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The Effect of a State's Commitment on Policy Responsiveness of the Endangered Species Act

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The Effect of a State's Commitment on Policy Responsiveness of the Endangered Species Act

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An abstract of
A thesis submitted to the Faculty of the
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Abstract

The Effect of a State's Commitment on Policy Responsiveness of the Endangered Species Act

By Halle Race Bradshaw

Illegal wildlife trade is a threat to both biodiversity and security globally, and the United States has no exemption to its effects. This analysis sought to explore how states differ in illegal wildlife import rates during the years of 2001 to 2016. Through the lens of the Endangered Species Act (ESA), a state's ability to manage its resources, funds, permits, and listing for species and its effect on illegal wildlife import rates were analyzed. Ultimately, two measures of commitment, resource manager of land and permit authority, had a significant relationship with the policy responsiveness of a state as indicated by illegal wildlife import rates. As states designated greater percentages of their land to conservation and received fewer permits to take from their species, the rate of illegal wildlife imports within the state lowered. Additionally, the control of urbanization had a significant and positive relationship. Given the results, this model suggests that states that have greater commitment to their roles of resource manager and permit authority can increase policy responsiveness to the ESA by increasing lands for conservation and decreasing issued permits within their state. While the complexities of conservation cannot be addressed by one single policy measure, it is nonetheless important to analyze the results of this model and consider it as an additional tool to addressing wildlife crime at the state-level.

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INTRODUCTION

On the topic of illegal wildlife imports, scientist Mariah Pfleger explained, "when one place gets blocked off, they move to another state and the trade shifts around" (Staletovich 2018). In her *Miami Herald* interview, Pfleger discussed the rise of shark fin imports into Florida after a recent analysis showed a steep increase beginning in 2014. A review of national trends reveals a ban in shark fin imports in California and New York in 2011 and 2013 respectively.

These sudden changes mentioned by Pfleger raise the question of when and why illegal wildlife import trade in the United States "shifts around" (Staletovich 2018). In 2016 alone, the U.S. Government Accountability Office estimated that $100 million to $250 million in protected species' products entered the United States illegally (Nellemann et. al 2016). The United States now ranks as one of the largest illegal wildlife trade hubs in the world, with prohibited imports increasing 10% over the past 15 years ("World Wildlife Crime Report" 2016).

For the purpose of this analysis, illegal wildlife trade refers to the act of smuggling or other taking (as defined by the Endangered Species Act) of protected species and the illegal trade in their related parts and products. This trade is regulated and studied at an international level by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), a non-binding treaty that instructs signed countries to adopt their own respective conservation legislation. In the United States, this legislation is found in the Endangered Species Act (ESA). Any product of the 2,000 species listed under the ESA—from whale teeth to ivory to live birds—is prohibited from importation unless permitted (Title 16, Section 10 2004).

Through the lens of the ESA, this study explores a state's commitment to species conservation and its relationship to policy responsiveness through quantitative analysis. The term commitment refers to the extent to which a state has mobilized its resources to protect species in

respect to the ESA. Policy responsiveness refers to the outcome of this commitment and its effect on illegal wildlife import percentages. Based on existing theory, a state with stronger commitment to species conservation will be more responsive to the measures put forth by ESA policy, as indicated by illegal wildlife import measures. If this is the case, a more committed state should have lower percentages of illegal wildlife imports, as it has successfully responded to ESA policy. Relating back to Pfleger's idea of "shifts," a state successfully responding to ESA policy will have shifted illegal wildlife imports elsewhere.

Conservation at a state-level involves the evaluation of many systems: biological, social, political, and economic. This study primarily focuses on a state's political system and its influence on policy responsiveness of the ESA. To do this, the partnership federalism model provides the theoretical backing (Melious 2001). While the complexities of political systems prevent one from determining impacts with full certainty, it is nonetheless important to analyze the potential relationships between species conservation and policy. Wildlife trade research has shown that "hard" solutions to wildlife trafficking such as GPS tracking and military defense are often ineffective. Political and social efforts have been shown to be the most effective and long-lasting (Annecke and Masubelele 2016).

The purpose of this analysis is to postulate the factors that lead to varying illegal wildlife import trends and offer suggestions in how a state can better protect its species. It is the hope that state researchers and policymakers can use this information to analyze and adjust indicators of conservation commitment within their area of influence. By using suggestions found through this model, it is possible that a state will increase its ability to commit to conservation and illegal wildlife import trends will decrease.

BACKGROUND

Review of the Endangered Species Act

Today, more than 2,000 animals and plants are listed under the ESA. Barring antiques, no listed species may be imported or exported into the United States. However, the U.S. Government Accountability Office estimated that in 2016, up to $250 million in protected species' products entered the country. The United States now ranks as one of the world's largest trafficking hubs and significantly contributes to the illegal wildlife crime sector's exponential growth over the past few decades (Nellemann et. al 2016).

To understand the rise in illegal wildlife trade as reported by the U.N. General Accounting Office, it is necessary to understand what makes wildlife trade illegal to begin with (Nellemann et. al 2016). In the United States, the majority of wildlife trade crimes are found in violation of the ESA. Signed into law in 1973 by President Nixon, the ESA's purpose was to "halt and reverse the trend toward species extinction," as well as carry out the duties of CITES (Title 16, Section 2 2004). The federal agencies of U.S. Fish and Wildlife Services (FWS) found under the Department of the Interior and U.S. National Oceanic and Atmospheric Administration (NOAA) found under the Department of Commerce are tasked with implementing the goals of the ESA and CITES. Today, the ESA is the most comprehensive piece of conservation legislation in the United States.

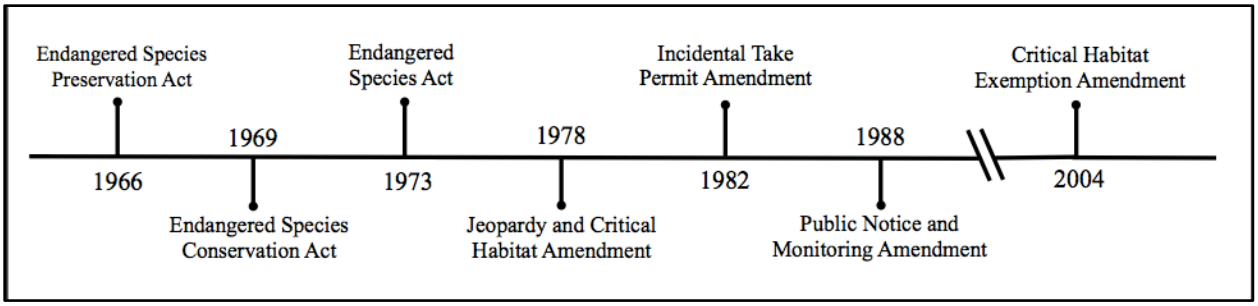

Figure 1: Timeline of the ESA (information from "Class of 1967" 2017)

As shown above in Figure 1, the history of the ESA is long and complex, lasting more than 50 years and experiencing seven major amendments. Before 1973, there were two preceding versions of the ESA: the Endangered Species Preservation Act of 1966 (ESPA) and the Endangered Species Conservation Act of 1969 (ESCA). Passed by Congress, the ESPA provided a framework in which the Department of the Interior could list vertebrates native to the United States for certain protections. Its primary method for species conservation was through habitat protection through the wildlife refuge system ("Class of 1967" 2017). Other federal agencies were encouraged to protect species, as well, but were not required to. Three years later, conservation biologists and policymakers called for an expansion to the original ESPA, due to the continued negative trend in species' population numbers. Thus, the endangered species framework was amended in 1969. This updated the original law to provide protection for invertebrates, plan an international meeting which would ultimately lead to the creation of the CITES treaty, and regulate wildlife trade in and out of the United States. With the Amendment of 1969, endangered species and parts were prohibited from importation and sale.

In 1973, President Richard Nixon worked with Congress to rewrite the act into its full form. With a team of lawyers and scientists, the ESA of 1973 presented landmark legislation not seen before in the world of species conservation. Particularly novel and contested was the Act's clause on the "take" of species found under Section 2, in which all harm or modification of a listed species was prohibited (Title 16, Section 2 2004). This addition resulted in federal agencies and private citizens alike expressing concerns over the ESA's blanketed approach to protection (Arha and Thompson 2011). At the state level, many FWS branches welcomed the ESA. It established cooperative agreements that made matching funds available to states that had shown the dedication and ability to protect their species (Title 16, Section 6 2004).

Within five years, the ESA was amended once more in 1978—and would be again in 1982, 1988, and 2004. Although significant, these changes kept the overall framework of the Act relatively unchanged. However, it is still necessary to review these amendments and their effect on the present form of the ESA, as they introduce aspects essential to this analysis. Particularly, the history and framework (discussed in the following section) of the ESA were fundamental in the formation of the independent variables in this study.

With the amendment of 1978 came leniency for federal agencies, as they were now permitted to take actions that could jeopardize the recovery of species if approved by a federal committee. Under Section 7 the Act, jeopardy is defined as, "the action an agency carries out, funds, or authorizes that may affect a listed endangered or threatened species" (Title 16, Section 7 2004). Although the purpose of the amendment was described as retaining "the basic integrity of the ESA, while introducing some flexibility," many critics viewed it as a significant decline in protection (Arha and Thompson 2011). Additionally, the 1978 amendment mandated that U.S. FWS must establish critical habitat simultaneously as it listed species under Section 4 ("Critical Habitat" 2017). This amendment came with growing evidence that protection of habitat was the key to species' survival. A study by the Center for Biological Diversity found that plants and animals with federally protected habitat are more than twice as likely to recover than those without it ("Protecting Critical Habitat" 2012). These findings of the importance of protected lands in combination with the addition of critical habitat into the ESA were instrumental in choosing FWS lands as an indicator for commitment.

In 1982, ESA was modified once more to provide more inclusive and immediate protection through its listing and permitting processes. Congress voted to alter both Section 4 (determination of species) and Section 9 (prohibited acts). The amendment of 1982 ruled that

U.S. FWS must only list species based on biological and trade information with no influence of economic analysis (Title 16, Section 4 2004). Today, the concept of purely intrinsic evaluation of a species' protection remains a highly contentious one. Additionally, once brought to the attention of U.S. FWS, species were now required to receive a final listing status within a year of proposal. This contrasts the previous ruling that the Service had two years to do so (Title 16, Section 4 2004). The emphasis on listing spurred the creation of the citizen petition variable, describing a state's want to list and protect its species.

With the 1982 amendment came incidental take permits and habitat conservation plans (Title 16, Section 10 2004). The addition of incidental take allowed for an individual or state to apply for a permit for activities that may harm listed species, such as partaking in land modification of critical habitat. Section 10 states that the Secretary of the Interior may grant exceptions if such activities are "applied for in good faith" and will not put listed species at a disadvantage. To acquire this permit, one must submit a habitat conservation plan, providing an analysis of the predicted effects of planned actions and how they will be minimized (Title 16, Section 10 2004). This amendment helped to form the issued permits variable, referring to permits granted by the federal government for a state's proposed take of protected species.

Following 1982, the amendment of 1988 brought about monitoring and public notice requirements. Candidate species for ESA protection, as well as recovered species, now had mandatory, continuous monitoring for 5 years. Recovery plans provided by the listing of each species had to undergo public notice and comment, followed by consideration from relevant federal agencies. While the amendment of 1988 did not exclusively guide the creation of any one variable, it did spur the development of many of the databases used in this analysis. For example,

data on FWS lands has been consistently reported and publicized since the passing of the 1988 amendment ("Annual Report of Lands" 2018).

The amendment of 2004 brought about relatively smaller changes than those previously. The Department of Defense became exempted from critical habitat designation provided that habitats were integrated into natural resource management plans approved by the Secretary.

A review of the ESA reveals significant changes throughout its almost half-a-century history. Given seven major versions and amendments, it is surprising that the core mission of the ESA as by Nixon has remained the same: to halt and reverse the trend towards species extinction (Melious 2001). When the ESPA was approved in 1966, 75 species were given federal protection under U.S. FWS jurisdiction ("Class of 1967" 2017). Today, 2,244 species are protected under the ESA, as shown in Figure 2. The original list of 75 included 14 mammals, 36 birds, 6 reptiles and amphibians, and 22 fish. Some of the most iconic endangered species were included in the original 75—American Alligator, California Condor, Florida Manatee, and the Bald Eagle. Of the original list, three species ultimately went extinct (Dusky Seaside Sparrow, Blue Pike, and Longjaw Cisco), the remaining 72 either fully recovered or are recovering today.

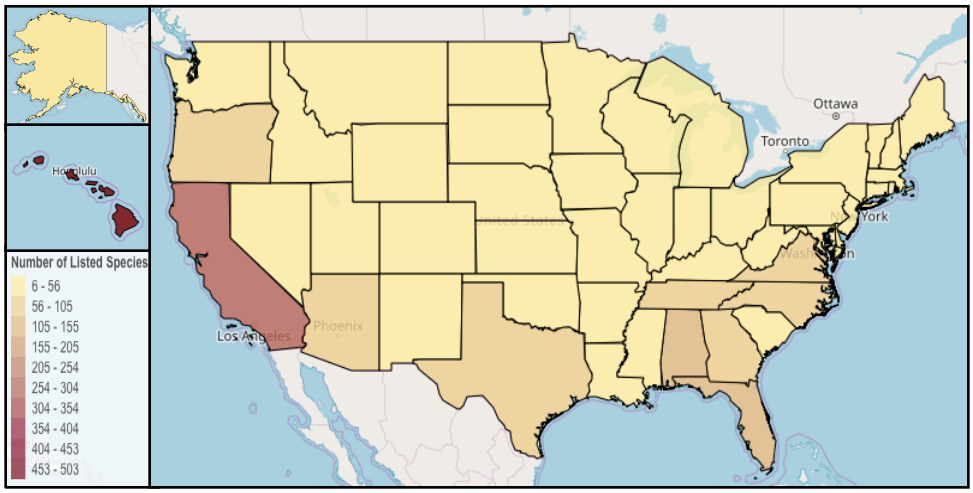

Figure 2: Map of Threatened and Endangered Species per State as of 2016 (data from "Listed Species Summary" 2019)

Current State

In 2016, the U.N. reported that the global wildlife crime sector was growing two to three times faster than that of the global economy (Nellemann et. al 2016). The United States is not exempt to this concerning trend. Because of this, President Barack Obama signed Executive Order 13648 in 2013, establishing a presidential task force on illegal wildlife trade with $10 million in funding. The task force included 17 federal departments and agencies, including the Departments of Interior, Commerce, Homeland Security, and State ("Executive Order – Combatting Wildlife Trafficking" 2013).

However, four years later and the narrative has almost entirely changed. With President Donald Trump's administration came increased emphasis on state-level conservation management. Currently, Senator John Barrasso of Wyoming, chairman of the Senate Environment and Public Works Committee, has proposed a bill that would shift ESA authority from the federal government to states entirely ("Leaked Trump Administration Memo" 2018). At the state-level, governors would be given the power to veto scientific decisions regarding candidate species for ESA protection. As well, citizens would no longer be able to petition a species' listing ("Leaked Trump Administration Memo" 2018).

In response to the present state of the ESA, a retired U.S. FWS official explained, "Towards the latter years, science was no longer the driving force" ("Interview with ESA Officer" 2018). Over the course of the interview, the need for more scientific-based research in conservation was emphasized continuously. The FWS officer expressed concerns over the lack of inclusion of data and research in respect to studies of the ESA in recent years. As discussed, conservation science is rooted in human behaviors, from market dynamics to cultural beliefs. Political systems are

equally as complex, making it impossible to fully describe either. However, it is important to analyze and explain trends where possible, and to do so through scientific measures.

Framework of the Endangered Species Act

In the United States, the ESA is the most comprehensive piece of species conservation legislation, protecting 2,244 species both domestically and internationally, both animals and plants ("The Office of Law Enforcement Annual Report" 2016). The distribution of these listed species varies significantly from state to state, shown above in Figure 2. U.S. FWS describes the purpose of the ESA as "to protect and recover imperiled species and the ecosystems upon which they depend" ("Class of 1967" 2017). The Act contains18 sections, and this analysis will focus on those most relevant to understanding a state's commitment and policy responsiveness, as shown below in Figure 3.

Section 2-
Findings, purposes, and policy

Section 3-
Definitions

Section 4-
Determination of listed species

Section 6-
State power

Section 9-
Prohibited acts and permitted ports

Section 10-
Exceptions and permits

Figure 3: Summary of Relevant Sections of the ESA used in Analysis (information from Title 16, 2004)

Section 2

The opening section of the ESA, Section 2, describes the Congressional findings that brought about the creation of the Act and its intended purposes and policies. In regards to the findings of Congress, Section 2 states that species in the United States have and will continue to become extinct "as a consequence of economic growth and development untempered by adequate concern and conservation" (Title 16, Section 2 2004). Additionally, these species are explained to be of great value—aesthetic, ecological, educational, historical,

recreational, or scientific. The ESA's purpose, as declared by Section 2, is to provide a legal framework in which: the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purpose of the treaties and conventions set forth, such as CITES (Title 16, Section 2 2004).

In the last subsection of Section 2, Congress emphasizes the need for all Federal agencies to conserve listed species. The section ends by declaring that all "Federal agencies shall cooperate with State and local agencies" (Title 16, Section 2 2004). This notion of states' involvement will be repeated throughout the ESA and is crucial to the theoretical backing of this analysis.

Section 3

The third section of the Act provides terms and definitions to be used throughout. While there are more than 50 terms—many biological and geopolitical definitions—the terms most relevant to this analysis are highlighted below in Figure 4. While all listed in Figure 4 are concepts necessary for this study, the definitions of "Import" in subsection 10 and "Take" in subsection 19 require additional consideration, particularly in reference to this analysis' dependent variable, illegal wildlife import percentage. The ESA makes it unlawful to engage in either the taking or importing of protected species. The illegal wildlife import variable in this analysis refers to species and species' products that have been taken illegally and then imported into a state.

(3) Conserve, Conserving, Conservation-
To use procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided in this Act are no longer necessary—such as research, law enforcement, habitat acquisition and maintenance, live trapping, and, in certain exceptions, regulated taking

(6) Endangered Species-
Any species which is in danger of extinction throughout all or a significant portion of its range determined by the Secretary

(10) Import-
To land on, bring into, or introduce into any place subject to the jurisdiction of the United States

(18) State Agency-
Any State agency which is responsible for the management and conservation of wildlife resources within a State

(19) Take-
To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect

Figure 4: Relevant Definitions Provided under Section 3 of the ESA used in Analysis (information from Title 16, Section 3)

Section 4

Following Section 3, the focus shift to the ESA's listing process. Section 4 designates that the Secretary of the Interior can list a species given that there is: the present or threatened destruction or modification of habitat or range, over-utilization for commercial, recreational, scientific, or educational purposes, disease or predation, inadequate existing conservation mechanisms, or other factors affecting its survival (Title 16, Section 4 2004). These conditions should be on the basis of "the best scientific and commercial data available," as well as take into account efforts being made at the State-level. There are two modes to listing a species: (1) the Secretary of the Interior or the Secretary of Commerce can request an investigation, or (2) a citizen can through the citizen petition process. This analysis focuses on the citizen petition mode through the use of proposed species listing by state.

Once listed, the Secretary must then designate critical habitat as mandated by the 1978 ESA amendment (Title 16, Section 4 2004). Defined above in Section 3, critical habitat refers to a specific area occupied by a species at the time of its listing that contains essential physical or biological features (Title 16, Section 3 2004). Critical habitat is determined by features that are

necessary for a species' life processes and reproduction, such as adequate space, shelter, food, and water (Title 16, Section 4 2004). Ideally, the designated habitat will be representative of the species' historic range. Although the process of listing species cannot include economic considerations, the establishment of critical habitat can ("Critical Habitat" 2017). This is contingent on the benefit of the considerations outweighing the benefit of the habitat. Given this, all listed species are required to have an established critical habitat in which Federal agencies are barred from destructive activities without approval, a process to be explained in Section 7 (Title 16, Section 4 2004). Once a habitat is proposed for ESA protection, it is published for public comment on the *Federal Register* ("Critical Habitat" 2017). Section 4's description of critical habitat helped guide the formation of the FWS state lands variable, as the ESA emphasized the creation of protected spaces and habitat.

Section 6

Although the shortest section of the Act, Section 6 serves as one of the most important for this analysis. It details:

> In carrying out the program authorized by this chapter, the Secretary shall cooperate to the maximum extent practicable with the States. Such cooperation shall include consultation with the States concerned before acquiring any land or water, or interest therein, for the purpose of conserving any endangered species or threatened species.

This notion of states' rights is critical for the analysis of commitment to and policy responsiveness of the ESA at a state-level. As discussed later in the *Theory* section, the model of

partnership federalism is necessary to understanding a state's role in respect to conservation policy. Partnership federalism "allows state and local governments to define the content of federal mandates," making it a fitting model for Section 6, which emphasizes collaborative and cooperative efforts at both federal and state levels (Melious 2001). Section 6 was fundamental in the development of all independent variables in this state-based analysis, but was particularly helpful in respect to FWS state lands and funds. These two variables reflect federal-state relationships, as the state requests federal assistance through land acquisitions and funding.

Section 9

The portion most relevant to this analysis' focus can be found in Section 9, which addresses illegal wildlife trade by declaring that it is unlawful for any person to engage in the trade of specimens listed under the CITES Secretariat (Title 16, Section 9 2004). As described in Section 3, "import" refers to a listed species or a product of a listed species that is introduced into the United States through selling, delivering, carrying, or shipping. This applies to interstate movement as well.

Under Subsection E, the process of reporting imports is outlined, stating that failure to file a declaration or report the trade of listed species is unlawful (Title 16, Section 9 2004). If one does require permission to import from the Secretary, she must keep all records and correctly report importation information. Additionally, the Secretary reserves the right to access one's place of business and examine inventory and documentation of imported species' products. While clearly prohibited, private parties rarely see enforcement of documentation regulation due to burden of proof issues (Nellemann et. al 2016). For example, in the case of permitted antique imports, it is difficult to correctly age products for proof of violations.

Subsection F covers the designation of ports, as decided by the Secretary of the Interior for "the purpose of facilitating enforcement of this Act" (Title 16, Section 9 2004). If one seeks to import or export a listed species, both a permit and use of a designated port are required. In most cases, to gain clearance, she must acquire a license and pay fees for each shipment ("Wildlife Law Enforcement" 2017). Wildlife officers are stationed at each designated port to ensure proper permitting and check shipments of wildlife. Currently, there are 18 ports designated by U.S. FWS, with 37 additional ports bordering Canada and Mexico. These border ports prohibit movement of any species or species product that has not originated from one of the two countries with which the border is shared ("Wildlife Law Enforcement" 2017). Section 9 provided the framework for the dependent variable illegal wildlife imports, as well as the selection of the states used in this analysis (those which have designated ports).

Section 10

The final section used in the analysis is Section 10, which covers the permitting process. It states that the Secretary of the Interior may grant exceptions to protections if such acts are "applied for in good faith" and will not put listed species at a disadvantage (Title 16, Section 10 2004). Actions allowed by permits differ based on whether the species is listed as endangered or threatened. There are three primary permits issued by the ESA: incidental take permits, enhancement of survival permits, and recovery and interstate commerce permits. This analysis uses incidental take permits, as they are most frequently requested at a state-level ("Proposed Rules" 2019). Incidental take permits allow non-Federal activities which result in the take of a species. These must be accompanied by a Habitat Conservation Plan (HCP) to ensure that the effects of incidental take permits will be adequately minimized and prevented. HCPs are put

forth through planning documents that include a concrete plan and its method of funding ("Habitat Conservation Plan" 2018). Section 10 guided the variable issued permits, as it provides the process in which a state can apply to take from its species.

In addition to permits, Section 10 outlines situations that are already exempted from ESA regulation. There are five main exemptions: pre-ESA, referring to any currently listed species that was living in captivity before the Act was passed in December 28, 1973; antiques, referring to a species' product at least 100 years old that has not been repaired or modified since the enactment of the ESA; special rules, any species part of an experimental population; interstate commerce, commercial activities that cross state borders but involve legally acquired species; and loans and gifts, referring to any species given without credit or compensation for breeding programs (Title 16, Section 10 2004).

THEORY

This research seeks to explore the relationship between a state's commitment to species conservation and its effect on policy responsiveness to the ESA. In order to guide this exploration, Melious' theory of partnership federalism (Melious 2001) with the supportive work of Scheberle (Scheberle 2004) are coupled with prevailing theories of wildlife policy to lay the theoretical foundation of this research. The following section discusses in greater depth the theory behind the conceptual foundation of this analysis, primarily with the concept of partnership federalism.

Partnership Federalism

Due to this analysis' focus on state-level conservation efforts, it is necessary to understand current theory on state and federal interactions in the United States. In general, federal policy only works if there is widespread and general responsiveness at the state level (Melious 2001). The reality of the ESA is that the federal government cannot control all the activities needed to protect species, due to the intensive and localized nature of conservation. As previously mentioned, Section 6 of the Act directs the federal branch to cooperate to the maximum extent with states in carrying out ESA programs (Title 16, Section 6 2004). Many of the problems that endangered species face call for the use of state powers, like land and water use controls (Melious 2001). As a result, the role of states in ESA compliance is increasing dramatically, whether or not they are fully prepared.

In their research *Assessing State Laws and Resources for Endangered Species Protection*, Camacho et. al discuss the current state of the ESA, particularly as it relates to states' involvement (Camacho et. al 2017). The authors open by examining Senator John Barrasso's proposal to dissolve the ESA at a federal level. They then spend the remaining analysis arguing why this proposal would not be beneficial to conservation. Primarily, the authors believe that lack of state funding as well as lack of adequate state-based conservation laws result in states being "inadequate to achieve the ESA's conservation and recovery goals" (Camacho et. al 2017). They argue that greater emphasis on state-based conservation will likely hurt conservation efforts and result in greater species extinction (Camacho et. al 2017).

On the opposing side, works like Christopher S. Elmendorf's *State Courts, Citizen Suits, and the Enforcement of Federal Environmental Law* argue that states "can, will, and should" oversee environmental and conservation decisions to the maximum extent (Elmendorf 2001). Elmendorf

argues that conservation efforts would benefit from increased state-based policy, as the state would provide a more localized, specific approach to conservation (Elmendorf 2001). It is the author's belief that federal policy is too rigid, while state policy "tends to be more liberal," making it advantageous to environmental interests (Elmendorf 2001). In particular, Elmendorf argues that citizens can use their position as taxpayers within a state to "challenge state construction and development projects that would violate federal environmental laws" (Elmendorf 2001). While Elmendorf's work takes the opposite stance to that of the authors in *Assessing State Laws and Resources*, this polarization in beliefs is not surprising. Issues of federal vs. state policy responsiveness in respect to conservation have riddled the ESA since its foundation (Arha and Thompson 2011).

Whether or not one agrees that conservation policy should be from the top-down federal level or bottom-up state level, it is clear through the framework of the ESA that federal and state governments must act as partners. During an interview with a retired FWS director, the interviewee shared his belief that "states are all over the place with what they can or cannot do" ("Interview with ESA Officer" 2018). While not a key text in the analysis, this interview helped guide the research's direction and selection of certain variables, particularly the grants used in the variable FWS lands. As shown with the director's quotation, conservation issues, like politics, are local and complicated. Because the majority of states have traditionally exerted authority over their respective wildlife and natural resources, a model has been created to explain the dynamic between federal policy and state power: partnership federalism.

This model created by Melious "allows state and local governments to define the content of federal mandates" (Melious 2001). Her text *Enforcing the Endangered Species Act Against States*, as well as her work analyzing the ESA, in general, provides an in-depth analysis of a

state's role in conservation and environmental policy. As this study was conducted, I encountered her findings multiple times throughout various papers surrounding the ESA. Because of this use and support, her notion of partnership federalism was used to guide this model.

In her book *Enforcing the Endangered Species Act Against the* States, Melious explains four primary roles states serve in relation to federal conservation policy: resource managers, proprietors, permit authorities, and content-providers. In each of these various roles, states interact with the federal government to commit (or fail to commit) to conservation policies. These four roles were crucial in the development of the four independent variables of this analysis.

Melious opens with the importance of the resource manager role, because the "most obvious state role in endangered species preservation is (management) of land and natural resources" (Melious 2001). This is primarily due to the fact that states have a greater amount of control over their own resources than the federal government does. She explains that the management of common property—such as wildlife, timber, land, and water—can lead to direct conflict with the ESA. States must respond to federal policies that potentially come at the expense of state resource management goals. Because of this, it was important to evaluate a state's ability to commit to the ESA through designation of its land resources. Thus, the FWS state lands variable was created to reflect Melious' role of resource manager.

Her second role of proprietor describes a state's relationship with the federal government in respect to the economy. Melious writes, "this proprietary role may oblige states to balance species preservation issues with their obligations to produce income for state citizens, a role that has the practical effect of establishing economic concerns as an important aspect of species

preservation programs" (Melious 2001). In short, states have the unique position of having to balance both the financial needs of citizens and the conservation needs of the federal government. The author uses an example of the Department of Natural Resources in Washington, in which the state department had to factor in fiduciary responsibilities with demands for increased commitment to conservation. The role of proprietor instructed the use of FWS state funds in this analysis, as I sought to study a state's ability to commit to conservation given financial constraints.

The permit authority role is Melious' third role, describing a state's "permit authority under the cooperative federalism provisions of other federal environmental laws" (Melious 2001). ESA permits can be issued at two levels, federal and state. At the state-level, states can issue permits to citizens to take from game species, or species that are hunted ("Wildlife Law Enforcement"). At the federal-level, governments can issue permits to citizens and states to take from protected species. This level of permit is analyzed in this analysis. Melious expands on issued permits to the states by writing that the federal government "has taken into account the need for state agencies to consider the impacts of permits on endangered species" (Melious 2001). Given this relationship with the federal government, I wanted to see the extent to which states had "taken into account," or committed, to conservation through the application of permits. Thus, the role of permit authority provided the theoretical background to the independent variable issued permits.

In her final role definition, Melious explains the state role of content-provider. The author explains that states seek to avoid federal intervention at all costs, particularly in respect to conservation. To do this, it is common for states to seek the listing of species for ESA protection before the federal agency does. Melious writes, "rather than waiting for the ESA 'train wreck' to hit, these states have attempted to take a proactive role by… protecting species before they are

listed" (Melious 2001). With this in mind, the independent variable citizen petition was created. I sought to explore if more committed states reflected higher demands to list species, as argued by Melious.

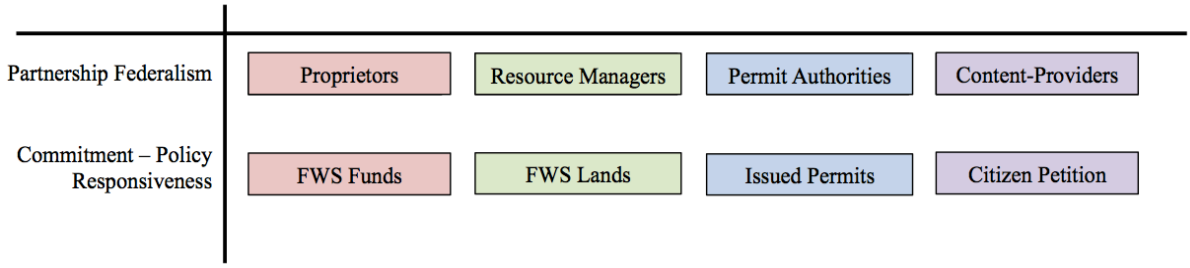

Figure 5: Dr. Jean Melious' Four Roles and their Respective Independent Variable used in the Analysis (information from Melious 2001)

Melious argues that support for increased state presence in species conservation (through any of the four roles presented in Figure 5) comes from the accumulated knowledge and experience of state wildlife agencies at the local-level. Because of the states' familiarity with its own ecological, economic, and social features, many argue they are more fit to design and implement species conservation program (Arha and Thompson 2011). Increasingly, state involvement has become important both in responding to federal policy and reflecting on it, allowing for feedback to the federal level. If this learning loop is successful for conservation policy, it is possible that a collaborative balance between federal and state forces can be achieved.

It is important to note that Melious is far from alone in her research on federal-state relationships in respect to conservation and environmentalism. In Scheberle's *Federalism and Environmental Policy: Trust and the Politics of Implementation*, she discusses how state and federal agencies work together to implement environmental laws. While this study is not focused on implementation, Scheberle's notions of the federal-state relationships are useful in understanding Melious' model. The author describes relationships between the federal and state government in four different categories, positioned on a spectrum from "pulling together" to

"coming apart" (Scheberle 2004). She argues that positive, stronger relationships facilitate the implementation of environmental policy.

Scheberle's model will be used to support Melious' model in this analysis. For all four of Melious' roles—proprietor, resource manager, permit authority, and content-provider—Scheberle's model adds additional theoretical backing. To begin with the role of proprietor, Scheberle echoes the idea that a state must balance economic and conservation concerns, writing about a particular event in which "the concern over costly environmental mandates increased, (and) state and local governments began a politically adroit campaign" against a federal environmental act (Scheberle 2004). She reflects on the importance of funding and the difficulties of balancing this with conservation needs. Additionally, she addresses the notion put forth by Melious' role of permit authority, through her idea of "civic environmentalism." Civic environmentalism refers to states' desires to "organize to protect the environment, without being forced to do so by the federal government" (Scheberle 2004). Like the permit authority role, Scheberle's civic environmentalism stresses the importance of proactivity and a state's pre-emptive commitment to conservation.

The model of partnership federalism under the ESA reflects the cooperative and dynamic nature of the act. More than 50 years after the ESA's creation, states have continued to demonstrate their interests in managing the protection of their natural resources (Melious 2001). While there is significant debate on whether or not greater state authority will result in successful protections—a debate that this research hopes to explore—there is no debate about whether or not the ESA allows for it. Written in its framework, the ESA has emphasized the need for state involvement from its first passage in 1973.

Wildlife Policy

Conservation studies like *A Review of the Impact of Militarisation* argue that stricter wildlife trade policies have a significant correlation with diminishing illegal wildlife trade rates (Annecke and Masubelele 2016). In their study, authors Wendy Annecke and Mmoto Masubelele explain the shortcomings of "hard" solutions to illegal wildlife trade, as they fail to address the social drivers behind criminal activities (Annecke and Masubelele 2016). "Hard" solutions describe on-the-ground efforts in areas where illegal wildlife take is common. Instead of addressing social standards and existing policy, these solutions involve GPS and drone surveillance, as well as physical and militarized enforcement of rules. Solutions of this sort often involve high financial and time costs, resulting in disenfranchised local communities. Ultimately, wildlife trade is driven by diverse and complex socioeconomic and cultural factors, such as food, healthcare, religion, fashion, and sport ("Game-Changing Ivory Ban" 2018). Because of this, the solution will also need to be complex and interdisciplinary.

The United States

As previously mentioned, the ESA is administered by two agencies, U.S. FWS of the Department of Interior and the National Marine Fisheries Service (NMFS) located within the National Ocean and Atmospheric Administration (NOAA) of the Commerce Department. Generally speaking, the two Departments divide conservation efforts through FWS management of land and freshwater species and NOAA management of marine species. In regards to their work in wildlife trade, the two departments have multiple partners for each step of the monitoring process. U.S. Customs and Border Protection, Immigration and Customs

Enforcement, and the Department of Agriculture help identify, intercept, and control imports in response to FWS regulations.

In 2016, U.S. FWS allocated $74.7 million and 205 special agents for wildlife crime investigatory efforts. NOAA had a $68.6 million budget and 77 special agents ("The Office of Law Enforcement Annual Report" 2018). Due to security reasons, data surrounding state-level wildlife special agents is not available through the Freedom of Information Act (FOIA) ("Interview with ESA Officer" 2018). In respect to state-level illegal wildlife imports, wildlife inspectors are stationed at each designated port to enforce the ESA. Inspectors identify species and related products, clear legal imports and exports, and stop shipments in violation of policy. Most of the monitoring focuses on commercial cargo shipments; however, inspectors also keep tabs on individual passengers, as many illegal wildlife trade rings smuggle goods on person, commonly in clothing, suitcases, and handbags ("Wildlife Law Enforcement" 2017).

International Efforts

At the international level, CITES is the primary treaty used for endangered species protection. CITES established a global monitoring framework for the trade in threatened and endangered species and products. Currently, more than 5,000 species of animals and 28,000 species of plants (primarily orchids) are listed under CITES' protections ("World Wildlife Crime Report" 2016).

Created in unison with the ESA in 1973, CITES now possesses the support of over 183 countries, or Parties, who have agreed to adopt their own respective legislation for the enforcement of measures put forth by the Convention. These measures include four major components: designation of management and scientific authorities, laws prohibiting the trade in violation of CITES, penalties for such trade, and laws for the confiscation of specimens. Because

the treaty is not legally-binding, it is only effective to the extent in which participating countries are able to enforce its measures. For the United States, this is accomplished through the ESA. Effective measures are not the norm, however, as currently 50% of the 183 Parties lack one or more of the four components ("World Wildlife Crime Report" 2016).

METHODS

This analysis used a fixed-effects regression (FE) to study the relationship between four independent and seven control variables from the years 2001-2016 for 16 states in which major FWS ports are found. By using FE, it was possible to analyze the relationship between the dependent variable, illegal wildlife import percentage, and independent variables: FWS lands, FWS state funds, issued permits, and citizen petition. Additionally, the controls of GDP, population, public lands, urbanization, environmental support, ideology, and polarized government were included in the model. All tests were conducted on R Studio.

The data were presented in panel form, or cross-sectional time-series form. FE regressions are particularly useful when data fall into categories that may affect the overall relationship between independent and dependent variables, as the regression controls for general effects this category might present. While it is not feasible to include all relevant control variables in one study, FE helps mitigate some of the unobservable factors underlying the correlation and assess the net effect of the independent variables on the dependent.

Ports

The ESA requires the majority of commercial wildlife shipments to pass through 18 designated ports, in which wildlife inspection officers can oversee imports and exports ("Designated Ports"

2017). All 18 ports are either airports or centers near airports found in major U.S. cities. In this analysis, the ports represent the state they are found in, as shown in Figure 6. While there are 18 ports, there are only 16 states, due to both California and Texas having two designated entry points. For these states, both data points are combined into one to represent their respective states.

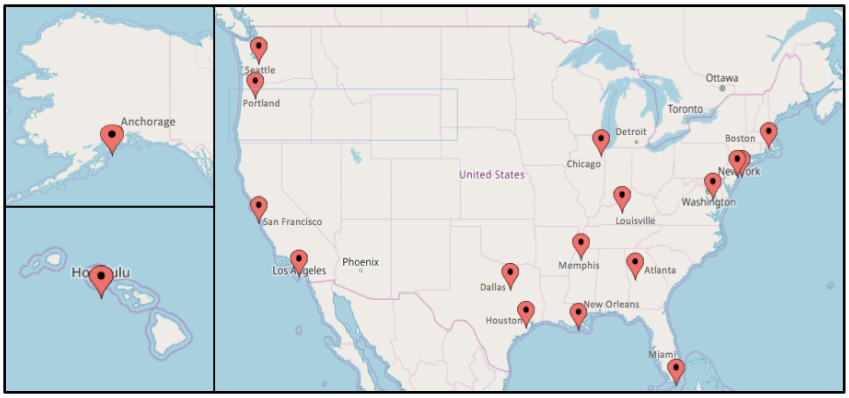

Figure 6: Map of U.S. FWS Designated Ports (data from "Designated Ports" 2017)

Dependent Variable – Illegal Wildlife Import Percentage

This analysis studies the effect of state commitment on policy responsiveness of the ESA, as indicated by illegal wildlife imports. As the wildlife trade theory showed above, stricter conservation policies have been shown to have a negative relationship with illegal wildlife import rates ("Game-Changing Ivory Ban 2018"). Combined with the legal framework described in ESA Section 9, this analysis further explores the notion of conservation policy at a state-level, studying whether a state's commitment to conservation will have an effect on illegal wildlife import rates.

Background

Through the Law Enforcement Management Information System, or LEMIS, U.S. FWS officers report occurrences of illegal wildlife imports at each of the 18 designated ports ("Final Response Dataset" 2017). Divided by total yearly wildlife trade per port, it is possible to find a relative

yearly percentage per state with the occurrences of illegal wildlife imports divided by the total occurrences of wildlife imports into the state ("The Office of Law Enforcement Annual Report" 2016). The relative percentage will be used in this analysis. Through FOIA, one can receive LEMIS reports from its first report until present, 1999 - 2018. Because this analysis utilizes a time-series, 2001 was chosen as the starting year as it is the first year all variables' records are available. The ending year is 2016 as the data were requested through FOIA at the end of 2017 before the present year's report was available.

For the purpose of this analysis, the term "import" refers to the definition used in Section 3 of the ESA: "to land on, bring into, or introduce into any place subject to the jurisdiction of the United States" (Title 16, Section 3 2004). When designating indicators for this quantitative analysis, there was debate between using illegal wildlife import percentage or species' recovery data, which reflects species populations since their time of listing. While recovery data would have been an additional useful indicator of policy responsiveness, there are many complex variables involved in how and why a species recovers, such as genetics, politics, culture, geography, and random chance (Boersma et. al 2001). In addition to this, recovery data was recently removed from public access ("Leaked Trump Administration Memo"). Ultimately, illegal wildlife import percentage was chosen as indicator for both its feasibility and under-studied nature.

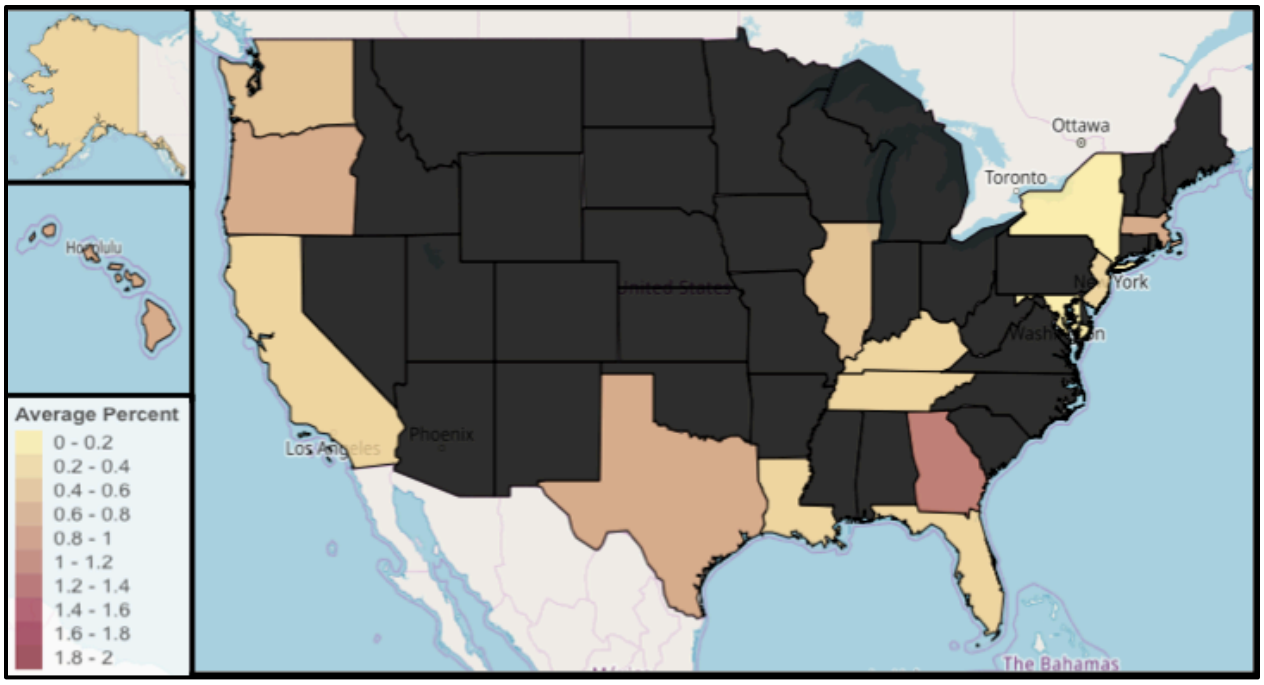

Figure 7: Map of Average Illegal Wildlife Import Percentage per State 2001 - 2016 (data from "Final Response Dataset" 2017)

Wildlife Import Process

When a wildlife officer identifies a shipment as containing wildlife products, legal or illegal, she must then classify the item as 1 of 90 possible descriptions. These can range from eggs (EGG) to ivory jewelry (JWL) to dead animals (BOD). The wildlife officer then decides whether or not the shipment is permitted or in violation of the ESA, resulting in seizure of the product. In this study, occurrences designated as the letter "I," or those that were confiscated or seized by an inspector due to being illegal, are analyzed. The combination of all permitted and illegal wildlife trade occurrences is reported federally and used here to base the relative percentage of illegal wildlife imports for each state. If designated as "I," individuals and companies are subject to abandonment of goods when seized and/or criminal penalties. However, it is much more common for simple forfeiture of goods than for criminal prosecution ("Wildlife Law Enforcement" 2017).

BOD	Dead Animal
BON	Bones
EGG	Egg
FEA	Feathers
FLO	Flowers
IVC	Ivory Carvings
LIV	Live Animal
LPS	Leather Product
MEA	Meat
MED	Medicinal Product
SHO	Shoe
SKE	Skeleton
SKI	Skin
SKU	Skull
TRO	Trophy
UNS	Unspecified

Figure 8: Sample of Wildlife Import ID's (information from "Final Response Dataset (FOIA Request) 2017")

Following the identification of type (Figure 8) and designation of legality, wildlife officers take notes on the port of entry, dimensions and units, purpose of import, country of origin, and actions taken afterward (abandoned, cleared, re-exported, or seized). It is important to note that the dimension category includes descriptions of quantity. While this is useful information when looking at the volume of certain types of illegal wildlife imports and how they relate to other types, this research is focused around the frequency in which illegal imports are entering a state, not around the types and quantities of each import. This would, however, be an interesting topic to expand on in future studies.

Assumptions

A key assumption in this analysis is that all wildlife officers have the same ability to monitor and identify illegal wildlife trade at each port. By making this assumption, the analysis can utilize import percentages as an indicator for the dependent variable. Higher illegal import rates will reflect the actual amount of illegal imports entering a state and not the wildlife inspectors' abilities to find these illegal imports. This is feasible, as wildlife officers are federal employees and trained in a centralized location and program ("Designated Ports").

Interpolation

Both the illegal wildlife import percentages from the ports of Louisville, Kentucky and Memphis, Tennessee were interpolated for the years 2001-2004 based on data of the years

provided. The lack of data for the initial years is a result of the two ports being opened after the analysis' 2001 start date. The interpolation was done through the R command approx. with the designation of a linear method. The LEMIS data from 2005 - 2016 for each of the two states was entered and a list of corresponding interpolated values was returned.

Data

Figure 7 above shows the substantial variation in average illegal wildlife import percentages per state, with Maryland having the lowest average (0.14%) and Georgia having the highest average (0.88%). Not only are there differences in frequency of imports, but also type of imports, as shown in Figure 9. While this study primarily focuses on the occurrences of illegal wildlife imports, it would be both interesting and useful to further explore differences in import type between states.

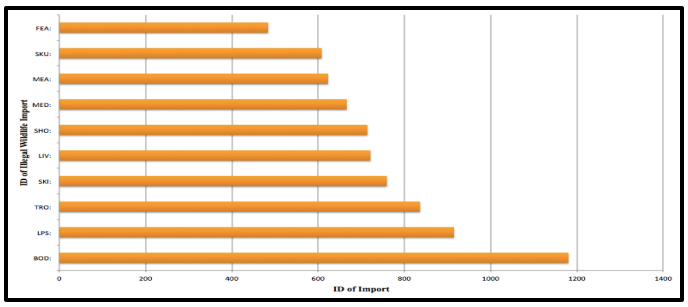

Figure 9: Chart of Most Frequently Imported illegal Wildlife Imports into the United States 2001 – 2016 (data from "Final Response Dataset 2017")

Independent Variables

The key hypothesis tested in this thesis is that states with a greater commitment to conservation will be more likely to have lower levels of illegal wildlife imports. This analysis uses four variables—FWS land, FWS funds, issued permits, and citizen petition—to indicate a state's commitment to conservation. As previously stated, the term commitment refers to the extent to which a state has mobilized its resources to protect species. The indicators for commitment were chosen with guidance from Dr. Jean Melious' partnership federalism model, which provides four

roles that states may take on when committing to conservation policy: proprietors (FWS funds), resource manager (FWS lands), permit authorities (issued permits), and content-providers (citizen petition). Additionally, the framework of the ESA provided guidance in to how best measure the four roles. Each indicator for commitment came with its own methodological challenges as explained in the upcoming sections; however, with the backing of theory, ESA framework, and guidance from FWS officials, these variables were chosen as the best possible proxy for a state's commitment to conservation.

Independent Variables – FWS State Lands

Building on the findings that listed species with protected habitat are more than twice as likely to recover, Melious' concept of partnership federalism takes this emphasis on protected habitat and applies it to states' roles as resource managers ("Protecting Critical Habitat" 2012). Melious writes that the most evident role a state plays in endangered species conservation is as manager of land (Melious 2001). This analysis reflects Melious' role of resource manager by arguing that a state with a high number of FWS lands indicates an increased commitment to the natural resource manager role, resulting in increased policy responsiveness. Given this, I hypothesize that a state with high FWS land percentage indicates its commitment to the role of resource manager. In addition, I utilized the purpose of the ESA as described in Section 4, "to protect the ecosystems upon which they (imperiled species) depend" (Title 16, Section 4 2004).

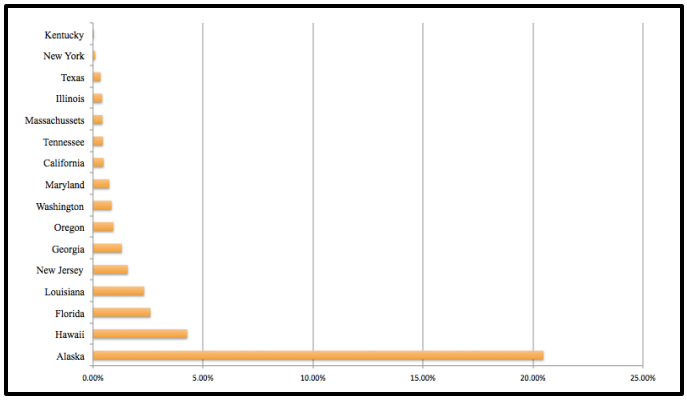

Figure 10: Chart of Average FWS Land Percentage per State 2001 – 2016 (data from "Annual Report of Lands" 2018)

Each year, FWS releases its annual Lands Report through the National Wildlife Refuge System, detailing areas currently under the Services' authority ("Annual Report of Lands" 2018). FWS oversees national protected areas set aside for listed species, wetland areas utilized for the Migratory Bird Conservation Act, refuges managed directly by the state, administrative sites, and national fish hatcheries ("Annual Report of Lands" 2018). All FWS lands are partially to completely overseen by states. Because of this, all FWS lands serve the proxy for Melious' role of resource manager, indicating state commitment to the ESA, shown in Figure 10.

Data

FWS land is presented as a relative percentage to control for a state's area. As Figure 10 shows, Alaska has the highest average relative percentage at 20.5% and also the highest amount of absolute FWS land with an average of 76,817,213 acres. Kentucky has the lowest average relative percentage at 0.04% and also the lowest absolute land with an average 10,715 acres. However, it is not always the case that a state's ranking of the relative percentage of FWS land and the absolute value of FWS land are the same. In the case of Hawaii, the state has the 2nd highest relative percentage at 4.28%, but has the 9th highest absolute land value of 200,317 acres.

The variable FWS land remains fairly constant throughout the 15 years analyzed, however, there are some significant fluctuations in the data. For example, Louisiana's FWS land grew 13.4%, while New York decreased 6.61% from 2001-2016. This analysis focuses on relationships among states, it is possible that a longitudinal study could trace trends within states and their effect on policy responsiveness.

Independent Variables – FWS State Funds

As a senior FWS wildlife officer explained, "States are hamstrung to a large extent because they just don't get funding" ("Interview with ESA Officer" 2018). Combined state funding for the ESA accounts for only 5% of federal funding (Arha and Thompson 2011). To Melious, this is a considerable issue, as she considers funding for any policy the strongest indicator for commitment (Melious 2001). The interview quoted above, Melious' role of proprietors, and ESA Section 6 combined to provide the theoretical backing behind the FWS state funds indicator. For a state to succeed in Melious' role of proprietor, it must appropriately fund its own conservation efforts. Thus, I hypothesize that a state with high FWS funding indicates its commitment to the Melious' proprietor role.

This analysis will focus on two primary forms of consistent state funding achieved through federal partnerships: Cooperative Endangered Species Conservation Fund (CESC) and Pittman-Robinson grants. According to the interview with the FWS director, these grants are the best measure of state's ability to commit to conservation through funding ("Interview with ESA Officer" 2018). While these are federal funds, states have a substantial influence on their distributions, as higher quality applicants with a stronger history of conservation commitment are more likely to be funded. The combination of Pittman-Robertson and state licensing dollars comprise around 75% of the average state fish and wildlife agency budget ("Federal Aid in Wildlife Restoration Act" 2017). Each year, the federal-level of FWS delivers funding to state-level branches through these programs based on an application process. This analysis will view the independent variable "FWS State Funds" as a combination of both grants received per state per year.

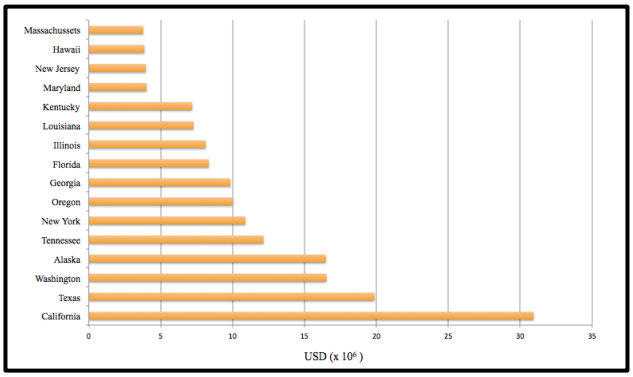

Figure 11: Chart of Average FWS State Funds used for ESA Policy 2001 – 2016 (data from "Federal Aid in Wildlife Restoration Act" 2017)

Cooperative Endangered Species Conservation Fund

In a conversation with a former regional director of the ESA, he explained that CESC funds were "a measure of how well states impress the feds" ("Interview with ESA Officer" 2018). Designated by Section 6 of the Act, the CESC fund provides grants to states for conservation projects for listed species (Title 16, Section 6 2004). To receive CESC funding, the Secretary of the Interior or Commerce must enter a cooperative agreement with the accepted state. Typically, grant allowances are used for species and habitat conservation plans on non-federal lands, covering both plant and animal recovery. Additionally, funds can be used for surveys, public education, outreach, and genetic studies. States that receive CESC funding must match 25 percent of the costs for approved projects, or 10 percent if granted to multiple states (Melious 2001).

Pittman-Robinson Act

From the earliest days of wildlife management in the United States, hunters and hunting activity have funded a significant proportion of conservation initiatives ("The North American Model of Wildlife Conservation" 2012). Also known as the Federal Aid in Wildlife Restoration Act, the Pittman-Robinson Act was created in 1937 to use firearm, ammunition and archery equipment taxes to fund wildlife restoration, particularly as it benefits game species. The current tax rate is around 11% ("Federal Aid in Wildlife Restoration Act" 2017). Tax revenue goes into U.S. FWS' Wildlife Restoration Account, which is then disseminated to state wildlife agencies for

conservation programs. Each state's allocation of funds is based on geographic size and the number of licensed hunters in the state for that year, as well as its proven commitment to the ESA as established by a set formula at the federal-level. Prior to receiving funds, states must submit budgets and proposed plans. Similar to CESC, states must agree to match 25% of received funds.

While originally for preserving wild game species, the Pittman-Robinson Act was amended in 1970 to include a greater variety of species protection and funding for hunter education programs. Since 1939, the Act has generated over $12 billion, resulting in the purchase of 4 million FWS state lands ("Federal Aid in Wildlife Restoration Act" 2017). However, some conservation groups argue that while there is benefit from the Act, it skews conservation priorities and places emphasis on hunting and protection only as a byproduct. Regardless, the Pittman-Robinson Act is the primary supporter for state-level conservation ("Federal Aid in Wildlife Restoration Act" 2017).

Data

Figure 12 illustrates the substantial variation within a state's FWS funding, as shown with Georgia. California has the highest state funding with an average of $30 million a year spent on the ESA. Massachusetts has the lowest average with less than $4 million spent a year. These values can fluctuate significantly each year, as shown in Figure 12 with the state of Georgia.

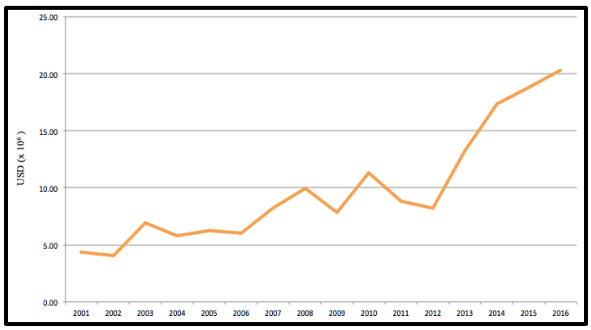

Figure 12: Graph of Fluctuating FWS Funds in Georgia 2001 – 2016 (data from "Federal Aid in Wildlife Restoration Act" 2017)

Independent Variable – Issued Permits

States have the ability to issue permits and licenses under the provision of federal conservation laws (Melious 2001). In the case of the ESA, citizens and states are able to apply for permits to take non-game protected species with the federal-level of U.S. FWS or U.S. NOAA. Permits for listed game species are approved through state agencies, but are not publically available to analyze through FOIA. This analysis will use permit requests by state for non-game listed species to represent a state's commitment to the ESA. These permits are federally-issued permits for states. I hypothesize that a state with a high number of issued permits indicates a lack of commitment to the Melious permit authority role.

For the purpose of this analysis, the term "permit" will apply exclusively to incidental take permits and not the three other possible options discussed previously in the Section 10 analysis: enhancement of survival permits, recovery permits, or interstate commerce permits (Title 16, Section 10 2004). Both permits issued by U.S. FWS and U.S. NOAA are considered in this study, as their respective totals are combined per state per year.

To find the permits approved by the Secretary of the Interior, the U.S. FWS Federal Register Documents library provides yearly indexes on incidental take permits per state ("Proposed Rules" 2019). Each request provides the proposed action's effective date, the relevant agency, a description of the action, the species affected, its corresponding habitat conservation plan, and the respective state. For finding permits under the Secretary of Commerce, NOAA utilizes the Authorizations and Permits for Protected Species (APPS) portal ("APPS Search Database" 2018). Similar to the Federal Register Documents library, APPS provides the dates, agency, descriptions, and plans necessary for approval of take. While both databases are informative, it is

possible that the reports are not complete, as it wasn't until recent years that they were centralized and digitized.

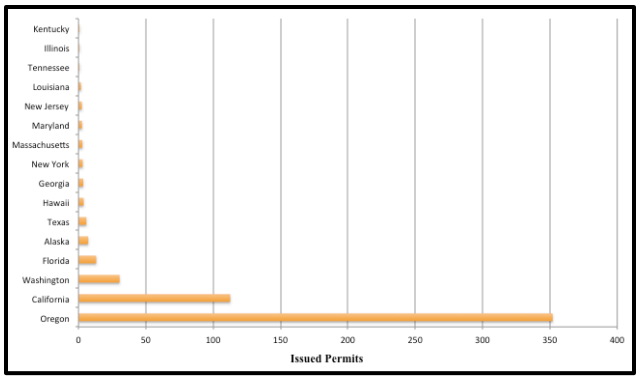

Figure 13: Chart of Average Issued Permits per State 2001 – 2016 (data from "Proposed Rules" 2019 and "APPS Search Database" 2018)

Data

The average number of permits issued to states from 2001 to 2016 was 33.85, as shown by Figure 13. However, given the extreme variety of issued permits per state, the median value of 3.28 is more useful for analysis, as it shows how relatively large the number of issued permits for Oregon is. Figure 13 express a non-normal trend in the data, an issue that will be addressed in the Results section.

Independent Variables – Citizen Petition

Section 4 of the ESA provides the process for which both the Secretary and an individual (citizen or state) can list a species. The final independent variable citizen petition refers to the latter. The ESA establishes that any interested person or party may be able to petition the Secretary of the Interior or Secretary of Commerce to list for or remove a species from protections of the Act (Title 16, Section 4 2004).

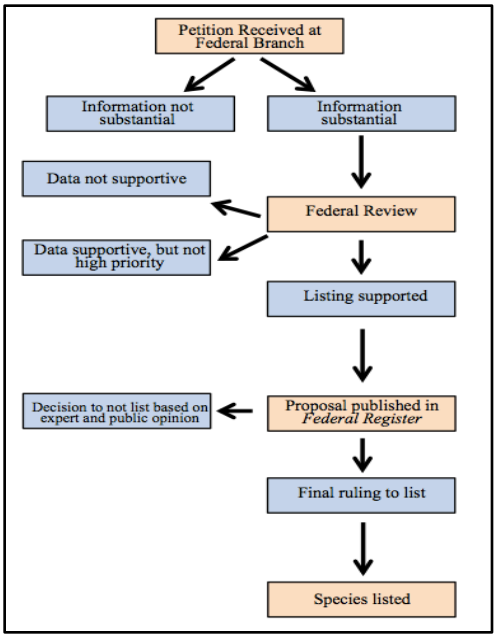

Figure 14: Diagram of Citizen Petition (or State) Listing Process (information from Title 16, Section 4 2004)

In this analysis, a state with a high number of

citizen petitions to list species indicates commitment to the Melious' content-provider role, as the desire to list species reflects a proactive relationship with the ESA. The role of content-provider describes a state that is committed to conservation work in order to avoid federal intervention and gain greater autonomy. By submitting a petition to list species, states embody the content-provider role as they take control of the conservation of its species.

Figure 14 details the listing process of the ESA as done through citizen petition. As described by Section 4 of the ESA, there are two modes of listing a species: through the Secretary of the Interior (or through citizen petition. This analysis focuses on the latter, primarily because of its indication of state commitment but also because it is much more common. If one (state or individual) believes that a species is at risk of extinction, one can file a petition to the federal branch of U.S. FWS or NOAA. Once received, the branch will then decide if there is substantial evidence to perform an official review of the species within 90 days ("Listing a Species as a Endangered Species" 2016). If there is substantial evidence, a 12-month status review is conducted, in which the petition will result in three options: not supported, supported but not considered a priority, or supported. If supported, the petition is then proposed in the *Federal Register*, a daily federal government publication ("Listing a Species as a Endangered Species" 2016). Finally, once the public and experts provide their opinion on the proposed role over a 60-day period, the petition receives its ultimate decision: a successful final rule or a withdrawn rule.

Through U.S. FWS' Environmental Conservation Online System (ECOS), one can view all citizen petition reports received by the agency. ECOS only includes the initial step of the process (the petition phase), the resulting decisions and findings are omitted. Each entry includes the date received, the species involved, the petitioner's name, the requested action, and related documents ("Listed Species Summary" 2019).

Data

Since 2001, 323 state and individual petitions have made it to the federal level for response, 143 ultimately resulting in species being listed under the ESA ("Listed Species Summary" 2019). The state of California has issued significantly more petitions with a total of 154 in a dataset where the median number of petitions filed was 11.

Control Variables

The analysis' control variables function to mitigate the effects of the pre-existing environmental conditions, the conservation interests, and the social and political background of the 16 states studied. These variables may potentially have an effect on a state's commitment to conservation, but are not the focus of this analysis, thus they need to be controlled to help obtain unbiased estimates of the four independent variables studied. Given the nature of this study, it is necessary to control for the components of a state that might affect its ability to commit and respond to conservation policy, specifically as it relates to the ESA. Previous studies, such as Melious' and Kaush Arha and Barton Thompson's discuss this importance of controlling for parts of a state's background that will affect its relationship to conservation. These parts refer to a state's economic, political, environmental, and social background. Below, each control variable is further explained in both its methods and theoretical backing.

Control Variables – GDP

GDP, gross domestic product, is a measure of the market value of goods and services of a defined area. GDP per state is reported yearly through the U.S Bureau of Economic Analysis

under the Department of Commerce ("Gross Domestic Product by State" 2019). Because this analysis focuses on the commitment to and responsiveness of policy, GDP must be controlled for. This is particularly important in respect to FWS state funds, as both state funds and GDP involve economic contexts. In her book about federalism, Denise Scheberle writes, "Many scholars observed that states enhanced their capacity to deal with environmental problems by adding state sources of funding" (Scheberle 2004). Because of this emphasis on state funding, GDP must be controlled for. By controlling for this variable, it was possible to see the effect of a state's role without the size of its economy in consideration. This helped to ensure that illegal wildlife import percentages in the state were not a reflection of market rates relating to the size of its economy.

Control Variables – Population

In addition to GDP, it is necessary to control for the change in a state's population each year. Through the U.S. Census, it is possible to congregate population data for each state for each year ("Resident Population" 2010). Controlling for population growth allowed for a more clear analysis of policy commitment and responsiveness, so that variables such as issued permits (indicating the role of permit authority), citizen petition (indicating the role of content-provider), and illegal wildlife imports were not impacted by the number of people and their respective demands in each state as population changed over time.

Control Variables – Public Lands

As discussed previously, land plays a fundamental role in conservation. Because of this, a state's public land must be controlled for in order to ensure that the effects of a state's role as resource

manger of land can be fully analyzed. Additionally, public lands can potentially be an indicator of a state's environmental interest, as citizens have more accessibility to the outdoors, so it is beneficial to control for this reason. Finally, controlling for federal public lands within a state ensures that federal interest and investment in a state is not factored into the analysis.

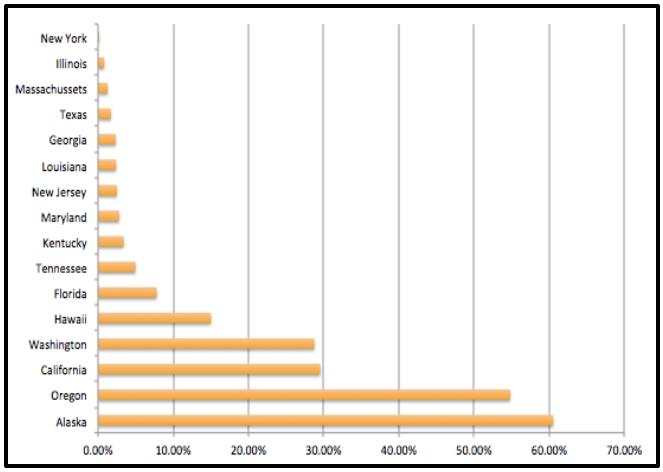

Figure 15: Chart of Average Public Land Relative Percentage per State 2001 – 2016 (data from "Land Areas of the National Forest System" 2018 and "Land Resources and Information" 2018)

Finding data to represent public lands in the U.S. was a complex and lengthy process. Because each state monitors federal lands in different local-level agencies, it is very difficult to find one consistent measure for each state for each year. Ultimately, it was possible to use a combination of the U.S. Department of the Interior' U.S. Bureau of Land Management (BLM) public land statistics and National Park Service reports (NPS), as well as the U.S. Department of Agriculture's U.S. Forest Service (USFS) Land of the National Forest System (LAR). Data from these reports are shown above in Figure 15. While BLM land statistics could have been a sufficient indicator of public lands on its own, adding on the records from USFS and NPS helped create more robust data for the control variable. Public land is analyzed as a relative percentage to the total area of the state.

Interpolation

The states of Hawaii, Massachusetts, and New Jersey were missing USFS data in the Land of the National Forest System for certain years, seemingly due to a data logging error ("Land Areas of the National Forest System" 2018). Because of this, interpolation was necessary. Achieved

through the R command approx., the linear method was used on the available USFS data points for the states: Hawaii 2001 – 2008, Massachusetts 2004 – 2016, and New Jersey 2001 – 2008. Once entered, a corresponding list of interpolated values was returned and used for the remaining analysis.

Control Variables – Urbanization

The exploitation of species has a long history with urbanization in the United States. As citizens became more removed from the rural landscape, wildlife markets increased, beginning with the taking of bison and elk ("The North American Model of Wildlife Conservation" 2012). With that in mind, it is possible that states with less urbanization will have higher connection to the surrounding land, meaning greater commitment to conservation. Additionally, Section 2 of the ESA states that species in the United States have and will continue to become extinct "as a consequence of economic growth and development untempered by adequate concern and conservation" (Title 16, Section 2 2004). This quotation argues that increased urbanization, or "economic growth and development," has led to the downfall of species. Because of this, urbanization must be controlled for as it has the potential to confound a state's ability to commit to the ESA.

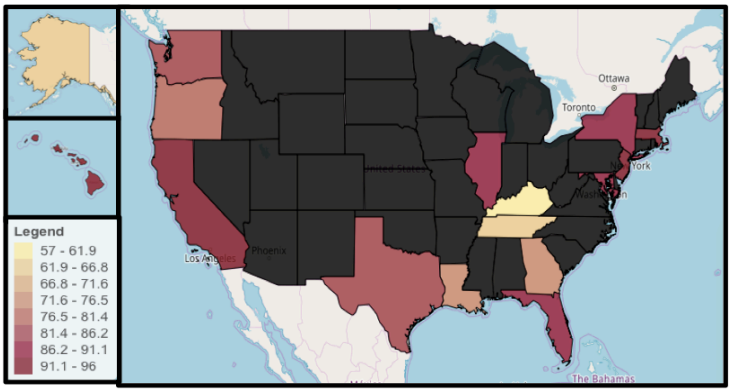

Figure 16: Map of Average Urbanization per State 2001 – 2016 (data from ("Urban and Rural" 2016).

The general U.S. Census defines urbanization as the percentage of people living in places of 2,500 or more inhabitants and is used in this analysis in combination with the American

Community Survey, a subset of the U.S. Census that happens yearly ("Urban and Rural" 2016). Figure 16 illustrates the average urbanization rates per state.

Interpolation

Because the U.S. Census is conducted once every 10 years, only the years of 2001 and 2010 are able to be used in this analysis. The American Community Survey has reports of urbanization per state, but only during the years of its operation: 2007 to 2016 ("Urban and Rural" 2016). The years from 2002 to 2006 were interpolated as explained previously.

Control Variables – Environmental Support

Recently, the United States Supreme Court used the Eleventh Amendment to reduce private party enforcement rights against states in order to enhance their "dignity." While not directly related, this decision had wide-reaching effects on conservation (Melious 2001). The Court's decision towards more "dignity" has resulted in many environmental groups believing that states will now be allowed to conduct harmful activities. This is largely due to states' new ability to hinder environmentalists from direct action against states if they fail their federal obligations under the ESA (Melious 2001). Because of this, the analysis must control for the presence of environmental support groups in each state, as they play an instrumental role in keeping states responsible to federal policy. Environmental support is measured through records of financial contributions to state campaigns and committees by pro-environmental policy organizations. This information was provided through the database FollowTheMoney.org ("Pro-Environmental Policy" 2019). The number of donations was used to indicate the amount of environmental support within a state, as it reflects the presence of environmental interests in state politics.

Control Variables – Ideology

To control for a state's political beliefs, NOMINATE scores from the database VoteView.com are utilized ("Realtime NOMINATE Ideology" 2019). NOMINATE stands for Nominal Three-Step Estimation and was developed by political scientists Keith T. Poole and Howard Rosenthal to analyze legislative roll-calling behavior ("Realtime NOMINATE Ideology" 2019). The NOMINATE score ranks from -1 to +1, where left-leaning Democratic beliefs tend towards -1 and right-leaning Republic beliefs tend towards 1. In Scheberle's review of federalism, she writes, "Politics plays a powerful role in implementing the environmental programs reviewed" (Scheberle 2004). By controlling for a state's ideology, the effects of a state's policy commitment are assessed independently of a state's underlying political and ideological cleavages.

States	NOMINATE Score
Hawaii	-0.39
Massachusetts	-0.39
New Jersey	-0.38
Maryland	-0.37
New Jersey	-0.37
California	-0.36
Washington	-0.32
Oregon	-0.23
Illinois	-0.14
Florida	0.06
Louisiana	0.11
Alaska	0.15
Georgia	0.35
Tennessee	0.36
Texas	0.49
Kentucky	0.53

Figure 17: Average State Ideology per State 2001 – 2016 (data from "Realtime NOMINATE Ideology" 2019)

NOMINATE scores from the VoteView project rank each state legislator's ideology for both state legislative chambers. Two measures of ideology are provided for each chamber, but this analysis will focus on the first (shown in Figure 17), as it is the most commonly used in political analyses. It is important to note that NOMINATE values can change significantly, typically every four or eight years depending on election cycles within each state. Some states are very consistent, like Hawaii, in which NOMINATE values have stayed within +/- 0.08 over 16 years. Others oscillate significantly, like with Oregon, in which the state held a NOMINATE value of -

0.06 from 2001 to 2008 and then drastically switched to -0.40 for the remaining years following an election in 2008.

Control Variables – Polarized Government

The final variable to be controlled is the extent to which a state government is polarized. In addition to controlling for ideology, it is important to understand the difference in opinions at the state-level, as it may affect a state's ability to come to a decision and commit or respond to the ESA. A state that is more polarized might have greater difficulty responding to policy. This analysis used the H_diffs score from Michigan State University's Institute for Public Policy and Social Research (IPPSR). IPPSR is the leading database for political measures and is open-source. The H_diffs score refers to the "average ideological distance between two state house members" and ranges from 0 to 2 ("House Polarization" 2016). This measure for polarized government does not vary as much as the previous measure for ideology from year to year; however, it is common to find significant variation following major state elections.

RESULTS

Normality

Before running the fixed-effects regression as described above, it was necessary to test the normality and correlation for each of the 12 variables in order to satisfy assumptions for the regression. The Shapiro-Wilk test was utilized to test from normal population. In this analysis, a W-value greater than 0.70 was set as the marker for normality.

Given this marker, the majority of variables met the normality qualification; however, the variables of citizen petition, ideology, and public lands did not reflect a normal distribution. This

can most likely be attributed to large sweeping measures that took place within a year interval. For example, from 2001-2003, the Bush administration created measures that severely limited individual's ability to petition species' listings, dramatically reducing the number or petitions for each state during these years (Melious 2001). For ideology, many states experience significant shifts in ideology during election years. Finally, public lands did not frequently reflect a normal distribution, due to the nature of acquiring federal land, which is typically in large parcels all at once and then very little movement for years ("Land Resources and Information" 2017).

Correlation

Correlation tests between variables were needed to avoid multicollinearity in the final analysis. To do this, the Pearson method tested correlation between all variables and is the most widely used to measure the degree of the relationship between continuous variables. To use Pearson, both variables should be normally distributed, thus this step followed the previous normality tests. The test outputs a correlation, shown with the variable *r*, in which values are ranked from -1 to 1. The closer an r-value is to 0, the least related the two variables being tested are. In this analysis, variables related with $r > 0.70$ were considered correlated. The majority of correlations were not above $r = 0.20$. Table 1 below shows2 general summary statistics for the variables studied.

Only the variables ideology and urbanization were above this value ($r = 0.72$), most likely due to the polarization in political values associated with urban and rural communities (Parker et. al 2018). Negative relationships were found with GDP and public land percentage ($r = -0.14$) and urbanization and public land percentage ($r = -0.16$). Perhaps most interesting was the relationship

between environmental support and public land percentage ($r = 0.39$), as both variables were used similarly as indicators for a state's predisposition towards conservation efforts.

Table 1: Table of summary statistics

	mean	*s.d.*	*min*	*max*
Dependent Variables				
Illegal Wildlife Import Percentage	0.44	0.33	0.00	1.78
Independent Variables				
FWS Land Percent	2.34	0.05	0.04	20.5
FWS Funds*	10.8	8.82	1.12	45.1
Issued Permits	33.9	88.2	0.00	387
Citizen Petition	1.27	2.65	0.00	18.0
Control Variables				
Population Growth	0.91	0.73	-5.78	3.30
GDP*	530,000	507,000	29,000	2,510,000
Public Land Percent	13.7	0.19	0.05	60.5
Urbanization	82.1	11.1	55.8	95.4
Environmental Support	43.0	97.0	0.00	695
Ideology	-0.06	0.35	-0.63	0.66
Polarized Government	0.86	0.33	0.32	1.69

The data above is from 2001 – 2016 for 16 states: Alaska, California, Florida, Georgia, Hawaii, Illinois, Kentucky, Louisiana, Maryland, Massachusetts, New Jersey, New York, Oregon, Tennessee, Texas, Washington

*Values displayed are divided by 1,000,000

Regression

In this analysis, the concept of the U.S. state is the category being fixed for in the FE model, with the assumption that its effects are time-invariant. The FE model allows one to explore the relationship between the independent and dependent variable within each category (state) by use of a dummy variable to represent the category. This is useful, because each state has its own individual constant characteristics that may influence the outcome of the regression. For example, characteristics of a state like cultural factors or political systems may impact how it interacts with the overall analysis' model. Because of this, the regression equation features the dependent variable as indicated by the independent and controls, fixing for the effects of the state category.

Table 2: Fixed Effects Regression: Determinants of Illegal Wildlife Imports in 16 States, 2001-2016

Fixed-Effects Regression							
Fixed-Effects Result	Estimate	Standard Error	t	P>|t|		[95% Confidence Interval]	
FWS Land	-1.2170	0.5360	-2.27	0.024	**	-1.853	-0.6810
FWS Funds	0.0028	0.0038	0.74	0.461		-0.0011	0.0076
Issued Permits	0.0019	0.0012	1.63	0.105	*	-0.0004	0.0041
Citizen Petition	0.0066	0.0103	0.64	0.521		-0.0136	0.0269
GDP	-7.344e-8	1.636e-7	-0.45	0.654		-8.981e-8	-5.714e-8
Population	0.0211	0.0269	0.78	0.435		-0.0317	0.0739
Urbanization	-0.0457	0.0221	-2.08	0.039	**	-0.0888	-0.0026
Public Land	0.0361	0.0296	1.22	0.224		-0.0002	0.0957
Environmental Support	-0.0001	0.0002	-0.63	0.529		-0.0005	0.0003
Ideology	0.0827	0.1337	0.62	0.537		-0.1794	0.3447
Polarized Government	0.0511	0.0511	0.16	0.874		-0.5780	0.6802
Observations	256	Adjusted R-Squared		0.565			
States	16	F-Statistic		13.7			
		Prob. F		0.002			
***p<0.01 , ** p<0.05, *p<0.10							

Table 2 reflects the full regression, meaning all variables were included together. However, there were many initial reiterations run previously to test for potential effects of correlation between variables. This included a regression without ideology, without GDP, without polarized government, and without urbanization. In all alternate regressions, the significant results remained the same as with the full. Because the results were the same, it was possible to reflect the full regression in this analysis. Additionally, each independent variable was run separately (with all of the control variables present) to ensure there were no effects resulting from multicollinearity between the independent variables, and the significance remained the same in each version.

From Table 2, one can see that the independent variables FWS land, representing a state's role of resource manager, ($p = 0.024$) had a statistically significant relationship and issued permits, representing a state's role as permit authority, ($p = 0.105$) had a borderline statistically significant relationship ($p = 0.105$) with illegal wildlife imports. More important, however, is the directionality of the estimates received. The role of resource manger (FWS land) had a negative relationship while permit authority (issued permits) had a positive. Given the regression results,

one can interpret that within states, for each additional percentage point change of FWS Land a state commits over time, illegal imports will lower within states by -1.2%, on average, controlling for the other variables included in the model. For each additional permit issued by the state over time, illegal imports will increase by 0.0019% within a state, on average, controlling for the other variables included in the model. Additionally, the control variable urbanization ($p = 0.039$) had a significant and negative relationship.

DISCUSSION

As shown in Table 2, there are significant results that support the research's hypothesis surrounding a state's commitment and policy responsiveness. Additionally, there are independent variables that were not significant. The discussion section will seek to explain further why the results manifested this way and what it means for the 16 states studied.

Expectations

The significant relationship between FWS state land and issued permits with the illegal wildlife imports was as to be expected according to this study's model. Their significance values as well as their directionality support the notion that a state's commitment to conservation affects its policy responsiveness to the ESA.

The role of resource manager, indicated by FWS land, had a negative coefficient in relation to the dependent variable illegal wildlife imports (-1.2170). This agrees with the theory shown above, particularly in respect to the Center for Biological Diversity's findings on the importance of habitat, as well as Melious' model of state roles as natural resource managers ("Protecting Critical Habitat" 2012). According to the theory, the result of FWS land in this regression was

supported, as it had a negative relationship with the dependent variable of policy responsiveness. In regards to this model, for each additional percent of land the state committed to conservation, its illegal wildlife import percentages lowered by -1.2170%, meaning the state was more increasingly responsive to ESA policy on average, controlling for the other variables included in the model.

The role of permit authority, indicated by issued permits, had a significant and positive relationship with illegal wildlife imports, which agrees with the theory put forth by this research, as well. It is important to note, however, that the p-value was 0.105, meaning it technically falls outside the significance of $p < 0.10$. However, because the value is very close to the cut-off, I will assume significance. The notion of permit authority supports Melious' model of partnership federalism in which a state works with the federal government to issue and receive permits (Melious 2001). For this analysis, this role manifested itself as the states applying for permits at the federal-level to take within state boundaries. This model argues that a state less committed to conservation is more likely to request the take of listed species through federal-issued permits. With this, a state that is less committed to conservation will have less policy responsiveness to the ESA, meaning that it will have higher illegal wildlife import percentages in this study. The regression results reflect this by showing a 0.0019% increase in illegal wildlife import percentages within a state for each additional issued permit. Although the focus is on federal-level permits issued towards states, it would be beneficial to explore state-issued permits for citizens in a future analysis to see if the results are also significant.

Differences

Both measures for the role of proprietor (FWS funds) and content-provider (citizen petition) expressed no significant relationship with illegal wildlife imports, nor did they reflect the hypothesized direction of correlation, as the increase of each variable resulted in an increase in illegal wildlife imports. Additionally, the control variable urbanization has a significant negative relationship with illegal wildlife imports, contrary to what was predicted with the model. The differences in what was expected and what resulted must be discussed to better understand the future and applicability of this research's model.

The difference in expected results and actual results for proprietor role was most likely due to the choice of data for the funding indicator. Both CESC and Pittman-Robinson funds require a collaborative effort between the state and federal level ("Federal Aid in Wildlife Restoration Act" 2017). Because of this, it is possible that the data used to indicate proprietor are more reflective of federal commitment than state, resulting in an insignificant effect on the policy responsiveness of the state. However, it is also important to consider that the reasoning behind the significance is due to the fact that funds are not a fully accurate measure of commitment. In her research on federalism, Denise Scheberle writes, "States are clearly pinched for dunging. Although available resources are an issue, however, other measures of agency capacity are strong" (Scheberle 2004). She goes on to explain that adequate staff training and relationships could be a better indicator of a state's relationship with federal policy.

Similar to the proprietor proxy (FWS funds), the insignificance of the content-provider role as indicated by citizen petition most likely resulted from understated federal involvement. Although the independent variable was supposed to be an indicator for citizen and state interest in conservation (or lack there of), it is possible that it was a greater indicator of federal

commitment, as it was reviewed and reported at the federal-level. This is further amplified by background information, such as the Bush administration's top-down approach to managing citizen petitions (Melious 2001).

Urbanization as a control variable had a significant and negative relationship with the dependent variable. As previously stated in ESA Section 2, listed species' habitat was described as at risk of being lost due to "fragmentation, suburban sprawl, energy development, transportation, and infrastructure" ("Critical Habitat" 2017). Because of this, one might suggest that urbanization would be indicative of less commitment to the ESA; however, the opposite is reflected. Illegal wildlife imports lowered with increased urbanization. A potential explanation for this result could be that greater urbanized areas are correlated with an unmeasured indicator for commitment efforts or market patterns. Perhaps areas of higher populations have better resources to commit to the ESA, or markets for illegal wildlife are higher in less populated areas where illegal activities can be better hidden.

Suggestions

This research would benefit from the inclusion of more state-based datasets. Due to time constraints, restrictions with the Freedom of Information Act, and the government shutdown in January 2019, it was not possible to gather state-reported information for variables that would have benefited from it, such as FWS state funds (proprietor role), issued permits (permit authority role), and public land. Additionally, limits in the FOIA prevented the inclusion or an authority construct (potentially indicated by state wildlife employees) would have created a more robust definition of commitment.

Future studies could expand on this work both at a very large scale and very small. For a more comprehensive portrait of illegal wildlife imports, the scope of this research could include all U.S. FWS ports or all 50 states. This study focused specifically on the 18 designated U.S. FWS ports located within 16 states, but there are 37 additional, smaller border ports overseen by U.S. FWS. By including their data, it would be possible to create a more comprehensive understanding of illegal wildlife imports into the country. From here, one could analyze how different types of illegal wildlife imports vary between states, not only postulating as to why that might be as this analysis has done. This would also allow an analysis of regional differences, such as differences between the Eastern and Western United States. In particular, it would be of great interest to study how the role of resource manager varies between these regions, as 47 percent of the West is public land while only 4 percent of the East is (Bui and Sanger-Katz 2016). As well, going much more narrow and performing a case study of a state would be beneficial. This would allow one to trace processes over time in one area, teasing out the theory that drives small-scale shifts.

CONCLUSION

Biological systems are complex. Social and economic systems are equally so. Together, these complexities make up the field of conservation. Because conservation challenges involve such diverse stakeholders, it is necessary that solutions are found not only in the biological sphere, but also in the social and political as well. In 1973, this solution was proposed with the ESA. The ESA was formed from a long and winding history of conservation legislation and state authority debates, a history that is writing itself still to this day.

This analysis chose to analyze the Act and its relationship with states quantitatively. The

study explored the relationship between state's commitment to conservation—as indicated by U.S. FWS lands, funds, issued permits, and citizen petition—and its policy responsiveness of the ESA, as indicated by illegal wildlife percentages. By using Melious' model for partnership federalism found in her work *Enforcing the Endangered Species Act*, it was possible to analyze what actions result in a state successfully responding to the ESA and what don't. Ultimately, commitment to more protected lands through the role of resource manager (p-value of FWS land < 0.03, p-value of urbanization < 0.04) and less approved federal-level "take" permits through the role of permit authority (p-value of issued permits <0.10) had a significant relationship with illegal imports into a state.

The goal of this analysis was to see what was working and what was not at the state-level. While this initial goal remained, the research process additionally brought about creating a comprehensive database for further research on federal-state dynamics and conservation. While there is no one solution, it is evident that there needs to be greater sustained collaboration between the state and federal levels. Simply searching for data for this analysis showed this, as there was significant disorganization and indirect paths at each step. To narrow the gap between state and federal levels there must be mutually agreed upon conservation goals with clear plans utilizing state knowledge and expertise combined with federal support and regulation. If a stronger relationship between state and federal levels is achieved, it is possible that states will be better at implementing federal policies like the ESA, as argued by Denis Scheberle (Scheberle 2004).

In a discussion with a retired U.S. FWS director, the statement "good science drives good action" was spoken ("Interview with ESA Officer" 2018). Hopefully this research will be able to inform state researchers and policymakers, so that they might analyze and adjust indicators of

conservation commitment within their area of influence. If commitment is increased, states can grow in their response to ESA policy, increasing both their abilities to combat illegal wildlife trade and their role in the partnership-federalism dynamic.

References

Annecke, Wendy, and Mmoto Masubelele. "A Review of the Impact of Militarisation: The Case of Rhino Poaching in Kruger National Park, South Africa." *Conservation and Society*, vol. 14, no. 3, 2016, pp. 195–245.

"Annual Report of Lands." *National Wildlife Refuge System*, U.S. Fish & Wildlife Service, 28 Feb. 2018, www.fws.gov/refuges/realty/archives.html.

"APPS Search Database." *Authorizations and Permits for Protected Species*, National Marine Fisheries Service, 15 Nov. 2018, https://apps.nmfs.noaa.gov/index.cfm

Arha, Kaush, and Barton H. Thompson. *The Endangered Species Act and Federalism: Effective Conservation through Greater State Commitment*. Routledge, 2011.

Bradshaw, Halle, and Michael Jenkins. "Interview with ESA Officer." 11 Nov. 2018.

Boersma, P. Dee, et al. "How Good Are Endangered Species Recovery Plans?" *BioScience*, vol. 51, no. 8, Aug. 2001, pp. 643–649.

Bui, Quoctrung, and Margot Sanger-Katz. "Why the Government Owns So Much Land in the West." *NYTimes.com*, The New York Times, 5 Jan. 2016, www.nytimes.com/2016/01/06/upshot/why-the-government-owns-so-much-land-in-the-west.html.

Camacho, Alejandro E., et al. "Assessing State Laws and Resources for Endangered Species Protection." *Environmental Law Reporter*, vol. 47, no. 10, 10 Nov. 2017, pp. 51–59.

"Class of 1967." *U.S. Fish & Wildlife Service - Endangered Species*, U.S. Fish & Wildlife Service, Mar. 2017, www.fws.gov/endangered/class-of-1967/index.html.

"Critical Habitat." *U.S. Fish & Wildlife Service - Endangered Species*, U.S. Fish & Wildlife Service, 19 June 2017, https://www.fws.gov/endangered/esa-library/critical_habitat.pdf

"Designated Ports." *U.S. Fish & Wildlife Service – Office of Law Enforcement*, U.S. Fish & Wildlife Service, 14 Nov. 2017, https://www.fws.gov/le/designated-ports.html

Elmendorf, Christopher S. "State Courts, Citizen Suits, and the Enforcement of Federal Environmental Law by Non-Article III Plaintiffs." *The Yale Law Journal*, vol. 110, no. 6, Apr. 2001, pp. 1003–1044.

"Executive Order - Combating Wildlife Trafficking." *ObamaWhiteHouse.org*, The White House, 1 July 2013, obamawhitehouse.archives.gov/the-press-office/2013/07/01/executive-order-combating-wildlife-trafficking.

"Federal Aid in Wildlife Restoration Act: Pittman-Robertson Act." *Wildlife.org*, The Wildlife Society, July 2017, wildlife.org/wp-content/uploads/2014/11/Policy-Brief_P-R_FINAL.pdf.

"Final Response Dataset (FOIA Request)." *Law Enforcement Management Information System*, U.S. Fish and Wildlife Service - Office of Law Enforcement , 19 Dec. 2017.

"Game-Changing Ivory Ban Takes Effect but Further Efforts Needed to Ensure Long-Term Gains." *Phys.org*, World Wide Fund for Nature, 27 Sept. 2018, phys.org/news/2018-09-game-changing-ivory-effect-efforts-long-term.html.

"Gross Domestic Product by State." *Bureau of Economic Analysis*, U.S. Department of Commerce, 26 Feb. 2019, www.bea.gov/data/gdp/gdp-state.

"Habitat Conservation Plan." *U.S. Fish & Wildlife Service - Endangered Species*, U.S. Fish & Wildlife Service, 6 Dec. 2018, https://www.fws.gov/endangered/what-we-do/hcp-overview.html.

"House Polarization." *Correlates of State Data Line Chart*, Michigan State University - Institute for Public Policy and Social Research, 2016, ippsr.msu.edu/correlates-state-data-line-

chart.

"Land Areas of the National Forest System." *Land Areas of the National Forest System*, USDA Forest Service, 2018, www.fs.fed.us/land/staff/lar-index.shtml.

"Land Resources and Information." *Public Land Statistics*, Bureau of Land Management, 2017, www.blm.gov/about/data/public-land-statistics.

"Leaked Trump Administration Memo: Keep Public in Dark About How Endangered Species Decisions Are Made." *Ecowatch.com*, Center for Biological Diversity, 19 Oct. 2018, www.ecowatch.com/trump-endangered-species-decisions-2613623876.html?fbclid=IwAR2StLMPbnP6ZVTbbBwlj2ZGif3oUmzm3pKg4RkZAL-3zz6HiPrArHKgfu8.

"Listed Species Summary." *Environmental Conservation Online System*, U.S. Fish & Wildlife Service, 16 Mar. 2019, ecos.fws.gov/ecp0/reports/box-score-report.

"Listing a Species as a Threatened or Endangered Species." *U.S. Fish & Wildlife Service - Endangered Species*, U.S. Fish & Wildlife Service, Aug. 2016, https://www.fws.gov/endangered/esa-library/pdf/listing.pdf

"Leaked Trump Administration Memo: Keep Public in Dark About How Endangered Species Decisions Are Made." *EcoWatch.com*, Center for Biological Diversity, 19 Oct. 2018, www.ecowatch.com/trump-endangered-species-decisions-2613623876.html.

Malcolm, Jacob W., and Ya-Wei Li. "Missing, Delayed, and Old: The Status of ESA Recovery Plans." *Wily - Conservation Letters*, 26 Mar. 2018, pp. 1–9.

Nellemann, C., Henriksen, R., Kreilhuber, A., Stewart, D., Kotsovou, M., Raxter, P., Mrema, E., and Barrat, S. (Eds). "The Rise of Environmental Crime – A Growing Threat To Natural Resources Peace, Development And Security." A UNEP- INTERPOL Rapid Response

Assessment. United Nations Environment Programme and RHIPTO Rapid Response–Norwegian Center for Global Analyses, 2016, www.rhipto.org/

"The North American Model of Wildlife Conservation." *The Wildlife Society and The Boone and Crockett Club Technical Review*, vol. 12, no. 4, Dec. 2012, pp. 1–35.

"The Office of Law Enforcement Annual Report." *Law Enforcement Annual Reports*, U.S. Fish and Wildlife Service - Office of Law Enforcement , 20 July 2016, www.fws.gov/le/annual-reports.html.

Melious, Jean "Enforcing the Endangered Species Act Against the States." *William & Mary Environmental Law and Policy Review*, vol. 25, no. 3, ser. 3, 2001, pp. 605–674. *3*.

Parker, Kim, et al. "Urban, Suburban and Rural Residents' Views on Key Social and Political Issues." *Pewsocialtrends.org*, Pew Research Center, 22 May 2018, www.pewsocialtrends.org/2018/05/22/urban-suburban-and-rural-residents-views-on-key-social-and-political-issues/.

"Pro-Environmental Policy." *Follow the Money*, National Institute on Money in Politics, 2019, www.followthemoney.org/our-data/about-our-data.

"Protecting Critical Habitat." *Biologicaldiversity.org*, Center for Biological Diversity, 2012, www.biologicaldiversity.org/programs/biodiversity/endangered_species_act/protecting_critical_habitat/index.html.

"Proposed Rules." *Federal Register Documents*, U.S. Fish & Wildlife Service - Division of Policy, Performance, and Management Programs , 15 Mar. 2019, www.fws.gov/policy/frsystem/default.cfm.

"Realtime NOMINATE Ideology and Related Data." *Voteview: Congressional Roll-Call Votes*, Vote View, 2019, voteview.com/data.

"Recovery Planning and Implementation." *U.S. Fish & Wildlife Service - Endangered Species*, U.S. Fish & Wildlife Service, Feb. 2017, https://www.fws.gov/endangered/esa-library/pdf/RPI-Feb2017.pdf

"Resident Population." *Census*, U.S. Census Bureau, 1 Apr. 2010, www.census.gov/quickfacts/fact/table/US#.

Scheberle, Denise. *Federalism and Environmental Policy*. 2nd ed., Georgetown University Press, 2004.

"Section 7 Consultation." *U.S. Fish & Wildlife Service - Endangered Species*, U.S. Fish & Wildlife Service, 6 Feb. 2019, https://www.fws.gov/midwest/endangered.html

Staletovich, Jenny. "Miami Now Nation's Top Importer of Shark Fins. Many States Have Banned the Product." *MiamiHerald.com*, Miami Herald, 2 May 2018, www.miamiherald.com/news/local/environment/article210157954.html.

United States, Congress, House. United States Code. Title 16, section 1531, Office of the Law Revision Counsel, 7 Jan. 2004, uscode.house.gov.

United States, Congress, House. United States Code. Title 18, section 42, Office of the Law Revision Counsel, 6 Aug. 2004, uscode.house.gov.

"Urban and Rural." *American Community Survey*, U.S. Census Bureau, 2016, www.census.gov/programs-surveys/acs.

"Wildlife Law Enforcement." U.S. Fish & Wildlife Service - Southeast, U.S. Fish & Wildlife Service, 13 June 2017, www.fws.gov/southeast/law-enforcement/.

"World Wildlife Crime Report - Trafficking in Protected Species." *United Nations Office on Drugs and Crime Research*, 2016, pp. 1–99.