THE ROLE AND PERCEIVED EFFECTIVENESS OF LAW ENFORCEMENT IN THE MULTI-JURISDICTIONAL MANAGEMENT OF GREAT LAKES FISHERIES

By

Molly Jane Good

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Fisheries and Wildlife—Doctor of Philosophy

2020

ABSTRACT

THE ROLE AND PERCEIVED EFFECTIVENESS OF LAW ENFORCEMENT IN THE MULTI-
JURISDICTIONAL MANAGEMENT OF GREAT LAKES FISHERIES

By

Molly Jane Good

Fisheries and aquatic ecosystem resources have ecological, social, economic, and
cultural value, and they provide a multitude of ecosystem service benefits for people. Thus,
ensuring the sustainability of these resources is important. Ecological (e.g., erosion) and
anthropogenic (e.g. climate change, human population growth) issues threaten the resilience of
these resources, especially in times of great, often damaging and destructive, changes. In
addition to good governance and holistic management of fisheries and aquatic ecosystem
resources, effective regulation of fishing behavior and related activities is critical in ensuring
these resources remain available, and plentiful, for society's future use and enjoyment.
However, the role of regulatory entities, and effectiveness of their approaches, in detecting fish
crime, obtaining voluntary compliance with laws that serve to protect, enhance, and conserve
fish and fish habitat, and deterring unlawful fishing behavior is poorly understood, overlooked,
and undervalued. Using the Laurentian Great Lakes as a case study, the primary objectives of
this dissertation were to:

- Review the roles of various fisheries law enforcement entities and officers involved in
  the regulation of Great Lakes fisheries;

- Investigate the key environmental and anthropogenic issues posing threats to, and
  opportunities for, fisheries law enforcement officers;

- Survey members of the Great Lakes Fishery Commission's Law Enforcement Committee to examine the effectiveness of a joint or multi-agency approach to fisheries law enforcement; and;

- Survey fisheries law enforcement officers representing multiple jurisdictions (federal, non-federal, and binational) in the Great Lakes Basin to document perceptions of their roles and effectiveness in carrying out their duties and activities.

Uncertainty surrounding the impacts of looming threats on fish and fish habitat will continue to influence fisheries law enforcement entities in strategizing improved, more proactive ways to detect and deter fish crime in the Great Lakes Basin. Given the high number and diversity of regulatory entities throughout the area, Committee members confirmed a joint approach is most effective in addressing cross-border fisheries crime. Surveying fisheries law enforcement officers also showed that these individuals—across multiple jurisdictions—value their role and proudly fulfill their duties with the mutually-shared goals of enforcing fish laws, protecting and enhancing fisheries and aquatic ecosystem resources, and educating the general public. While the majority of those officers surveyed shared their satisfaction with their entities', and their own, effectiveness, they also helped identify ways in which to improve, or at least measure improvements in, both organizational and individual effectiveness.

To Mom and Dad, for always instilling in me
the confidence to achieve my dreams.

ACKNOWLEDGEMENTS

As I reflect on my academic and professional journey, I feel richly blessed to have interacted with, and learned from, many special people. These people—my family, mentors, and friends—have guided and supported me in all of my endeavors, and they continue to inspire and empower me to set high goals for myself.

I am sincerely grateful for my graduate advisor, Dr. Bill Taylor, who showed me that you can get much more out of an informal meeting at Buffalo Wild Wings than a boneless wing special, "Asian Zing" style. Thank you for believing in me; for opening up your relationships with family, friends, and colleagues to me; and for reminding me that "God really does sort them out." You have changed my life and have prepared me to be a leader, capable of real change, in the world. I am also grateful for my graduate committee members, Drs. Ed McGarrell, Norm Graham, and Adam Zwickle. I thank Ed for his patience and thoughtful insight on how to bridge the conservation and criminology disciplines; Norm, for his humor and depth of knowledge about global systems of governance; and Adam, for his positive attitude and social science perspective on my approach to data collection and methods.

I am hugely indebted to Drs. Bill Taylor, Henry Regier, and Karen Klomparens for the opportunity to have served as the first Taylor and Regier Great Lakes Fishery Fellow at Michigan State University (MSU). I am also indebted to Drs. Bill Taylor and Bill Porter, and Bill Demmer, Morrie Stevens, Mark and Francesca Rey, Jordan Burroughs, Becky Humphries, Hannibal Bolton, and Tim Brady for the opportunity to have served as a Boone and Crockett Fellow, and for their nomination of me as a Professional Member of the Boone and Crockett Club. I know that my values about wildlife management and conservation, hunting and fishing, and fair chase ethics

Lastly, to my family—what a ride! Joe, thank you for always lifting my spirits with your quick wit and late-night ping pong scrambles (when we were both still close to home). Mom

and Dad, the completion of this dissertation is illustrative of your success as parents; thank you for giving up your lives to make so many opportunities possible to me and my brother. I hope I have made you proud.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The Persistence of Law in Society

Since the beginning of civilization, from the establishment of the Mesopotamian Code of Hammurabi in the 18th century BC to the approval of the Constitution of the Roman Republic in the 6th century AD, law, in one form or another, has existed (Urch 1929; Posner 2010). Law has endured and evolved over time, guiding the development of social and cultural norms and impacting human behavior. In today's world, various forms of law exist in almost all countries. For example, in the United States (U.S.), common law—a body of laws or rules based on legal precedents established by the courts—is the basis of its multi-layered legal system, characterized further by a division between federal and state law (Stone 1936). The 1787 U.S. Constitution is the supreme federal law of the country and outlines a framework for good governance[1], while the states retain their own legal authorities through state constitutions (Agere 2000; Weiss 2000; UN 2009). In the U.S., law exists even at the county and local governance levels and, outside of the U.S., at the international and provincial levels.

Though legal systems (i.e., institutions, processes and procedures, and laws) vary among countries, customary or traditional law is generally upheld as a system of statutes, rules, and regulations that have been created to help regulate the social conduct of agencies and organizations, other groups, and people (Clark and Gibbs 1965; Fuller 1971). In accordance with these rules, law has served, and continues to serve, many roles in society including: exercising social control (Black 2010) and maintaining order (Chambliss and Seidman 1971); shaping and

---

[1]Good governance is achieved when institutions (e.g., government) and processes produce results that meet the needs of society, while making the best use of available resources. Good governance is considered to be participatory, consensus-oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and follows the rule of law (UN 2009). Good governance is conceptualized in the context of fisheries and freshwater aquatic ecosystem resources in Bartley et al. (2016).

establishing norms or standards of human behavior (Kandori 1992; Ellickson 1994; Nielsen and Mathiesen 2000; Ellickson 2001; Posner 2009; Acemoglu and Jackson 2017); distributing authority and power among government, states, and citizens (Entin 1990); preserving individual rights and liberties (e.g., the right to keep and bear Arms (Shelton 2002); and offering procedural tools that help ensure organizational or individual accountability (World Bank Group 2017). Without the law—without a system that regulates human behavior or conduct—there would be chaos.

Peoples' Relationship with, and Opinions of, the Law

Many people generally believe in, and abide by, the law (Tyler 1990). Even when presented with an option, people generally choose to obey the law. For example, in the U.S., people generally wait to take their driver's test before they drive a car for the first time, and they generally refrain from becoming physical with a stranger in a heated argument. Not all people comply, or act in accordance, however, with the law (Tyler 1990). Some people violate the law: they speed and drive through stop signs; they burglarize homes and steal others' possessions; and they harm others and take lives. Ultimately, there are people who violate the law unintentionally and intentionally, and some of these people—for various reasons (e.g., because there is an opportunity to do so)—violate the law more frequently than others (Tyler 1990).

In multiple areas or jurisdictions, violating the law is considered a crime or an illegal offense. According to criminal law theory—regardless of legality—a crime is characterized by some wrongful conduct (e.g., speeding). Crimes are often public in nature and, further, they can negatively impact not only the individual who is behaving wrongfully (i.e., the actor), but also

the immediate individual wronged (i.e., the victim) and potentially the society or community at large (Melissaris 2014). In this context and throughout this dissertation, wrongful conduct or criminal wrongfulness signifies what has been declared illegal under the law and more; it is meant to be interpreted in such a way as that which inflicts or causes harm (i.e., leaving someone or something "worse off") (Melissaris 2014), or even poses the risk of harm, to someone or something else (Mill 1892; Harcourt 1999).

Peoples' opinions of the law, and their conceptions of what is harmful and what is not harmful, differ and, thus, it is not always guaranteed, acting individually and freely, they will choose to behave legally and in ways that avoid all harms. For example, a person in a position of authority (i.e., the actor) may feel entitled to hold contempt for an individual of a different race, gender, or religion and make poor decisions regarding that individual (i.e., the victim) based on those reasons alone, thereby discriminating against, or causing harm to, that individual. Other people may be more accepting and considerate in their treatment of others, and thus choose not to be so judgmental. As another example, a person might participate in drug use and sell drugs and related paraphernalia, thereby negatively affecting their own health in the long-term and posing harm to their clientele and, potentially, to society as a whole. Other people might be more aware of, or take more seriously, the consequences of drug use and abuse, and thus choose to avoid drugs entirely. In these examples and beyond, law provides the general guidelines of human behavior that society and individuals should follow—whether they agree with them or not—to maintain order and avoid harm (Mill 1892; Harcourt 1999).

Compliance, and the Deterrence Theory of Punishment

Even so, peoples' reasons, or motivations, for compliance with the law differ (Winter and May 2001). As stated, many people voluntarily comply with the law. Following a normative perspective grounded in traditional criminological theory, people may comply because they see it as the right thing to do; a moral obligation and commitment. They may be more encouraged to voluntarily comply with the law if they also feel confident in, and respect, the legitimacy of (i.e., fairness exemplified by, and peoples' trust in and respect for) the legal authorities in dictating behavior (Tyler 1990; 1997; Herian et al. 2012). Other people may comply with the law simply because they fall in line with social and cultural norms that collectively encourage people to follow the law. For example, Amir N. Licht, Doctor of Juridical Science, highlights the use of campaigns against littering in public places (e.g., "Don't Be a Litter-Bug!") as a common way of establishing social norms that influence people to behave according to the rule of law (2008). While there will always be people who act in self-interest and, thus, disregard the law, many people comply with the law in response to both incentives and penalties associated with the law, and the legitimacy of agencies, organizations, and individuals in implementing them. For example, drivers may be more willing to comply with speed laws given certain financial incentives, such as reduced car insurance rates. Thus, following an instrumental perspective grounded in criminological theory, people may comply not necessarily because they see it as the right thing to do, but perhaps because they have judged the personal gains and losses (i.e., including economic benefits and costs) a certain way as a result of different behavior scenarios (Becker 1968; Tyler 1990; Furlong 1991; Nielsen and Mathiesen 2000; Nielsen 2003; UN Environment Programme 2018).

At the end of the 16th century, classical philosophers formulated the deterrence theory of punishment, which postulates that rational-choice people choose to comply with, or violate, the law based on three primary factors: the certainty, severity, and celerity (i.e., swiftness) of punishment (Hobbes 1651; Bentham 1781; Chambliss 1962; Tyler 1997; Mendes 2004; Beccaria 2016; Hobbes n.d.). This theory suggests that punishing or sanctioning violators or offenders is enough to prevent or deter an individual from violating the law (e.g., general deterrence) (Apel and Nagin 2011; Nagin 2013) or offenders from committing crimes again in the future (e.g., specific deterrence) (Gunningham 2017; Hobbes n.d.). This theory also assumes that, inherent in an individual's decision to violate the law, is an analysis of perceived risk of the certainty and celerity of getting caught, and the severity of the potential punishment, sanction, or penalty granted (Paternoster et al. 1982). Thus, some people may be more inclined to commit a crime if they perceive a low risk associated with the crime being detected (e.g., trespassing on private property) or a weak punishment (e.g., small monetary fine). In both scenarios, and individual's perception that the personal gains are potentially greater than the personal losses might be the only motivation he or she needs to violate the law. Conversely, others may be more inclined to comply with the law if they perceive a higher risk associated with the crime being detected (e.g., manslaughter) or a more severe punishment (i.e., life imprisonment).

While voluntary compliance (Apel and Nagin 2011) should be the ultimate goal of any authoritative or regulatory entity that imposes the law, the use of punishments has proven to be an effective strategy in reducing harms (Paternoster and Iovanni 1986; Paternoster 1987; Mendes 2004; Gunningham 2017). However, it is not a perfect solution. And, factors other than risk perception surrounding punishments (e.g., peoples' morality or lack thereof, their

disposition, their prior behavior) can still affect an individual's level of compliance with the law. Thus, a mix of compliance (e.g., advise and persuade) or deterrence strategies, which addresses the range of motivations felt by violators, will likely be most effective in deterring people from violating the law (Gunningham 2017).

Law Enforcement, Defined

In a traditional sense, law enforcement describes those entities[2] that possess authority, and are responsible, for enforcing, or obtaining compliance with, the law. Primary duties of law enforcement include the: 1) deterrence or prevention, detection, and investigation of crime; 2) apprehension and detention of violators; and sometimes, 3) coordination or facilitation of law enforcement efforts among multiple entities (i.e., related to cross-border crimes) (Passas 2003). Collectively, through these activities, law enforcement upholds the law, maintains social control and order, and protects society from harms. In these ways, the enforcement of law is as important as, if not more than, the law itself (Andrews 1909).

There are many different types of law enforcement entities, ranging from international or intergovernmental (e.g., International Criminal Police Organization [INTERPOL]) to local or single-system entities (e.g., Lansing Township Police Department in the State of Michigan) (O'Connor Shelley and Crow 2009). There are also tribal law enforcement agencies, which receive support from the U.S. Department of Interior's Bureau of Indian Affairs (BIA) and have criminal jurisdiction in federally-recognized reservations, tribal communities, and identified trust lands (Perry 2019). In the U.S., more than 18,000 federal, state, county, and local law

---

[2]Entities include any government agency, organization, or group of individuals that performs the administration of government-, management-, or law enforcement-related processes and activities.

enforcement agencies exist (Banks et al. 2016). Each of these agencies is composed of law

enforcement professionals—agents, specialists, rangers, officers, wardens, sheriffs, and more—

with various job duties, which often differ by entity and location. As of 2016, the U.S. employed

approximately 132,000 full-time federal law enforcement officers and 1,050,000 general-

purpose[3] sworn officers[4] at state, county, or local government levels (Brooks 2019a; b; Hyland

and Davis 2019). As of 2000, tribally-operated law enforcement agencies employed

approximately 3,500 full-time personnel (Hickman 2003).

Thinking Beyond Traditional Law

Thus far, this dissertation has established key themes, theories, and considerations

regarding societal and individual behavior that have long been discussed, and even debated, in

the traditional or customary legal and other social science disciplines. While such discourse has

resulted in an abundance of new knowledge and learning, it has also led to novel realizations

about how to approach similar questions about the law, human behavior and social conduct,

compliance and deterrence, and law enforcement in other contexts—namely, in the context of

the natural world or environment (Moreto 2017).

Just as people regularly interact with each other, they also regularly interact with, and

impact (i.e., depend on, adapt, and modify), the environment. Scholars have studied and

discussed such interactions as occurring in coupled human and natural systems (CHANS), in

---

[3]General-purpose officers include those officers employed by regional, county, and municipal police departments; most sheriffs' offices; and, primary state and highway patrol agencies. They are distinct from federal law enforcement agencies, sheriffs' offices with only jail and court duties, and special-purpose agencies (e.g., those agencies with jurisdiction on tribal lands; and, in parks, schools, airports, subways, hospitals, housing authorities, and government buildings).
[4]Sworn law enforcement officers are those officers who have taken an oath to support the U.S. Constitution and the laws of their state and/or entity's jurisdiction.

which connections and adaptive feedback structures are identified within and among systems to further characterize human and natural system components and better understand how they function together (Liu et al. 2007a; Liu et al. 2007b).

Because human and natural systems are connected, this dissertation argues that a multi- and interdisciplinary approach—one that draws upon natural, social, economic, cultural, and political sciences—is essential to enhance awareness of, and understanding about, human impacts to environmental conditions throughout the world (Clifford and Edwards 2011; Gore 2011). Consequently, such an approach is also critical in determining how to best offer protection from negative human impacts (e.g., overpopulation, pollution, climate change) that risk or pose harm to the environment (Boratto and Gibbs 2019). Drawing on lessons learned in traditional criminological theory thus far, this dissertation seeks to highlight one particular type of law—environmental law—and its legal aspects in place to protect, enhance, and conserve the environment.

Environmental Law, Criminology, and Crime

Environmental law describes the range of international treaty, provincial, federal, and state laws that protect the environment and preserve natural resources (e.g., air, water, land, minerals). In the U.S., the 1960s environmental movement birthed a number of the first environmental laws and regulations related to emissions and pollutants, threatened and endangered species, coal and natural gas resources, and, more recently, climate change. Examples of some of today's important environmental laws include: the Kyoto Protocol to the United Nations Framework Convention on Climate Change of 1997 (37 I.L.M. 22 [1998]; 2303 U.N.T.S. 148); the Canada Environmental Protection Act of 1997 (S.C. 1999, c. 33); the Clean Air

Act of 1963 (42 U.S.C. § 7401 et seq.), Clean Water Act of 1972 (33 U.S.C. §§ 1251 et seq.), and the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.) (Act); and the California Environmental Quality Act of 1970 (California Public Resources Code § 2100 et seq.). These and other environmental laws aim to lesson negative human impacts to the environment.

While criminologists have observed the emergence and growing interest of negative human impacts to the environment, questions about the drivers and consequences of these impacts remain (Keane et al. 2008). To address these and similar questions, environmental or "green" criminology has "emerged from a multidisciplinary body of work," namely as a sub-field of, or "distinct area of inquiry within," traditional law, though it has not been fully established as its own discipline (Lynch 1990; Potter 2010; Wolf 2011). Even less understood is the conceptualization of, or what constitutes, environmental crime. The criminal justice literature is laden with a number of different, often competing, versions of definitions of environmental crime (Shover and Routhe 2005; Finster 2007; Gibbs et al. 2010; Wolf 2011; White 2013; White and Heckenberg 2014; Di Vita 2015; Brisman 2016), which poses challenges for the systematic identification and investigation of crimes against the environment. This dissertation relies on the following definition of environmental crime:

> "An act committed with the intent to harm or with the potential to cause harm to ecological and/or biological systems, for the purpose of securing business or personal advantage, and in violation of [Federal or state] statutes for which criminal sanctions apply" (Clifford 1998; Clifford and Edwards 2011).

This particular definition is inclusive and clarifies intent and lack of compliance as

determining factors for assigning culpability (Clifford 1998). While environmental crimes can be diverse in size and scope (e.g., poaching, illegal logging, the disposal of hazardous materials or pollution, overfishing), and can result in a range of environmental and, likely, socio-economic costs, not all environmental crimes are considered violations under existing criminal sanctions (Finster 2007). More work is needed to broaden the scope of, and formally define, environmental law to properly address the full suite of environmental crimes that occur on a daily basis, throughout the world.

Conservation Criminology

To address the impacts of environmental crime on global and local scales, the field of conservation criminology—the "cousin" of green criminology—has recently emerged as one multi- and interdisciplinary framework that can be used to solve CHANS problems (Gibbs et al. 2010; Gore 2017; Kahler and Gore 2017). Incorporating key themes, theories, and considerations from three primary disciplines (risk and decision analysis, natural resources conservation and management, and criminal justice and criminology) (Gore 2011), the field of conservation criminology has been, and can be, applied to garner an improved understanding of the intersection of 1) human behavior and social conduct; and, 2) global and local environmental risks as it relates to both the preservation and exploitation of the environment and its natural resources (Figure 0.1) (Gibbs et al. 2010).

<u>Jurisprudence in the Great Lakes Basin: A Case Study</u>

This dissertation raises novel questions about, and tests the effectiveness of, multi- and interdisciplinary approaches and frameworks discussed in this introduction. The overarching
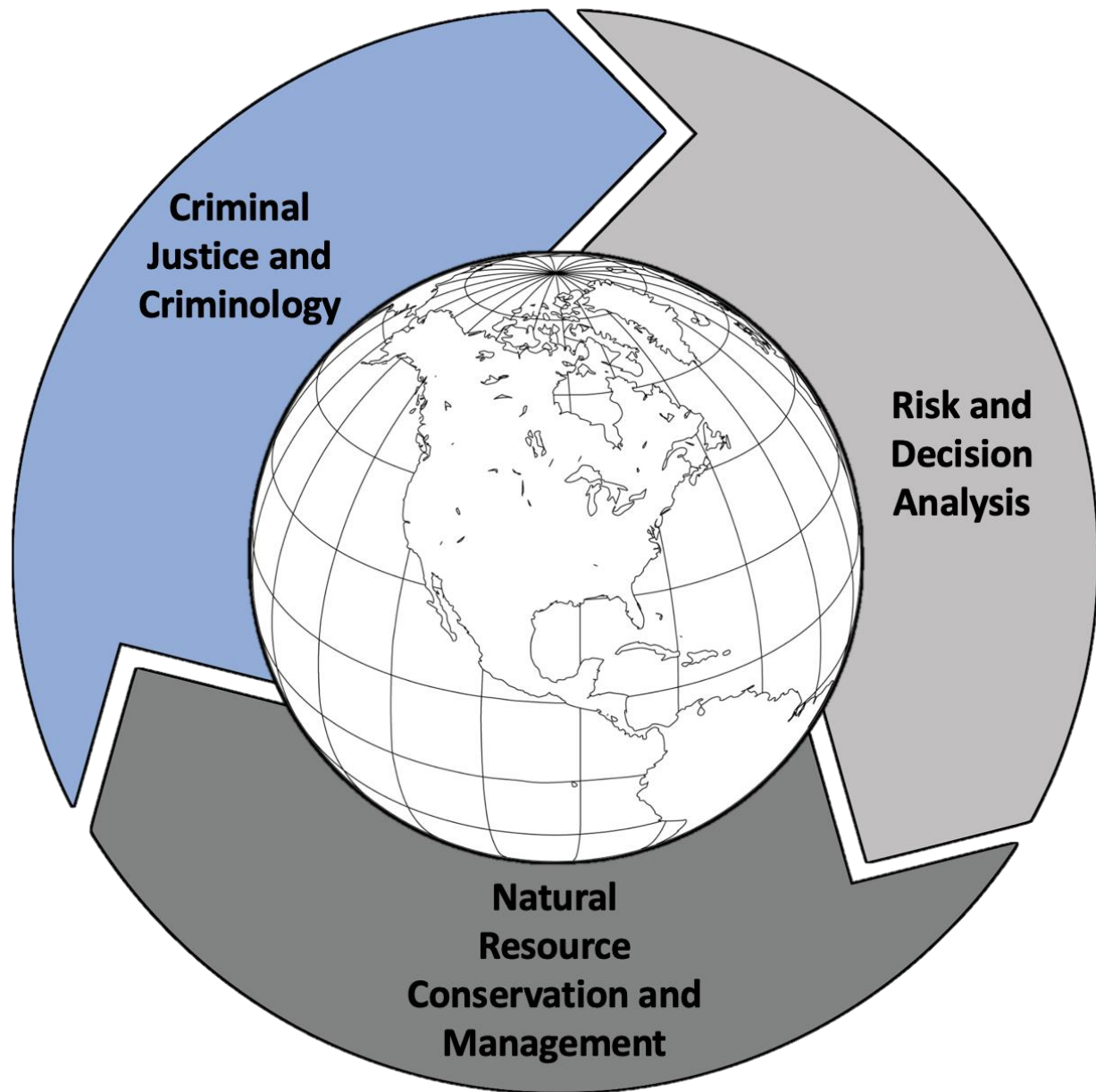
Figure 0.1. A depiction of the conservation criminology framework, which integrates the risk and decision analysis, natural resource conservation and management, and criminal justice and criminology disciplines in attempt to improve human livelihood security, environmental resilience, and biodiversity. Adapted by M.J. Good from Gore (2017).

goal of this dissertation is to increase awareness of, and understanding about, the law and law enforcement in the context of CHANS or social-ecological systems throughout the world.

This dissertation focuses such questions on a particularly complex social-ecological system—the Great Lakes basin (Basin), a system of five freshwater lakes (Lakes Erie, Huron, Michigan, Ontario, and Superior) that spans two nations, two provinces, eight Midwestern states, and many tribal communities. The inherent connectivity among the people who live and recreate in the Basin and the abundant natural resources (e.g., drinking water, minerals, fish and wildlife) and ecosystem services[5] (e.g., recreational fishing, beach use, boating, swimming, wildlife viewing, transportation, industrial and municipal water resources) made available to them make the Basin an ideal case study for exploring further analysis of: 1) human behavior and its impacts to the environment or, in the context of this dissertation, to fisheries and aquatic ecosystem resources; and, 2) governing, managing, and regulatory authorities and entities that dictate and monitor such behavior (Steinman et al. 2017). Thus, supported by data collected through a combination of natural and social science methods and tools, this dissertation serves as a record of jurisprudence, or the science of law, as it relates to fisheries resources in the Basin related to fisheries and aquatic ecosystem resource sustainability.

Dissertation Format

This dissertation includes four primary chapters, bound by this Introduction and a Synthesis. In this dissertation, I first introduce, and orient the reader to, the Great Lakes basin and present the status of its fisheries and aquatic ecosystem resources as protected by the

---

[5]For the purposes of this dissertation, ecosystem services, including both use and non-use services, are the many and diverse benefits society receives from the environment (e.g., recreational fishing) (Steinman et al. 2017).

current management regime and regulatory structure (Chapter 1). I also discuss the challenges of, and opportunities for, fisheries law enforcement[6], identified by fisheries law enforcement officers working in the Basin and beyond (Chapter 2).

I surveyed and interviewed fisheries law enforcement officers throughout multiple jurisdictions, representing various law enforcement entities, in the Basin to better understand their perceptions of a joint or multi-agency (i.e., versus single-agency) approach to fisheries law enforcement—one that is already facilitated by the Great Lakes Fishery Commission's Law Enforcement Committee (Chapter 3). Lastly, I surveyed additional fisheries law enforcement officers affiliated with 16 natural resource management and law enforcement entities (federal, non-federal, and binational) throughout the Basin to compare and contrast perceptions of the role and effectiveness of fisheries law enforcement in conserving fisheries and aquatic ecosystem resources (Chapter 4). The final synthesis highlights the conclusions and key measures of fisheries law enforcement effectiveness resulting from this investigation and associated data collection.

In the Basin, fisheries law enforcement is a critical component of the multi-jurisdictional management of Great Lakes fisheries and aquatic ecosystem resources. As environmental and anthropogenic issues have, and will continue, to threaten the resilience of these resources— especially in times of further exploitation and change—regulatory entities will have to find ways to maintain their relevancy and demonstrate their value in protecting fisheries and aquatic ecosystem resources for sustainable, future use.

---

[6]Collectively, fisheries law enforcement includes those entities and individuals (i.e., fisheries law enforcement officers) responsible for enforcing fish laws, orders, statutes, rules, and regulations, which aim to protect, enhance, and conserve fisheries and aquatic ecosystem resources.

LITERATURE CITED

LITERATURE CITED

Acemoglu, D. and M. O. Jackson (2017). "Social norms and the enforcement of laws." <u>Journal of the European Economic Association</u> **15**(2): 245-295.

Agere, S. (2000). <u>Promoting Good Governance: Principles, Practices, and Perspectives</u> (**11**). London, United Kingdom, Commonwealth Secretariat.

Andrews, C. S. (1909). "The importance of the enforcement of law." <u>The Annals of the American Academy of Political and Social Science</u> **34**(1): 85-89.

Apel, R. and D. S. Nagin (2011). "General deterrence: A review of recent evidence." <u>Crime and Public Policy</u> **4**: 411-436.

Banks, D., J. Hendrix, et al. (2016). National sources of law enforcement employment data, U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics**:** 17.

Bartley, D. M., N. J. Leonard, et al. (2016). Moving towards effective governance of fisheries and freshwater resources. <u>Freshwater, Fish, and the Future: Proceedings of the Global Cross-Sectoral Conference</u>. W. W. Taylor, D. M. Bartley, N. J. Leonard and R. L. Welcomme. Bethesda, Maryland, The American Fisheries Society: 285-291.

Beccaria, C. (2016). <u>On Crimes and Punishments</u>, Transaction Publishers.

Becker, G. S. (1968). "Crime and punishment: An economic approach." <u>Journal of Political Economy</u> **76**(2): 169-217.

Bentham, J. (1781). An Introduction to the Principles of Morals and Legislation, McMaster University Archive for the History of Economic Thought.

Black, D. (2010). <u>The Behavior of Law</u>. Bingley, United Kingdom, Emerald Group Publishing.

Boratto, R. and C. Gibbs (2019). "Advancing interdisciplinary research on illegal wildlife trade using a conservation criminology framework." <u>European Journal of Criminology</u>: 108810.

Brisman, A. (2016). Environmental harm as deviance and crime. <u>The Handbook of Deviance</u>. E. Goode. Hoboken, New Jersey, John Wiley & Sons, Inc.: 471-487.

Brooks, C. (2019a). Federal Law Enforcement Officers, 2016—Statistical Tables. <u>Federal Law Enforcement Officers Series</u>, U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics**:** 12.

Brooks, C. (2019b). Sheriffs' Offices, 2016: Personnel. <u>Sheriffs' Office Series</u>, U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics**:** 18.

Chambliss, W. J. (1962). "The deterrent influence of punishment." <u>Crime and Delinquency</u> **12**(1): 70-75.

Chambliss, W. J. and R. B. Seidman (1971). <u>Law, Order, and Power</u>. Reading, Massachusetts, Addison-Wesley.

Clark, A. L. and J. P. Gibbs (1965). "Social control: A reformulation." <u>Social Problems</u> **12**(4): 398-415.

Clifford, M. (1998). <u>Environmental Crime: Enforcement, Policy, and Social Responsibility</u>. Burlington, Massachusetts, Jones & Bartlett Learning.

Clifford, M. and T. Edwards (2011). <u>Environmental Crime</u>. Burlington, Massachusetts, Jones & Bartlett Learning.

Di Vita, G. (2015). Environmental crime. <u>Encyclopedia of Law and Economics</u>. J. Backhaus. New York City, New York, Springer Publishing: 1-8.

Ellickson, R. C. (1994). <u>Order WIthout Law: How Neighbors Settle Disputes</u>. Cambridge, Massachusetts, Harvard University Press.

Ellickson, R. C. (2001). "The market for social norms." <u>American Law and Economics Review</u> **3**(1): 1-49.

Entin, J. L. (1990). "Separation of powers, the political branches, and the limits of judicial review." <u>Ohio State Law Journal</u> (1): 175-228.

Finster, J. L. (2007). Investigating injurious species introductions as environmental crimes. East Lansing, Michigan, Michigan State University**:** 78.

Fuller, L. L. (1971). "Human interaction and the law." <u>The American Journal of Jurisprudence</u> **14**(1): 1-36.

Furlong, W. J. (1991). "The deterrent effect of regulatory enforcement in the fishery." <u>Land Economics</u> **67**(1): 116-129.

Gibbs, C., M. Gore, et al. (2010). "Introducing conservation criminology: Towards interdisciplinary scholarship on environmental crimes and risk." <u>British Journal of Criminology</u> **50**.

Gore, M. (2011). "The science of conservation crime." <u>Conservation Biology</u> **25**: 659-661.

Gore, M. (2017). Global risks, conservation, and criminology. <u>Conservation Criminology</u>. M. Gore. Hoboken, New Jersey, John Wiley & Sons Ltd.: 1-23.

Gunningham, N. (2017). Compliance, deterrence and beyond. <u>Elgar Encyclopedia of Environmental Law</u>. Cheltenham, United Kingdom, Edward Elgar Publishing: 63-73.

Harcourt, B. E. (1999). "The collapse of the harm principle." <u>Journal of Criminal Law and Criminology</u> (1): 109-194.

Herian, M. N., J. A. Hamm, et al. (2012). "Public participation, procedural fairness, and evaluation of local governance: The moderating role of uncertainty." <u>Journal of Public Administration Research and Theory</u> **22**(4): 815-840.

Hickman, M. J. (2003). Tribal Law Enforcement, 2000, U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics**:** 4.

Hobbes, T. (1651). Leviathan: Or the Matter, Forme and Power of a Commonwealth, Ecclesiasticall and Civil. London, England, Simon and Schuster.

Hobbes, T. (n.d.). "Deterrence theory." <u>Criminology</u> **41**(1): 99-130.

Hyland, S. S. and E. Davis (2019). Local Police Departments, 2016: Personnel. <u>Local Police Depatments Series</u>, U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics**:** 21.

Kahler, J. and M. Gore (2017). Conservation crime science. <u>Conservation Criminology</u>. M. Gore. Hoboken, New Jersey, John Wiley & Sons Ltd.: 25-43.

Kandori, M. (1992). "Social norms and community enforcement." <u>The Review of Economic Studies</u> **59**(1): 63-80.

Keane, A., J. P. G. Jones, et al. (2008). "The sleeping policeman: Understanding issues of enforcement and compliance in conservation." <u>Animal Conservation</u> **11**(2): 75-82.

Licht, A. N. (2008). "Social norms and the law: Why peoples obey the law." <u>Review of Law and Economics</u> **4**(3): 715-750.

Liu, J., T. Dietz, et al. (2007a). "Complexity of coupled human and natural systems." <u>Science</u> **317**(5844): 1513-1516.

Liu, J., T. Dietz, et al. (2007b). "Coupled human and natural systems." <u>Ambio</u> **36**(8): 639-649, 611.

Lynch, M. (1990). "The greening of criminology: A perspective for the 1990s. ." Green Criminology.

Melissaris, E. (2014). Theories of crime and punishment. Oxford Handbook of Criminal Law. Oxford, United Kingdom, Oxford University Press: 355-378.

Mendes, S. M. (2004). "Certainty, severity, and their relative deterrent effects: Questioning the implications of the role of risk in criminal deterrence policy." Policy Studies Journal 32(1): 59-74.

Mill, J. S. (1892). On Liberty. Harlow, United Kingdom, Longman, Green and Co.

Moreto, W. D. (2017). "Avoiding the tragedy of (un)common knowledge: Reflections on conducting qualitative criminological research in conservation science." Qualitative Research 17(4): 440-456.

Nagin, D. S. (2013). "Deterrence in the twenty-first century." Crime and Justice 42(1): 199-263.

Nielsen, J. R. (2003). "An analytical framework for studying: Compliance and legitimacy in fisheries management." Marine Policy 27(5): 425-432.

Nielsen, J. R. and C. Mathiesen (2000). "Important factors influencing rule compliance in fisheries lessons from Denmark." Marine Policy 27(5): 409-416.

O'Connor Shelley, T. and M. S. Crow (2009). "The nature and extent of conservation policing: Law enforcement generalists or conservation specialists?" American Journal of Criminal Justice 34(1-2): 9-27.

Passas, N. (2003). "Cross-border crime and the interface between legal and illegal actors." Security Journal 16.

Paternoster, R. (1987). "The deterrent effect of the perceived certainty and severity of punishment: A review of the evidence and issues." Justice Quarterly (2): 173-218.

Paternoster, R. and L. Iovanni (1986). "The deterrent effect of perceived severity: A reexamination." Social Forces 64(3): 751-777.

Paternoster, R., L. E. Saltzman, et al. (1982). "Perceived risk and deterrence: Methodological artifacts in perceptual deterrence research." Journal of Criminal Law and Criminology 73: 1238.

Perry, S. W. (2019). Tribal Crime Data-Collection Activities, 2019. Tribal Crime Data Collection Activities Series, U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics: 7.

Posner, E. A. (2009). Law and Social Norms. Cambridge, Massachusetts, Harvard University Press.

Posner, E. A. (2010). "The constitution of the Roman Republic: A political economy perspective." John M. Olin Law and Economics Working Paper Chicago, Illinois **540**: 35.

Potter, G. (2010). "What is green criminology." Sociology Review **20**(2): 8-12.

Shelton, D. (2002). "Protecting human rights in a globalized world symposium: Globalization and the erosion of sovereignty in honor of Professor Lichtenstein." Boston College International and Comparative Law Review (2): 273-322.

Shover, N. and A. S. Routhe (2005). "Environmental crime." Crime and Justice **32**: 321-371.

Steinman, A. D., B. J. Cardinale, et al. (2017). "Ecosystem services in the Great Lakes." Journal of Great Lakes Research **43**(3): 161-168.

Stone, H. F. (1936). "The common law in the United States." Harvard Law Review (1): 4-26.

Tyler, T. R. (1990). Why People Obey the Law. New Haven, Connecticut, Yale University.

Tyler, T. R. (1997). "Procedural fairness and compliance with the law." Revue Suisse D Economie Politique et de Statistique **133**: 219-240.

UN (2009). "What is good governance?" Economic and Social Commission for Asia and the Pacific: 3.

UN Environment Programme (2018). The State of Knowledge of Crimes that have Serious Impacts on the Environment. Nairobi, Kenya, United Nations Environment Programme**:** 110.

Urch, E. J. (1929). "The law code of Hammurabi." American Bar Association Journal (7): 437-441.

Weiss, T. G. (2000). "Governance, good governance, and global governance: Conceptual and actual challenges." Third World Quarterly **21**(5): 795-814.

White, R. (2013). Crimes Against Nature: Environmental Criminology and Ecological Justice. London, United Kingdom, Routledge.

White, R. and D. Heckenberg (2014). Green Criminology: An Introduction to the Study of Environmental Harm. London, United Kingfom, Routledge.

Winter, S. C. and P. J. May (2001). "Motivation for compliance with environmental regulations." Journal of Policy Analysis and Management: The Journal of the Association for Public Policy Analysis and Management **20**(4): 675-698.

Wolf, B. (2011). "'Green-collar crime': Environmental crime and justice in the sociological perspective." Sociology Compass **5**(7): 499-511.

World Bank Group (2017). The role of law. World Development Report 2017: Governance and the Law, World Bank Publications: 304.

CHAPTER 1: LAW ENFORCEMENT—A CRITICAL COMPONENT OF THE MULTI-JURISDICTIONAL MANAGEMENT AND CONSERVATION OF GREAT LAKES FISHERIES

Abstract

The Laurentian Great Lakes is an interconnected freshwater system that supports diverse fisheries and other aquatic ecosystem resources, and is highly-valued by people who use and depend on such resources for their livelihoods. Due to its size, geographic setting, and susceptibility to ecological and anthropogenic threats, the Great Lakes basin provides for an ideal case study to evaluate the status, role, and importance of various entities and individuals charged with the responsibility of sustaining these resources into the future. Along with natural resource management entities, law enforcement entities are major players in basin-wide, multi-jurisdictional efforts to protect and conserve Great Lakes fisheries and aquatic ecosystem resources. However, in the Basin, fisheries law enforcement is poorly understood, overlooked, and undervalued by fisheries professionals and the general public in comparison to its governing and managing entity-counterparts. This chapter provides a thorough examination of today's fisheries regulatory regime in the Great Lakes, which includes three distinct governments levels (federal, non-federal, and binational) spread across multiple jurisdictional authorities. While each government entity has its own unique role in fisheries law enforcement, all entities are well-poised to take more action to raise the profile of fisheries law enforcement as a major factor—along with governance, management, and research—in ensuring a sustainable future for Great Lakes fisheries and aquatic ecosystem resources.

KEYWORDS: fisheries; aquatic ecosystem resources; law; enforcement; Great Lakes; management

Introduction

The Laurentian Great Lakes is a massive, interconnected freshwater system, where

agencies, organizations, and individuals must work together across jurisdictions to ensure the

conservation of fisheries and aquatic ecosystem resources. The expansive geography and sheer

size of the Great Lakes basin (Basin); the importance and nature (i.e., features) of the resources

themselves; the number of entities involved in managing these resources; and the number and

diversity of values held by fisheries resource users in the area further complicate efforts to

effectively maintain, preserve, and enhance fisheries and the environments that support them.

While ecological (e.g., erosion) and anthropogenic (e.g., climate change, human

population growth) issues have threatened, and continue to threaten, the Basin and its

inhabitants, illegal fishing behavior and fish crime (e.g., overharvesting, fishing out of season,

false reporting) can further exacerbate these issues, thereby threatening biodiversity,

ecological integrity, and overall productivity (Musgrave et al. 1993; Gavin et al. 2010; Filteau

2013). As illegal behavior and crime are present in nearly all of today's fisheries (Randall 2004),

resulting negative impacts to fisheries and aquatic ecosystems—though difficult to measure,

quantitatively—are not negligible (Gavin et al. 2010). In the Basin, entities that govern and

manage fisheries and aquatic ecosystem resources can only do so much to ensure their

sustainability (Taylor et al. 1995; O'Connor Shelley and Crow 2009; Arnason 2013). Through the

development and implementation of regulatory actions and interventions, law enforcement

entities that monitor and enforce human behavior provide additional protection for these

resources. By working together, these entities can enhance their capacity to more effectively

address ecological and anthropogenic threats that may negatively impact fisheries and aquatic

24

ecosystem resources in the long-term (Morse 1973).

Among fisheries professionals (e.g., managers and decision-makers) and the general public, the role of law enforcement in protecting today's fisheries and aquatic ecosystem resources is poorly understood, overlooked, and undervalued (Beattie et al. 1977; Beattie and Giles 1979; Forsyth 1994; Eliason 2003; Randall 2004; Eliason 2006; Nie 2008; O'Connor Shelley and Crow 2009; Eilason 2011; Crow et al. 2013; Eliason 2013; McGarrell et al. 2013). Even less understood are the capacity and effectiveness of law enforcement (i.e., entities and individuals) in obtaining compliance among fisheries resource users with existing statutes, rules, and regulations, and deterring or preventing illegal fishing behavior that poses harm to the Basin's aquatic resources and ecosystems. Without such information, these resources may be further exploited or eventually lost.

With an emphasis on the importance of the many ecologically-, socially-, economically-, and culturally-valuable fisheries and aquatic ecosystem resources in the Basin, this chapter sets the stage for defining and exploring the critical, yet under-researched and underappreciated, regulatory role of law enforcement in the basin-wide management and conservation of these resources.

Orientation to the Great Lakes Basin

Due to its size and scope, the Basin is a world-famous natural landmark that connects fish and aquatic ecosystems; landscapes and habitats; people; and governing, managing, and regulatory actions intended to protect and conserve this coupled, social-ecological system into the future (Goddard 2013). The Basin consists of the five Laurentian Great Lakes: Lakes Erie, Huron, Michigan, Ontario, and Superior; the neighboring lands of the provinces of Ontario and

Quebec in Canada; and Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania,

and Wisconsin in the United States (U.S.) (Figure 1.1) (Beeton et al. 1999; Gaden et al. 2013).

Water flows (from Lake Superior, to Michigan and Huron, to Erie, and finally to Ontario)

through the St. Lawrence River and drains into the Atlantic Ocean. The lakes also drain into

many other connecting waterways (e.g., St. Mary's River, St. Clair River, Detroit River, Welland

Canal), major rivers, and inland lakes.
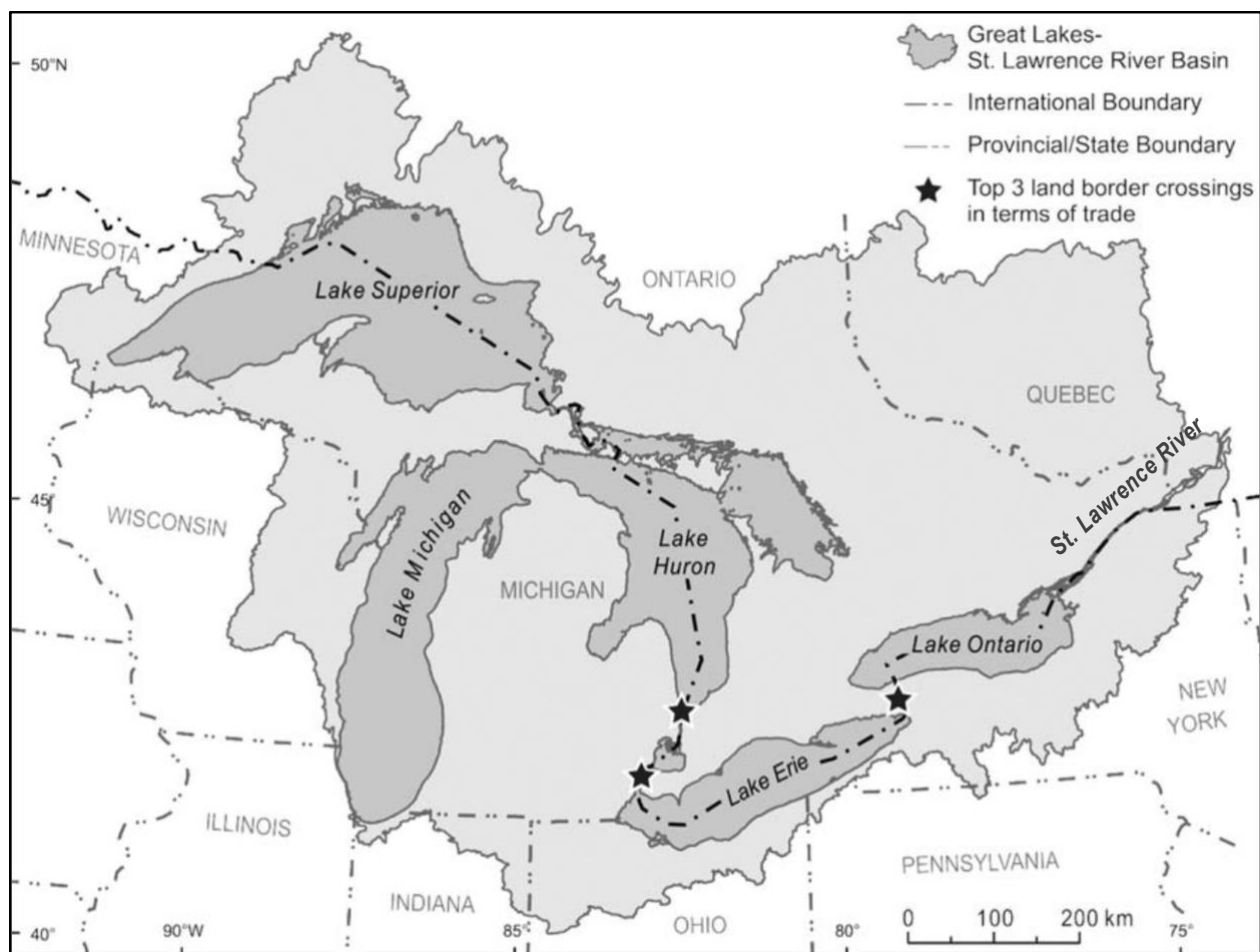
Figure 1.1. The Great Lakes basin (Campbell et al. 2015).

The Basin, which consists of 20% of the world's surface freshwater, is home to more

than approximately 3,500 plant and animal species, and it is characterized by various terrestrial

(e.g., forests, grasslands, dunes) and aquatic (e.g., wetlands, coastline, rivers and streams, lakes) landscapes (GLC n.d.). As a result of the diversity of ecosystems and number of natural resources occurring in the Basin, this region offers to society many ecosystem services. While quantifying the current or potential economic value of these ecosystem services is subjective and remains a challenge, estimates show that the Basin supports an economy with a gross regional product or GRP of approximately $6 trillion U.S. dollars (USD). In the Basin, recreation alone, including boating, fishing, swimming, and hunting opportunities, generates more than $52 billion USD annually (Campbell et al. 2015; Lynch et al. 2016; Steinman et al. 2017; GLC n.d.)

Great Lakes Fisheries

The Basin supports more than 250 cold-, cool-, and warmwater fishes, of which approximately 150 are native to the region (Craig 2016). Forage species include ciscoes, sculpins, and shiners, while top predators include brook trout (*Salvelinus fontinalis*), lake trout (*S. namaycush*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), walleye (*Sander vitreus*), and yellow perch (*Perca flavescens*). The Basin is also home to a number of non-native fishes, which have infiltrated the region through multiple vectors (e.g., ship-ballast, accidental release, deliberate release) and pathways (Ruiz and Carlton 2003; Kelly 2007). Asian carp (bighead carp [*Hypophthalmichthys nobilis*], black carp [*Mylopharyngodon piceus*], grass carp [*Ctenopharyngodon idella*], and silver carp [*H. molitrix*]), Eurasian ruffe (*Gymnocephalus cernuus*), goldfish (*Carassius auratus*), sea lamprey (*Petromyzon marinus*), round goby (*Neogobius melanostomus*), and zebra mussels (*Dreissena polymorpha*) are examples of non-native, aquatic invasive species (AIS) that have established in the Basin and

negatively impacted aquatic ecosystems and native fish populations and communities.

In general, a fishery involves the capture and harvest of fishes, and it is comprised of not just a species or type of fish, but also people, the area of water or seabed targeted, and method of fishing involved (UNFAO 2020). Together, the Basin's commercial (i.e., operated for commercial profit), recreational (i.e., for sport and pleasure), tribal fisheries, and artisanal fisheries are valued at more than $7 billion USD annually, and they support more than 75,000 jobs (GLFC 2019a). The annual net value of recreational fishing and associated activities in this region alone is estimated as high as $1.47 billion USD (Poe et al. 2013; Lynch et al. 2016; USFWS 2016). Ciscoes, lake whitefish, walleye, and yellow perch are primary target species in commercial fisheries, while muskellunge (*Esox masquinongy*), salmon, trout, and walleye are popular target species that comprise the world-class recreational fishery (Brenden et al. 2013; Thayer and Loftus 2013).

Status of the Fisheries

Since the formation of the Great Lakes thousands of years ago, major environmental changes (i.e., in water levels, size of waterbody) have occurred in the region. More recently, the Basin and its fisheries and aquatic ecosystem resources have also experienced social, economic, and cultural (i.e., anthropogenic) changes due to human population growth, urban expansion, transportation, water resource development, extractive activities (e.g., mining, forestry), agriculture, and increased natural resource use (Beeton et al. 1999; Coon 1999). Though the breadth and depth of impacts resulting from these changes differ depending on the waterbody or system in question, overall, they have led to declines in fish population abundance, diminished critical habitat for threatened and endangered species, degraded coastal habitat,

higher levels of industrial waste and toxic substances, additional AIS introductions and

establishments, and overexploitation of fisheries resources (Taylor et al. 2019).

In some cases, these changes (e.g., increased fishing pressure, interspecies competition,

predation) have resulted in the loss and extinction of fishes (e.g., deepwater cisco [*Coregonus*

johannae], shortnose cisco [*C. reighardi*]) in the Basin. While some international organizations

have established ranking systems (e.g. International Union for the Conservation of Nature,

NatureServe) to assess the status of fishes and propose recommendations to conserve them, in

the U.S., the U.S. Fish and Wildlife Service (USFWS) has classified some fishes (e.g., lake

sturgeon [*Acipenser fulvescens*]) with listing statuses under the Act (Mandrak and Cudmore

2013). Similarly, the Government of Canada, influenced by the federal Committee on the Status

of Endangered Wildlife in Canada, has classified other species as extinct, extirpated,

endangered, threatened, or of special concern under the Species at Risk Act (S.C. 2002, c. 29)

(Coon 1999). Species with such listing statuses are highly protected under the law, and they are

the subject of many conservation and recovery strategies and activities.

All changes in the Basin—coupled with an overall warmer regional climate, increased

precipitation, and less ice cover as a result of climate change—have, and will continue to,

threaten the sustainability of fisheries and aquatic ecosystem resources and the resiliency of

habitat and landscapes that support them (Lynch et al. 2010). While environment is dynamic by

nature, so too should be the governing, managing, and regulatory entities that monitor, and

respond to, these changes.

Management of Great Lakes Fisheries

The Basin has a complex governance structure, where no one government or level of government possesses exclusive authority for managing fish and aquatic ecosystem resources (Gaden et al. 2013). Instead, management is split among the governments acting collectively and individually within the Basin, including those of: the U.S. and Canada, two provinces, eight states, numerous Indian Tribal Nations and Aboriginal First Nations, and even some local governments (Dochoda 1999; Bogue 2001; Gaden 2007; Gaden et al. 2013). As each government maintains its own jurisdiction—meaning that it has authority to make its own decisions and judgements—current management of Great Lakes fisheries is multi-jurisdictional (i.e., of or relating to more than one jurisdiction).

The U.S.-Canada international border runs through four of the five Great Lakes and, thus, at the highest level, both countries maintain a responsibility to manage resources within their respective boundaries (Piper 1967). Between these countries, three levels of government—federal, non-federal, and binational—are involved, and have overlapping authorities, in the multi-jurisdictional management of Great Lakes fisheries (Figure 1.2) (Bogue 2001).

Federal Government Authorities and Entities

United States

The U.S. Constitution does not explicitly identify fisheries management as a federal power. Rather, through a series of court cases, the U.S. federal government has retained its authority to involve itself in, and can even supersede, fisheries management decisions at other government levels (e.g., state) and make treaties with tribes (Gaden et al. 2013).
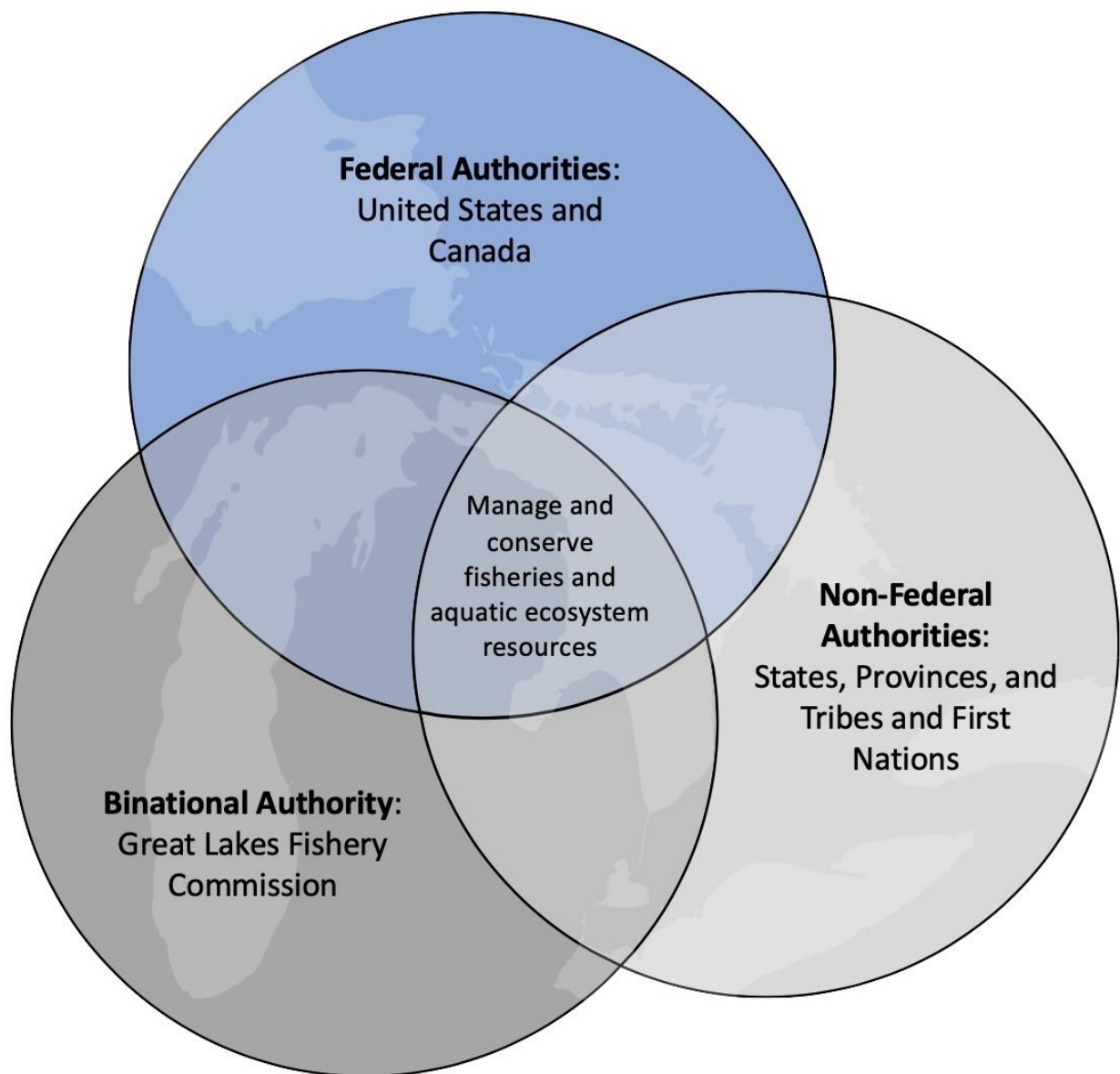
Figure 1.2. The three levels of government with overlapping authorities in managing and conserving fisheries and aquatic ecosystem resources in the Great Lakes basin. Adapted by M. J. Good from M. Gaden (2007; 2008).

Canadian

The Canadian Constitution (via the Constitution Act of 1867, also known as the British North America Act of 1867 [30-31 Vict., c. VI § 91]) (BNA Act) designates inland fisheries management as a federal power. The Canadian federal government exercises its authority to protect all fishes and fish habitat through the Fisheries Act (R.S.C., 1985, c. F-14).

Non-Federal Government Authorities and Entities

State

Supported by a history of court cases and legal decisions, the states have retained their ownership of fish, game, and lakebeds. Thus, they are the primary authority in managing Great Lakes fisheries within their waters, which extend to the international border but are not considered international (Piper 1967; Dochoda 1999; Bogue 2001; Gaden 2007). Though the U.S. Constitution does not directly grant the federal government authority to manage fisheries, the federal government can insert itself in state fisheries management affairs, as needed, to influence, enhance, or even restrict state management actions (Gaden et al. 2013).

Provincial

While there is jurisdictional overlap among all three government levels in Canada, the Canadian provinces own the natural resources within their respective boundaries. According to the BNA Act and the subsequent rulings of a series of court cases, the Canadian provinces have also affirmed their ownership of lakebeds and the surrounding waters (Piper 1967; Bogue 2001; Gaden et al. 2013). Thus, the Canadian provinces—like the states—retain the primary authority in managing Great Lakes fisheries in their respective waters.

Tribal

Tribes are sovereign and, thus, possess supreme authority to self-govern and manage fisheries and aquatic ecosystem resources on their reservations (Hand 2007; Gaden et al. 2013). Off-reservation, in ceded lands and adjacent waters, tribal fishing rights have been stipulated by the tribes and the U.S. federal government working together through treaties (e.g., Treaty of Washington of 1836, a "Consent Decree") (Busiahn 1985; Keller 1986; COTFMA 1999; United States vs. Michigan 2000). There are 35 federally-recognized tribes whose reservation or treaty-guaranteed rights to fish in ceded waters are valid within the Basin (GLRC 2005). Many of these tribes work closely with other non-federal governments (e.g., states) to co-manage the resource, with some tribes even forming inter-tribal organizations (e.g., Chippewa Ottawa Resource Authority [CORA], Great Lakes Indian Fish and Wildlife Commission) (Hand 2007).

First Nation

In contrast to the U.S., there are more than 120 federally-recognized First Nations communities or reserves with their own governments spread throughout the Ontario and Quebec Provinces in Canada (Cassidy 2003). Historically, treaties or agreements among Canadian federal governments and the First Nations established rights of Aboriginal people (i.e., North American Indian, Métis, and Inuit) to harvest fish and wildlife resources in the Great Lakes, though these rights could be subject to federal and provincial management decisions and regulations (Gaden 2007; Gaden et al. 2013). In 1990, the *R. vs. Sparrow* court case confirmed a federal managing and regulatory authority, but also recognized and affirmed treaty fishing rights of First Nations (R. vs. Sparrow 1990). The Canadian federal government ensures these rights are maintained through the "Sparrow Justificatory Test," which includes criteria to

determine whether or not management decisions and regulations are unimposing and reasonable, according to the First Nations (Rotman 1997).

Binational Government Entity and Authority

Great Lakes Fishery Commission

The Great Lakes Fishery Commission (Commission) was birthed out of a widely-recognized and urgent need to address a basin-wide problem for native fisheries and aquatic ecosystems—the introduction and subsequent establishment of the invasive sea lamprey (Crowe 1975; Gaden 2007; Gaden et al. 2013). In response, the U.S. and Canadian federal governments cooperated to develop and sign a treaty, the Convention on Great Lakes Fisheries, on September 10, 1954 (Convention on Great Lakes Fisheries n.d.). This treaty established the Commission in 1955 and effectively limited the Commission's authority so as not to supersede the rights of other federal and non-federal government authorities and entities (Dochoda 1999; Gaden 2007). Today, the Commission, comprised of four members from each country plus one alternate member from the U.S., is responsible for developing management programs (e.g., Sea Lamprey Research Program), conducting scientific studies, and facilitating (rather than leading or supervising) fisheries management among all government authorities and entities in the Basin.

With so many governments carrying out their own authorities in the same place (the Basin) regarding the same resources (fisheries and aquatic ecosystem resources), there became a need for better coordination and information-sharing across borders and jurisdictions. (Dochoda 1999). To improve coordination and communication; limit federal authority in fisheries management affairs; and enhance strategic planning for future governance and

management actions in the Basin, these governments came together to develop and approve a

Joint Strategic Plan for Management of Great Lakes Fisheries (JSP) in 1981 (as revised, June

1997) (Dochoda and Koonce 1994; Gaden 2007; GLFC 2007). Through the plan, all three

government levels (federal, non-federal, and binational) are represented by senior staff from 15

signatory agencies who serve on Lake Committees—the "action arms" of the plan—and the

Council of Lake Committees, technical subcommittees, and other committees (e.g., Law

Enforcement Committee) (GLFC 2000; 2007). Since the inception of the plan, the Commission

has more effectively facilitated fisheries management in the Basin by prioritizing consensus,

accountability, information-sharing, and the use of ecosystem-based management processes

(Figure 1.3) (Slocombe 1998; Guthrie et al. 2019a; Guthrie et al. 2019b) among all signatories

(Gaden et al. 2008; Gaden et al. 2013).
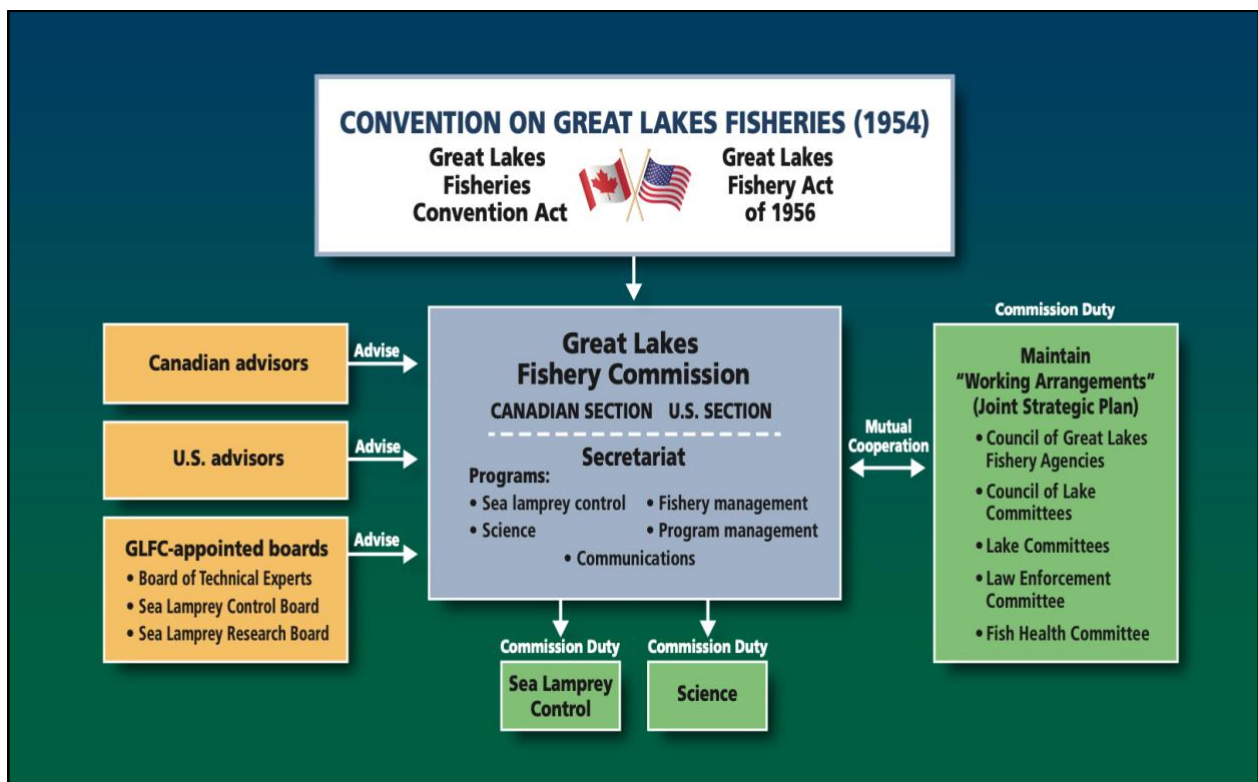
Figure 1.3. Organizational structure of the Great Lakes Fishery Commission (GLFC 2014).

Regulation Within Great Lakes Fisheries

Regulation of human behavior and crime that impacts Great Lakes fisheries and aquatic ecosystem resources is supported through the traditional criminal justice system, which is comprised of four main units: the courts or judiciary, corrections, the private sector, and law enforcement (Hart 1958; Neubauer and Fradella 2018). These units, acting both independently and interdependently, function to uphold laws and crime that affects Basin ecosystems and resources (Gross 1979).

As many of the aforementioned governing and managing authorities and entities (e.g., state) have a law enforcement bureau- or division- component, regulatory actions also span multiple jurisdictions in the Basin (Piper 1967; Bogue 2001; Kirshman and Leonard 2003; Gaden 2007). The fisheries regulatory regime in the Basin, for instance, involves more than 650 federal, non-federal, and binational (and some local) government agencies, each with their own unique (and often conflicting) missions (Caldwell 1994; McGarrell et al. 2013). Table 1.1 includes a broad listing of the government agencies and organizations of particular focus in this chapter and dissertation, their roles and responsibilities, and the primary laws that guide Great Lakes fisheries law enforcement.

Each of the law enforcement or regulatory entities listed in Table 1.1 include associated law enforcement personnel. While law enforcement personnel differ in regard to their titles (e.g., law enforcement officer, peace officers, game warden, special agent) and regular duties, they—and the entities they represent—are primarily responsible for protecting fisheries and aquatic ecosystem resources in the Basin (Eliason 2003; 2006). In doing so, these carefully selected and well-trained law enforcement officers, execute a range of duties including, but

Table 1.1. Government levels, authorities and entities (law enforcement and natural resource management), roles and responsibilities, and primary laws (listed by original enactment date) and treaties or deals in Great Lakes fisheries law enforcement.

Level of Government	Jurisdictional Authority	Entities	General Roles and Responsibilities	Primary Laws, Treaties, and Deals
Federal	United States	Office of Law Enforcement NOAA Fisheries	• Lead federal fisheries law enforcement • Support international treaty requirements (NOAA Fisheries n.d.) • Ensure compliance with fish regulations • Inspect and monitor fishing vessels • Conduct long-term investigations • Support mutually-desirable fisheries management outcomes (Randall 2004)	Lacey Act (1900) Migratory Bird Treaty Act (1918) Clean Water Act (1972) Marine Mammal Protection Act (1972) Endangered Species Act (1973) Magnuson-Stevens Fishery Conservation and Management Act (1976) Convention on International Trade in Endangered Species of Wild Fauna and Flora (1975)[7] National Invasive
		Enforcement Branch U.S. Coast Guard	• Lead at-sea or maritime law enforcement • Deter (Randall 2004) and monitor illegal activity along the international border (Kirshman and Leonard 2003) • Ensure compliance with fisheries regulations • Inspect and monitor fishing vessels • Patrol offshore fishing grounds and nearshore areas	

[7]While the Convention on International Trade in Endangered Species of Wild Fauna and Flora or CITES is an international treaty, the United States and Canada are contracting Parties to the treaty and, through federal government entities like the USFWS, prevent fish and aquatic species from becoming extinct, endangered, and threatened as a result of international trade.

Table 1.1 (cont'd).

Level of Government	Jurisdictional Authority	Entities	General Roles and Responsibilities	Primary Laws, Treaties, and Deals
		Office of Law Enforcement U.S. Fish and Wildlife Service	• Address domestic and international organized crime (e.g., trafficking) • Protect fish and safeguard fish habitat • Enforce federal regulations • Prevent introduction and spread of aquatic invasive species • Use forensic science to analyze evidence and solve crimes (USFWS 2019) • Educate and conduct outreach to promote voluntary compliance (USFWS 2015; 2017) • Train law enforcement personnel • Collaborate with other government entities to carry out law enforcement activities	Species Act (1996) Plant Protection Act (2000) Smart Border Declaration (2001) Clean Boating Act (2008)
	Canadian	Conservation and Protection Fisheries and Oceans	• Protect fish and fish habitat from physical damage • Develop and implement fish regulations • Assist with investigations • Issue or authorize fishing licenses (Kirshman and Leonard 2003) • Implement increased use of modernized technology to solve crimes (DFO 2020) • Educate the general public to promote voluntary compliance	Constitution Act (1867, 1982, as amended) Fisheries Act (1985)

Table 1.1 (cont'd).

Level of Government	Jurisdictional Authority	Entities	General Roles and Responsibilities	Primary Laws, Treaties, and Deals
			• Collaborate with other government entities to carry out law enforcement activities	
Non-Federal	United States State	Bureaus, Divisions, and offices of Law Enforcement Departments and commissions of natural resources and environmental equality for the states of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin	• Protect fisheries and aquatic ecosystem resources • Establish harvest regulations • Enforce fish laws and regulations within respective jurisdictions • Patrol within, and monitor, respective jurisdictions • Issue fishing licenses (Gaden et al. 2013) • Arrest offenders • Respond to general public requests for law enforcement information (Chapman and Hartman 1962) • Participate in multi-agency patrols, operations and investigations, and training • Collaborate with, and assist, other government entities to carry out law enforcement activities • Serve as first responders to natural disasters and emergencies • Research and write case briefings • Provide testimonies in court	Natural Resources and Environmental Protection Act (1994) State codes (Fish and Aquatic Life Code [n.d.]), orders, statutes, rules, and regulations

Table 1.1 (cont'd).

Level of Government	Jurisdictional Authority	Entities	General Roles and Responsibilities	Primary Laws, Treaties, and Deals
	Tribal	Law Enforcement Individual tribes and those tribes operating through inter-tribal agencies (e.g. Chippewa-Ottawa Resource Authority, Great Lakes Indian Fish and Wildlife Commission)	• Establish, apply, and enforce regulations in treaty-ceded waters (Kirshman and Leonard 2003) • Patrol in, and investigate, ceded waters • Issue fines, citations, or other sanctions for civil and criminal infractions • Summon offenders to tribal court • Participate in annual training exercises • Collaborate and cooperate with other government entities to carry out law enforcement activities	Treaty of Washington (1836) Consent Decree (2000) Inland Consent Decree (2007)
	Canada Provincial	Enforcement Branch Ontario Ministry of Natural Resources and Forestry	• Enforce fish regulations • Conduct routine inspections • Investigate, arrest, search and seize, and prosecute offenders • Educate the general public on conservation and safety (MNRF 2019)	Fish and Wildlife Conservation Act (1997) Fisheries Act (1985)
	First Nations	Law Enforcement Individual tribes	• Develop and enforce regulations on reservation lands and adjacent waters (Gaden et al. 2013) • Conduct surveillance to investigate and report offenders • Facilitate cooperation among Aboriginal	Constitution Act (1867, as amended 1982) Indian Act (1876) Various treaties (e.g., Robinson

Table 1.1. (cont'd).

Level of Government	Jurisdictional Authority	Entities	General Roles and Responsibilities	Primary Laws, Treaties, and Deals
			• Facilitate cooperation among Aboriginal communities and government entities	Huron- and Robinson-Superior Treaties [1850]) signed between the Canadian federal government and First Nations
Binational	United States-Canada	Law Enforcement Committee Great Lakes Fishery Commission	• Prevent exploitation of fisheries and aquatic ecosystem resources by unlawful means (GLFC n.d.) • Support the Law Enforcement Committee • Provide annual updates • Share law enforcement information with fisheries managers, decision-makers, and researchers • Facilitate collaboration among jurisdictions	Convention on Great Lakes Fisheries (1954) Great Lakes Water Quality Agreement (1972) Joint Strategic Plan for Management of Great Lakes Fisheries (1981)

not limited to: routine patrolling and monitoring for illegal activities; identifying current or potential threats to fish and fish habitat; ensuring compliance with the law by issuing sanctions (e.g., ticket, summons, appearance notices); conducting special operations or investigative, undercover work to detect larger-scale criminal operations; educating fisheries resource users about existing regulations; and collaborating with, and assisting, other entities in law enforcement activities, as necessary (Chapman and Hartman 1962; Eliason 2003; Kirshman and Leonard 2003).

Coordination and Basin-Wide Representation

The variety and number of governments involved in conserving Great Lakes fisheries makes it impossible to manage these resources and develop, let alone enforce, statutes, rules, and regulations to ensure their future sustainability with a uniform, one-size-fits-all approach. Each system (e.g., a river, stream, or freshwater lake) is different, in that it is characterized by multiple ecological and physical processes; diverse landscapes and habitats; and distinct fish and wildlife species assemblages, which often occupy unique niches.

What might be a fisheries issue worthy of regular intervention by law enforcement personnel in one jurisdiction (e.g., presence of Asian carp in Illinois) may not appear as urgent, or be an issue at all, in another jurisdiction (e.g., in Michigan, where self-sustaining populations of Asian carp have not yet established). Additionally, the values and interests held among the people—society—that live adjacent to, and interact with, each system differ. As a result, fisheries law enforcement decisions may not have the same impacts across jurisdictions as they would if they were tailored specifically to a subset of society with similar values and interests. Such is the case for tribal-licensed and state-licensed commercial fishing in the Great Lakes, for

instance. While commercial fishing occurs in the same waters, it is regulated by different groups of people (Natives and non-Natives) who exercise their own value systems and judgments in developing polices that govern decisions about law enforcement (Hudson and Ziegler 2014). Undoubtedly, acknowledgement of the ecological and social nuances associated with Great Lakes fisheries is critical in developing targeted regulatory approaches—specific to each system and the people supported by it—to ensure fisheries and aquatic ecosystem resource sustainability. Without such targeted approaches, issues such as overharvesting or the accidental release of AIS, might be missed or left unaddressed and become exacerbated on a larger, basin-wide level later. Much like what the Commission addressed through the JSP, facilitation of these targeted approaches and improved coordination among authorities and entities are necessary in addressing issues that span multiple jurisdictions and could threaten the entire Basin.

The Law Enforcement Committee

The Law Enforcement Committee (Committee), supported by the Commission, is the result of the Commission's forward-thinking attempt to represent all government levels in coordinating law enforcement activities, as they relate to fisheries, throughout the Basin (McGarrell et al. 2013). The Committee is unique in its mission, structure, and function, and while other multi-agency enforcement groups do exist (e.g., CORA Law Enforcement Committee), they are not as inclusive in terms of representation and do not necessarily embrace the same basin-wide perspectives when it comes to discussing current fisheries law enforcement issues.

Overall, the Committee serves to "protect, enhance, and promote the safe and wise use

of natural resources" in the Great Lakes (GLFC n.d.). Importantly, the Committee also:

- Acknowledges and promotes law enforcement as a critical element of overall Great Lakes fisheries and aquatic ecosystem resource sustainability;

- Facilitates cooperation and information-sharing among all Great Lakes law enforcement entities;

- Ensures alignment among management and policy decisions that affect Great Lakes fisheries;

- Participates in fisheries management initiatives; and,

- Provides regular updates to the Commission, as necessary (Kirshman and Leonard 2003; GLFC 2019b).

As of 2020, the Committee is led by a Chair and Vice-Chair, who each serve two-year terms, and it includes law enforcement representation from 16 natural resource management entities throughout the Basin (

Table 1.2). The Committee holds meetings twice per year, alternating meeting locations between the U.S. and Canada each time (GLFC n.d.).

Table 1.2. Federal, non-federal, and binational government (i.e., natural resource management) entities represented in the Law Enforcement Committee.

Level of Government	Natural Resource Management Entity
Federal	National Oceanic and Atmospheric Administration
	U.S. Coast Guard (District 9)
	U.S. Fish and Wildlife Service (Midwest Region)
	Fisheries and Oceans Canada

Table 1.2 (cont'd).

Level of Government	Natural Resource Management Entity
Non-Federal	Illinois Department of Natural Resources
	Indiana Department of Natural Resources
	Michigan Department of Natural Resources
	Minnesota Department of Natural Resources
	New York Department of Environmental Conservation
	Ohio Department of Natural Resources
	Wisconsin Department of Natural Resources
	Ontario Ministry of Natural Resources
	Pennsylvania Fish and Boat Commission
	Chippewa-Ottawa Resource Authority*
	Great Lakes Indian Fish and Wildlife Commission*
Binational	Great Lakes Fishery Commission

Asterisk indicates the inter-tribal organizations, which represent the interests of individual tribes. The Chippewa-Ottawa Resource Authority represents all 1936 Treaty fishing tribes (i.e., Bay Mills Indian Community, Grand Traverse Band of Ottawa and Chippewa Indians, Little River Band of Ottawa Indians, Little Traverse Bay Bands of Odawa Indians, and the Sault Ste. Marie Tribe of Chippewa Indians). The Great Lakes Indian Fish and Wildlife Commission or GLIFWC represents eleven Ojibwe tribes throughout Michigan, Minnesota, and Wisconsin.

Conclusion

The Basin presents a number of challenges for managing and governing authorities and entities to overcome in ensuring Great Lakes fisheries and aquatic ecosystem resource sustainability. Even if these groups are able to work across borders and coordinate approaches to conserve these resources, the approaches must be implemented and behavior among fisheries resource users, according to whatever is implemented, should be enforced.

In the Basin, regulatory authorities and law enforcement entities, such as those described in this chapter, are the backbone of fisheries and aquatic ecosystem resource sustainability. They are the only group of authorities, entities, and personnel that serve as intermediaries between those that create and implement fisheries-related policies and

management decisions (e.g., policy-makers and managers) and those that benefit in some way

from the resource (e.g., fisheries resource users). Many of these law enforcement personnel

serve as the boots on the ground—actively patrolling and monitoring areas and ensuring

compliance among fisheries resource users with statutes, rules, and regulations that offer

protection for valuable resources and ecosystems (Wilson 2017). They also serve as educators

or extension agents—sharing information with the fisheries resource users they encounter, as

necessary.

In the Basin, a greater awareness and appreciation of the role of law enforcement in

protecting fisheries and aquatic ecosystem resources and the effectiveness of law enforcement

in obtaining compliance among fisheries resource users is necessary. Only then will it be

possible to increase understanding about how to more successfully leverage regulatory

authorities and enhance law enforcement capacity and effectiveness across jurisdictions,

perhaps with assistance from the Commission and the Committee. If this occurs, then it is likely

that Great Lakes fisheries and aquatic ecosystem resources will be more resilient as new

ecological and anthropogenic threats emerge.

LITERATURE CITED

LITERATURE CITED

(1990). R. vs. Sparrow, Supreme Court of Canada.

(2000). United States vs. Michigan, U.S. District Court.

Arnason, R. (2013). "On optimal dynamic fisheries enforcement." <u>Marine Resource Economics</u> **28**(4): 361-377.

Beattie, K. H. and R. H. Giles (1979). "A survey of wildlife law enforcement research needs and current research." <u>Wildlife Society Bulletin (1973-2006)</u> **7**(3): 185-188.

Beattie, K. H., R. H. Giles, et al. (1977). "Lack of research in wildlife law enforcement." <u>Wildlife Society Bulletin</u> **5**(4): 170-174.

Beeton, A. M., C. E. Sellinger, et al. (1999). An introduction to the Laurentian Great Lakes ecosystem. <u>Great Lakes Fisheries Policy and Management: A Binational Perspective</u>. W. W. Taylor and C. P. Ferreri. East Lansing, Michigan, Michigan State University Press: 3-54.

Bogue, M. B. (2001). <u>Fishing the Great Lakes: An Environmental History, 1783–1933</u>. Madison, Wisconsin, The University of Wisconsin Press.

Brenden, T. O., R. W. Brown, et al. (2013). Great lakes commercial fisheries: Historical overview and prognoses for the future. <u>Great Lakes Fisheries Policy and Management: A Binational Perspective</u>. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 339-398.

Busiahn, T. R. (1985). "An introduction to native peoples' fisheries issues in North America." <u>Fisheries</u> **9**(5): 3.

Caldwell, L. K. (1994). "Disharmony in the Great Lakes basin: Institutional jurisdictions frustrate the ecosystem approach." <u>Alternatives Journal</u> **20**(3): 26.

Campbell, M., M. Cooper, et al. (2015). "The economy as a driver of change in the Great Lakes–St. Lawrence River basin." <u>Journal of Great Lakes Research</u> **41**.

Cassidy, F. (2003). "The First Nations Governance Act: A legacy of loss." <u>Policy Options</u> **24**(4): 46-50.

Chapman, S. G. and J. Hartman (1962). "Conservation law enforcement in Michigan." <u>The Journal of Criminal Law, Criminology, and Police Science</u> **53**(3): 384-390.

Coon, T. G. (1999). Ichthyofauna of the Great Lakes Basin. Great Lakes Policy and Management: A Binational Perspective. W. W. Taylor and C. P. Ferreri. East Lansing, Michigan, Michigan State University Press: 55-71.

COTFMA (1999). Michigan's 1836 Treaty Fishery Guide. Public Information and Education Committee. Sault Ste. Marie, Michigan.

Craig, J. F. (2016). Freshwater Fisheries Ecology. Hoboken, New Jersey, John Wiley & Sons.

Crow, M. S., T. O. C. Shelley, et al. (2013). "Camouflage-collar crime: An examination of wildlife crime and characteristics of offenders in Florida." Deviant Behavior **34**(8): 635-652.

Crowe, W. R. (1975). Great Lakes Fishery Commission: History, Program, and Progress. Ann Arbor, Michigan, Great Lakes Fishery Commission.

DFO (2020). "Fisheries Enforcement." Retrieved April 27, 2020, from https://www.dfo-mpo.gc.ca/fisheries-peches/enf-loi/index-eng.html.

Dochoda, M. R. (1999). Authorities, responsibilities, and arrangements for managing fish and fisheries in the Great Lakes ecosystem. Great Lakes Fisheries Policy and Management: A Binational Perspective. W. W. Taylor and C. P. Ferreri. East Lansing, Michigan, Michigan State University Press: 93-110.

Dochoda, M. R. and J. F. Koonce (1994). "A perspective on progress and challenges under a Joint Strategic Plan for Management of Great Lakes Fisheries." University of Toledo Law Review (2): 425-442.

Eilason, S. L. (2011). "Policing natural resources: Issues in a conservation law enforcement agency." Professional Issues in Criminal Justice **6**(3 and 4): 43-58.

Eliason, S. L. (2003). "Throwing the book versus cutting some slack: Factors influencing the use of discretion by game wardens in Kentucky." Deviant Behavior **24**(2): 129-152.

Eliason, S. L. (2006). "Factors influencing job satisfaction among state conservation officers." Policing: An International Journal of Police Strategies and Management **29**(1): 6-18.

Eliason, S. L. (2013). "Policing the poachers in the United States: A qualitative analysis of game wardens and profiling." International Journal of Criminal Justice Sciences **8**(2): 235-247.

Filteau, M. R. (2013). "Deterring defiance: 'Don't give a poacher a reason to poach'." International Journal of Rural Criminology **1**(2): 236-255.

Forsyth, C. J. (1994). "Bookers and peacemakers: Types of game wardens." Sociological Spectrum **14**(1): 47-63.

Gaden, M. (2007). Bridging jurisdictional divides: Collective action through a Joint Strategic Plan for Management of Great Lakes Fisheries. Ann Arbor, University of Michigan**: 296.**

Gaden, M., C. Goddard, et al. (2013). Multi-jurisdictional management of the shared Great Lakes fishery: Transcending conflict and diffuse political authority. <u>Great Lakes Fisheries Policy and Management: A Binational Perspective</u>. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 305-338.

Gaden, M., C. Krueger, et al. (2008). "A Joint Strategic Plan for Management of Great Lakes Fisheries: A cooperative regime in a multi-jurisdictional setting." <u>Aquatic Ecosystem Health and Management</u> **11**(1): 50-60.

Gavin, M. C., J. N. Solomon, et al. (2010). "Measuring and monitoring illegal use of natural resources." <u>Conservation Biology</u> **24**(1): 89-100.

GLC (n.d.). "About the Lakes." Retrieved April 15, 2020, from https://www.glc.org/lakes/.

GLFC (2000). A Joint Strategic Plan for Management of Great Lakes Fisheries. Ann Arbor, Michigan, Great Lakes Fishery Commission.

GLFC (2007). A Joint Strategic Plan for Management of Great Lakes Fisheries. Ann Arbor, Michigan, Great Lakes Fishery Commission**: 29.**

GLFC (2014). Great Lakes Fishery Commission. Ann Arbor, Michigan, Great Lakes Fishery Commission**: 2.**

GLFC (2019a). "The Fishery." Retrieved April 18, 2020, from http://www.glfc.org/the-fishery.php.

GLFC (2019b). "Law Enforcement Committee." Retrieved April 25, 2020, from http://www.glfc.org/law-enforcement-committee.php.

GLFC (n.d.). Terms of Reference. Ann Arbor, Michigan, Great Lakes Fishery Commission**: 3.**

GLIFWC (n.d.). "Mission Statement." Retrieved July 2, 2020, from http://www.glifwc.org/About/.

GLRC (2005). Tribal Nations Issues and Perspectives, Conference of Great Lakes and St. Lawrence Governors and Premiers. **1:** 18.

Goddard, C. (2013). Foreword. <u>Great Lakes Fisheries Policy and Management: A Binational Perspective</u>. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press. **2**: ix-xi.

Gross, H. (1979). A Theory of Criminal Justice. New York City, New York, Oxford Press University.

Guthrie, A. G., W. W. Taylor, et al. (2019a). "The role of a multi-jurisdictional organization in developing ecosystem-based management for fisheries in the Great Lakes basin." Aquatic Ecosystem Health and Management **22**(3): 329-341.

Guthrie, A. G., W. W. Taylor, et al. (2019b). "Linking water quality and fishery management facilitated the development of ecosystem-based management in the Great Lakes basin." Fisheries **44**(6): 288-292.

Hand, J. P. (2007). "Protecting the world's largest body of fresh water: The often overlooked role of Indian tribes' co-management of the Great Lakes." Natural Resources Journal: 815-847.

Hart, H. M. (1958). "The aims of the criminal law." Law and Contemporary Problems **23**(3): 401-441.

Hudson, J. C. and S. S. Ziegler (2014). "Environment, culture, and the Great Lakes fisheries." Geographical Review **104**(4): 391-413.

Keller, R. H. (1986). "The Chippewa treaties of 1826 and 1836." American Indian Journal (3): 27-32.

Kelly, D. W. (2007). Vectors and Pathways for Nonindigenous Aquatic Species in the Great Lakes. Transportation Research Board Special Report. **291:** 27.

Kirshman, H. and N. J. Leonard (2003). Protecting the Fishery through Law Enforcement. Ann Arbor, Michigan, Great Lakes Fishery Commission**:** 8.

Lynch, A. J., S. J. Cooke, et al. (2016). "The social, economic, and environmental importance of inland fish and fisheries." Environmental Reviews **24**(2): 115-121.

Lynch, A. J., W. T. Taylor, et al. (2010). "The influence of changing climate on the ecology and management of selected Laurentian Great Lakes fisheries." Journal of Fish Biology **77**(8): 1764-1782.

Mandrak, N. E. and B. Cudmore (2013). Fish species at risk and non-native fishes in the Great Lakes Basin: Past, present, and future. Great Lakes Fisheries Policy and Management. W. W. Taylor, A. J. Lynch and N. J. Leonard, Michigan State University Press: 167-202.

McGarrell, E. F., M. Suttmoeller, et al. (2013). Great Lakes fisheries law enforcement. Great Lakes Fisheries Policy and Management: A Binational Perspective. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 455-472.

MNRF (2019). "Conservation Officer Powers and Authorities." Retrieved April 27, 2020.

Morse, W. B. (1973). "Law enforcement: One third of the triangle." Wildlife Society Bulletin **1**(1): 39-44.

Musgrave, R. S., S. Parker, et al. (1993). "The status of poaching in the United States—Are we protecting our wildlife?" Natural Resources Journal: 977-1014.

Neubauer, D. W. and H. F. Fradella (2018). America's Courts and the Criminal Justice System. Boston, Massachusetts, Cengage Learning.

Nie, M. (2008). "The underappreciated role of regulatory enforcement in natural resource conservation." Policy Sciences **41**(2): 139-164.

NOAA Fisheries (n.d.). "Enforcement." Retrieved April 27, 2020, from https://www.fisheries.noaa.gov/topic/enforcement.

O'Connor Shelley, T. and M. S. Crow (2009). "The nature and extent of conservation policing: Law enforcement generalists or conservation specialists?" American Journal of Criminal Justice **34**(1-2): 9-27.

Piper, D. C. (1967). The International Law of the Great Lakes: A Study of Canadian-United States Co-operation. Durham, North Carolina, Duke University Press.

Poe, G., T. B. Lauber, et al. (2013). Net Benefits of Recreational Fishing in the Great Lakes Basin: A review of the Literature. Human Dimensions Research Unit Publication Series. Ithaca, New York, Cornell University.

Randall, J. K. (2004). "Improving compliance in U.S. federal fisheries: An enforcement agency perspective." Ocean Development and International Law **35**(4): 287-317.

Rotman, L. I. (1997). "Defining parameters: Aboriginal rights, treaty rights, and the Sparrow Justificatory Test." Alberta Law Review **36**(1): 149-179.

Ruiz, G. M. and J. T. Carlton (2003). Invasion vectors: A conceptual framework for management. Invasive Species: Vectors and Management Strategies. G. M. Ruiz and J. T. Carlton. Washington, D.C., Island Press: 459-504.

Slocombe, D. S. (1998). "Defining goals and criteria for ecosystem-based management." Environmental Management **22**(4): 483-493.

Steinman, A. D., B. J. Cardinale, et al. (2017). "Ecosystem services in the Great Lakes." Journal of Great Lakes Research **43**(3): 161-168.

Taylor, W. W., C. P. Ferreri, et al. (1995). "Essay-teaching ecosystem management: Educating fisheries professionals using a watershed approach to emphasize the ecosystem paradigm." <u>Fisheries</u> **20**(9): 6-8.

Taylor, W. W., M. J. Good, et al. (2019). "The changing face of Great Lakes fisheries." <u>Aquatic Ecosystem Health and Management</u> **22**(3): 355-367.

Thayer, S. A. and A. J. Loftus (2013). Great Lakes recreational fisheries and their role in fisheries management and policy. <u>Great Lakes Fisheries Policy and Management: A Binational Perspective</u>. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 399-440.

UNFAO (2020). "Fisheries." Retrieved April 18, 2020, from http://www.fao.org/fisheries/en/.

USFWS (2015). U.S. Fish and Wildlife Service, Office of Law Enforcement, Strategic Plan 2016-2020. Falls Church, Virginia, U.S. Fish and Wildlife Service**:** 29.

USFWS (2016). 2016 National Survey of Fishing, Hunting, and WIldlife-Associated Recreation. Washington, D.C., U.S. FIsh and Wildlife Service, U.S. Department of Commerce, U.S. Census Bureau**:** 132.

USFWS (2017). Office of Law Enforcement, Accomplishments 2016: Protecting the Nation's Wildlife and Plant Resources. Falls Church, Virginia, U.S. Fish and Wildlife Service**:** 56.

USFWS (2019). "Forensics Laboratory." Retrieved April 27, 2020, from https://www.fws.gov/lab/index.php.

Wilson, E. O. (2017). "Biodiversity research requires more boots on the ground." <u>Nature Ecology and Evolution</u> 1(11): 1590-1591.

CHAPTER 2: CHALLENGES OF, AND OPPORTUNITIES FOR, GREAT LAKES FISHERIES LAW ENFORCEMENT

Abstract

Ecological and anthropogenic threats (e.g., climate change) pose risks to the health and sustainability of Great Lakes fish and fish habitat. While Great Lakes regulatory authorities and entities should be poised, well-equipped, and well-informed to adequately prepare for, and be able to address, existing and emerging threats, they face numerous issues (e.g., geographic size and scope of the Basin). This chapter provides a summary of key issues that present challenges of, and opportunities, for fisheries law enforcement officers related to threats to fisheries and aquatic ecosystem resource sustainability in the Great Lakes basin. From 2015 to 2020, I used a participant observation approach to engage with fisheries law enforcement officers at multiple meetings (e.g., Great Lakes Fishery Commission's Law Enforcement Committee Meetings, American Fisheries Society Annual Meeting) to gather their perspectives in identification of these key issues. Regardless of the government level, authority, or entity, many of the key issues presenting challenges of, and opportunities for, fisheries law enforcement are similarly shared among jurisdictions throughout the Great Lakes basin and beyond (e.g., Pacific Northwest). This chapter provides insight for regulatory entities that are interested in increasing their effectiveness in working across borders to better protect Great Lakes fisheries and enhance the resiliency of aquatic ecosystem resources.

KEYWORDS: threats; challenges; opportunities; fisheries; law enforcement; Great Lakes

Introduction

As ecological and anthropogenic threats facing Great Lakes fisheries and aquatic ecosystem resource sustainability are complex and ever-evolving, so too should be the regulatory strategies used to anticipate them. Some of these threats (e.g., aquatic invasive species) have already come to fruition while others (e.g., climate change)—with new knowledge and improved, more targeted regulatory strategies—may be better addressed. Future threats, however, may present entirely new challenges that decision- and policy-makers, managers, researchers, and regulators could neither have predicted nor imagined.

In any case, such threats have resulted, and will likely continue to result, in significant changes (e.g., increasing water temperatures, habitat loss, increasing competition and predation) for Great Lakes fisheries and aquatic ecosystem resources (Taylor et al. 2019). Reflecting on historical events (e.g., opening of new canals, signing of international treaties and agreements, stocking of non-native species) that have shaped the Great Lakes basin (Basin) into the place it is today, and the values of the people that live there, shows that change in any sphere—ecological, social, economic, cultural, and political—can be fast-paced and result in both positive and negative impacts to people, fish, and wildlife (Bogue 2001; Taylor et al. 2019; Mayfield n.d.). Given increasing trends in human population growth (Gold et al. 2018), transportation and trade (CGLR 2017a), and tourism (CGLR 2017b) especially related to aquatic activities (USFWS 2016), future impacts to Great Lakes fisheries and aquatic ecosystem resources are inevitable.

Threats to these resources and the resulting impacts can negatively affect human behavior, potentially leading to higher levels of illegal fishing behavior and fish crime. Thus,

regulatory authorities and law enforcement entities should be poised and well-positioned to address such threats. They should also be well-equipped with the support (e.g., funding, staff resources), training, and tools and technologies to adjust their responses to the resulting impacts appropriately and quickly. Otherwise, Great Lakes fisheries and the ecosystem services they provide could be further degraded or lost entirely. Before it is possible to assess and enhance the current preparedness of Great Lakes regulatory authorities and law enforcement entities, however, an understanding of their challenges and opportunities, in the scope of their dynamic working environment, is necessary.

The goal of this research study was to identify and evaluate the key issues presenting shared challenges and opportunities among Great Lakes fisheries law enforcement entities in anticipating and addressing threats to fisheries and aquatic ecosystem resources. The outcomes of this research study will offer valuable insight regarding the potential effectiveness[8] of regulatory authorities in working across borders to better protect Great Lakes fisheries and enhance the resiliency of aquatic ecosystem resources.

Identification and Evaluation Process

I focused on identifying the key issues by participating in regular meetings of, and observing, the Great Lakes Fishery Commission's (Commission's) Law Enforcement Committee (Committee). The Committee includes diverse representation among supervisory and staff law

---

[8]Traditional law scholars have defined and conceptualized police effectiveness in different ways (Cordner 1989; Sherman et al. 1997; Worrall 1999; National Research Council 2004b; a; Skogan and Frydl 2004; Bowling 2007). Based on their work, this term can be described in the context of fisheries law enforcement. In this dissertation, effectiveness refers to the extent to which fisheries law enforcement (e.g., agencies, organizations, and individuals) protects fisheries and aquatic ecosystem resources, reduces or eliminates crime, and maintains or enhances legitimacy (e.g., fairness) in carrying out its regular duties.

enforcement personnel affiliated with multiple natural resource management entities

throughout the Basin. The Committee holds annual and mid-annual meetings during the year,

in September and March, respectively. These invitation-only meetings provide a forum for

fisheries law enforcement officers to learn about, and openly discuss, pressing issues facing

Great Lakes fisheries, and collaborate in the planning of future law enforcement activities.

For comparative purposes, I also focused on obtaining perspectives of these key issues

by targeting and bringing together select fisheries law enforcement personnel working in the

Basin and in other geographic areas (e.g., Pacific Northwest). I selected these individuals based

on their jurisdictional authority (e.g., tribal), position and status (e.g., supervisory), and

expertise (e.g., forensic science). In 2015, these individuals came together for a full-day

symposium (i.e., "Fisheries Sustainability, Crime, and Enforcement: Whodunnit, and How Do

We Manage It") held during the 145h American Fisheries Society (AFS) Annual Meeting in

Portland, Oregon. In general, the annual meeting promotes sustainable fisheries and aquatic

ecosystem resource management, research opportunities, collaborative learning, professional

development, and science communication among more than 8,000 members around the world

(AFS 2020).

Participant Observation

I used a participant observation approach—a qualitative data collection strategy—to

gain familiarity, establish good rapport, and build trust with the Committee's members over a

five-year period and elicit support for my doctoral research (Jorgensen 1989; DeWalt and

DeWalt 2011). Following this same approach, and informed by my long-time involvement with

the Commission, I targeted additional fisheries law enforcement personnel who demonstrated

(i.e., through their authority, role and status, and expertise) deep knowledge of, and insight on, key issues facing fisheries and aquatic ecosystem resources in the Basin and beyond. I invited these individuals to, and observed them during, a full-day symposium at the AFS Annual Meeting.

The Great Lakes Fishery Commission's Law Enforcement Committee

From 2014 to 2019, I participated in nine, multi-day Committee meetings, during which I was provided a close-up, detailed view into members' regular law enforcement duties and activities (Spradley 2016) (Appendix A. Meeting Timeline and Locations, Table 2.2). During that time, I was also invited by the Committee's Chair and Vice-Chair to give five oral presentations with status updates regarding my doctoral research (Appendix B. Oral Presentations, Table 2.3).

The participant observation approach allowed me to gain a more holistic understanding of fisheries law enforcement in the Basin—the entities, individuals, key issues they face, and practices and activities they engage in—thereby increasing the validity of this study and my ability to develop and test additional research questions (DeWalt and DeWalt 2011). In addition to attending and participating in these Committee meetings and regularly interacting (i.e., in person, through e-mail, and over the phone) with Committee members, I maintained detailed notes with descriptions of my observations. These notes included information about the Committee members (e.g., entity affiliation), meeting agendas, presentation summaries, main topics of discussion (e.g., undercover investigations), and informal conversations. Ultimately, these notes enabled me to build a five-year long record of what conversations and activities I observed occurring within the Committee (DeWalt et al. 1998).

American Fisheries Society Symposium

In February 2015, I submitted an abstract for the full-day symposium, "Fisheries Sustainability, Crime, and Enforcement: Whodunnit, and How Do We Manage It?" (Appendix C. Symposium Abstract). In March, I worked with Committee members to identify fisheries law enforcement personnel as potential presenters for the symposium. I targeted individuals from multiple jurisdictional authorities to obtain a range of expertise, training, and perspectives— related to Great Lakes fisheries law enforcement—among the presenters. I asked them to focus their oral presentation on a list of topics suggested by the Committee members and me (e.g., fish crime, technology and surveillance) and highlight key issues along with challenges for, and opportunities of, fisheries law enforcement (Figure 2.1). In August 2015, I moderated and participated in the symposium. Appendix D. Oral Presentation Schedule, Authors, and Affiliation (Table 2.4) lists the presentation titles and those individuals who accepted my invitation and their affiliations.

Though the symposium was a one-time event, the participant observation approach helped me make new comparisons and acknowledge contrasts regarding key issues facing natural resource management and law enforcement entities in the Basin and other regions. Thus, I maintained additional notes with these realizations.

Summary of Challenges and Opportunities for Law Enforcement

Threats to Great Lakes fisheries and aquatic ecosystem resources have been well-documented in the primary literature (Beeton et al. 1999; Bogue 2001; Lynch et al. 2010; Hayes 2013; Mandrak and Cudmore 2013; Hudson and Ziegler 2014; Campbell et al. 2015; Taylor et al. 2019). Building upon the primary literature, and based on my observations during Committee

Figure 2.1. Mark Robbins (retired), Provincial Enforcement Specialist with the Enforcement Branch of the Ontario Ministry of Natural Resources and Forestry, gives a presentation as part of the 145th American Fisheries Society Annual Meeting.

meetings and the AFS Annual Meeting, I identified the following key issues presenting

challenges of, and opportunities for, fisheries law enforcement in the Basin. A diagram of these

threats, challenges, and opportunities is included in Figure 2.2.

Challenges

The following subsections describe the key issues presenting primary challenges to

effective implementation of fisheries law enforcement in the Basin, perceived by law

enforcement personnel.

Geography, Size, and Scope

Situated in the upper Mideast portion of the United States (U.S.) on the U.S.-Canada

border, the Basin includes the five Laurentian Great Lakes—Lakes Erie, Huron, Michigan,

Ontario, and Superior—the St. Lawrence River, and all other connecting waterways, rivers,

streams, tributaries, and inland lakes (Chapter 1, "Orientation to the Great Lakes Basin"). The

five lakes comprise the largest surface freshwater system on Earth, where their total water area

equals more than 94,000 square miles (mi^2) (243,459 square kilometers [km^2]) (roughly the size

of Oregon) and total volume exceeds 5,400 cubic miles (22,508 cubic kilometers) (EPA 2020a;

b). With over 10,000 mi^2 (25,899.9 km^2) of shoreline, the five lakes spread far and wide

throughout the Basin, crossing diverse aquatic and terrestrial natural landscapes and human

environments (EPA 2020a).

The unique geography, massive size, and extensive scope of the Basin present an

incredible challenge for entities that monitor human behavior and establish and enforce

statutes, rules, and regulations that protect these resources. Due to the number and range of
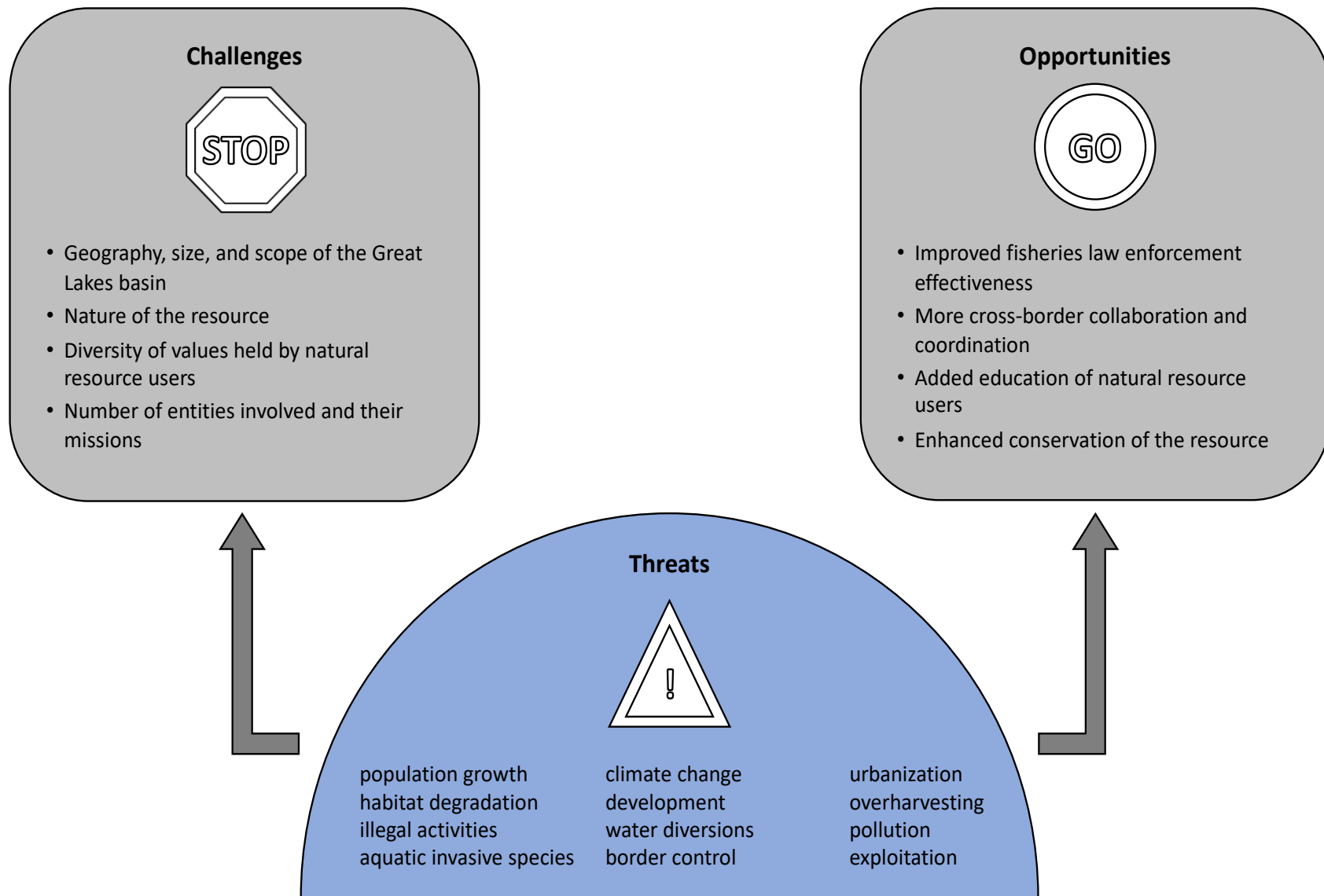
Figure 2.2. A diagram of the threats facing Great Lakes fisheries and aquatic ecosystems, and the challenges of, and opportunities for, fisheries law enforcement, perceived by law enforcement personnel.

threats, and where they occur in the Basin, regulatory policies that aim to address these threats

holistically are difficult, if not impossible, to develop (McGarrell et al. 2013). Successful

development of such policies would likely require a coordinated or joint approach, inclusive of

representation from all jurisdictional authorities and government levels throughout the Basin

(GLFC 2019). On-the-ground enforcement of these policies is difficult, too, for there are simply

not enough fisheries law enforcement officers to provide coverage of the Basin, let alone detect

all illegal fishing behavior and fish crime. While many law enforcement personnel indicated

their affiliated entities lack adequate staff capacity, recent publications suggest this capacity

continues to dwindle as a result of shrinking conservation budgets, long hours and low wages,

and limited hiring and training opportunities (Eilason 2011; Helmer 2020).

Nature of Fisheries Resources

<u>Held in Common</u>

In the U.S. and Canada, fisheries, fish, and fish habitat are considered common property

or common-pool resources (CPR). They are available to everyone and, because of their

economic value, they are usually in high demand (Ostrom 1990). As a result of the availability,

accessibility, and value of these resources, conflict among people who want to use or enjoy

these resources is inevitable (Berkes 1985a; b). Conflict can be avoided if fisheries resource

users work together and cooperate, or act collectively, to manage CPRs with the goal of

sustaining them for the future. However, if each individual pursues his or her own self-interest

regarding use, CPRs provide diminished benefits and are likely to experience degradation and

collapse (Ostrom 1990; Gaden 2007). The choice of some resource users to act according to

their self-interest by competing for and exploiting (i.e., overusing, overharvesting, or depleting)

CPRs was interpreted by Hardin as the "tragedy of the commons" (1968). Hardin supports that, without coercion or incentives (e.g., monetary, social), perhaps implemented or developed, respectively, by a regulatory entity, collective action is unlikely to occur (Olson 1965; 1968). Since then, other scholars have offered a different perspective, claiming that "communication, trust, and the anticipation of future interactions, and the ability to build agreements and rules sometimes control behavior well enough to prevent tragedy" (Dietz et al. 2002; Giordano 2003; Gaden 2007).

In the Basin, governing, managing, and regulatory entities grapple with challenges in ensuring the sustainability of CPRs as they continue to be at risk from certain threats (i.e., exploitation) (Dietz et al. 2003). In response to these threats, innovative governance, management (e.g., co-management), and regulatory strategies (e.g., community engagement, community-oriented policing) (Patten 2010; Roe et al. 2015) have proven to be effective in obtaining voluntary compliance (Apel and Nagin 2011) among fisheries resource users and maintaining sustainable resource levels in some communities (Ostrom 1990; 2000; Acheson 2013; Lawrence 2015). Even some fisheries resource users have been able to self-organize through collective action without external institutional authorities, coercion, or incentives (Ostrom et al. 1992; Ostrom 2009; Lawrence 2015). In the Basin, however, institutions of all types—organized and disorganized, formal and informal—will be challenged in devising strategies to reduce competition for already-dwindling fisheries and aquatic ecosystem resources.

Widely Distributed

Further, unlike humans, fisheries and other aquatic ecosystem resources do not observe

jurisdictional borders or political boundaries (McGarrell et al. 2013). In the Basin, they can swim, move, and migrate freely. Many species (e.g., salmon and steelhead [*Oncorhynchus mykiss*]) naturally overlap two or more geographic areas based on their life history strategies and general requirements (i.e., related to spawning, rearing, foraging, migration, and overwintering).

The transboundary-nature of fish as frequent travelers and migrants poses challenges for fisheries law enforcement (McGarrell et al. 2013). Since these resources can move, so too can people who choose to target and exploit them and, in the process, may also destroy habitat. In the Basin, law enforcement entities are likely to experience difficulties monitoring and investigating fish crime that spans multiple jurisdictional authorities and government levels, and enforcing illegal fishing behavior and activities that negatively impact fish and fish habitat. To circumvent this challenge, law enforcement entities should be encouraged to look past border and boundary lines and cooperate or work collaboratively to identify crimes; enforce statutes, rules, and regulations; and deter illegal fishing behavior that could negatively impact fisheries. aquatic ecosystem resources, and the habitats they require (Kirshman and Leonard 2003).

Diversity of Values

More than 30 million people live in the Basin (EPA 2020a). Each person is distinct in their ethnicities and cultural identities; opinions and preferences; attitudes; and their personal and professional life experiences. They also have formed their own values, which guide their thinking and decision-making (Sharp and Lach 2003). Tensions can arise when values or belief systems conflict. For example, based on my observations, recreational and commercial anglers

66

in the Basin can be at odds with each other as they both advocate for their share of relative take or harvest of fisheries resources. While both user groups are likely to desire the bigger share, or more take or harvest opportunities, they may do so as a result of differing values. Recreational anglers may value the feelings of relaxation and satisfaction they get from fishing, while commercial anglers may value the financial security that is dependent upon a successful harvest.

Given the number and diversity of people living in the Basin, fisheries law enforcement is, and will continue to be, challenged in developing and enforcing statutes, rules, and regulations that address the breadth and depth of values held by fisheries resource users. Rather than focusing on identifying a "one size fits all" approach to, or panacea for, all illegal fishing behavior and fish crime, law enforcement entities and individuals (i.e., officers) should be cognizant and respectful of the values held by people within their jurisdictional authorities (Ostrom 2007). They should also be prepared to embrace conflict, rather than avoid it, and exercise flexibility (e.g., issue warnings instead of more severe sanctions) in handling tense situations among frequently-volatile fisheries resource users.

Number of Entities

Many law enforcement entities exist throughout the U.S. (more than 18,000) and Ontario, Canada (more than 60) (Banks et al. 2016; 2019). Of these, as stated in Chapter 1, "Regulation Within Great Lakes Fisheries," the fisheries regulatory regime in the Basin involves more than 650 federal, non-federal, and binational (and some local) government agencies (McGarrell et al. 2013). While these agencies might share a mutual goal to protect fisheries and aquatic ecosystem resources, differences in their geographic location, size (i.e., in terms of staff

capacity), leadership composition, and resources or issues of interest may dictate variances in

the mission, vision, objectives, and activities of each law enforcement entity.

Table 2.1 includes examples of mission statements from four law enforcement agencies,

representing the three levels of government specified in Chapter 1, "Management of Great

Lakes Fisheries." Each mission statement calls for the "protection" and "preservation" of

natural resources and also includes other details specific to the agency's unique scope (e.g.,

endangered species) and the resource users it serves (e.g., Tribal members).

Table 2.1. Mission statements of fisheries law enforcement agencies in the Great Lakes basin.

Level of Government	Law Enforcement Entity Natural Resource Management Entity	Mission Statement
Federal	Office of Law Enforcement U.S. Fish and Wildlife Service	To protect wildlife and plant resources. Through the effective enforcement of Federal laws, we contribute to U.S. Fish and Wildlife Service efforts to recover endangered species, conserve migratory birds, preserve wildlife habitat, safeguard fisheries, combat invasive species, and promote international wildlife conservation (2020).
Non-Federal	Law Enforcement Division Michigan Department of Natural Resources	To protect Michigan's natural resources and the environment, and the health and safety of the public through effective law enforcement and education (Gervasi 2020).
	Law Enforcement Division Great Lakes Indian Fish and Wildlife Commission	To implement its members' off-reservation treaty rights to fish, hunt, and gather in ceded territories; preserve and enhance natural resources so harvest opportunities

Table 2.1. (cont'd).

Level of Government	Law Enforcement Entity Natural Resource Management Entity	Mission Statement
		will be available for generations come; and infuse Ojibwe culture and values into all aspects of its work (GLIFWC n.d.).
Binational	Law Enforcement Committee Great Lakes Fishery Commission	To protect, enhance, and promote the safe and wise use of the natural resources in the Great Lakes for present and future generations (GLFC n.d.).

The sheer number of entities and their different, often conflicting, missions present major challenges for fisheries law enforcement in the Basin, especially when faced with opportunities (e.g., investigations that overlap multiple states) to work together (Kirshman and Leonard 2003). In an environment where cooperation across jurisdictional borders is essential in protecting, enhancing, and conserving fisheries and aquatic ecosystem resources, law enforcement entities should be in agreement when it comes to developing and/or prioritizing approaches to identify illegal fishing behavior and fish crime, and ensure compliance. Based on my observations, to avoid potential limitations in effectiveness, fisheries law enforcement entities should take more time to consider their mutually-shared goals and objectives and brainstorm new ways to combine and use their resources. As a result, over time, the mission statements might evolve to be more reflective of a basin-wide, versus a single-agency, focus or approach to fisheries law enforcement.

Opportunities

The following subsections describe the key issues presenting primary opportunities for effective implementation of fisheries law enforcement in the Basin, perceived by law enforcement personnel.

Improved Effectiveness

In the Basin, fisheries law enforcement is critical in identifying, deterring, and monitoring unlawful fishing activities, however it is not perfectly effective; it has neither reduced nor eliminated all illegal fishing behavior and fish crime (Randall 2004). In general, the probability a fisheries violation will be detected, let alone considered further for a punishment or penalty, is very low, approximately less than 1% (Sutinen and Kuperan 1999). Additionally, over time, non-compliance rates may increase as people discover new ways to bypass the law undetected (Randall 2004; Hilborn et al. 2006). Thus, opportunities to improve fisheries law enforcement effectiveness should be prioritized and strongly considered by supervisory law enforcement personnel. Such opportunities could include eliminating, revising, or developing new statutes, rules, and regulations; evaluating entity size (Cordner 1989); providing more support (i.e., funding, staff resources) (Eilason 2011) and training for law enforcement (Brereton 1961); refining primary duties and responsibilities (Chapman and Hartman 1962; Falcone 2004; Eliason 2007; O'Connor Shelley and Crow 2009); developing or leveraging new technology (Randall 2004); managing discretion (Forsyth 1993; Eliason 2003; Carter 2006; Forsyth and Forsyth 2012); and increasing transparency (Randall 2004), legitimacy, and trust (Nielsen and Mathiesen 2000; Nielsen 2003).

More Cross-Border Collaboration and Coordination

Increasing human population growth, development, urbanization, and transportation in the Basin could lead to more illegal fishing behavior and fish crime. Additionally, these threats could open up new vectors and pathways for species to invade and potentially establish in Great Lakes waters, thereby increasing the possibility that more threats to fisheries (e.g., increasing predation and competition) and aquatic ecosystem resources (e.g., habitat degradation) will emerge (Ruiz and Carlton 2003; Kelly 2007).

Law enforcement entities retain an opportunity to cooperate in their jurisdiction and among other jurisdictional authorities to address negative impacts resulting from these threats (Kirshman and Leonard 2003). Further, law enforcement personnel (i.e., officers) should be encouraged to explore opportunities to coordinate with fisheries managers and researchers, and other law enforcement personnel to discuss, or develop their own, collaborative approaches to more effective regulation of human behavior that affects fisheries and aquatic ecosystem resources.

Additional Education of Resource Users

In the Basin, increasing illegal behavior and fish crime is likely to lead to more interactions among law enforcement personnel and the general public. With each interaction, law enforcement personnel have an opportunity to not only enforce the law, but also educate fisheries resource users on a variety of topics including, but not limited to: fishing statutes, rules and regulations (Benoit 1973; Kirshman and Leonard 2003); ethical fishing behavior and activities; appropriate locations to fish; significance of fisheries and aquatic ecosystem resources; and importance of fisheries management and conservation efforts (Forsyth and

Forsyth 2012). As more interactions and teaching moments occur, the general public may become more informed users of fisheries and aquatic ecosystem resources and, perhaps, more likely to behave according to the law in future situations.

Enhanced Conservation of the Resource

In the Basin, the greatest opportunity for fisheries law enforcement is to offer greater protection for fisheries and aquatic ecosystem resources. While illegal fishing behavior and fish crime will continue to threaten the sustainability of these resources, fisheries law enforcement can, through improved effectiveness, increase compliance among fisheries resource users and the general public with existing statutes, rules, and regulations that serve to protect fish and aquatic ecosystems (Randall 2004). Higher rates of compliance will likely lead to reduced stress and pressure on fish and fish habitat, thereby offering greater protection for, and respect of, these resources.

Conclusion

Based on my participation in, and observations of, Committee meetings and a full-day symposium with law enforcement personnel, numerous issues in the Basin will continue to present challenges in addressing emerging threats to fisheries and aquatic ecosystem resources. Along with these challenges, however, are opportunities to improve law enforcement effectiveness and enhance overall protection for, and conservation of, these resources. Supervisory staff affiliated with Great Lakes law enforcement entities should possess a deep understanding of these issues and the people they encounter in the field, and a heightened awareness of potential threats. With enhanced understanding and awareness, law

enforcement entities will be in a position to better organize, educate, and train their staff for fisheries law enforcement success.

In the Basin and elsewhere, the future is, however, uncertain, and this issue of uncertainty itself presents both challenges of, and opportunities for, fisheries law enforcement. As much as leaders (i.e., supervisors) in fisheries law enforcement can do to adequately prepare their staff to address emerging threats, it may not be enough, or the right kind of preparation, for what is to come. Thus, law enforcement entities should continue to practice flexibility in its enforcement styles and approaches, knowing that they will surely have to adapt in some or many ways to maintain their effectiveness in protecting and conserving fisheries and aquatic resources in the uncertain future.

APPENDICES

Appendix A. Meeting Timeline and Locations

Table 2.2. Meeting times, names, and locations.

Year	Date	Meeting Name	Location
2014	March 25-26	Mid-Annual Great Lakes Law Enforcement Committee Meeting	Windsor, Ontario
	September 4-5	28th Annual Great Lakes Law Enforcement Committee Meeting	Huron, Ohio
2015	March 24-25	Mid-Annual Great Lakes Law Enforcement Committee Meeting	Ypsilanti, Michigan
	September 15-16	29th Annual Great Lakes Law Enforcement Committee Meeting	Windsor, Ontario
2016	March 22-23	Mid-Annual Great Lakes Law Enforcement Committee Meeting	Milwaukee, Wisconsin
	September 13-14	30th Annual Great Lakes Law Enforcement Committee Meeting	Bolingbrook, Chicago
2017	March 21-22	Mid-Annual Great Lakes Law Enforcement Committee Meeting	Ypsilanti, Michigan
2018	March 28-29	Mid-Annual Great Lakes Law Enforcement Committee Meeting	Toronto, Ontario
2019	March 26-27	Mid-Annual Great Lakes Law Enforcement Committee Meeting	Ypsilanti, Michigan
2020	March 17-18	Mid-Annual Great Lakes Law Enforcement Committee Meeting*	Sault Ste. Marie, Ontario

Asterisk indicates meeting cancellation due to COVID-19.

Appendix B. Oral Presentations

Table 2.3. Oral presentation titles.

Year	Date	Title
2014	September 4	Fenske Fellowship: Enforcement and inland fisheries sustainability
2016	March 22	The role and perceived effectiveness of law enforcement in the multi-jurisdictional management of Great Lakes fisheries
	September 13	Understanding role, perceived efficacy, and impacts on fisheries: A questionnaire for Great Lakes law enforcement officers
2018	March 29	The efficacy of a joint approach to fisheries law enforcement in the Great Lakes basin
2019	March 27	A study of fisheries law enforcement in the Great Lakes basin: Status update

Appendix C. Symposium Abstract

Fisheries Sustainability, Crime, and Enforcement: Whodunnit, and How Do We Manage It?

Law enforcement is a critical yet often under-appreciated and under-represented component of fish crime and fish management. Law enforcement personnel and fisheries management professionals must work together to achieve the common goals of protecting and sustaining fisheries resources. Law enforcement must understand the scientific basic of fisheries management decisions in order to be effective in enforcing regulations, reducing fish crime, and educating and protecting citizens. Fisheries professionals must be aware of the limitations and concerns of law enforcement when developing scientifically-based management regulations. Fisheries law enforcement professionals have largely been under-represented in the American Fisheries Society despite the common goal of perpetuating fisheries resources and the continued contribution of law enforcement to the many successful fisheries management programs. The goal of this symposium is to create a forum where law enforcement personnel and fisheries professionals can cooperatively discuss the role of law enforcement and conservation criminology in shaping the future of fisheries science and the fisheries profession. This symposium will feature presentations from law enforcement, fisheries professionals, and conservation criminologists detailing specific case studies involving fisheries enforcement including advances in criminal and fisheries science and technology. The ultimate outcome of this symposium will be continued closer cooperation and communication between law enforcement and fisheries professionals.

Appendix D. Oral Presentation Schedule, Authors, and Affiliation

Table 2.4. Oral presentations, authors, and author affiliations.

Time	Title	Author(s)	Affiliation
1320	Law enforcement: A critical management tool for ensuring fisheries sustainability	Molly J. Good* William W. Taylor Edmund McGarrell	Michigan State University
1340	Collaborating across borders: Fishery conservation in the Great Lakes through a Joint Strategic Plan for Management of Great Lakes fisheries	Marc Gaden*	Great Lakes Fishery Commission
1400	Strengthening the weakest link: The role of law enforcement in protecting multi-jurisdictional waters from aquatic invasions	Jill Wingfield* Kevin Ramsey	Great Lakes Fishery Commission
1420	Tribal fisheries enforcement	Mitchell G. Hicks*	Columbia River Inter-Tribal Fish Commission
1440	Marine fisheries enforcement: Salty tales of fraud, forensics, and justice	Piper Schwenke* Trey Knott Kathy Moore Linda Park	NOAA Fisheries
1520	Forensic science and fisheries crimes: Beyond CSI	Mary K. Burnham-Curtis*	U.S. Fish and Wildlife Service
1540	Illegal harvest of marine resources on Andros Island and the legacy of colonialism	Elizabeth Silvy* Emma Johnson Casey Story M. Nills Peterson Justa Heinen-Kay R. Brian Langerhans	Texas A&M University North Carolina State University
1600	Assessing recreational fishing compliance before, during, and after implementation of a	Dana Haggarty* Steve Martell Jon Shurin	Biodiversity Research Centre

Table 2.4 (cont'd).

Time	Title	Author(s)	Affiliation
	network of conservation areas: Rockfish conservation areas in British Columbia		
1620	Fisheries for the future: How can law enforcement help us get there?	Mark Robbins* Brad Gerrie	Ontario Ministry of Natural Resources and Forestry

Asterisk indicates those individuals who gave the oral presentation during the symposium.

LITERATURE CITED

LITERATURE CITED

(2019). "Policing in Ontario." Retrieved July 1, 2020, from https://www.mcscs.jus.gov.on.ca/english/police_serv/about.html#:~:text=There%20are %2050%20municipal%20police,Nations%20police%20services%20in%20Ontario.

(2020). "News Around the Service." Retrieved July 2, 2020, from https://www.fws.gov/le/.

Acheson, J. (2013). "Co-management in the Maine lobster industry: A study in factional politics." Conservation and Society **11**(1): 60-71.

AFS (2020). "American Fisheries Society." Retrieved June 13, 2020, from https://fisheries.org/about/.

Apel, R. and D. S. Nagin (2011). "General deterrence: A review of recent evidence." Crime and Public Policy **4**: 411-436.

Banks, D., J. Hendrix, et al. (2016). National Sources of Law Enforcement Employment Data. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics**:** 17.

Beeton, A. M., C. E. Sellinger, et al. (1999). An introduction to the Laurentian Great Lakes ecosystem. Great Lakes Fisheries Policy and Management: A Binational Perspective. W. W. Taylor and C. P. Ferreri. East Lansing, Michigan, Michigan State University Press: 3-54.

Benoit, P. J. (1973). "From fish and wildlife officer to environmental conservation officer." Wildlife Society Bulletin **1**(3): 128-130.

Berkes, F. (1985a). "The common property resource problem and the creation of limited property rights." Human Ecology **13**(2): 187-208.

Berkes, F. (1985b). "Fishermen and 'the tragedy of the commons'." Environmental Conservation **12**(3): 199-206.

Bogue, M. B. (2001). Fishing the Great Lakes: An Environmental History, 1783–1933. Madison, Wisconsin, The University of Wisconsin Press.

Bowling, B. (2007). "Fair and effective policing methods: Towards 'good enough'policing." Journal of Scandinavian Studies in Criminology and Crime Prevention **8**(S1): 17-32.

Brereton, G. H. (1961). "The importance of training and education in the professionalization of law enforcement." The Journal of Criminal Law, Criminology, and Police Science **52**(1): 111-121.

Campbell, M., M. Cooper, et al. (2015). "The economy as a driver of change in the Great Lakes–St. Lawrence River basin." Journal of Great Lakes Research **41**.

Carter, T. J. (2006). "Police use of discretion: A participant observation study of game wardens." Deviant Behavior **27**(6): 591-627.

CGLR (2017a). Great Lakes and St. Lawrence Region Transportation Trends, Issues, and Opportunities. Toronto, Ontario, Council of the Great Lakes Region**:** 26.

CGLR (2017b). Great Lakes-St. Lawrence Region Tourism Trends and Statistics. Toronto, Ontario, Council of the Great Lakes Region**:** 34.

Chapman, S. G. and J. Hartman (1962). "Conservation law enforcement in Michigan." The Journal of Criminal Law, Criminology, and Police Science **53**(3): 384-390.

Cordner, G. W. (1989). "Police agency size and investigative effectiveness." Journal of Criminal Justice **17**(3): 145-155.

DeWalt, K. and B. R. DeWalt (2011). Participant Observation: A Guide for Fieldworkers. Lanham, Maryland, AltaMira Press.

DeWalt, K. M., B. R. DeWalt, et al. (1998). Participant observation. Handbook of Methods in Cultural Anthropology. H. R. Bernard. Lanham, Maryland, AltaMira Press: 259-300.

Dietz, T., N. Dolsak, et al. (2002). The drama of the commons. E. Ostrom, T. Dietz, N. Dolsak et al. Washington, D.C., National Academy Press: 3-35.

Dietz, T., E. Ostrom, et al. (2003). "The struggle to govern the commons." Science **302**: 1907-1912.

Eilason, S. L. (2011). "Policing natural resources: Issues in a conservation law enforcement agency." Professional issues in Criminal Justice **6**(3 and 4): 43-58.

Eliason, S. L. (2003). "Throwing the book versus cutting some slack: Factors influencing the use of discretion by game wardens in Kentucky." Deviant Behavior **24**(2): 129-152.

Eliason, S. L. (2007). "From wildlife specialist to police generalist? The scope of non-wildlife violations encountered by conservation officers." Southwest Journal of Criminal Justice **4**(2): 120-132.

EPA (2020a). "Basic Information, Physical Facts." Retrieved June 28, 2020, from https://web.archive.org/web/20120529233616/http://www.epa.gov/glnpo/physfacts.html.

EPA (2020b). "The Great Lakes." Retrieved June 28, 2020, from
https://www.epa.gov/greatlakes.

Falcone, D. (2004). "America's coservation police: Agencies in transition." Policing: An
International Journal of Police Strategies and Management **27**(1): 56-66.

Forsyth, C. J. (1993). "Factors influencing game wardens in their Interaction with poachers: The
use of discretion." Free Inquiry in Creative Sociology **21**(1): 51-56.

Forsyth, C. J. and Y. A. Forsyth (2012). "Examining the responses of game wardens to types of
poachers." Kentucky Journal of Anthropology and Sociology **2**(1): 27-36.

Gaden, M. (2007). Bridging jurisdictional divides: Collective action through a Joint Strategic Plan
for Management of Great Lakes Fisheries. Ann Arbor, University of Michigan**:** 296.

Gervasi, K. (2020). Mission of conservation officers has expanded. Holland Sentinel. Holland,
Michigan.

Giordano, M. (2003). "The geography of the commons: The role of scale and space." Annals of
the Association of American Geographers **93**(2): 365-375.

GLFC (2019). "Law Enforcement." Retrieved April 25, 2020, from http://www.glfc.org/law-
enforcement.php.

GLFC (n.d.). Terms of Reference. Ann Arbor, Michigan, Great Lakes Fishery Commission**:** 3.

GLIFWC (n.d.). "Mission Statement." Retrieved July 2, 2020, from
http://www.glifwc.org/About/.

Gold, A., R. Pendall, et al. (2018). Demographic Change in the Great Lakes Region: Recent
Population Trends and Possible Futures. Washington, D.C., Urban Institute**:** 53.

Hardin, G. (1968). "The tragedy of the commons." Science **162**(3859): 1243-1248.
The population problem has no technical solution; it requires a fundamental extension
in morality.

Hayes, D. B. (2013). Issues affecting fish habitat in the Great Lakes Basin. Great Lakes Fisheries
Policy and Management: A Binational Perspective. W. W. Taylor, A. J. Lynch and N. J.
Leonard. East Lansing, Michigan, Michigan State University Press: 51-80.

Helmer, J. (2020). Hunting for Game Wardens: A Shortage of Conservation Officers Threatens
Wildlife. The Revelator.

Hilborn, R., P. Arcese, et al. (2006). "Effective enforcement in a conservation area." Science (New York, N.Y.) **314**: 1266.

Hudson, J. C. and S. S. Ziegler (2014). "Environment, culture, and the Great Lakes fisheries." Geographical Review **104**(4): 391-413.

Jorgensen, D. L. (1989). Participant Observation: A Methodology for Human Studies. Newbury Park, California, SAGE Publications, Inc.

Kelly, D. W. (2007). Vectors and Pathways for Nonindigenous Aquatic Species in the Great Lakes. Transportation Research Board Special Report. **291:** 27.

Kirshman, H. and N. J. Leonard (2003). Protecting the Fishery through Law Enforcement. Ann Arbor, Michigan, Great Lakes Fishery Commission**:** 8.

Lawrence, T. J. (2015). Investigating the Challenges and Successes of Community Participation in the Fishery Co-management Program on Lake Victoria, East Africa.

Lynch, A. J., W. T. Taylor, et al. (2010). "The influence of changing climate on the ecology and management of selected Laurentian Great Lakes fisheries." Journal of Fish Biology **77**(8): 1764-1782.

Mandrak, N. E. and B. Cudmore (2013). Fish species at risk and non-native fishes in the Great Lakes Basin: Past, present, and future. Great Lakes Fisheries Policy and Management: A Binational Perspective. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 105-136.

Mayfield, C. (n.d.). "Timeline for the Great Lakes." Retrieved June 8, 2020, from http://www.colinmayfield.com/biology447/modules/module1/GREATLAKESTIMELINE.htm.

McGarrell, E. F., M. Suttmoeller, et al. (2013). Great Lakes fisheries law enforcement. Great Lakes Fisheries Policy and Management: A Binational Perspective. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 455-472.

National Research Council (2004a). The effectiveness of police activities in reducing crime, disorder, and fear. Fairness and Effectivess in Policing: The Evidence. W. G. Skogan and K. Frydl. Washington, D.C., The National Academies Press: 217-251.

National Research Council (2004b). Police fairness: legitimacy as the consent of the public. Fairness and Effectiveness in Policing: The Evidence. W. G. Skogan and K. Frydl. Washington, D.C., The National Academies Press: 291-326.

Nielsen, J. R. (2003). "An analytical framework for studying: Compliance and legitimacy in fisheries management." Marine Policy **27**(5): 425-432.

Nielsen, J. R. and C. Mathiesen (2000). "Important factors influencing rule compliance in fisheries lessons from Denmark." Marine Policy **27**(5): 409-416.

O'Connor Shelley, T. and M. S. Crow (2009). "The nature and extent of conservation policing: Law enforcement generalists or conservation specialists?" American Journal of Criminal Justice **34**(1-2): 9-27.

Olson, M. (1965). The Logic of Collective Action. Cambridge, United Kingdom, Cambridge University Press.

Ostrom, E. (1990). Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge, United Kingdom, Cambridge University Press.

Ostrom, E. (2000). "Collective action and the evolution of social norms." Journal of Economic Perspectives **14**(3): 137-158.

Ostrom, E. (2007). "A diagnostic approach for going beyond panaceas." Proceedings of the National Academy of Sciences **104**(39): 15181-15187.

Ostrom, E. (2009). "A general framework for analyzing sustainability of social-ecological systems." Science **325**(5939): 419-422.

Ostrom, E., J. Walker, et al. (1992). "Covenants with and without a sword: Self-governance is possible." American Political Science Review **86**(2): 404-417.

Patten, R. (2010). "Policing in the wild: the game wardens' perspective." Policing **33**(1): 132-151.

Randall, J. K. (2004). "Improving compliance in U.S. federal fisheries: An enforcement agency perspective." Ocean Development and International Law **35**(4): 287-317.

Roe, D., R. Cooney, et al. (2015). Beyond Enforcement: Engaging Communities in Tackling Wildlife Crime, International Institute for Environment and Development.

Ruiz, G. M. and J. T. Carlton (2003). Invasion vectors: A conceptual framework for management. Invasive Species: Vectors and Management Strategies. G. M. Ruiz and J. T. Carlton. Washington, D.C., Island Press: 459-504.

Sharp, S. B. and D. Lach (2003). "Integrating social values into fisheries management: A Pacific Northwest study." Fisheries **28**(4): 10-15.

Sherman, L. W., D. Gottfredson, et al. (1997). Preventing Crime: What Works, What Doesn't, What's Promising. College Park, Maryland, University of Maryland: 528.

Skogan, W. G. and K. Frydl (2004). Fairness and Effectiveness in Policing: The Evidence. Washington, D.C., The National Academies Press.

Sutinen, J. G. and K. Kuperan (1999). "A socio-economic theory of regulatory compliance." International Journal of Social Economics.

Taylor, W. W., M. J. Good, et al. (2019). "The changing face of Great Lakes fisheries." Aquatic Ecosystem Health and Management **22**(3): 355-367.

USFWS (2016). 2016 National Survey of Fishing, Hunting, and WIldlife-Associated Recreation. Washington, D.C., U.S. FIsh and Wildlife Service, U.S. Department of Commerce, U.S. Census Bureau: 132.

Worrall, J. L. (1999). "Public perceptions of police efficacy and image: The "fuzziness" of support for the police." American Journal of Criminal Justice 24(1): 47.

CHAPTER 3: THE EFFECTIVENESS OF A JOINT APPROACH TO GREAT LAKES FISHERIES LAW ENFORCEMENT

Abstract

Fisheries law enforcement offers protection for fisheries and aquatic ecosystem resources in the Great Lakes basin. Due to various characteristics of the Great Lakes basin (e.g., geography and size, nature of fisheries resources), some regulatory approaches are more effective than others in ensuring the long-term sustainability of Great Lakes fish and fish habitat. This chapter examines perceptions of law enforcement personnel who comprise the Great Lakes Fishery Commission's Law Enforcement Committee Membership in facilitating basin-wide regulation of illegal fishing behavior and fish crime. As part of this research study, I surveyed and interviewed 22 committee members to document their understanding of the Law Enforcement Committee's role and effectiveness in working across borders to protect and conserve fisheries and aquatic ecosystem resources. Respondents identified the Law Enforcement Committee's distinct role in bringing people together to collaboratively discuss, and share information about, issues (e.g., training and staff resource needs) that are likely to impact regulation of these resources. However, respondents also highlighted ways (e.g., taking more law enforcement action, fostering relationships with fisheries managers and researchers) in which the Law Enforcement Committee could be more effective in offering protection for Great Lakes fisheries aquatic ecosystem resources. Respondents' perceptions will provide meaningful insight to the Law Enforcement Committee and other law enforcement entities that are interested in, and willing to, increase their organizational effectiveness in anticipating, and responding to, unlawful fishing activities (e.g., overharvesting) that may negatively affect these resources.

Introduction

The Great Lakes basin (Basin) is home to many valuable fisheries and aquatic ecosystem resources (Taylor et al. 2019). Natural resource management entities, representing multiple jurisdictions at various governmental levels (e.g., federal, non-federal, and binational), are charged with studying, managing, and offering protection for these resources (Kirshman and Leonard 2003; Gaden 2007; McGarrell et al. 2013). However, due to the nature of these resources (Chapter 2, "Nature of Fisheries Resources"), operating individually as entities within their own jurisdictions may hinder natural resource management from reaching its full conservation potential on a basin-wide scale.

The binational Great Lakes Fishery Commission (Commission) supports the Law Enforcement Committee (Committee), which does not operate individually as a committee Rather, the committee includes representation from, and fosters collaboration among, 21 natural resource management entities, and their associated law enforcement entities, throughout the Basin (GLFC 2019b). Similar to how the Commission supports a holistic, ecosystem-based approach to fisheries management in the Basin, the Committee also strives to facilitate cooperation and information-sharing among all Great Lakes jurisdictional authorities to ensure alignment among regulatory approaches that affect Great Lakes fisheries and aquatic ecosystem resources (Gaden 2007; Guthrie et al. 2019a; GLFC n.d.). Increased cooperation, information-sharing, and alignment in regulatory directives—encouraged by the Committee's Chair and Vice-Chair—could help rectify some of the challenges to effective implementation of fisheries law enforcement presented in Chapter 2, "Challenges" (Kirshman and Leonard 2003; McGarrell et al. 2013)

The goal of this research study was to learn more from committee members about: their understanding of the Committee and its function and structure; their perceptions of the Committee in facilitating a joint (i.e., multi-agency) approach to fisheries law enforcement; and their perceptions of the Committee's overall effectiveness in protecting, enhancing, and conserving fisheries resources and their habitat. The outcomes of this research study will provide meaningful insight to the Committee as they evolve to meet the regulatory demands of a changing environment and fisheries user base.

Methods

The Basin includes many law enforcement entities that often have to work across jurisdictional borders to protect and conserve a diverse suite of ecologically-, socially-, economically-, and culturally-valuable fisheries and aquatic ecosystem resources. Thus, the Basin presents an opportune study area in which to pose questions about the status of these resources and make comparisons among law enforcement entities and their approaches to taking regulatory action.

Target Sample and Participants

The target sample in this research study was composed of the Committee's Membership. The participants represented a subset of the membership; supervisory and staff law enforcement personnel from multiple natural resource management (Table 3.1), and their associated law enforcement, entities. In general, these individuals either choose, or are assigned, to spend their time engaging in the Committee's regular annual and mid-annual meetings, organized by the Chair and Vice-Chair.

Table 3.1. Natural resource management entities with law enforcement representation in the Law Enforcement Committee in March 2017.

Natural Resource Management Entity	Leadership Role in Law Enforcement Committee
NOAA Fisheries	
U.S. Coast Guard	
U.S. Fish and Wildlife Service	
Fisheries and Oceans Canada	
Illinois Department of Natural Resources	
Indiana Department of Natural Resources	
Michigan Department of Natural Resources	Chair
Minnesota Department of Natural Resources	
New York Department of Environmental Conservation	
Ohio Department of Natural Resources	
Pennsylvania Fish and Boat Commission	
Wisconsin Department of Natural Resources	
Ontario Ministry of Natural Resources and Forestry	Vice-Chair
Chippewa-Ottawa Resource Authority	
Bay Mills Indian Community	
Grand Traverse Band of Ottawa and Chippewa Indians	
Little River Band of Ottawa Indians	
Little Traverse Bay Bands of Odawa Indians	
Sault Ste. Marie Tribe of Chippewa Indians	
Great Lakes Indian Fish and Wildlife Commission	
Bad River Band	
Bay Mills Indian Community	
Fond du Lac Band	
Keweenaw Bay Indian Community	
Lac Courte Oreilles Band	
Lac du Flambeau Band	
Lac Vieux Desert Band	
Mille Lacs Band	
Red Cliff Band	
Sokaogon Mole Lake Band	
St. Croix Band	
Great Lakes Fishery Commission	Law Enforcement Specialist Liaison

Research Design

I designed a survey and a series of semi-structured interview questions to engage with

participants, learn about their reasons for participating in the Committee, and examine their

perceptions regarding the Committee's effectiveness in protecting and conserving fisheries and

aquatic resources in the Basin. These data collection methods were approved by the Michigan

State University Institutional Review Board (IRB # x17-370e; i053719). While the participants

were comfortable with the research design, they did not wish to identify themselves according

to the natural resource management and/or law enforcement entity(ies) they represented in

the case that sensitive information was revealed. I used a detailed information and consent

form (Appendix A. Information and Consent Form) to describe the purpose of this research

study and remind the participants that their involvement in this data collection would be

voluntary and remain anonymous. The Committee's Chair and Vice-Chair, and a few committee

members, formed a focus group to help me design, review, and offer suggestions to improve

the survey and interview questions before I posed them to the participants.

I disseminated the survey to, and conducted the interview with, participants who were

present during the Mid-Annual Great Lakes Law Enforcement Committee Meeting, which took

place in March 2017, in Ypsilanti, Michigan (Appendix B. Agenda). The participants represented

a subset of the Committee's Membership, including only those committee members who

participated in this meeting. Respondents provided either written consent (i.e., for the survey)

or verbal consent (i.e., for the interviews) prior to any approved data collection.

Survey

I designed ten, multiple-choice survey questions (Appendix C. Survey Instrument) to obtain demographic information about the participants. In total, 23 of 31 committee members responded to the survey, however one response was excluded from the analysis due to logistical reasons (i.e., for a response rate of 71%). Respondents completed the survey during the meeting and, to ensure anonymity, submitted their responses first to the Law Enforcement Specialist Liaison, who returned them to me at the end of the meeting. Committee members affiliated with only one natural resource management and law enforcement entity (i.e., Ontario Ministry of Natural Resources and Forestry, Enforcement Branch) declined to respond to the survey.

Semi-Structured Interview

I also developed eleven semi-structured interview questions (Appendix D. Semi-Structured Interview Questions) to further probe the participants about their perceptions of the Committee's role and effectiveness. The purpose of the interview was to have a one-on-one conversation with the participants, recognizing that each participant would likely bring a unique perspective to the data collection process. I chose to use a semi-structured interview rather than a structured or fixed form interview to allow each participant an opportunity to answer the questions based on his or her own interests and experiences, and within his or her area of expertise (Adams 2015). I organized the questions within two themes regarding participants': 1) reasons for engagement in, and understanding of the function and structure of, the Committee; and, 2) perceptions of the Committee and its effectiveness in shaping the regulation of human behavior that affects Great Lakes fisheries and aquatic ecosystem resources. Ten questions

were open-ended, and one question was a modified Likert-scale question that inquired about participants' perceived level of satisfaction with the Committee's effectiveness in protecting and conserving fish and fish habitat in the Basin (Likert 1932).

Twenty-six of the 31 committee members volunteered to participate in the interview, however time permitted only 22 interviews (i.e., for a response rate of 85%). The average interview length was approximately 18 minutes. I recorded all interviews over a two-day period at the hotel where the meeting occurred. During each interview, I asked all of the questions, though occasionally in a different order or context. I asked additional or probing questions based on the nature of the conversation and the respondents' interests and experiences. One hundred percent of the participants who responded to the survey also participated in the interview. Committee members affiliated with only one natural resource management and law enforcement entity (i.e., Ontario Ministry of Natural Resources and Forestry, Enforcement Branch) declined to participate in the interview. Thus, perceptions of Committee members associated with the provincial government level were not represented in the collected data.

Analysis

To summarize the survey responses, I complied and evaluated the quantitative data from the multiple-choice survey questions using descriptive statistics (e.g., count [percentage], mean, mode). The quantitative data complimented the qualitative data resulting from the interview responses, providing necessary context and helping identify patterns.

I transcribed each interview response verbatim, and I used the computer software package, MAXQDA, to code, re-code, and analyze the qualitative data resulting from the interview transcripts (VERBI Software 2019). Following a process outlined in Miles and

Huberman, I read my notes and interview transcripts, and I looked for general patterns and

relationships evident in the data (1984). Through open-coding, I reviewed the interview

transcripts, line-by-line, and sorted and organized the data into broad themes (e.g. types of

threats and challenges) and various sub-themes (e.g. biological, non-biological).

Results

Twenty-two committee members responded to the survey and participated in the

interview between March 21 and 22, 2017. One hundred percent of respondents were affiliated

with United States (U.S.) government entities (i.e., natural resource management and law

enforcement entities).

Seventeen respondents (77%) identified as White or Caucasian; 2 (10%) identified as

American Indian; 1 (14%) identified as Native Hawaiian or other Pacific Islander, Hispanic or

Latino, and Multiracial, respectively. Table 3.2includes a breakdown of the number of

respondents organized by government level. Table 3.3 includes a breakdown of the number of

respondents, organized by their self-identified role in fisheries law enforcement. Table 3.4

includes general descriptions of these roles. I presented these descriptions in the survey as

options for the participants to select from.

Table 3.2. Number of respondents organized by level of government.

	Number	Percent
Federal	3	14
State	12	55
Tribal	6	27
Binational	1	5

Table 3.3. Number of respondents organized by their self-identified role in fisheries law enforcement.

	Number	Percent
Supervisory	7	32
Field	7	32
Investigative	6	27
Administrative	2	9

Table 3.4. Roles and general descriptions presented in the survey.

Role	Description
Administrative Officer	You primarily write, process, and analyze case reports and do not spend a majority of your time in the field or in an investigative capacity.
Field Officer	You spend most of your time patrolling and monitoring in the field.
Investigative Officer	You spend most of your time investigating crimes, conducting surveillance, and interviewing suspects.
Supervisory Officer	You primarily supervise staff and do not spend a majority of your time in the field or in an investigative capacity.

At the time of this research study, the average respondent was 45 years old. The mean and standard deviation (i.e., 45±9.62 standard deviation) of the age distribution (Figure 3.1) of respondents indicate a normal range. The time spent by respondents in their current positions ranged from less than 1 year (minimum) to 22 years (maximum). Respondents differed in their level of participation in committee meetings. To capture these differences, I coded their frequency of participation according to the following categories: always (two meetings per year); very often (one meeting per year); sometimes (one to two meetings every two years, on and off); rarely (one meeting every few years); never; or first time (indicating a first-time participant) (Figure 3.2).

The majority of respondents were well-educated; 15 (68%) had Bachelor's degrees,
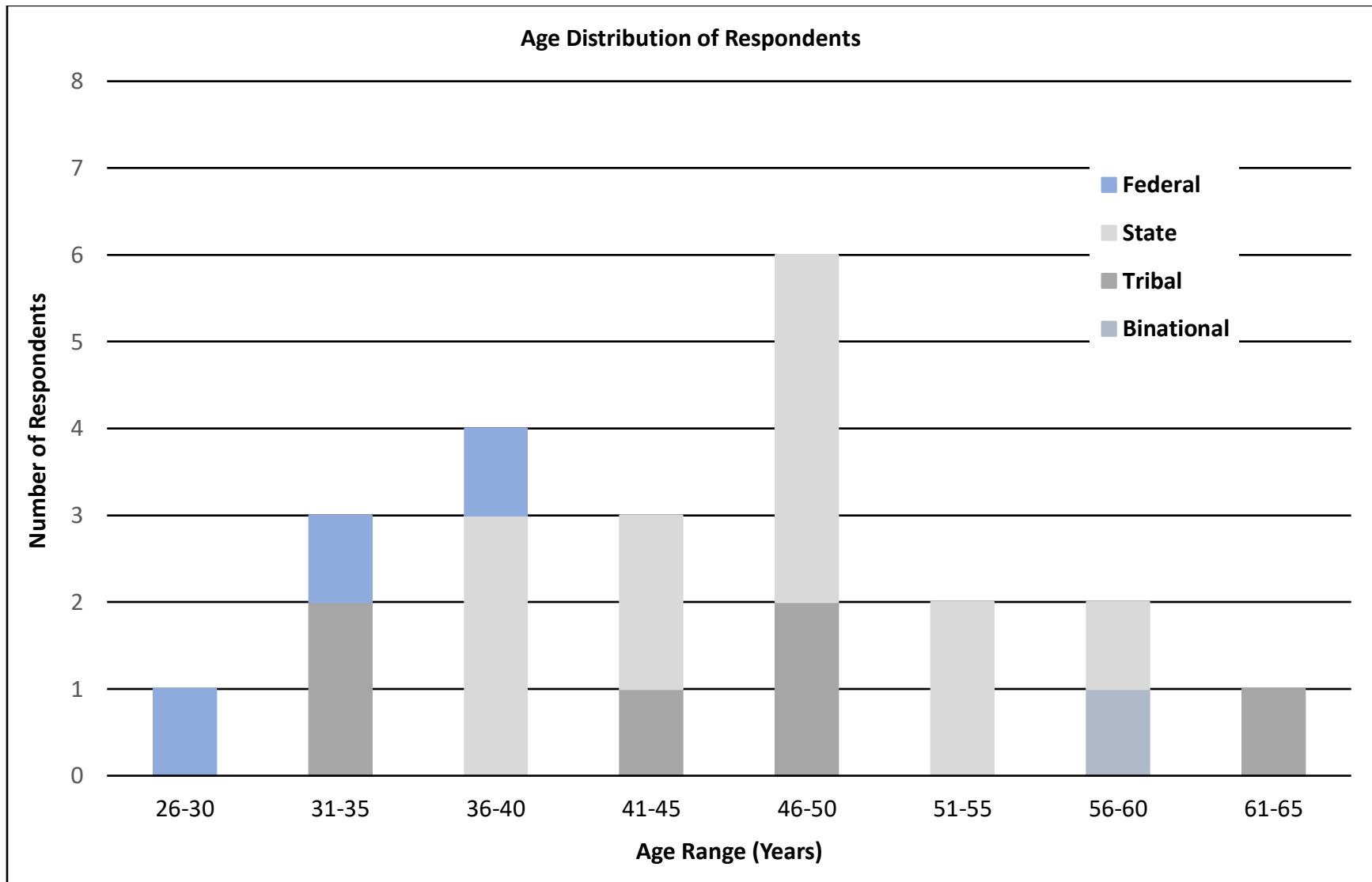
Figure 3.1. Age distribution of respondents, organized by government level.
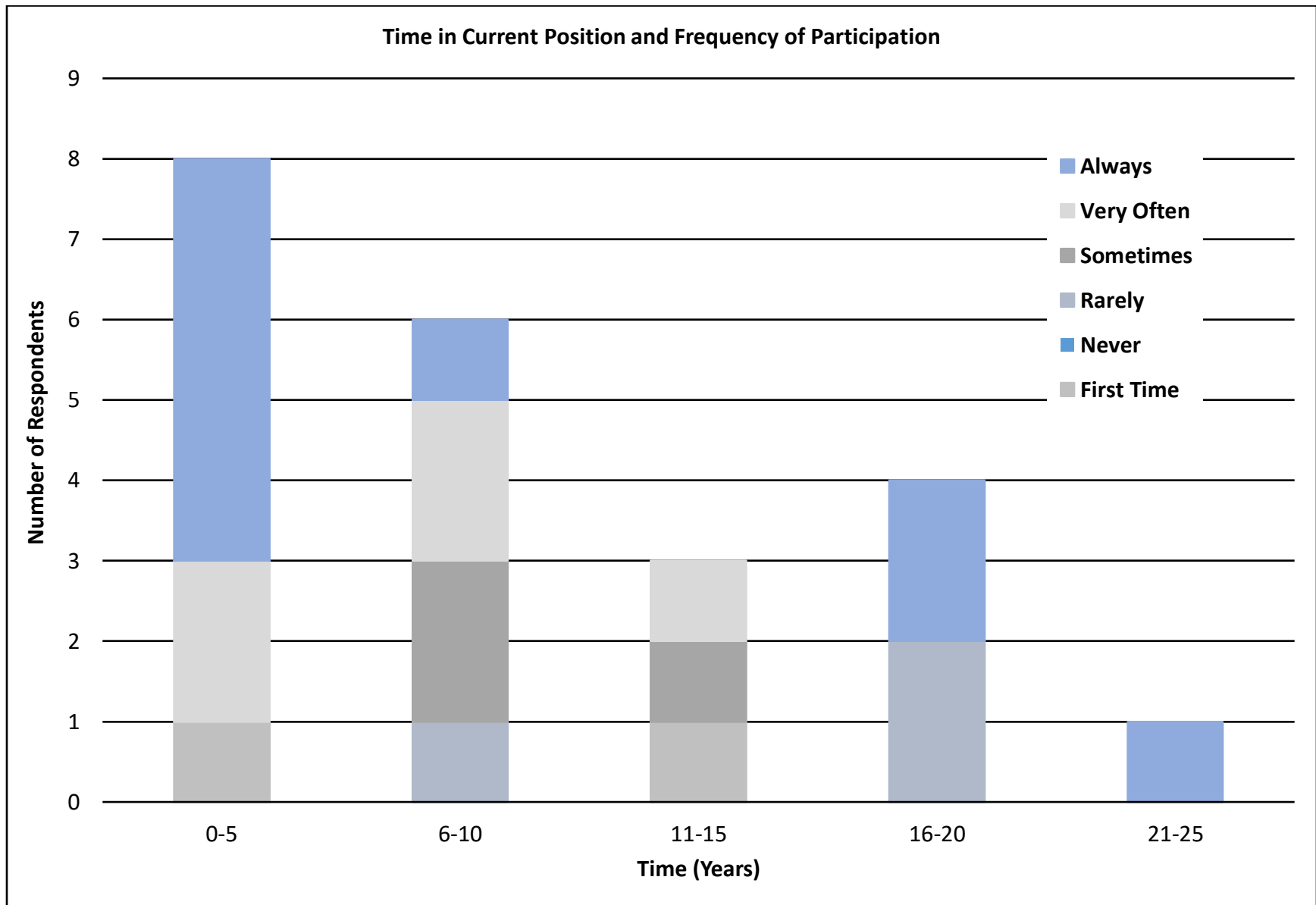
Figure 3.2. Time spent by respondents in their current position, organized by frequency of participation in committee meetings.

and 1 (5%) had a Master's degree. Of the 16 respondents with a Bachelor's or Master's degree, 13 (81%) had obtained their degrees in either a criminal justice, natural resource management, or public policy discipline, at minimum. Twenty-one respondents (95%) were male and 1 (5%) was female.

Purpose of Committee and Motivations for Participation

Respondents demonstrated their understanding of the purpose or goals of the Committee by commenting on the Committee's function and structure. Figure 3.3 and Figure 3.4 show the primary functions and structural elements of the Committee, respectively, as perceived by the respondents.

Thirteen respondents (59%) most frequently indicated they are motivated to participate in committee meetings to make connections, network, and build relationships with other committee members. Respondents also indicated they are motivated to participate to share information and elicit expertise from each other (41%); gain better insight across law enforcement entities and programs (23%); and meet, or find opportunities to meet, their training needs (14%). Other respondents were more pragmatic in reflecting on their motivations for participation in committee meetings. For instance, these respondents indicated they participate to simply represent their law enforcement entity (27%); because they were directed by their supervisor(s) to participate (14%); or because there were available resources (e.g., funds) to support their participation (5%). At least 2 respondents (10%) indicated they are motivated to participate because they want to; they enjoy "getting together" with other committee members and find it to be a "beneficial" experience overall.

Primary Functions of the Law Enforcement Committee

Legend:
- Federal
- State
- Tribal
- Binational

X-axis categories:
- Share information, facilitate exchange of ideas
- Bring people together
- Provide counsel
- Enhance uniformity among regulatory approaches
- Offer training opportunities
- Increase trust among entities
- Advocate for certain egulatory approaches
- I don't know

Y-axis: Number of Respondents

Figure 3.3. Primary functions of the Law Enforcement Committee, as perceived by respondents and organized by government level.

Primary Structural Elements of the Law Enforcement Committee
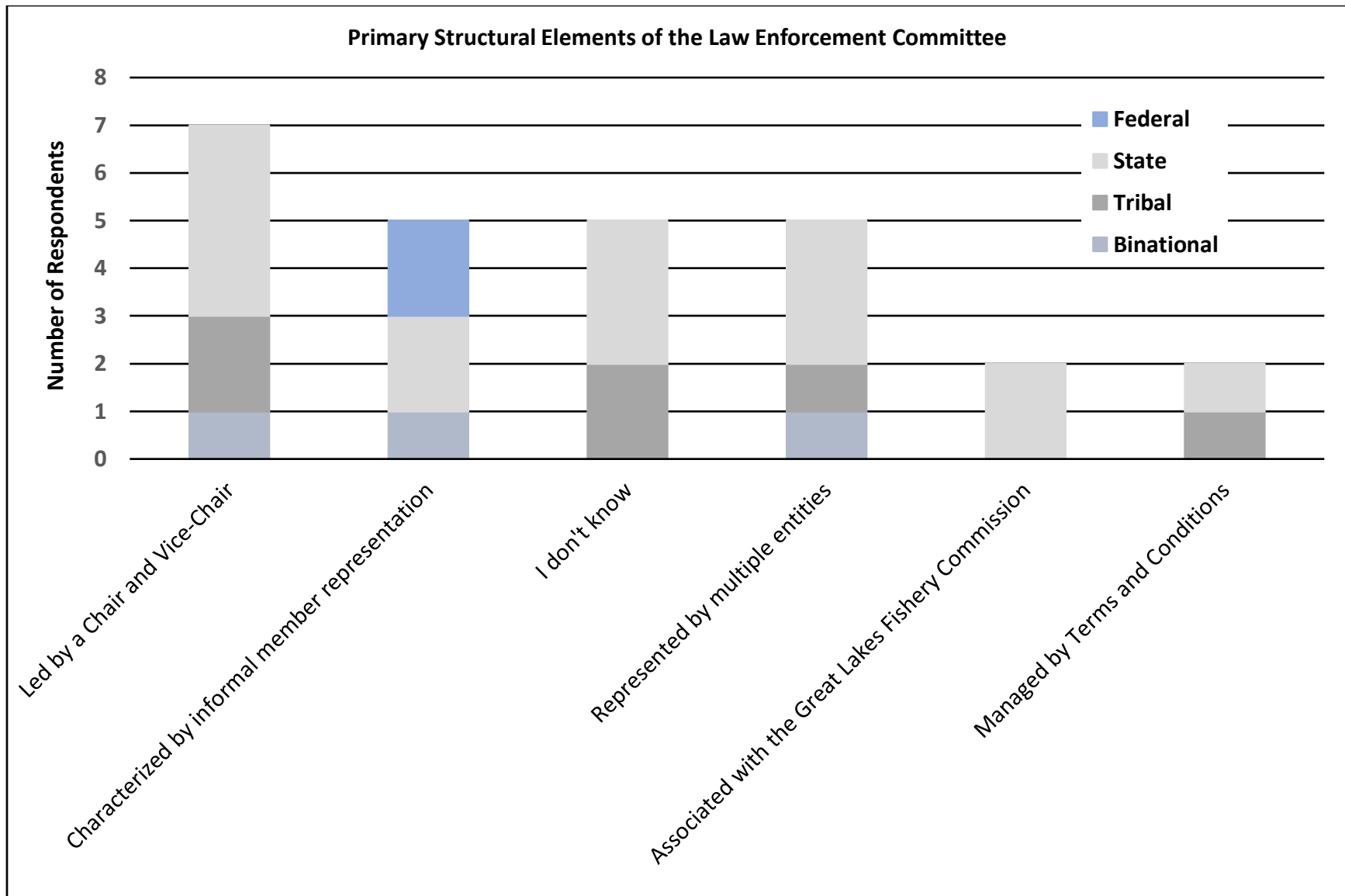
Figure 3.4. Primary structural elements of the Law Enforcement Committee, as perceived by respondents and organized by government level.

Identification of Threats to, or Challenges for, Fisheries Law Enforcement

Relying on their expertise and experience, respondents shared their opinions of current

threats to, or challenges for, fisheries law enforcement in protecting and conserving Great

Lakes fisheries and aquatic ecosystem resources. I coded the threats or challenges as either

biological (e.g., aquatic invasive species [AIS]) or non-biological (e.g., lack of funds). As Figure

3.5, shows there was some overlap between these categories in regard to threats or challenges

that have both biological and non-biological components (e.g., pollution). An overwhelming 15

respondents (68%) identified AIS as the primary biological threat to, and challenge for, effective

fisheries law enforcement in the Basin.

Seven respondents (32%) indicated they believe the Committee is better equipped (i.e.,

in terms of staff resources) than the law enforcement entities they represent in addressing

emerging threats to, and challenges for, fisheries law enforcement in the Basin (Figure 2.2). In

addition, respondents highlighted the diverse Committee Membership (36%) and established

network (5%) of, and expert knowledge within (14%), the Committee as reasons for why they

perceived the Committee to be well-equipped.

In contrast, 4 respondents (18%) indicated they did not perceive the Committee to be

better equipped than the law enforcement entities they represent in addressing current threats

and challenges. These respondents highlighted the Committee's inability to take regulatory or

law enforcement action (e.g., issue sanctions) (23%); broad representation (10%); stagnant

growth (i.e., in terms of status, impact, and value) (5%); and informal member representation

and structure (5%) as reasons for why they perceived the Committee to be less than well-

equipped. An overwhelming 19 respondents (86%) underscored the need for the Committee

Biological   **Non-Biological**

aquatic invasive species

pollution

illegal stocking

unregulated commercial harvest

commercialization of fisheries resources

overfishing

complex politics

lack of funding

inadequate technology

limited enforcement

"big" problems

uncertainty
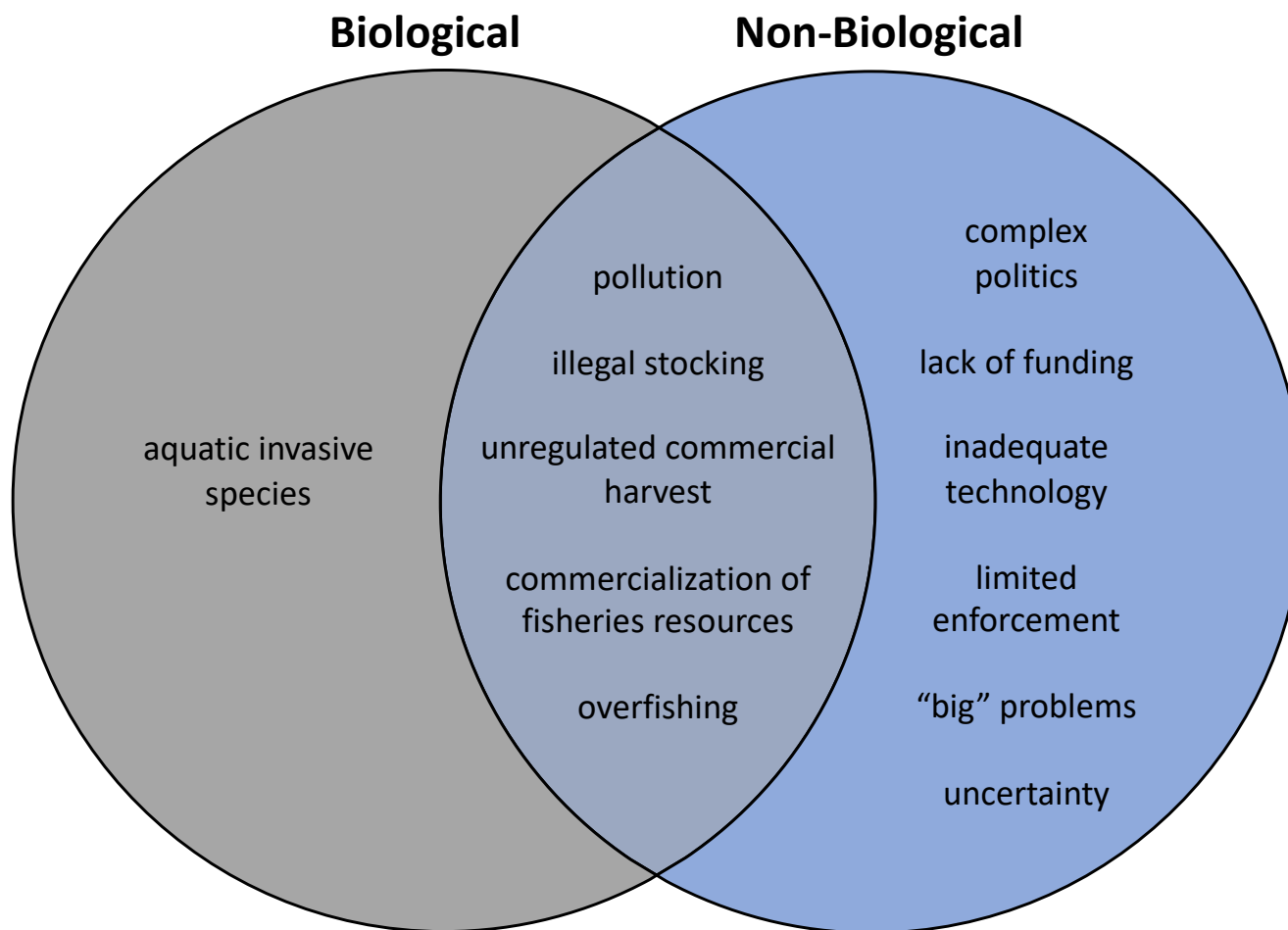
Figure 3.5. Primary threats to, and challenges for, fisheries law enforcement as perceived by respondents. "Big" problems refer to problems that are large in geographic size and scope (e.g., urbanization).

to evolve in the future, especially as it seeks ways to adapt to address emerging threats and challenges.

Perceptions of Law Enforcement Committee Effectiveness

Respondents (82%) were predominately satisfied with the effectiveness of the Law Enforcement Committee in protecting and conserving Great Lakes fisheries and aquatic ecosystem resources (Figure 3.6). Respondents were satisfied with the Committee in remaining transparent and sharing information (14%); fostering the establishment of relationships among committee members (10%); building trust and promoting understanding among law enforcement entities (5%); and elevating its status, impact, and value (5%). However, respondents also voiced their frustration with the Committee, highlighting its inability to take regulatory or law enforcement action (18%) and infrequent meeting schedule (5%) in slowing momentum within the Committee in achieving its mission. Six respondents (27%) indicated there is room for improvement in regard their current level of satisfaction with the Committee's effectiveness.

Respondents shared their understanding of the Committee's effectiveness in protecting and conserving fish and fish habitat by commenting on the aspects of the Committee they perceive to be the most (Figure 3.7) and least (Figure 3.8) effective. Respondents most frequently highlighted the ability of the Committee to foster cooperation, collaboration, and communication among jurisdictional authorities and entities (45%) to be most effective. In contrast, respondents most frequently highlighted the potential misrepresentation of some authorities and entities (18%) in the Basin—especially if they are not well-represented at
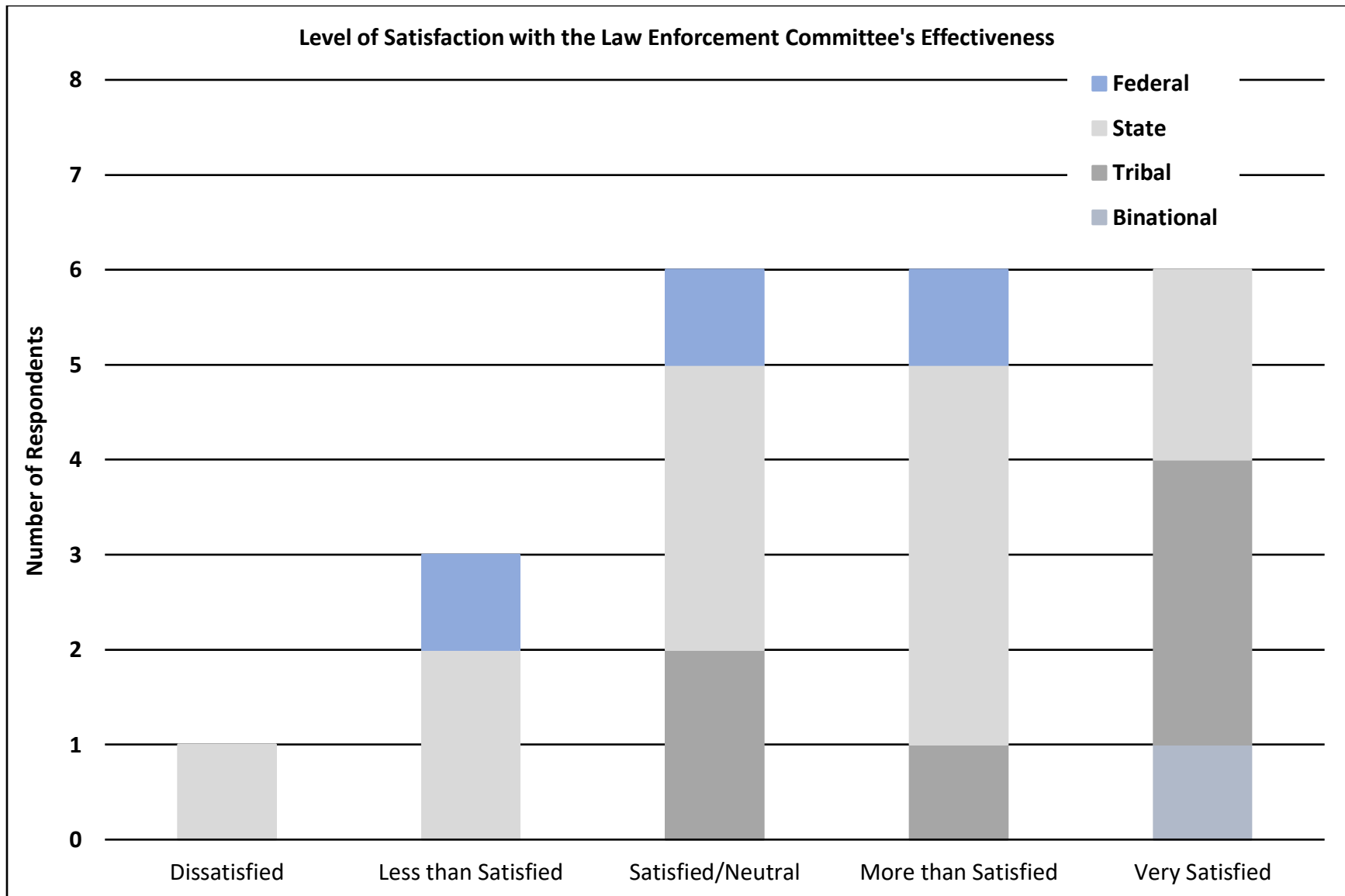
Figure 3.6. Level of satisfaction among respondents with the Law Enforcement Committee's effectiveness, organized by government level.
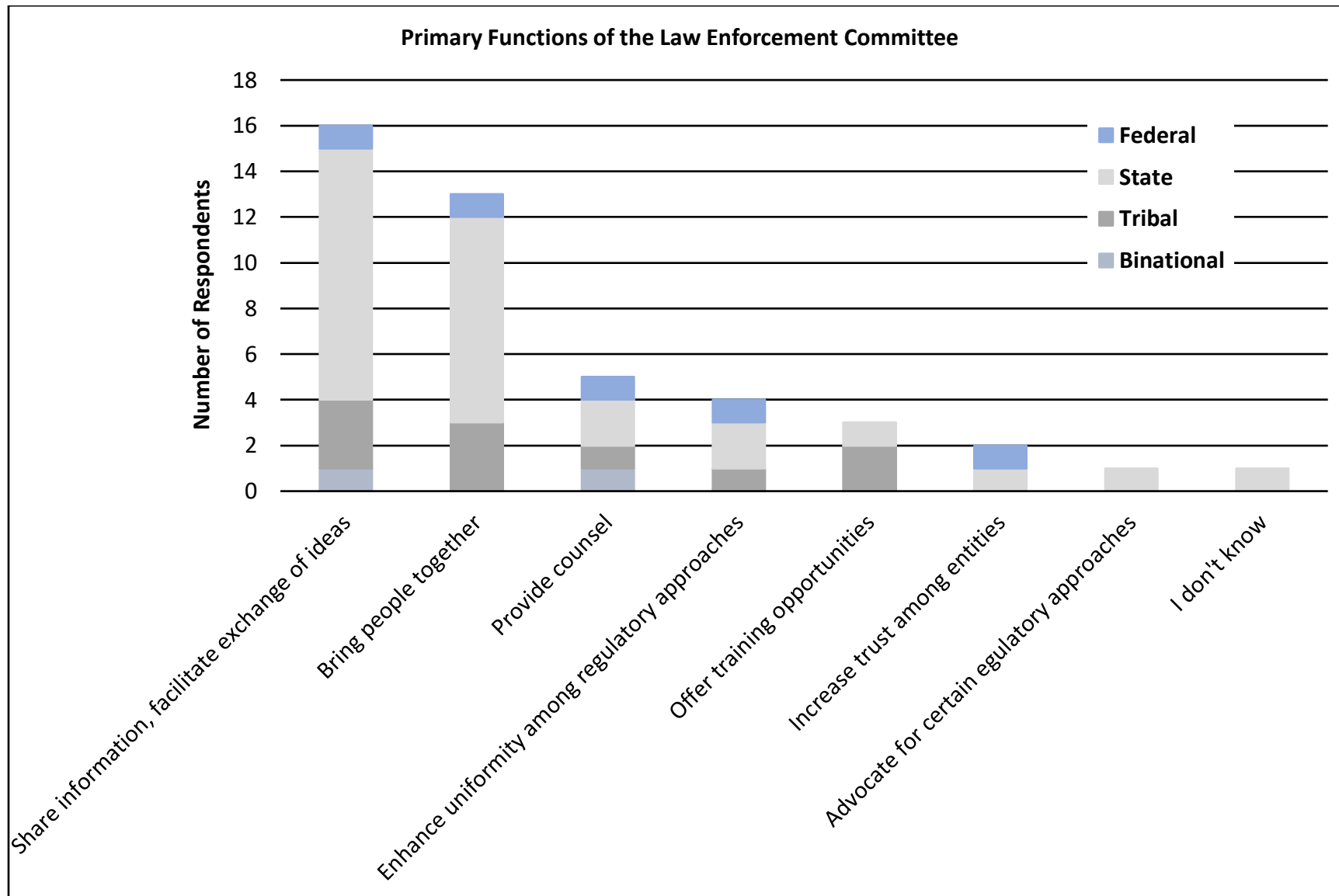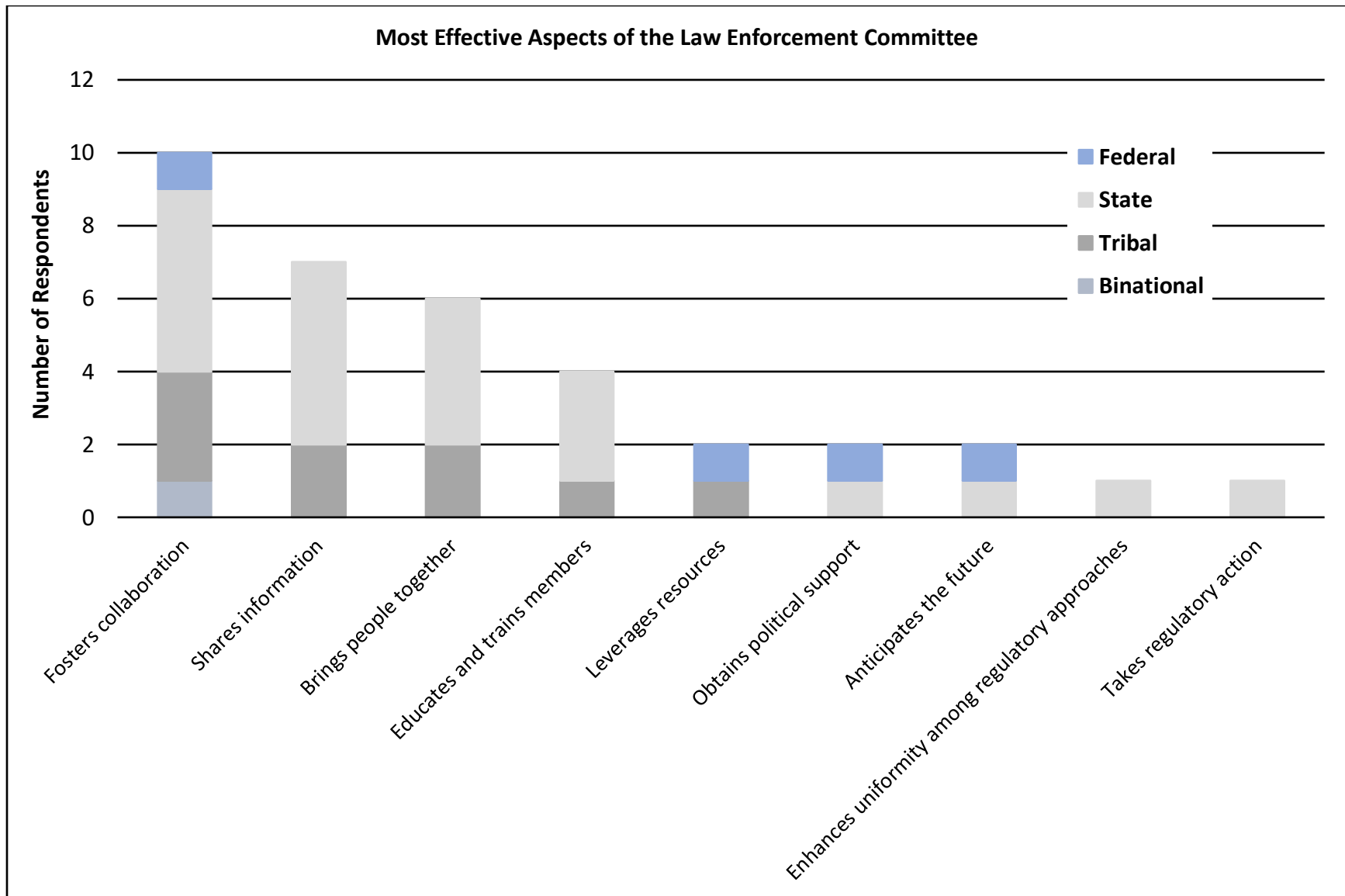
Figure 3.7. Most effective aspects of the Law Enforcement Committee, as perceived by respondents and organized by government level.
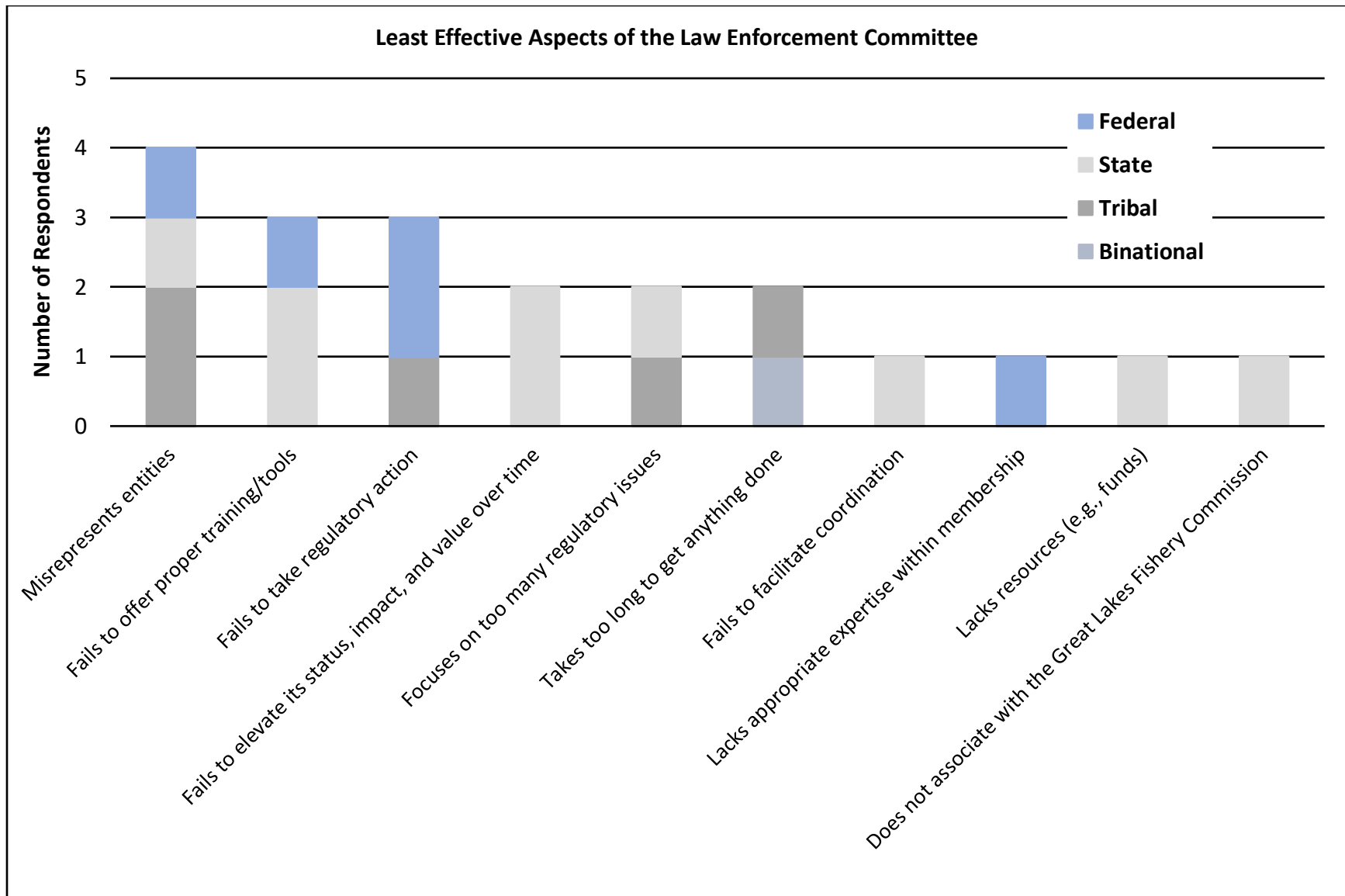
Figure 3.8. Least effective aspects of the Law Enforcement Committee, as perceived by respondents and organized by government level.

regular committee meetings—to be least effective. An overwhelming 18 respondents (82%)

perceived a coordinated or joint approach to be most effective regulatory approach to fisheries

law enforcement in the Great Lakes basin. Many respondents recognized that, in the Basin, two

or more law enforcement entities are often necessary in addressing shared-border, unlawful

fishing activities (32%). Respondents also highlighted the significance of unified approaches to

fisheries law enforcement (36%); established relationships and partnerships (36%); diversity

(i.e., of knowledge, skills, and experience) within the Committee's Membership (10%);

anonymity, especially while working undercover investigations and operations (5%); and shared

control in taking regulatory action and making decisions (5%)—all of which the Committee

currently supports—in bolstering the Committee's effectiveness in protecting and conserving

Great Lakes fisheries and aquatic ecosystem resources.

Only 1 respondent (5%) blatantly disagreed that a joint approach is the most effective

regulatory approach to fisheries law enforcement in the Basin. This respondent, and a few

others, indicated that, sometimes, law enforcement entities and their associated personnel are

so different (i.e., in their conservation priorities, laws, regulatory training and practices) that it

is not always feasible or productive to come together and attempt to jointly enforce fish laws

(14%) while, other times, it can just be too difficult to implement a joint approach at all (10%).

Impact(s) of the Law Enforcement Committee

When questioned about the ways in which the Committee has impacted, either

professionally or personally, the members, the 19 respondents (86%) provided positive

answers. These respondents shared their praise of the Committee for impacting them by:

fostering relationship-building (46%); facilitating mutual learning among different jurisdictional

authorities and law enforcement entities (32%); providing educational experiences (e.g.,

forensic lab tours) (23%); determining new regulatory issues, and those in common, among

authorities and entities (18%); offering a broader perspective of regulatory issues (14%);

offering critical trainings (10%); expanding their awareness of different cultures, histories, and

traditions (5%); and instilling in them a greater sense of value or purpose in the regulatory work

they accomplish (5%).

Discussion

      The survey and semi-structured interview responses were representative of 4

government levels (federal, state, tribal, and binational) and 15 of the 16 natural resource

management, and their associated law enforcement, entities included in the target sample

(Table 3.1). However, these responses were not wholly representative of basin-wide law

enforcement, which is inclusive of additional law enforcement entities that have different

workload priorities (e.g. U.S. Marshals Service). Nevertheless, the responses were

representative of a typical group that would participate during the annual and mid-annual

committee meetings. While the Committee's Membership is generally well-distributed in terms

of age and role in fisheries law enforcement, 21 of 22 committee members (95%) who

participated in this research study self-identified as male. The underrepresentation of female

committee members may be a significant barrier to gathering an accurate portrayal of the full

diversity of perspectives regarding fisheries law enforcement effectiveness in the Basin.

Purpose of Committee and Motivations for Participation

      As of March 2017, the average time spent by respondents in their current positions was

9 years, and most of the respondents indicated they regularly participate in committee meetings. For example, 20 respondents (91%) indicated they had participated in committee meetings at least once before March 2017, while 2 (10%) identified themselves as first-time meeting participants.

As a result of this evidence, I made the assumption that most respondents shared a high level of understanding of the purpose of the Committee and its function and structure. I found that respondents were more easily able to identify the Committee's function than elaborate on its structure. For example, only 2 respondents (10%) acknowledged the Committee and its connection to, or association with, the Commission. And, only 2 respondents (10%) indicated they were aware of the Committee's Terms of Reference document, which outlines the Committee's mission and organizational structure (GLFC n.d.). Without such knowledge, some participants may not understand the Committee's role in fisheries law enforcement, which could distract from meaningful discussions that, otherwise, would likely take place. In the future, the Committee's Chair and Vice-Chair may wish to consider implementing a new-member orientation, or setting some time aside at the beginning of each committee meeting, to ensure that participants are aligned in their understanding of the Committee; what it is, what it does, and how it fits into broader Great Lakes fisheries management and policy goals.

Respondents shared many reasons for why they are motivated to participate in committee meetings. While some respondents indicated they are motivated to participate because it is expected of them (usually by their supervisors), most respondents indicated they are motivated to participate to build relationships and share or ask other committee members for information that could be helpful to their regulatory efforts. The face-to-face interactions

and sub-conversations (which often take place at the social hour), facilitated by the Committee, are especially critical, for they make it easier for committee members to call on, and learn from, each other when regulatory issues arise. For instance, one respondent said:

> "If I can pick up the phone and call somebody that I've had a face-to-face conversation [with]…I don't care if it's about their favorite football team, but if I can pick up the phone and call them—it's that whole rapport-building thing. Hey, we know each other, we trust each other. And, that's a big thing, especially if you're working an investigation and you've been working [it] three or four years. I have to know that when I pick up the phone and call you, that we're on the same page. It's kind of like a gift, coming into this scenario, because it's instant introductions and then reinforcement, you know, every six months. I've picked up the phone and called people in this room because I met them here. And, otherwise, I wouldn't have known who to call."

Another respondent said:

> "I've been involved in a number of cases where the information or what made or broke the case actually [was shared] outside the meeting; those conversations and those connections [occurred] because the trust has been established."

Each of these respondents identified the act of building trust among multiple jurisdictional authorities and law enforcement entities to be an important factor in coordinating more effectively in the Basin.

Identification of Threats to, or Challenges for, Fisheries Law Enforcement

Based on the average time spent by respondents in their current position (9 years) and their educational backgrounds, the majority of respondents expressed confidence in identifying biological and non-biological threats to, and challenges for Great Lakes fisheries law enforcement. The majority of respondents indicated AIS as the primary biological threat to native fish populations and fish habitat, and a challenge for, fisheries law enforcement. For example, one respondent said:

> "The Great Lakes is actually ground zero for invasives coming in—when you look at everything we're talking about, we're talking about trying to do stuff to prevent invasives from going out. So, tell me, what proactive [strategies] are [we] doing in the Great Lakes basin so we're not ground zero? And that, that has not been addressed. That's hard."

These respondents conceptualized the establishment of AIS in the Basin as an ongoing problem that negatively affects fisheries resources (i.e., increasing competition and predation) and aquatic landscapes (i.e., habitat loss) throughout the Basin. As a result, some respondents argued that AIS is an appropriate threat or challenge best for the committee members to discuss together rather than separately, as individual law enforcement entities. Some respondents also expressed their frustrations with the Committee for taking ample time during committee meetings to address certain threats and challenges that were not perceived as serious as AIS. For instance, one respondent said:

> "We're worrying about fish being stocked in ponds and bait buckets and, I'm sorry; that's [like] giving a speeding ticket to a fast speeder, thinking you're

going to change all the other speeders on the interstate."

Respondents indicated, within their own jurisdictions, fisheries law enforcement entities have to consider the impacts of these threats to fish and fish habitat, and whether or not the impacts warrant a full investment or prioritization of their time and resources. At least 13 respondents (59%) indicated that non-biological threats and challenges (e.g., lack of funds, inadequate technology, uncertainty) often require them to consider tradeoffs in determination of how, and where, they dedicate their time and staff resources.

Respondents indicated that the Committee's diverse membership and knowledge base, established network, educational and training opportunities, and consistent overall growth (i.e., regarding number of members) have helped ensure the Committee is well-equipped with the appropriate leadership staff, resources, and tools to address current, and emerging, threats and challenges. However, at least 5 respondents (23%) acknowledged the Committee's inability to take actual regulatory action or develop and implement fisheries management or policy decisions as major obstacles to being able to fully address threats to, and challenges for, Great Lakes fisheries law enforcement. One respondent said:

> "We have a tendency to talk a lot and not take much action. And, this is true in
> law enforcement across the board, but, I mean, [fisheries] law enforcement in
> particular. Even as a single officer or single agent, you can sit around and talk
> about a lot of the problems and potential solutions, but if you don't get out and
> go do it, you're not going to make a difference."

Though the Committee does not currently have the power to take action, jointly, to enforce fishing statutes, rules, and regulations, it can still strategize and identify regulatory

initiatives (e.g., education and outreach campaigns) for committee members to bring back to their own jurisdictions and entities for potential implementation. And, through more effective coordination with, and information-sharing between the Committee and the Commission, the Committee could better shine a spotlight on what regulatory changes may be necessary to protect and conserve Great Lakes fisheries and aquatic ecosystem resources. In support of this, one respondent said:

> "The potential is there to get a lot of work done with a group like this because, when you have the joint group with three or four states [or more], international partners, federal partners—that gets the attention of legislators and of executives within those governments. That's where you make the changes."

"That's the only thing that's constant in this life…change," "…and we're going to have to evolve with it," said two respondents. As new threats to, and challenges for, Great Lakes fisheries law enforcement emerge, the Committee acknowledges it must be better prepared and more easily able to adapt and flex in its regulatory responses. Commenting on the traditional approach to the regulation of illegal fishing behavior and fish crime, on respondent said:

> "Traditionally…it's a reactive approach. Plain and simple. And that's because, if somebody does something wrong, we deal with the problem, you know?"

Nine respondents (41%) identified a need for the Committee to embrace a more proactive approach to fisheries law enforcement in the future for, as another respondent mentioned, "If we're trying to chase the issues, then we're always going to be behind."

Perceptions of Law Enforcement Committee Effectiveness

Overall, respondents were more satisfied than dissatisfied with the Committee's

effectiveness in protecting and conserving Great Lakes fisheries and aquatic ecosystem

resources. Respondents affiliated with state law enforcement entities exhibited the widest

range of satisfaction, however this could be attributed to the fact that there was a greater

number of state-affiliated respondents than federal-, tribal-, or binational-affiliated

respondents. At least 6 respondents (27%) acknowledged the Committee to be imperfect and

indicated there is room for improvement regarding its effectiveness.

In general, respondents identified more positive aspects rather than negative aspects

regarding the Committee's effectiveness. Respondents perceived the Committee to be most

effective in fostering cooperation, collaboration, and communication among jurisdictional

authorities and law enforcement entities; sharing information and facilitating the exchange of

ideas; bringing people together; and educating and training committee members. Respondents

perceived the Committee to be least effective in taking regulatory action; adequately

representing the perspectives of all regulatory authorities and entities in the Basin; and offering

the right training opportunities and tools necessary to positively impact fish and fish habitat. At

least 2 respondents (10%) indicated that the Committee attempts to address too many

regulatory issues during their limited meeting time, which can be distracting for, and

sometimes irrelevant to, some committee members. For instance, one respondent said:

> "It's difficult with a group like this, when you're interagency and interjurisdictional
>
> because it [overharvesting, for example] might be still a problem for this guy over
>
> here, but I need to move on. So, you have to be willing to recognize that you have

116

personal issues that you [have] to deal with back home at your office and in your

jurisdiction. This group is about prioritizing larger issues in their region."

By focusing the Committee's meeting topics and on broader, higher-priority issues that, in some

way, affect all jurisdictional authorities and law enforcement entities, the Committee's

relevancy and overall effectiveness could be maximized.

At least 18 respondents (82%) stated their belief that a joint approach is the most

effective type of regulatory approach to deter unlawful fishing activities and ensure compliance

among fisheries resource users in the Great Lakes. One respondent likened this type of

approach to an ecosystem, in which all entities should function together, as part of one

system—similar to how species and habitat types comprise, and function together as,

ecosystems. This respondent noted that issues of noncompliance are "ecosystem problems. If

you just look at a single agency [entity], you're not dealing with the whole ecosystem." Like an

ecosystem-based approach has been critical in effective Great Lakes fisheries management, a

joint approach, according to the respondents, is also critical in effective Great Lakes fisheries

law enforcement (Hartig et al. 1998; McGarrell et al. 2013; Guthrie et al. 2019a; Guthrie et al.

2019b).

Specific to the Committee, 20 respondents (91%) perceived the Committee to facilitate

a joint approach to fisheries law enforcement in the Basin, while 2 respondents (10%) provided

no direct response. This evidence reflects strong support for, and achievement of, the

cornerstones of the following two mission statements of the Commission and Committee,

respectively: To facilitate successful cross-border cooperation that ensures the two nations

[U.S. and Canada] work together to improve and perpetuate this fishery [Great Lakes fishery]

(GLFC 2019a); and, to promote cooperation among all Great Lakes law enforcement

jurisdictions (GLFC n.d.).

Impact(s) of the Law Enforcement Committee

Overall, respondents expressed they felt positively impacted by their affiliation with,

and participation in, the Committee. As a result of their participation, many of the respondents

have established and maintained professional relationships, which have evolved into more

personal relationships over time. Additionally, respondents shared how observing mutually-

shared regulatory issues with other committee members has helped them build trust and feel

more comfortable to share and elicit information. Some respondents expressed that the

Committee has encouraged them to broaden their own perspectives, and expand their

awareness of, different cultures, histories, and traditions, especially regarding those that

govern tribal fisheries law enforcement. This evidence suggests that positive impacts are felt

not only by Committee members, but also are brought back to, and shared within, the

jurisdictional authorities and law enforcement entities they represent. For example, in response

to how the Committee has impacted them, either positively or negatively, one respondent said:

"We're always here so we get the information—we always try, every meeting,

we try to take something back and change the way we work."

Thus, due to its sphere of influence, the Committee can have positive, cascading effects on

fisheries law enforcement effectiveness throughout the Basin as long as individuals continue to

participate in committee meetings.

One of the respondents (5%) indicated that being a committee member gives them a

"higher feeling of purpose with what we're trying to accomplish." Evidence suggests that the Committee is valuable, especially regarding its potential to positively impact Great Lakes fisheries and aquatic ecosystem resources. Respondents had different opinions about whether or not the Commission recognizes the value of the Committee and, thus, coordinates with the Committee, as necessary. Six respondents (27%) responded positively while 12 respondents (55%) responded either negatively or did not know. Though a few respondents indicated they recalled some level of participation among Commission staff (e.g., the Commissioners, Secretariat) at annual and mid-annual committee meetings, other respondents noted that these and similar interactions are rare. Some respondents elaborated to share their perceptions of disjunction among the Commission and Committee groups. Since the Commission's and Committee's annual and mid-annual meetings usually take place during the same time of year, at the same venue, perhaps, in the future, both groups could take steps (i.e., plan joint meetings) to increase their engagement with each other. In support of this, at least 2 respondents (10%) shared their interest in taking conscious steps toward more coordination among the fisheries managers, policy-makers, researchers, and fisheries law enforcement officers, stating:

> "Law enforcement needs the managers more than the managers need law enforcement to do their work. So, it's on us to reach out to those people and talk to them. It's on me to reach out to my [researchers], my managers, and say, 'Hey, I need to know what you're doing, you need to know what I'm doing, we need to work together.'"

> "It's all on the law enforcement [staff] to build those relationships because we

need them more than they need us, just to accomplish our work."

Increasing the level of coordination among the Commission and Committee groups could lead to additional opportunities to enhance the Committee's effectiveness in protecting and conserving Great Lakes fisheries and aquatic ecosystem resources.

Conclusion

The future will bring new threats to, and challenges for, the regulatory regime charged with enforcing, or ensuring compliance with, statutes, rules, and regulations in place to protect and conserve Great Lakes fisheries and aquatic ecosystem resources (Taylor et al. 2019). Jurisdictional borders that separate authorities and entities throughout the Basin will remain and, thus, law enforcement personnel will have to continue to coordinate, collaborate, and communicate to respond effectively to unlawful fishing activities.

While the current regulatory regime already includes a Law Enforcement Committee with diverse law enforcement entity representation—capable of influencing basin-wide regulatory actions and decisions—the Committee could be more effective in fulfilling its mission to "promote cooperation" in perpetuation of Great Lakes fisheries (GLFC 2019b). By maintaining strong relationships among committee members; building trust within the Committee; finding opportunities to be more proactive in addressing regulatory issues; focusing on broader, high-level regulatory issues; continuing to facilitate a joint approach to fisheries law enforcement; and encouraging more coordination among fisheries law enforcement and non-fisheries law enforcement groups (e.g., the Commission), the Committee could be even more effective in guiding multiple jurisdictional authorities and law enforcement entities through future changes affecting Great Lakes fisheries, aquatic environments, and fisheries resource

user behavior.

Acknowledgements

APPENDICES

Appendix A. Information and Consent Form

Great Lakes Fishery Commission Law Enforcement Committee Meeting Survey and Semi-Structured Interviews

Please consider participating in this survey and these interviews if you identify as a supervisory law enforcement officer working, or having worked, in the Great Lakes basin.

Fisheries and Wildlife Department
Center for Systems Integration and Sustainability

MICHIGAN STATE
U N I V E R S I T Y

Dear Participant,

Due to your involvement in the Great Lakes Fishery Commission's (Commission) Law Enforcement Committee (Committee), you are being asked to participate in research study that will investigate your perceptions and beliefs about the significance of the Committee in protecting fisheries resources and aquatic habitats in the Great Lakes. If you identify as a supervisory conservation law enforcement officer working, or having worked, in the Great Lakes basin, then I invite you to participate in this survey. This survey is part of my doctoral research at Michigan State University (MSU), and the results will be utilized to describe joint law enforcement perceptions, efforts, and efficacy on a basinwide scale.

Following this introduction, there are two pages of survey questions that seek to obtain information about the general demographics of the Committee's law enforcement officers. Please consider taking five to ten minutes to complete the survey, and return it to Kevin Ramsey or to me, Molly Good, at the end of the meeting. During the meeting, I also invite you to participate in a twenty-minute semi-structured interview. In that time, I will ask you a series of questions, which are located in this document following the survey questions. Though your semi-structured interview responses will be recorded and linked to your survey responses, **all data that is collected will be identifiable only by a 5-digit random code to maintain anonymity. We will not analyze any private information**.

This research will be facilitated by me, Molly Good, a Ph.D. candidate in the Department of Fisheries and Wildlife at MSU, and it is supported by my primary advisor and the Commission's U.S. (Alternate) Commissioner, Dr. William Taylor, MSU Distinguished Professor in global fisheries systems. Please note that your participation in this research study is voluntary. You may also change your mind at any time and withdraw yourself as a participant in this research study. **Whether you choose to participate or not will have no effect on your employment status or your involvement in the Commission's Committee.** You will neither incur nor receive any costs during the implementation of this research study, and you will not receive any credit or extra credit for your participation in this research study.

If you have any questions or concerns about this research study, *please contact Molly Good via*: **e-mail**: goodmoll@msu.edu; **phone**: (513) 919-6050; or **address**: 510 Desmond Drive SE Suite #102, Lacey, WA 98503 OR 115 Manly Miles Building, 1405 South Harrison Road, East Lansing, MI 48823.

If you have any questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, *you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at*: phone: (517) 355-2180; fax: (517) 432-4503; e-mail irb@msu.edu, or regular mail: Olds Hall, 408 West Circle Drive, Room 207, East Lansing, MI 48824. **YOU INDICATE YOUR VOLUNTARY AGREEMENT TO PARTICIPATE BY COMPLETING AND RETURNING THIS CONSENT FORM TO KEVIN RAMSEY OR MOLLY GOOD.**

Your Name (print) _____

Your Name (signature) _____

Date _____

Appendix B. Agenda

Please Join Us In

Ypsilanti,
Michigan
for the
Great Lakes Law Enforcement Committee Meeting

March 21-22, 2017

Protecting the Great Lakes Fishery through Law Enforcement
Great Lakes Fishery Commission

MEETING AND HOTEL INFORMATION

Ann Arbor Marriott Ypsilanti at Eagle Crest

1275 S Huron St,
Ypsilanti, MI 48197
United States

Room reservations must be made by February 18, 2017 to receive a rate of $115/night. Please call the hotel at 1-877-757-7133 and be sure to mention the Great Lakes Fishery Commission

*Please also RSVP to Brenda Koenig, Ontario Ministry of Natural Resources and Forestry, at: brenda.koenig@ontario.ca, or 705-755-5689

DRAFT AGENDA
Tuesday, March 21, 2017

8:00 am	Welcome, Agenda Review and Announcements - T. Short, MDNR •Review of Terms of Reference for committee
8:45 a.m.	Update: Michigan State University Dissertation - M. Good, MSU
9:00 a.m.	Summary of Ontario's New Invasive Species Act - B. Koenig, OMNRF
9:30 a.m.	Roundtable: Aquatic Invasive Species - T. Short, MIDNR
10:00 a.m.	BREAK
10:15 a.m.	Trap Net Mortality and Proposed Changes to Commercial Fishing Regulations in Michigan - T. Short, MIDNR
11:00 a.m.	DNA Data Requirements for Forensic Cases – Update on Database Work - B. Koenig, OMNRF
11:30 a.m.	LUNCH
1:00 p.m.	Formal Photo of Officers in Uniform (e.g. an hour with time for changing etc.)

2:00 p.m.	Presentation on Use of Drones with Footage - D. North, GLFIWC
2:30 p.m.	Roundtable: Aerial Surveillance (Drones, Aircraft, Satellite Photography) - T. Short, MINDR
2:45 p.m.	BREAK
3:00 p.m.	Committee Discussion and Recommendations on Invasive Species •Please note that this will include (representatives from Conference of Great Lakes Governors and Premiers will be in attendance)
5:00 p.m.	Adjourn

For more information, contact Kevin Ramsey at striperrams@msn.com or 419-217-2461

Appendix C. Survey Instrument

We wish to obtain some information on supervisory conservation law enforcement officer general demographics among various jurisdictions in the Great Lakes basin. The following questions are posed in reference to your general demographics.

1. Of the following, please select the type of officer you **most** identify with in your role. Please select all that apply.

   ☐ **Field officer** (i.e., someone who spends most of their time patrolling and monitoring in the field)

   ☐ **Investigative officer** (i.e., someone who spends most of their time investigating crimes, conducting surveillance, and interviewing suspects)

   ☐ **Administrative officer** (i.e., someone who primarily writes, processes, and analyzes case reports and does not spend a majority of their time in the field or in an investigative capacity)

   ☐ **Supervisory officer** (i.e., someone who primarily supervises employees and does not spend a majority of their time in the field or in an investigative capacity)

2. In what year were you born? _____

3. What is your gender?
   ☐ Female
   ☐ Male

4. What is your ethnicity origin or race?
   ☐ American Indian
   ☐ Asian
   ☐ Black or African American
   ☐ White or Caucasian
   ☐ Hispanic or Latino
   ☐ Native Hawaiian or other Pacific Islander
   ☐ Multi-Racial
   ☐ Other; please specify: _____

5. What is your highest level of school completed or degree attained?
   ☐ Some high school, no diploma
   ☐ High school, diploma or the equivalent (e.g., GED)
   ☐ Some college, no degree
   ☐ Trade, technical, or vocational training
   ☐ Associate's degree
   ☐ Bachelor's degree
   ☐ Master's degree

☐ Ph.D., law, medical, or other degree beyond a Master's degree

6. If you have a Bachelor's degree, what was your major?

_____

7. If you have a Master's degree, what was your area of study?

_____

8. If you have a Ph.D., law, medical, or other degree beyond a Master's degree, what was your area of study?

_____

9. Do you personally fish recreationally, commercially, or for sustenance?
   ☐ Yes
   ☐ No
   ☐ I prefer not to answer

10. Do you personally hunt recreationally or for sustenance?
    ☐ Yes
    ☐ No
    ☐ I prefer not to answer

Appendix D. Semi-Structured Interview Questions

We wish to better understand the reasons for your participation in, and your understanding of, the Great Lakes Fishery Commission's Law Enforcement Committee. The following questions are in reference to your interest and willingness to participate in, and your understanding of, the Law Enforcement Committee.

1. How often do you participate in Great Lakes Fishery Commission's (Commission) Law Enforcement Committee (Committee) Meetings? How long have you been in your current position? Are you affiliated with what agency (e.g., federal, state, tribal, provincial, binational)?

2. In your own words, please describe the primary **function(s)** of the Commission's Law Enforcement Committee. In your own words, please describe the **structure** of the Commission's Law Enforcement Committee.

3. Please describe some reasons for **why** you participate in the Commission's Law Enforcement Committee Meetings.

We wish to improve our understanding of the Great Lakes Fishery Commission's Law Enforcement Committee and its role in leading law enforcement efforts throughout the Great Lakes basin. The following questions are in reference to your perception(s) about the Committee and its significance in addressing threats and challenges facing Great Lakes fisheries resources and aquatic habitats.

4. As a current, or retired, law enforcement officer, what is your opinion of the major threats and challenges facing Great Lakes fisheries and their habitat?

5. Do you believe the Commission's Law Enforcement Committee is currently equipped to help address these threats and challenges? Why? More than individual law enforcement agencies?

6. Do you believe the Commission's Law Enforcement Committee must **evolve** to address these threats and challenges? How so?

7. On a scale from one to five, with one being "unsatisfied," three being "satisfied," and five being "very satisfied," please rate your level of satisfaction with the effectiveness of the Commission's Law Enforcement Committee in conserving fisheries and their habitat.

8. From your perspective, how is the Commission's Law Enforcement Committee **most effective** in conserving fisheries resources and their habitat? How is the committee **least effective**?

9. Do you believe that a joint approach to fisheries law enforcement is the **most effective** approach in the Great Lakes basin? Why or why not? Do you believe that the Commission's Law Enforcement Committee encourages this type of approach?

10. In your opinion, how have you been personally and/or professionally impacted by your involvement with the Commission's Law Enforcement Committee? Can you provide an example?

11. Lastly, do you believe the Commission recognizes the value of the Law Enforcement Committee and coordinates with the Committee effectively to promote fisheries and aquatic habitat conservation? If not, what do you think the Commission can do to improve their perception of the Committee and coordinate more effectively?

LITERATURE CITED

LITERATURE CITED

Adams, W. C. (2015). Conducting semi-structured interviews. Handbook of Practical Program Evaluation. K. E. Newcomer, H. P. Hatry and J. S. Wholey, John Wiley & Sons.

Gaden, M. (2007). Bridging jurisdictional divides: Collective action through a Joint Strategic Plan for Management of Great Lakes Fisheries. Ann Arbor, University of Michigan: 296.

GLFC (2019a). "About." Retrieved August 30, 2020, from http://www.glfc.org/about.php.

GLFC (2019b). "Law Enforcement Committee." Retrieved April 25, 2020, from http://www.glfc.org/law-enforcement-committee.php.

GLFC (n.d.). Terms of Reference. Ann Arbor, Michigan, Great Lakes Fishery Commission: 3.

Guthrie, A. G., W. W. Taylor, et al. (2019a). "The role of a multi-jurisdictional organization in developing ecosystem-based management for fisheries in the Great Lakes basin." Aquatic Ecosystem Health and Management 22(3): 329-341.

Guthrie, A. G., W. W. Taylor, et al. (2019b). "Linking water quality and fishery management facilitated the development of ecosystem-based management in the Great Lakes basin." Fisheries 44(6): 288-292.

Hartig, J. H., M. A. Zarull, et al. (1998). "An ecosystem approach to Great Lakes management: Practical steps." Journal of Great Lakes Research 24(3): 739-750.

Kirshman, H. and N. J. Leonard (2003). Protecting the Fishery through Law Enforcement. Ann Arbor, Michigan, Great Lakes Fishery Commission: 8.

Likert, R. (1932). "A technique for the measurement of attitudes." Archives of psychology: 5-55.

McGarrell, E. F., M. Suttmoeller, et al. (2013). Great Lakes fisheries law enforcement. Great Lakes Fisheries Policy and Management: A Binational Perspective. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 455-472.

Taylor, W. W., M. J. Good, et al. (2019). "The changing face of Great Lakes fisheries." Aquatic Ecosystem Health and Management 22(3): 355-367.

VERBI Software (2019). MAXQDA 2020. Berlin, Germany, VERBI Software.

CHAPTER 4: THE PERCEIVED ROLE AND EFFECTIVENESS OF LAW ENFORCEMENT IN PROTECTING FISHERIES AND AQUATIC ECOSYSTEM RESOURCES THROUGHOUT THE GREAT LAKES

Abstract

   Hundreds of federal and non-federal entities and people work across jurisdictional

borders to ensure compliance with statutes, rules, and regulations that aim to protect and

conserve fisheries and aquatic ecosystem resources. Law enforcement personnel (i.e., officers)

represent these entities while also serving as intermediaries or liaisons among fisheries

managers, decision-makers, researchers, and the general public (i.e., including fisheries

resource users). This chapter examines the perceptions of a subset of fisheries law enforcement

officers representing federal, state, and tribal government levels and jurisdictional authorities

in the Great Lakes basin. As part of this research study, I surveyed 597 fisheries law

enforcement officers from 15 natural resource management and law enforcement entities to

document their perceptions of unlawful fishing activities and the resulting environmental

impacts; consequences (i.e., punishments or sanctions) for violators; voluntary compliance with

fish laws; coordination with other entities; and organizational and individual effectiveness in

protecting Great Lakes fisheries and aquatic ecosystem resources. In general, respondents

expressed that they were satisfied with their organizations', and their individual, effectiveness

in protecting fish and fish habitat. Respondents also noted certain aspects of their roles that are

likely to reduce overall fisheries law enforcement effectiveness. For example, some

respondents indicated they spend a significant percentage of their time on non-fisheries law

enforcement activities (i.e., traditional or general policing activities such as littering or traffic

control), which precludes them from dedicating their time to addressing ongoing regulatory

issues (e.g., commercialization of fisheries resources) that are likely to affect fish and fish

habitat. Respondents' perceptions will provide meaningful insight to law enforcement entities

that wish to enhance their regulatory role in the Basin and improve their overall effectiveness.

Introduction

Hundreds of federal, non-federal, binational (and even local) government agencies and organizations are involved in ensuring the sustainability of fisheries and aquatic resources in the Great Lakes basin (Basin). Within these entities, law enforcement personnel or officers have specialized roles, duties, and responsibilities to protect, enhance, and conserve these resources (Kirshman and Leonard 2003; Finster 2007; McGarrell et al. 2013).

In the Basin, fisheries law enforcement officers are challenged in executing the full extent of their position duties and responsibilities. The uncertainty surrounding the type and level of illegal fishing behavior and fish crimes; reasons that motivate people to violate fish laws; lack of coordination among jurisdictional authorities; disproportion of time dedicated to various law enforcement activities; and limited staff and financial resources could exacerbate these challenges (Eliason 2007; 2011). Additionally, these challenges could limit organizational and individual effectiveness, thereby decreasing the perceived value of, and general morale in, fisheries law enforcement basin-wide (McGarrell et al. 2013).

Through the application of traditional criminological theories surround deterrence (Scholz 1984; Paternoster 1987; Furlong 1991; Mendes 2004; Filteau 2013; Gunningham 2017), voluntary compliance (Keane et al. 2008; Apel and Nagin 2011; Wilson and Boratto 2020), trust, and procedural fairness (Tyler 1997; Kuperan and Sutinen 1998; Nielsen and Mathiesen 2000; Skogan and Frydl 2004; Herian et al. 2012), the goal of this research study was to engage with fisheries law enforcement officers to better understand their self-identified roles and perceived effectiveness in protecting and conserving fisheries and aquatic ecosystem resources. To accomplish this, I surveyed federal, state, and tribal fisheries law enforcement officers working

in multiple jurisdictions throughout the Basin. The outcomes of this research study will be informative for natural resource management and their associated law enforcement entities as they continue to make decisions about funding, training, coordination efforts, and staff workloads. Additionally, I am hopeful this study will help bring awareness to the value of fisheries law enforcement as a critical component of the overall fisheries management regime (Ostrom 1990; Keane et al. 2008).

Methods

Great Lakes fisheries law enforcement involves hundreds of federal and non-federal entities spread across multiple jurisdictions. Each entity has their own vision, mission, regulatory approaches and strategies, and staff composition. Thus, the Basin presents an opportune study area in which to examine and compare the roles and the effectiveness of these entities in protecting and conserving Great Lakes fisheries and aquatic ecosystem resources.

Target Sample and Participants

The target sample in this study was composed of law enforcement officers from those 16 law enforcement entities with staff representation in the Great Lakes Fishery Commission's (Commission's) Law Enforcement Committee (Committee) (Table 3.1). The participants included individuals who work for these entities. I targeted supervisory, investigative, administrative, and other fisheries law enforcement officers. Please refer to Appendix A. Breakdown of Target Sample and Participants (Table 4.6) for a breakdown of the target sample and participants included in this research study.

136

Research Design

I designed a survey with a series of multiple-choice, ranking, and short-answer questions to engage with participants and examine their perceptions regarding their role and effectiveness in identifying illegal fishing behavior and reducing fish crime in the Basin. I designed and hosted the survey electronically in Qualtrics (Qualtrics 2019). The survey method was approved by the Michigan State University Institutional Review Board (Study ID 00003854).

I worked with the Committee's Chair and Vice-Chair to identify points-of-contact (POCs) at each entity to obtain their assistance in reviewing and disseminating the survey to the targeted participants. Once we identified the POCs, I e-mailed them to: 1) inform them about the goals of this research study; 2) request their participation; and 3) ask for their assistance in nominating other staff to participate in the survey. In the e-mail, I also included a letter written by the Commission's Executive Secretary (Appendix B. Letter of Support), in support of this research study. I followed up with the POCs over the phone to clarify the intent of the request and answer questions. While the POCs were generally comfortable with the research design, a few of them did not wish to identify themselves according to the natural resource management and/or law enforcement entity(ies) they represented. I used a detailed information and consent form (Appendix C. Information and Consent Form) to convey the purpose of this research study and remind the participants that their involvement in this data collection would be voluntary and remain anonymous.

Beginning in January, and running through September, 2020, the POCs disseminated a link to the survey through e-mail to the participants. Of the 16 POCs, only one (i.e., a supervisory officer) required mandatory participation from the other staff. The rest of the POCs

137

requested voluntary participation from other staff. Respondents provided written consent prior to any data collection.

Survey

I designed a 42-question survey (Appendix D. Survey Instrument) to obtain information about the participants. I organized the survey questions within five themes regarding participants':

- Demographic information;

- Employment status and roles within their respective law enforcement entity(ies);

- Beliefs about, and behaviors in, fulfilling their regular law enforcement duties;

- Perceptions of the type, level, and significance of unlawful fishing activities occurring throughout the Basin; and,

- Perceptions of organizational and individual effectiveness in identifying illegal fishing behavior and reducing fish crime in the Basin.

In total, POCs at 15 of the 16 entities with staff representation in the Committee responded positively to my request for their participation (Table 3.1). The POCs disseminated a link to the survey through e-mail to fisheries law enforcement officers representing federal, non-federal, and binational government levels in the Basin. In total, after removing incomplete (i.e., less than 33% complete) and unclassified responses (n = 42), I received 597 unique responses to the survey, for a response rate of 48%. Approximate response rates, organized by government level, are included in Appendix E. Approximate Response Rates (Table 4.7). Response rates did not differ significantly among federal and non-federal respondents, and

there were no binational respondents. Staff affiliated with only one natural resource

management and law enforcement entity (i.e., Ontario Ministry of Natural Resources and

Forestry, Enforcement Branch) declined to participate in the survey. Thus, perceptions of

fisheries law enforcement officers associated with the provincial government level were not

represented in the collected data.

Analysis

To summarize the survey results, I compiled and evaluated the quantitative data from

the multiple-choice and ranking survey questions using descriptive statistics (e.g., count

[percentage], mean, mode). I used the computer software package, MAXQDA, to analyze the

qualitative data from the ranking and short-answer questions (VERBI Software 2019).

Results

Five hundred and ninety-seven officers responded to the survey between January 1 and

September 30, 2020. Most of the respondents answered all of the survey questions, but some

respondents left questions unanswered. One hundred percent of respondents were affiliated

with either United States (U.S.) or Canada.

Five hundred and thirty-five respondents (94% of the total respondents)

identified as White or Caucasian while 35 (6%) identified as either Multi-Racial, Hispanic or

Latino, American Indian, or Other (e.g., Asian American). The remaining respondents provided

no response. Zero respondents identified as Black or African American, Native Hawaiian, or

other Pacific Islander. Five hundred and seventy-one respondents (96%) self-affiliated with

state (nonfederal) entities and, of these respondents, 339 (59%) self-identified as field officers.

Table 4.1includes a breakdown of the number of respondents organized by government level.

Table 4.2 includes a breakdown of the number of respondents, organized by their self-identified role in fisheries law enforcement. I presented these roles and general descriptions (Table 3.4) in the survey as options for the participants to select from.

Table 4.1. Number of respondents organized by level of government.

	Number	Percent
Federal	20	3
State	571	96
Tribal	6	1
Binational	0	0

Table 4.2. Number of respondents organized by their self-identified role in fisheries law enforcement.

		Number	Percent
Federal			
Supervisory		13	65
Staff	Field	4	20
	Investigative	2	10
	Administrative	1	5
	Other	0	0
State			
Supervisory		130	25
Staff	Field	339	65
	Investigative	43	8
	Administrative	4	1
	Other	6	1

Table 4.2 (cont'd).

		Number	Percent
Tribal			
Supervisory		3	50
Staff	Field	3	50
	Investigative	0	0
	Administrative	0	0
	Other	0	0

At the time of this research study, 28 respondents (5%) were 18-25 years old; 90 (16%) were 26-30; 92 (16%) were 31-35; 91 (16%) were 36-40; 89 (16%) were 41-45; 104 (18%) were 46-50; 59 (10%) were 51-55; 17 (3%) were 56-60; 2 (0.3%) were 61-65; 2 (0.3%) were over 65; and 23 (4%) did not provide a response (Figure 4.1).

The majority of respondents were well-educated; 366 (64%) had Bachelor's degrees, 26 (5%) had Master's degrees, and 1 (0.2%) had a Ph.D., law, medical, or other higher-level degree. Of these respondents, 183 (47%) had obtained their degrees in either a criminal justice or natural resource management discipline, at minimum. Of the 547 respondents (95%) who self-indicated their gender, 501 (92%) of the respondents were male, 45 (8%) were female, and 1 (0.2%) was gender variant/non-conforming.

Roles, Activities, and Duties

Based on their expertise and experience, respondents identified their perceptions of the primary roles of Great Lakes fisheries law enforcement officers, summarized in Table 4.3. I grouped their responses into categories, organized by government level, and listed by those roles most frequently mentioned to those least frequently mentioned.

Respondents broadly identified their perceptions of the type of fisheries law
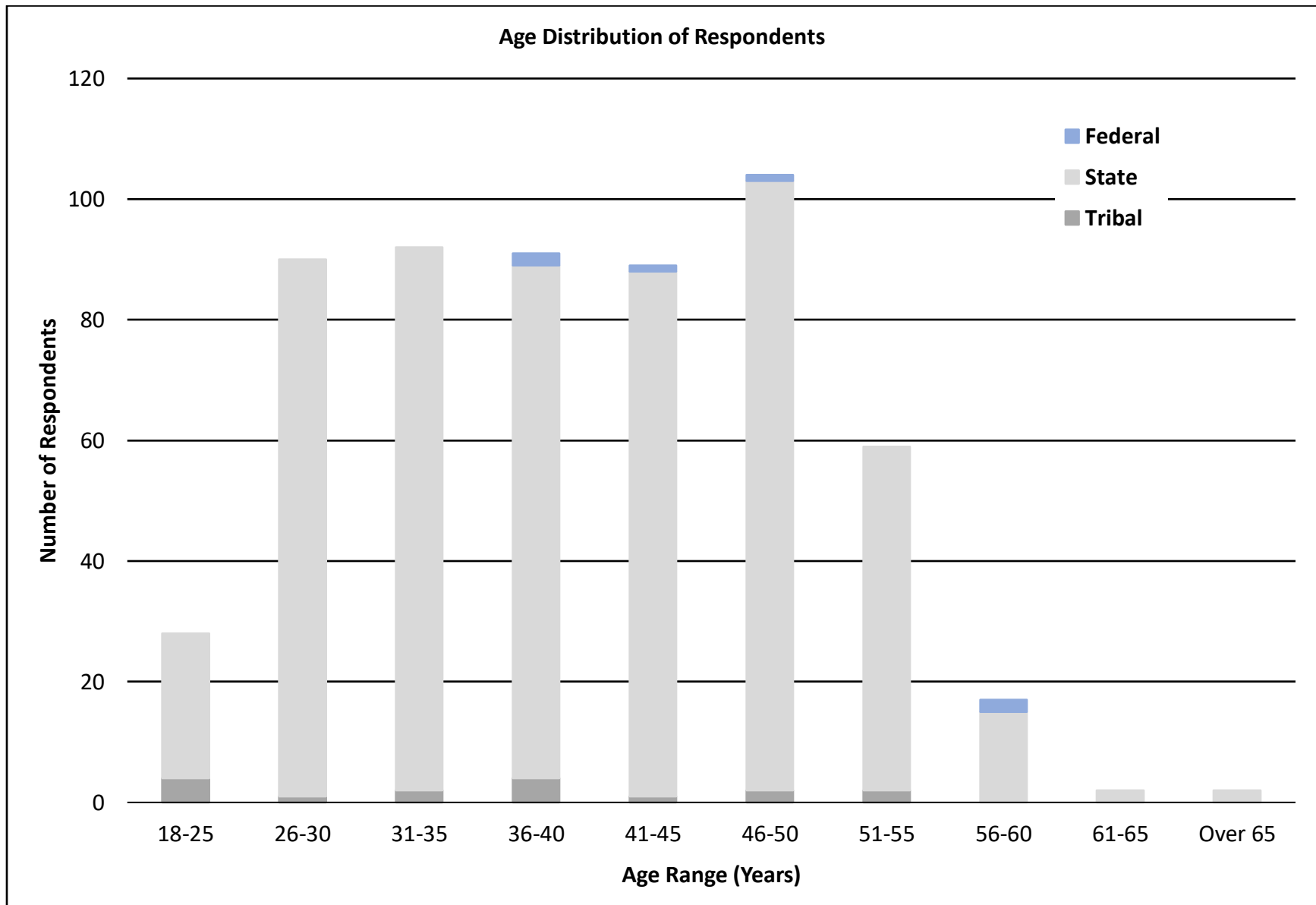
Figure 4.1. Age distribution of respondents, organized by government level.

Table 4.3. Primary roles of fisheries law enforcement officers in the Great Lakes basin, as perceived by respondents.

Level of Government	Primary Roles
Federal	Protect, enhance, and conserve fisheries resources, habitats, and the environment*
	Investigate and/or prosecute illegal fishing activities
	Educate the general public*
	Identify and enforce fish laws*
	Ensure fishing opportunities for future generations
	Conduct non-fisheries and wildlife law enforcement
	Maintain safety of the general public*
	Oversee regulation of fish harvest
	Patrol, monitor, and follow-up on illegal fishing activities
	Support fisheries management
State	Identify and enforce fish laws
	Protect, enhance, and conserve fisheries resources, habitats, and the environment
	Educate the general public
	Ensure fishing opportunities for future generations
	Oversee regulation of fish harvest
	Maintain safety of the general public
	Patrol, monitor, and follow-up on illegal fishing activities
	Investigate and/or prosecute illegal fishing activities
	Support fisheries management
	Build and enhance community relationships
	Encourage use of fisheries resources at sustainable levels
	Ensure fairness in fishing opportunities among fisheries resource users
	Advise on key issues and emerging threats to fisheries resources, habitats, and the environment
	Serve and respond to the general public
	Assist in creation of new laws and policies
	Complete routine administrative tasks
	Reduce conflict among fisheries resource users
	Train other fisheries law enforcement officers
Tribal	Protect, enhance, and conserve fisheries resources, habitats, and the environment

Table 4.3 (cont'd).

Level of Government	Primary Roles
	Identify and enforce fish laws
	Educate the general public
	Maintain safety of the general public

Asterisk indicates those primary activities that are were perceived by respondents to be commonly shared by fisheries law enforcement officers.

enforcement activities in which they primarily engage. I presented a list of typical regulatory activities in the survey as options for the participants to select from. Respondents affiliated with state entities most frequently indicated they enforce statutes, rules, and regulations that govern sport or recreational fishing. Respondents affiliated with federal entities most frequently indicated they enforce boating and general recreation (e.g., transportation, swimming) laws. Both state and federal respondents least frequently indicated they enforce tribal fishing (i.e., tribal commercial, recreational, and subsistence fishing) laws. Respondents affiliated with tribal entities most frequently indicated they enforce tribal fishing in the Basin. Overall, respondents indicated other regulatory activities in which they engage, including, but not limited to monitoring and, as necessary, investigating: the spread of aquatic invasive species; the commercialization of fisheries resources; charter fishing operations; habitat degradation (e.g., littering); and other environmental crimes (e.g., contamination and pollution).

Respondents also identified their perceptions of their own primary duties, related to their current positions. I presented a list of typical regulatory duties in the survey as options for the participants to select from. Overall, respondents most frequently indicated they perceive their primary duties to align closest with enforcing laws; investigating violations; patrolling and

monitoring assigned areas; collecting and documenting evidence; writing incident reports; and, potentially, testifying in court. Respondents also indicated, though less frequently, they perceive a duty to coordinate with fisheries managers and researchers, and other law enforcement entities in their own, and among other, jurisdictions. Uniquely, respondents affiliated with tribal entities perceived to have a primary duty in educating or developing outreach efforts to inform fisheries resource users. Overall, respondents indicated other primary duties they perceive to have, including, but not limited to: conducting surveillance; conducting search and rescue missions; coordinating with legislators, prosecutors, and judges; reviewing permits; supervising officers; conducting non-fisheries law enforcement; training officers; and general administrative tasks.

Perceptions of Fish Crimes and Impacts

Respondents identified many illegal fishing behaviors they encounter on a regular basis within their jurisdictions. Commonly-reported behaviors included fishing without a license or permit; overharvesting; fishing during closed times or seasons; fishing in closed or restricted areas; fishing with illegal or damaged gear, or by illegal method (e.g., snagging); false reporting (e.g., underreporting harvest, harvesting or possessing undersized fishes); habitat destruction (e.g., pollution, disturbance); issues regarding boat safety and operations, and more.

The majority of respondents indicated they do not perceive all illegal fishing behaviors to negatively impact fisheries and aquatic resources in their jurisdictions. Two hundred respondents (35%) indicated the contrary and 45 (8%) were uncertain. Respondents affiliated with federal and tribal entities expressed more uncertainty about whether or such behaviors negatively impact fisheries and aquatic ecosystem resources. Overall, respondents most

frequently identified overharvesting or exploitation (i.e., harvesting at an unsustainable rate) as

the behavior they perceive to have the greatest negative impact(s) on Great Lakes fish

populations and fish habitat. Related to overharvesting, and in general, there was no significant

difference among respondents' perceptions of whether or not commercial versus recreational

fishing violations result in greater negative impacts on fisheries and aquatic ecosystem

resources (X^2 [2, N = 580] = 5.926, p = 0.0517).

Perceptions of Consequences, and Ensuring Compliance

While respondents acknowledged the occurrence of unlawful fishing activities in, and

among, their jurisdictions, the majority of respondents most frequently indicated they perceive

commercial anglers (335; 56%) and recreational anglers (512; 86%) to comply with fish statutes,

rules, and regulations most of the time (Figure 4.2). However, respondents' perceived levels of

compliance among anglers differed significantly overall, as respondents perceived there to be

less compliance among commercial anglers versus recreational anglers (X^2 [2, N = 1089] = 9

2.162, p < 0.00001).

In cases in which anglers fail to comply, 299 respondents (51%) indicated they perceive

the severity of consequences or sanctions issued to fit (i.e., match or align with) the severity of

the crime(s), most of the time. Two hundred and sixty-one (44%) expressed more skepticism,

indicating they either do not often perceive the severity of sanctions to fit the severity of the

crime(s) or do not know (9; 2%). Of those respondents who were skeptic, 196 (75%) perceived

the severity of sanctions to be generally less severe than the severity of the crime.

Respondents selected the regulatory approach they primarily use in their current

positions. I presented a list of traditional regulatory approaches (Table 4.4) to law enforcement
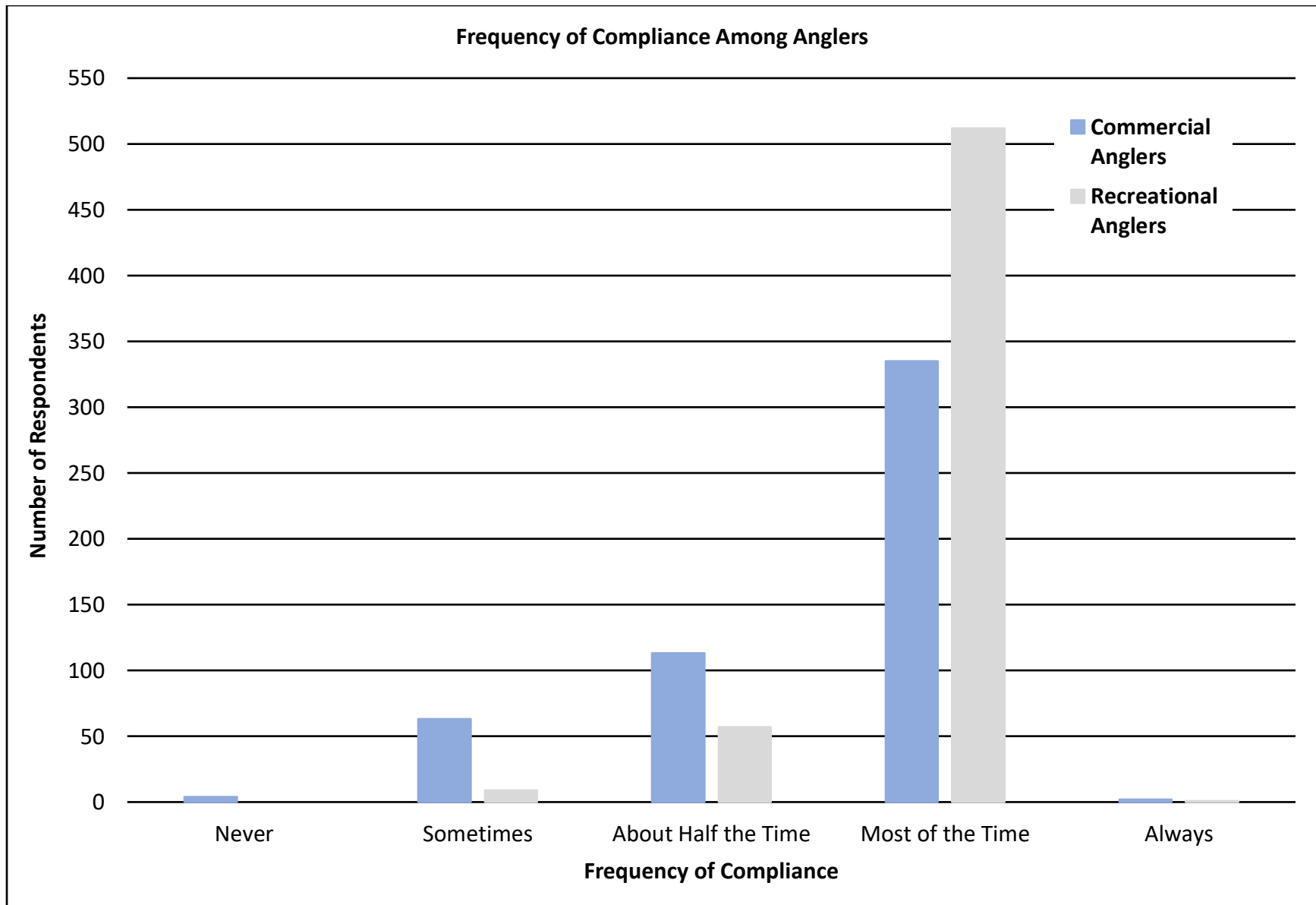
Figure 4.2. Frequency of compliance among Great Lakes commercial and recreational anglers, perceived by respondents.

Table 4.4. Traditional regulatory approaches presented in the survey.

Role	Definition
Crime Control Approach	You prioritize the distribution of quick and appropriate sanctions or punishments to stop unlawful behavior and deter or prevent natural resource users from behaving unlawfully in the future.
Fairness or 'Due Process' Approach	You prioritize fairness and equality in your interactions with natural resource users who behave unlawfully; rather than quickly distribute a sanction or punishment, you are more likely to listen to, and take into consideration, the natural resource users' rationale behind their unlawful behavior before deciding upon a punishment.
Education Approach	You prioritize the use of educational strategies and outreach to inform natural resource users to behave unlawfully about the negative consequences of their actions and deter them from behaving unlawfully in the future.

in the survey as options for the participants to select from. Overall, 324 respondents (55%) most frequently indicated they primarily use a combination of two or more of these approaches. Respondents affiliated with state and tribal entities emphasized their use of the "Fairness or 'Due Process' Approach" over other approaches. Respondents affiliated with federal entities emphasized their use of the "Crime Control Approach" and "Fairness or 'Due Process' Approach."

Coordination In, and Among, Jurisdictions

Among the stakeholders[9] in the Basin, respondents indicated which stakeholder group they perceive to have the most positive, long-term impact(s) on fisheries and aquatic ecosystem resources. Respondents affiliated with federal, state, and tribal entities most

---

[9]For the purposes of this dissertation, stakeholders are those individuals who have vested interests in the health and sustainability of fisheries and aquatic ecosystem resources in the Great Lakes basin.

frequently identified fisheries resource users (e.g., anglers) (199; 34%), researchers (179; 30%), and law enforcement (121; 21%) as the stakeholder groups they perceive to have the most positive impact(s). Interestingly, respondents less frequently identified educators and outreach staff, legislators, and managers as having the same level of impact.

To gain an improved understanding of the type, and level of, coordination regarding regulatory efforts already occurring among stakeholder groups in the Basin, respondents offered their perceptions regarding ongoing coordination, or lack thereof, among fisheries law enforcement and fisheries researcher stakeholder groups. Results showed mixed responses regarding whether or not the entity with which respondents affiliate coordinates regularly with fisheries researchers. Overall, while 272 respondents (46%) indicated that regular coordination is occurring, there was no significant difference reported among those responses, contrasting responses, and those responses expressing uncertainty (X^2 [4, N = 586] =2.503, p = 0.6442).

Of those respondents who expressed that regular coordination is occurring, they most often indicated that such coordination occurs biannually, monthly, and weekly. Table 4.5 includes some of the typical ways in which respondents indicated they coordinate among stakeholder groups in the Basin. While some respondents suggested coordination can occur more regularly (daily), they also suggested it occurs less regularly (annually), or as needed.

Table 4.5. Typical ways in which respondents coordinate in the Great Lakes basin.

Level of Government	Methods of Coordination
Federal	E-mail
	In-person formal and informal communications*
	Meetings*
	Phone calls
	On-site inspections

Table 4.5 (cont'd).

Level of Government	Methods of Coordination
	Assemblies for special case studies and projects
State	Briefings and reports
	E-Mail
	In-person formal and informal communications*
	Joint research and investigative efforts
	Meetings*
	Phone calls
	Trainings
Tribal	Briefings and reports
	In-person formal and informal communications*
	Meetings*
	Trainings

Asterisk indicates those ways of coordinating that were perceived to be commonly shared by federal, state, and tribal respondents.

Organizational and Individual Effectiveness

Four hundred and ninety respondents (85%) perceived the entities they represent to be moderately or very effective in identifying illegal fishing behavior and reducing fish crime in their jurisdictions. However, four hundred and forty-two respondents (77%) indicated they could be more effective. Ninety-five respondents (16%) also expressed uncertainty about whether or not the entities with which they affiliate, given direction about how to do so, could be more effective. At least 524 of the respondents (91%) indicated they felt either moderately supported or more than moderately supported by their entities to make necessary improvements to organizational effectiveness in the future.

An overwhelming 491 survey respondents (85%) perceived themselves, as individuals, to be moderately or very effective in identifying illegal fishing behavior and reducing fish crime in their jurisdictions. Only a small subset of respondents (9, 2%), which solely included state

fisheries law enforcement officers, perceived themselves to be extremely effective.

Discussion

While not wholly representative of basin-wide law enforcement, the survey responses were representative of 3 government levels (federal, state, and tribal) and 15 of the 16 natural resource management, and their associated law enforcement, entities included in the target sample (Table 3.1). The number of respondents affiliated with state entities significantly outnumbered the respondents affiliated with federal and tribal entities (Appendix E. Approximate Response Rates, Table 4.7). However, this was expected, as the number of individuals with dedicated fisheries law enforcement duties and responsibilities differ per governmental level. While the survey respondents were well-distributed in terms of age, 476 respondents (80%) identified as White or Caucasian males. The underrepresentation of females and other ethnic origins and indicates a major lack of diversity in those perceptions—representative of all values and interests—included in this research study and related to regulatory approaches to fisheries law enforcement in the Great Lakes.

Roles, Activities, and Duties

Across 3 government levels and 15 jurisdictions, respondents expressed their perceptions of the primary roles of Great Lakes fisheries law enforcement officers, which included the 3 following components, the:

- Identification and enforcement of fish laws;

- Protection (i.e., "to protect a resource that cannot protect itself,"), enhancement, and conservation of fisheries resources, habitats, and the aquatic environment; and,

- Education of the general public, which includes fisheries resource users.

Respondents indicated they fulfill these roles by serving in supervisory and staff positions; working in field, investigative, administrative, and other capacities; and participating in certain law enforcement activities within their jurisdictions.

While respondents affiliated with federal, state, and tribal entities indicated they shared some of these activities in common (Table 4.3), evidence suggests that the scale and frequency at which these activities are typically carried out differ according to government level. State respondents expressed the highest level of participation in the most diverse range of law enforcement activities, targeted or focused most closely on protecting fisheries and aquatic ecosystem resources. In contrast, federal and tribal respondents were both fewer in number and more limited in their participation in law enforcement activities. For instance, federal respondents indicated they participate in a broader set of law enforcement activities, related not only to fisheries resources but also boating operations, trade and transport, marine mammals, special case studies and investigations, and general public safety. Tribal respondents indicated they participate in a narrower set of law enforcement activities, focused primarily on tribal commercial, recreational, and subsistence fishing. Additionally, evidence suggests that all respondents spend a significant percentage of their time conducing non-fisheries law enforcement activities, which precludes respondents and other officers from dedicating their time to protecting fisheries and aquatic ecosystem resources. This outcome aligns well with results obtained through other research studies that have examined natural resource law enforcement (Eliason 2007).

Respondents further identified themselves by their position titles. The word cloud

(Figure 4.3) illustrates the range of position titles held by the respondents. At the time of this research study, 266 respondents (45%) had spent 0-5 years in their current positions. Three hundred and fourteen respondents (53%) expressed they felt extremely satisfied in their current positions.

Perceptions of Fish Crimes and Impacts

Survey respondents confirmed that illegal fishing behavior and fish crimes are prevalent throughout the Great Lakes, however they also expressed uncertainty regarding how much crime is occurring and the magnitude of the resulting negative impacts on fisheries and aquatic ecosystem resources. As of September 2020, respondents affiliated with federal, state, and tribal entities came to a consensus that commercial overharvest, especially in tribal commercial fisheries, is potentially the most environmentally-damaging and -destructive fish crime occurring throughout the Basin. For instance, one respondent said:

> "The amount of illegal commercial harvest from the Great Lakes is more than anyone can quantify."

However, the illegal harvest itself, and associated impacts, remain difficult, if not impossible to quantify. Quantifying the level of unlawful fishing activities has been a challenge in other fisheries, too, for it is time-consuming, expensive, and can be resource intensive or destructive (Randall 2004; Gavin et al. 2010; Donlan et al. 2020). Nevertheless, the uncertainty surrounding the true amount of illegal harvest presents a major roadblock to ensuring sustainable fisheries and aquatic ecosystem resources in the Basin.

Some respondents agreed that overharvesting in, or other criminal behavior related to,

Figure 4.3. Range of position titles held by respondents.

recreational or sport fisheries (e.g., false reporting) are also likely to lead to long-term, negative

impacts on Great Lakes fish and fish habitat. On a case-by-case basis, the magnitude of impacts

resulting from a recreational fishing violation may be less in comparison to that resulting from a

commercial fishing violation. However, the build-up of these recreational fishing violations over

time, which are perceived to occur on a more frequent basis than others, could equate to or

even exceed the magnitude of such impacts resulting from commercial overharvest and other

commercial fishing violations. Still, estimates of how much crime is occurring and the severity of

impacts remains unknown.

Perceptions of Consequences, and Ensuring Compliance

Respondents most frequently perceived commercial and recreational anglers to comply

with fish statutes, rules, and regulations most of the time in the Basin. However, respondents

also reported spending a significant percentage of their time identifying and taking law

enforcement action—often involving the issuance of sanctions—in response to fish crimes (e.g.,

fishing during closed times or seasons). While the majority of respondents perceived the

severity of these sanctions to fit the severity of the crime, some respondents perceived the

severity of sanctions to be less severe than the severity of the crime. Further, respondents

noted that they perceive consequences for fish crimes to be uncertain, inconsistently issued,

and, in a court of law, they can be potentially delayed in their issuance or negotiated down by

effective prosecutors. Following the deterrence theory of punishment, violators may choose

not to comply with fish laws if the certainty, severity, and celerity (i.e., swiftness) of

punishment do not exceed the perceived benefits of the crime (Hobbes 1651; Bentham 1781;

Chambliss and Seidman 1971; Tyler 1997; Mendes 2004; Beccaria 2016; n.d.). As a result, there

exists opportunity for violators to avoid consequences entirely or, almost worse, choose to accept consequences if the personal gains outweigh the losses. According to two respondents, for some violators, engaging in illegal fishing activities and behaviors is often "worth the risk of getting caught," and, more than that, it is part of the "cost of doing business."

Anticipating the risks violators are willing to take may become easier through improved understanding of their motivations to commit fish crimes. For instance, respondents most frequently perceived violators to be motivated by whether or not they identify an opportunity to get away with a crime without incurring any or too many personal losses. In addition to the motivations exhibited in Figure 4.4, respondents cited other possible motivations to commit crimes as a potential result of: cultural beliefs and traditions (e.g., interest in gathering food); poor ethics and values; costly license and permit fees; interest in avoiding further injury or death of the resource; and/or a genuine need to break the law (i.e., perhaps due to homelessness); and learned behavior.

With an improved understanding of the motivations behind why violators engage in unlawful fishing activities, Great Lakes fisheries law enforcement entities could modify or tailor their approaches to more effectively enforce, and ensure compliance with, fish statutes, rules, and regulations (Tyler 1990; Eliason 2010). For example, if fisheries law enforcement officers encounter a violator and, after inquiring, understand the violator to be unaware of the law or regulation (e.g., daily limit), then the officer might choose to handle the situation using an "Education or Outreach Approach," offering a warning and educating the violator rather than issuing a more severe sanction (e.g., citation or fine). Given the range of fish crimes occurring in the Great Lakes, fisheries law enforcement officers should be trained and prepared to use a
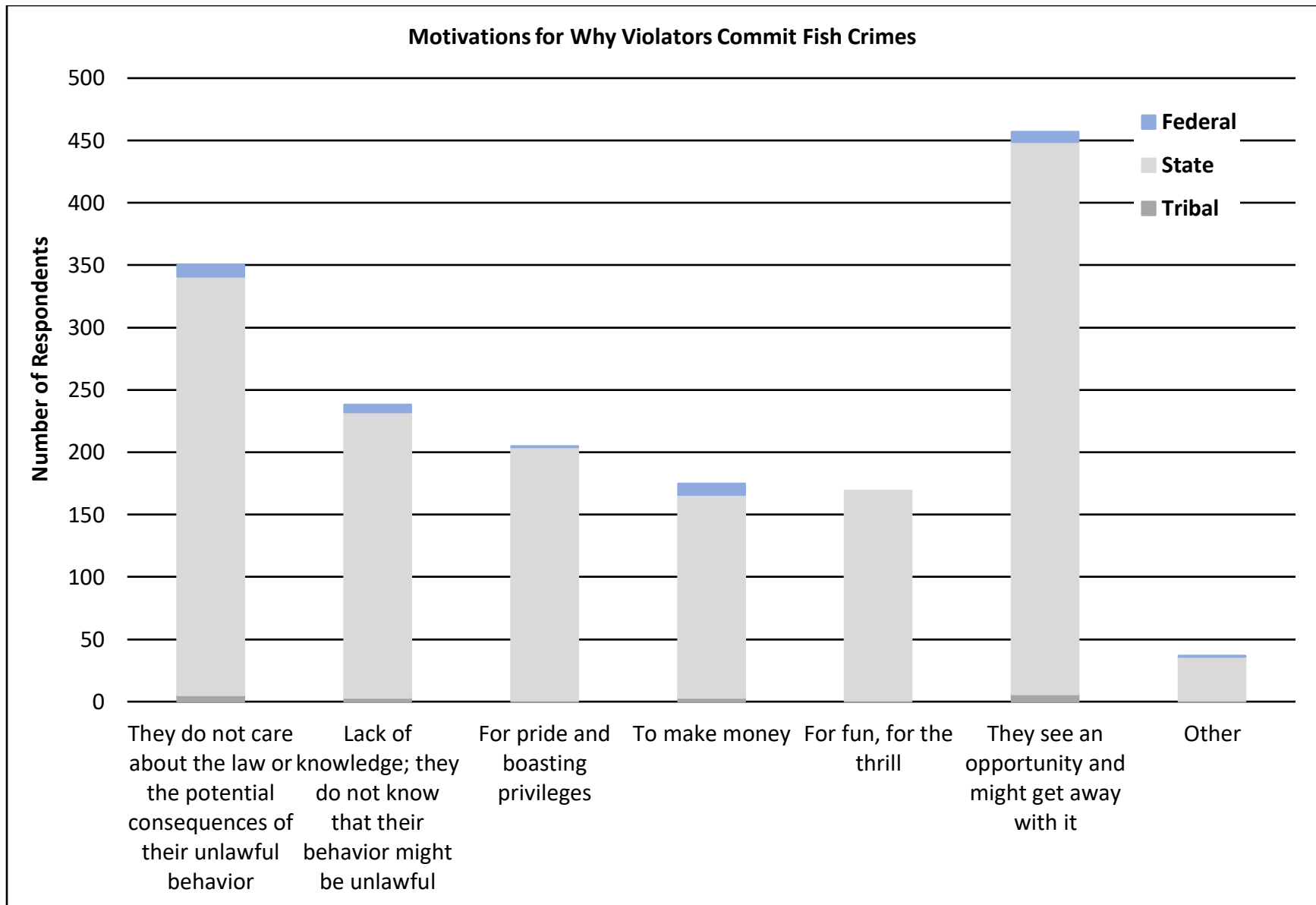
Figure 4.4. Motivations for why violators commit fish crimes, as perceived by respondents.

combination of approaches (Table 4.4) depending on the violators they encounter and the

violators' motivations.

Coordination In, and Among, Jurisdictions

Respondents emphasized the potential of fisheries law enforcement entities—

coordinating with other organizations and individuals—to positively impact fisheries and

aquatic ecosystem resource sustainability in the Great Lakes. For instance, respondents

affiliated with federal, state, and tribal entities noted the unique capacities in which they

function as part of natural resource management entities, which include: working with fisheries

researchers to identify the need for, develop, and implement fish laws; and, serving the general

public by sharing information, educating others, and enforcing fish laws. With more regular,

effective coordination, fisheries law enforcement officers can help ensure that statutes, rules,

and regulations are clearly written, yet remain enforceable. They may also be able to better

monitor the unlawful fishing activities occurring in, and among, their jurisdictions.

Overall, respondents indicated they regularly—at the most, daily, and at the least,

biannually—coordinate with other fisheries law enforcement entities and fisheries researchers.

Interestingly, 89 respondents (33%) shared that they did not know how regular such

coordination occurs throughout Great Lakes in a given year. A subset of respondents affiliated

with state entities who expressed this uncertainty indicated that they believe coordination, if it

occurs at all, does so at a higher grade or pay-level and involves only supervisory officers . If this

is the case, then fisheries law enforcement entities should consider involving their staff more in

regular coordination efforts or, at least, improving internal information-sharing processes (e.g.,

circulation of briefings or memos) with the goal of clarifying expectations and keeping staff

appraised of the status of regulatory activities.

Ten survey respondents (2%) clarified they perceive a combination of stakeholder groups, coordinating and working together, to have the potential to make the most positive, long-term impact on Great Lakes fisheries and aquatic ecosystem resources. For instance, respondents emphasized the need for improved coordination among law enforcement entities, officers, and prosecutors, judges, and court staff. They perceived this coordination could lead to a better understanding of the negative environmental impacts resulting from unlawful fishing activities and, consequently, the development of stricter, or more severe, sanctions for violators.

Organizational and Individual Effectiveness

Overall, survey respondents perceived themselves and the law enforcement entities with which they affiliate to be effective in reducing illegal fishing activities and behaviors in the Great Lakes. Seventy-seven survey respondents (13%) perceived themselves to be less than moderately effective, indicating there to be room for improvement in increasing effectiveness of fisheries law enforcement officers in identifying, enforcing, and deterring fish crimes in, and among, their jurisdictions. Federal, state, and tribal survey respondents exhibited the same patterns in their perceptions of individual versus organizational effectiveness regarding fisheries law enforcement. For example, the majority of survey respondents (302; 52%) also perceived the law enforcement entity with which they affiliate, as an organization, to be moderately effective in reducing illegal fishing activities and behaviors throughout its jurisdiction—with room for improvement.

More than modifying the severity and distribution of consequences or punishments,

survey respondents most frequency indicated that fisheries law enforcement officers should

consider increasing and enhancing coordination efforts (402; 30%) and improving educational

and outreach tactics (251; 19%)—aimed to inform the general public about the potential

negative impacts of illegal fishing activities and behaviors—as strategies to increase individual

effectiveness. Federal, state, and tribal respondents indicated other strategies, ranging from

increasing the percentage of time spent on, and dedicated to, fisheries law enforcement

activities to organizing and more community policing efforts within communities, that may also

lead to increased individual effectiveness (Eliason 2007; 2011).

Survey respondents most frequently indicated that law enforcement entities should

consider increasing the abundance and presence of fisheries law enforcement officers (i.e.,

boots on the ground) (426; 30%) and strategizing improved officer coverage in, and among,

jurisdictions (359; 25%) spanning the Basin as ways to increase organizational effectiveness.

Interestingly, federal, state, and tribal respondents also emphasized the importance of

recruitment in building a law enforcement staff group that possesses personal knowledge of,

and expertise in using, natural resources in addition to passion and enthusiasm for ensuring

protection for fisheries and aquatic ecosystem resources in the Great Lakes. Respondents

perceived law enforcement officers who exemplify this personal connection to the resource to

be more effective in carrying out their law enforcement duties and responsibilities than those

who do not. As of September 2020, 97% and 94% of federal, state, and tribal respondents

indicated they personally fish or hunt—either recreationally, commercially, or for sustenance--,

respectively. This evidence indicates that the current fisheries law enforcement regime in the

Great Lakes is staffed with people who have a vested interested in ensuring the sustainability of

fisheries and aquatic ecosystem resources.

Conclusion

Fisheries law enforcement officers serve critical roles in field, investigative, administrative, and other capacities and execute a diverse range of duties and responsibilities throughout the Great Lakes. They are enforcers of law, protectors of fish and habitats, and educators. They serve as intermediaries among other law enforcement entities, researchers, managers, legislators, judges and prosecutors, and the general public with the common goal of ensuring the sustainability of fisheries and aquatic ecosystem resources for future generations to use and enjoy. Further, fisheries law enforcement officers possess essential knowledge and experience, which can be used to improve law enforcement entities' understanding of fish crimes, the motivations behind violators of fish laws, and best-fit consequences or punishments for these violators. Without the dedicated efforts of fisheries law enforcement officers, the future health and well-being of fisheries and aquatic ecosystem resources basin-wide are at stake.

Currently, while some officers are satisfied in their work and perceive themselves to be effective in achieving the vision and mission of the law enforcement entities they represent, others consider themselves to be merely a "patch in a gaping wound." Thus, more needs to be done, at both individual and organizational levels, to raise the profile of, and provide more support for, fisheries law enforcement and the critical role it serves not only in conserving fisheries resources, but also protecting and establishing trust with resource users (Riley et al. 2018). Of all the strategies this chapter outlines to increase fisheries law enforcement effectiveness, natural resource management and law enforcement entities should prioritize a

reevaluation of their assigned duties and responsibilities, ensuring that staff have the time,

space, and flexibility to focus and dedicate their energies on identifying and enforcing illegal

fishing activities and behaviors versus general policing activities. Such a reevaluation would

confirm the high value these law enforcement officers carry in protecting Great Lakes fisheries

and habitat.

<u>Acknowledgements</u>

APPENDICES

Appendix A. Breakdown of Target Sample and Participants

Table 4.6. Breakdown of target sample and participants.

Level of Government	Law Enforcement Entity Natural Resource Management Entity	Jurisdiction	Description of Participants	Approximate Number of Officers Who Received Survey
Federal	Office of Law Enforcement NOAA Fisheries	District 1 (New England/Mid-Atlantic)	Law enforcement officers identified by chief and supervisory points-of-contact	3
	Enforcement Branch U.S. Coast Guard	9th District, Great Lakes (Atlantic Area)	All Boarding Officers working in and near the Great Lakes basin	366*
	Office of Law Enforcement U.S. Fish and Wildlife Service	Midwest Region (3)	Law enforcement officers identified by chief and supervisory points-of-contact	3
	Conservation and Protection Fisheries and Oceans Canada	Central and Arctic Region	Law enforcement officers working throughout Ontario, Canada; identified by chief and supervisory points-of-contact	7
Non-Federal	Office of Law Enforcement Illinois Department of Natural Resources	State of Illinois	All Conservation Police Officers statewide	125
	Division of Law Enforcement Indiana Department of Natural Resources	Investigation Section District 1 District 10	All Conservation Officers and supervisors working in and near the Great Lakes basin	41

Table 4.6 (cont'd).

Level of Government	Law Enforcement Entity Natural Resource Management Entity	Jurisdiction	Description of Participants	Approximate Number of Officers Who Received Survey
	Law Enforcement Division Michigan Department of Natural Resources†	State of Michigan	All Field Officers and supervisors statewide	232
	Enforcement Division Minnesota Department of Natural Resources	State of Minnesota	All Peace Officers statewide	190
	Division of Law Enforcement New York Department of Environmental Conservation	State of New York	All Environmental Conservation Police Officers statewide	310
	Office of Law Enforcement Ohio Department of Natural Resources	State of Ohio	All law enforcement officers statewide	134
	Bureau of Law Enforcement Pennsylvania Fish and Boat Commission	State of Pennsylvania	All Waterways Conservation Officers statewide	70
	Bureau of Law Enforcement Wisconsin Department of Natural Resources	State of Wisconsin	Conservation Wardens working in and near the Great Lakes basin	89‡
	Enforcement Branch Ontario Ministry of Natural Resources and Forestry§	Lakes, trails, and backroads of Ontario	Not applicable	Not applicable

Table 4.6 (cont'd).

Level of Government	Law Enforcement Entity Natural Resource Management Entity	Jurisdiction	Description of Participants	Approximate Number of Officers Who Received Survey

	Law Enforcement
	
	Chippewa-Ottawa Resource Authority
	    Bay Mills Indian Community
	    Grand Traverse Band of Ottawa and Chippewa Indians
	    Little River Band of Ottawa Indians
	    Little Traverse Bay Band of Odawa Indians
	    Chippewa Indians
		Treaty-ceded waters in the State of Michigan	Tribal Conservation Officers working in and near the Great Lakes basin; identified by chief and supervisory points-of-contact	10

	Law Enforcement Division
	
	Great Lakes Indian Fish and Wildlife Commission
	    Bad River Band
	    Bay Mills Indian Community
	    Fond du Lac Band
	    Keweenaw Bay Indian Community
	    La Courte Oreilles Band
	    Lac du Flambeau Band
		Treaty-ceded waters in the States of Michigan, Minnesota, and Wisconsin	Tribal Conservation Officers working in and near the Great Lakes basin; identified by chief and supervisory points-of-contact	20

Table 4.6 (cont'd).

Level of Government	Law Enforcement Entity Natural Resource Management Entity	Jurisdiction	Description of Participants	Approximate Number of Officers Who Received Survey
	Lac Vieux Desert Band			
	Mille Lacs Band			
	Red Cliff Band			
	Sokaogon Mole Lake Band			
	St. Croix Band			
Binational	Law Enforcement Committee Great Lakes Fishery Commission	Great Lakes basin	Law Enforcement Specialist Liaison	1

Asterisk indicates those 366 Boarding Officers who received the electronic link to the survey; only a subset of these officers (i.e., approximately 20 individuals) were expected to participate due to their limited capacity in working in and near the Great Lakes basin.
† indicates the entity that required mandatory, statewide participation in the survey.
‡ indicates the number of Conservation Wardens surveyed (= 39% of all wardens statewide)
§ indicates the entity that did not participate in the survey.

Appendix B. Letter of Support

Great Lakes Fishery
Commission

Dear Great Lakes basin fisheries law enforcement personnel:

On behalf of the Great Lakes Fishery Commission (GLFC) and Law Enforcement Committee, I appreciate your consideration in participating in a research study being conducted by Molly J. Good, a Taylor and Regier Great Lakes Fisheries Fellow and Ph.D. Candidate, Dr. William Taylor, a U.S. Commissioner and MSU Distinguished professor in global fisheries systems at Michigan State University (MSU). This research study focuses on the perceived efficacy of law enforcement officers and organizations in deterring, documenting, and reducing unlawful fishing behavior in the multiple jurisdictions in the Great Lakes basin (Basin).

As noted, this research project is being facilitated by Molly Good and Dr. Taylor with assistance from the GLFC Law Enforcement Committee. Together, they have prepared an **anonymous**, **electronic** survey about officer and agency roles in fisheries law enforcement, beliefs and values related to law enforcement and natural resource management, and perceptions of the type and impacts of unlawful fishing behavior in the Great Lakes basin. This survey is being sent to supervisory, field, investigative, administrative, and other fisheries law enforcement officers from state, Federal, tribal, and provincial jurisdictions in the Great Lakes basin.

Through this survey, the researchers wish to highlight the value of law enforcement officers in the basin by obtaining current information about law enforcement officers' perceptions regarding their individual and organizational efficacy in maintain sustainable fisheries within their jurisdiction(s). From the responses to this anonymous survey, the researchers will be able to characterize the perceptions held by law enforcement officers related to unlawful fishing behavior on a basinwide scale.

The GLFC is supportive of this unique and important research study and encourages Law Enforcement Committee members to participate in this survey effort. Through the survey, researchers are particularly interested in gaining new insight about how the law enforcement community can increase its efficacy in facilitating coordination among law enforcement agencies and organizations, which could also lead to more efficient and collaborative enforcement practices basinwide. The research will also highlight the need for, and importance of, law enforcement in the sustainability of the Great Lakes fisheries resources.

EST 1955 BY TREATY   Great Lakes Fishery Commission 2200   734.662.3209
Commonwealth Blvd, Suite 100 Ann   glfc.org
Arbor, MI, 48105

I would appreciate your support of this research study by participating in the survey and, when appropriate, supporting your staff in taking the survey should they receive it.

The survey will take approximately ten to fifteen minutes to complete, and it includes multiple choice, ranking, and short-answer questions. **This survey will not collect any identifiable information, such as your name, e-mail address, and agency or organization affiliation.** The results of this survey effort will be shared through a future presentation at our biannual Law Enforcement Committee Meeting and in official publication format.

Thank you for your consideration to participate in this research study and survey effort. If you have any questions or concerns, then please feel free to contact me (734-662-3209), Molly Good (goodmoll@msu.edu; 513-919-6050), or Dr. William Taylor (taylorw@msu.edu; 517-432-5025).

Sincerely,

Robert Lambe
Executive Secretary
Great Lakes Fishery Commission
2200 Commonwealth Boulevard, Suite 100
Ann Arbor, Michigan 48105

EST 1955 BY TREATY

Great Lakes Fishery Commission 2200
Commonwealth Blvd, Suite 100 Ann
Arbor, MI, 48105

734.662.3209
glfc.org

169

Survey of Perceived Effectiveness of Law Enforcement in Maintaining Sustainable Fisheries in the Great Lakes basin

Please consider participating in this anonymous, electronic survey if you identify as a field, supervisory, investigative, or administrative law enforcement officer who enforces fisheries law in the Great Lakes basin

Fisheries and Wildlife Department
Center for Systems Integration and Sustainability

MICHIGAN STATE
U N I V E R S I T Y

Due to your participation in, and affiliation with, law enforcement agencies or organizations throughout the Great Lakes basin that document fish crimes, deter unlawful behavior and activities, and protect fisheries and aquatic ecosystem resources, you are being asked to participate in this research study. **If you identify as a field, supervisory, investigative, administrative, or other fisheries law enforcement officer currently working and/or representing a certain jurisdiction (e.g., tribal, state, federal, provincial, binational, county, local) in the Great Lakes basin**, then we invite you to participate in this anonymous, electronic survey. For the purposes of this study, we define the Great Lakes basin as the Laurentian Great Lakes and surrounding lands and waters of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin in the United States and the province of Ontario, in Canada. Your voluntary response to this survey is important. We will use results of this research study and survey effort to describe the role of fisheries law enforcement and its effectiveness, from your valued perspective, in helping protect and conserve important fisheries and aquatic ecosystem resources for future use.

Following this introduction, there are a series of survey questions that seek to obtain information about your role in fisheries law enforcement, your beliefs and values related to law enforcement and natural resource management, and your perceptions of the type and impacts of unlawful behaviors. Please consider taking approximately ten to twelve minutes to complete the survey, which includes multiple choice, ranking, and short answer questions. **This survey will not collect any identifiable information, such as your name, e-mail address, and agency or organization affiliation.** All responses to the survey will remain anonymous. Thus, please feel comfortable to share your true perspective as you read and reflect upon each question.

This research study is facilitated by Molly J. Good, a Ph.D. candidate in the Department of Fisheries and Wildlife at MSU, and it is supported by Molly's primary advisor, Dr. William W. Taylor, MSU Distinguished Professor in global fisheries systems. This research is further supported by Robert Lambe, Executive Secretary of the Great Lakes Fishery Commission (GLFC). Please note that your participation in this research study is voluntary. You may also change your mind at any time and withdraw yourself as a participant in this research study. **Whether you choose to participate or not will have no effect on your employment status or your current, or future, involvement with the GLFC Law Enforcement Committee.** You will neither incur nor receive any costs during the implementation of this research study.

If you have any questions or concerns about this research study, *please contact Molly J. Good* via: **e-mail** (goodmoll@msu.edu); **phone** (513-919-6050); or **regular mail**: 623 Eastside Street SE #406, Olympia, WA 98501 OR 115 Manly Miles Building, 1405 South Harrison Road, East Lansing, MI 48823. To remain anonymous, please do not share any identifiable information with Molly.

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this research study, then *you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at*: **e-mail** (irb@msu.edu); **phone** (517-355-2180); **fax** (517-432-4503); or **regular mail**: 400 Collins Road, Suite 136 (IRB) or Suite 137 (Compliance), Lansing, MI 48824.

By clicking on the button below, you indicate your consent to voluntarily participate in this anonymous, electronic survey.

☐ I consent.
☐ I do not consent.

Appendix D. Survey Instrument

We wish to improve our understanding of fisheries law enforcement officers' employment status and roles within multiple jurisdictions in the Great Lakes basin. The following questions ask you about your current employment status and your perceived role (i.e., how you view your role) as a fisheries law enforcement officer.

1. With which law enforcement entity (e.g., agency, organization, program, branch, division) do you primarily affiliate?
   - ☐ State
   - ☐ Federal
   - ☐ Tribal
   - ☐ Provincial
   - ☐ Binational
   - ☐ County
   - ☐ Local
   - ☐ Other; please specify: _____

2. Do you have a staff or supervisory (i.e., oversee staff, direct or manage operations) position?
   - ☐ Staff
   - ☐ Supervisory

3. From the list below, please select the type of law enforcement officer you most affiliate with in your current position.

   - ☐ **Field Officer** – you spend most of your time patrolling and monitoring behavior in the field

   - ☐ **Investigative Officer** – you spend most of your time investigating crimes, conducting surveillance or working undercover, or interviewing suspects

   - ☐ **Administrative Officer** – you spend most of your time writing, processing, and analyzing case reports rather than in the field or in an investigative capacity

   - ☐ Other; please specify: _____

Questions for field officers only*

4. Approximately what percentage of your time at work is spent completing the following duties? Total must sum to 100.*
   - _____ Patrolling and monitoring behavior in the field
   - _____ Coordinating with other fisheries law enforcement agency staff
   - _____ Coordinating with fisheries biologists, researchers, or managers
   - _____ Completing routine administrative tasks
   - _____ Other; please specify: _____
   - _____ Other; please specify: _____

173

5. If you encounter someone exhibiting the following unlawful behaviors **for the first time**, then what do you typically do to enforce the law?*

	Issue a warning	Issue a citation or fine	Coordinate with another natural resource law enforcement agency	Do nothing	I cannot enforce this behavior
Bait bucket dumping	☐	☐	☐	☐	☐
False advertising or labeling of fish products	☐	☐	☐	☐	☐
Fishing during closed seasons	☐	☐	☐	☐	☐
Fishing in closed or restricted areas	☐	☐	☐	☐	☐
Fishing with restricted gear	☐	☐	☐	☐	☐
Fishing without a license or permit	☐	☐	☐	☐	☐
Overharvesting	☐	☐	☐	☐	☐
Harvesting threatened or endangered species	☐	☐	☐	☐	☐
Possessing threatened or endangered species	☐	☐	☐	☐	☐
Illegally distributing, transporting, or trading species	☐	☐	☐	☐	☐

6. From the list below, please select **the primary factor** that could impact your decision to issue a warning rather than a more severe punishment to someone who is exhibiting unlawful behaviors.*
    ☐ Demeanor of the individual

☐ Your general demeanor or mood
☐ Nature of the interaction with the individual
☐ Species or habitat (i.e., resources) involved
☐ Quantity or amount of resources involved
☐ Type of unlawful behavior or violation
☐ Individual's criminal record
☐ Quantity or amount of paperwork involved
☐ Individual's knowledge of the law (or lack thereof)

Question for supervisory officers only†

7. Approximately how many staff do you supervise?†
☐ 0 to 5 staff
☐ 6 to 10 staff
☐ 11 to 15 staff
☐ 16 to 20 staff
☐ More than 20 staff

8. What is the title of your current position?

_____

9. How many years have you been in your current position?
☐ 0 to 5 years
☐ 6 to 10 years
☐ 11 to 15 years
☐ 16 to 20 years
☐ More than 20 years

10. How satisfied are you in your current position?
☐ Extremely satisfied
☐ Slightly satisfied
☐ Neither satisfied nor dissatisfied
☐ Slightly dissatisfied
☐ Extremely dissatisfied

11. In your current position, which type of fisheries law enforcement do you primarily engage in? Please select all that apply.
☐ Sport or recreational fishing
☐ Boating and general recreation
☐ Commercial fishing
☐ Distribution, transport, or trade of fish resources
☐ Tribal recreational fishing

☐ Tribal commercial fishing
☐ Tribal subsistence fishing
☐ Other; please specify: _____

12. In your opinion, what is **the primary role** of a fisheries law enforcement officer?

_____
_____

13. What are **your primary duties**, as you perceive them to be, in your current position? **Please select all that apply.**
    ☐ Patrol or monitor assigned areas
    ☐ Enforce laws (e.g., by issuing warnings, citations, and fines)
    ☐ Investigate violations
    ☐ Collect and document evidence
    ☐ Write incident reports and, potentially, testify in court
    ☐ Educate or develop outreach efforts to inform natural resource users
    ☐ Collaborate with fisheries biologists and managers
    ☐ Collaborate with law enforcement entities in other jurisdictions
    ☐ Other; please specify: _____
    ☐ Other; please specify: _____

14. From the list below, please select **the primary reason** for why you chose to become a fisheries law enforcement officer.
    ☐ Love of natural resources and the environment
    ☐ Interest in protecting natural resources and the environment for the future
    ☐ Interest in stopping and deterring (i.e., preventing) unlawful behaviors
    ☐ Friend or family history or encouragement
    ☐ Only option for me
    ☐ No reason, in particular
    ☐ Other; please specify: _____

We wish to improve our understanding of fisheries law enforcement officers' beliefs about, and behaviors in, fulfilling their law enforcement duties. The following questions ask you about your beliefs and how you behave or act in fulfilling your duties.

15. From the list below, please select the stakeholder group that you believe most positively impacts long-term fisheries sustainability.
    - ☐ Law enforcement
    - ☐ Biologists or researchers
    - ☐ Managers
    - ☐ Legislators
    - ☐ Educators and outreach staff
    - ☐ Natural resource users
    - ☐ Other; please specify: _____

16. In your experience, how often does the severity of the punishment (e.g., warning, citation, fine, criminal sentence) issued to a violator of fisheries law fit the severity of the crime?
    - ☐ Always
    - ☐ Most of the time
    - ☐ About half the time
    - ☐ Sometimes
    - ☐ Never
    - ☐ I do not know

Question for officers who answered "About half the time, "Sometimes," and "Never" to the prior questions‡

17. In your experience, how does the severity of the punishment (e.g., warning, citation, fine, sentence) typically compare to the severity of the crime?‡
    - ☐ Severity of punishment **is greater than** the severity of the crime
    - ☐ Severity of punishment **is less than** the severity of the crime
    - ☐ Severity of punishment **is equal to** the severity of the crime
    - ☐ I do not know

18. From the list below, please select the approach you primarily exhibit in enforcing fisheries law.

    - ☐ **Crime Control Approach** – you prioritize the distribution of quick and appropriate punishments (e.g., warning, citation, fine) to stop unlawful behavior and deter natural resource users from behaving unlawfully in the future

    - ☐ **Fairness or "Due Process" Approach** – you prioritize fairness and equality in your interactions with natural resources users who behave unlawfully; rather than quickly issue a punishment, you are likely to listen to, and take into consideration, the natural

resource users' rationale behind their unlawful behavior before deciding upon a punishment

☐ **Education Approach** – you prioritize the use of education strategies and outreach to inform natural resource users who behave unlawfully about the negative consequences of their actions and deter them from behaving unlawfully in the future

☐ A combination of two or more of the approaches

☐ Other; please specify: _____

19. In your experience, does the law enforcement entity you affiliate with coordinate (i.e., meet, arrange something) regularly with fisheries biologists in regard to fisheries law enforcement decisions?
    ☐ Yes
    ☐ No
    ☐ I do not know

Questions for officers who answered "Yes" to the prior question§

20. In your experience, how regularly does such coordination occur in a given year?§
    ☐ Daily
    ☐ Weekly
    ☐ Monthly
    ☐ Semiannually
    ☐ Annually
    ☐ I do not know
    ☐ Other; please specify: _____

21. Briefly describe the typical coordination activity (e.g., monthly meeting), venue (e.g., hotel conference room, staff meeting room), or process (e.g., information-sharing presentations).§
_____
_____

We wish to improve our understanding of fisheries law enforcement officers' perceptions of the type, level, and significance of unlawful fishing behaviors occurring in the Great Lakes basin. The following questions ask you about your perceptions of unlawful fishing behaviors and natural resource user compliance with fishing rules, regulations, and laws in your jurisdiction.

22. From the list below, please **select three primary unlawful fishing behaviors** you encounter on a regular basis in your jurisdiction.
    - ☐ Bait bucket dumping
    - ☐ False advertising or labeling of fish products
    - ☐ Fishing during closed seasons
    - ☐ Fishing in closed or restricted areas
    - ☐ Fishing with restricted gear
    - ☐ Fishing without a license or permit
    - ☐ Overharvesting
    - ☐ Harvesting threatened or endangered species
    - ☐ Possessing threatened or endangered species
    - ☐ Illegally distributing, transporting, or trading species
    - ☐ Other; please specify: _____
    - ☐ Other; please specify: _____
    - ☐ Other; please specify: _____

23. In your experience, do you believe that **all** unlawful fishing behaviors you encounter on a regular basis negatively impact fisheries resources (e.g., fish, habitat) in your jurisdiction?
    - ☐ Yes
    - ☐ No
    - ☐ I do not know

24. From the list below, please select the unlawful fishing behavior that, in your opinion, has the **greatest negative impact on fisheries resources** in your jurisdiction.
    - ☐ Bait bucket dumping
    - ☐ False advertising or labeling of fish products
    - ☐ Fishing during closed seasons
    - ☐ Fishing in closed or restricted areas
    - ☐ Fishing with restricted gear
    - ☐ Fishing without a license or permit
    - ☐ Overharvesting
    - ☐ Harvesting threatened or endangered species
    - ☐ Possessing threatened or endangered species
    - ☐ Illegally distributing, transporting, or trading species
    - ☐ Other; please specify: _____

25. In your opinion, what general type of violators (e.g., crimes, civil wrongs) result in the **greatest negative impact on fisheries resources** in your jurisdiction?

☐ Recreational fishing violations
☐ Commercial fishing violations

26. In your experience, why do natural resource users exhibit unlawful behaviors (i.e., break the law)? **Please select all that apply.**
☐ They see an opportunity and might get away with it
☐ For fun, for the thrill
☐ To make money
☐ For pride (i.e., seek the trophy) and boasting privileges
☐ Lack of knowledge; they do not know that their behavior might be unlawful
☐ They do not care about the law or the potential consequences of their unlawful behavior
☐ Other; please specify: _____
☐ Other; please specify: _____

27. In your experience, how compliant (i.e., inclined to obey the law) are the following natural resource users with fishing regulations in your jurisdiction?

	Always	Most of the time	About half the time	Sometimes	Never
Commercial anglers	☐	☐	☐	☐	☐
Recreational anglers	☐	☐	☐	☐	☐

> *We wish to obtain information on fisheries law enforcement officers' perceptions of their individual effectiveness, and the effectiveness of their affiliated law enforcement entity, in reducing unlawful fishing behaviors occurring in the Great Lakes basin. The following questions ask you about your perceptions of individual and organizational effectiveness.*

28. In your opinion, how effective are **you** in reducing unlawful fishing behaviors in your jurisdiction?
    - ☐ Extremely effective
    - ☐ Very effective
    - ☐ Moderately effective
    - ☐ Slightly effective
    - ☐ Not effective at all

29. In your opinion, could **you** be more effective in reducing unlawful fishing behaviors in your jurisdiction?
    - ☐ Yes
    - ☐ No
    - ☐ I do not know

30. From the list below, please **select three primary ways** to increase **your** effectiveness in reducing unlawful fishing behaviors in your jurisdiction.
    - ☐ Issue fewer warnings or citations and fines
    - ☐ Issue more citations and fines and fewer warnings
    - ☐ Issue more warnings **and** fewer citations and fines
    - ☐ Use more fairness and equality in your interactions with natural resource users who behave unlawfully
    - ☐ Coordinate more regularly with fisheries biologists and managers in your jurisdiction
    - ☐ Coordinate more regularly with fisheries law enforcement officers from other jurisdictions
    - ☐ Obtain more educational training and certifications
    - ☐ Use more educational strategies and outreach to inform natural resource users about the potential negative consequences of their unlawful behavior
    - ☐ Other; please specify: _____
    - ☐ Other; please specify: _____

31. In your opinion, how effective is the **law enforcement entity** you affiliate with in reducing unlawful fishing behaviors in your jurisdiction?
    - ☐ Extremely effective
    - ☐ Very effective
    - ☐ Moderately effective
    - ☐ Slightly effective
    - ☐ Not effective at all

32. In your opinion, could the **law enforcement entity** you affiliate with be more effective in reducing unlawful fishing behaviors in your jurisdiction?
   ☐ Yes
   ☐ No
   ☐ I do not know

33. From the list below, please **select three primary ways** the **law enforcement entity** you affiliate with could be more effective in reducing unlawful fishing behaviors in your jurisdiction.
   ☐ Advocate for more fairness and equality in fisheries law enforcement officers' interactions with natural resource users
   ☐ Increase the number of fisheries law enforcement officers (i.e., boots on the ground) throughout the entire jurisdiction
   ☐ Increase the number of fisheries law enforcement officers in concentrated geographic areas
   ☐ Improve existing, or offer more, educational trainings or certifications for fisheries law
     enforcement officers
   ☐ Promote more education strategies and outreach efforts for fisheries law enforcement officers to use in their interactions with natural resource users
   ☐ Other; please specify: _____
   ☐ Other; please specify: _____

34. How supported are **you** by the law enforcement entity you affiliate with to carry out your primary duties?
   ☐ Very supported
   ☐ Moderately supported
   ☐ Somewhat supported
   ☐ Slightly supported
   ☐ Not at all supported

35. What is your age?
    - ☐ 18 to 25
    - ☐ 26 to 30
    - ☐ 31 to 35
    - ☐ 36 to 40
    - ☐ 41 to 45
    - ☐ 46 to 50
    - ☐ 51 to 55
    - ☐ 56 to 60
    - ☐ 61 to 65
    - ☐ Over 65

36. To which gender identity do you most identify?
    - ☐ Female
    - ☐ Male
    - ☐ Transgender female
    - ☐ Transgender male
    - ☐ Gender variant/non-conforming
    - ☐ I prefer not to answer
    - ☐ Other; please specify: _____

37. What is your ethnicity origin or race?
    - ☐ American Indian
    - ☐ Asian
    - ☐ Black or African American
    - ☐ White or Caucasian
    - ☐ Hispanic or Latino
    - ☐ Native Hawaiian or other Pacific Islander
    - ☐ Multi-Racial
    - ☐ Other; please specify: _____

38. What is your highest level of school completed or degree attained?
    - ☐ Some high school, no diploma
    - ☐ High school, diploma or the equivalent (e.g., GED)
    - ☐ Some college, no degree
    - ☐ Trade, technical, or vocational training
    - ☐ Associate's degree
    - ☐ Bachelor's degree
    - ☐ Master's degree

☐ Ph.D., law, medical, or other degree beyond a Master's degree

Question for officers who answered "Bachelor's degree," "Master's degree," or "Ph.D., law, medical, or other degree beyond a Master's degree" to the prior question|

39. From the list below, which of these fields **best describes** your area of study?|
    ☐ Agriculture
    ☐ Biological, environmental, and life sciences
    ☐ Business
    ☐ Communications
    ☐ Computer and information sciences
    ☐ Criminal justice
    ☐ Education
    ☐ Engineering
    ☐ Ethnic and cultural studies
    ☐ Fisheries
    ☐ Foreign languages
    ☐ Health (e.g., kinesiology, nursing, physical therapy, health technology)
    ☐ History
    ☐ Humanities
    ☐ Liberal or general studies
    ☐ Mathematics
    ☐ Multidisciplinary studies (e.g., international relations)
    ☐ Physical sciences (e.g., physics, chemistry)
    ☐ Public administration
    ☐ Social sciences (e.g., anthropology, economics, political science, psychology)
    ☐ Visual and performing arts
    ☐ Undecided
    ☐ Other; please specify: _____

40. Do you personally fish recreationally, commercially, or for sustenance?
    ☐ Yes
    ☐ No
    ☐ I prefer not to answer

41. Do you personally hunt recreationally or for sustenance?
    ☐ Yes
    ☐ No
    ☐ I prefer not to answer

42. Please share with us any comments or additional information you wish to include as part of your response to this survey effort.
_____

Appendix E. Approximate Response Rates

Table 4.7. Approximate response rates for the survey.

Level of Government	Number of Respondents (Expected)	Number of Respondents (Actual)	Approximate Response Rate (Percent)
Federal	33	20	61
Non-Federal	1,221	577	47
State	1,201	571	48
Tribal	20	6	30
Provincial	0	0	0
Binational	1*	0	0

Asterisk indicates a participant who could be affiliated with multiple government levels and, thus, likely chose to affiliate with a different government level (e.g., state versus binational) upon completion of the survey.

LITERATURE CITED

LITERATURE CITED

Apel, R. and D. S. Nagin (2011). "General deterrence: A review of recent evidence." <u>Crime and Public Policy</u> **4**: 411-436.

Beccaria, C. (2016). <u>On Crimes and Punishments</u>, Transaction Publishers.

Bentham, J. (1781). An Introduction to the Principles of Morals and Legislation, McMaster University Archive for the History of Economic Thought.

Chambliss, W. J. and R. B. Seidman (1971). <u>Law, Order, and Power</u>. Reading, Massachusetts, Addison-Wesley.

Donlan, C. J., C. Wilcox, et al. (2020). "Estimating illegal fishing from enforcement officers." <u>Scientific Reports</u> **10**(1): 1-9.

Eilason, S. L. (2011). "Policing natural resources: Issues in a conservation law enforcement agency." <u>Professional Issues in Criminal Justice</u> **6**(3 and 4): 43-58.

Eliason, S. L. (2007). "From wildlife specialist to police generalist? The scope of non-wildlife violations encountered by conservation officers." <u>Southwest Journal of Criminal Justice</u> **4**(2): 120-132.

Eliason, S. L. (2010). "Accounts of wildlife law violators: Motivations and rationalizations." <u>Human Dimensions of Wildlife: An International Journal</u> **9**(2): 119-131.

Filteau, M. R. (2013). "Deterring defiance: 'Don't give a poacher a reason to poach'." <u>International Journal of Rural Criminology</u> **1**(2): 236-255.

Finster, J. L. (2007). Investigating injurious species introductions as environmental crimes. East Lansing, Michigan, Michigan State University**:** 78.

Furlong, W. J. (1991). "The deterrent effect of regulatory enforcement in the fishery." <u>Land Economics</u> **67**(1): 116-129.

Gavin, M. C., J. N. Solomon, et al. (2010). "Measuring and monitoring illegal use of natural resources." <u>Conservation Biology</u> **24**(1): 89-100.

Gunningham, N. (2017). Compliance, deterrence and beyond. <u>Elgar Encyclopedia of Environmental Law</u>. Cheltenham, United Kingdom, Edward Elgar Publishing: 63-73.

Herian, M. N., J. A. Hamm, et al. (2012). "Public participation, procedural fairness, and evaluation of local governance: The moderating role of uncertainty." <u>Journal of Public Administration Research and Theory</u> **22**(4): 815-840.

Hobbes, T. (1651). Leviathan: Or the Matter, Forme and Power of a Commonwealth, Ecclesiasticall and Civil. London, England, Simon and Schuster.

Hobbes, T. (n.d.). "Deterrence theory." <u>Criminology</u> **41**(1): 99-130.

Keane, A., J. P. G. Jones, et al. (2008). "The sleeping policeman: Understanding issues of enforcement and compliance in conservation." <u>Animal Conservation</u> **11**(2): 75-82.

Kirshman, H. and N. J. Leonard (2003). Protecting the Fishery through Law Enforcement. Ann Arbor, Michigan, Great Lakes Fishery Commission**:** 8.

Kuperan, K. and J. G. Sutinen (1998). "Blue water crime: deterrence, legitimacy, and compliance in fisheries." <u>Law and Society Review</u>: 309-338.

McGarrell, E. F., M. Suttmoeller, et al. (2013). Great Lakes fisheries law enforcement. <u>Great Lakes Fisheries Policy and Management: A Binational Perspective</u>. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 455-472.

Mendes, S. M. (2004). "Certainty, severity, and their relative deterrent effects: Questioning the implications of the role of risk in criminal deterrence policy." <u>Policy Studies Journal</u> **32**(1): 59-74.

Nielsen, J. R. and C. Mathiesen (2000). "Important factors influencing rule compliance in fisheries lessons from Denmark." <u>Marine Policy</u> **27**(5): 409-416.

Ostrom, E. (1990). <u>Governing the Commons: The Evolution of Institutions for Collective Action</u>. Cambridge, United Kingdom, Cambridge University Press.

Paternoster, R. (1987). "The deterrent effect of the perceived certainty and severity of punishment: A review of the evidence and issues." <u>Justice Quarterly</u> (2): 173-218.

Qualtrics (2019). Michigan State University Qualtrics. Provo, Utah.

Randall, J. K. (2004). "Improving compliance in U.S. federal fisheries: An enforcement agency perspective." <u>Ocean Development and International Law</u> **35**(4): 287-317.

Riley, S. J., J. K. Ford, et al. (2018). "Stakeholder trust in a state wildlife agency." <u>The Journal of Wildlife Management</u> **82**(7): 1528-1535.

Scholz, J. T. (1984). "Cooperation, deterrence, and the ecology of regulatory enforcement." <u>Law and Society Review</u>: 179-224.

Skogan, W. G. and K. Frydl (2004). <u>Fairness and Effectiveness in Policing: The Evidence</u>. Washington, D.C., The National Academies Press.

Tyler, T. R. (1990). <u>Why People Obey the Law</u>. New Haven, Connecticut, Yale University.

Tyler, T. R. (1997). "Procedural fairness and compliance with the law." <u>Revue Suisse D Economie Politique et de Statistique</u> **133**: 219-240.

VERBI Software (2019). MAXQDA 2020. Berlin, Germany, VERBI Software.

Wilson, L. and R. Boratto (2020). "Conservation, wildlife crime, and tough-on-crime policies: Lessons from the criminological literature." <u>Biological Conservation</u> **251**: 108810.

SYNTHESIS

Along with good governance and multi-jurisdictional management, law enforcement is a critical component of basin-wide efforts to protect and conserve fisheries and aquatic ecosystem resources in the Great Lakes basin (Basin). However, the role and effectiveness of law enforcement in ensuring the sustainable use of these resources is poorly understood, overlooked, and undervalued. Further, there is uncertainty surrounding the type and level of illegal fishing behavior and fish crime occurring in the Basin, thereby making it challenging for fisheries law enforcement entities and individuals to ascertain the full scope of resulting negative impacts on fish and fish habitat. As key ecological and anthropogenic issues have, and will continue, to threaten the resilience of these resources in times of change, the onus is on fisheries law enforcement to take necessary steps to enhance their organization and individual effectiveness, even with limited staff resources and financial support (Thomas et al. 1999).

Law enforcement is a critical component of Great Lakes fisheries management and conservation

Law enforcement describes those entities and individuals that have authority, and are responsible, for enforcing or obtaining compliance with the law. In the context of fisheries and aquatic ecosystem resources, fisheries law enforcement includes those entities and individuals that administer law enforcement-related processes and activities (Introduction, "Law Enforcement, Defined") (Andrews 1909; Keane et al. 2008). In the Great Lakes, federal, non-federal, and binational governing and managing natural resource entities (e.g., Michigan Department of Natural Resources), along with associated regulatory entities (e.g., Law Enforcement Division), carry out their duties and responsibilities within, and among, various jurisdictional authorities (Piper 1967; Bogue 2001; Kirshman and Leonard 2003; Gaden 2007).

Law enforcement officers (i.e., boots on the ground) serve as intermediaries between fisheries managers, decision-makers, researchers, and resource users.

Fisheries law enforcement is overlooked and undervalued

Prior research indicates that law enforcement is overlooked and undervalued in the fisheries and aquatic ecosystem context (McGarrell et al. 2013). Further evidence collected during this research study supports this finding. For instance, fisheries law enforcement officers working in the Basin reported that they are often assigned non-fisheries law enforcement duties and responsibilities, which prevent them from dedicating their time to, or prioritizing, the enforcement of fish laws (Eliason 2007). Officers also shared their frustrations regarding their compensation, expressing they believe to be generally underpaid and under-supported (e.g., offered fewer and fewer opportunities for overtime work/pay) in comparison to traditional or general police officers (Walsh and Donovan 1984; Eliason 2006; 2011). Lastly, officers indicated that, as a result, they generally perceive morale within their agencies to be low. These factors not only make it difficult for law enforcement officers to continue to hone their fish law expertise, but also degrade the value of basin-wide fisheries law enforcement efforts over time.

Currently, commercial overharvest is likely the most negatively impactful fish crime

A survey of law enforcement officers representing multiple government levels and jurisdictional authorities in the Great Lakes confirmed that illegal fishing behavior and fish crime—ranging from fishing with illegal or damaged gear, or by illegal method, to habitat destruction—are occurring basin-wide. However, the level or scope, and frequency, at which

these crimes occur, and the resulting negative impacts they have on the environment is uncertain and difficult, if near impossible, to measure (Randall 2004; Gavin et al. 2010; Donlan et al. 2020). Based on their firsthand knowledge, expertise, and field experience, fisheries law enforcement officers perceived overharvesting in, or exploitation of, commercial fisheries to be the most negatively impactful fish crime occurring in today's Great Lakes. Officers also expressed particular concerns about the level of overharvesting occurring in tribal commercial fisheries, indicating there to be fewer controls on the type and level of harvest in comparison to federal and other non-federal (e.g., individually-operated or private) commercial fisheries (Chapter 4, "Discussion: Perceptions of Fish Crimes and Impacts").

Aquatic invasive species are the primary biological threat to today's Great Lakes fisheries and aquatic ecosystem resources

Over time, the Basin and its fisheries and aquatic ecosystem resources have experienced social, economic, and cultural changes due to increasing human population growth, urban expansion, transportation, water resource development, extractive activities (e.g., mining and forestry), agriculture, and increasing natural resource use (Beeton et al. 1999; Coon 1999). Additionally, ecological changes (e.g., erosion) have modified the aquatic landscape (Hayes 2013; Taylor et al. 2019). A survey of, and interviews with, members of the Great Lakes Fishery Commission's Law Enforcement Committee suggest these changes threaten the sustainability of fisheries and aquatic ecosystem resources. Similar to what prior research has indicated, committee members cited the introduction and establishment of aquatic invasive species as the primary biological threat to today's Great Lakes fisheries and aquatic ecosystem resources (Chapter 2, "Introduction") (Ruiz and Carlton 2003; Finster 2007; Rasmussen et al. 2013). In the

future, while ecological and anthropogenic threats will certainly pose challenges for fisheries

law enforcement (Chapter 2, "Challenges") they may also provide opportunities for fisheries

law enforcement to improve its effectiveness as well (Chapter 2, "Opportunities").

Law enforcement is not wholly effective in protecting Great Lakes fisheries and aquatic ecosystem resources, and improvements are necessary

In the Basin, fisheries law enforcement must function effectively—across local, state,

tribal, provincial, national, and international borders—to carry out their primary role, which

includes: the identification and enforcement of laws; protection, enhancement, and

conservation of fisheries and aquatic ecosystem resources; and education of the general public

(Chapter 4, "Results: Roles, Activities, and Duties"). A survey of fisheries law enforcement

officers representing jurisdictions in the Basin confirmed these officers perceive themselves,

and the entities with which they affiliate, to be far from wholly effective in fulfilling their

primary roles.

In traditional policing, examples of measures or metrics of law enforcement

effectiveness typically include police statistics (e.g., the number of tickets issued) and

victimization surveys (Skogan 1975). Based on the survey responses, coupled with lessons

learned from traditional criminological theory, this synthesis offers the following metrics,

suggested by fisheries law enforcement officers working in the Basin, to evaluate law

enforcement effectiveness:

- Level of cross-border coordination and collaboration among fisheries law enforcement

   entities, managers, decision-makers, researchers;

- Prioritization (e.g., high, medium, low) of fisheries law enforcement officer activities, duties, and responsibilities;

- Distribution of officers in, and among, jurisdictions;

- Number and diversity of trainings and educational opportunities offered internally (i.e., within natural resource management and/or law enforcement entities) and externally;

- Level and quality of officer recruitment and retention; and,

- Level of diversity among law enforcement officer staff.

In consideration of these metrics, supervisory officers may be better able to evaluate the effectiveness of their own entities, and their staff, or establish a baseline from which to measure improvements in effectiveness over time. Fisheries law enforcement has the potential to make positive, lasting impacts on the health and well-being of Great Lakes fisheries and aquatic ecosystem resources where other entities simply cannot. I hope, as a result of this dissertation, its true value is realized.

LITERATURE CITED

LITERATURE CITED

Andrews, C. S. (1909). "The importance of the enforcement of law." <u>The Annals of the American Academy of Political and Social Science</u> **34**(1): 85-89.

Beeton, A. M., C. E. Sellinger, et al. (1999). An introduction to the Laurentian Great Lakes ecosystem. <u>Great Lakes fisheries Policy and Management: A Binational Perspective</u>. W. W. Taylor and C. P. Ferreri. East Lansing, Michigan, Michigan State University Press: 3-54.

Bogue, M. B. (2001). <u>Fishing the Great Lakes: An Environmental History, 1783–1933</u>. Madison, Wisconsin, The University of Wisconsin Press.

Coon, T. G. (1999). Ichthyofauna of the Great Lakes Basin. <u>Great Lakes Policy and Management: A Binational Perspective</u>. W. W. Taylor and C. P. Ferreri. East Lansing, Michigan, Michigan State University Press: 55-71.

Donlan, C. J., C. Wilcox, et al. (2020). "Estimating illegal fishing from enforcement officers." <u>Scientific Reports</u> **10**(1): 1-9.

Eilason, S. L. (2011). "Policing natural resources: Issues in a conservation law enforcement agency." <u>Professional Issues in Criminal Justice</u> **6**(3 and 4): 43-58.

Eliason, S. L. (2006). "Factors influencing job satisfaction among state conservation officers." <u>Policing: An International Journal of Police Strategies and Management</u> **29**(1): 6-18.

Eliason, S. L. (2007). "From wildlife specialist to police generalist? The scope of non-wildlife violations encountered by conservation officers." <u>Southwest Journal of Criminal Justice</u> **4**(2): 120-132.

Finster, J. L. (2007). Investigating injurious species introductions as environmental crimes. East Lansing, Michigan, Michigan State University**:** 78.

Gaden, M. (2007). Bridging jurisdictional divides: Collective action through a Joint Strategic Plan for Management of Great Lakes Fisheries. Ann Arbor, University of Michigan**:** 296.

Gavin, M. C., J. N. Solomon, et al. (2010). "Measuring and monitoring illegal use of natural resources." <u>Conservation Biology</u> **24**(1): 89-100.

Hayes, D. B. (2013). Issues affecting fish habitat in the Great Lakes Basin. <u>Great Lakes Fisheries Policy and Management: A Binational Perspective</u>. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 51-80.

Keane, A., J. P. G. Jones, et al. (2008). "The sleeping policeman: Understanding issues of enforcement and compliance in conservation." Animal Conservation **11**(2): 75-82.

Kirshman, H. and N. J. Leonard (2003). Protecting the Fishery through Law Enforcement. Ann Arbor, Michigan, Great Lakes Fishery Commission**:** 8.

McGarrell, E. F., M. Suttmoeller, et al. (2013). Great Lakes fisheries law enforcement. Great Lakes Fisheries Policy and Management: A Binational Perspective. W. W. Taylor, A. J. Lynch and N. J. Leonard. East Lansing, Michigan, Michigan State University Press: 455-472.

Piper, D. C. (1967). The International Law of the Great Lakes: A Study of Canadian-United States Co-operation. Durham, North Carolina, Duke University Press.

Randall, J. K. (2004). "Improving compliance in U.S. federal fisheries: An enforcement agency perspective." Ocean Development and International Law **35**(4): 287-317.

Rasmussen, J. L., H. A. Regier, et al. (2013). Aquatic invasive species risks to the Great Lakes and Mississippi River basins: Asian Carp as a case study for serious consideration of hydrologic separation. Great Lakes Fisheries Policy and Management: A Binational Perspective. W. W. Taylor, A. J. Lynch and N. J. Leonard, Michigan State University Press: 767-786.

Ruiz, G. M. and J. T. Carlton (2003). Invasion vectors: A conceptual framework for management. Invasive species: vectors and management strategies. G. M. Ruiz and J. T. Carlton. Washington, D.C., Island Press: 459-504.

Skogan, W. G. (1975). "Measurement problems in official and survey crime rates." Journal of Criminal Justice **3**(1): 17-31.

Taylor, W. W., M. J. Good, et al. (2019). "The changing face of Great Lakes fisheries." Aquatic Ecosystem Health and Management **22**(3): 355-367.

Thomas, J. K., C. E. Adams, et al. (1999). "Law enforcement personnel eeds of a state natural resource agency." Human Dimensions of Wildlife **4**(1): 1-19.

Walsh, W. F. and E. J. Donovan (1984). "Job stress in game conservation officers." Journal of Police Science and Administration **12**(3): 333-338.