

***This document is an internal discussion draft. The U.S. Fish and Wildlife Service is now in the process of soliciting employee feedback on this document, as well as the draft 5-Year Action Plan. Once we have integrated comments from employees, we will also provide opportunity for comment from partners and the public. Both documents will not be final until these processes are completed and the documents are published in final form, which we expect to occur in late-summer or fall of 2009.***

***Until finalized, this draft document does not represent the official position of the Service, nor commit the agency to implement any proposed actions.***

**INTERNAL DISCUSSION DRAFT**

# *Rising to the Urgent Challenges of a Changing Climate*

## **Strategic Plan for Responding to Accelerating Climate Change in the 21st Century**



**“The supreme reality of our time is...the vulnerability of our planet.”  
-- John F. Kennedy, 35<sup>th</sup> President of the United States, 1963 --**



**The U.S. Fish and Wildlife Service**

**December 12, 2008**

This draft strategic plan is an internal discussion draft. It is intended to give Service employees an opportunity to provide feedback concerning the draft plan's content, direction and organization. After Service personnel have provided input, the Service will provide external partners and audiences an opportunity to help shape this plan.

## Executive Overview

Climate change is the greatest challenge the U.S. Fish and Wildlife Service (Service) has ever faced in conserving fish, wildlife, and their habitats.<sup>a</sup> The Earth's climate is changing at a rate that has the potential to cause abrupt changes in ecosystems and mass species extinctions. In turn, these changes will diminish the goods, services, and social benefits Americans have grown accustomed to receiving at little cost from ecosystems across our nation and will adversely affect local, state, regional, national and international economies and cultures. Consequently, we cannot afford to simply view climate change as a crisis and go about our business as usual. We must approach conservation differently than we have in the past, positioning ourselves more strategically, building shared capacity, and working collaboratively across the entire conservation community to combat climate change. Most importantly, we must act boldly, like President Theodore Roosevelt did when he created the first National Wildlife Refuge at Pelican Island and set the direction our nation has followed for more than a century in building a system of conservation lands and waters that today exceeds 95 million acres.

Our strategic plan recognizes that no single organization or agency can succeed fully in its mission without the support and involvement of others. This vision commits us to a new philosophy of conservation, rooted in true interdependence, which calls us to:

- Commit our personnel and assets to shared and explicit objectives, goals, and targets, and joint undertakings whenever possible;
- Use the core principles of adaptive management and planning, implementing, evaluating and adjusting together; and
- Design and apply landscape conservation strategies, principles and tools.

Our strategic plan is primarily for our employees and our organization. It provides direction and focuses our talents, creativity and energy on goals, objectives and strategies we believe will be successful in the struggle to sustain fish, wildlife and their habitats nationally and internationally. Our plan also defines our role within the larger conservation community and commits us to specific conservation strategies. We express our specific commitments to the goals and objectives of this strategic plan, as a cohesive set of actions, in a companion, 5-year Climate Change Action Plan.

We are committed to examining everything we do, every decision we make, and every dollar we spend through a climate change filter. The urgency of the climate change crisis demands we recalibrate our objectives, embrace landscape conservation, as we have defined it in our Strategic Habitat Conservation framework, and adopt a substantially different philosophy of conservation.

The Service occupies a unique position within the broader conservation community by virtue of legal authorities that allow us to work across jurisdictional boundaries; our shared responsibility with the States to manage fish and wildlife populations; our authority to conserve endangered species, interjurisdictional fish, and migratory birds; and our unequalled conservation

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<sup>a</sup> Our use of the term "fish, wildlife and their habitats" throughout this plan includes plants.

land base—the National Wildlife Refuge System. Thus, the Service is uniquely positioned to be a leader in catalyzing the conservation community’s collective response to climate change, by bringing the community together to engage in dialogue, identify common goals, and define innovative and collaborative strategies. Our future success in conserving fish and wildlife will depend on how well we integrate our efforts with those of our partners, how quickly we can build needed technical and technological capacities, and how strategic we are with our limited resources while addressing these global changes.

Our strategic plan calls for bold, aggressive action. Particularly noteworthy are seven commitments that we believe will help re-shape the face of conservation and enable us to play a leading role in addressing the challenges of a changing climate system:

- Establishing new scientific and technical capacity, in the form of *Regional Climate Science Partnerships*, shared among the conservation community to acquire and translate climate change information into knowledge that conservationists and conservation organizations can apply to better predict, understand and address the effects of climate change on fish, wildlife and their habitats at all spatial scales;
- Establishing *Landscape Conservation Cooperatives* where members of the conservation community build shared capacities to plan, design and deliver conservation in ways that integrate local, state, regional, national and international activities;
- Developing new processes and procedures that enable the Service to evaluate its actions, decisions, and expenditures through the filter of climate change;
- Using our training, education and outreach capacity to build awareness of the consequences of climate change among our employees, conservation community partners, the public, and other audiences and inspire innovative action to combat climate change and its effects on fish, wildlife and their habitats;
- Becoming carbon neutral as an agency by 2020 and helping other organizations become carbon neutral;
- Applying Strategic Habitat Conservation (SHC)<sup>1</sup> as the Service’s framework for landscape conservation; and
- Inspiring and leading the conservation community’s development of a *National Fish and Wildlife Adaptation Plan* that is likely to be an important element of climate change legislation before the United States Congress; developing a *National Biological Inventory and Monitoring Partnership*, so members of the community can use their monitoring resources more strategically and more cohesively; and organizing a *National Climate Change Forum* where members of the conservation community can gather to develop a shared vision for addressing climate change.

Our plan establishes specific goals and objectives to accomplish these priority commitments as integral and essential elements of broader strategies designed to address climate change. Our strategies focus on three key things: (1) helping fish, wildlife and their habitats adapt to climate change; (2) mitigating levels of greenhouse gases in the Earth’s atmosphere; and (3) expanding awareness among our employees, external audiences and partners regarding the many ways in which climate change is affecting fish, wildlife and their habitats nationally and internationally, and inspiring and empowering them to help. Consequently, we have arrayed our goals and objectives under the broad headings of Adaptation, Mitigation and Education.

Our strategic plan acknowledges the climate crisis as one of enormous consequence and challenge for fish and wildlife conservation. We propose it as our commitment, as individuals and as an organization, to face this challenge with a sense of duty and integrity, and a spirit of public service and optimism.

*“Individual commitment to a group effort - - that is what makes a team work, a company work, a society work, a civilization work.”*

-- Vince Lombardi --

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## Introduction

Climate change is an immense, serious, and sobering challenge — one that will affect fish and wildlife profoundly. At the same time, we see climate change as a force that is galvanizing the conservation community in ways we have not seen since the early 1960s, when Rachel Carson's groundbreaking book, *Silent Spring*, alerted the world to the hazards of pesticides. As concern for climate change and its impacts grows, we see expanding opportunities for the Service and members of the conservation community to pool their talents, imagination, creativity, and spirit of public service to reduce and manage those impacts in ways that sustain fish, wildlife and their habitats. We see a new era of conservation in which conservation organizations become truly interdependent and work together to maintain sustainable landscapes and fish and wildlife populations. In that new era, we see the Service responding boldly, first and foremost on the ground, where our decisions and actions have the most impact, and in other settings where policies, priorities, and budgets are shaped and tough choices and decisions are made.

Across the Service, our employees have initiated local actions to address climate change. Some employees are monitoring sea-level rise and exploring ways of safeguarding our coastal National Wildlife Refuges and the trust resources they support. Other employees are finding creative ways of protecting ice-dependent species, like polar bear, whose survival is threatened by receding ice in Arctic waters. Other employees are working tirelessly with water managers to ensure fish and wildlife resources are considered meaningfully in water allocation decisions, particularly in the Southwest, where climate change is likely to prolong drought. Other employees are busy calculating the Service's carbon footprint and devising innovative ways of helping the Service become carbon neutral. Still other employees are reaching out to our employees and our external partners to help them better understand the direction and magnitude of climate change and its effects on fish and wildlife. It remains for the Service to do two things. First, we must focus the talents, creativity and energy of our employees on a common set of goals, objectives and strategies for addressing climate change impacts. Second, we must provide employees with additional support, so they can realize their full potential in conserving fish, wildlife and their habitats.

This strategic plan establishes a basic framework within which the U.S. Fish and Wildlife Service and our employees will work within the larger conservation community to help ensure the sustainability of fish, wildlife and their habitats in the face of climate change. It looks broadly at how climate change is affecting fish, wildlife and their habitats; what our role will be in the conservation community as it addresses climate change; and what we will contribute to that community and its campaign to ensure the future of fish and wildlife.

This plan is a starting point for action and discussion. We look forward to updating it as we work with and learn from others, as our experiences and knowledge grow, and as the conservation community unites more closely in a new era of conservation. Likewise, we welcome feedback on the approaches described in this plan and its companion document, our 5-year Climate Change Action Plan.

## The Crisis

The Earth's climate is changing at an accelerating rate, due in large measure to human influences.<sup>2</sup> Increasing surface and water temperatures, rising sea-level, melting sea ice and glaciers, changing precipitation patterns, growing frequency and severity of storms, and increasing ocean acidification are among the many climate-driven changes observed to date.

The challenge of climate change is immense and urgent. The Fourth Assessment Report (AR4)<sup>3</sup> of the Intergovernmental Panel on Climate Change's (IPCC) concludes that approximately 20 to 30 percent of the plant and animal species assessed are likely to be at increased risk of extinction if increases in global average temperature exceed 1.5 - 2.5°C. Global average temperature increases of 0.74°C are already documented and temperatures in some areas are projected to exceed 3.0°C over the next decade. The IPCC also concludes that, for increases in global average temperature exceeding 1.5 - 2.5°C, major changes in ecosystem structure and function, species' ecological interactions, and species' geographical ranges will occur. These changes will have predominantly negative consequences for biodiversity and ecosystem goods and services (e.g., water and food). In addition, the IPCC reports that the resilience of many ecosystems around the world is likely to be exceeded this century by an unprecedented combination of climate change, associated disturbances (e.g., flooding, drought, wildfire, insects) and other global change drivers (e.g., land-use change, pollution, habitat fragmentation, urbanization, and growing human population and economies). These projected changes have enormous implications for management of fish, wildlife, and their habitats around the world.

A growing body of evidence indicates that accelerating climate change<sup>b</sup> is affecting the water, land, and wildlife resources of the United States.<sup>4</sup> Population declines and extirpations have already been noted from the Arctic (polar bears)<sup>5</sup> to San Francisco Bay area (Bay checkerspot butterflies)<sup>6</sup> to the Great Basin (pikas)<sup>7</sup>. Across the continental United States, climate change is affecting migratory phenology and body condition of migratory songbirds. There is growing documentation that this is causing trophic "mismatches," such as differences between the arrival dates of birds on their breeding grounds and the availability of the prey they need for successful reproduction.<sup>8</sup> Climate change has very likely increased the size and number of wildfires, insect out-

- In the Arctic, receding pack ice is affecting the distribution and behavior of Pacific walruses and impacting Native cultures that depend on walruses for subsistence.
- In the Southeast, rising sea levels are expected to flood as much as 30 percent of the habitat on the Service's coastal refuges.
- In the Southwest, climate change is already exacerbating deep droughts, heightening water allocation conflicts, and increasing pressure on water uses at the Service's National Fish Hatcheries and National Wildlife Refuges.
- In the Northwest, climate change is warming the landscape and enabling insect pests to expand their ranges and decimate ecologically and commercially valuable forests.

<sup>b</sup> Hereafter, when we refer to "climate change," we mean accelerating climate change. While climate change has occurred throughout the history of our planet, current changes are occurring at a greatly accelerated rate, largely as a result of human activities.



breaks, pathogens, disease outbreaks, and tree mortality in the interior West, the Southwest, and Alaska, and will continue to do so.<sup>9</sup> In the aquatic environment, evidence is growing that higher water temperatures resulting from climate change are negatively impacting cold- and cool-water fish populations across the country.<sup>10</sup> Along our coasts, rising sea levels have begun to affect fish and wildlife habitats, including those used by as shorebirds and sea turtles that nest on our coastal National Wildlife Refuges.<sup>11</sup> In the oceans, subtropical and tropical corals in shallow waters have already suffered major bleaching events driven by increases in sea surface temperatures.<sup>12</sup> We cannot envision success in achieving our mission into the 21<sup>st</sup> Century, except by approaching conservation through the filter of a changing climate system.

If unabated, climate change will cause abrupt ecosystem changes and widespread species extinctions. These changes will reduce the ability of natural systems to provide many societal goods and services – including the availability of clean water, our planets’ lifeblood -- and in turn will impact local, regional, and national economies and cultures. Consequently, we cannot delay in addressing climate change; it demands urgent attention and aggressive action.

## The Challenge

Mission success in fish and wildlife conservation over the next half century will require unprecedented cooperation and partnership among government, private and non-government organizations, and individual citizens. Consequently, the greatest challenge we and other members of the conservation community face is the need to form new and interdependent relationships, sharing integrated capacities, building on common strengths, identifying and addressing weaknesses, and focusing our responses on shared goals and objectives. This is especially true of our relationships with state fish and wildlife agencies, who have management authority on much of our nation’s lands and waters. To succeed in sustaining fish, wildlife and their habitats, our plans and actions must recognize all management roles and authorities and realistically reflect the limitations and uncertainties in our understanding of climate change. They must target stewardship activities at all geographic scales, by beginning with the design of conservation strategies at landscape scales. They must also encourage collaborative approaches that give common purpose to our employees and our conservation activities at all geographic scales — local, state, regional, national, continental, international, and global.

### The Challenge of Thinking Differently about Partnerships

In the Southeast, we have built new relationships with traditional and non-traditional partners — The Conservation Fund, American Electric Power Company, and Entergy Inc. — to help achieve their objectives and ours. Nine years ago, we launched an innovative program in the Lower Mississippi Valley aimed at restoring native habitats to bolster populations of wildlife and migratory birds through a carbon sequestration initiative. Together we have added over 40,000 acres of habitat to the National Wildlife Refuge System and reforested more than 80,000 acres with more than 22 million trees, sequestering 30 million metric tons of carbon over the project’s 70-year lifetime.

Our experiences with climate change in Alaska and its effects on sea ice, polar bear, walrus and Native cultures, have taught us that we will be increasingly challenged to recalibrate our conservation goals by integrating climate change, and we need to plan for conservation on



landscape scales and be prepared to act quickly, sometimes without the scientific certainty we would prefer.

Despite tremendous advances in our understanding of climate change over the past decade, there remains considerable uncertainty about the magnitude, extent, and timing of climate changes that will occur in any given geographic area. Likewise, there remains considerable uncertainty as to how climate change will interact with non-climate stressors to cause ecological changes at different scales. One of the major challenges inherent in addressing the effects of climate change on fish and wildlife will be identifying and accounting for this uncertainty as we design, implement and evaluate decisions, as well as management, regulatory and monitoring programs. Research priorities must be defined to reduce key uncertainties, as we learn more about climate change and how to incorporate it into our decisions, planning, and other actions.

Another major challenge of climate change is its unprecedented scope and magnitude. In the history of wildlife conservation, the Service and the larger conservation community have never experienced a challenge that is so ubiquitous across the landscape. Our existing conservation infrastructure will be pressed to the limit — quite likely beyond its limit — to respond successfully. New and different skills and capacities will be required, and our dedicated employees will be challenged to acquire new skills quickly. The current legal, regulatory, and policy frameworks within which we and our partners operate will no longer be adequate to encourage and support the new management approaches and innovative thinking needed to address climate change effectively. We will need financial and technological resources commensurate with this great challenge, and we will need the political leadership and support to pursue necessary statutory and regulatory changes, apply predictive models, make risk-based decisions, and operate adaptively in changing environments.

Another challenge facing the Service, our state counterparts, and conservation community at large is helping people become more aware of how climate change is harming fish, wildlife, and their habitats, and of how it is reducing the stream of societal goods and services that ecosystems provide. And we know that the same ecosystem functions that provide for sustainable fish and wildlife populations also provide significant goods and services for human communities, including water quality, flood and fire protection, and recreations. The Service and its conservation partners will be challenged to help officials everywhere understand the ecological, economic, social, and cultural costs inflicted by climate change.

## **Our Vision**

Over the first half of the 21<sup>st</sup> century, we envision a North American continent continuing to be altered by accelerating climate change, but managed to sustain diverse, distributed, and abundant populations of fish and wildlife by conserving healthy habitats in a network of interconnected, ecologically-functioning landscapes. While many species will continue to thrive, we also envision that some populations and species will be lost, and some will only survive in the wild through our direct and continuous intervention. We will be especially challenged to conserve species and habitats that are particularly vulnerable to climate-driven changes, but we will dedicate our best efforts and expertise to the task, recognizing that we cannot save

everything. We will need to make choices, and we will need to apply ourselves where we can make the greatest difference.

For fish, wildlife, and their habitats, we see:

- The North American continent continuing to be altered by climate change, but being managed to sustain diverse, distributed, and abundant populations of fish and wildlife by conserving healthy habitats in a network of interconnected, ecologically-functioning landscapes; and
- Many species continuing to thrive, but some being lost and some surviving only through our direct and continuous intervention.

As a member of the larger conservation community, we see:

- Climate change as an issue that will unite the conservation community like no other issue has since the early 1960s, when Rachel Carson sounded an alarm about pesticides;
- A new era of conservation in which members of the conservation community work together interdependently, sharing expertise and pooling resources more widely, crafting explicit landscape-scale goals, and pursuing those goals jointly;
- Immense challenges to conserving species and habitats that are particularly vulnerable to climate-driven changes and necessity to carefully consider and set priorities, so we apply efforts where they will have the greatest effect;
- The need to make difficult choices, in close collaboration with partners;
- Unparalleled opportunities to engage and enlist the support of private citizens, businesses, non-governmental organizations, and governments at all levels to conserve fish, wildlife and their habitats while combating climate change;
- Innovative conservation planning and delivery at landscape scales that build resilience, representation, and redundancy of key populations and habitats to facilitate adaptation to accelerating climate change;

Successes through Interdependent Conservation  
The Service's Habitat and Population Evaluation Team (HAPET) office in Fergus Falls, Minnesota, provides national leadership in working with partners to develop landscape-scale solutions to bird management challenges in the Central and Mississippi flyways. The office specializes in applying spatial information and GIS capabilities to species-specific management issues at landscape scales, enabling conservation agencies and organizations to prioritize habitats that are most important in sustaining bird species. Based on these conservation planning and design activities, the Service and its state partners, conservation organizations, landowners and communities are protecting, restoring and managing habitats of special importance to birds.

- Application of a growing scientific body of knowledge and expertise, both nationally and internationally, to reduce greenhouse gas sources and enhance carbon sinks in ways that also benefit fish and wildlife;
- Generation of empirical data needed to successfully model future conditions, predict population and habitat change, and determine if we are achieving our goals;
- The Service occupying a unique position in the broader conservation community by virtue of: (1) legal mandates that enable us to work across jurisdictional boundaries; (2) our shared responsibility with the states to manage fish and wildlife populations; (3) our authority to conserve endangered species, interjurisdictional fish, and migratory birds; and (4) our unequaled land base — our National Wildlife Refuge System; and
- The need to catalyze a collective response to climate change, by bringing the fish and wildlife conservation community together.

As a leading conservation organization, we see ourselves:

- United across our programs in a shared commitment to address the effects of climate change on fish, wildlife, and their habitats;
- Reflecting our six climate change principles in all of our actions and relationships;
- Reflecting climate change in the planning, management and evaluation of all Service programs;
- Becoming carbon neutral by 2020;
- Sequestering carbon aggressively and strategically in ways that restore and create habitat for fish and wildlife;
- Increasingly applying the principles of adaptive management whenever appropriate to help reduce uncertainty, increase transparency and accountability, and ensure that we deliver conservation effectively;
- Depending on our 95 million acre National Wildlife Refuge System to play a critical role in ensuring habitat connectivity and conserving key landscapes and populations of fish and wildlife;

Our Climate Change Principles

- Priority Setting. We will continually evaluate our priorities and approaches, make difficult choices, take calculated risks and adapt.
- Partnership. We will commit to a new spirit of coordination, collaboration and interdependence.
- Best Science. We will reflect scientific excellence, professionalism, and integrity in all our work.
- Landscape Conservation. We will emphasize the conservation of habitats within sustainable landscapes, applying our “Strategic Habitat Conservation” framework.
- Technical Capacity. We will assemble and use state-of-the-art technical capacity to meet the climate change challenge.
- Global Approach. We will be a leader in national and international efforts to address climate change.

- Aggressively responding to the imperative to facilitate renewable and non-renewable energy development by working with the energy community to use landscape-scale approaches when designing, siting, and operating energy facilities;
- Sharing information and educational resources to help the public better understand the relationships among its actions, climate change, and resulting changes to fish and wildlife resources; and
- Sharing information to help federal, state, tribal, and local decision-makers and public officials better understand and consider the implications of climate change on fish and wildlife resources of importance to their constituents.

## Our Commitment

Our adaptive response to climate change will embrace strategic conservation of terrestrial, freshwater, and marine habitats within sustainable landscapes. The framework we will apply to achieve landscape conservation objectives is called “Strategic Habitat Conservation” (SHC). SHC includes four elements that occur in an adaptive management loop: (1) biological planning; (2) conservation design; (3) conservation delivery; and (4) monitoring and research.

IN adopting the SHC framework, the Service has recognized that it needs:

- a structured, objective-driven process for biological planning and conservation design;
- predictive models for managed systems, especially models that acknowledge uncertainties and challenge our decisions;
- monitoring to improve our understanding and management; and
- effective ways of delivering conservation action on the ground, which will typically require extensive partnerships and collaboration.<sup>13</sup>

Our strategic approach to climate change will emphasize three strategies that are often used to describe responses to climate change — Adaptation, Mitigation, and Education.

**Adaptation** is defined by the IPCC as an *adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*. Adaptation refers to the management actions we take to reduce the impacts of climate change on fish, wildlife, and their habitats. Adaptation forms the core of the Service’s response to climate change and is the centerpiece of our strategic plan.

We recognize two types of adaptive response to climate change — reactive and anticipatory. Traditional and current approaches to conservation have been directed mainly toward maintaining current or historic conditions. In many cases, maintaining those conditions means working against the effects of climate change as they occur on the landscape. Reacting to climate change in this way is reactive adaptation. Combating rising sea level by pumping sand ashore to replenish beaches and maintain habitat for nesting sea turtles and shorebirds would be

an example of reactive adaptation. A second approach to responding to climate change is to manage toward future, and often less certain, landscape conditions by predicting and working with the effects climate change. This is anticipatory adaptation because it anticipates and manages for future conditions. Letting rising sea level erode existing beaches and establish new shorelines landward for nesting sea turtles and shorebirds would be an example of anticipatory adaptation.

We will be explicit and strategic about which adaptation approach we will take in a given situation — because an inappropriate response or a series of inconsistent responses can result in large expenditures of time, energy, and resources with questionable or insufficient outcomes. In some situations, our response to climate change will be to implement reactive adaptation measures only. In other situations, we may implement reactive adaptation measures first, and then transition to anticipatory adaptation as our capacity to predict and manage future conditions grows. In other situations we will proceed immediately with anticipatory adaptation. We will base our decisions about using adaptive strategies on the abilities of the conservation community to identify and adopt new techniques, technologies and tools. We will learn by practicing adaptive management and over time we will increase the certainty of our collective understanding of the magnitude and direction of climate change impacts.

**Mitigation** is defined by the IPCC as *human intervention to reduce the sources or enhance the sinks of greenhouse gases*. Mitigation involves reducing our agency’s “carbon footprint” by using less energy, consuming fewer materials, and altering land management practices, such as controlled burning, water pumping and feed production. Our success in pursuing and achieving carbon neutrality will help us model appropriate organizational behaviors and assist the conservation community in catalyzing action to reduce greenhouse gas (GHG) emissions locally, regionally, nationally and internationally. In addition, we expect our mitigation successes to influence local, regional, national, and international land use and energy policies and actions, and further reduce GHG emissions.

Mitigation is also achieved through terrestrial carbon sequestration, which is the process through which CO<sub>2</sub> from the atmosphere is absorbed by vegetation through photosynthesis and stored as carbon in biomass (e.g., tree trunks) and soils. Sequestering carbon in vegetation, such as bottomland hardwood forests, can often restore or improve habitat and directly benefit fish and wildlife.

We will be aggressive in sequestering carbon and using best practices to manage our lands, meet our stewardship responsibilities, and manage our facilities, vehicles and vessels, travel, and purchases and acquisitions — so we become carbon neutral by 2020. Our successes will assist the global community in reducing GHG emissions and in reducing the impacts of climate change on fish, wildlife and their habitats.

**Education** is helping people learn and discover, thereby creating awareness and empathy, and ultimately leading to changes in human behavior. Education is a fundamental conservation tool and a public service responsibility. In the context of climate change, education means helping Service employees, our national and international partners, and our constituencies (e.g., the public, Congress) understand that climate change is real and happening now; it

threatens fish and wildlife resources we have come to value; and each of us can do something meaningful to reduce the threats. Through education, Service employees will be better equipped to address climate change in their day-to-day responsibilities. Members of the public will be encouraged and motivated to reduce their carbon footprint, reduce atmospheric levels of greenhouse gases, and help wildlife adapt in a climate-changed world. Legislators and policymakers will be motivated to support legislation and policy that address climate change locally, regionally, nationally and internationally.

We will use a balanced approach in undertaking adaptation, mitigation and education. Goals and objectives established later in this plan will be stepped-down to specific actions that together will form our near-term Action Plan for addressing climate change. We will proceed in a progressive manner that will reflect increasing certainty about what actions we should take and when.<sup>c</sup> With regard to mitigation, we will begin immediately and work aggressively to reduce our carbon footprint. Over time, we will build a strong “mitigation consciousness” in our organization and, consequently, our mitigation successes will grow and we will need to emphasize mitigation less. With regard to education, we will increase our internal educational efforts immediately so our employees can acquire the additional knowledge and skills they need to reflect climate change as a central focus of our programs. At the same time, we will increase our external educational and outreach efforts to garner public support nationally and internationally for our adaptation and mitigation activities. In addition, we will encourage members of the public to reduce their carbon footprint. With regard to adaptation, we will increase our reactive adaptation response in the near term as we react to increasing climate change impacts. However, over the long term we will assemble technical and institutional capability in concert with our partners and together we will engage more in anticipatory adaptation, particularly where we become more certain about the impacts of climate change. As our expertise and that of our conservation partners grow, and as we learn more about climate change, we will increasingly emphasize anticipatory adaptation.

## Strategic Goals and Objectives

*“Vision without action is a dream. Action without vision is simply passing the time. Action with vision is making a positive difference.”*

-- Joel Barker --

Goals and objectives will turn our strategic vision into action, and distinguish the Service as a national and international leader and creative partner in facilitating wildlife adaptation, greenhouse gas mitigation, and education to address the effects of accelerating climate change on fish and wildlife and their habitats. Action items needed to achieve the following goals and objectives are included in our companion document: “Action Plan for Implementing the Service’s Strategic Vision on Climate Change, FY 2009 – 2013.”

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<sup>c</sup> **Certainty** increases when the collective understanding of climate change trajectories (i.e., the magnitude and direction of change) in a given area, their impacts on fish, wildlife, plants and their habitats, and our ability to successfully manage those impacts increases and becomes more accepted, both within the Service and the general public. Increasing certainty within the Service and among our publics and partners is a strategic goal of our research and monitoring programs and our educational endeavors.



## *Adaptation*

**Goal 1 - We will develop and apply capacity for biological planning and conservation design to drive conservation at broad landscape scales.**

### **Objective 1.1 - Develop a National Fish and Wildlife Adaptation Strategy**

Pending climate legislation in both the U.S. Senate and House of Representatives mandates a national strategy for assisting fish and wildlife in adapting to climate change.<sup>d</sup> We view this as the most consequential and crucial conservation endeavor of the 21<sup>st</sup> Century and we commit ourselves to an intensive 5-year collaboration, to develop a National Fish and Wildlife Adaptation Strategy (NFWAS). The NFWAS will be our nation's shared blueprint to guide wildlife adaptation partnerships over the next 50-100 years. Achieving this will require unprecedented collaboration among private, state, tribal, federal, and international organizations.

Through the NFWAS our nation will (1) identify and monitor fish and wildlife resources that are critically vulnerable to climate change; (2) set strategic priorities and guide tactical efforts to achieve resilience, representation, and redundancy of fish, wildlife and plant populations and habitats; (3) identify and prioritize key ecological processes that must be protected or restored to sustain fish and wildlife populations over this century; and (4) identify reactive and anticipatory approaches to facilitate adaptations by fish and wildlife. The NFWAS will cover terrestrial, coastal, estuarine, and marine habitats across the entire United States, and will include transboundary areas with Canada and Mexico<sup>e</sup>, and more distant areas in the Western Hemisphere that are associated with many of our migratory species (e.g., Central and South American wintering areas of migratory songbirds). Resource management agencies and organizations from around the country and internationally will be fully integrated into the process of developing the NFWAS. The Service will help inspire, organize and facilitate a collaborative process bringing diverse interests together to develop this Strategy.

### **Objective 1.2 – Acquire Regional Climate Science and Modeling Expertise**

Successful conservation strategies will require an understanding of climate change; the ability to predict how that change will affect fish and wildlife at multiple scales; and the skill to translate this understanding into useful tools for landscape-level conservation design. We need access to a broad expertise in climate data and modeling, and in forms that are useful for landscape-scale biological planning and conservation design. In some Service Regions, this

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<sup>d</sup> Lieberman-Warner Climate Security Act of 2008, Title IV, Subtitle G, Sec. 4702; Dingell-Boucher “discussion draft” of climate change legislation released on October 7, 2008

<sup>e</sup> Transboundary issues will be addressed through the Canada/Mexico/US Trilateral Committee for Wildlife and Ecosystem Conservation and Management (the Trilateral Committee). The Trilateral Committee was established to facilitate and enhance coordination, cooperation, and the development of partnerships among the wildlife agencies of the three countries regarding programs and projects for the conservation and management of species and ecosystems of mutual interest in North America.

expertise will be found within relatively few organizations, such as the United States Geological Survey (USGS) or universities. In other Regions, this expertise will be more widely dispersed. We will help provide employees and partners with access to this expertise by facilitating development of Regional Climate Science Partnerships. These partnerships will facilitate the development of climate knowledge networks among our employees and key partners that will support a broad spectrum of resources management.

Climate science and modeling expertise will (1) make global General Circulation Model (GCM) outputs usable at landscape planning scales through modeling and statistical approaches; (2) blend GCM and land-use change projections to model plausible future scenarios to inform decisions (scenario planning); (3) identify and predict climate change thresholds for key species and habitats; (4) inform decisions between reactive and anticipatory adaptations; (5) facilitate research to address key uncertainties in applying climate change science to fish and wildlife conservation; and (6) support regional inventory and monitoring programs. Currently, this expertise is largely unavailable to managers, and without it they cannot develop successful adaptation strategies for fish and wildlife.

### **Objective 1.3 – Acquire Biological Planning and Conservation Design Expertise**

To promote species adaptation, we need the capability to develop, test, and implement conservation strategies responsive to dynamic landscape changes resulting from accelerating climate change. These strategies must be model-based and spatially explicit, allowing us to apply emerging climate knowledge, predict habitat and species changes, and target conservation to address climate change impacts. To accomplish this, we will develop biological planning and conservation design expertise across the Service, and among diverse partners, as defined in our Strategic Habitat Conservation framework. This expertise will assemble climate, land-cover, land-use, hydrological and other relevant data, in spatially-explicit contexts. It will apply population-habitat and ecological models, statistical analysis and conservation biology to assemble strategies to drive conservation delivery at landscape scales.

This expertise already exists, in some measure, in partnerships like the Lower Mississippi Valley Joint Venture. However, in most areas we need to build new or expand existing partnerships if we are to successfully support fish and wildlife adaptations to changing climate. So, we will work with partners to develop Landscape Conservation Cooperatives (LCCs or cooperatives), as shared networks of expertise. The precise organizational structure for cooperatives will vary based on the shared needs of cooperators. In some cases, we can build cooperatives by enhancing existing partnerships such as Joint Ventures or similar initiatives. In other cases, new cooperatives will be established, networking partner organizations with the technical capability to guide landscape-scale biological planning and conservation design.

With the expertise available through LCCs, we and our partners will be able to develop explicit, predictive and measurable biological objectives to guide landscape-scale conservation design and delivery. We will develop and refine dynamic population-habitat models and other decision-support tools. We will identify and model areas of converging climate and non-climate stressors (e.g., Alaska Landscape Cumulative Effects Model, ALCES), and we will test various adaptation approaches to demonstrate and evaluate their effectiveness.

#### **Objective 1.4 - Conduct Species and Habitat Vulnerability Assessments**

In order to establish priorities for species and landscape conservation we must understand which species and habitats are most vulnerable to accelerated climate change. We will work with partners to develop and test methodologies, and assess species and habitat vulnerability. Assessments will identify the climate and non-climate factors that are the principal causes of vulnerability, including water quantity and quality for aquatic species.

#### **Objective 1.5 – Incorporate Climate Change in all Service Activities and Decisions**

We will consider actual and predicted climate change impacts to fish and wildlife populations in all Service planning, management, and restoration efforts. Planning efforts will include both resource planning (e.g., Recovery Plans, Fish Habitat Plans, Migratory Bird Plans, and Comprehensive Conservation Plans), operations planning (e.g., facility maintenance, construction, and equipment and fleet management) and administrative planning (e.g., workforce planning, and information technology management planning).

#### **Objective 1.6 - Provide requested support to State and Tribal Managers to address climate change issues that affect FWS Trust resources**

Many states are already working to address climate change in their State Wildlife Action Plans and other management plans. Tribes are likely to consider management changes as well. We will work collaboratively with states and tribes to provide information and support to incorporate climate change considerations into State Wildlife Action Plans (SWAPS) and other appropriate state and tribal fish and wildlife management plans and programs.

#### **Objective 1.7 - Evaluate Legal, Regulatory, and Policy Framework to Identify Barriers and Opportunities for Successful Implementation of Climate Change Actions**

We will review, identify, and work to revise all elements of the Service's legal, policy, and regulatory framework necessary to support effective adaptive responses to changing climate. We will place particular focus on developing necessary new policies (e.g., assisted colonization) and needed revision of existing policies (e.g., what constitutes native, invasive, or exotic species?). In addition, we will identify laws, regulations, policies, guidance, and other protocols necessary to provide incentives or eliminate barriers to our efforts to mitigate climate change by reducing our carbon footprint.

#### **Objective 1.8 - Revise Service Grant Criteria to Incorporate Climate Change Considerations**

We will review all Service grant programs and modify grant criteria as necessary to direct greater amounts of funding to projects that specifically address climate change adaptation, mitigation, or education.

**Goal 2 - *We will plan and deliver landscape conservation that supports climate change adaptations by fish, wildlife, and plant populations of ecological and societal significance.***

While our long-term response to climate change will be determined over the next 5 years as we work collaboratively in developing the National Fish and Wildlife Adaptation Strategy, there will be many near-term actions we can take to begin the process of managing fish and wildlife adaptation to climate change. Near-term conservation delivery will apply vulnerability assessments and focus on (1) protecting acutely vulnerable species, such as ice-dependent or sky island species; (2) reducing habitat fragmentation and building connectivity by means such as habitat corridors; (3) acquiring key water rights and flows; (4) managing genetic resources; (5) reducing susceptibilities to disease, pathogens, and contaminants; (6) addressing coastal and marine resource issues; (7) addressing key ecological processes; (8) reducing non-climate stressors; and (9) fostering international efforts on climate change.

**Objective 2.1 - Take Conservation Action for Climate-Vulnerable Species**

We must place high priority on taking near-term action to identify and conserve climate-vulnerable species. Timely identification of climate-vulnerable species and their habitats may allow us to take “pre-emptive” action to conserve species, thereby avoiding the need to list them under the Endangered Species Act (ESA). In other instances, identifying climate vulnerable species will provide the basis for listing them as endangered or threatened and designating critical habitat under the ESA as early as possible in order to provide more flexibility in developing regulatory and recovery efforts. Novel conservation and recovery actions, such as assisted colonization<sup>f</sup>, will be developed and implemented to protect acutely climate-vulnerable species.

**Objective 2.2 – Promote Habitat Connectivity**

Climate change will interact with non-climate stressors such as land-use change, fire, and habitat fragmentation from urban, suburban and agricultural development. Protecting contiguous and unfragmented habitat and enhancing connectivity between protected areas using linkages and corridors will facilitate the movement of fish, wildlife, and plant species in response to climate change. Through conservation design, we will work with partners to identify needed habitat protection and landscape-scale habitat linkages and corridors. By joining the habitat protection and management capacities of the Service (e.g., National Wildlife Refuge System, Partners for Fish and Wildlife Program, and North American Wetlands Conservation Act) with those of partners, we will help build this connectivity within and between landscapes.

**Objective 2.3 – Identify and Fill Priority Freshwater Needs**

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<sup>f</sup> Assisted colonization is the intentional translocation of a species with limited dispersal ability to a site or sites where it currently does not occur or has not been known to occur in recent history in order to lower the extinction risk from climate change.

Water is the key to life, and climate change will alter the distribution and abundance of water by affecting precipitation, air and water temperatures, and snowmelt. To meet human needs for water, water supply infrastructure and allocations will be adapted in response to climate change. As these human adaptations are considered, we will work with partners (including water management agencies and other water entities) to ensure water resources of adequate quantity and quality to support biological objectives for fish and wildlife. Within the Service this will be a critical issue for National Wildlife Refuges (NWRs), National Fish Hatcheries (NFHs), threatened and endangered species, migratory birds, and fish and aquatic species conservation. We will work to ensure that fish and wildlife resources have adequate water by acquiring key water rights and by working with water management authorities to ensure in-stream flows to address priorities determined by vulnerability assessments.

#### **Objective 2.4 – Manage Genetic Resources**

Because many species will have difficulty surviving in the wild in a climate-changing world, we must continue to expand our partnership with states, zoos, botanical gardens, and other partners to develop effective ways to manage genetic resources of fish and wildlife resources, and to build the policy framework and decision support needed to determine when and how to apply these measures in a transparent, responsible, and ethical manner.

#### **Objective 2.5 – Reduce Susceptibility to Diseases, Pathogens, Pests, and Contaminants**

Climate induced stress will compromise species resistance to diseases, pests and contaminants, and likely increase mortality. In addition, changing climate will allow pathogens and pests to spread to areas where they are currently climate-limited (e.g., by low temperatures in the winter). Working with our partners we will: (1) improve surveillance and response capabilities; (2) improve predictions of climate change impacts on the biology of wildlife and vector species; and (3) identify and implement management measures to reduce wildlife vulnerabilities to climate change and susceptibility to disease, pathogens, pests and contaminants.

#### **Objective 2.6 – Conserve Coastal and Marine Resources**

Coastal habitats are among the most important habitats for fish and wildlife. A large number of our National Wildlife Refuges are along coastlines, and coasts are tremendously important to myriad migratory birds and endangered species such as marine turtles and manatees. Marine ecosystems are among the most biologically diverse in the world. We will make sea-level rise models (e.g., SLAMM<sup>g</sup>) available to all coastal refuges and expand modeling to additional coastal areas including the Coastal Barrier Resources Act (CBRA) units, to determine the relative vulnerability of these areas. In addition, we will assess the vulnerability of our marine NWRs, other protected areas, and other priority marine resources. We will work with partners to develop and implement new strategies for coastal and marine management and

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<sup>g</sup> The Sea Level Affecting Marshes Model (SLAMM) simulates the dominant processes involved in wetland conversions and shoreline modifications during long-term sea level rise. Map distributions of wetlands are predicted under conditions of accelerated sea level rise, and results are summarized in tabular and graphical form.

restoration. We will work to get more marine protected areas designated, where they are needed to achieve our resource population objectives.

### **Objective 2.7 - Address Key Ecological Processes**

We must develop new and innovative ways of protecting and restoring key ecological processes to sustain fish, wildlife, and plant populations. Among these processes are pollination, seed dispersal, and nutrient cycling. The potential for trophic mismatches (e.g., ecological relationships between birds and prey, or pollinators and plants) must also be understood and considered. In the near-term, this objective will be addressed primarily through research (see Objective 3.4) and demonstration projects, particularly on Land Management Research and Demonstration (LMRD)<sup>h</sup> Refuges.

### **Objective 2.8 - Reduce Non-climate Stressors**

Successful adaptation strategies for fish and wildlife will require success in understanding and reducing the combined and cumulative effects of climate change and non-climate stressors such as land-use changes (e.g., agricultural conversion, energy development, urbanization), invasive species, wildfire, contaminants and wildlife crime. Reducing these non-climate stressors is a fundamental objective of many current Service programs and activities; however, the key with climate change will be to target non-climate stressors where they will do the most good in conserving priority species and landscapes. We cannot simply work to reduce non-climate stressors on an *ad hoc* or opportunistic basis. Our work must be targeted to reduce specific stressors that our predictive tools indicate will be key limiting factors in an overall adaptation strategy for priority species or landscapes. Thus, working with partners to reduce these key non-climate stressors will be an important component of our landscape conservation strategies.

### **Objective 2.9 - Foster International Coordination for Landscape Conservation**

We will foster international landscape conservation on the North American continent, working through the Trilateral Committee and the Western Hemisphere Migratory Species Initiative (WHMSI)<sup>i</sup>. More broadly throughout the world, we will work through our Wildlife Without Borders<sup>j</sup> and Migratory Bird programs to promote landscape conservation to reduce climate change effects on priority species and landscapes, particularly migratory and cross-border species.

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<sup>h</sup> Land Management Research and Demonstration Areas (LMRDs) are places on National Wildlife Refuges where new habitat management techniques and approaches are developed, implemented and showcased.

<sup>i</sup> The Western Hemisphere Migratory Species Initiative (WHMSI) seeks to contribute significantly to the conservation of the migratory species of the Western Hemisphere by strengthening communication and cooperation among nations, international conventions and civil society, and by expanding constituencies and political support.

<sup>j</sup> Wildlife Without Borders is a program of the Division of International Conservation within our International Affairs Program



**Objective 2.10 - Implement National Fish and Wildlife Adaptation Strategy as the Service's Long-term Adaptive Response to Climate Change**

Our long-term adaptive response to climate change will be guided by the National Fish and Wildlife Adaptation Strategy (NFWAS), a coordinated, multi-organization plan for landscape conservation across the United States, portions of Mexico and Canada, and certain, more-distant areas within Central and South America. Implementation of the bulk of NFWAS is likely to occur after 5 years, and therefore, is largely beyond the scope of the 5-year Action Plan that implements this Strategic Plan.

As it is developed, we will work to ensure that the NFWAS (1) embraces the philosophy that fish and wildlife population and ecosystem sustainability are interdependent goals; (2) recognizes appropriate roles for both reactive and anticipatory adaptation approaches; (3) reflects the goal that, over time, we will be better able to make anticipatory adaptations; (4) addresses species and habitat priorities that reflect scientific assessments and risk-based predictions of vulnerability to changing climate; and (5) identifies key ecological processes and methods to conserve them. Finally, we expect the NFWAS will include a national strategy for monitoring of species and habitats that are most vulnerable to climate change, and one that will support and encourage adaptive resource management strategies as a keystone in our response to climate change. As we implement near-term actions, we will evaluate success and failure and use this information to inform development of the NFWAS.

***Goal 3 – Monitoring and research partnerships will make available complete and objective information to plan, deliver, evaluate, and improve actions facilitating fish and wildlife adaptations to accelerating climate change.***

**Objective 3.1 - Develop a National Biological Inventory and Monitoring (I&M) Partnership**

Biological inventory and monitoring is an essential tool to understand the status and trends of fish, wildlife, and plant populations and their habitats, as well as to help determine large-scale patterns of ecosystem health. To address this need, we will advocate and lead efforts to develop a national, integrated inventory and monitoring (I&M) partnership to monitor continental changes in key populations and biological diversity. Our efforts will be driven by the inventory and monitoring priorities developed by Landscape Conservation Cooperatives, as well as priorities developed collaboratively among many agencies within the NFWAS. We will leverage our efforts with those of existing Federal monitoring programs with proven track records and relevancy to climate change (e.g., the Forest Service's Forest Inventory & Analysis Program (FIA), EPA's Environmental Assessment and Monitoring Program (EMAP), and USGS's National Phenology Network). We will incorporate new monitoring approaches as necessary and practical, including complete plant and vertebrate species inventories and inventories of select subsets of invertebrate species for all Service lands within 10 years.

**Objective 3.2 - Promote Physical Science and Remote-sensing Monitoring Programs**

Remote sensing of abiotic and biotic change will be a key component of any comprehensive monitoring program, particularly for larger landscapes. We will work with partners and experts such as USGS, NOAA, and the National Aeronautics and Space Administration (NASA) to define remote-sensing monitoring priorities. We will continue to support existing physical science and remote-sensing monitoring programs that have proven track records and are relevant to climate change (e.g., Remote Automated Weather Stations, and Interagency Monitoring of Protected Visual Environments).

**Objective 3.3 - Develop Research and Monitoring Capability for Use In Landscape Conservation**

Monitoring and research are key components of adaptive management as outlined in the Service's Strategic Habitat Conservation framework. By measuring the effect of conservation efforts against explicit predicted outcomes, managers can learn from both success and failure, thereby increasing the probability of success in future actions. We will develop appropriate research and monitoring programs to ensure that the adaptation efforts we undertake are evaluated and that key uncertainties are identified, prioritized and targeted for research. We will provide relevant education and training opportunities to Service managers, and ensure that this component is incorporated into all of our landscape conservation efforts.

**Objective 3.4 – Further Develop Collaborative Research Partnerships**

We will enhance existing and develop new collaborative partnerships to conduct research related to fish and wildlife adaptation to climate change. We will enhance our use of existing Federal research capability (e.g., USGS-FWS Science Support Partnership, Cooperative Research Units) and develop new partnerships with universities and university consortiums (such as Cooperative Ecosystem Studies Units) in designing and implementing a climate research program in conjunction with Landscape Conservation Cooperatives. In addition, we will designate areas that are long-term sites for integrated research on climate change (e.g., Research Natural Areas, NWRS LMRD Areas).

***Mitigation***

**Goal 4 – *We will achieve carbon neutrality by 2020.***

**Objective 4.1 - Reduce the Carbon Footprint of the Service's Facilities, Vehicles, and Work Force**

To achieve carbon neutrality by 2020, we must reduce the energy use and carbon footprint of our buildings, facilities, vehicle fleet, and workforce to the maximum extent possible. We have ongoing efforts to inventory, monitor, evaluate, and reduce our energy usage. By expanding these efforts and embarking upon new and innovative efforts across the Service we anticipate success in reducing our carbon footprint by approximately 10 percent annually between now and 2020.

#### **Objective 4.2 - Reduce the Service's Land Management Carbon Footprint**

The Service's land management activities (e.g., farming, water pumping, prescribed burning) have an associated carbon footprint. To achieve carbon neutrality, we must assess and reduce this footprint to the maximum extent possible. Our understanding of the carbon footprint associated with our land management activities is rudimentary, and significant effort must be invested in inventory, monitoring, and evaluation of that footprint. We must then determine how to reduce that footprint while continuing to achieve the Service's highest mission priorities. This will involve evaluating alternatives and trade-offs, and making difficult choices.

#### **Objective 4.3 - Offset the Remaining Carbon Balance**

After minimizing the carbon footprint of the Service's facilities, vehicles, work force and land management activities, a residual carbon footprint will remain. We will offset our residual carbon footprint, through carbon sequestration and other measures, in order to become carbon neutral by 2020.

#### **Objective 4.4 - Evaluate Efforts to Become Carbon Neutral**

To judge the success of our efforts and adjust them as necessary, we will regularly evaluate our actions to avoid, reduce, and offset our carbon footprint.

***Goal 5 – We will build capacity to understand, apply, and share terrestrial carbon sequestration science, and work with partners to sequester atmospheric GHGs while conserving fish and wildlife habitat at landscape scales.***

#### **Objective 5.1 – Develop Terrestrial Carbon Sequestration Expertise**

Terrestrial carbon sequestration has the potential to simultaneously accomplish adaptation and mitigation objectives. For example, by reforesting a corridor between two protected areas with an appropriate mix of native trees, we not only sequester carbon, we create viable habitat as well. When the restored habitat contributes to attainment of explicit population objectives for climate-vulnerable species or species assemblages, then we are achieving both mitigation and adaptation goals. Landscape Conservation Cooperatives will provide the basic scientific and technical capabilities and expertise needed to accomplish this vision. But we will also need to develop specific expertise in terrestrial carbon sequestration in order to address the tasks outlined in Objectives 5.2 through 5.5.

#### **Objective 5.2 – Develop Standards, Guidelines, and Best Management Practices for Terrestrial Carbon Sequestration**

Our carbon sequestration expertise will identify scientific approaches, standards, guidelines, and Best Management Practices (BMPs) for terrestrial carbon sequestration activities, both domestically and internationally, and provide optimal fish and wildlife habitat through strict requirements for use of native vegetation. This information will be shared, domestically and

internationally, to encourage large-scale partnership in science-driven terrestrial carbon sequestration supporting fish and wildlife adaptation to climate change.

### **Objective 5.3 - Conduct Carbon Sequestration Research**

Our carbon sequestration experts and managers will work with others to identify and fill information gaps regarding terrestrial carbon sequestration techniques.

### **Objective 5.4 – Integrate Carbon Sequestration Activities into Landscape Conservation Approaches**

We will ensure that terrestrial carbon sequestration activities, whether initiated by the Service or others, are implemented within an adaptive, landscape conservation context, including biological planning and conservation design, on-the-ground delivery, and research and monitoring to evaluate success. Applying our landscape conservation framework will help us, in our work with partners, to determine where, when, how much, and what habitat types should be conserved, protected, and enhanced in a given area to achieve both species and carbon sequestration objectives.

### **Objective 5.5 - Facilitate International Carbon Sequestration**

One of our most important roles in carbon sequestration may well be to facilitate carbon sequestration activities internationally. By working with international partners and stakeholders to help reduce deforestation rates in key areas (e.g., tropical forests) and by providing technical assistance and funding for carbon sequestration through reforestation, we will help preserve key areas for biodiversity conservation and help with GHG mitigation. We will work through our Wildlife Without Borders and Multinational Species Programs to provide funding and technical assistance to increase carbon sequestration, restore habitat, and increase connectivity.

### **Objective 5.6 - Evaluate Geologic Sequestration**

We will participate in Department of the Interior geologic sequestration efforts to minimize potential impacts to fish, wildlife, and plants.

## ***Goal 6 – We will ensure that fish and wildlife conservation is considered as America strives to achieve sustainable energy security.***

### **Objective 6.1 – Facilitate Balanced Renewable Energy Development**

As wildlife management professionals, we believe that renewable sources of energy are a key element in attaining a national goal of sustainable energy security, and in mitigating emissions of GHGs, which are the root of the climate crisis and its consequences for fish and wildlife. While we understand that the expansion of renewable energy development will contribute to the nation’s energy needs with lower net atmospheric release of GHGs per unit of energy (as compared to nonrenewable sources), we recognize that such development will result

in impacts to fish and wildlife. Therefore, it will be our goal and obligation to facilitate balanced renewable energy development by providing timely and effective information on impacts to fish and wildlife. We will consider renewable energy project proposals in the context of effects to fish and wildlife populations, habitats, and human uses of those fish and wildlife resources, applying the shared expertise within Landscape Conservation Cooperatives, and we will be an objective source of information on avoiding, minimizing, and off-setting those effects. We will work with industry, agencies, and other stakeholders to facilitate siting, construction, operation and maintenance of renewable energy projects that explicitly evaluate, and avoid or otherwise mitigate, significant impacts to fish and wildlife.

### **Objective 6.2 – Provide Technical Assistance for Nonrenewable Energy Development**

Nonrenewable energy development will continue to be a large part of the United States' energy sector for years to come. We have ongoing efforts to help avoid, minimize, and compensate the adverse effects to fish and wildlife of nonrenewable energy development, and will be called upon to expand our effort significantly in the near future. We must work closely with industry and other Federal land management agencies (e.g., Forest Service, Bureau of Land Management) as they site, construct, operate, and maintain nonrenewable energy projects. We will consider such proposals in the context of their suspected cumulative impacts to population-levels, applying the shared expertise within Landscape Conservation Cooperatives, and we will be an objective source of information on avoiding, minimizing, and mitigating those effects.

## ***Education***

***GOAL 7 – We will provide educational and training opportunities for Service employees regarding the implications and urgent nature of climate change as it relates to the Service mission and will engage them in seeking solutions.***

### **Objective 7.1 - Provide Educational and Training Opportunities to Service Employees**

Our workforce and field structure are core strengths in addressing changing climate. Building awareness and expertise within our employees is a priority. The Assistant Director, External Affairs and the Director of the National Conservation Training Center (NCTC), will establish and co-chair a Service Climate Education and Training Team. The team will develop and oversee implementation of a comprehensive plan addressing internal education and communication toward the goal of preparing and inspiring Service employees to address climate change. It will ensure that every Service employee understands basic climate change science, the urgency of climate change to our mission, and the need to accept personal responsibility by being involved in mitigation, adaptation, and education.

Working through NCTC, the team will develop materials, curricula, and train employees in methods to address climate change in their day-to-day activities. We will also provide our employees with tools that allow them to serve as a resource for our partners and the public in dealing with climate change adaptation and mitigation for fish, wildlife and plants. Specifically,

NCTC will develop, and within one year, begin to implement a climate change curriculum designed to educate Service employees regarding climate change and engage them in solutions. NCTC will also incorporate climate change into all appropriate courses.

**Objective 7.2 – Obtain Staff Support for New Approaches to Conservation**

Climate change is ushering in a new era of conservation for the Service, involving novel ways of thinking and bold innovations. We will view all of our endeavors through the filter of climate change, be willing to question the status quo, re-examine priorities and make difficult choices regarding where we can make a difference and where we cannot. We will develop and implement a near-term strategy to communicate plans for institutional changes addressing climate change. Every employee must be engaged and prepared to embrace change.

***GOAL 8 – We will inform American citizens about the implications and urgent nature of climate change for fish and wildlife and what actions they can take to assist fish and wildlife adaptation and to minimize their carbon footprint***

**Objective 8.1 - Provide Educational and Training Opportunities for External Audiences**

The Climate Education Team will develop and implement an education and communication plan for external audiences. The plan will educate external audiences about the effects of accelerating climate change on fish and wildlife, and what they can do to minimize their carbon footprint and conserve fish and wildlife.

We will develop education materials and provide education and training opportunities for outside audiences (e.g., partners, other stakeholders, the public), and use Refuge visitor centers as a primary means of communication with the public. NCTC will develop climate change materials for use in Refuge visitor centers, web sites, and employee presentations for educational purposes.

**Objective 8.2 - Provide Domestic Technical Assistance**

We will provide technical assistance to public and private landowners, conservation organizations, industry, and non-governmental organizations to help them understand and address impacts caused by climate change and inspire and assist them in undertaking mitigation, adaptation, and education efforts.

**Objective 8.3 - Learn From Others**

To become a better, more-informed partner, we will actively seek knowledge from State, Federal, Tribal, and local agencies; non-governmental organizations; individuals; and industry already engaged in climate change.



***Goal 9 – We will work with international partners and other nations to share information, tools and technical assistance on climate change, and to influence international climate change and related policies.***

**Objective 9.1 – Exchange Information and Influence Policy Internationally**

Working principally through our International Affairs and Migratory Bird programs, we will engage other countries in sharing state-of-the-art knowledge on climate change adaptation, mitigation, and education strategies. We will seek to learn from their experiences, and will share our experiences with them, to achieve a common understanding and common ground for moving forward together on climate change policy and action. We will also seek ways to address climate change more effectively through the U.N. Framework Convention on Climate Change (UNFCCC), international conventions such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Ramsar Convention on Wetlands, and other international agreements.

**Objective 9.2 - Provide International Assistance for Outreach and Education**

By working with international partners and national governments to educate their citizens about the causes and consequences of climate change, we have an opportunity to create support for minimizing deforestation, creating new habitat through carbon sequestration efforts, and helping local communities get involved in carbon markets to assist conservation. In this way, we can have a substantial impact on international efforts on wildlife adaptation and climate change mitigation.

***Leadership and Management to Implement Our Strategic Plan***

Within the next 2-3 years, it is likely that policy and political decisions will be made to address changing climate, and these decisions will have enormous significance for conservation of fish, wildlife, plants and their habitats during the 21<sup>st</sup> Century. In order to effectively influence these decisions, we must immediately invest in management capability at both the national and regional levels to develop a credible and cohesive approach to climate change. To address regional needs, we will create Regional Climate Teams that will ensure the step down of national policies and guidance to the regional and field levels and will ensure on-the-ground implementation of our adaptation, mitigation, and education goals and objectives. To address national needs, we will create a National Climate Team. The National Climate Team will ensure leadership and management of climate change activities, including: budget and performance; policy development and implementation; landscape conservation design, delivery, and evaluation; internal and external partnership development; Congressional assistance; education and communication; and science direction.

To accomplish our mission in an era of accelerated climate change, we must fundamentally change how we do business in the coming decades. We will need to take new conservation approaches, redirect priorities, and make tough budget decisions. Fundamental change requires leadership at all levels of the Service. The Directorate must lead the way by

recognizing both the crisis of accelerated climate change and the transformational changes that will be needed to successfully address it. The Directorate will be called upon to make difficult choices about program priorities and budgets, and its response will guide the rest of the agency. But change cannot be limited to the Directorate; it must permeate all levels of the Service. All employees will work to find new and innovative ways to incorporate climate change into day-to-day activities of the agency. Only through leadership at all levels will we make a successful transition to this new way of doing business.

With leadership comes accountability. Accountability can only be assessed if we monitor and evaluate our effectiveness in implementing the Strategic Plan and associated 5-year Action Plan. We will develop reporting mechanisms for Regions and Programs to assess implementation annually. The written assessments will evaluate the Service's performance in meeting the goals and objectives of the Strategic Plan. The Directorate will use this report as the basis for taking appropriate actions to ensure the Service remains true to the intent of the Strategic Plan. After three years of implementation, the Directorate will seek outside, independent reviews of our climate change efforts. Finally, to add incentive to our efforts, we will recognize and reward Service employees, programs, or offices that demonstrate leadership by taking substantive actions on climate change adaptation, mitigation, or education.

We also have a unique opportunity to be a leader on climate change within the wildlife conservation community. Such leadership will be demonstrated through actions, not words. We will establish Service leadership in climate policy discussions to effectively represent Service conservation interests in discussions relating to climate legislation. We will work to achieve climate change legislation that reflects our Guiding Principles and our Strategic Plan in its provisions related to wildlife adaptation. We will also establish leadership by playing a key role in galvanizing agencies, organizations and industry to come together to work collectively to develop a National Fish and Wildlife Adaptation Strategy.

## **Meeting the Challenge**

Our plan is ambitious — and rightfully and necessarily so.

Climate change must become our highest priority; consequently, we will deploy our resources, creativity and energy in a long-term campaign to reduce emissions of greenhouse gases and safeguard fish, wildlife and their habitats. Our strategic plan commits us to reaching inward to every part of our organization and reaching outward to the larger conservation community to tackle climate change as a community venture and build the philosophies, relationships and capabilities we need to succeed. Changes of this type and scale will understandably appear daunting to some members of the community. But with persistence, patience and, above all, respect, we can, as a community, embrace landscape-scale strategies for adaptation, mitigation and education that will serve fish, wildlife and their habitats well in the struggle against climate change.

The Service is mobilizing on the ground and has already made important strides in combating climate change, just as we did when the conservation community rallied in opposition to reckless overharvest of game species in the first half of the 20<sup>th</sup> Century, when Rachel Carson

led the charge against indiscriminant pesticide use almost a half century later, and when the conservation community joined in establishing joint ventures over the last two decades to reverse severe declines in migratory bird populations.

With the help of this plan, we are moving forward enthusiastically and optimistically in working across the conservation community to nurture a new philosophy and era of interdependent conservation that will sustain fish, wildlife and their habitats in the face of climate change. We and the larger conservation community will be challenged many times over, but we are confident that over the next half century we can walk in the footsteps of Rachel Carson and make climate change yesterday's crisis.

*“Man is not imprisoned by habit. Great changes in him can be wrought by crisis—once that crisis can be recognized and understood.”*

-- Norman Cousins--

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