

An Abstract of the Final Report of

Elizabeth R. Jackson for the degree of Professional Science Masters in Fisheries and Wildlife Administration, Department of Fisheries, Wildlife, and Conservation Sciences, Oregon State University, presented December 7, 2021.

Title: How Federal Employees Manage the Challenge of Implementing the Endangered Species Act

Primary internship conducted at: United States Fish and Wildlife Service
215 Melody Lane
Wenatchee, WA 98801
via Microsoft Teams

Internship Supervisors: Sierra Franks and Tara Callaway

Secondary internship conducted at: Western Division of the American Fisheries Society
via virtual platforms

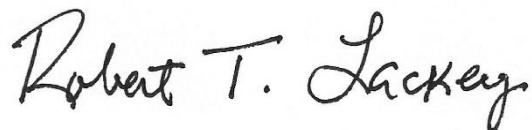
Internship Supervisor: Dr. Todd Pearsons

Tertiary internship conducted at: Washington Department of Fish and Wildlife
via virtual platforms

Internship Supervisor: Wendy Connally

Dates of Internship: June 2020 – September 2021

Abstract approved:



Approved:

Major Professor: Robert T. Lackey

Abstract:

The Endangered Species Act (ESA) grants legal standing for any individual or party willing to challenge a species status finding in court. As a result, the legislation has become a controversial, but powerful tool leveraged in political battles and legal disputes that go far beyond the narrow confines of conservation science. Bureaucrats in charge of implementing the ESA face unrelenting challenges about their recommendations and decisions from political conflict and criticisms of the law itself. At the same time, the list of at-risk species continues to increase. I shadowed professionals from the US Fish and Wildlife Service (FWS), the Western Division of the American Fisheries Society (AFS/WD), and the Washington Department of Fish and Wildlife (WDFW) in virtual meetings. Further, I interviewed them in one-on-one conversations to better understand how ESA bureaucrats deal with the stress of ESA implementation while upholding their civil servant duties to be impartial in their decision-making. I extracted several lessons from these observations about the candid realities of how civil servants manage stressful conflicts when implementing the ESA, all the while under constant scrutiny and political pressures. These lessons include: (1) Federal and state fish and wildlife employees have difficulty compartmentalizing their personal policy and political preferences; (2) FWS staff are uncomfortable providing a finding when there is insufficient data to do a scientifically rigorous job of implementing the law; (3) Federal and state employees welcome participants to share their experiential knowledge, but its use is minimal; (4) FWS employees believe their listing recommendations should be the key policy driver and not court-ordered decisions; (5) The major long-term policy drivers of species distribution or abundance are generally outside the purview of the ESA and this greatly frustrates FWS staff; and (6) Implementation of the ESA in the decision-making process reflects societal values rather than technical science, and ESA bureaucrats are exasperated when their species determinations are not followed. Overall, ESA implementation will continue to be stressful for bureaucrats implementing the law as ongoing litigation and ecological constraints preclude species recovery.

How Federal Employees Manage
the Challenge of Implementing
the Endangered Species Act

by
Elizabeth R. Jackson

A Final Report
submitted to
Oregon State University

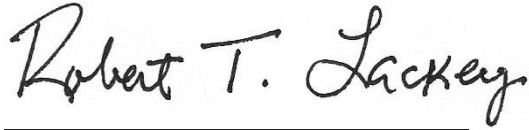
In partial fulfillment of
the requirements for the
degree of

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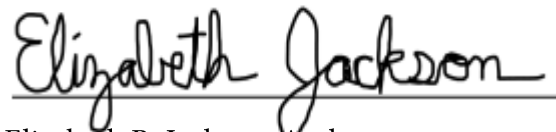
APPROVED:

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Robert T. Lackey, Major Professor

Representing Department of Fisheries, Wildlife, and Conservation Sciences, Oregon State University

I understand that my final report will become part of the permanent collection of Oregon State Universities Libraries. My signature below authorizes release of my final report to any reader upon request.

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Elizabeth R. Jackson, Author

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1. Introduction

Ecological policy issues are not for the intellectually languid as they can be “messy, disappointing, even shocking” (Gvosdev, 2015). Ecological policy issues share problems with overlapping qualities, including complexity, polarization, winners and losers, delayed consequences, decision distortion, national versus regional conflict, and an ambiguous role for science (Gvosdev, 2015; Lackey, 2006; Mills and Clark, 2001). The divisive political challenge comes when deciding which societal preferences are adopted by determining the winners and losers, compromising, and making tradeoffs. The task becomes even more complicated when configuring natural resource achievements on a broad scale (Doremus, 2001a; Salzman and Thompson, 2019). As scientific knowledge increases in the realm of at-risk species and biodiversity, so do the political disputes, controversy, and gridlock for effective decision-making (Sarewitz, 2004). No wonder it can be politically impossible to reach a broad consensus on an ecological policy issue for the most appropriate goals to adopt for a viable solution (Doremus, 2001a; Kemmis, 2002).

The implementation of the Endangered Species Act (ESA), possibly the world’s most powerful environmental legislation, has resulted in vitriolic debates, political contention, social division, and scientific uncertainty (Doremus, 2001a; Schwartz, 2008; Wilhere, 2017). Initially and in the abstract, the ESA had broad bipartisan support, perhaps since the ramifications of this powerful statute were not yet implemented nor appreciated by many, including the members of Congress that passed it (Bogert, 1994; Schwartz, 2008). Over time, the ESA has become the “pit bull” (Bogert, 1994) in the battlegrounds of natural resource controversy and a frequent target for legislative modification (Bogert, 1994; Nie, 2008; Schwartz, 2008).

In this paper, I examine how bureaucrats deal with the challenges of implementing the ESA, a contentious US law. First, I recount the four possible roles of scientists in ecological policy as defined by Pielke (2007) to explain the different roles that scientists can choose to play when their work intersects with policy implementation. Next, I describe my internship, conducted under several organizations, which allowed me to observe how the employees manage the challenge of implementing the ESA. Then, I cover the ESA more in-depth in sections 4-9 to explain why the ESA is such a complex law to enforce. In these sections, I provide detail about what is the ESA, why the law creates so much political conflict, the various challenges facing bureaucrats when implementing the ESA, general criticisms of the law, how the ESA relates to employee “burnout,” and information about the public’s perception of the role of scientists. The core of this paper is chapters 10-16, where I present several lessons learned that were developed

based on events and observations from my internship. Finally, I conclude with the challenges bureaucrats must manage when implementing the ESA.

2. The Four Possible Roles of Scientists In Ecological Policy

How much does society value preserving individual species compared with competing policy priorities? This is a profound and challenging question that society must determine through the political process. To help answer it, some scientists elect themselves as working in a privileged domain known as “science,” or the collection and application of empirical research. While some scientists strive to remain objective, other scientists may provide an “obvious” answer to this challenging question by deciding solely on science instead of society’s preferences (Wilhere, 2012; Zohoor, 2003).

Scientists can play different roles in the decision-making process, thereby altering their influence on the outcome based on the role they choose to adopt. Pielke (2007) challenges society to carefully consider how science can best contribute to a healthy democracy through policymaking. He examines the four roles that scientists can play in policy and politics: Pure Scientist, Science Arbiter, Issue Advocate, or Honest Broker of Policy Alternatives.

The Pure Scientist has no direct connection with decision-makers and does not consider the utility of their research (p. 15). The role of a Pure Scientist is to share basic information about factors involved with a specific subject regardless of what the public does with that information. Such as a researcher that does not consider the utility of their research. The Science Arbiter is another role that can serve as a resource for the public by providing relevant, empirical answers for decision-makers, but without stating their policy preference. The Science Arbiter is like the Pure Scientist since they both serve as information resources and are not concerned with a specific policy decision. Yet, the Pure Scientist has less connection to policy and politics. Both roles may answer scientific inquiries posed by decision-makers by responding with “is” statements instead of “ought” or “should” statements (p. 16-17; Wilhere, 2017).

The Pure Scientist and the Science Arbiter are less connected to the policy realm, while the Issue Advocate and the Honest Broker are more involved. The Issue Advocate seeks to reduce policy alternatives to compel a particular decision by invoking their scientific status to argue for their preferred policy option and take a side in contested political issues (p. 15-16, 18). On the opposite spectrum, the Honest Broker of Policy Alternatives seeks to extend or clarify the scope of choices available to decision-makers by presenting more “forks in the road” (p. 3, 17, 29). The

Honest Broker often is in the form of a formal committee or assessment through the integration of a diversity of perspectives and the presentation of comprehensive policy options (p. 17).

Government employees can pick their scientific role/s when implementing ecological policies. Although all four roles are critical in a well-functioning democracy and the exploration of the scientific enterprise, Pielke (2007) asserts that scientists must choose how their role relates to the decision-making process without playing two roles simultaneously (p. 7). Government employees may interpret the roles and responsibilities of their jobs differently. Pielke (2007) ultimately cautions against political advocacy cloaked in scientific ideas and recommends that scientists consider assuming the role of Honest Broker more often than they currently do to avoid defaulting into stealth policy advocacy (Mills and Clark, 2001; Pielke, 2004; Wilhere, 2017). Pielke's four roles are essential to understand since Government employees are expected to implement laws impartially and avoid allowing their personal policy preferences to influence their work. While theoretically clear-cut, it becomes challenging when employees firmly hold personal political views on the topic.

3. Internship

The Professional Science Master's degree in Fisheries and Wildlife Administration (PSMFWA) provides professional training for students by advancing their knowledge in fish and wildlife biology and ecology while examining natural resources policy and the human dimensions of natural resources management (OSU, 2021). The PSMFWA degree allows students to participate in an intensive internship instead of a thesis by engaging students in real-world work situations (OSU, 2016). After completing an intensive internship, I summarized essential lessons learned for those interested in ESA and its implementation, how the employees implementing ESA handle this challenging task, and offer ideas for improvement.

I followed several government agencies and non-profit organizations during my internship. The primary component involved shadowing the US Fish and Wildlife Service (FWS), specifically the Ecological Services Division (ES) in Washington State. The FWS is focused on aquatic and terrestrial species that are threatened, endangered, or candidates for listing. FWS/ES employees also address management decisions and policies to reduce human activities' impacts on natural resources. These employees provide consultations with Federal agencies (i.e., US Forest Service, the Bonneville Power Administration, the Bureau of Land Reclamation, and the Natural Resources Conservation Service, to ensure the actions carried out

by the other Federal agencies are not likely to jeopardize the continued existence of listed species (FWS, 2017b).

Employees from several subcomponents were shadowed to provide a broader range of ESA implementation perspectives. The major subcomponents included the Washington Division of the American Fisheries Society (AFS/WD) and the Washington Department of Fish and Wildlife (WDFW). The minor subcomponents were with the Upper Columbia Salmon Recovery Board (UCSRB) and the Center Valley Animal Rescue (CVAR), a private sector non-profit organization. My internship mostly took the form of shadowing employees during a virtual or phone meeting/conference due to the COVID-19 pandemic.

My internship provided insights about how individual employees in different organizations address contentious fish and wildlife policy issues, like the ESA, while balancing tradeoffs of competing policy priorities associated with fish and wildlife related conflicts. Ecological, economic, political, and social factors help shape the tradeoffs. Addressing ecological policy tradeoffs is a drawn-out process whose options are typically partially or fully mutually exclusive and take an extensive amount of time, money, and energy from multiple stakeholders and staff, all of whom are skilled advocates (Mills *et al.*, 2001; Pielke, 2007). The diversity of internship organizations taught me lessons about different viewpoints, policies, management goals, and objectives related to the ESA since non-Federal and Federal employees and their respective organizations interact with the FWS to find a viable solution for at-risk fish and wildlife. The ESA decision-making process is very complex, so the internship allowed me to investigate “why” Federal and State employees acted the way they did (Doremus, 2001a; Gvosdev, 2015).

Often, the people implementing the ESA tend, not surprisingly, to have strong personal policy preferences about protecting species. Presumably, it must be challenging to make difficult choices about whether to invoke legal protection based on technical information when a person has firmly held personal values. The Federal employees tasked with implementing the ESA face the daunting task of operating impartially. Many of these same employees have strong personal policy preferences about ESA policy issues or interpret their governmental roles and responsibilities to take immediate action. To investigate this challenge, the internship requirement for the PSMFWA offered by Oregon State University (OSU) allowed me to shadow people who regularly implement aspects of the ESA. I wanted to learn about how they deal with (1) the political controversies and mutually exclusive policy choices of species management and (2) compartmentalizing their personal policy preferences or not.

4. Endangered Species Act of 1973

The goal of the ESA is to recover species to the point that protection under the law is no longer needed. On December 28, 1973, Congress made the political choice to pass the Endangered Species Act (16 USC. § 1531 et seq) with the purpose “to protect and recover imperiled species and the ecosystems upon which they depend.” After this political decision, bureaucrats such as Federal employees, often with scientific training, are entrusted with implementing the ESA. Legislators initially thought the ESA could help answer the ecological question, “how much does society value nature?” (Doremus, 2001a). By December 2021, the FWS had listed 2,363 species worldwide as endangered or threatened, of which 1,669 occur in the United States (FWS, 2021a). Even with thousands of species listed, only 39 species have been delisted due to recovery. The majority (28) of these 39 delisted species have been delisted starting in 2001 (FWS, 2017b). For perspective, Mora *et al.* (2011) estimated there are 8.75 million species on Earth: 2.21 million ocean species and 6.54 million terrestrial species. Employees tasked to implement the ESA lack the capacity to assess or manage many species.

Two Federal departments administer the ESA: the Department of Interior’s (DOI) US Fish and Wildlife Service (FWS) and the National Marine Fisheries Science (NMFS) in the Department of Commerce. The FWS is primarily responsible for terrestrial, avian, and freshwater organisms. The NMFS is responsible for marine species and most anadromous fish species, but not, for example, sea-run coastal cutthroat trout (*Oncorhynchus clarki clarki*). Both organizations must define what a species is, including subspecies or distinct population segment, whether that species is at risk of extinction, and propose to protect them under ESA (Salzman and Thompson, 2019; Schwartz, 2008). The Interior’s FWS is the central administrative unit between the two departments because more listed species fall within their jurisdiction (Salzman and Thompson, 2019).

The definition of a “species” includes subspecies and distinct populations. Thus, a “species” can be any biological species of plant or animal, except pest insects, that is defined more narrowly than at the biological species level, such as subspecies, varieties, and distinct population segments for vertebrates. A “species” that is genetically distinct from other populations is considered a “distinct population segment” (FWS, 2017b). To those not familiar with the nuances of the ESA, this broader definition of “species” (defined *below* the biological species level) may not be apparent, making a more accurate title for the law to be the Endangered *Subspecies* Act. In actuality, the policy goal of the legislation was purposefully written to be vague and required detailed administrative process requirements to implement the law (Salzman and Thompson, 2019).

Species are ESA-listed into a distinct status category. An ESA “species” can be listed into different status categories based on the best available scientific and commercial information. Under the ESA, a “species” (whether a biological species, subspecies, variety, or distinct population segment) may be listed as 1) *endangered* – a species is in danger of extinction throughout all or a significant portion of its range; 2) *threatened* – a species is likely to become endangered within the foreseeable future, or 3) *candidate* – the species warrants listing proposal but is precluded from doing so by higher listing priorities (FWS, 2017b).

Multiple factors are considered when proposing to list a species. The FWS considers five factors when evaluating a species for listing: 1) damage to, or destruction of, a species’ habitat; 2) overutilization of the species for commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) inadequacy of existing protection; and 5) other natural or manmade factors that affect the continued existence of the species (FWS, 2017b). The law does not protect species or ecosystems when populations face little danger of extinction, even if the species population is a fraction of the historical (pre-1850) size (Salzman and Thompson, 2019). ESA is unique from international policies and agreements dealing with at-risk species management because listing decisions are made solely based on the best available scientific and commercial information, such as a species’ biological status and threats to their existence. Social, political, or economic factors are not included because the cost of “protecting” a species is not supposed to be part of the listing process (FWS, 2017a; FWS, 2017b; FWS, 2020b; Nie, 2008).

The FWS and NMFS also enforce the protection of a listed species. The administrative tasks required by the ESA include listing species; designating critical habitat for listed species; the option to develop and implement a recovery plan to downlist or delist the species; and engaging in consultation to prevent “take” that jeopardizes listed species (Schwartz, 2008). “Take” is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct” (FWS, 2017b). Furthermore, in a court ruling, the term “harm” was defined as any act that kills or injures fish or wildlife, including “significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife” (FWS, 2020a). FWS and NMFS must protect threatened and endangered species by prohibiting “take” of listed animals, the trading of listed plants and animals, and by prohibiting Federal actions that are likely to jeopardize the continued existence of listed species or adversely modify designated critical habitats. To further control the “take” of species, permits are required for interstate and international trade for conservation and scientific purposes. Landowners can receive “take” permits through an approved habitat conservation plan (FWS, 2017b).

Implementation of the ESA involves the designation of species' *critical habitat*. Critical habitat is the specific areas within the geographic area occupied (in some instances, not occupied) by the species when it was listed. Critical habitat contains the physical or biological features essential to conserving endangered and threatened species (FWS, 2017a). Critical habitat designations affect only Federal agency actions or federally funded or permitted activities, consider probable economic impacts, and require a public comments process. How much and which habitat to designate as "critical" is defined by FWS employees, but sometimes the definition is delegated down by the Secretary of the Interior, FWS Director, Chief of ES, or is defined by FWS/ES (FWS, 2017a; Salzman and Thompson, 2019).

5. Why does the ESA create so much political conflict?

In 1973, the ESA was passed virtually with bipartisan support. It was not considered major or controversial legislation because its scope and consequences were assumed to be narrow. Congress had intentionally passed a federal mandate that possessed vague or ambiguous statutory language. However, legislators did not know just how controversial and stressful the law would become (Doremus, 2001a; Salzman and Thompson, 2019; Wilhere, 2017). Today, the ESA is perhaps the most potent natural resources law in the United States, possibly the world (Salzman and Thompson, 2019).

Initially, legislators thought that the ESA would be an expression of concern to protect the more charismatic, nationally treasured birds and megafauna against hunters and poachers. For example, the American alligator (*Alligator mississippiensis*), bald eagle (*Haliaeetus leucocephalus*), Florida manatee (*Trichechus manatus*), and grizzly (*Ursus arctos horribilis*) were some of the first ESA-listed species (Doremus, 2001a; Kunich, 1994; Salzman and Thompson, 2019). Over time, the ESA has repeatedly been invoked in legal disputes, particularly to challenge FWS interpretations of the vague or ambiguous statutory language. The continual broadening of the ESA by the courts was an unexpected consequence of the law (Kunich, 1994; Wilhere, 2017). Effectively, anyone can challenge Federal government employees' interpretations of the ESA. Anyone is granted legal standing under the ESA. Thus, litigants do not have to show tangible evidence of "harm" to sue, which is an unusual aspect for a US law (Somach, 1994; Wilhere, 2017).

The judicial branch interprets and thus defines the meaning of environmental laws. Throughout the 1960s and 70s, a suite of environmental laws were passed, beginning with the Wilderness Act in 1964. Shortly after passage of this novel environmental law, the case *Scenic*

Hudson Preservation Conference v. Federal Power Commission (1965) marked the first example of granting an environmental group the ability to bring a lawsuit before a court through legal “standing” based on aesthetic or environmental benefits. This lawsuit opened the door for governmental agency decisions to be challenged by environmental groups through citizen suits. Thus, the citizen suits essentially became a catalyst for other action suits, like those initiated from interpreting the ESA. The court’s decision established a legal roadmap for similar groups to take legal action to protect the public interest (Salzman and Thompson, 2019).

In another hearing, Hiram Hill, a second-year law student at the University of Tennessee, and a local environmental group sued under the ESA’s citizen suit provision, arguing that the Tennessee Valley Authority (TVA) violated Section 7(a)(2) of the ESA (Salzman and Thompson, 2019). The plaintiffs disputed that completing the \$80 million Tellico Dam would destroy critical habitat and eradicate the known population of the recently listed endangered snail darter (*Percina tanasi*) (Salzman and Thompson, 2019; *TVA v. Hill*, 1978). Eventually, the court ruled in favor of Hill *et al.*, thus blocking dam completion. *TVA v. Hill* (1978) is important because it was the court’s first interpretation of the ESA to hold that endangered species would be afforded the highest policy making priority, no matter the cost. Since this case, FWS determinations have become a common occurrence in ESA implementation where interpretation of the vague language is the primary focus. ESA actions continue to be challenged by many individuals and organizations besides environmental groups (Salzman and Thompson, 2019; Wilhere, 2017).

As a practical matter, anyone can interpret the vague ESA language to comport with their own values to support their political objectives and preferred policy outcomes. Salzman and Thompson (2019) proclaim that the ESA is the most robust federal protection against species loss because Congress intended to prioritize endangered species, or species in danger of extinction. Through this intent, the ESA has become a federal law with “real teeth” in protecting natural resources. The ESA continues to be the most potent source to reference for individuals or organizations promoting a political or policy preference to protect biological subspecies and full species (Salzman and Thompson, 2019). In turn, the implementation of ESA shapes natural resource policy in the United States as other policy priorities do not receive this level of legal protection (Nie, 2008; Salzman and Thompson, 2019).

Due to the vague language, the ESA has caused many contentious lawsuits where people across the ideological spectrum commonly dispute the definition of the ESA terms and the scientific or technical information based on their values and policy preference (Lackey, 2004; Salzman and Thompson, 2019; Stone, 1972; Wolters and Steel, 2017). As a result, *scientific*

arguments used to interpret the ESA can implicitly or explicitly be equated to political opinions, thereby skewing the view of how science and scientists support policy (Pielke, 2004).

Government employees experience political pressure when implementing the ESA. Human actions are the primary cause of the current wave of species extinctions (Doremus and Pagel, 2001). Any remaining habitat available for the species in question may be reduced and fragmented by habitat alteration, the introduction of non-indigenous species, excess harvest levels, urban expansion, and increased agriculture. Bureaucrats responsible for implementing the ESA are recipients of significant political pressure from all parties to list, or not list, a species for the sake of that party's policy preference (Salzman and Thompson, 2019). When interpreting the ESA, these employees must constantly deal with this pressure while providing objective, policy-neutral information (Wilhere, 2017).

As a statutory requirement in the ESA, FWS employees are tasked with collecting the "best available science" before making a listing decision. If a Federal employee does not compartmentalize their personal policy and political preferences, whether intentionally or unintentionally, they may seek subjective science from advocacy organizations disguised as objective to support the FWS employee's political agenda (Pielke, 2004; Wilhere, 2017). "Stealth advocacy" occurs when the ESA bureaucrats (or anyone for that matter) subtly skew the science used by interpreting it to favor their personal policy preference or that of the Government (Pielke, 2004; Wilhere, 2017). Consequently, implementing the ESA is an enormous and stressful duty for the responsible Federal employees.

6. Challenges with implementing the Endangered Species Act

Constrained funding presents challenges when implementing the ESA. As with every Federal law, the ESA can only be implemented based on funding provided by Congress. As one may expect, funding levels are less than the amount requested by FWS, and, as such, FWS leadership makes decisions about which ESA activities to implement (FWS, 2021b). While this is true for all agencies involved in the ESA, the listing activities that are not funded are apparent to at least "interested policy advocates." For instance, limited funding has forced agencies to allocate resources among competing needs, thereby creating a backlog of species in need of listing, who are relegated into a "warranted but precluded" finding (Greenwald *et al.*, 2019; Schwartz, 2008). In general, incomplete or inefficient ESA implementation represents a response to competing priorities for taxpayer dollars, the public's lack of interest to increase ESA implementation effort, and the need for the ESA administrators to prioritize their resources (Schwartz, 2008).

FWS/ES employees have a significant role in ESA interpretation. Although the words in the ESA may sound straightforward, the mandate is very general, probably more so than other US legislation. The lack of definitions throughout the ESA makes imprecise terms controversial and conflicting (Salzman and Thompson, 2019; Wilhere, 2017). The FWS and FWS/ES are delegated to define the ambiguous terms of the ESA (Wilhere, 2017). Bureaucrats required to interpret the ESA language are now making a non-scientific decision due to the necessarily or intentionally vague language found in the law (Walker, 2003). These employees and most scientists have no experience in statutory interpretation, yet their responsibilities to interpret a statute with vague and ambiguous language can promote the scientist's preferred policy, including the preferred interpretation of ESA (Somach, 1994; Wilhere, 2017).

The courts have a more significant role in ESA interpretation than FWS employees. Those adversely affected by the ESA listing result will likely use legal recourse to appeal the decision. Hence, it is not surprising that many, if not most, prominent bureaucratic choices will be challenged politically and judicially (Doremus, 2001b; Salzman and Thompson, 2019). Appropriately, judges on Federal courts and lawyers in government agencies are relied on to be impartial and objective when interpreting statutory language that contains scientific words or concepts (Wilhere, 2017). Effectively, the courts define the terms in the law, such as "species," "subspecies," "distinct population segment," and "significant portion of its range" (Gleaves *et al.*, 1992).

When implementing the law, frequent intervention and influence by court decisions can be a stressful challenge for ESA bureaucrats. The ESA is implemented based on the best scientific information "available." Thus, additional scientific research cannot be contributed before determining the listing of a species (Salzman and Thompson, 2019; Wilhere, 2017). The courts tend to uphold this process to not engage in new research; however, efforts by state and local government to protect an at-risk species to reduce the chances of a listing can be considered (Salzman and Thompson, 2019). In another example, according to Salzman and Thompson (2019), some 250 species were once kept on the candidate species list until an unreferenced lawsuit settlement, possibly a "sue and settle" or "friendly" lawsuit facilitated discretely by the FWS, forced this number to be reduced to about 25 species. The FWS/ES had to appropriate their priorities and the associated funding to meet the new directive requirements, therefore reducing recovery effort for species not on the candidate list (Hayes, 2015; Salzman and Thompson, 2019).

Government intervention is another challenge of implementing the ESA. Intervention by Congress can also influence ESA implementation. For example, a moratorium was imposed on new listings for about a year in 1995 (Salzman and Thompson, 2019). Such decisions from the

courts and Congress will profoundly influence employee workloads and priorities. At least some of these interventions are discretely facilitated by the FWS.

7. Criticisms of the Endangered Species Act

Implementation of the ESA forces society to ask, “how much, both in monetary and nonmonetary terms, are the endangered species worth to humans?” and “how much should society be willing to spend to protect and restore endangered species?” (Salzman and Thompson, 2019). The answer to these questions is complex, contentious, and is not readily measurable. Opponents to a policy decision often argue they should not have to pay for these societal policy choices, thus “policy losers” attack the ESA for restricting new land development, angering property owners and local governments, constraining the construction of dams and roads, as well as the harvest of natural resources (Salzman and Thompson, 2019).

Under the ESA, all Federal agencies must consult with the FWS or NMFS before taking any action that might affect an at-risk species without considering the cost. Presumably, “The plain intent of Congress in enacting [the ESA] was to halt and reverse the trend towards species extinction, whatever the cost” (Nie, 2008) and, according to the Supreme Court, “Congress intended endangered species to be afforded highest priorities” (*TVA v. Hill*, 1978). Because of this, many critics of the ESA feel that the law restricts land and water use without compensation.

These criticisms fall into several general categories (Salzman and Thompson, 2019). First, the ESA may persuade landowners to alter species habitat (i.e., their land) to make it unappealing to the listed species, commonly known as the “Three-S Syndrome” or “shoot, shovel, and shut up.” The Three-S Syndrome may result when landowners feel prevented from using their property without adequate compensation. In the example of the Northern spotted owl (*Strix occidentalis caurina*), timber was harvested before reaching a maturity that was attractive to spotted owls for nesting, roosting, and foraging (Andre and Velasquez, 2015; Little, 2012).

Second, a limited group is forced to “bear the burden” of protecting ESA-listed species, resulting in incentives to avoid helping the species at all. Critics argue that everyone should contribute to preserving ESA-listed species, for example, by purchasing public lands for preservation (Salzman and Thompson, 2019).

Third, some critics argue that the costs to society outweigh the value of the protected species as intangible benefits are really in the eye of the beholder. This political position follows from the competing perspectives about how much a species is worth to society and who bears the cost (Salzman and Thompson, 2019).

Some landowners, who are potentially at risk of owning ESA suitable habitat, fear the ESA restricts land use. A “no surprises policy” is one attempt to provide landowners with greater certainty that the Government will pay for unforeseen circumstances, such as new habitat or actions needed, if they receive an incidental take permit. Regardless, the FWS can still revoke a permit if unforeseen circumstances cannot avert jeopardy. Such assurances do not always prevent dissatisfied and influential non-governmental environmental organizations from pursuing a legal challenge (Salzman and Thompson, 2019).

Essentially and overall, lawsuits fundamentally are driving ESA implementation since the vagueness of the ESA language gives anyone legal standing to sue over ESA actions. These lawsuits, Congressional legislation, and political pressures have allowed interest groups and property owners to force the FWS to implement the ESA in ways that were not prioritized or preferred by agency staff or leadership, thus the ESA continues to prevent routine give and take tradeoffs that are typical when implementing United States laws (Salzman and Thompson, 2019).

8. Endangered Species Act Implementation and Employee “Burnout”

Not surprisingly, bureaucrats implementing the ESA are susceptible to burnout. Burnout can happen at any job and level in natural resource fields, especially those involving highly controversial laws or regulations. The World Health Organization describes burnout as “a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed” (Doerr, 2021). The ESA remains highly controversial as Congress regularly debates proposals that threaten modifications to the law to restrict land and water use. Besides government intervention, large workloads, strict deadlines, the ubiquitous threat of lawsuits, and an ever-growing, unending list of at-risk species that cannot be credibly assessed can be very burdensome tasks to take on in a job (Doremus and Pagel, 2001; Salzman and Thompson, 2019).

ESA bureaucrats regularly encounter criticisms about the law. The ESA is constantly questioned whether it actually works to protect species from extinction from all sides of the political world. Some believe that it is not enforced aggressively enough, while others think ESA is a gross overreach by the Federal Government (Salzman and Thompson, 2019). Such directed criticisms are stressful to hear regularly and can make employees feel their role is irrelevant or their job performance is lacking.

The lack of progress to recovery (e.g., delist) species and the responsibility to define ESA language can also lead to FWS employees “burning out” while working on ESA and ESA-related

responsibilities for extensive periods. For example, 85 species had been “delisted” by late 2018, with some of the delistings met with a court challenge. According to Salzman and Thompson (2019), “Eleven of these species were delisted because they are now extinct. Another 20 were delisted because of taxonomic revisions, new information, errors in the initial listing, or changes in the ESA.” It is important to note that defining taxonomic classifications, like distinct population segments or even a full biological species, involves subjective judgment from those involved leading to different answers depending on which expert is asked (Salzman and Thompson, 2019; Wilhere, 2017). Between the FWS and NMFS, only about 50 species can be deemed “success stories,” which often include the more charismatic species: American alligator, bald eagle, gray wolf (*Canis lupus*), grizzly, peregrine falcon (*Falco peregrinus*), brown pelican (*Pelecanus occidentalis*), and gray whale (*Eschrichtius robustus*) (Salzman and Thompson, 2019). Eventually, some FWS employees burn out as they are often required to “do more with less” and may succumb to the feelings of, “Nothing I do matters. Why bother? or I cannot do the job anyways” (Doerr, 2021; Salzman and Thompson, 2019).

9. The Public’s Perception of Scientists

Society’s worldviews are constantly evolving, thereby influencing the role of science in natural resource management (Kemmis, 2002; Mills and Clark, 2001). For example, United States policy, such as the ESA, is no longer solely driven by Federal bureaucrats, but instead can be heavily influenced by interest groups, lobbies, alliance commitments, and court adjudications. FWS and FWS/ES staff are merely one player in the contentious debate (Gvosdev, 2015).

Scientists play a specific role in the decision-making process. The role of science in the decision-making process has become an argument about who gets to speak in public on such issues as controversial species (Kloor, 2017). In the policy realm, science that is often vehemently debated serves as a surrogate for the unwillingness or inability of decision-makers to adjudicate unpleasant political tradeoffs (Gvosdev, 2015; Hulme, 2009). Contentious fish and wildlife policy issues force scientists and bureaucrats to examine how to reconcile agenda-driven science with a policy-neutral perspective. During the decision-making process, civil servant employees on the frontlines of ESA implementation can become proxies for political battles, whether knowingly or not, to push the law in directions that may not be impartial or what Congress intended (Hulme, 2009).

Typically, the role of a civil servant is assumed to be an impartial one. Thus, the challenge for scientists and bureaucrats whose role in implementing the ESA is to be impartial while being

“clear, candid, and brutally frank” about the losses, costs, and difficult choices (Lackey, 2004, Pielke, 2007). Scientists and Federal bureaucrats play a unique role in the decision-making process since it is their job to cite objective, policy-neutral science to help lay out the various options and by realistically and impartially describing the consequences of the tradeoffs of competing values (Mills and Clark, 2001; Pielke, 2007; Scott *et al.*, 2007; Wilhere, 2017). By doing so, a suite of alternatives can be discussed openly through policy-neutral and policy-relevant information to preserve the credibility of science instead of being substituted by a personal policy preference (Mills and Clark, 2001; Pielke, 2007; Scott *et al.*, 2007). Civil servants implementing the ESA are often under tight supervision by Regional staff supervisors and/or Headquarters to ensure the law is applied fairly and consistently as it is written and how the courts have interpreted it.

Scientists can, and do, disagree on their role in public policy and policy advocacy (Scott *et al.*, 2007). Other professionals may not welcome policy-neutral science in a values-driven bureaucracy (McShane *et al.*, 2010; Pielke, 2007). Some scientists may believe that normatively based science-based concepts are appropriate in their trade, particularly if the scientists are paid to be policy advocates or have firmly held personal policy preferences, and the tactic of using “advocacy masquerading as science” can be a successful method for getting policy preference adopted (Mills *et al.*, 2001; Pielke, 2004; Scott *et al.*, 2007). However, such stealth advocacy contributes to the politicization of science by creating a false impression that one policy or interpretation is backed by science while others are not (Kloor, 2017; Wilhere, 2017). Normative science used in the political process, intentionally or unintentionally, can influence political decision-making where highly loaded terms affect perceptions of the public, policy officials, and scientists (Scott *et al.*, 2007; Wilhere, 2017).

Normative science can take different forms. For example, normative science includes scientific results published under a pessimistic or optimistic sentiment to either sell or not sell a policy preference (Kloor, 2017; Metz and Weigel, 2013). Normative science commonly involves the use of value-laden terms such as degradation, improvement, good, poor, impact, alien, and invasive instead of more impartial science terminology like alternation, change, increase, or decrease to show greater transparency while making realistic predictions of the future (Lackey, 2004; Scott *et al.*, 2007).

Every policy position pitched by anyone can be packaged such that science appears to advance an agenda and sell a policy preference. Therefore, research and science are often viewed as attempts to elicit political or ideological support (Kloor, 2017). For example, sharing of research or information, like with groups or organizations that possess a similar view on an issue,

was perceived by long-term members of the Society for Conservation Biology, The Wildlife Society, and the American Fisheries Society as a form of advocacy while sharing results with all interested parties was not (Scott and Rachlow, 2011). Indeed, information that is more widely distributed to every interested party can help shape policy and promote science in policy development. Selective sharing erodes the public's confidence in scientists, although it promotes a particular policy preference (Funk *et al.*, 2019; Scott and Rachlow, 2011).

The public's trust in scientists varies. A poll conducted by Funk *et al.* (2019) found that roughly 44% of U.S. adults say scientists' judgments are just as likely to be biased as other people's, while 55% believe scientists' judgments are based solely on facts. In addition, people with more familiarity and factual knowledge of science are more likely to trust scientists to provide fair and accurate information (Funk *et al.*, 2019). Further, this poll also found that roughly a third of Americans say environmental research scientists can be relied on to provide fair and accurate information about their research all or most of the time. Approximately 35% of Americans say that environmental researchers are not transparent enough (Funk *et al.*, 2019). Funk *et al.* (2019) found that a majority of Americans have positive views of environmental scientists. Still, trust in the objectivity of environmental scientists varies by politics, likely because more scientists (in the United States) identify as a Democrat rather than Republican. Wolters and Steel (2017) noted that the "trust in science has declined for conservatives (Republicans / lean Republican) but has remained relatively static for liberals (Democrats / lean Democrat) and moderates (independents who identify with each party)" since the 1970s. One result is the partisan "war on science" and stalemated decision-making as Americans are "discerning about which scientists and scientific knowledge to view as both credible and accurate."

Scientists cannot recommend a solution without giving or assuming a value statement. The poll results published by Funk *et al.* (2019) demonstrate that any side in a contentious species issue may result in "scientists for hire" to put their conclusions in the record. The public is wise to the image of "science for sale," and this insight creates deep cynicism about scientists and erodes the public's confidence in the decision-making process. In very general terms, the public has difficulty determining if trust in the scientific experts is warranted if they detect value judgments masquerading as science (Kemmis, 2002).

Another context is essential to evaluate in assessing the role of science: ESA guidance is nebulous. The debate about policy advocacy by scientists applies to statutory interpretation as it will entail policy choices. For example, the ESA does not set a deadline for the FWS to prepare a recovery plan after a species has been listed as endangered or threatened. The FWS can conclude

that “such a plan will not promote the conservation of the species” and thus delay the preparation of a recovery plan. Also, this decision to delay could be made depending on funding constraints. Thus, implementation of the ESA process to prevent extinction (e.g., developing a plan) is supported in the abstract, while actual species recovery results are not (in other words, the recovery plan does not have to work) (Doremus and Pagel, 2001; Salzman and Thompson, 2019). Moreover, the public, Congress, and Executive branch political appointees tend to favor mammals, birds, and fish as “poster species” over reptiles, amphibians, invertebrates, and plants.

10. Lessons Learned

Recognizing that ESA is bureaucratically challenging to implement, I shadowed a cross-section of primarily government employees who had responsibility for some aspect of ESA. The goal was to identify how these employees manage implementing ESA. The lessons presented were extracted from my analysis of several organizations' administrative and management workings.

To provide a range of perspectives, I shadowed the Ecological Services Division within the US Fish and Wildlife Service (FWS/ES), the Washington Division American Fisheries Society (AFS/WD), the Washington Department of Fish and Wildlife (WDFW), the Upper Columbia Salmon Recovery Board (UCSRB), and the Center Valley Animal Rescue (CVAR). These lessons are not absolutes, nor universally applicable. Instead, they are characteristic of many situations involving ESA policy and decision-making and reflect the challenges of implementing a powerful, yet contentious law.

11. Lesson 1: *Federal and state wildlife employees have difficulty compartmentalizing their personal policy and political preferences.*

During the internship, I evaluated how scientists were able (or not) to keep their personal political preferences from affecting their civil servant duties. It is often assumed that bureaucrats implement US laws fairly and impartially by avoiding adopting their personal policy preferences into their daily tasks (Wilhere, 2017). However, civil servants are sometimes required to use their own judgment while implementing the ESA, thus leading to instances where personal preferences or values may influence the outcome (Gleaves *et al.*, 1992). For example, the definition of “recovery” can vary among individuals, prompting recovery planning teams to fill

this policy void using their own moral judgments for what they feel is an acceptable extinction risk until an operational definition is explicitly by Congress or the courts (Wilhere, 2012).

ESA bureaucrats are tasked with making difficult species management decisions. Not surprisingly, Administrations will use vague or ambiguous statutes to advance their policy goals when an unclear term is interpreted. Thus, effectively, bureaucrats implementing the ESA (FWS/NMFS) may determine, or at least substantially influence, these policy choices (Wilhere, 2017). Science advice can become viewed as expressions of personal policy preferences from those who provided it rather than impartial information when science advisors and bureaucrats incorporate value-laden language to interpret their results (Pielke, 2007; Rice, 2011). In addition, partisan groups can exploit the uncertainties posed by contentious species management, thereby removing the impact of science advice on decision-making (Rice, 2011).

Normative terms can sneak into species recovery. Defining an ecosystem as either “healthy” or “sick” is a matter of how it is perceived through the lens of an individual’s values and policy preferences. Such terms are examples of normative science (i.e., “information developed, presented, or interpreted based on an assumed, usually unstated, preference for a particular policy or class of policy choices”) where values are embedded within science (Lackey, 2004; Pielke, 2004; Scott *et al.*, 2007). Terms like “ecosystem health” remain ambiguous and variable depending on the individual perspective of the “desired” ecological condition. These terms become a metaphor, passed off as policy-neutral science, but based on contested, value-based assumptions where natural and pristine (“healthy”) ecosystems are often the baseline (i.e., preferred) condition (Lackey, 2001; Scott *et al.*, 2007).

Policy guidance provides consistency across the FWS to maintain credibility to administer the law impartially. Of course, in a scientific sense, neither native nor exotic species are inherently preferable when measuring biological diversity. Instead, it is a policy choice, determined by Congress (the people) to include or exclude non-indigenous species (Kloor, 2017; Lackey, 2004). Federal and state employees implementing the ESA to maintain the biodiversity of imperiled species are executing the law as directed by Congress. However, policy guidance from senior leadership is administered to field staff to prevent them from setting policy based on their preferences as ESA bureaucrats are often delegated to use their discretion while implementing the law.

It is plausible that bureaucrats and scientists interpret ESA and act within *their* normative framework, prompting closer oversight and supervision by senior leadership (Sarewitz, 2004). Sarewitz (2004) states that humans only have a partial policy understanding of the world, and “it is in the context of these always-incomplete understandings” that bureaucrats are making their

decisions and judgments. Scientists and civil servants can avoid biases trickling into the decision-making process by utilizing diverse experts in the peer review process; integrating while separating ecological, economic, and social advice; and providing decision support on the risks, costs, and tradeoffs of different types of management error (Rice, 2011). There is always a chance that bureaucrats will act in their personal policy interest despite continuing education training and the best intentions. Strong regional and central office oversight helps to prevent personal policy preferences from influencing the outcome (Tyler, 2013).

ESA bureaucrats frequently discussed court cases related to ESA-listed species during my internship. When talking about new court determination announcements and theorizing about future determinations, most Federal and state staff were openly supportive of a particular policy tradeoff if it resulted in habitat conservation for an at-risk species. In contrast, some others did not express an opinion either way. Such policy support was articulated for sensitive and endangered plants, the endangered Columbia Basin pygmy rabbit (*Brachylagus idahoensis*), Greater sage-grouse (*Centrocercus urophasianus*), wolves (*Canis lupus*), and grizzlies (*Ursus arctos horribilis*).

FWS/ES employees felt they have a sense of purpose. The FWS frequently presents opportunities for personnel to take on new roles and assignments. Morale seemed high among all FWS field staff that were shadowed as they felt they could positively impact species conservation since their position could substantially be what they make of it. Subsequently, they can pursue work and contribute greater support for the species they are most passionate. Therefore, as long as it is within bounds and is consistent with the law, civil servants can advance their personal policy priorities to their managers based on the role they wish to take within the agency. For example, in the earlier years of ESA implementation, plants and non-charismatic species did not receive as much effort for recovery (Doremus, 2001a; Salzman and Thompson, 2019). Today, these species receive greater attention and effort. My observations demonstrated that, to a degree, Federal and staff employees can increase recovery efforts for less charismatic species, such as plants, invertebrates, and insects, by creating working groups and collaborating with other organizations. In addition, FWS employees felt their roles allow them to influence funding, notably where it may be lacking to support recovery efforts for a specific species.

State wildlife divisions are not funded equally and funding differences are related to the perceived political importance of the divisions. State employees expressed great optimism and confidence that at-risk species will be recovered in the future despite having to conserve 117 at-risk species with a limited capacity and a budget allocated based on competing and often mutually exclusive policy choices throughout the state (WDFW, 2021a; WDFW, 2021b). The

Wildlife Diversity Division, the organizational unit that supports non-game species management, including threatened and endangered species recovery and land conservation, has no dedicated funds and acquires funding through multiple state sources. Meanwhile, the Game Division receives guaranteed funding under the Pittman-Robertson Act (TWS, 2017; WDFW, 2021a; WDFW, 2012).

State employees can acquire more funding for their programs while promoting their personal policy and political preferences. State employees recognized the necessity to partner with highly influential non-governmental organizations and maintain good partnerships with private landowners to support and recover “healthy” habitats ideal for the species of interest. Influencers, such as politicians, are potential allies to incentivize to achieve the agency’s mission. The functionality of State Fish and Wildlife is connected to regional work with input gathered about the science and the culture, or what their constituents care about. Therefore, the agency can acquire funding for a specific species if the employee/s push the species as a priority.

Depending on their interests, the same Federal and state employees may elect to join and actively participate in a professional or scientific society. Some members may use their membership in a professional association to advocate for personal policy preferences. Such policy advocacy may be particularly effective because the public generally perceives professional and scientific societies as unbiased sources of objective information and guidance (Wilhere, 2017). Indeed, many of these societies explicitly adhere to advancing conservation policy by providing relevant science and policy recommendations (Scott and Rachlow, 2011).

Professional science societies, such as the Society for Conservation Biology and the American Fisheries Society, have a history of debating whether to advocate or not (Scott and Rachlow, 2011; Wilhere, 2017). During my internship, the AFS/WD, which has members from many Federal and state organizations, had lengthy discussions in several monthly meetings about a request to write a letter of support for a particular ecological policy preference. The AFS/WD already has a step-by-step process to address these types of requests, confirming that such contentious letters of support requests have come through in the past. The AFS/WD was very critical of how the letter was worded to avoid discrediting the organization's credibility. They wrote a “science-supported” letter instead of a “values-driven” one by removing “ought” letter language and replacing it with “is” statements (Pielke, 2007; Wilhere, 2017). The group recognized that the science letter might not carry as much weight as a policy advocacy tool while admitting that their personal policy preferences would benefit fish.

According to the AFS/WD President and Executive Committee, each state Chapter within the AFS/WD did not cohesively support the same position on the contentious issue. This

organizational dynamic indicates that professional and scientific societies may and can decide to play the role of policy advocate even if it is contrary to their own goals (Pielke, 2007; Wilhere, 2017). After much discussion, the members opted for a preferred alternative: submit a data-driven letter from expert/s on the subject to provide technical information on this contentious issue in coordination with other Chapters.

These events brought to light the differences of opinion among AFS members. The AFS/WD wanted to take this opportunity to examine this internal conflict that the preferred policy position differed among the state Chapters and what language to use in the final letter of support (e.g., whether to take an advocacy stance or only provide objective, impartial science). This example highlights the difficulty of determining a broad consensus for a controversial policy because nine representatives across 12 Western US States, Alberta, and British Columbia, had very different ideas for addressing the request and the stance to take.

Suppose a professional and scientific society decides to play the role of policy advocate. In that case, their reputation as a purveyor of high-quality, impartial, scientific information and expertise may be diminished (Wilhere, 2017). The FWS and the public may eventually regard them as another environmental advocacy organization with a political agenda rather than an objective party. Thus, they would unlikely be trusted to provide unbiased, impartial science relevant to listing decisions and species recovery, effectively limiting their contributions to future policies, regulations, or conservation plans (Wilhere, 2017). Ethically, it may well be a conflict of interest when an ESA bureaucrat, tasked with implementing the law fairly and even-handedly, also advocates as a member of a professional or scientific society. Members of professional and scientific societies that are honest and clear about the policy tradeoffs can avoid misleading the public and prevent *policy* choices from being confused with scientific choices (Wilhere, 2012).

12. Lesson 2: U.S. Fish and Wildlife Service staff are uncomfortable providing a finding when there is insufficient data to do a scientifically rigorous job of implementing the law.

Limited data exist for many at-risk species. Under the ESA, the FWS routinely make findings on whether to list a species as threatened or endangered by assessing historical and current populations, the current amount of suitable habitat, the apparent carrying capacity of that suitable habitat, and historic habitat trends using the best “available” science (Brennan *et al.*, 2003). Controversy exists because the ESA allows decisions to be made with limited data and

with what FWS employees consider to be “scientific” data (Lieben, 1997). Freemuth (2010) notes that there are disputes over what constitutes the best available scientific information, while Coffman (2003) asserts “best” is a comparative word, lacking a descriptive definition. Additionally, Coffman (2003) cites a National Wilderness Institute study that found nearly one-third of recovery plans for endangered species had “little to no hard information about the status of listed species.”

Data collected after implementing the 1994 Northwest Forest Plan is considered more credible. In some of my internship observations, the data collected before the 1994 Northwest Forest Plan policy (USFS, 2021), the management response to the controversial recovery of the Northern spotted owl (*Strix occidentalis caurina*), was considered unreliable information or insufficient instead of the best available science. Pre-1994 data was considered to lack scientific quality control, thus this “historical” data was eliminated from contributing to recent management decisions. Instead, post-1994 data was applied in the models while research experts were referred to collect more technical information about the at-risk species under review. This lack of information can be stressful to those on the frontline of implementing the ESA because they may have to defend their recovery plans against the policy “losers” whose scientific experts are well aware of these issues and point out this limited data (Lackey, 2006; Lieben, 1997; Zeigler *et al.*, 2013).

All employees know that data used for at-risk species assessments and decisions will be scrutinized. Bureaucrats implementing the ESA must be willing to conduct extensive outreach to request scientific and commercial data from credible resources, primarily from peer-reviewed journals. Next, they must determine which “scientific” sources are acceptable to use (e.g., retain neutrality). Then, they must defend the validity of their data because it will be heavily scrutinized and questioned across the ideological spectrum (Lackey, 2004; Ruhl, 2008; Salzman and Thompson, 2019; Wilhere, 2017). Good record-keeping of a well-documented rationale for rejecting or accepting a data source and why it is considered the best available science of technical information will help uphold credibility amongst such scrutiny (Brennan *et al.*, 2003; Lieben, 1997).

Policy decisions will often be made regardless of the amount of information available. In several internship observations, during species status assessment meetings, work group members acknowledged that ground-truthing model resiliency units and Habitat Suitability Indexes were not possible due to constrained funding, lack of personnel and resources, yet decision making must proceed even if the species is not fully understood (FWS, 2021b; Tyler, 2013). This decision imperative may lead to bureaucrats and researchers feeling pressured by their supervisors and

decision makers to provide more data, accentuated with either optimistic or pessimistic messaging. Civil servants must develop impartial and credible policy options with the information at hand to assist the decision-making process, even if the information is incomplete and uncertain (Tyler, 2013; Zeigler *et al.*, 2013). Of course, information is always incomplete and uncertain, but FWS employees have a higher threshold of certainty than the public and decision-makers. Intrinsically, such requests can make FWS employees uncomfortable. The lack of information and higher uncertainty results in less credible options and does not represent the full extent of the current conditions for the species under review.

The pressure to produce more information may encourage the politicization of science and is an appeal of the “linear model” (Pielke, 2004). The linear model is science and policy working independently with science characterized as collecting objective knowledge and policy characterized by adjudicating value conflicts (Gustafsson, 2019). Under the linear model, the science or research is completed first to get the facts “right,” followed by a policy debate with scientists suggesting what decision-makers “ought” or “should” value in the decision-making process (Pielke, 2004; Pielke, 2007).

Science can contribute to the decision making process, but science cannot compel a political outcome. The linear model inaccurately characterizes the relation of science and decision making because a policy choice does not miraculously emerge from scientific understanding (Pielke, 2004). Gustafsson (2019) agrees and argues that the distinct separation of science and policy to work independently from one another to produce credible knowledge without subtle influence on policy decisions has yet to be achieved. Instead, the linear relationship between science and policy does not have clear boundaries. Policy choices are not determined by “getting the science right” to reduce the scientific uncertainties and compel everyone to believe it. If it were true, then this unrealistic view about how policy choices are decided would place an even greater burden on the scientific enterprise because of the complexity, contingency, and uncertainty of contentious issues (Hulme, 2009).

My internship observations demonstrated that most government employees upheld the linear model of decision making at least subconsciously. However, the same employees responsible for implementing ESA never have enough data to complete a scientifically rigorous implementation of the law. During my internship, technical meetings and discussions routinely referred to the scarcity of information about a species. In some instances, this limited data availability was implied or taken as a given. In contrast, in others, it was acknowledged by Federal and state staff that adequate funding was needed to support the species being discussed.

Different factors contribute to having limited data for many at-risk species. Groups mentioned insufficient survey access, small population sizes, and limited funding to monitor and coordinate as barriers to acquiring enough data to make the most informed decisions, constantly seeking the “best scientific and commercial data available” since experiential knowledge cannot contribute to species status assessments (Brennan *et al.*, 2003). Such discussions were noted for a variety of species, including bull trout (*Salvelinus confluentus*), Burrington jumping-slug (*Hemphillia burringtoni*), Columbia Basin pygmy rabbit (*Brachylagus idahoensis*), Greater sage-grouse (*Centrocercus urophasianus*) inhabiting Washington State (e.g., evidence to list them as a Distinct Population Segment), Monarch butterfly (*Danaus plexippus*), Ute Lady’s Tresses (*Spiranthes diluvialis*), and the golden (*Castilleja levisecta*) and harsh (*Castilleja hispida*) paintbrushes.

The political world and the scientific world operate on different timescales. Having comprehensive information on a species is unrealistic because species and their ecosystems are inherently complex. Of course, more information can always be acquired about any species, habitat, or ecosystem (Kemmis, 2002; Tyler, 2013). In the political realm, species management decisions cannot be delayed while conducting new research unless tactful political pressure or a court order delays a species listing/delisting decision citing insufficient information as a reason. Policy makers may become frustrated when parties across the ideological spectrum request collecting additional information, for example, in the form of a multi-year research program, before contributing to the decision making process (Tyler, 2013). When a policy decision is needed, there is pressure to make one regardless of the extent of species abundance or trends data available. In effect, for many ESA decisions, researchers and policy implementers cannot seek additional time and funding to conduct research as ESA policy decisions must be made within much shorter timeframes, usually in days or weeks, not months. Although, political pressure or court orders can influence the timeline by altering FWS species priorities (Tyler, 2013).

External factors can and do influence species listing decisions. A listing decision can be forestalled or undermined by stating there is not enough information about an at-risk species to produce a finding (Kemmis, 2002). Some species may go extinct while waiting for protection (Greenwald *et al.*, 2019). Some listed species are subjected to a limited range of recovery actions resulting in a permanent listing status (Kemmis, 2002). Significant political pressure, threatening lawsuits, and unanticipated government intervention may prompt the FWS not to list a species, particularly if the ESA listing results in limiting local development or economic activity (Brennan *et al.*, 2003; Salzman and Thompson, 2019).

The FWS can avoid listing a controversial species. For example, when influenced by substantial pressures, the FWS can conclude that additional information is needed before making a listing decision even though courts do not require “conclusive evidence” for such determinations. Courts resist ordering the FWS to perform additional scientific research as the ESA only considers historical and current data. The law does not require the agency to develop new information before making a listing determination (Brennan *et al.*, 2003; Salzman and Thompson, 2019). A “warranted but precluded” finding can result from the agency having too heavy of a workload to implement the listing, or another way to avoid listing a controversial species, unless a court order moves the species up the priority list (Salzman and Thompson, 2019).

The most controversial species decisions lead to policy “domestication.” Policy domestication occurs when decisions are no longer made or are delayed for divisive and challenging policy issues until either a solution arises or the problem disappears by solving itself (e.g., the species is extirpated) (Lackey *et al.*, 2006). Nonetheless, policy issues remain highly contentious even for at-risk species that have a lot of data because the policy choice always results in a set of winners and losers (Tyler, 2013). The general public tends to feel more affection and responsibility for these favored species of interest, which have typically undergone extensive research. Such highly controversial fisheries and wildlife policy issues can lead to “domesticating” a species decline. Thus, more resources and funding are allocated to species tied up in political controversy to emphasize the need for more research to aid policy decisions. The illusion of substantive action is provided through funding more research or scientific reviews, organizing workshops and stakeholder collaboration, forming more planning teams, and amending current regulations or policies. In cases such as salmon recovery, it is easier to domesticate the salmon decline policy challenge than develop explicit and drastic policies to reverse the decline (Lackey *et al.*, 2006).

13. Lesson 3: Federal and state employees welcome participants to share their experiential knowledge but its use is minimal.

Policies are not decided in isolation. Instead, policy analysis and making consist of complex interactions at local, national, and international scales where scientific evidence is a single component that a policy maker must consider (Tyler, 2013). Science is not always more important than experiential knowledge in the real world, nor is it a form of higher truth as it

cannot answer value questions. Thus, definitive cause-effect scientific predictions of possible decision making outcomes are only one aspect of decision making (Crittenden, 2020; Freemuth, 2010). The unknowns and uncertainties will always be consequences of decision outcome predictions where science can only reduce the uncertainty, not eliminate it (Freemuth, 2010). However, the ESA is unique because science is elevated to a privileged and pivotal role in the decision making process for at-risk species management decisions.

The ESA recognizes peer-reviewed scientific knowledge as the best available science. The ESA has a rigid set of bureaucratic requirements where only foundational, scientific information can be used for species status assessments (SSAs). FWS staff collect and determine the best available science without considering experiential knowledge when developing SSAs (FWS, 2016b). Experiential knowledge is the economic, social, political, and cultural insights gained through experience. Experiential knowledge can be considered for critical habitat designations (FWS, 2017a) and Section 7 consultations (FWS, 2017b). Section 7 consultations require Federal agencies to consult with the FWS and NMFS (for marine and most anadromous species), as appropriate, to “ensure that effects of actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species” (FWS, 2017b).

SSAs are a type of biological risk assessment. Essentially, SSAs are a method to streamline both the biological and policy components of a species listing status. SSAs aid decision-makers that use the best available scientific information to make policy decisions where science becomes the sole factor in the SSA process (FWS, 2017b; Lackey, 2001). Science becomes the sole factor for a policy decision when only SSAs are referenced. Science is necessary for the decision making process, but other factors are considered to make an informed decision since most conflict is over competing values and winners/losers.

Scientists are tasked as the experts for the ESA. Other groups, such as policy makers, civil servants (bureaucrats), and politicians in government, can also possess experiential expertise on an issue, but published peer reviewed articles the very definition of best available science (Tyler, 2013). Unfortunately, not all these published peer reviewed documents retain neutrality. Some may contain subtle personal preferences that go undetected, while other documents explicitly state the author or employer policy preferences. Regardless, ESA civil servants make a concerted effort to select the best available science that does not contain experiential knowledge or personal preferences.

Experiential knowledge can be expressed at meetings. My internship observations demonstrated that ESA bureaucrats in working group meetings, public presentations, and SSA meetings were open and welcoming to receiving experiential knowledge, even though the

application of this information is minimal. On occasion, it was encouraged that members share their anecdotal experiences. This method of allowing participants to express their experiential knowledge seemed to lend itself to additional aspects that could assist species recovery in the future. For example, participants who shared experiential knowledge exhibited a greater feeling of inclusion as their ideas and concerns were validated. This same participant might be more likely to join future group activities if they adjourned feeling as if they were heard.

Although sharing experiential knowledge contributes to group dynamics, this information cannot be used for SSAs. Experiential knowledge can promote group comradery since it involves lighter, more heartfelt discussions about the at-risk species in-between complex and contentious debates. Through outdoor activities such as hunting, fishing, or wildlife viewing, FWS might encourage participants to gain experiential knowledge to help form a universal connection or nostalgia with the species and its habitat. Similarly, conversations involving experiential knowledge may advertently or inadvertently provide ESA implementers with additional contacts who might be able to contribute added best available science to a topic lacking technical expertise (Doremus and Pagel, 2001). In general, many biologists and ecologists are reluctant to speculate beyond their area of technical expertise.

FWS employees excluded experiential knowledge in SSAs. Even though experiential knowledge was a typical conversation topic, FWS employees facilitating SSAs implemented the ESA as the law intended by excluding this knowledge in the threats assessment documents. Occasionally, the FWS employees would, in a respectful manner, gently remind participants that experiential knowledge, although informative, cannot be included in SSAs.

FWS staff must implement the ESA objectively. Policy making is iterative and bureaucrats implementing ESA presumably do so fairly and impartially (Tyler, 2013; Wilhere, 2017). Pielke (2007) recommends that scientists, including bureaucrats, be mindful of their ecological policy administrative role to effectively implement the law without being influenced by their personal policy preferences. In referencing the four possible roles of scientists and the linear model defined in sections 2 and 12, respectively, Pielke (2007) warns that the contemporary linear model creates an incentive for the Pure Scientist and Science Arbiter to slip into “stealth policy advocacy,” whether intentionally or not. Stealth policy advocates are experts who hide their personal policy preferences behind a façade of science. However, scientific information is only one element in a democracy with complex political deliberations. Science has little capacity to reconcile differences in values. Advocates masquerading as scientists attempt to answer these value questions for society (Lackey, 2006; Pielke, 2007).

The stakeholder model presents a suite of decisions and the associated outcomes. It is an alternative to the linear model (facts first, decision second). The stakeholder model holds users of science to have a role in its production and considers how science can be used in decision making to understand the effectiveness of science in policy and politics (Pielke, 2007). ESA bureaucrats that appropriately take on the role of Honest Broker should be able to objectively convey pleasant and unpleasant facts to the public, senior bureaucrats, and elected or appointed officials while being explicit about alternatives where cost is very high and the chance of success for recovery is low (Pielke, 2007). Such an assertion is supported by Scott and Rachlow (2011), who argue that it is irresponsible for scientists and conservation professionals to do nothing to help shape environmental policy. However, conservation professionals can better achieve biodiversity conservation by providing and referencing the best available science that is “policy relevant but not policy prescriptive.”

Policy choices are about tradeoffs. To make effective decisions in implementing ESA, it is essential to include public values explicitly (Freemuth, 2010). To be successful, contemporary species recovery and conservation efforts must balance species needs and societal values (e.g., species existence). For example, salmon restoration presents a suite of alternatives with the “best” practice chosen based on the accepted vision of the restoration objective, or the most politically viable option, where the scientific information does not inherently support any policy option (Lackey, 2004; Wilhere, 2012). The “best” or most effective choices for species recovery may not always be available to or feasible for policy makers, so strategic decision making is used to evaluate the impact of the decision, such as public opinion or potential media response (Gvosdev, 2015). During this process, the “science” can become disputed, with these scientific debates sometimes playing a central role in political battles (Pielke, 2004). Such debates over science are often reflective of a values debate since science is only one component in the decision making process at the policy level (Lackey, 2001; Wilhere, 2012).

Overall, the ESA process and what counts as credible information is extremely prescriptive with minimal flexibility. The explicit rules of the ESA give the law more “teeth” to be legally consequential. At-risk species policies may be much less rigid in agencies other than FWS and WDFW. Under these policies, science plays a crucial, but far more modest role when collaborating recovery efforts (Kemmis, 2002). The Salmon Recovery Funding Board (SRFB) process with the Upper Columbia Salmon Recovery Board (UCSRB) as the Lead Entity is a prime example of how a policy is structured dramatically differently than the ESA. At the UCSRB, environmental actions are determined by a complex array of values (Fleming, 2021) as experiential knowledge contributes to project selection and implementation for salmon recovery.

UCSRB policy is highly flexible in responding to public priorities and interest groups where values and input from the public are essential, and the economic consequences possess more weight than scientific evidence (Tyler, 2013). However, the UCSRB policy has significantly less legal authority than the highly prescriptive ESA, which has clear and largely inflexible rules.

A diversity of community representatives participate in UCSRB efforts. The UCSRB has two Tribal and three local government representatives on the Board, an implementation team, a Regional Technical Team (RTT), three Citizen Advisory Committees (CAC), and several Watershed Action Teams. Projects proposals are evaluated by ranking the technical and socio-economic impacts. The CAC has the final determination of whether to fund the project (UCSRB, 2021).

In contrast to the ESA, the CAC is a grassroots group for bottom-up project implementation. Each of the country-specific groups comprises approximately eight community members of various backgrounds to represent the diverse elements of society, including agriculture, irrigation districts, real estate, local landowners, and non-profits. Of course, maintaining wild salmon is only one of many competing societal priorities (Lackey, 1999). The CAC provides input to help answer difficult questions, such as how important is maintaining wild salmon populations compared to alternative societal priorities.

Tension exists between the RTT and the CAC about the project ranking system due to differing opinions and values about salmon recovery projects. For instance, the RTT wishes to implement the most priorities projects based on scientific evidence. In contrast, the CAC prefers greater community involvement by incorporating experiential and faith-based knowledge into decision making (Pielke, 2007). This tension may be reduced when funding is abundant, but the debate of what are *legitimate* sources of knowledge for at-risk species management decisions will persist. Unlike UCSRB policy, the ESA only recognizes scientific knowledge as a credible source of knowledge.

14. Lesson 4: *U.S. Fish and Wildlife Service employees believe their listing recommendations should be the key policy driver, not court-ordered decisions.*

There are two ways to list a species under the ESA. First, the FWS can investigate a species to list on its own initiative. Second, the public (e.g., an individual or an organization) can

petition the FWS to list a species (FWS, 2016a). The latter has become the more common occurrence in recent ESA implementation (Hayes, 2015) because big environmental non-governmental organizations use this tactic (Salzman and Thompson, 2019). The ESA listing and delisting decisions are not limited to lawsuits by these groups alone, but litigation is often used to achieve their political goals (Nie, 2008).

Court-ordered decisions do substantially impact species recovery and FWS work priorities. A key feature of why the ESA is a powerful tool leveraged in the judicial system is that the ESA allows anyone legal standing, so any individual or group can sue the Federal government in court (Bogert, 1994; Nie, 2008; Schwartz, 2008). Basically, various organizations and entities can sue the FWS involving any species or distinct population segment, effectively compelling the courts to set ESA listing and delisting decision priorities. Such judicial intervention results in the ESA being implemented through court-driven policymaking and no longer through the classic bureaucratically-driven linear model since the courts implicitly approve or deny the political influences in statutory interpretation. These court decisions, including interpreting the meanings of ESA language and definitions, have a profound impact on the fate of at-risk species and the priorities of ESA bureaucrats (Wilhere, 2017).

FWS employees believe their recommendations should be the key policy driver. Not surprisingly, FWS employees feel their decisions should be maintained in the judicial processes because they appropriately selected the “best available science” and provided an adequate rationale. FWS employees were exasperated when the courts redefined ESA language or increased or maintained their workload for the very same species they had been working on for years, unless it helped to realize the employee’s personal policy goals.

FWS employees were disappointed when court determinations overturned FWS recommendations or listing/delisting decisions. According to Salzman and Thompson (2019) and conversations with FWS employees, courts have been reluctant to overturn FWS decisions since the determination requires scientific expertise. FWS employees were discouraged when court decisions go against their findings, given the scrutiny the best available science faces. Further, a single court decision can influence future listing and delisting determinations for that species in that ecosystem.

Eventually, ESA bureaucrats will be guided by a Federal lawyer. According to Wilhere (2017), there have been over 100 cases where the courts have interpreted ESA language. In response to the proceedings, lawyers and judges have become tasked with statutory interpretation of the ESA, with scientists relegated to clarifying technical terms or explaining scientific concepts, instead of providing their own definition. ESA bureaucrats implementing the

law must now understand the interpretation process and their professional responsibility for interpreting the law. ESA bureaucrats must accept that they must collaborate or consult with lawyers to interpret the ESA, except when scientific words or concepts are clearly stated (Wilhere, 2017).

Long-term litigation assignments can result in burnout. Observations in my internship showed that FWS employees dealing with litigation occasionally had to rotate out of these positions to prevent burnout. Litigation work involves strict deadlines and short notifications to prioritize the collection of court-related information. FWS employees can become overstressed and overwhelmed when working on these fast-paced, short notice cases for prolonged periods.

All matters relating to open litigation cases were kept confidential during the internship. Closed-door settlements can contribute to many litigation settlement deals to avoid public scrutiny and having to stay wrapped up in expensive and prolonged litigation (Hayes, 2015; Mernit, 2013; Somach, 1994). Throughout my internship, FWS employees never provided information about closed-door settlements. There are several possible reasons why closed-door settlements were never discussed. First, the personnel may not have been involved in such cases (e.g., no experience). Second, the staff had to uphold a non-disclosure agreement. Third, a closed-door settlement resulted in the employee's personal policy priorities being implemented, thus their discrete involvement was not divulged. Fourth, the employees believe they are the key policy driver and, therefore, they only referenced cases that reflected this idea.

Litigation and appeals influence FWS employee work priorities and may allocate additional funding for high profile cases. A common and extensive topic during meetings was pending court decisions that might redefine ESA language. The determination could result in an increased/decreased workload or countered the employee's own priorities (Salzman and Thompson, 2019; Walker, 2003). Obviously, FWS employees disagreed when external factors had a significant influence on their work priorities, especially after a listing determination had already been made. For example, updates about policy and management challenges for wolves (*Canis lupus*) and grizzlies (*Ursus arctos horribilis*) resulted in lengthy conversations as pending ESA definition changes for these large roaming predators could potentially eliminate FWS consultation requirements. FWS employees were concerned that such drastic alterations to ESA language could lead to adverse outcomes for species recovery. In theory, the courts are tasked with interpreting and defining ESA language impartially, but, perhaps, not surprisingly, it seemed that FWS employees preferred to define the ESA language themselves. Additionally, FWS employees recognized that the workload could not be equally distributed when litigations and high profile species take priority with limited capacity. For example, grizzly biological reports are

carefully worded and scrutinized to prevent future litigation prompting additional time to develop and edit documents that are more subject to litigation and appeals.

The political importance of a species influences FWS employee work priorities. Besides court challenges, highly controversial projects require significant time and money dedicated to public meetings, outreach, and comment reviews. For example, in October 2019, a public meeting was held in Okanogan County. Approximately 500 people attended, with nearly 127,000 public comments received for the Draft North Cascades Grizzly Bear Restoration Plan/ Environmental Impact Statement (DEIS) (Conservation Northwest, 2021). FWS employees seemed agitated when much public attention drastically altered their work priorities. The dedication to high-profile projects prevented them from addressing other species or their previous obligations.

Nonetheless, FWS employees believed it was necessary to address the ever-increasing list of lower priority species, even at a lesser effort level. Supposedly, the ESA is implemented impartially among all listed species, yet petition challenges and court intervention prevent equal implementation efforts (Mernit, 2013). Some FWS staff addressed the lesser priorities species regardless of their instructed work priorities. FWS personnel are required to report conflicts of interest when participating in SSAs and listing decisions. To do so, FWS/ES employees increased their coordination efforts with other staff members by dividing workloads to develop materials for other, less controversial species.

FWS employees answered questions relating to non-Federally listed species differently. FWS employees were split when asked to provide their opinions about court decisions and status reviews for non-Federally listed species, such as the Greater sage-grouse (*Centrocercus urophasianus*). Some staff removed themselves from providing any thoughts on the matter since a third party was dealing with the sage-grouse status review, and FWS was not involved in new litigation related to the grouse. Other personnel were concerned pending court decisions in the latest cases would cause more habitat to be altered because the recovery of this species was a personal policy priority (Roth, 2021). Overall, court intervention, such as forcing FWS to decide if a deadline was missed or receiving new petitions with a long list of species, tended not to be favored by FWS personnel, unless it was a sweetheart lawsuit that assured the realization of the employee's personal policy priorities.

In summary, burnout and collaborating with advocacy organizations are at odds with implementing the ESA impartially. Overall, FWS/ES employees had to remain optimistic and retain a sense of purpose in their positions to influence species recovery positively. Otherwise, ESA bureaucrats could burn out or become too cynical of ESA implementation if they only

stayed assigned to contentious litigation cases. If such a level of fatigue was reached, it could result in biased reviews of species listing status and listing petitions. This risk of personnel becoming frustrated after years of ignoring a particular species cannot be ignored. Further, mounting frustration could provoke FWS employees to affiliate with the very entity that petitions for a species listing (Somach, 1994). In other words, the staff may feel inclined to leak critical information to advocacy organizations that will be used in a “sweetheart lawsuit.” This discrete collaboration was difficult to distinguish during my internship. Still, I discovered that many FWS employees were active members of or affiliated with well-known advocacy organizations that might potentially sue the FWS.

15. Lesson 5: The major long-term policy drivers of species distribution or abundance are generally outside the purview of the ESA and this greatly frustrates U.S. Fish and Wildlife Service staff.

At times, it frustrated FWS employees that essential conservation activities to protect an at-risk species and its habitat were outside ESA implementation's scope. Many policy drivers determine the abundance of at-risk species, but some of the most significant ones (i.e., climate change and the expanding human ecological footprint) are outside the purview of ESA (Ebersole *et al.*, 2020, Ruhl, 2008; Sheridan, 2007). Although some species will thrive under these new conditions, other species with different habitat requirements, narrow physical tolerances, weak adaptive capacity, and limited dispersal capability will be more susceptible to population decline (Ebersole *et al.*, 2020). Including predictions of how at-risk species may respond to altered overall environments and shifting climate could help anticipate a species' future distribution and abundance.

Freemuth (2010) posits that contemporary conservation goals may experience a change in priorities for at-risk species management as the human population and footprint in the western United States continues to expand. The US Census Bureau (2017) projects the 2016 US population to increase by approximately 81 million by 2060. Similarly, the National Research Council (1996) explains that if the Pacific Northwest population of about 14 million in 2000 continued to grow at a rate of 1.9% per year (or the rate it has in the past half-century), then the population of the Pacific Northwest in 2100 would be over 65 million people. That is over four times the population size in 2000. Whether expressly acknowledged or not, society will choose

policy tradeoffs between competing priorities to maintain a relatively small number of at-risk species populations. Aquatic and terrestrial habitats have drastically changed since 1850, the human ecological footprint continues to expand, and human behaviors per capita are not changing (Lackey, 1999; Sheridan, 2007). These are policy choices, whether or not they are acknowledged.

FWS employees viewed climate change as a threat to species recovery and conservation for species adapted to pre 1850 climates and a limited footprint. FWS staff included the potential impacts of climate change when conducting species distribution and abundance evaluations, but climate change was categorized as a broad threat where the predictions are difficult to make, they change depending on the prediction date (e.g., 10 years, 100 years, 1,000 years), and the impacts are lessened through adaptive management. FWS staff acknowledged that ephemeral recovery actions are no longer included in recovery plans to address climate change. Also, climate change will have to recalibrate FWS staff expectations of species recovery as environments are constantly transitioning into new ecosystems, prompting different species adaptation requirements to survive. The employees seemed frustrated that, in the long-term, they cannot account for greater recovery efforts to reduce the risk of extinction from climate change. They expressed a climate change policy implemented by world leaders could drive these out-of-reach species recovery efforts, but the ESA alone cannot (Ruhl, 2008).

The human ecological footprint is rarely, if ever, explicitly considered in discussions since the subject is outside the purview of the ESA. My observations confirmed that FWS employees did their due diligence in collecting technical information from relevant parties about species recovery and conservation and the current range of a species before making listing change recommendations. However, the long-term effect of the growing human ecological footprint was not included, perhaps because it involves uncertain predictions linked to distant prediction dates (usually more than 50 years). Policy-wise, this is neither “good” nor “bad,” but simply “is.”

The nexus of the increasing human ecological footprint and species recovery was discussed when human safety conflicts arose. For example, long debates were focused on how best to manage increasing grizzly attacks where human expansion is rapidly occurring. In contrast, the growing human presence along the rivers in Washington is seldom identified. Instead, such policy decisions apparently default to the organization issuing building permits adjacent to the streams.

ESA bureaucrats were unlikely to acknowledge the growing human ecological footprint as the *primary* factor driving species changes. If they did so, presumably, they would then have to work within the constraints and pressures dictated by the expanding footprint, such as

competition for water resources, timber, and developmental land (Ebersole *et al.*, 2020; Di Marco, 2018; Sheridan, 2007). Such cognitive dissonance to avoid acknowledging the constrained options may mislead the public into a conspiracy of optimism by endorsing false expectations and realities of at-risk species recovery. Presumably, the public expects to receive accurate information about the long-term prospects of species recovery success even if the threats are outside the scope of ESA recovery plans (Mills and Clark, 2001).

Aside from bureaucratic or legal constraints, the individual and collective ecological footprint, including the human population trajectory and climate change, would be considered in any serious discussion about the future of at-risk species to help preserve the credibility of science and scientists (Mills *et al.*, 2001). Otherwise, if these significant, long-term policy drivers are not considered, society may refuse to adopt further species protection measures as the public was not fully informed about the realities of at-risk species recovery. Additionally, society may unexpectedly be impacted by ESA definition changes upheld by the courts and Congress. For instance, “critical habitat” designations must take into consideration “the economic impact, the impact on national security, or any other relevant impact, if the FWS determines that the benefits of excluding it outweigh the benefits of including it, unless failure to designate the area as critical habitat may lead to the extinction of the species” (FWS, 2017a; Ruhl, 2008). Once again, FWS employees face scrutiny in their work as social pressure and court rulings executing ESA goals may revise the critical habitat designated for an at-risk species. For example, courts could rule certain riversides primed for development as critical habitat, in due course affecting at-risk species populations and human lifestyles. Alternatively, courts could have an opposite ruling, resulting in a negative impact on at-risk species recovery. For example, dams providing reliable electricity is a competing policy priority to the survival of an at-risk species.

FWS employees who are frustrated that the crucial long-term policy drivers of species recovery are outside the purview of ESA often expressed the need to amend the ESA for species management at a landscape level. Almost all my internship interactions resulted in this comment where a need exists to shift management strategies from a species-centered to a systems-based approach (Benson, 2012). Although difficult to achieve politically, compromising and aligning management objectives at various levels (local, state, federal, tribal) could overcome institutional barriers between the institutions that manage the competing natural resources within a given geographical area (Ebersole *et al.*, 2020). FWS employees felt they could better account for long-term species recovery, resilience against climate change, and the expanding human ecological footprint if the ESA was rewritten to focus on systems rather than single species. The FWS employees that countered this argument felt a landscape-based approach was highly dependent

on the abundance of public lands available within a FWS Region and could not adequately provide the resources necessary for individual species recovery as ecosystem interactions are complex.

Of course, the conspiracy of optimism does not aid true species recovery, but it does have other effects. Predictions about how climate change and the growing human ecological footprint may impact at-risk species abundance and distribution can proactively inform management about the necessary conditions for a species to sustain their populations, or the species may face an increased risk of extinction over time (Di Marco, 2018). Additionally, these predictions may also reclassify species believed to have lower susceptibility to human expansion and climate change pressures to high-risk species if their risk of extinction is greater than previously thought (Di Marco, 2018). Interestingly, such predictions are not provided to the public so that the average person can understand. Thus, decision-makers and ESA bureaucrats are providing the public with greater optimism of species recovery without recognizing the realities of at-risk species recovery.

Long-term conservation planning is frustrating partly because democracies often have regular changes in policy priorities. According to Metz and Weigel (2013) and Rice (2011), voters prefer a pro-active approach to conservation and believe that such long-term planning has been absent from governmental actions. Elections are relatively frequent, and therefore in electoral campaigns, short-term outcomes are given more weight over more extended duration consequences. For FWS employees, it is frustrating to plan extended conservation and species recovery efforts when newly elected leaders change priorities.

Expansion of the human ecological footprint and population growth are essential factors when evaluating the future of species of concern. Whether acknowledged or not, society currently *makes* choices that address an ever-increasing number of people and their overall footprint. Eventually, if society really wants to reduce the number of at-risk species, drastic behavioral changes are needed to save certain “desirable” species adapted to 1850 climates and a limited footprint (Lackey *et al.*, 2006; Sheridan, 2007). Whether society is willing to embrace these changes is yet to be determined, although such major changes from current lifestyles seem unlikely as most people do not indicate a wish to revert to the former ways of living. Such a policy change would involve moving to population levels of a century or more ago (Lackey *et al.*, 2006).

16. Lesson 6: *Implementation of the ESA in the decision-making process reflects societal values rather than technical science, and ESA bureaucrats are exasperated when their species determinations are not followed.*

At least theoretically, societal values are reflected in ESA implementation because Congress partly selected from among competing *values* to pass the law. ESA bureaucrats implementing the law collect the best available science to determine a species' status (FWS, 2016a). In principle, the science is provided for politicians, policy makers, and the public who will choose which policy tradeoffs, weighed against competing values, will or will not be implemented to recover at-risk species (Mills *et al.*, 2001; Tyler, 2013). The public and policy makers often criticize the ESA for being too inflexible in how the law is implemented since the implementation is primarily based on technical science (Salzman and Thompson, 2019). However, in governance, public policy decisions are made by elected officials, where public opinion is a critical component of the policy process and can directly influence planning decisions (Tyler, 2013).

Implementing the ESA in the decision-making process reflects societal values instead of technical science. My internship observations demonstrated that ESA bureaucrats disagreed when the policy decision deviated from science-based management decisions, particularly if the decision caused the FWS to lose court cases. These employees became disheartened, discouraged, and frustrated when decision-makers did not follow the linear model after they had to endure scrutiny to make their determination. The linear model is science and policy working independently where the policy is determined after the science or research is completed, with scientists recommending what decision-makers “should” value (Gustafsson, 2019; Pielke, 2004; Pielke, 2007).

FWS employees disagreed with management decisions that did not support purely technical science. FWS employees expressed disagreement and discouragement when decision-makers did not follow the technical science for an at-risk species management decision. These attitudes were most prominent for politically-charged species that are frequently in the public spotlight, such as grizzlies and wolves, and for species like bull trout, which have been listed for decades, but the populations show little indication of improving. Minimal emotions were exhibited for species listings determined as “warranted but precluded,” such as the Monarch butterfly. FWS employees are often criticized for this listing determination, especially when high profile species are left in this category indefinitely. Some critics assert that this may indicate that

the FWS may have inappropriately considered political and economic factors to avert public scrutiny (Lieben, 1997).

Societal values influence at-risk species recovery. Society can help make difficult decisions about partially or fully mutually exclusive policy tradeoffs (Pielke, 2009). The public's involvement with implementing ESA policy and regulations informs decision-makers about the recovery and conservation of at-risk species based on societal values and not the values of scientists and bureaucrats (Lackey, 2001; Pielke, 2009). The gap between aspirational goals and actual policy implementation can be small if at-risk species recovery is an important societal value and preference (Pielke, 2009). Unfortunately, this gap often appears to be significant.

Governance can be a messy process. It is up to society to weigh policy choices in the context of prevailing values and preferences to determine species restoration goals by choosing between competing values and priorities (Gvosdev, 2015; Lackey, 1999). US policy, including the ESA, is not always driven by government employees, but instead can be heavily influenced by interest groups, lobbies, alliance commitments, and legal constraints. Indeed, domestic groups regularly pressure government employees to adopt favorable policies while politicians construct coalitions among those groups for power (Gvosdev, 2015).

Different individuals regularly fill government jobs as part of the normal turnover. Further personnel change occurs because elected officials and senior bureaucrats, including appointed officials, change, and these individuals directly influence species recovery and conservation. A newly elected official can create or dissolve departments or reorganize entire agencies, presumably to better reflect the priorities of the President or his appointees. Such major changes in an Administration often reflect a shift in values, thus a different attitude toward ESA implementation for fisheries and wildlife management (Wilhere, 2012). For instance, an elected official tasked to address climate adaptation may prioritize human infrastructure, agricultural needs, energy, and transportation over species conservation if the public has greater support for these values (Ebersole *et al.*, 2020).

Listing determinations for politically-charged species may be driven by “sue and settle” lawsuits. Sue and settle lawsuits are negotiations and settlements behind closed doors, also known as “sweetheart” or “friendly” lawsuits. ESA management efforts are often, but not always, geared toward avoiding lawsuits and public scrutiny of listing decisions rather than building species resilience. The sue and settle lawsuits are an example of political pressure (generated in part by Government employees) influencing the listing or non-listing of species (Benson, 2012; Hayes, 2015; Somach, 1994).

Socially and politically favored species tend to receive more funding. The bald eagle is an iconic species of national pride. In an example provided by Schwartz (2008), the bald eagle remained a high priority species just three years before delisting. These actions demonstrate how societal interests and politics are significant drivers in implementing the ESA compared to scientific considerations, especially when it comes to recovery expenditures. The recovery attention around this species allowed the bald eagle to receive more recovery funds than the cumulative total of the 894 species (67%) with the least amount of funding (Schwartz, 2008).

It is politically challenging to make Federal and state prioritization and funding consistent for environmental actions. Elections lead to regular changes in government priorities based on society's values, also known as responsive government (Wilhere, 2012). This challenge is apparent when "science" is used in policy advocacy. For example, policy advocacy commonly takes the form of "advocacy masquerading as science" (Gvosdev, 2015). Still, Ebersole *et al.* (2020) encourage institutions that manage the natural resources within a given geographical area to find common ground with the alignment and coordination of management objectives to help remove institutional barriers to fulfilling ESA objectives. Additionally, Pielke (2009) supports that although ESA bureaucrats can learn from past policies and implementation efforts, there is merit in trying different approaches to species recovery in diverse areas since no one knows how best to conserve and recover at-risk species and most people are unsatisfied with the number of recovered species since 1973.

Government responding to changing policy priorities was observed during my internship. The FWS was experiencing significant departmental changes and a reorganization process throughout my internship due to a change in the Presidential Administration from the 2016 election. An organizational restructuring had already occurred at the national level, typical with a new political party in control. At the state level, the FWS was in the process of reorganizing workloads based on "ecozones" and a new electronic database system. A common criticism of the ESA is the inconsistent enforcement across FWS Regions, states, and offices. The intention of the reorganization into new ecozones and the addition of more "coordinators" was to add value to FWS field offices for greater consistency and standards across the entire state by increasing team efforts and greater knowledge-sharing statewide.

Opinions about the reorganization process differed among FWS employees. Longer-term FWS employees (e.g., have been with the agency for several decades) had experienced administrative restructurings in the past. These employees felt that with each change, ESA implementation had improved slightly, but the restructuring processes were very time-consuming. Newer employees, meanwhile, expressed optimism about the reorganization to offer

employees more opportunities to diversify their experiences. The polarization in opinions tended to cause the employees to either welcome or disregard their new roles, with some taking new positions that may allow them to shape the progress for specific species based on their personal preferences. In contrast, others were content to have a lesser diversified role.

Implementing ESA policy and regulations is politically complicated and involves making decisions between challenging tradeoffs (Gvosdev, 2015; Mills *et al.*, 2001; Wilhere, 2012). Many players are involved, from Federal bureaucrats to state bureaucrats to special interest groups. Unfortunately, the realities of the messy decision-making process with so many players can potentially undermine confidence in how government functions (Gvosdev, 2015). For example, the Secretary of the Interior is nominally the person in charge of ESA implementation responsibilities delegated down the chain of command (Brennan *et al.*, 2003; Schwartz, 2008). Fundamentally, the ESA is implemented through the best available science, yet political and economic priorities allocate resources to address which species get considered for ESA listing priorities. This process can be frustrating to FWS employees tasked with implementing a law driven by technical science. Consequently, the FWS staff may be under exceptional political pressure to recover and eventually delist ESA-listed species using limited resources and funding in short timeframes (Lieben, 1997; Tyler, 2013).

17. Conclusion

The Endangered Species Act addresses a controversial political issue: what is to be done about at-risk species. Decision-making about a topic as controversial as the ESA is a tumultuous process. It is naive to expect any strategy will be found that satisfies all parties. The ESA continues to be a focal point of conflict and has been mired as a mechanism in political controversy and legal theatre. The political issue is further complicated because the law grants legal standing to anyone without submitting tangible evidence of “harm.” Not surprisingly, the individuals or parties that do not favor the decision outcomes of ESA use the vague and ambiguous language of the law to their advantage by debating the definitions of ESA terms to overturn decisions. ESA bureaucrats on the frontlines of ESA implementation will face stressful work situations and public scrutiny. A personality type that can cope with these circumstances is required to strive in this work environment.

The FWS adopted several measures to prevent ESA scientists from implementing the law based on their personal policy preferences. Still, it is difficult for ESA bureaucrats tasked with

implementing the law to do so objectively when trained in the sciences and not law and policy. Presumably, the ESA is implemented impartially, yet it can be difficult for some ESA scientists to compartmentalize their personal policy preference about the species in review. To ensure impartiality while enforcing the law, ESA bureaucrats must acknowledge conflicts of interest and complete objectivity training annually. Additionally, regional offices provide frequent oversight and direction to halt field office employees from going rogue while implementing the ESA.

ESA bureaucrats seem to believe that the science should be implemented over stakeholder decision-making to successfully recover at-risk species. ESA scientists were increasingly frustrated and discouraged about the realities of recovering at-risk species when social, political, and economic factors influence at-risk species management decisions. Although experiential knowledge is solicited in species review discussions, Federal ESA scientists preferred to be the advisors in the decision-making process, primarily to authorize management that follows the technical science.

Society and policy makers can push for ESA amendments if at-risk species recovery is unsatisfactory. ESA bureaucrats are hesitant to provide a determination about an at-risk species when the science is lacking since it can result in legal challenges, public scrutiny, and creates uncertainty about the species. Similarly, the ESA will likely become increasingly difficult to enforce given the changing climate and expansion of the human ecological footprint in the western United States. Litigation will persist and likely will increase as ecological constraints preclude species recovery. Eventually, policy makers and society will have to decide whether the ESA of 1973 requires modification. For example, the revisions could update the goals, objectives, and language to reflect evolving societal values, or address the major long-term threats counteracting species recovery efforts, such as climate change and the growing human ecological footprint. All such revisions would be highly contentious.

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