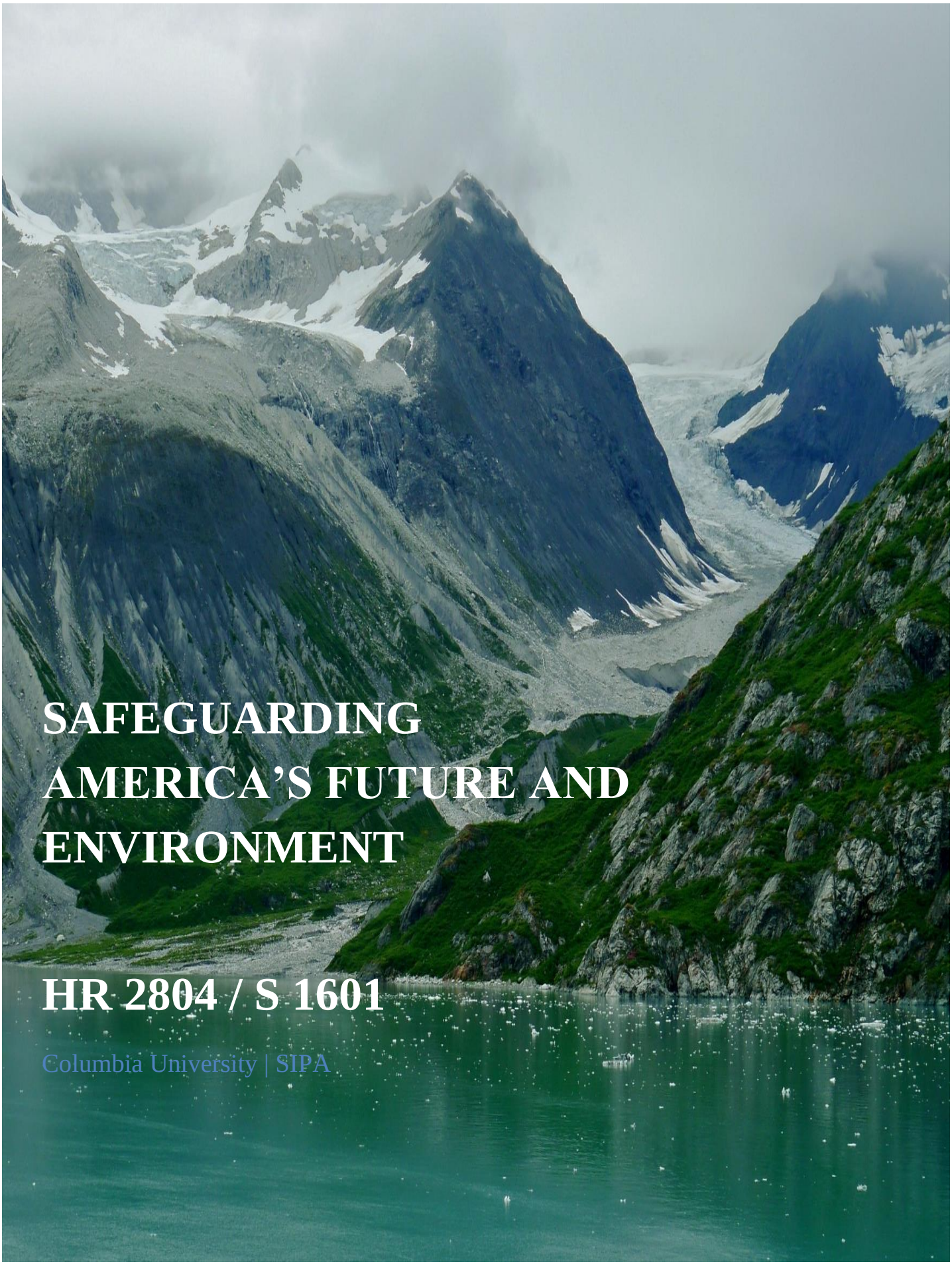

SAFEGUARDING AMERICA'S FUTURE AND ENVIRONMENT

HR 2804 / S 1601

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Acronyms and Abbreviations

DOI – Department of the Interior

EPA – Environmental Protection Agency

FEMA – Federal Emergency Management Agency

FTEs – Full-time Equivalents

FWS – United Stated Fish and Wildlife Service

NOAA – National Oceanic and Atmospheric Administration

NASA – National Aeronautics and Space Administration

SAFE – Safeguarding America's Future and Environment Act, H.R. 2804

Definitions

Adaptation: the process of adjustment to actual or expected climate and the effects of climate change, and with respect to fish, wildlife, and plants, the protection, management, and conservation efforts designed to maintain or enhance the ability of fish, wildlife, and plants to withstand, adjust to, or recover from the effects of extreme weather and climate change (including, where applicable, ocean acidification, drought, flooding, and wildfire).

Center: The term ‘‘Center’’ means the National Climate Change and Wildlife Science Center.

Committee: The term ‘‘Committee’’ means the Advisory Committee on Climate Change and Natural Resource Sciences.

Ecological Processes: The term ‘‘ecological processes’’ means biological, chemical, or physical interaction between the biotic and abiotic components of an ecosystem.

Habitat: The term ‘‘habitat’’ means the physical, chemical, and biological properties that fish, wildlife, or plants use for growth, reproduction, survival, food, water, or cover (whether on land, in water, or in an area or region).

Habitat connectivity: The term ‘‘habitat connectivity’’ means areas that facilitate terrestrial, marine, estuarine, and freshwater fish, wildlife, or plant movement that is necessary.

Indian tribe: The term ‘‘Indian tribe’’ has the meaning given to the term in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b).

National Strategy: The term ‘‘National Strategy’’ means the National Fish, Wildlife, and Plants Climate Adaptation Strategy released March 26, 2013.

Phenology: The study of periodic plant and animal life cycle events and how these are influenced by seasonal and inter-annual variations in climate, as well as habitat factors (such as elevation)

Resilience, resilient: The terms ‘‘resilience’’ and ‘‘resilient’’ mean the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.

State: The term ‘‘State’’ means (A) a State of the United States; (B) the District of Columbia; (C) American Samoa; (D) Guam; (E) the Commonwealth of the Northern 2 Mariana Islands; (F) the Commonwealth of Puerto Rico; and (G) the United States Virgin Islands.

Working Group: The term ‘‘Working Group’’ means the National Fish, Wildlife, and Plants Climate Adaptation Strategy Joint Implementation Working Group.

Executive Summary

Many populations of fish, plants, and wildlife in the United States are being increasingly threatened by global climate change. Rising temperatures, longer droughts, and more frequent storms are devastating habitats and food sources for a substantial number of species. When these species cannot adapt quickly enough to their changing environments, their future resilience is placed in doubt. In turn, this can impact the US economy negatively if the natural benefits these species provide, from water filtration to pollination, are lost as their numbers decline. The Safeguarding America's Future and Environment (SAFE) Act was proposed in 2011 to ensure federal oversight and government efficiency in developing solutions to protect, manage, and conserve the species most vulnerable to climate change.

The SAFE Act is a non-regulatory federal bill that aims to streamline the existing framework for adaptation to climate change by U.S. fish, wildlife, and plant species. If passed, the legislation would convene a Working Group comprised of federal, state, local, and tribal representatives, as well as various non-governmental stakeholders, to implement long-term adaptation solutions. Similarly, the SAFE Act promotes inter-agency federal coordination and data sharing, so as to reduce redundancy and establish best conservation management practices. The National Strategy, referenced within the SAFE Act and released in 2013, details a plan for coordinating local and regional species conservation plans.

Although the SAFE Act has yet to be passed into law by Congress, this report anticipates the need for a sufficient program design to implement the bill's goals in its first year of implementation. The U.S. Fish and Wildlife Service would be largely responsible for overseeing SAFE's implementation at the federal level, and $5.4 million would be allocated from its existing agency budget for this purpose in the first year after passage. Primary goals of this initiative include preliminary conservation functions, enhancing agency capacity, and collecting and disseminating scientific knowledge. Further specific actions would accompany each of these objectives, and progress would be routinely measured and evaluated according to a benchmarked performance management system. Future integration of the SAFE Act, and thus the security of countless U.S. species, would rest on the successful and timely implementation of the program outlined in this report.

1. Introduction

From the mounting threat of sea level rise to the occurrence of extreme weather events, changing climactic patterns have defined the last century. Climate alterations are intensified by the rate at which they are occurring and pose significant risks to the United States. These stressors jeopardize fundamental components of the United States' economy, security, and natural resilience. Just as labor (human capital) and technology provide value to the economy, so do the nation's fish, wildlife, and plants (natural capital). The Safeguarding America's Future and Environment (SAFE) Act highlights climate change as a pressing concern and calls for multi-level, multi-agency governmental collaboration to efficiently protect, manage, and conserve the nation's fish, wildlife, and plant species and the ecosystem services they provide. Climate change is currently threatening many species that cannot adapt as quickly as the climate is changing.

The National Strategy

In 2009, Congress recognized the need to draft a national climate change adaptation strategy for fish, wildlife, and plant species, delegating that responsibility to the White House Council on Environmental Quality (CEQ) and the U.S. Department of the Interior (DOI). Federal, state, and tribal fish and wildlife agencies were tasked with drafting the National Strategy, which was released on March 26, 2013. It identifies specific methods and blueprints for fish, wildlife and plant species to adapt to climate change by increasing resilience to extreme weather events, shifting temperatures, and changing seasonal patterns. It was written by a steering committee that included government representatives from fifteen federal agencies, five state fish and wildlife agencies, and two tribal commissions. Since its release, the U.S. Fish and Wildlife Service (USFWS) has led the implementation of the National Strategy's associated conservation plans and consultations with local conservation managers.

The SAFE Act was proposed to provide a solution for adaptive conservation management. SAFE is a non-regulatory bill designed to employ an integrated national approach for protecting and conserving natural resources by providing federal oversight and coordination, reducing redundancy and costs, and thus increasing government efficiency and effectiveness[1]. Conservation management efforts are currently undertaken by state governments and localities, but often with little input from other branches of government. The SAFE framework would facilitate engagement between all levels of government, with inputs from local, state-level, and tribal authorities, as well as non-governmental stakeholders. Specifically, the SAFE Act requests the organization and prioritization of state and local adaptation plans based upon the National Fish, Wildlife, and Plants Climate Adaptation Strategy, as well as the federal collection and dissemination of scientific data to foster best practices among a network of conservation managers. (See Box 1 for information on "The National Strategy.")

This report will elaborate upon the SAFE Act's scientific necessity and proposed solutions, legislative framework, and a prospective program implementation to accomplish the first-year goals of the bill. The National Strategy identifies eight goals, encompassing both short-term and long-term objectives. As the implementation of the National Strategy is an integral component of the SAFE Act, it will inform the foundation of the program design. For the purposes of this report, however, this design will be limited in scope to the bill's first-year deployment by one federal agency. The US Fish and Wildlife Service has been identified as the model agency to oversee the first-year programming due to their longstanding involvement in federal conservation and leadership in the SAFE Act's and the National Strategy's composition. Because the SAFE Act encompasses ongoing collaboration between federal, state, local, and tribal governments, and other partners, its successful implementation will require cooperation by all parties.

2. Climate Change and Species Adaptation – The Problem

The SAFE Act requires the cooperation and collaboration of diverse scientific bodies, federal agencies, and other partners to incorporate up-to-date analyses into local conservation plans. Objective scientific understanding of the changing climate and its ecological repercussions are critical for the legislation's long-term success.

Climate is defined as the characteristic or average weather of a region. Climate change, then, refers to changes in these characteristics or average weather, such as shifts in average annual rainfall or average temperature of a month or season in a given region. Since global climate is simply the composite of all the regional climates on Earth, global climate change signifies a change in Earth's overall temperature or changes to Earth's regular precipitation patterns. Although Earth's climate is always changing, its climate patterns have historically lasted for thousands of years. More recently, Earth's temperature has risen over one degree Fahrenheit during the last hundred years, which is an unprecedented rate. Many species cannot adapt sufficiently of their own accord to this rate of changing climate. At present, species' resilience to environmental disturbance is being challenged to a point of moderate to extreme stress[2,3]. As global climatic changes are expected to continue to alter ecological processes[2,3], the vitality of whole ecosystems, as well as the services they provide, is being put at risk.

2.1 Disruption of Atmospheric Processes

Although some details are still being debated, the United Nations' Intergovernmental Panel on Climate Change (IPCC) is certain that cumulative emissions of carbon dioxide (CO_2) and other greenhouse gasses have largely determined global mean surface warming since the Industrial era. These gases, notably released as a byproduct of fossil fuel combustion, play a crucial role by trapping a portion of earth's heat energy and preventing it from radiating back into space. As the amount of heat energy trapped in the atmosphere increases, surface temperatures also increase. Average surface temperatures in the United States have increased roughly 1.5 degrees Fahrenheit over the last century[4].

Such a rapid shift in temperature has had profound effects on local and regional climates, primarily through the increased frequency and severity of extreme weather events. This includes floods, hurricanes, seasonal changes, and wildfires, as well as more subtle changes brought on by altered patterns of rainfall, snowfall, and river flow. Rapid accumulation of CO_2 in the atmosphere is also responsible for ocean acidification. Taken together, these and several other phenomena are changing habitat conditions for many species, and introducing new biological, chemical, and physical stresses into their environments.

2.2. Disruption of Ecological and Biological Processes

Fish, wildlife, and plants experience a natural resilience threshold to environmental disturbances. For example, red squirrels, native to coniferous forests throughout the United States, naturally feed on seeds and cones of evergreen trees; yet, due to their natural food source depleting, they tailor their diet to consume whatever is available, such as bird eggs, fruit, and berries[4]. Behavior modifications like these are generally referred to as adaptations and are essential to the survival of a given species or population. However, some species' adaptation abilities cannot keep pace with their changing climate. For example, the Oyster Mussel, native to Tennessee's Cumberland River, has experienced an 80% decline in population over the last 25 to 50 years, creating the risk that populations of this species may collapse within three generations. The distribution of Oyster Mussels has declined for many reasons including, but not limited to, increased water temperatures, lack of oxygen in the water, host fish abundance, and erosion of the river bank; these have interfered with the adhesive properties of rocks in the river, where mussels

inhabit[5]. Rapidly changing climatic conditions can diminish what habitat remains for the recovery of this species, and many others that face increased threats.

Other disrupted biological processes include phenological changes, or shifts in the timing of fish, wildlife, and plants' natural cycles. In plants, warming temperatures can trigger early blooming. This could misalign with pollinators' seasonal cycles and ultimately result in reduced seed dispersal. Similarly, many animals base their mating and breeding behaviors on seasonal patterns. If seasonal conditions occur in altered patterns due to the changing climate, offspring can be born without adequate food sources in their surrounding environment. Another critical threat ecosystems face in the presence of rapidly changing climate patterns is the decimation of keystone species. These unique species serve a disproportionately significant role within their ecosystem. A decline in keystone species typically results in a domino effect that causes declines among other species, and ultimately, the deterioration of an entire ecosystem. Keystone species represent a significant example of the ways in which ecosystems are interdependent and how the stress of one species can be amplified to influence the economic, aesthetic, and cultural services and benefits an ecosystem provides.

2.3. Biodiversity and the Implications of Biodiversity Loss

Biodiversity (or biological diversity) is the variety of life on Earth. This definition includes all living things and the ways they interact with each other and their environment, and is categorized into three levels. The first level incorporates genetic diversity, which constitutes the variety of genes in individual plants, animals, and microorganisms. The second level, species diversity, addresses the variety of species within an ecosystem. The third level is ecosystem diversity, or the variety of biological processes, habitats, and ecological communities.

Biologically diverse, or species-rich, ecosystems provide crucial services to humans, commonly referred to as 'ecosystem services.' These services include the economic, social, and cultural benefits that humans gain from nature such as raw materials, food, water, crop pollination, medicine, water and air filtration, recreation, and aesthetic beauty. In situations where species' resilience is lost or extremely stressed, the encompassing ecosystem suffers a loss in its diversity of species. This loss is compounded when an ecosystem's populations are dramatically reduced by, for example, one or more severe weather events. When a high percentage of individuals is lost, the degree and speed with which the population can recover declines as remaining organisms are left with fewer gene variants to protect them and their offspring from disease and environmental stress. In addition, survivor populations are more susceptible to predation, habitat loss, food scarcity and other detrimental factors, creating a feedback mechanism for the population's decline[3,4,6].

3. Political Analysis

The SAFE Act was first proposed in 2011 by Sen. Sheldon Whitehouse (D-RI), who was concerned with the harmful impact of rising coastlines and ocean temperatures on the commercial fishing industry in his home state of Rhode Island. The bill has been introduced in Congress three times from 2011 to 2015 without passage, and is unlikely to pass in its current form. Opposition stems from the unwillingness of some members of Congress to recognize the existence and/or consequences of global warming, as well as a prevailing aversion towards government intervention. Congressional support for SAFE is generally split along party lines, and passage of the bill would require a major shift in the political climate. Recently, non-governmental organizations and industry lobbying groups have lined up on both sides of the issue to either support or oppose the bill's passage.

3.1. Legislative History

Having been previously referred to several subcommittees in both the Senate and the House of Representatives, the SAFE Act was subject to a Congressional hearing in 2013. In it, members of Congress questioned representatives of the Environmental Protection Agency and the U.S. Fish and Wildlife Service to assess the impact and cost of the proposed legislation. Though the bill was referred to more congressional subcommittees for further review in both the Senate and House, it ultimately expired in 2013 without once being brought to the floor for a vote. Sen. Whitehouse and House Rep. Matthew Cartwright (D-PA) organized a similar push for the SAFE Act again in 2015, but as of the date of this report's publication, the bill has been effectively tabled for the current legislative session.

3.2. Issues and Political Background

The prioritization of environmental legislation differs significantly between the two major U.S. political parties, and the past few legislative sessions have not been favorable for the consideration of bills like SAFE. Since climate change is explicitly mentioned as the root cause of the problem that the SAFE Act intends to address, the bill stands little chance of being passed into law. The political opposition to climate change may be due to the influence of oil, gas, and coal-industry funding for the lawmakers controlling both chambers of Congress, as well as the dominant priorities within the Republican Party's political agenda. Fossil fuel companies view congressional acknowledgement of the dangers of climate change as a threat to their business model, and are thus incentivized to lobby for obstruction of relevant legislation. Congressional support for environmental legislation has been fiercely partisan in recent years, and will likely continue that way, unless campaign finance reform laws are enacted to minimize the influence of fossil fuel lobbyist groups.

3.3. Support and Opposition for SAFE

Environmental opposition stems mostly from industrial groups representing chemical manufacturers, oil producers, mining companies, timber companies, real estate developers, nuclear power industries, and electric utilities. Often, they resist federal regulations that could affect their profitability and/or business prospects. Though there are no groups on record specifically opposed to the SAFE Act, many active lobbying groups and think tanks such as the Heartland Institute have a long history of opposing conservation legislation on these grounds. While few congress members would argue the merits of protecting wildlife, for many it is considered a niche issue that is not a matter of high priority. As one prominent House Representative stated in SAFE's 2013 hearing:

> *"I do not support the Safeguarding America's Future and Environment (SAFE) Act. This legislation would require implementation of a National Fish, Wildlife, and Plants Climate Adaptation Strategy. With a more*

$17 trillion national debt, eroding confidence in the President's ability to secure our borders, deteriorating geopolitical relations in the Middle East, foreign policy failures around the world and serious outstanding concerns with the management of our federal agencies, I am quite confident there are other more pressing items of national concern we can focus on."[7]

Nonetheless, over thirty non-governmental organizations have officially endorsed SAFE, including several prominent conservation-oriented groups. Some, such as the World Wildlife Fund, Defenders of Wildlife, Sierra Club, and National Audubon Society support the effort to protect nature's intrinsic value because it aligns with the groups' stated missions of conservation activism. Others have a more commercial interest, including the Outdoor Industry Association and the American Canoe Association. It is worth noting that virtually all of these groups have a history of working with, and consistently advocating for, environmental legislation authored by congressional Democrats[8]. The current iteration of the SAFE Act has 23 Democratic co-sponsors in Congress, but no Republican support.

The SAFE Act's persistent proposal in Congress, as well as fluctuating environmental support and opposition, necessitates this report's exercise of implementation to remain prepared for the legislation's passage and next steps. Although the bill remains under congressional review at the time of this report's publication, it will be treated and referred to for the remainder of this analysis under the assumption that the legislation has been passed.

4. SAFE - A Legislative Solution to a Complex Problem

Climate change adaptation represents a sophisticated problem that will require an equally multifaceted, but streamlined solution. Currently, numerous Federal, State, local, and tribal agencies are engaged in wildlife conservation efforts and legislation for this purpose. These include, but are not limited to, the U.S. Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (FWS), the Environmental Protection Agency (EPA), the National Park Service (NPS), the U.S. Geological Survey (USGS), and the National Oceanic and Atmospheric Administration (NOAA). SAFE aims to foster communication and coordination between these groups and others to enable long-term climate-smart conservation.

It establishes a National Climate Change and Wildlife Science Center, as well as an Advisory Committee on Climate Change and Natural Resource Sciences. The legislation's Joint Implementation Working Group will call upon these resources to aid them in revising the National Strategy every four years, as mandated by the bill. SAFE will draw on existing funds from the budget of the FWS, NOAA, and the U.S. Forest Service to fund its administration. The legislation also intends to remain adaptive and flexible to scientific innovation, and the SAFE Act's National Strategy is constructed accordingly.

4.1. Multilateral, Multi-Stakeholder Collaboration

As specified in SAFE's legislation, the President will establish a Joint Implementation Working Group within ninety days of the bill being passed[9]. This Working Group will consist of the heads of federal and state agencies or departments that have authority over the fish, wildlife, and plant resources of the US, as well as tribal representatives, and will have jurisdiction over the National Strategy.

The National Strategy provides both high-level goals to inform policy-makers as well as specific actions for conservation agencies and managers to follow[10]. The goal of the National Strategy is to improve the management and conservation of fish, wildlife, and plants by maintaining or improving their ability to withstand, adjust to, or recover from the effects of current or future extreme weather conditions. Within one year of the bill's passing, and no later than one year after each revision of the National Strategy, the Working Group will develop a strategic plan to implement the National Strategy[11]. This strategic plan will include broad conservation strategies, a gap analysis, guidance for resource managers, ideas for interagency collaboration, as well as methods for evaluating activities. The Working Group will provide options for public review and comment, and then submit the plan to the President to be approved.

The Secretary of the Interior, state officials, tribal leaders, and other partner organizations, will establish a National Climate Change and Wildlife Center[12]. The Center will assess and develop scientific information, tools, strategies, and techniques to support the Working Group, and other interested organizations, in addressing the effects of extreme weather and climate change on fish, wildlife, and plants. In addition, the Advisory Committee on Climate Change and Natural Resource Sciences will aid the Working Group by offering a multi-stakeholder perspective in the fields of ecology, biology, and climate change[13]. The Secretary of the Interior will establish this Advisory Committee and fill it with representatives from the private sector, public sector, and non-governmental organizations.

4.2. The Formulation of Local Adaptation Plans

SAFE allows the Department of Interior and the Department of Commerce to allocate funding from existing grant programs to states that submit wildlife climate adaptation plans[14]. Each State will be eligible to be considered for funds within one year of

SAFE's passage and within one year of each revision of the National Strategy. The Secretary of the Interior and the Secretary of Commerce will review and approve each state's plan based on its consistency with the National Strategy as well as existing laws. SAFE stipulates that these plans must be revised every four years and must involve public comment. The goal of this process is to build capacity at the state-level for adaptive management. Instead of overseeing conservation practices directly, the federal government will instead provide support in the form of these grants, the National Strategy, the Working Group, and the Science Center.

To successfully aid wildlife climate change adaptation, it will be necessary to engage local conservation actors, making use of their scientific knowledge and management expertise. Many of these actors have already started developing local adaptation programs. The grants distributed under the SAFE Act will provide resources to implement these and future adaptation programs. While federal agencies will provide strategic and scientific support, the majority of adaptive management efforts will be performed either by state wildlife agencies or collaborations between different combinations of government, private, or non-profit organizations. Rather than being a regulatory bill that mandates certain actions, placing federal agencies in a 'command and control' position, SAFE is a non-regulatory solution that solidifies partnerships between federal and state agencies working on conservation efforts. This report will focus on designing a program for the United States Fish and Wildlife Service, an agency that was founded for the purpose of protecting, conserving, and managing fish, wildlife, and plants.

4.3. Review and Revision

The National Strategy and each state's adaptation plan will undergo periodic review and revision[15]. Each plan can be considered a "living document," subject to adaptation due to changes in climatic patterns, scientific understanding, as well as the social and political environment. To address ecological and climatic variance, the programs established by the SAFE Act must remain dynamic and innovative.

5. SAFE in Action

As previously stated, local and federal agencies will work in tandem to develop SAFE's climate change adaptation strategies for fish, wildlife, and plants. However, a realignment of these agencies' current missions at all levels of government will be required in order to incorporate innovative solutions to the unique problems introduced by climate change. The Fish and Wildlife Service will serve as the pilot agency to establish a first-year program to catalyze the legislation's goals and objectives, and the program design identifies three of the National Strategy's time-sensitive goals and pairs them with feasible actions.

5.1. Overview of First Year Implementation of SAFE within USFWS

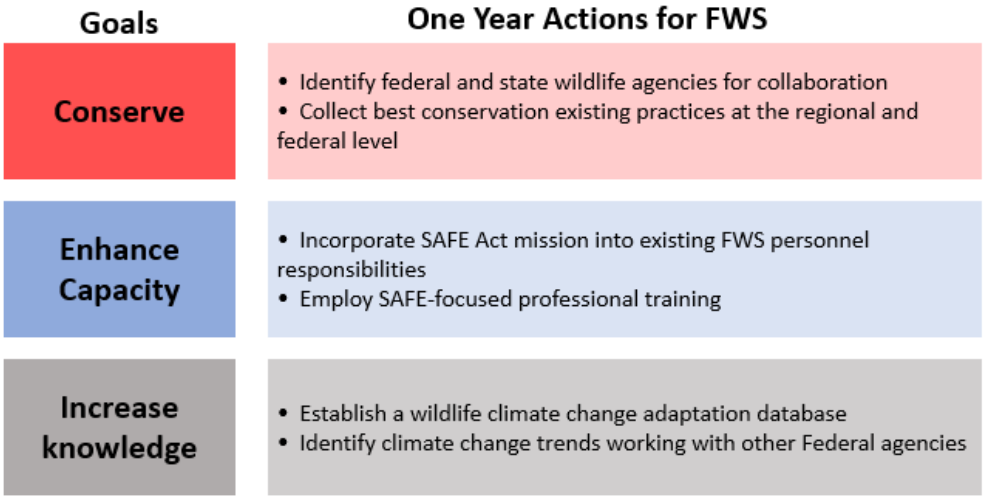
SAFE intends to build upon existing initiatives of governmental agencies to catalyze action and collaboration between different tiers of the government. Furthermore, the National Strategy outlines key implementation goals related to conservation of wildlife and habitat, capacity building at all agency levels, and increasing awareness regarding the impact of climate change. As mentioned, several governmental agencies within the Working Group including NOAA, EPA, and others, will be working together on the implementation of SAFE. However, the scope of the program outlined in this report is limited to the purview of the U.S. Fish and Wildlife Service (FWS).

Given the key role of the FWS in the development of the National Strategy, and its subsequent involvement in the conservation plans conceived and developed under the Strategy, it has been chosen as the lead agency to spearhead the implementation of SAFE. Created in 1871, the agency is now considered a principal federal conservation agency with strong biological science expertise. This pilot program design addresses the process by which the FWS will incorporate climate-sensitive capabilities to facilitate stakeholders, advise in state and local conservation plan designs, and offer technical support. The timeline for the proposed program design is limited to one year, and the following analysis includes specific steps required to complete each of the three first-year goals of the program design, as well as the budgeting and staffing requirements they entail. A performance management system for the first year of the program is also outlined. Beyond the first year of the legislation's passage, the outcome of the steps described will guide the required subsequent actions.

5.2. Program Goals

Without requiring any additional Congressional funding to the agency and without requiring funding from the grants referenced in the legislation, the program design will address the most pertinent objectives outlined within the National Strategy. For the program's purposes, the strategy's objectives are translated into three goals and six actions for the FWS.

Figure 1: SAFE First Year Goals and Actions



The first goal, "Conserve", entails identification and prioritization of conservation activities. This includes collecting existing best conservation practices employed by the local, regional, and national levels of FWS, and identifying federal and state wildlife agencies for collaboration. The second goal, bolstering management capacity for implementation, or "Enhance Capacity", requires incorporating the SAFE Act's mission into existing FWS personnel responsibilities and employment of SAFE-focused professional training. The third goal, "Increase Knowledge", entails optimizing agency technical support. The goal's two actions include identifying climate change trends in concert with other Federal agencies and the establishment of a wildlife climate change adaptation database.

In order to achieve the agency's internal transition to address these goals and develop climate-smart capacity for conservation plans, the program has a complementary master calendar, staffing plan, and budget plan for translating goals into specific actions.

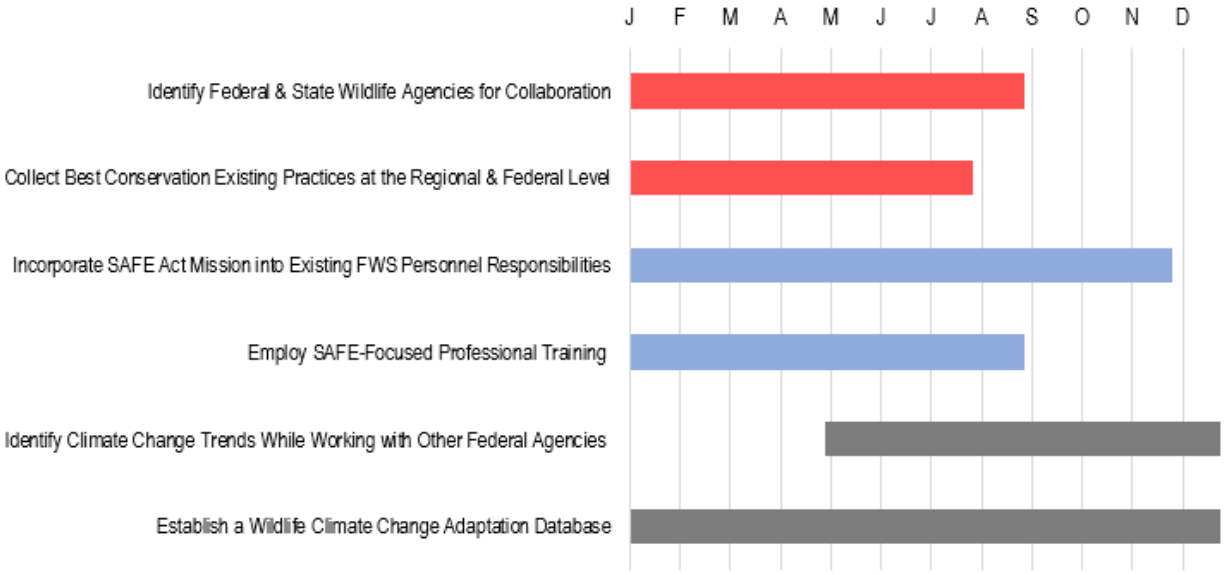
5.3. Program Calendar

In constructing a calendar for the first year of implementation for the SAFE Act, all six preliminary actions were considered. Each action was then broken down to the tasks that would be completed in the first twelve months. The time needed to complete each of these steps was considered, compiled, and charted to provide clear depictions of the timelines. If properly adhered to, this master calendar sets up FWS for the next year of planning so that SAFE can be implemented as effectively as possible.

For example, the steps required to implement the collection of best conservation practices are, first, to appoint the Deputy Assistant Director from FWS headquarters Ecological Services department as manager of the collection process. Next, the designated staff from headquarters will create criteria for "Initial Review Standards" to be used by the eight regional FWS Ecological Services departments. These departments will then contact local offices, and those local offices will identify best conservation practices within their respective jurisdictions. Finally, localized, climate-specific best practices will be submitted by the eight regional departments to the manager.

Note: Individual action calendars of each goal can be referred to in the Appendix.

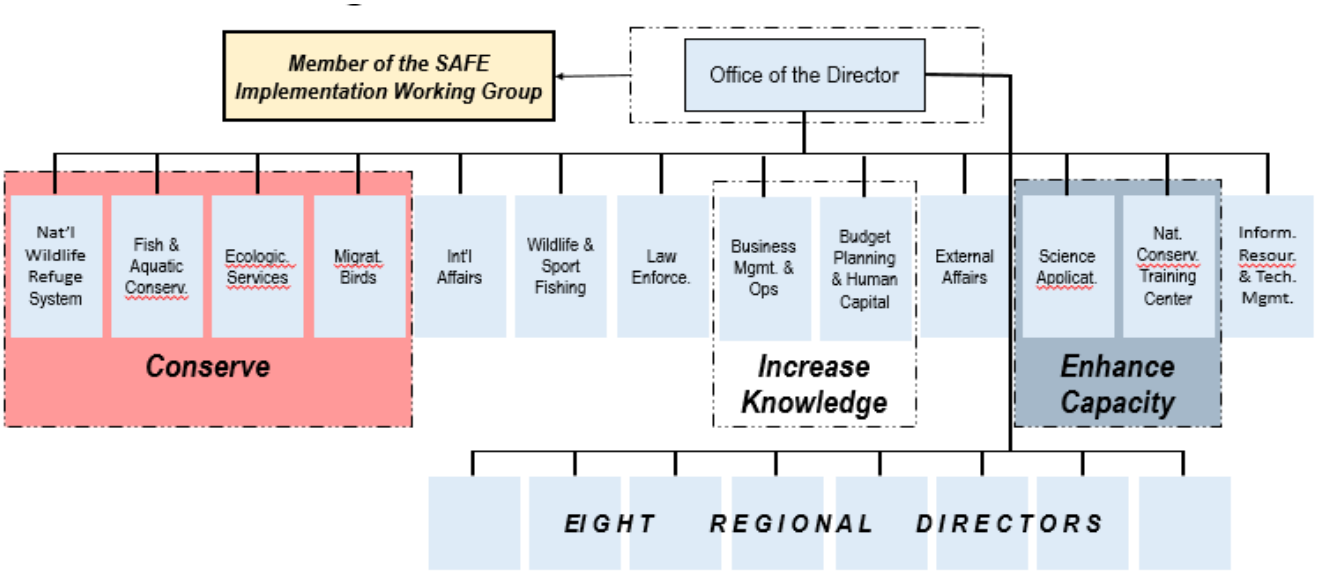
Figure 2: First Year Master Calendar



5.4. US Fish and Wildlife Service Organizational Structure with SAFE Proposed Changes

Within the existing FWS organizational structure, the current Director reports to the Department of the Interior's Assistant Secretary for Fish, Wildlife, and Parks and has direct authority over FWS headquarters and eight Regional Directors. The Headquarters-based Assistant Directors provide policy, program management, and administrative support to the Director. The Regional Directors then guide the agency's policy and program implementation, supervise fieldwork, and coordinate activities with partners. To make effective progress on SAFE's first-year goals, all three goals have been outlined and assigned to several departments for completion (shown below). This alignment adheres to the central principle of the SAFE Act, which emphasizes the coordination of different agencies and their efforts to ensure species' adaption to climate change.

Figure 3: US Fish Wildlife Service Organization Chart

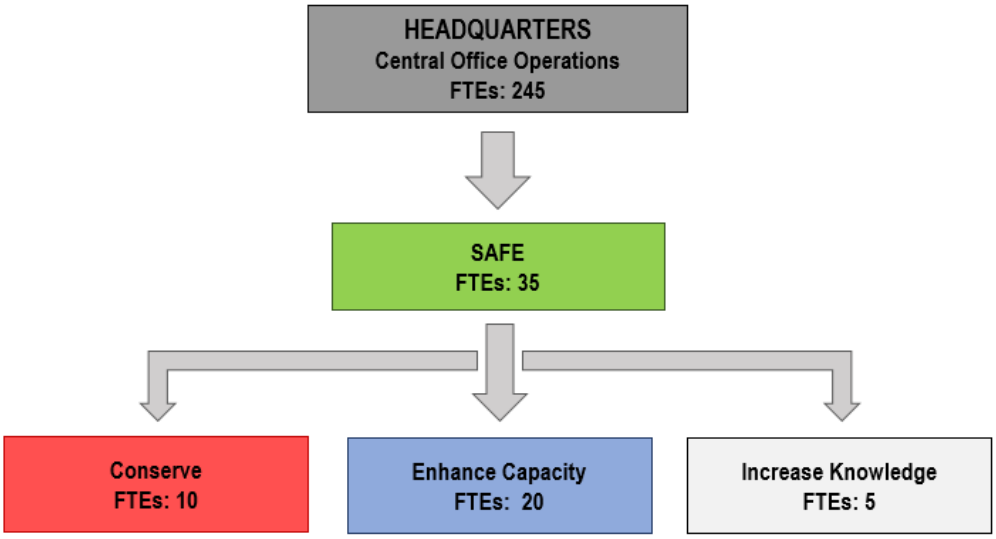


5.5. SAFE Staffing Implementation within the FWS

Upon implementation of the SAFE Act within the first year at FWS, the Office of the Director will engage the legislation's Joint Implementation Working Group, along with other federal agencies such as the EPA, NOAA, and USGS. Engagement with the Working Group will allow the FWS to develop a more effective approach to the six actions outlined within the program's three goals.

Eight of the agency's departments will be directly involved in the actions outlined in order for FWS to adopt the National Strategy. These eight departments are responsible for workflows that align with the respective actions required by the program, which are described below. Within each department, staffing needs are quantified in full-time equivalents (FTEs). These FTEs will incorporate the SAFE mission into their current FWS duties. The finalized numbers and divisions were taken from the official FWS budget from fiscal year 2015.

Figure 4: Staffing Plan within FWS Headquarters



Ten FTEs would be required to identify federal and state wildlife agencies for collaboration and assess climate change trends recognized by those agencies, the actions associated with the goal of "Conservation." To "Enhance Capacity", twenty FTEs would be allocated for the development and implementation of SAFE-focused professional training workshops and lectures to incorporate the SAFE mission into existing FWS personnel responsibilities. An additional five FTEs would be tasked with implementing the "Increase Knowledge" goal through the collection of best conservation practices at the regional and federal level and aiding an external contractor in the development of a climate change adaptation database. Overall, thirty-five FTEs would be dedicated to the incorporation of SAFE in the FWS' daily operations.

5.6. Contracting Plan

As previously mentioned, a wildlife climate change adaptation database will be established in the first year under the goal of 'Increasing Capacity.' The information that would populate the database would be formulated through research and collected by designated FTEs within the Science Applications Department and the four other conservation-oriented departments. However, the creation and design of the online portal for the database will be outsourced to a contractor. This activity will be overseen and managed by the Deputy Assistant Director of Science Applications program from the Adaptive Science team. The FWS will use

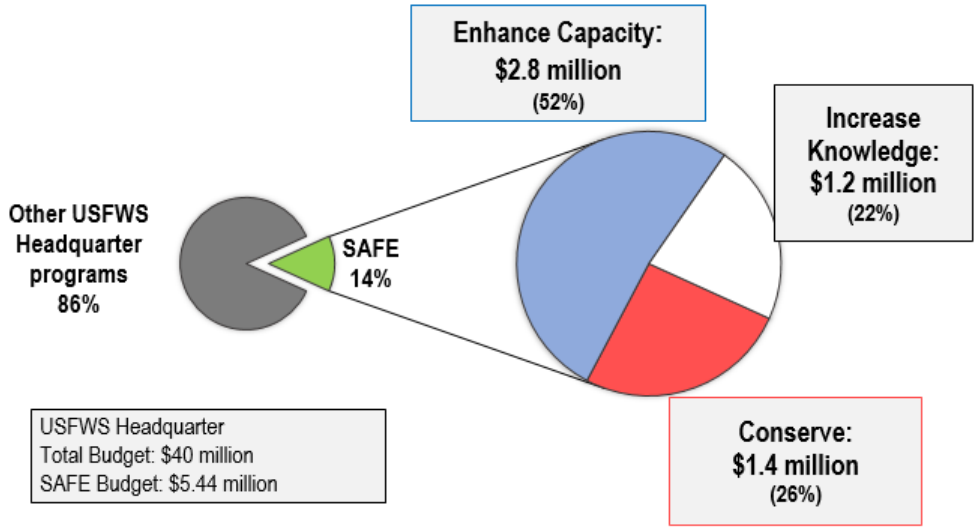
the Department of Interior's Design-Build, Construction and Construction Services Multiple Award Task Order Contract (MATOC) Ordering Guide, thus delegating roles and responsibilities to comply with the needs of the database creation[16].

5.7. Program Budget

The US Fish and Wildlife Service will not receive any additional federal funding for the implementation of SAFE, but will make use of its existing budget allocation. Each year, FWS is required to submit a Budget Justification to the Department of the Interior which, upon review, is then submitted to Congress, where the appropriate amount of agency funding is then determined. By examining the FWS Budget Justification, the 'actual budget' can be used to estimate the cost of SAFE implementation. This 'actual budget' indicates the specific budget amount spent by the FWS during a given year. Because 2015 is the most recent fiscal year available, the expenses from that year will be used. As the first-year program design targets the FWS headquarters, the funds allocated to that particular office are used for the following program estimates. In fiscal year, 2015, this amounted to a sum of $40 million[17]. As the FWS would be incorporating SAFE programming into their existing operations, only 15% of this budget would be allocated specifically for the bill's implementation.

The funding available for SAFE implementation will be divided so that each of the three aforementioned goals would be appropriately funded to satisfy their first-year objectives. Allocation of funds for each goal is proportional to the number of FTEs required to achieve it. Therefore, $1.4 million will go toward 'Conserve', $2.8 million toward 'Enhance Capacity', and $1.2 million toward 'Increase Knowledge'. The graph below illustrates the FWS headquarters budget as divided between these three overarching goals.

Figure 5. Budget Allocation for the Implementation of SAFE within the FWS Headquarters



5.8. Allocation of Funding

Typically, funding is initially allocated to both personnel and 'other than personnel services' (OTPS). While each aforementioned goal would receive funds that encompass both areas, there is a differentiation in allocation of funds between the different goals. For example, "Conserve" would have additional funds to be used towards travel. This determination was made because travel would be necessary in order to identify existing conservation practices at regional and federal levels. Such travel would involve conference attendance and in-person meetings with conservation practitioners with the purpose of sharing information and

strengthening collaboration and partnership. With regard to the "Enhance Capacity" goal, supplies would represent a larger portion of the budget due to the manuals and training books required to employ SAFE-focused professional training. However, the goal of "Increase Knowledge" would have a different budget designation because it is the only goal that requires the hiring of an outside contractor to assist in establishing a wildlife climate change adaptation database.

The table below illustrates the final line-item budget. The total for each of the categories is shown, as well as the overall budget allocated for the implementation of SAFE within FWS, totaling $5.44 million.

Figure 7: FWS Line-Item Budget for First Year SAFE Program

	Percentage (%)	Amount ($ '000)
Personnel	77	4,200
Contracting	9	500
Indirect Costs	9	500
Travel	2	130
Supplies	2	110
TOTAL:	**100**	**$5.44 million**

6. Performance Management and Measuring Success

The implementation and overall impact of the SAFE Act on the Fish and Wildlife Service must be effectively measured to evaluate its success. Progress for the six actions outlined will be measured using a performance management system. A key component of this system will be a management innovation process by which director-level feedback can systematically address problems or capitalize on identified opportunities.

The SAFE performance management system will be integrated and aligned with current methods already in place within the FWS. The management strategy will stem from the six overarching actions which are defined and observed at the director level. The progress of the goals will then be monitored by managers who will review progress in relation to determined benchmarks and provide feedback to teams and individuals with assigned responsibilities.

6.1. Overview of the Performance Management System

The six first-year actions of the SAFE Act within FWS will utilize four performance activities. Namely, data will be measured, collected, and reported, and periodic feedback will be integrated into the sub-actions for each goal. Measures of performance will identify needs, identify goals and provide a means to monitor progress in relation to determined milestones. Identification of needs will occur through surveying future users and scheduling a series of benchmarks in route to the completion of each output. This activity will occur at the level of individuals and their immediate managers performing action specific functions. Collection of data will be accomplished through meetings and the compiling of interim product outputs as appropriate. These actions will occur primarily at the managerial level with an initial bi-weekly frequency. Reporting will be achieved by managers who directly oversee progress and receive reports from individuals performing specific sub-actions. Managers will then submit monthly reports to their department Director, who will review the progress being reported. Finally, quarterly feedback will originate from department directors and will first address the questions of whether or not key milestones have been achieved. Specific projects can then be considered either completed, on-track, or requiring managerial intervention. In the third case, the director will determine necessary adjustments and changes to the original plan. Feedback may consist of alterations of the original plan for each task, modifying or adding benchmarks, or the adjustment of collection and reporting schedules.

6.2. Action-Specific Methods

The performance management system deployed within the FWS will employ the aforementioned performance activities for each action to be completed within the first year. As shown below, the specific performance measures that will be completed for each action are specific to each action. Outputs that are generated for ongoing and dynamic use by FWS employees will first have their scope determined by end-user surveys. Outputs which result in the identification of a series of elements are represented by lists. Uniquely, the establishment of a climate change adaptation database will not only have its scope determined by surveys, but it will be the only goal that is also measured by the development of software, described below as coding, but inclusive of all intermediate elements in the creation of this specific software platform.

The collection of data for all actions will include meetings between managers and teams or individuals responsible for defined activities. Actions which include the creation of a specific product will have their intermediate outputs collected and shared. Notably, the collection of best practices will have information primarily collected through meetings, as composed lists will be incorporated into the developing database.

Reporting for all goals will include monthly progress reports communicating collected information between managers and directors. The identification of climate trends and potential collaborators with whom the FWS could partner will require analysis from the managerial level, but because the product takes the form of a list, it is not expected to initially require monthly meetings with a director. The more complex outputs, whose directions are expected to require supervisory input, would require meetings between managers and directors to ensure their effective implementation.

Feedback for every action will originate from the director level. If determined benchmarks are met and directors are satisfied, each action could then move forward with the original schedule. Similarly, each action may be modified if determined to be sluggish or ineffectual. Finally, the goals of 'Establishing a Database' and 'Identifying Partners' are planned to be completed after one year, at which point the director would officially consider those actions to be complete.

These performance measures should allow seamless transition from the agency's first year of program implementation to long-term success of all agencies in addressing the concerns identified by the SAFE Act and its National Strategy. By measuring, monitoring, reporting, and innovating, this program will provide a model for associated and partnering agencies and organizations to emulate within their own structures.

Figure 8: Performance Measurement Framework

Actions	Measure	Collection	Reporting	Feedback
Identify Partners	L	M, O	P, A	K, R, X
Collect Best Practices	S,	M	P, M, A	K, R
Incorporate SAFE into FWS	S	M	P, M, A	K, R
Professional Development	S	M	P, M, A	K, R
Establish Database	S, C	M, O	P, M	K, R, X
Identify Climate Trends	L	M, O	P, A	K, R

S = Surveys L = List C = Coding	M = Meetings O = Outputs	P = Progress Reports M = Meetings A = Analysis	K = Keep Plan R = Revise Plan X = Complete

7. Conclusion

Studies undertaken by United States research institutions and federal agencies, as well as international scientists, have observed that climate change is negatively impacting biodiversity and threatens the ecosystem services they provide[18]. Local and regional communities, as well as the national economy, are already experiencing the effects associated with fish, wildlife, and plant populations that have been compromised and degraded by climate change. The SAFE Act intends to unify and maximize the efficiency of wildlife adaptation activities that have begun to take form but are still disparate. The primary method by which the SAFE Act will achieve this will be through the coordination of federal, state, local, and tribal governments and the implementation of the National Strategy.

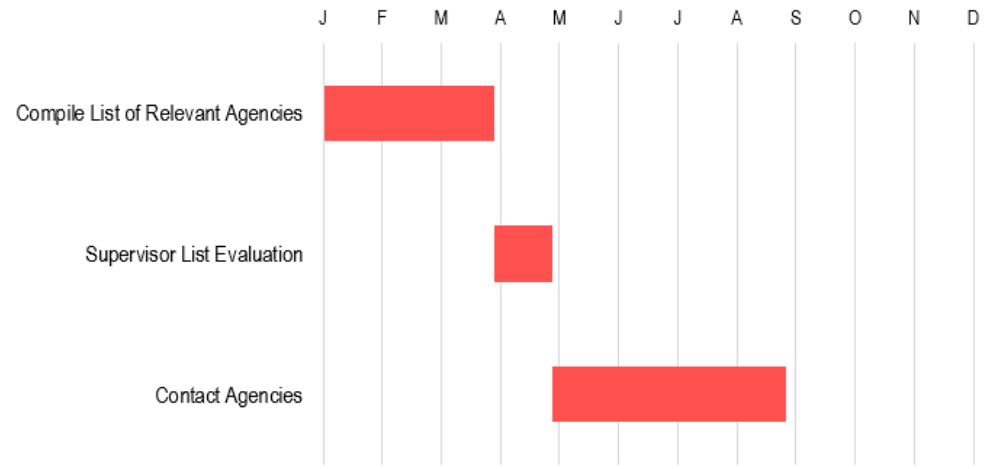
Creating innovative and effective adaptation plans will require input and effort from the FWS as well as collaboration with other agencies to build the foundation on which to implement the SAFE Act. The FWS will implement the first-year goals of SAFE to protect, manage, and conserve fish, wildlife, and plants. After the first year of SAFE implementation within FWS, specific adaptation plans can then be researched, designed, and executed as a result of the first-year goals and actions being successfully completed.

As climate change continues to incur greater ecological repercussions, conservation plans can no longer remain "static," but must instead embrace flexible management with continuously updating research. The long-term initiatives identified within the first-year plan will can help shift conservation strategies towards more dynamic models of management, where climatic trends combine with ecological parameters in determining adaptation plans. Effective federal engagement, as well as multi-stakeholder cooperation, will ensure the successful merging of conservation and climate science, as well as the continued survival of the fish, wildlife, and plant species upon which the United States depends.

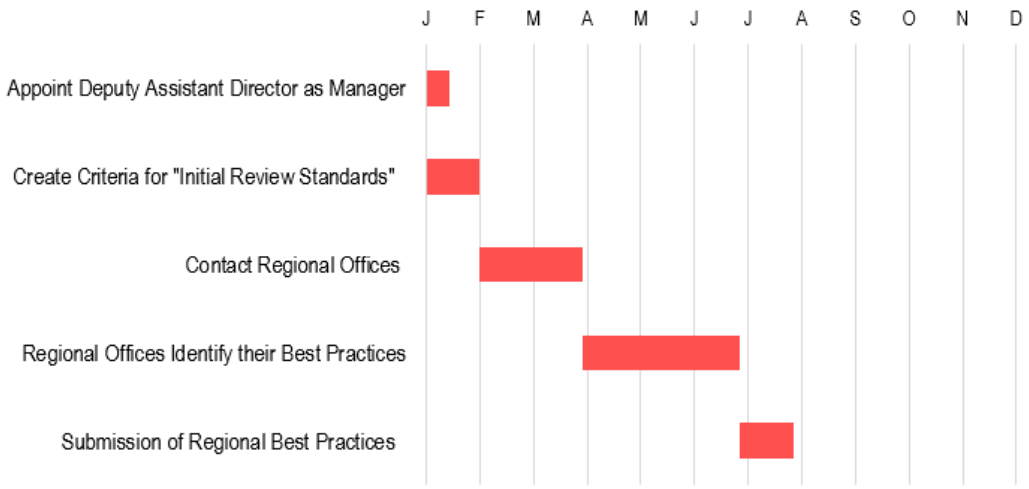
Appendix

Schedules for Individual Goals

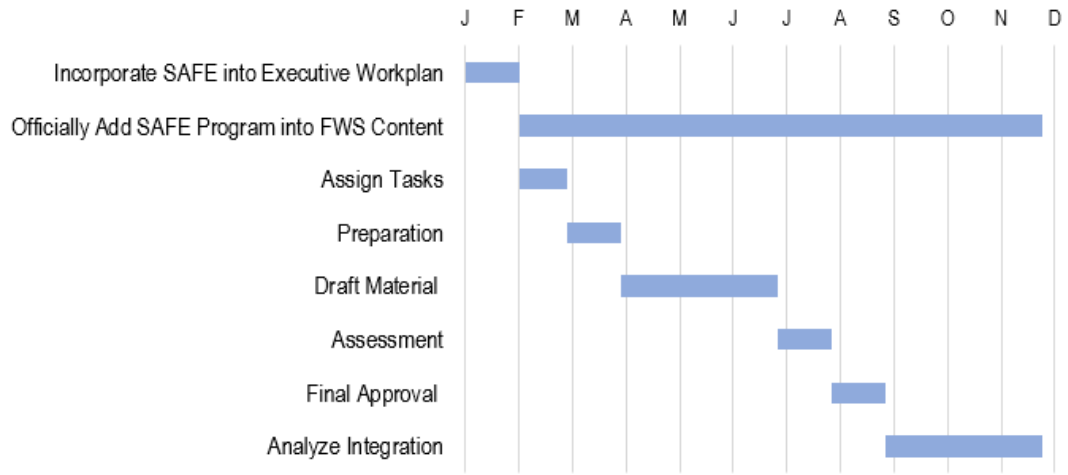
Conserve: Identify Federal and State Wildlife Agencies for Collaboration



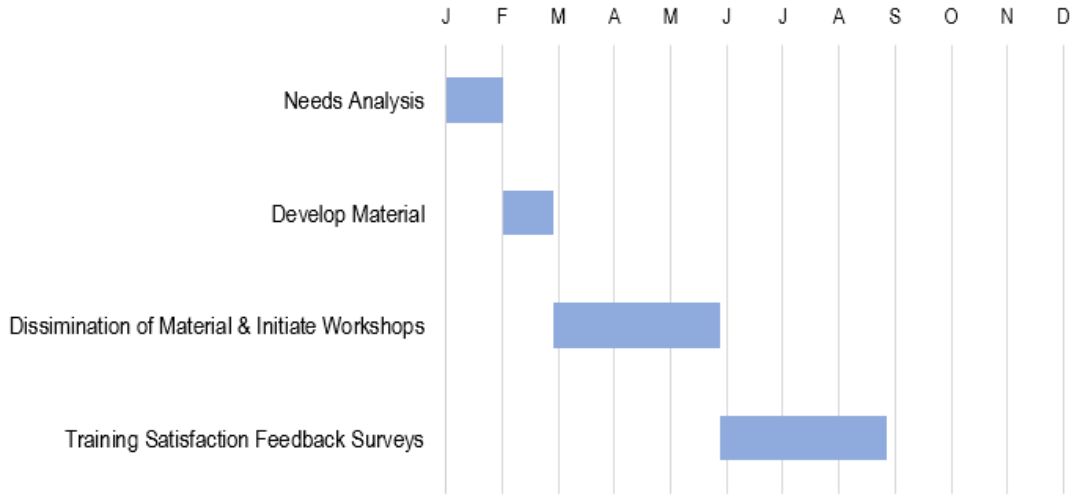
Conserve: Collect Best Conservation Existing Practices at the Regional and Federal Level



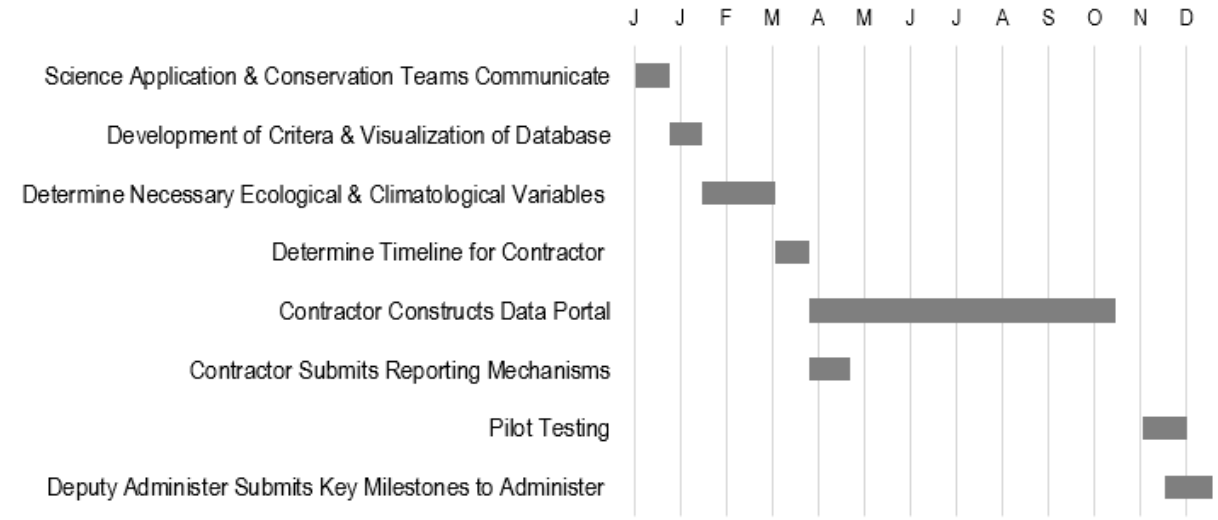
Enhance Capacity: Incorporate SAFE Mission into Existing FWS Personnel Responsibilities



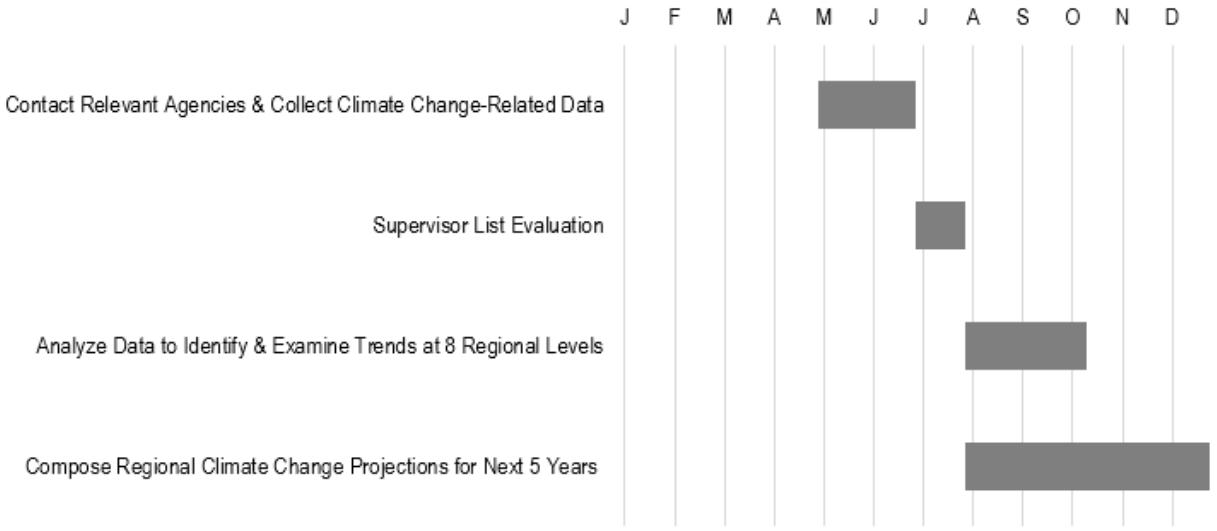
Enhance Capacity: Employ SAFE-focused Professional Training



Increase Knowledge: Establish a Wildlife Climate Change Adaptation Database



Increase Knowledge: Identify Climate Change Trends While Working with Other Federal Agencies



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