

**TESTIMONY OF DAN ASHE, DIRECTOR
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DEPARTMENT OF THE INTERIOR
BEFORE THE
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON OVERSIGHT
REGARDING
NATURAL RESOURCE ADAPTATION: PROTECTING ECOSYSTEMS AND ECONOMIES**

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Chairman Whitehouse and Members of the Committee, thank you for the opportunity to testify before you today on the role and efforts of the U.S. Fish and Wildlife Service (Service), in partnership with other Department of the Interior (Department) bureaus and stakeholders at all levels, to protect ecosystems and other natural resources in the face of climate change impacts.

This hearing comes at a time when the nation's living resources are being impacted by forces acting upon large landscapes and ecosystems such as habitat fragmentation or loss due to land use changes; invasive species; fish and wildlife disease; wildfire, floods, and drought – all exacerbated by climate change. The nation's natural resources, including water, fish and wildlife, and forests, are among our most valuable economic assets. Our natural heritage, including hunting, fishing, and outdoor recreation are being threatened by these impacts at landscape and watershed scales that cross multiple Federal, State, Tribal, and local management jurisdictions.

Impacts of Climate Change on Natural Resources

The Earth's average surface temperature is increasing due to human emissions of greenhouse gases, and this has and will likely continue to erode habitat quality and sustainability for fish and wildlife species and, in some cases, cause abrupt changes to entire ecosystems. From the Arctic to the Everglades to our territories in the Pacific Ocean, these impacts are already affecting local, State, Tribal, regional, national and international economies and cultures.

According to the U.S. Global Change Research Program significant changes in the U.S. climate over the past 50 years have occurred, including increases in average temperatures, shifts in rainfall and storm patterns, increases in wildfires, more frequent water shortages, rising sea levels, loss of Arctic sea ice, ocean acidification, changing precipitation patterns, and coastal flooding and erosion. This has the potential to gradually erode habitat quality and sustainability for fish and wildlife species, and in some cases cause abrupt changes to entire ecosystems. These working landscapes to wilderness areas far from human habitation, impacts can be seen from the Arctic to the Everglades, and across the nation to our territories in the Pacific Ocean, and are already affecting local, State, Tribal, regional, national and international economies and cultures. As the climate continues to change over the next century, so too will the effects on species, ecosystems, and their functions.

Climate change is now among the greatest challenges facing the conservation of our native species, and it is contributing to dramatic changes in the habitats they need for breeding, migrating, and wintering. Over time, climate change is impacting the dynamics of wildlife disease, increasing the

threat to biodiversity. As the Earth warms, ecosystems adapted to cooler climates are altered in important ways, creating new habitat for some species and reduced habitat for others. Species distribution shifts in response to climate change can lead to a number of new challenges for natural resource managers, such as the arrival of new pests, the disruption of ecological communities and interspecies relationships, and the loss of particularly valued species from some areas. Warmer temperatures, be they in the Spring, Summer, Fall, or Winter cause change to plant communities and shorten insect life cycles. This leads to the annual appearance of these important food sources to being out of sync with bird migration and breeding cycles; this means less opportunities for bird watchers and hunters to enjoy our natural heritage.

National Wildlife Refuges along our nation's coasts are losing habitat to sea level rise. A host of species, from birds to mammals to fish and reptiles, are losing their homes. Dramatic and measurable loss of sea ice is impacting wildlife in the northern latitudes, where the impacts of climate change are most profound. Areas of the nation are experiencing extreme drought, which, while not entirely due to climate change, starkly illustrates the linkage between climate water availability and the sustainability of fish and wildlife.

Climate adaptation is defined by the Intergovernmental Panel on Climate Change (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. Most simply, climate adaptation means helping people and natural systems prepare for and cope with the effects of a changing climate. Integrating and coordinating adaptation planning efforts among government and nongovernment sectors can help decrease the risks and impacts of climate change on our natural resources, communities, and economies.

Coordinated Action to Address the Need for Adaptation

Over the past decade, there have been an increasing numbers of calls for action by government and nongovernmental entities to better understand, prepare for, and cooperatively address the impacts of climate change on natural resources and the communities that depend on those resources. For example, in 2007 the U.S. Government Accountability Office released a study entitled: *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources*, recommending that guidance and tools be developed to help Federal natural resource managers incorporate and address climate change into their resource management efforts. In 2008, the U.S. Global Change Research Program released the report: *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources*, which called for and identified a variety of new approaches to natural resource management to increase resilience and adaptation of ecosystems and resources.

More recently, the President's Climate Action Plan (Plan) released in June 2013 serves as a blueprint for responsible national and international action to slow the effects of climate change using existing authorities. Building on efforts underway in States and local communities across the country, the Plan describes the regulatory activities aimed at reducing carbon pollution while helping the nation prepare for, and reduce, future impacts. The Plan's recognition of the importance of protecting natural resources and promoting resilience in fish and wildlife and their habitats is an integral part of our nation's comprehensive response to climate change. Given the disruption that a changing climate implies for our mission, the Service is committed to meet the

goals of this important Plan by continuing to reduce our carbon emissions, implement adaptation measures, and engage our key stakeholders and constituencies. On November 1, 2013 the Administration released Executive Order (EO) 13653: Preparing the United States for the Impacts of Climate Change. In response, the Department is now working to update its Climate Change Adaptation Plan and assess how policies, programs, and regulations need to change to become more resilient to climate change, among other activities.

Adaptation forms the core of the Service's response to climate change and means strategic, science-based management actions, including regulatory and policy changes that will help reduce the impacts of climate change on fish, wildlife, and their habitats. It is also the centerpiece of Department's Secretarial Order 3289.

Department of the Interior Secretarial Order 3289

In 2009, then Secretary of the Interior Ken Salazar signed Secretarial Order 3289, which established a Departmental Climate Change Response Council (Council) to "execute a Department-wide strategy to increase scientific understanding of and development of effective adaptation management tools to address the impacts of climate change on cultural and natural resources." Composed of the Secretary, the Deputy Secretary, Counselor to the Secretary, Assistant Secretaries, and the Solicitor, the Council was assembled to coordinate the climate change adaptation response efforts of its agencies and Bureaus, and the Secretarial Order commits the Department to working with other, relevant Federal agencies. The Secretarial Order also requires the Departments agencies and bureaus to consider and analyze climate change impacts when engaged in long-term planning, setting priorities for scientific research, or making major decisions about the use of Departmental resources. Specifically regarding adaptation to climate change, the Secretarial Order requires Department decisions with regard to climate change adaptation be informed by science, and it directs the establishment of the Landscape Conservation Cooperatives (LCCs) and regional Climate Response Centers, which have become the Department's Climate Science Centers, managed by the U.S. Geological Survey (USGS).

The Department's climate change adaptation policy was issued in the Department Manual in December of 2012 (523 DM 1). The policy provides guidance for addressing climate change impacts upon the Department's mission, programs, operations, and personnel. The Service is currently working to step down this policy into bureau-level guidance on climate change, and has completed an initial policy (056 FW 1) designating responsibilities and expectations related to climate adaptation.

National Fish, Wildlife and Plants Climate Adaptation Strategy

In March of 2013, the National Fish, Wildlife, and Plants Climate Adaptation Strategy (the Strategy) was released. As the accompanying Federal Register notice (April 1, 2013) states: "This Strategy presents a unified approach—reflecting shared principles and science-based practices—for reducing the negative impacts of climate change on fish, wildlife, plants, our natural resource heritage, and the communities and economies that depend on them. The Strategy provides a basis for sensible actions that can be taken now, in spite of the uncertainties that exist about the precise impacts of climate change."

Development of the Strategy was co-led by the Service, the National Oceanic and Atmospheric Administration (NOAA), and the New York State Department of Environmental Conservation, representing state fish and wildlife agencies. It was developed in response to a request in the Conference Report for the FY 2010 Interior, Environment and Related Agencies Appropriations Act (House Report 111–316, pages 76–77) for the White House Council on Environmental Quality (CEQ) and the Department of the Interior to: “develop a national, government-wide strategy to address climate impacts on fish, wildlife, plants, and associated ecological processes” and “provide that there is integration, coordination, and public accountability to ensure efficiency and avoid duplication.” In addition, CEQ’s Interagency Climate Change Adaptation Task Force supported this request and called for the development of a climate adaptation strategy for fish, wildlife, and plants in its 2010 Progress Report to the President.

The Strategy was developed in coordination with other Federal adaptation efforts such as the National Ocean Policy Implementation Plan and the National Freshwater Action Plan (Priorities for Managing Freshwater Resources in a Changing Climate) , and it draws from existing adaptation efforts by States, Federal agencies and others. Its premise is that no single entity or level of government can safeguard wildlife and society against the effects of climate change. It does not prescribe any mandatory or regulatory requirements, but is designed to coordinate government-wide fish and wildlife climate change adaptation efforts and to build on growing efforts outside the Federal and State fish and wildlife governments to understand, track, and reduce impacts of a changing climate on the nation’s valuable fish, wildlife, and plants. It outlines a roadmap of key steps needed to help safeguard the nation’s natural resources in the face of these challenges. This Strategy is a key component of the growing effort by Federal, State and Tribal governments and non-governmental entities to reduce the risks and impacts of climate change.

The Strategy was developed with input from a wide variety of sources, with multiple opportunities for public input, and was shaped by comments from more than 55,000 Americans. In addition to describing the impacts of climate change on fish and wildlife, the Strategy identifies seven key steps, or goals, to help safeguard the nation’s fish, wildlife, and plants in a changing climate. These seven goals are

- Goal 1: Conserve habitat to support healthy fish, wildlife, and plant populations and ecosystem functions in a changing climate.
- Goal 2: Manage species and habitats to protect ecosystem functions and provide sustainable cultural, subsistence, recreational, and commercial use in a changing climate.
- Goal 3: Enhance capacity for effective management in a changing climate.
- Goal 4: Support adaptive management in a changing climate through integrated observation and monitoring and use of decision support tools.
- Goal 5: Increase knowledge and information on impacts and responses of fish, wildlife, and plants to a changing climate.
- Goal 6: Increase awareness and motivate action to safeguard fish, wildlife, and plants in a changing climate.
- Goal 7: Reduce non-climate stressors to help fish, wildlife, plants, and ecosystems adapt to a changing climate.

The Strategy also describes opportunities for numerous sectors to address these challenges and then describes how its goals and strategies may be implemented with coordination across the Federal

government, States, and other entities. It provides guidance about what further actions are most likely to promote natural resource adaptation to climate change, and describes mechanisms that will foster collaboration for effective action among all levels of government, conservation organizations, and private landowners.

The Service is now co-leading a Joint Implementation Working Group (JIWG) to promote implementation of the Strategy. Our partners are NOAA and the Association of Fish and Wildlife Agencies (AFWA). The White House Council on Environmental Quality is also supporting this effort. The JIWG includes representation from most of the agencies that participated in development of the Strategy (15 Federal, 5 State, and one inter-Tribal commission) and will be responsible for reporting on implementation and for future revisions of the Strategy. The Service will continue its dual role of implementing the Strategy within its own programs, and also working with the many other agencies that need to be involved in Strategy implementation through the JIWG.

Strategic Habitat Conservation and Landscape Conservation Cooperative Network

Complex and persistent challenges, like climate change, have led the Service to re-assess how best to meet our goals under our mission, which is “*working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.*” The agency’s traditional focus has been to conserve fish and wildlife resources in the face of anthropogenic activities that threaten their sustainability. In modern times, the threats to the sustainability of fish and wildlife populations are much more diffuse and, in many cases, result from cumulative impacts caused by stressors such as habitat loss and climate change.

The Service’s response to this has included the adoption of Strategic Habitat Conservation as our core conservation approach for sustaining populations of fish and wildlife. This is in the context of landscape and system sustainability, and led to the establishment of the Landscape Conservation Cooperative (LCC) Network to apply public-private partnerships that can support conservation planning, implementation, and evaluation at landscape scales. With the signing of Secretarial Order 3289, the Department launched the LCC Network to better integrate science and management to address climate change and other landscape scale issues. Holistic, collaborative, adaptive, and grounded in science, LCCs are working to ensure the sustainability of our, land, water, wildlife, and cultural resources. Twenty-two LCCs across the nation, working within their respective landscapes and collaborating across their geographic boundaries, collectively form an integrated network of resource managers and scientists who share a common need for scientific information to achieve their individual and shared goals of conserving our nation’s natural heritage.

Taken together, and working within the larger conservation community, Strategic Habitat Conservation and the LCC Network will improve the necessary collaboration that enables private, State, Tribal, and Federal conservation infrastructure to operate as a networked, leveraged system.

Landscape Conservation Cooperatives

Habitat loss and fragmentation through land conversion, fire, floods and drought, invasive species, and other watershed and landscape-level threats to fish and wildlife is being exacerbated by global climate change. This has made it necessary for the Service to make an important and really historic

shift in our approach to conservation from a single species, parcel-by-parcel, threat-by-threat management agency toward collaborative, cross-jurisdictional work through LCCs and other partnerships. These broader, more inclusive approaches help us better understand and then meaningfully and strategically reduce widespread threats at the landscape level. The traditional jurisdictions of local, State, Tribal and Federal agencies over land and wildlife can fragment conservation efforts. With limited funding and resources, the cost of securing and applying the necessary science to understand how these many stressors are affecting natural resources and what can be done to help them adapt must be pooled among government agencies and leveraged with non-government funds where possible.

The LCCs are self-directed, applied science conservation partnerships that build a shared view of landscape conservation science needs across Federal, State, Tribal, and local agencies and nongovernmental organizations. The LCC forum supports collaborative conservation partnerships that define, share and acquire science and management tools, including research, monitoring, and conservation planning and design, and decision-support tools. The resulting data, information, knowledge, and tools can be applied by resource or land management agencies and private landowners to build resilience to climate change impacts and other landscape-level threats. Resource management entities using these products can then monitor, re-evaluate and adapt them to better fit changing resource needs, landscape conditions, or just to improve their application. Partners in the LCCs bring resources to the projects selected by the LCCs, thereby leveraging the Federal investment and ensuring meaningful partner investment in this collaborative approach. With the size of conservation challenges presented by climate change and other forces on the landscape, no one agency or land manager can fully conserve our natural resources and their benefits to our economy alone. We cannot afford to act in isolation, risking wasteful redundancies and significant gaps in the science and the applied management that must consider the larger threats to ecosystems that threaten our valuable living and cultural assets. By focusing multiple management agencies and private efforts on the highest priority conservation issues, the Department expects to be able, in the long term, to demonstrate new efficiencies in the management of natural resources through the LCCs.

The work of LCCs is informed by the Department's Climate Science Centers (CSCs) and many other scientific institutions. These 22 forums are unique in the conservation world and directly address congressional mandates to improve efficiency, reduce duplication, and coordinate among the diverse set of agency programs operating at multiple levels. LCCs do not duplicate other regional, cooperative conservation partnerships, like the Joint Ventures for Migratory Birds or the National Fish Habitat Partnerships, which are comprised of entities that determine conservation priorities and implement them on the ground. Rather, LCCs provide a forum for these conservation partnerships and other management entities to determine the higher-level science needs to inform their work and to help their applications adapt as new information is collected and applied to their efforts.

Examples of the work of LCCs include the development of a critical tool for understanding how climate change will affect protected areas and native island species by the Pacific Islands Climate Change Cooperative. This vulnerability assessment measures the risk that climate change poses to more than 1000 plant species native to Hawaii, helping State and Federal managers with native plant conservation by revealing which plant species are at highest risk from climate change, which areas to protect as future habitat, which protected areas will lose species, and which species will

benefit most from stronger management in the present. In addition, the Upper Midwest and Great Lakes Landscape Conservation Cooperative, along with other partners, has identified opportunities to optimize connectivity in the Great Lakes Basin to restore native fish migrations, while controlling invasive species. This project has resulted in identification of more than 270,000 potential barriers and an initial optimization model that identifies those barriers in which removal would provide connectivity to the most tributary distance given a certain budget.

Like many LCCs, the North Atlantic LCC is fully supporting implementation of the National Fish, Wildlife and Plant Climate Adaptation Strategy. Because effective adaptation begins with understanding how the landscape is changing, the LCC is developing information and tools that assess the combined impacts of climate change (temperature, precipitation, sea level rise, floods) and urban growth on natural resources in the Northeast. In addition, the LCC is working with Northeast Region States to develop habitat classifications and maps, regional species and habitat vulnerability assessments, frameworks for modeling landscape change, assessments of regional species of concern and other decision-making tools. These tools collectively will create a landscape conservation design “blueprint” for the region that provides broader context for State and local conservation decisions and actions. The LCC is now putting these tools into action through a comprehensive landscape design effort with North Atlantic LCC partners in the Connecticut River watershed – about 400 miles long and 7.5 million acres – to conserve, connect and restore habitats and natural systems that sustain fish, wildlife and people. What we achieve and learn with our partners in this pilot geography will be refined and applied in landscapes throughout the Northeast. The information and tools being developed through the LCC are providing regional context for updating State Wildlife Action Plans so that States can understand (and reflect in their updated plans) their best contribution to regional conservation as well as their best response to the challenge of climate change.

The Inter-LCC Greater Sage Grouse Initiative in partnership with the Western Association of Fish and Wildlife Agencies has led to many important developments, including an enhanced working relationship with the western States. This multi-LCC project is characterized by: collaboration among management entities at range-wide and LCC scales; coordination of planning, implementation, and evaluation to increase efficiency and reduce redundancy; development of science-based decision support tools; and shared access to sage-grouse data through a common data portal which allows State and Federal managers to work from the same information for interpretation of current and future habitat and population conditions.

The Great Northern LCC (GNLCC) is working with cooperators to assess and develop wildlife corridors at the regional, ecosystem, and local scales. For example, they support the Western Governors' Association (WGA) Crucial Habitats and Corridors Landscape Integrity and Connectivity analysis across 18 western states; provide funding for the Washington Wildlife Habitat Connectivity Working Group to complete wildlife corridor analyses for 16 focal species throughout Washington and in the Columbia Plateau region across Oregon and Washington; support the Crown Managers' Partnerships in analyzing and mapping connectivity in the Crown of the Continent; collaborate with the America's Great Outdoors Crown Demonstration Landscape Team to improve connectivity across roads in the Crown; and support a collaborative Land and Water Conservation Fund Proposal in the Idaho-Montana Divide area to improve wildlife connectivity between Yellowstone Park and the Central Idaho Wilderness. Species that stand to benefit from this work include grizzly and black bears, elk, wolverine, mule deer, cutthroat trout,

bull trout, and many others. The Great Northern LCC has, in collaboration with the USGS, also developed LC-MAP, a virtual database and shared collaborative workspace that allows partners to share, access, and analyze common datasets and information to further coordinated research, management, and resource conservation. The GNLCC recently received a grant to integrate LC-MAP with the WGA Crucial Habitat Assessment Tool (CHAT) system. This LCC, which covers portions of Montana, Idaho, Oregon, Washington, and Wyoming, has 25 partner organizations on the Steering Committee and over 50 organizations participating in regional conservation forums.

South Atlantic LCC staff are working closely with a multitude of resource organizations and several interdisciplinary teams to complete a shared conservation blueprint for the multi-State LCC geographic area, due in 2014. This will provide an actionable and spatially-explicit map depicting the places and actions needed to sustain ecosystems of the southeastern US in the face of future change.

The self-directed working group model presented by the LCCs is an effective and efficient approach to testing, adapting, and delivering the science and conservation tools necessary to meet modern conservation challenges with the biggest value for the use of public and private funds contributed to their work.

Agency Implementation of Cooperative Adaptation Approaches

Sea Level Rise: At Alligator River National Wildlife Refuge on the North Carolina coast, the North Carolina chapter of The Nature Conservancy (TNC) and the Service have forged a partnership to evaluate the effects of different adaptation strategies on areas impacted (or likely to be impacted) by sea level rise. This project is also supported by a \$1 million donation from Duke Energy, a \$250,000 private donation, a Southeast Aquatic Resources Partnership Community-based Restoration Program grant, a NOAA Community-based Restoration Program grant, and several other smaller donations. The project managers have engaged with local communities, fishermen, NGOs, State and Federal agencies, and the general public to educate them on the project through public meetings, volunteer involvement, and other outreach activities.

This refuge encompasses about 154,000 acres on the Albemarle Peninsula in North Carolina, where sea level rise is the primary climate change impact of concern. This vulnerability is exacerbated by human alterations to the system, including an extensive network of drainage ditches used for agriculture and forestry. Sea level rise will in turn intensify other problems such as shoreline erosion, saltwater intrusion, and biodiversity loss. The strategies this partnership is testing include constructing oyster reefs to buffer shorelines from waves and storm surges, restoring the natural hydrologic regime and associated wetland systems, and planting salt- and flood-tolerant species. Successes would include reductions in the rates of ecosystem change, shoreline erosion, saltwater intrusion, and land subsidence, and an increase in the growth and survivability of salt- and flood-tolerant plant and tree species.

The Blackwater Climate Adaptation Project is a partnership between The Conservation Fund, Audubon Maryland/DC, and the U.S. Fish and Wildlife Service supported by a grant from the Town Creek Foundation. Our objective is to ensure the long-term persistence of high tidal marsh habitat in Dorchester County, MD, together with its full assemblage of associated bird species, as well as Chesapeake Bay fisheries that depend on these wetlands for shelter and food. Rapid sea

level rise threatens the survival of this ecosystem during the current century. This Assessment is the first step toward developing a sea level rise adaptation strategy and corresponding actions to conserve the tidal marshes of Blackwater National Wildlife Refuge for the long term.

Northeast Biological Toolbox: In collaboration with Federal and State partners as well as non-governmental conservation organizations, the Service is developing and implementing tools to predict the effects of climate change and inform future management plans. In the Northeast, this includes a vulnerability assessment for shorebird habitat, created in partnership with the Manomet Center for Conservation Sciences and designed for refuge managers to determine the vulnerability of their sites to climate change and consider what options are available to best maintain shorebird habitat. The assessment is being implemented currently at Monomoy (Massachusetts), Chincoteague (Virginia), and E.B. Forsythe (New Jersey) National Wildlife Refuges.

Conclusion

The Service's responsibilities cover a wide range of natural resources that are to be preserved, protected, managed, and made available for public use through Federal statutes. Many of these resources are managed for public use because of their importance to the national economy. In fact, it could be said that the abundance of natural resources in the United States has contributed to our global economic leadership. We recognize the importance of these resources to a range of economic sectors, and we know that climate change is already and will continue to impact their availability for current and future generations of Americans.

With Congressional support, the Department created strong networks to deliver the science and adaptive conservation actions needed to protect our native ecosystems, living resources, and their economic benefits to a wide range of commercial and public interests. In closing, I would like to thank the Sub-Committee and Senators Whitehouse and Baucus for their leadership in designing and promoting both the need and the necessary approaches to accomplish this important task.