. 03-23745's connection to the Lacey Act and how decisions are made within the complexity of spaces that fall within the arena of rulemaking. Is the process a scientific or economic process or a combination of both? How can we characterize the data used to make decisions regarding invasibility? And who/what participates (and who/what remains or is forced to be silent)?

In order to investigate these questions, I wrote a request under the Freedom of Information Act to the Service requesting material not limited to comments and letters written to the agency during three public comment periods regarding bighead, silver, and larger-scale silver carp (see Appendix C). The agency responded by sending me 162 letters with attachments that accompanied a few letters from the three public comment periods regarding bighead, silver, and larger-scale silver carp. 44 of those letters were connected to the bighead carp commenting period. A quick textual rhetorical analysis of the documents reveals a stark contrast between the tenure of the conversation in comparison to the silver carp commenting periods. There was not a lot of support for listing bighead carp as an invasive species. In fact, overwhelming support leaned in favor of not listing the species. Furthermore, there were no gray areas; actors were either for listing or against.

It is important to consider how human and nonhuman actors organize themselves in relation to social situations when looking at these letters collectively. This necessitates marking patterns of collective commitment born from actors' perspectives and what they hope to achieve through collective action via their

dedications to space. During the comment period regarding the listing of bighead carp, two distinct oppositional spaces emerge as important in defining bighead carp's identity, the "Aquaculture Industry" and the "Great Lakes" (see Figure 3: Social World/Arena Map: Arena map displaying actors in relation to their spatial commitments during the bighead commenting period. This image does not conform to the Michigan State University graduate school's guidelines; therefore, I had to remove it from the dissertation. Please contact me at donniejsackey@gmail.com in order to receive a copy of the image.). The former comprises entities with attachments to various southern states (Arkansas, Missouri, Mississippi, and Florida) and bodies of water (Mississippi River and Missouri River). The latter includes entities associated with Great Lakes through either states surrounding the region or bodies of water. A single boundary space emerges between the two as a quasi-space of dependence and engagement in relation to bighead carp—the Mississippi River Basin. Here the actors refer either to the Mississippi River or more abstractly as the area below the Chicago Sanitary and Ship Canal or both.

Through the analysis of letters and my discussions with various actors involved in the Service's rulemaking process, the most interesting network-building occurs via the aquaculture industry and the Great Lakes. The primary matters of concern within these spaces of dependence regard 1) whether aquaculturists can safely farm bighead carp; and 2) whether bighead carp actually pose a threat to the Great Lakes via transportation vectors. Rather than focusing on every letter written during the public commenting period, I want to focus on two letters that best represent each space with respect to the matters of concern that I highlighted above.

Let us consider two actors and how they assemble their carptologies in relation to their commitments to space. I will try my best to treat them as separate; however, I will periodically note the critical (and unexamined) nodes where they're linked.

Carptology no. 1: Aquaculture—Mike Freeze, KEO Fish Farm

How do fish farmers understand bighead carp? How is this represented in the networks they construct? What relations seek to disrupt and destabilize fish farmer understanding of bighead carp? Consider the following statements: "The negative economic impact of listing the bighead carp as injurious is enormous and will not prevent a single bighead carp from swimming up the Mississippi River through the man-made Chicago ship canal and into the Great Lakes" and "If bighead carp were listed as injurious, will a commercial fisherman be allowed to harvest bighead carp on the Iowa side of the Mississippi River and transport these live fish to the Illinois side of the river? Can bighead carp harvested in one state be transported live to a processing facility in another state?"

I chose the excerpted statements from his letter because they best represent the complexity of the argument that originates from the space of aquaculture in terms of how we should understand making. Mike, like most aquaculturists, frame bighead carp's identity solely within the purview of economic understandings. Bighead carp are not a problem for him. The real problem regards regulatory procedures and legislation. Of concern are both the ways in which bureaucratic actors link to the spaces of dependence of fish farmers and the many levels at which they fail to make connections. To bolster the case of why bighead carp is not an invader, he gathers a network that features writing actors such as the Lacey Act and

Document No. 03-23745 (see Figure 4: Actor-network map: A network map of how Mike realizes bighead carp's non/invasive identity. This image does not conform to the Michigan State University graduate school's guidelines; therefore, I had to remove it from the dissertation. Please contact me at donniejsackey@gmail.com in order to receive a copy of the image.). Here we have a fiscal carptology built from legal frames works that denote why bighead carp are not invasive and why actions to label them as invasive emerge as problems. I will walk you through this network, which is based both on my conversation with Mike and his letter.

Let us begin from the position of Mike's reality. This means acknowledging the links that stabilize carp as non-invasive. Although he does not state this directly, Mike distinguishes between *wild* and *farm-raised* bighead carp in both our conversation and his letter. The distinction between the two is important and gets to the heart of the aquaculture industry's concern with listing. *Farm-raised* bighead carp exist within containers. As stated in the previous chapter, they are a helper species used to control the taste of catfish bound for markets and they are also sold as food here in the US and abroad. If there is legitimate risk regarding invasion of the Great Lakes, it is not from these actors. They do not exist within the main waterway networks that connect to the Great Lakes.

For actors who use the Lacey Act to frame these carp as invaders, their spaces of dependence lie between the markets and the farms. Trucks, roads, boats and other vessels located near bodies of water become an unnecessary risk. Disrupt these networks and you suspend the invasion. Still, what does this do for *wild* bighead carp, which are also fished for sale at markets? *Wild* carp have freely

roamed the waters below the Great Lakes for decades. While listing would most definitely stop the unlikely transit from the aquaculture industry, it's not as if *wild* carp will automatically become regulation abiding entities. They remain free to travel. Disrupting transportation also presents the consequence of making a legal business practice (constitutionally-protected through interstate commerce law) illegal with the issuing of a final rule.

At this point, statements become critical with respect to how the Service will write the final rule on bighead carp. Both the Lacey Act and Document No. 03-23745 take center stage for Mike and other fish farmers. I have written about the significance of the distinction between *wild* and *farm-raised*; however, *alive* and *dead* add a new layer of regulatory complexity. This is best illustrated in Mike's second statement I excerpted above. Most fishing boats in the Mississippi River Basin are not factory ships. Instead, commercial fishers are largely dependent on kill facilities. Yet, a condemned Illinoisan fish traveling the last mile to a death chamber in Missouri is a serious matter of concern. The problem is not transporting the fish from water to land where it may potentially find uninvaded spaces. It is actually transportation across the invisible boundary that Missouri and Illinois share along the Mississippi River. Any bighead carp caught in Illinois must be dead before it arrives in Missouri; otherwise a fisherman has committed a misdemeanor or felony. This may sound arbitrary and highly unlikely; however, I can assure you that it represents a legitimate level of concern, especially when penalties for violating the Lacey Act's authority can amount to a felony conviction with a possible prison sentence of up to five years and/or a $250,000 fine for an individual.

Additional statements from the Lacey Act affect how fishermen perform their identities and bighead carp. The difference between a misdemeanor and a felony hinges upon two words—*knowingly* and *should know*. When Congress amended the Lacey Act in 1969 to broaden its scope, liability covered violations committed *knowingly* and *willfully*. In 1981, Congress removed *willfully* when they joined the Black Bass Act of 1926 with the Lacey Act. The change in language occurred to ease prosecutorial efforts (Anderson, 1995). While Congress would amend the act in 1988 and 2003, they acted to amend it again in 2008 to address the mislabeling of protected plants. Part of this amendment involved a minor tweaking of language that read as follows:

> knowingly engages in conduct prohibited by any provision of this chapter […] *and in the exercise of due care should know* that the fish or wildlife or plants were taken, possessed, transported, or sold in violation of, or in a manner unlawful under, any underlying law, treaty or regulation.

According to Mike, this was a change that the Service made in conjunction with Congress without alerting the aquaculture industry. "It's one of the things that we'd like to get changed back is the language that said that the perpetrator who was doing this [transporting banned species] had to *knowingly* violate the law [inaudible] and now it says *should have know* that he was violating the law," Mike said. "That's a huge legal difference, because what we used to tell people in the 80s and 90s…is that ignorance was excused" (my emphasis). For example, prior to the 2008 amendment, if a catfish farmer had a bighead carp in his truck and he was unaware of it before officials had discovered it, then the burden of proof would be on the official to prove that the farmer knew he was violating the law. What seems

like a minor change in language switches the burden upon the farmer. Fishing bighead carp and farming catfish through catfish-bighead polyculture become very difficult. Here an actor's statement composed to regulate the spaces of the logging industry enrolled aquaculture (and other spaces) with the consequence of transforming farmers into criminals or potential criminals. For aquaculturists, the stability of their spaces of dependence looms largely on key terms within the Lacey Act, which also serve as spaces of dependence for actors wanting to list bighead carp as injurious.

So far I have focused on actors that are present and actively *writing* to affect realities. There are others who have not been enrolled into networks that denote bighead carp's invasibility. For aquaculturists, if these network elements are not enrolled then the species is not legally invasive. In his letter, Mike lists four technical objects that are necessary in bringing together the heterogeneous networks that would form an invasive identity: 1) an environmental impact assessment, 2) a cost-benefit and economic analysis, 3) an analysis as dictated by the Small Business Regulatory Enforcement Fairness Act (SBREFA) and 4) a Regulatory Flexibility analysis as defined under the Regulatory Flexibility Act. I will not go into a long explanation of what each of these actants do. What I will say is that they each work independently to modify our understanding of bighead carp; however, it is necessary for the Service to join them into a single network through Document No. 03-23745. This is mandated by the rulemaking procedure. Yet, the service issued the notice of inquiry without these nonhumans. "Is the addition of a species to the injurious list without a formal risk assessment going to become a 'normal

procedure' for the [Service]," Mike said. "This rule will have a significant economic effect on a substantial number of small entities." Through his network building, Mike illustrated that in rulemaking, the Service broke its own rules and this puts fish farmers at a disadvantage in the rulemaking process.

Carptology no. 2: The Great Lakes— Bernard Hansen, Great Lakes Fishery Commission

While fish farmers position bighead carp as a non-issue and regulatory procedures as invasive, other entities work from their own space to construct an invader identity for the species. Mull over the following statements: "Bighead carp pose a significant threat to aquatic communities and to fisheries of the Great Lakes" and "The Great Lakes remain vulnerable to bighead carp invasion through other vectors, such as live transport for food, baitfish, and the aquaculture industry—directly and as contaminants in shipments of other species." These statements position spaces contained within the Great Lakes as important spaces of dependence. They also rhetorically construct the space of aquaculture as a harmful set of heterogeneous relations that can destabilize the network that composes the Great Lakes. Literally aquaculture makes bighead carp invasive (see Figure 5: Actor-network map: A network map of how realizes the Great Lakes Fisheries Commission understands bighead carp's non/invasive identity. This image does not conform to the Michigan State University graduate school's guidelines; therefore, I had to remove it from the dissertation. Please contact me at donniejsackey@gmail.com in order to receive a copy of the image.).

Still, how does Bernard as a representative of not only the Great Lakes Fishery Commission (GLFC) but also the larger imagined community of the Great Lakes convey this reality of an invasive species? The rhetoricity of this network hinges on value, the value of the Great Lakes to be exact. Whether it is this letter, statements from other entities responding to Document No. 03-23745 or his statements to me, the monetary worth of the region (estimated anywhere from $4-7 billion) and the ecological sensitivity of the region is often touted. These two descriptors serve as heuristics for human and nonhuman writing actors. Even Mike raised this figure as an issue for aquaculture during our interview saying, "People will throw out these grandiose numbers of hundreds of millions or billions of dollars, and they really don't have the data to back it. It's not peer-reviewed data." Mike did not read GLFC's letter, but his statement is a perfect illustration of the rhetorical work that these writing objects do upon disembarking from their sponsors.

There is no exact monetary value for the region. In fact, the final appraisal depends upon what actors incorporate within their ontological frameworks. For example, some include recreational boating, sportsfishing, swimming, and aesthetics; others focus exclusively on commercial fishing. For GLFC, the region's significance is wholly associated with the "fishery," which includes commercial and recreational fishing. Bernard states without equivocation, "Bighead carp have little economic or sport value compared to Great Lakes fishes, which support a fishery valued up to $4 billion." Allowing the vectors that create stable links to the Great Lakes to exist is a tacit devaluing (or lack of value recognition) of the space. Here

what make bighead carp invasive are the associations in space between the Chicago Sanitary and Ship Canal and the aquaculture industry. While ecological separation will physically stop carp trafficking, how aquaculture performs bighead carp needs to be made illegal. With a simple statement, the Lacey Act can separate this portion of the industry's network from the Great Lakes.

Ecological sensitivity weighs heavily in performing bighead carp. For actors that reside in Bernard and GLFC's space, one cannot understand bighead carp without taking into account "illegals" that have made a home in the Great Lakes and the associations that they have brought with them. "If bighead carp are allowed entry into the Great Lakes and connecting waters, we expect that the species will quickly and extensively establish itself in the Great Lakes and connected waters, as have other invasive species such as zebra mussels, gobies, sea lampreys, and alewife," Bernard stated. "[They] exacerbate the ecological damage now being exacted […] by recent invaders—in particular the filter-feeding dreissenid mussels and the *predaceous* cladocerans, *Bythorephes* and *Ceropagis*" ("predacious," my emphasis on). We should just call this guilt by association. Think of this as gathering enough relations of other invasive actors to make a convincing case of why bighead should be listed as invasive.

Do we have enough room for this species? There is a limited amount of resources and these resources have to be shared between foreign species that will not leave and natives. Now does this mean that if these actors were not present, would GLFC be against listing? Not necessarily. There are other associations that threaten the Great Lakes' value and raise bighead carp as an issue, spring viremia to

be exact. “While bighead carp itself would constitute an undesirable addition to Great Lakes fauna, its continuing importation also can introduce pathogens as ‘contaminants” Bernard’s letter reads. Spring verimina is a viral disease caused by the RNA *Rhabdovirus carpio*, which has been responsible for significant mortality in carp species. The first confirmed discovery of the virus, “apparently an Asian genotype,” in North America in 2002 was a source of unease for GLFC. The concern was for the affect bighead carp would have on “native species such as northern pike and cyprinids, including threatened and endangered species.”[6] Its one thing to destabilize space by using resources intended for others and displacing natives to make space for oneself, but to bring a disease is another matter of concern entirely. If the presence of spring verimina is a concern, then why list only bighead? Why not common carp? Do northern pike also become an issue because they are not only affected but also transmit the virus? While the Lacey Act can indeed limit carp’s movement by way of aquaculture, it does little to stop spring verimina.

This weak linkage between the virus and other actors is critical. It is at this point that we can begin to answer the question of what makes bighead carp invasive. Bernard writes, “While we appreciate the Service’s current solicitation of information about threats posed by bighead carp, we believe that such information is more effectively deployed as a screening process prior to importation rather than

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[6] There is an interesting rhetorical construction occurring with this statement that you would not realize if you were not a scientist. Cyprinids (or cyprinidae) are a large family of freshwater fishes. There are some that are native to North America, but most members reside in Asia. The name comes from the Greek *kyprînos*, which means “carp.” In fact, all the cyprinids in North America listed as affected by spring viremia are not native. This includes bighead and silver carp.

in declaring a species injurious once here." It's the absence of a technical object—a screening process—that makes GLFC's reality of carp possible. Bighead carp with its associations cannot become invasive if we have a mechanism in place to prevent its enrollment into various networks. Once again, Document No. 03-23745 and the Lacey Act take center stage. The only tool that actors have at their disposal to deal with invasive species like bighead carp is the Lacey Act. The act and the accompanying rulemaking process exist to addresses matters of concern, but they are actually responsible for making bighead carp. Here I mean making not by the issuing of a final rule declaring their status. Instead, I mean making by not preventing them for entering the U.S. I noted with aquaculture how the Lacey Act is a matter of concern. It is also an issue for GLFC and other actors who reside in the space of the Great Lakes.

I also want to speculate on the fundamental question of value between networks. We have actors with dedications to disparate spaces fighting for the primacy of the value of bighead carp in relation to aquaculture versus the value of the Great Lakes in relation to bighead carp. How is public deliberation supposed to successfully occur when actors fail to acknowledge each others' understanding of value? Is it the fault of the Service, which did not design Document No. 03-23745 to goad actors to engage in meaningful discussions of value? Or is it the Lacey Act that does not make such considerations part of the rulemaking process? This all hinges on a single statement from Document No. 03-23745 that states the "Service is reviewing available economic and biological information on bighead carp." The communication channels during the rulemaking process are a many-to-one

relationship. The Service has to take on the task of weighing actors' sense of value and translating that value into new networks that denote why carp is *or* is not invasive. There are no additional conversations that happen around the letters. They simply speak for themselves and as representatives of their organizations. The bridging of space occurs via letters and supplemental documents. This is the moment when the Service's regulatory power becomes an issue for aquaculture and the Great Lakes.

De-linking/Linking

Should we really be concerned with bighead carp? The exploration of two competing versions of reality and seemingly disconnected spaces raises a single point of importance between actors. Through the exploration of space, the Lacey Act emerges as a space of engagement. It is literally the location where a bridge between two competing realities can be made. Still, despite actors either directly or indirectly pointing to the act as being an issue with respect to how they understand carp, why does the connection between spaces remain unrecognized? Social groups construct boundaries around themselves to sustain their own conditions of place, which is co-terminus with identity. It is only natural that they erect boundaries. The formation of boundaries around places whether physical mental or psychological is linked to reactionary politics that authorize actors to dwell only within their ontological space and exclude and devalue others (Escobar, 2001). How can we construct spaces through a non-reactionary/non-exclusionary politics?

We could do away with the Lacey Act and replace it with a screening process that looks similar to the current rulemaking process. Still, that does nothing to bring

actors together—to make them encounter each other's realities and coordinate their activities. It might be best to rethink how rulemaking takes place. Rather than having the current system—a many-to-one relationship—where the service is in the position of receiving and processing information, it might be best to facilitate conversations in which stakeholders must engage with each other. This many-to-many configuration raises story as a means of linking units and creating new associations across space.

Any method that focuses on the relationships between various entities has to be attentive to location and how spaces and places often affect the nature of relationships. In my opinion, Michel de Certeau provides a way of navigating locations and connecting disparately-fragmented/seemingly-unconnected spaces. In speaking about place he writes:

> Places are fragmentary and inward-turning histories, pasts that others are not allowed to read, accumulated times that can be unfolded but like stories held in reserve, remaining in an enigmatic state, symbolizations encysted in the pain or pleasure of the body. "I feel good here": the well-being under-expressed in the language it appears in like a fleeing glimmer is a spatial practice. (de Certeau, 2002: p 108)

The notion that places are fragmentary is another way of saying that place exists a multiple depending upon the perspective of an agent. Stories can be the structures that serve as meeting points between spaces. In providing the metaphor of the train, de Certeau talks about the window—"the partition [that] makes noise" yet "creates two inverted silences" (112). With this he signals that spaces often exist as fragmentary and separate, but it is the stories (spatial stories) that exist to connect these spaces. It is difficult not to think of Guinsatao Monberg's work on listening and Lowe's notion of sedimented space in relation to de Certeau's idea of the partition.

These interstices are the locations where meaning exists for users/travelers. How people (physically/cognitively) move within and between spaces can reveal how they relate to spaces, other people, and things. We have to make use of these relations to allow for better deliberation around environmental issues.

CHAPTER 6. MAPPING COMPLEXITY: RE-TOOLING ENVIRONMENTAL RHETORICS

I want to end this dissertation where I began—in a museum. In Fall 2012, I taught a course entitled, "Nature, Environmental, and Travel Writing." The course is housed in the Professional Writing program but it is also cross-listed as an intensive reading/writing experience for Fisheries and Wildlife students. I was given free reign to completely revamp the syllabus. Since, my dissertation is very conscious of writing space and how we write in space, I wanted to re-design the course so that my students and I could trouble what environmental, nature and travel writing are as genres, but also interrogate the often unexamined cultural epistemologies and ontologies that these writers rely upon. Earlier constructions of the course focus on traditional nature writers like Aldo Leopold, Charles Darwin, and John Muir. I did not want to make a course where we simply stylistically analyzed these writers' text. Instead, I wanted to design a course that would allow students to interrogate how writers like these are designing an experience for their audience that is reliant upon distinct cultural positions be they tacit or acknowledged. This worked doubly because it also forced them to consider the systems that they use while writing. Whether we read non-fiction, travel guides or environmental impact statements, I consistently repeat that professional writing (especially in relation to environmental issues) is about designing space and there are affordances and consequences that come with our spatial practices as writers. Aside from the course being a survey of genres, my vision was to encourage students to realize that as professional writers they are designing experience.

For one unit, I took my students to an exhibit at the MSU museum's Heritage Gallery titled, "Echoes of *Silent Spring*: 50 Years of Environmental Awareness." We had just read a couple chapters from Carson's book, as well as writing from her critics, and the work of others who had analyzed the entire controversy surrounding the book. The purpose of the exhibit was to examine the larger ecology of *Silent Spring* by situating it within the context it was written and its affects subsequent to publication. Adding another layer of complexity to the exhibit is the connection between the book's content and Michigan State University. Her most famous case study examined how *dichlorodiphenyltrichloroethane* (DDT), which was used on campus to fight the spread of Dutch elm disease, indirectly caused the deaths of birds, particularly robins. This was primarily facilitated by the efforts of MSU ornithologist George Wallace and his students, who collected, documented, and tested dead and dying birds for the insecticide.

There was a rich layering of stories within the exhibit. Within the confines of this space, multiple actors and their worlds emerged to connect and either bolster particular realities or lay waste to them. This presented a great opportunity for the students to reflect upon the relationship between the spaces of texts to the physical world. Literally, how is it that designers make bridges to create meaning and facilitate understanding especially as they must navigate complexity? The ultimate goal was twofold: 1) to recognize that we can critique constructions of place at multiple levels of abstraction and that such analytical moves are a necessity; and most importantly, 2) to make inferences into how writing can allow us to remake place and offer new possibilities for travel between realities. If the act of questioning

space and arrangement is the analysis of the dynamics of culture through the understanding of power via race, gender, economic and ableist privilege, then attempts to reorder relations through rhetoric and writing become the work of justice—environmental justice.

This might sound weird, but I had to teach this class in order to understand and assemble ideas about the environmental rhetoric tradition, which I had been wrestling with for quite some time. Here I am talking about disciplinarity, theory, methodology, and pedagogy. I offered in the introduction three issues with which environmental rhetoric scholars should concern themselves. This entails a turn toward ontology, engagement with complexity, and a shift from analyzing rhetorical practice toward envisioning rhetoric as a corrective to solving environmental crises. You have seen me practice these things within the spaces of this dissertation. For me, rhetoric is an assembly of texts, nontexutal practices, people, institutions, and objects that exist in complex networks that transpire across multiple geographies. We have to situate texts within the networks and orders they exist in order to make claims about rhetoric. This also means that we have to be willing to consider the multiple roles that texts and other artifacts assume in forming the social. Sometimes they are objects (e.g. Consider how any actor's letter in the previous chapter functions as an intellectual technology for rhetorical purposes. Actors compose these technologies using a variety of calculating devices which includes but is not limited to instruments, measurements, and other accounts.); sometimes they are actors (e.g. Consider how the same letters assume lives of their own and either practice their authors' politics long after their authors have gone or seemly adopt

new characters as they move through new spaces.). Nevertheless, we should not be in the business of favoring one view of a thing over another. We should commit ourselves toward exploring the multiple identities of a thing and investigate how these realities coalesce to produce the thing itself. Seeing a letter as an actor and actant simultaneously is important because each identity renders a different analysis and fundamentally provides alternative ways of addressing a problem (e.g. Do we make interventions at the point at which actors are writing letters to encourage actors to make certain design considerations? Or do we make interventions after letters are written by augmenting the systems that facilitate engagement with the realities of others where documents are made to speak for others?).

Therefore, incursions into ontology should speculate 1) how nonhumans (e.g. texts) create environments; 2) how they work in concert with other subjects to create realties; and 3) how multiple realities co-ordinate (relate) with others? These ideas, which I have wrestled with for some time, are principally about a different orientation to scholarly practice within the environmental rhetoric tradition. I want to articulate further what I means with those sentiments:

i. There has to be a reconsideration of subjectivity. This entails moving away from an object-view of nonhumans that indirectly assigns agency to people and adopting an understanding of nonhumans as actors that participate with people and other nonhumans in order to make reality. Once again, I am asking that we rethink arguments such as *guns kill people* versus *people, not guns, kill people* and opt for

considering the ways in which people and guns kill together. Agency is not a property that lies squarely in the hands of humans acting as subjects. Instead, agency is distributed amongst multiple actors in a network. The performance of one actor cannot take place unless others perform their roles accordingly. Consider Kohler's (2002) study of people, places, and practices of field biology during the early 20th century as an example of not only how humans made knowledge through manipulation of the nonhuman environment but also how the nonhuman environment, as an intrusive agent, has interrupted and altered scholarly practice to produce knowledge. It is a discursive process and our writing research should account for that. So when providing a particular account, environmental rhetoricians (especially those of us interested in environmental history) must take care not to frame scenes as if science/people are controlling nature, but should consider the extent to which nature affects people and scientific practice; let's stop reproducing narratives of anthropocentric triumphalism over nature.

ii. My second and third claims are deeply interrelated, so I have merged them here. Environmental rhetoricians must engage with the multiple knowledges or realities associated with a particular subject. Rather than producing "flat-world" accounts, we should engage with complexity to create multi-dimensional accounts of our subjects of study. This is a call to move away from monolithic analyses of

environmental issues and consider how agents and events that are located either in other spaces or on the periphery of what may seem like the center of our research focus contribute in meaningful ways to shape an environmental issue. The ontological politics of environmental rhetorics acknowledges two meta-spaces that humans occupy—a biosphere, consisting of the Earth and its atmosphere that ensure life, and a semiosphere, consisting of discourse that provides meaning to life in the biosphere. Within the tradition, only ecocomposition has acknowledged these two spaces as mutually-dependant. The biosphere can be segmented into multiple realms (realities)—political environments, electronic environments, economic environments and natural environments, but analysis of these spaces are rarely seen in relation to each other. This signals that ecompositionists' analyses of environment often fail to engage in complexity that moves beyond sites and make inquiries into how other spaces also affect how a text develops or why positions in environmental phenomenon vary greatly among stakeholders.

The shift toward moving away from epistemology (e.g. what is knowledge) toward ontology (e.g. what knowledge represents) is a crucial shift in solving environmental problems. I have offered a few accounts of how Asian carp exist in multiple within this dissertation. Telling these stories is a means of accounting for realities that are

> purposefully not made a part of the official narrative regarding what *is* Asian carp or are often treated as separate issues entirely, but nevertheless contribute to the complexity of the issue we face in the present. Why should we understand Asian carp as invasive purely through the lens of science, without attending to the ways in which science makes use of legal institutions to do its work? Alternatively, how can we understand carp as being economically invasive without considering the work scientists and aquaculturists accomplished in the 1970s to make to construct carp as economically and environmentally beneficial? Ontological work is messy, but I am skeptically of neatness to the extent that I am concerned with what is not accounted for. By telling and engaging with these multiple accounts of carp, we can begin to practice an environmental rhetoric of possibilities. Here we can assemble the full range of relations in all their complexity and consider rhetorically responsible ways in which we can engage with the worlds of others and devise solutions that benefit stakeholders in a way where there are not winners and losers in rhetoric. I tell these stories about carp not as some postmodern exercise, but to explicate the problem of what happens when we elevate certain realties and screen out others.

The first step toward achieving this vision regards deliberation over the definition of what constitutes an environmental problem (e.g. what is Asian carp). How we *see* environmental problems is the result of distance. This is an issue for researchers

and stakeholders. Environmental problems often present themselves (or we present them) in the form of local versus global concerns. Distance through this dichotomy is important. The assumption has always been the more global the greater the complexity of the problem; the more local the simpler the problem and the easier it is to address. A good example would be littering versus global climate change. A person in New York may not care about trash lying on the sidewalk in Detroit, because of distance and a feeling that the trash does not affect his or her space. Alternatively, a New Yorker is likely to have a dissimilar response if he or she believes a new trash incinerator in Detroit contributes to the climate phenomenon that has seen warmer than usual temperatures. The carp drama recapitulates the local vs. global conundrum in many ways within this project itself. For example, for years carp have been a nuisance species in the lower Mississippi Basin. There has never been enough attention focused on efforts to mitigate the problem in the lower Mississippi Basin. Now that carp are said to be at the door of the Great Lakes, there is very little incentive for actors residing in spaces such as Mississippi, Louisiana or Arkansas to stop the movement of carp, especially if the effort does nothing to mitigate the problem within their own spaces. Their response is also partial to Great Lakes actors' success at defining carp as a local concern to them rather than a global concern that affects all. In his thoughts on the politics of historiography, Mao (2010) asked us, as a discipline, to consider how our choice of study is indicative of our ideology. Following Mao's recommendations, I am moved to consider how this dichotomy serves to limit scholarly practice as it plays out within the environmental rhetoric tradition. If we are going to deal in the ontology of environmental problems

through the lens of complexity, then we have to address how our use of scale affects the ways we see and act. The point here is that we cannot see an environmental problem as limited to a particular space. In fact, we have to venture beyond the initial site to other spaces in order to understand the practices we see. Why is it that carp only becomes an issue when we see it as a Great Lakes concern rather than a concern for other spaces? The problem here is that when we define the issue so locally, we make design decisions that that are tied exclusively to local concerns that do not adequately address the ways in which multiple stakeholders hold interests in a single space (e.g. the Chicago Waterway System) across scale. Ecological separation between the Chicago Waterway System and the Great Lakes is a solution that benefits the Great Lakes community; however, it ignores entirely the fact that commercial shippers and a host of other industries are reliant upon the waterway system to move goods. As researchers, just because Asian carp are defined as an issue that affects the Great Lakes, does not mean that space should be the center of our analysis. Roping off the scene of the social to specific areas reduces complexity and simplifies solutions in a way that benefits a few rather than many. The reconsideration of how we deploy scale as unit of measure definitely would affect how we approach the analysis of environmental problems, but it might also present avenues through which we can transform even the way we teach environmental rhetoric—specifically, as it relates to civic engagement.

It is easy to see how scale works within and outside environmental rhetoric with respect to how we think about green culture. The collective understanding of local is best understood via the slogan "Think globally, act locally." This is the idea

that small activities in your place essentially add up to global change. Environmental rhetoric has made use of this idea and deployed it through its study of environmental issues. In contrast to local, environmental rhetoricians have used global to denote problems that permeate outside of local and national (or regional) boundaries and attempt to connect with a larger culture comprised of several large and small cultures. Killingsworth and Palmer (1992) provide an insightful heuristic toward understanding global as a categorical distinction by locating a definition within the circles of economists and social ecologists. Accordingly, globally effective discourse promotes "universally acceptable values" has "strong inducements to constructive action" and always targets what would benefit the "global ecosystem" (Killingsworth & Palmer, 1992, p 240). As I have said in the introduction, this is why I find a study of Asian carp so compelling. Asian carp as invasive species cannot be understood solely through the lens of science, legal apparatuses or aquaculture. As an environmental problem they are a collection of constellated performances. To flatten space and take a more global or local approach to studying this crisis does not responsibly attend to the multiple ways in which carp materialize and the full range of possibilities for solutions that attend those realities.

When I use scale, I am leveraging a term that in many ways serves as a component within the foundation of geography as a discipline. Scale refers to a theoretical system of measurement within geography in which differentially sized and bounded units (e.g., local, regional, global etc.) are arranged within a set hierarchy (e.g., big to small: local to global) as a means of describing relationships and the flows of power between agents residing within oppositional units (Agnew,

2003; Brenner, 2005). Scale and its value within geography has been the subject of theoretical discussion as it has continued to place geographers at odds with each other for the past two decades. While there are some who have argued for and demonstrated the necessity of scale (Jonas, 1988, 1994, 2006; Jones and MacLeod, 2004; Harvey, 1998; Massey, 1994; McDowell, 1999; Smith, 1984, 1992, 1993; Swyngedouw, 1997, 2000, 2004), others have regarded scale as nothing more than an operationalized measure or "intuitive fiction" made fact (Escobar, 2007; Howitt, 2002, 2003; Jones, 1998). What my study does is make an argument for studying the interactions between human and nonhuman actors across multiple sites. I do not make any assumptions about how spaces are ordered. Employing hierarchies in the study of spatial relations (e.g. decisions regarding which sites matter and which do not, or excluding certain units within sites from the purview of analysis) limit the possible of entry points for practicing progressive politics. My focus on the rule-making process in the previous chapter stands as an example of this. Studying how a solitary actor (e.g. Lacey Act or Document No. 03-23745) functions as it shuttles between spaces within individual realities presents the possibility for making new connections across social sites that proffer solutions to problems that satisfy the concerns of multiple stakeholders. I have found much value in the work of geographers who position themselves in opposition to scalar measures, because they question the use of a measure that predetermines relationships between agents and their respective spaces before one arrives at a site of study rather than theorizing alternative movement that adequately accounts for how power travels across geographies through horizontal flows via networks.

The move to envision networked accounts of travel across locations within human and cultural geography is a step toward rethinking scale and its relationship to scholarly practice. This is predicated on the belief that it is impossible to define scalar units, that is to say, scale is unreliable and therefore not a useful metric for theorizing how the world works. Specifically, we can best understand this point-of-view by raising a question, what is local/global, which has never been answered in a way that does not appear to operationalize definitions within the scholarship—at least that is how Marston, Jones and Woodward (2005) understood it in their read of geography as a discipline. Similarly, I find that I am skeptical of how environmental rhetoricians employ scale. The problem with definitions like what Killingsworth and Palmer offer (e.g. global = "universally acceptable values" or "act locally, think globally") is the fact that they lack a sense of cultural and social sensitivity. They elevate global over local by instituting a hierarchal ordering of scales that denotes a certain sense of importance of global concerns over local concerns. Moreover, they also assume that local can be measured in material actions (e.g. recycling, campaigning, letter writing) that build-up over time to create universal (or global) change. Here local serves as action-space whereas global becomes thinking-space. What definitions like this ignore is the extent to which a local site is an amalgamation of many sites. They also keep our attention on vertical flows of power rather than allowing us to look horizontally to ask and see how other localities affect what is happening on the ground. There has never truly been interest in defining what makes a location local or pulling at the complexity of sites that would force us to think of multiple geographies and alternative relationships

within and outside of the local or global contexts in which we situate our work. It merely appears that its standard practice to use local and global because they are forms that have been handed down for us to deploy without question. The underlying mantra here is "have scale, will travel." There is little thought of how the form and how our reliance upon form can be an impediment toward either understanding environmental phenomena and their constitutive practices. We merely trust that the form will generate the appropriate content (White, 1990; Marston et al., 2005).

We need to approach the study of environmental rhetoric through site ontology. This in itself would move us away from scale as it asks us to think about what defines a space without applying a preconceive descriptor to that area (i.e. naming a site local without knowing what makes it local or even having to rely upon the term). Thus we are not recapitulating ideas of top-down/bottom-up movement (i.e. arguing that the global affects the local or vice-versa) or the idea that certain boundaries exists to partition specific geographies from others; instead we are recognizing how power moves across spaces in constantly changing horizontally linked networks of certain and uncertain connectivity. This work begins when environmental rhetorics more formally solidifies its relationship not only with rhetorics of space and place but also the discipline of geography. It has taken me some time, but I have come to appreciate Reynolds's *Geographies of Writing* (2004) because it is the first stab at breaking down the boundaries between the three.

It has provided me with the room to think about how spaces are layered to inhibit or promote activity in a variety of ways. I am talking specifically about the

many spaces nested within and around a single site of focus that affect the activity we see in a sight. This also encompasses the many units (actors and actants) within those spaces that are arranged in a variety of ways that structure how actors understand the world. For example, consider the space of the rulemaking process. How can we make sense of actors' activity in this space without venturing back in time to make sense of the Lacey Act and how it has come to mean across time and a variety of spaces. Depending on space and how others are arranged around it, the Lacey Act assumes a different character. For me, the question of how spaces are layered to produce their own sets of relations is a resurrection and reconsideration of the rhetorical canon of arrangement (*dispositio*). Here we can better theorize how acts of composition in textual worlds affect the physical world and vice-versa. From alternating vantage points, we researchers might observe all the assemblages and paths for travel in our spatial analyses and make in roads into practicing a different kind of environmental politics—one that is more inclusive. All of this is built from my critique of Reynolds's treatment of spaces as unconnected. The "no go zones" of Leeds remain separate spaces where students must go to "dwell a little more" in order to understand difference (Reynolds, 2004). Neither Reynolds nor the students consider the ways in which "no go zones" and "safe zones" are connected to reinforce each other and the activities of their respective agents. If we follow Reynolds's lead and treat spaces as separate then we run the risk of not truly being able to understand how the activity we see in the everyday is a result of how spaces are arranged to support or inhibit practices. When we do this we then run the risk of making assumptions about spaces and subsequently people. This happens within

Reynolds's book even though her focus on difference is the result of not wanting to make assumptions about people and the spaces they inhabit.

If place is always seen as local, then we can readily ignore how forces beyond the local affect how the local should be understood. For example, framing the Asian carp crisis squarely within the local contexts of the Great Lakes' lucrative fishery is an issue in that it excludes how spaces within the Chicago-area and the lower Mississippi, which utilize the waterway system, regularly contribute to the fishery in recognized and unacknowledged ways. Stakeholders raise ecological separation as the best solution to protect the fishery; however, they fail to consider or downplay the affects such an action will have on other economic spaces (e.g. an Arkansas catfish farm or commercial shippers). These spaces are tied to each other in a complex set of relations. Analysis of one space cannot happen without considering how others are tied to it to create the characterization we witness. Engaging in this politics of scale is an argument that all places are local and are networked to each other. Doing this allows us a foundation to critique power dynamics. In this light, critiques of how we tour the spaces of others, be they in an exhibit, a city, or a letter about carp become meaningful. I closed the previous chapter by talking about connections. This was the idea that we must think about the many ways in which seemingly disconnected spaces are actually connected. I raised the use of stories or memories of events as one particular means of bridging space.

I find memory to be interesting because of the multiple forms it can take within assemblies of actors. Memory can be an artifact, an institution, or an event at any given time; however, we are conditioned to regard memory as a stable artifact,

which we can recall from our minds for the purposes of recollecting events. This positionality reifies memory to the point where we are led to believe that the act of remembering is an objective activity that maps onto how the event may have been experienced by others within a community. Hoang (2009) posited an alternative way of thinking about memory. She presents memory as an artifact, an event, and a tool. For her, the idea of memory as tool means that to remember is to analyze and recompose an artifact (a memory) so that it has performative capabilities that can be liberating and empowering for community members. The act of recomposition is a move to destablize a memory (dominant cultural narrative) and allow for other memories to circulate and define the boundaries of any given cultural experience. The locations of these countermemories, which "haunt" the dominant, reside in the "sedimented spaces" that exist as fissures in the surface of cultural memory (Lowe, 1996; Braun & Wainwright, 2001). Any event is haunted by memories. These hauntings emerge in the ways people arrange other actors, institutions and various spatial elements contained within an event. The memories attached to a single event in a space are often tied to other spaces—and other events. As individuals narrate their experiences, spaces unfold as they travel throughout their networks. The forms that memory assumes within a community point to the varying spaces of dependence among agents. Thus the bridges we build in the study of space create multiple constellative sites.

A good example would be a story not captured in this dissertation. This is the story of how carp came to the US. Depending on to whom you speak, you will get a different account. Some say it was the sole efforts of an Arkansas fish farmer named

Jim Malone; others say Jim, who preferred another species for cleaning aquaculture tanks, was convinced to consider to use bighead and silver carp instead by the United States Fish and Wildlife Service. Then there is the fact that Jim was not the only person in possession of these carp species during the time.

My archival trace indicated that it was initially a commercial fish producer, who was responsible for importing silver and bighead carp into the U.S. in 1973; however, all of the fish were transported from the producer to the Arkansas Game and Fish Commission (AGFC) for a period of three years (Kelly et al. 2011; Mike Freeze, personal communication, January 8, 2012). This was a result of a formal agreement between the producer and the AGFC for the purposes of water quality research. In fact, the AGFC was the first among public and private institutions to reproduce these two species through captive breeding directed toward research. I would argue that it is not necessarily Arkansas fish farmers that we should direct our attention toward, but the AGFC. From 1972 to 1982, the AGFC was principally responsible for all research on bighead and silver carp's value to aquaculture. This was a period of time in which they not only stocked four different sites with carp, but also provided carp to universities, research stations and state and federal agencies. From the mid-70s to the 80s, there were several universities, state and federal agencies that were conducting studies involving bighead and silver carp. Among institutions Auburn and the Illinois Natural History Survey both received carp from AGFC in 1974 (Buck et al., 1978; Burke and Bayne, 1990; Kelly et al, 2011). These studies ranged from assessing the value of silver carp in polyculture

and sewage treatment systems to assessing bighead and silver carps growth rates (Cremer and Smitherman, 1980; Henebry et al., 1988).

The relationship between Jim and the Service never makes it into the official stories told by the United States government. In fact, even Document No. 03-23745 states: "Bighead carp were imported into the United States in 1972 by a fish farmer who wanted to use them in combination with other phytoplankton-eating fish to improve water quality and increase fish production in culture ponds." Moreover, statements similar to the aforementioned quote flatten space and deny us the ability to understand the many sites outside of Jim's farm where researchers and environmental activists were busy creating knowledge about carp in order to position it as a helper species. Disassemble these bridges and it becomes easier to lay blame and to make the case for invasibility. The origin story of the curious case of the Asian carp becomes the result of error on the part of a careless farmer rather than the collective effort between a farmer, aquaculture, university researchers, and the government. Jim stopped speaking to the media and researchers a while back. In fact, he is likely to never speak to anyone about the incident ever again now that he is in the later stages of Alzheimer's disease. His son, who has taken over the family business, also refuses to speak to anyone about the farm's relationship to Asian carp. I was told that he is incredibly protective of his father and remains upset with how blame for the introduction has been place squarely on Jim's shoulders.

Focusing on how differing memories haunt an event and subsequently a site (a community) provides a window into understanding the dynamics and complexity of why we cannot regard an event as exclusively local. Events are given meaning

through the links that exist within an agent's network. What happens to create meaning for an event requires a person's unfolding of space and time as they travel through that network of experience by way of memory. Still, memory-work comes with a caveat. We must be careful that countermemories not replace older narratives in order to establish new dominant narratives. We must remember that an event is experienced by multiple people and is likely to be valued in varying ways that depend upon how people choose remember. In closing, I offer these questions from my study of ontology for us to consider that appear as both environmental and social challenges, assuming that we can make definitive demarcations between the two. First, how might we relate with our environments in other ways and make meaningful use of those relations? Moreover, how might we relate with each other on more just terms? And, finally, how do we consciously/unconsciously maintain networks through our everyday practices? With that final question, I'm revisiting Taylor's understanding of embodiment and practice with respect to the archive and the repertoire.

APPENDICES

Appendix A:
Research Participant Information and Consent Form

MICHIGAN STATE UNIVERSITY
CONSENT TO PARTICIPATE IN A RESEARCH STUDY

TITLE OF STUDY: Carp Stories: Building a Cultural Rhetorical History of an Invasive Species

RESEARCHERS: **Error! Contact not defined.**, 423.580.5577 / dsackey@msu.edu

William Hart-Davidson, 517.353.9184 / hartdav2@msu.edu

PURPOSE:
You are being asked to participate in a research project. The purpose of this project is to collect stories of individuals' and organizations' experiences with Asian carp and other invasive species.

INFORMANTS:
You have been asked to participate because you are a person who has either worked for an organization or agency that works around issues related to Asian carp as invasive, conducts research regarding Asian carp or has made public statements regarding Asian carp as an invasive species.

PROCEDURES:
You have been invited to provide your thoughts and opinions regarding invasive species, particularly Asian carp. The interview will first start by asking a series of background questions related to your familiarity with environmental issues. Thereafter, the researcher will present a series questions related to your experiences with Asian carp and other invasive species. After the interview, the researcher will answer any questions you may have regarding the purpose of this study.

RISKS:
While highly unlikely, the only perceived risk in this study regards the fact that you may be asked to provide your opinions concerning a potentially controversial issue—invasive Asian carp. You are free to decline to answer any questions that make you uncomfortable. You may also ask the research to not quote directly from your response.

BENEFITS:
There are no perceived benefits to research participants.

CONFIDENTIALITY:
Your identity will be protected to the extent allowed by the law. You will not be personally identified in any reports or publications that may result from this study unless you state otherwise. While this is not an anonymous study, all information gained will be considered confidential. The researcher will retain your data from this study for no longer than three years. The research will retain your data on a password-protected computer.

COST/COMPENSATION:
There will be no cost to you nor will you be compensated for participating in this research study.

RIGHT TO REFUSE OR WITHDRAW:
This research is voluntary. You may refuse to participate or withdraw from this project at anytime without penalty. If the study design or use of data is to be changed, you will be so informed and your consent re-obtained. You will be told of any significant new findings developed during the course of this study that may relate to your willingness to continue participation.

QUESTIONS:
If you have any questions, please ask us. If you have additional questions later, please contact William Hart-Davidson (Principal Investigator) at 517.353.9184 / hartdav2@msu.edu/ or Suite 7 Olds Hall, Michigan State University, East Lansing, MI 48824 or contact Donnie Sackey at 517.355.2403 / dsackey@msu.edu / or 274 Bessey Hall, Michigan State University, East Lansing, MI 48824.

You may report (anonymously, if you so choose) any complaints or comments regarding the manner in which this study is being conducted to the Michigan State University Human Research Protection Program at 517.355.2180 or by addressing a letter to the Chair of the Board, c/o Human Research Protection Program, 202 Olds Hall, Michigan State University, East Lansing, MI 48824.

I WILLINGLY VOLUNTEER AS A RESEARCH INFORMANT FOR THIS STUDY.

_____ **__/__/2012**

NAME DATE

I AGREE TO HAVING MY VOICE RECORDED FOR THIS RESEARCH STUDY.

_____ **/ /2012**

NAME

Appendix B:
Preliminary Interview Questionnaire

INTERVIEW PROTOCOL

OVERVIEW

- Introduce myself and describe the purpose of the interview.
- Read the "Consent Script."
- Inquiry as to whether they understand or have any questions about the study; thereafter, I ask if they are willing to provide consent to participate.
- Ask permission to use an audio-recording device and disclose why I am choosing to use the device as part of the study.

QUESTIONS

- Could you describe for me the position you currently have? How is it that you came to this position?
- What is your connection to environmental movements or issues regarding the environment?
- How familiar are you or your organization with invasive species?
- When discussing the nature of invasive species to people who are unfamiliar with the what they are, what language do you use (e.g. metaphors; special terminology; stories)
- Is this similar of different from the way that you hear others discussing invasive species?

- When did your organization first become aware of Silver carp, Bighead carp, or Asian carp?
- Has use of the term Asian carp rather than Silver carp or Bighead carp affect how you or your organization organizes around the issue?
- What position (or positions) has your organization held with respect to Asian carp?
- Do these positions differ from other groups or individuals focused on the issue of Asian carp's presence within the Mississippi Basin?
    - What do you think of their representation of Asian carp? Does it make a lot of sense to you? In what ways do your positions differ?
- Are there groups or individuals that you or your organization have built working relationships with as you or your organization have organized around Asian carp?
    - How did these relationships manifest? What is the nature of the work that you do together?
- What publications are you aware of that your organization has produced with respect to Asian carp?
    - Are these documents available for the public or are they internal and private? Do you retain copies of these documents?
- What publication have you produced with respect to Asian carp?

    - Are these documents available for the public or are they internal and private? Do you retain copies of these documents?
- If you provide me with documents, is it possible that I could ask you follow-up questions regarding these documents via email correspondence or telephone?

Appendix C:
Request for Documents from the United States Fish and
Wildlife Service under the Freedom of Information Act (FOIA)

Donnie Johnson Sackey
Michigan State University
Department of Writing, Rhetoric, & American Cultures
7B Olds Hall
East Lansing, MI 48823

February 17, 2012

Dr. Stuart Leon
Chief, Division of Fisheries and Aquatic Resource Conservation
U.S. Fish and Wildlife Service
4401 North Fairfax Drive, Room 770
Arlington, VA 22203

RE: Freedom of Information Act request

Dear Dr. Leon,

This is a request under the Freedom of Information Act (5 USC 552). I request that a copy of the following records be provided to me:

Any and all documents, which includes but is not limited to public comments and letters that the U.S. Fish and Wildlife Service received: during the 60-day public comment period in response to a Federal Register notice of inquiry on silver carp (68 FR 43482-43483), during the public comment period (between September 5, 2005 and November 6, 2006) for the proposed rule (71 FR 52305) to add all live silver and largescale silver carp to the list of injurious fishes under the Lacey Act, and during the public comment period (September 17, 2003 and November 17, 2003) seeking inquiry on the addition of bighead carp to the list of injurious wildlife under the Lacey Act (68 FR 54409).

In order to help you determine my status for the purpose of assessing fees, you should know that I am a graduate student, and that this request is made as part of research aimed at the completion of my doctoral dissertation rather than for commercial use. Responsive files will be shared with researchers and the public, and will not be licensed for profit.

I request a waiver of fees for this request, since the public dissemination of the requested materials will aide public understanding of the federal government's process for listing species as injurious wildlife, as they relate to what has been colloquially referred to as "Asian carp." In general, most people are not knowledgeable about the rulemaking process by which species are listed as invasive.

If this waiver is denied, I am willing to pay fees of up to $100.00. If fees are estimated to exceed this amount, please notify me first.

For timely process of this request, I can be contacted at 423-580-5577 or dsackey@msu.edu if you need to discuss any aspect of this request.

Sincerely,

Donnie Johnson Sackey

Appendix D:
List of Documents Received from FOIA Request and
Documents Received

Name	Organization	Date	Subject	No. of pages	Notes
(Unknown)	University of Arkansas Pine Bluff Progress in Canned Bighead Carp Product Development	n.d.	[Research abstract]	2	This is not a letter
William B. Kittrell, Jr.	Department of Game and Inland Fisheries	11-Jul-96	"Bighead Carp Incident	2	Unknown who directly submitted. Not written for the comment period.
Robert P. Glennon	Jim Malone and Son, INC.	16-Jul-03	"Bighead Carp Comments ATTN: [RIN 1018-AT49]"	10	1 Attachment [Author's article]
Cindy Kolar, PhD Research Fishery Biologist		21-Aug-03	"Bighead and silver"	1	
Rob Maher	Illinois Department of Natural Resources	?-Sep-03	"Tables Reported catch in pounds of fish taken in Illinois waters"	15	
William Van Scyoc		17-Sep-03	"Bighead Carp, Injurious Species candidate"	1	

Table 1. Catalogue of letters written to the US Fish and Wildlife Service's 2003 Notice of Inquiry for Review of Information Concerning Bighead Carp (*Hypophthalmichthys nobilis*).

Table 1 (cont'd)

B. Sachau		17-Sep-03	"Bighead Carp being banned from this country-proposal per"	1	
Mike Larimore		18-Sep-03	"Too little too late"	1	
B. Sachau		25-Sep-03	"RE 50 CFR Part 16 RIN 1018-AT49 Big head carp - public comments"	1	
Mike Freeze, Vice President	Keo Fish Farm, INC.	28-Sep-03	(No subject line)	2	
Joey Lowery	Lowery Aqua Farms, INC.	1-Oct-03	(No subject line)	2	
Jamie Duncan Daniel	Bellaire Fish Farms	11-Oct-03	"BIGHEAD CARP"	2	1 attachment
Bill Warren	Mallard Farms	13-Oct-03	"Economic impact of bighead carp"	1	
Tom Jones Fish Health Biologist	Vermont Fish & Wildlife Department	15-Oct-03	"Comment Concerning Bighead Carp"	2	
Lester Spell, Jr. Commissioner	Mississippi Department of Agriculture and Commerce	21-Oct-03	(No subject line)	1	
C.B. Sledge		28-Oct-03	(No subject line)	1	

Table 1 (cont'd)

Louis S. Thompson	Thompson Fisheries, INC	28-Oct-03	(No subject line)	2	
Gerald A. Barnhart, Director Division of Fish, Wildlife, and Marine Resources	New York Department of Environmental Conservation	3-Nov-03	"The potential listing of bighead carp (*Hypophthalmichtys nobilis*) as injurious wildlife"	2	
Bob Hopper and Mark Stephens	Hopper-Stephens Hatcheries, INC.	4-Nov-03	(No subject line)	1	
Martha Melkovitz	Keo Fish Farm, INC.	4-Nov-03	(No subject line)	3	1 attachment
Carole R. Engle		5-Nov-03	(No subject line)	7	
Joe Oglesby, President	Catfish Farmers of Mississippi	6-Nov-03	(No subject line)	1	
Randall Evans, President	Catfish Farmers of Arkansas	7-Nov-03	(No subject line)	2	
Craig S. Tucker, Director	National Warmwater Aquaculture Center	10-Nov-03	(No subject line)	2	

Table 1 (cont'd)

John D. Hoskins, Director	Missouri Department of Conservation	10-Nov-03	"Federal Register/Vol. 68, No. 180/Wednesday, September 17, 2003/Proposed Rules: Review of Information Concerning Bighead Carp (Hypophthalmichthys nobilis)/RIN 1018-AT49	2	
John R. MacMillian, President	National Aquaculture Association	11-Nov-03	"Request for Information on Bighead Carp (*Hypophthalmichthys nobilis*) RIN 10-18-AT49, FR Docket 03-23745"	2	
Thad Finley, President	Farm Cat, INC.	11-Nov-03	(No subject line)	2	
Paul L. Smith, President	Trans Fisheries, INC.	11-Nov-03	(No subject line)	2	
John Teem, Invasive Species Coordinator Division of Aquaculture	Florida Deparment of Agriculture and Consumer Services	12-Nov-03	(No subject line)	9	1 attachment (Carole Engle research)

Table 1 (cont'd)

Bill Lafferty, Chair Robert Nestor, Vice-Chair	Great Lakes Law Enforcement Committee	13-Nov-03	(No subject line)	2	
John R. MacMillian, President	National Aquaculture Association	13-Nov-03	"Request for Information on Bighead Carp (*Hypophthalmichthys nobilis*) RIN 10-18-AT49, FR Docket 03-23745"	2	
Bernard Hansen, Chairman U.S. Section	Great Lakes Fishery Commission	14-Nov-03	"RIN 1018-AT49"	3	
Paula Moore, Staff Biologist	Jones & Eaker Farms	14-Nov-03	(No subject line)	1	
Duane L. Shroufe, Director	Arizona Game and Fish Department	14-Nov-03	"Review of Information Concerning Bighead Carp (*Hypophthalmichthys nobilis*)"	2	
Liz Christiansen, Deputy Director	Iowa Department of Natural Resources	14-Nov-03	(No subject line)	2	
Pete Kahrs	Osage Catfisheries, INC.	15-Nov-03	(No subject line)	8	1 attachment [Glennon article]
Cynthia D. DiBartolo	Pappas Fish Company et al.	15-Nov-03	(No subject line)	3	
David McLeish, Chair	Council of Lake Committees	17-Nov-03	"RIN 1018-AT49"	2	

Table 1 (cont'd)

Peter W. Hofherr, Director	Missouri Department of Agriculture	17-Nov-03	"Federal Register/Vol. 68, No. 180/Wednesday, September 17, 2003/Proposed Rules RIN 1018-AT49, Review of Information Concerning Bighead Carp (*Hypophthalmichthys nobilis*)	1	
Michael J. Donahue, President/CEO	Great Lakes Commission des Grands Lacs	17-Nov-03	"RIN 1018-AI87"	2	
R. Sherman Wilhelm, President	National Association of State Aquaculture Coordinators	17-Nov-03	(No subject line)	1	
Marion Berry, Congressman (Ark-1)		19-Nov-03	"Request for Information on Bighead Carp: RIN 10-18-AT49, FR Docket 03-23745"	2	
Jame L. Dexter, Acting Chief	Michigan Department of Natural Resources	20-Nov-03	"Nominations of injurious Species"	2	
Kevin Flowers	Flowers Fish Farm	25-Nov-03	"Bighead Carp"	1	
LaDon Swann, President-Elect	U.S. Aquaculture Society, a Chapter of the World Aquaculture Society	18-Dec-03	(No subject line)	4	1 attachment

Name	Organization	Date	Subject	No. of pages	Notes
Dr. Mike K. Anan, Esq		26-Jul-03	"Confidential Relationship"	2	Spam
Kelly Huckins, Project Evaluation Specialist	Arizona Department of Fish & Game	28-Jul-03	"Proposed Rule: Addition of Silver Carp to the list of Injurious Wildlife Species"	1	
Doug Henley	Kentucky Department of Fish and Wildlife	30-Jul-03	"Silver Carp"	1	
Mike Freeze	KEO Fish Farm	3-Aug-03	"ATTN: [RIN 1018-AI87]"	1	
Christian Spies		4-Aug-03	"Review of information concerning Silver Carp"	1	
James A. Rokia		6-Aug-03	(No subject line)	1	
Andrew Swan		18-Aug-03	"Carp Problem Solved"	1	
Joel Brunsvold, Director	Illinois Department of Natural Resources	18-Aug-03	(No subject line)	1	
R. Sherman Wilhelm President	National Association of State Aquaculture Coordinators	1-Sep-03	(No subject line)	1	

Table 2. Catalogue of letters written to the US Fish and Wildlife Service's 2003 Notice of Inquiry for Review of Information Concerning Silver Carp (*Hypophthalmichthys molitrix*) and Largescale Silver Carp (*Hypophthalmichthys harmandi*).

Table 2 (cont'd)

Lee Sprague, Tribal Chairman John L. Koon, Natural Resources Commission Robert Hardenburgh, Directory Natural Resources Department Archie Martell, Fisheries Biologist	Little River Band of Ottawa Indians	4-Sep-03	(No subject line)	3
Bill Lafferty, Chair Robert Nestor, Vice-Chairman	Great Lakes Law Enforcement Committee	5-Sep-03	(No subject line)	2
Jennifer Nalbone, Habitat and Biodiversity Coordinator	Great Lakes United	9-Sep-03	(No subject line)	2
Rickalon L. Hoopes, Director	Bureau of Fisheries Pennsylvania Fish & Boat Commission	15-Sep-03	"50 CFR Part 16, RIN 1018-A187 Review of Information Concerning Silver Carp (*Hypophtalmichthys molitrix*)	2
Scott Hassett, Secretary	Wisconsin Department of Natural Resources	16-Sep-03	(No subject line)	2

Table 2 (cont'd)

Liz Christiansen Deputy Director	Iowa Department of Natural Resources	16-Sep-03	(No subject line)	1	
Jeffery Parker Executive Director	Chippewa Ottawa Resource Authority	16-Sep-03	"ATTN: [RIN 1018-AI87]"	2	
Helen A. Brohl, Executive Director	United States Great Lakes Shipping Association	16-Sep-03	"ATTN: [RIN 1018-AI87]"	1	
Paul J. Wingate, Chair	Council of Lake Committees	18-Sep-03	"ATTN: [RIN 1018-AI87]"	2	
Roy Stein, Vice-Chair	Great Lakes Fishery Commission	18-Sep-03	"ATTN: [RIN 1018-AI87]"	4	
Aimee Delach, Senior Program Associate	Defenders of Wildlife	18-Sep-03	"ATTN: [RIN 1018-AI87]"	1	
Mallam Irahim Saleh		21-Sep-03	"A life time oppurtunity (sic)"	1	Spam
Kelly D. Smith, PhD	Michigan Department of Natural Resources	22-Sep-03	"Nominations of Injurious Species"	2	
John A. Andersen, Jr. Great Lakes Director	The Nature Conservancy	22-Sep-03	"Proposed rule; notice of inquiry concerning Silver Carp July 23, 2003 *Federal*	2	

Name	Organization	Date	Subject	No. of pages	Notes
Robert Glennon, Biologist		n.d.	"Silver Carp Comments RIN number 1018-AT29"	2	
Robyn Draheim, Assistant Coordinator	Oregon Aquatic Nusiance Species Manage Ment Plan	5-Sep-06	"Injurious Wildlife Species; Silver Carp (Hypophthalmichthys molitrix) and Largescale Silver Carp (Hypophthalmichthys harmandi)"	2	
Lynn R. Schlueter, Special Project Biologist	North Dakota Department of Fish and Game	21-Sep-06	"RIN number 1018-AT29"	1	
Sam Flood, Acting Director	Illinios Department of Natural Resources	2-Oct-06	(No subject)	5	
Jim Doyle, Govenor of Wisconsin	Council of Great Lakes Govenors	12-Oct-06	"RIN Number 1018-AT29"	2	
Doug Hansen, Director Division of Wildlife	South Dakota Department of Game, Fish, and Parks	16-Oct-06	(No subject)	1	

Table 3. Catalogue of letters written to the US Fish and Wildlife Service's 2007 Final Rule on Listing Silver Carp (*Hypophthalmichthys molitrix*) and Largescale Silver Carp (*Hypophthalmichthys harmandi*) as Injurious Wildlife.

Table 3 (cont'd)

John D. Hoskins, Director	Missouri Department of Conservation	17-Oct-06	"Federal Register/Vol. 71, No. 17/September 5, 2006/Proposed Rules: Injurious Wildlife Species; Silver Carp (Hypophthalmichthys molitrix) and Largescale Silver Carp (Hypophthalmichthys)/RIN 1018-AT29	2
J. Michael Hayden, Secretary	Kansas Department of Wildlife & Parks	19-Oct-06	"Silver Carp and Largescale Sliver Carp-Injujrious Species Listing"	2
Jim Gores, Invasive Species and Wildlife Integrety Coordinator	Oregon Department of Fish and Wildlife	20-Oct-06	"RIN number 1018-AT29"	1
Doug Keller		24-Oct-06	"RIN number 1018-AT29 (Silver Carp)"	1
Kyle J. Hupfer	Indiana Department of Natural Resources	24-Oct-06	"RIN 1018-AT29"	2
Mark Maslyn, Executive Director	American Farm Bureau Federation		"RIN Number 1018-AT29"	2

Table 3 (cont'd)

Bradford Parsons, Immediate Past-President	American Fisheries Society-North Central Division	25-Oct-06	"RIN Number 1018-AT29"	2
Jonathan Gassett, Commissioner	Kentucky Deparment of Fish & Wildlife Resources	25-Oct-06	(No subject)	4
Steve Kroes		25-Oct-06	"RIN number 1018-AT29 - Asian Carp"	1
Greg Duffy, Director	Oklahoma Department of Wildlife Conservation	26-Oct-06	"RIN number 1018-AT29"	3
Cyndi Roper, Great Lakes Policy Director	Clean Water Action	27-Oct-06	"RIN Number 1018-AT29"	1
Jennifer Price, PhD	South Carolina Department of Natural Resources	27-Oct-06	"RIN Number 1018-AT29"	1
Jennifer McKay, Policy Specialist	Tip of the Mitt Watershed Council	27-Oct-06	"RIN number 1018-AT29"	3
Marion Conover, Fisheries Chief	Iowa Department of Natural Resources	30-Oct-06	(No subject)	3
James J. Provenzano, President	Clean Air Now	30-Oct-06	"RIN number 1018-AT29"	2
Erick McWayne, Executive Director	Northwest Environmental Education Council	30-Oct-06	"RIN number 1018-AT29"	1

Table 3 (cont'd)

J. Andrew McCammon		30-Oct-06	"RIN number 1018-AT29"	1
Timonthy A. Pearce, Ph.D		30-Oct-06	"RIN number 1018-AT29"	1
Jed Fuhrman		30-Oct-06	"RIN number 1018-AT29"	1
Theodore A. Endreny, Ph.D, P.E.		30-Oct-06	"RIN number 1018-AT29"	1
Robert Rutkowski		30-Oct-06	"Ban Two Asian Carp Species/RIN number 1018-AT29"	3
Michael Norden		30-Oct-06	"RIN number 1018-AT29"	1
Kurt A. Brownell, Natural Resources Specialist		30-Oct-06	"RIN number 1018-AT29"	1
James E. Byers		30-Oct-06	"RIN number 1018-AT29"	1
Dorthee E. Krahn, PhD.		30-Oct-06	"Carp"	1
Marilyn Ortt, President	Friends of Lower Muskingum River	30-Oct-06	"RIN number 1018-AT29"	1
I.E. Lindsey		30-Oct-06	"RIN number 1018-AT29"	1
Norman Andresen, PhD.		30-Oct-06	"RIN number 1018-AT29"	1
Marilyn M. Harlin		30-Oct-06	"RIN number 1018-AT29"	1

Table 3 (cont'd)

Richard M. McNutt, President		30-Oct-06	"RIN number 1018-AT29"	1
Tom Matych		31-Oct-06	"ASIAN CARP"	1
Dan Foster	Georgia Department of Natural Resources Wildlife Resources Division	31-Oct-06	"RIN number 1018-AT29, Comments on Proposed Rule on Injurious Wildlife Species; Silver Carp (Hypophthalmichthys molitrix) and Large Silver Carp (Hypophthalmichthys harmandi)	3
Chris Hunter, Administrator	Montana Fish, Wildlife & Parks	31-Oct-06	"RIN: 1018-AT29"	1
David Weedman, Aquatic Habitat Program Coordinator	Arizona Game and Fish Department	31-Oct-06	"Injurious Wildlife Species; Silver Carp and Largescale Silver Carp (FR Vol. 71, No. 171, p. 52305)"	2
Walter Taylor		1-Nov-06	"Asian Carp"	1
David Meuninck, President	American Fisheries Society (Indiana Chapter)	1-Nov-06	"RIN number 1018-AT29"	3
Carole Seagle, PhD Marine Science		1-Nov-06	"RIN number 1018-AT29"	1

Table 3 (cont'd)

Joel Brammeier, Associate Director for Policy	Alliance for the Great Lakes	2-Nov-06	"RIN Number 1018-AT29"	2
John Navarro, Program Administrator	Ohio Department of Natural Resources	3-Nov-06	(No subject)	2
David A. Ullrich, Executive Director	Great Lakes and St. Lawrence Cities Initiative /Alliance des villes des Grands Lacs et du Saint-Laurent	3-Nov-06	"RIN number 1018-AT29"	2
Gordon C. Robertson, Vice-President	American Sportsfishing Association	3-Nov-06	(No subject)	2
Bret A. Preston, Assistant Chief Warmwater Fisheries Management	West Virginia Division of Natural Resources	3-Nov-06	"RIN 1018-AT29 Silver and Largescale silver carp"	2
Edward L. Michael, Chair	Illinois Council of Trout Unlimited	3-Nov-06	"RIN Number 1018-AT29, US Fish and Wild life Service proposal to list silver"	1
Susan & Michael Stinson		3-Nov-06	"RIN Number 1018-AT29"	1
James R. Robinett	Shedd Aquarium	3-Nov-06	(No subject)	2

Table 3 (cont'd)

John Covert		3-Nov-06	"RIN Number 1018-AT29"	1
Thomas Kelly		3-Nov-06	"RIN Number 1018-AT29"	1
Gerry Forsell		3-Nov-06	"RIN Number 1018-AT29"	1
Suzanne Dixon		3-Nov-06	"RIN Number 1018-AT29"	1
Ilene Beninson		3-Nov-06	"asian carp"	1
Bruce Lindgren		3-Nov-06	"Comment on RIN Number 1018-AT29"	1
Lissa Radke, US Coordinator Lake Superior Binational Forum Sigurd Olson Environmental Institute on the Northland College campus		3-Nov-06	"RIN Number 1018-AT29"	1
Chuck Walker, President	Nation's Capitol Bass Federation	3-Nov-06	(No subject)	2
Kevan Urquhart, AFS Certified Fisheries Professional, Member of the American Institute of Fisheries Research Biologists		3-Nov-06	"RIN Number 1018-AT29"	1

Table 3 (cont'd)

Athan Barkoukis		3-Nov-06	"RIN Number 1018-AT29"	1	
Judith R. Johnston		4-Nov-06	"RIN Number 1018-AT29"	1	
Stuart D. Ross		4-Nov-06	"RIN Number 1018-AT29"	1	
Ruth Spero, Illinois Voter		4-Nov-06	"Rin number 1018-AT29"	1	
Kim Stone, Citzen of Lake Michigan Basin		4-Nov-06	"RIN Number 1018-AT29"	1	
Catherine Greenwald		4-Nov-06	"rin # 1018-at29"	1	
Brian Gibbons		4-Nov-06	"RIN Number 1018-AT29"	1	
Mary Jo Cullen		4-Nov-06	"RIN Number 1018-AT29"	1	
Chad W. Lord, Director	National Great Lakes Restoration Campaign	5-Nov-06	"RAN number 1018-AT29"	1	
Suku Menon		5-Nov-06	Great Lakes Invasive Species	1	
Jessica Kenzie		5-Nov-06	"RIN Number 1018-AT29"	1	
Carol McGeehan		5-Nov-06	"rin number 1018-AT29"	1	
Jim Sweeney		5-Nov-06	"RIN Number 1018-AT29"	1	
Margaret Dochoda, President	Introduced Fish Section	6-Nov-06	(No subject)	2	Two attachments

Table 3 (cont'd)

Robert Nestor, Chair	Great Lakes Law Enforcement Committee	6-Nov-06	(No subject)	3
Gerald A. Barnhart, Vice-Chair	Great Lakes Fishery Commission	6-Nov-06	(No subject)	3
Thomas W. Daggett	Daggett Law Firm	6-Nov-06	"RIN Number 1018-AT20 - Supporting a ban on Asian Carp"	1
John Schmitt		6-Nov-06	"RIN number 1018-AT29 - Ban Asian Carp"	1
Jane Schmitt		6-Nov-06	"RIN number 1018-AT29 - Ban Asian Ca"	1
Jay Greenberg		6-Nov-06	"RIN number 1018-AT29 - Ban Asian Carp"	1
Margie Campaigne, Personal & AD(H)D Coach		6-Nov-06	"RIN number 1018-AT29"	1
Shawn P. Good, Chair Aquatic Nusiance Species Committee	Vermont Department of Fish & Wildlife	6-Nov-06	"Comments from the Vermont Fish & Wildlife Department regarding RIN 1018-AT29"	3
Joel Brammeier et al.	Healing Our Waters--Great Lakes	6-Nov-06	"RIN number 1018-AT29"	4

Table 3 (cont'd)

Phyllis N. Windle, Senior Scientist and Director Invasive Species Global Environment Program	Union of Concerned Scientists	6-Nov-06	(No subject)		
Amy Elliot		6-Nov-06	"RIN number 1018-AT29"	1	
Vicki Milano	Colorado Division of Wildlife	6-Nov-06	"RIN number 1018-AT29"	1	
Tim Eder, Executive Director	Great Lakes Commission	6-Nov-06	"RIN number 1018-AT29"	2	One attachment
John E. Roussel, Deputy Assistant Secretary	Louisiana Department of Wildlife and Fisheries	6-Nov-06	"Silver Carp Comments for Louisiana"	2	
Nprouko2		6-Nov-06	"Great Lakes and Asian Carp"	1	
Peter T. Jenkins	Defenders of Wildlife	6-Nov-06	"RIN number 1018-AT29; Proposed rule - Injurious Wildlife Species; Silver Carp (Hypophthalmichthys molitrix) and Largescale Silver Carp (Hypophthalmichthys harmandi)	5	
Paula J. Moore, Staff biologist	Jones & Eaker Farms	6-Nov-06	"RIN number 1018-AT29"	2	

Table 3 (cont'd)

Cheri & Jim Niewiara		6-Nov-06	"RIN number 1018-AT29 Asian carp"	1
Sally Howard		6-Nov-06	"RIN number 1018-AT29 - Ban Asian Carp"	1
Dan Thomas, President	Great Lakes Sport Fishing Council	6-Nov-06	"RIN number 1018-AT29"	1
Ken DeBeaussaert, Director Rebecca A. Humphries, Director	State of Michigan Office of the Great Lakes --- Deparment of Natural Resources	6-Nov-06	"RIN number 1018-AT29"	1
Martha L. Willis	League of Women Voters of Porter County, Indiana	6-Nov-06	"Protecting our Great Lake-MICHIGAN RIN Number 1018-AT29"	1
Richard M. Daley, Mayor	Office of the Mayor City of Chicago	6-Nov-06	(No subject)	1

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