AFWA EXECUTIVE SUMMARY

The *Climate Change Wildlife Action Plan Guidance Document* provides voluntary guidance for state fish and wildlife agencies wanting to better incorporate the impacts of climate change on wildlife and their habitats into Wildlife Action Plans. The approaches and techniques described in this document also will be useful in modifying other wildlife plans (e.g. big game/upland game/migratory bird plans, joint venture implementation plans, national fish habitat action plan, etc.) to address climate change. The document provides an overview of the information currently available on climate change, tools that can be used to plan for and implement climate change adaptation, voluntary guidance and case studies. Climate change is a large and growing threat to all wildlife and natural systems and will also exacerbate many existing threats. Efforts to address climate change should not diminish the immediate need to deal with threats that may be independent of climate change such as habitat loss/fragmentation from development, introduction of invasive species, water pollution and wildlife diseases. Since climate change is a complex and often politically-charged issue, it's understood that the decision to revise Wildlife Action Plans or other plans to address climate change, rests solely with each state fish and wildlife agency.

All states will be required to update their Wildlife Action Plans by 2015, although some states have opted for earlier revisions. Wildlife Action Plans may need to be revised earlier or more frequently than anticipated to account for the accelerating impacts of climate change. In addition climate change legislation passed in the U.S. House of Representatives in June 2009 would require each state to develop a state adaptation strategy and to incorporate that strategy into a revision of the state's Wildlife Action Plan (similar legislation in the U.S. Senate will likely be considered in the Fall of 2009). Although revision of Wildlife Action Plans for climate change is not currently required, starting the revision process now can help states prepare for potential climate change funding through federal appropriations in FY10 and/or through funding that may become available if Congress passes comprehensive climate change legislation.

The Guidance Document consists of the three major chapters that provide information and resources that could be used to update Wildlife Action Plans to incorporate climate change impacts. Chapter 1 introduces processes, approaches and key concepts that can be used to develop climate change adaptation strategies for fish and wildlife management. Chapter 2 describes tools, both old and new, that may be useful in developing, implementing and monitoring for these plans. Chapter 3 provides more detail on the process of updating Wildlife Action Plans, summarizes existing guidance and discusses how addressing climate change might affect the plan revision process. The references section and appendices to the document are a source of additional information on climate change.

Chapter 1: Adaptation Strategies

The first chapter provides guidance on how to develop climate change adaptation strategies. Adaptation is defined as *adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*(Intergovernmental Panel on Climate Change). Key concepts, approaches and processes are discussed, but just as each state faces a unique set of climate impacts, each will need to customize its approach to adapt to those changes. To illustrate the diversity of potential strategies, the document contains several case studies to demonstrate how states have begun to identify and implement wildlife adaptation planning. Developing and implementing adaptation strategies will involve looking at what we are currently doing to conserve fish, wildlife and their habitats through the lens of climate change and identifying which strategies should be continued, which need to be significantly altered to avoid negative consequences, which might only require

minor adjustments and which need to be reevaluated to determine urgency and priority. It will also require that states look at new approaches and tools to determine what additional conservation actions we should be taking in light of a changing climate. Taking an adaptive approach to fish and wildlife conservation will be especially important, given the uncertainties and our evolving understanding of the impacts and response of climate change to wildlife, ecosystems and ecological processes.

Climate change adaptation strategies will vary among regions and ecosystems depending on effects of climate change and the social-political contexts used for management decisions. Therefore, it is important to develop feasible site-based and target-based strategies for conservation action. Climate adaptation planning can include the following steps: 1) engage diverse partners and coordinate across state and regional boundaries; 2) take action now on strategies effective under both current and future climate conditions; 3) clearly define goals and objectives in the context of future climate conditions; 4) consider appropriate spatial and temporal scales when assessing wildlife adaptation needs; 5) consider several likely or probable scenarios of future climate and ecological conditions; and 6) use adaptive management to help cope with climate change uncertainties. Identifying the target species, communities, ecosystems, or ecological processes to be addressed by climate change adaptation planning and action is a critical part of identifying goals and objectives of an adaptation strategy. In many cases, wildlife adaptation may require managers to use a habitat or an ecosystem-based approach to conservation. Species conservation will become more challenging as habitats change, resulting in new and sometimes unfamiliar combinations of plants and animals. Species conservation efforts that focus on identifying and protecting those habitats most likely to persist as climate changes, will likely be better investments than those that depend on habitats which are likely to become unsuitable. The case studies in chapter one provides examples of how adaptation can be applied on the landscape.

Chapter 2: Adaptation Toolbox

Vulnerability Assessments

Understanding which species and habitats are vulnerable and why is key to developing effective adaptation strategies. This process is often referred to as a vulnerability assessment. The goal of a vulnerability assessment is to describe the following elements: 1) exposure; 2) sensitivity; and 3) the capacity to adapt to climate change. A vulnerability assessment provides the scientific basis for developing climate adaptation strategies and uses information about future climate scenarios with ecological information about climate sensitivity and adaptive capacity to help managers anticipate how a species or system is likely to respond under the projected climate change conditions. The relative vulnerability of species or habitats can be used to set goals, determine management priorities and inform decisions about appropriate adaptation strategies. The following steps can be taken when assessing vulnerability to climate change: 1) determine the scope of the assessment; 2) collect relevant climate and ecological data; and 3) describe vulnerability qualitatively and/or quantitatively. The vulnerability case studies illustrate a range of methods for balancing the need for information on climate impacts and responses, the importance of stakeholder participation and limitations on the time and resources available for a vulnerability assessment.

Adaptive Management

Adaptive management can be an important tool for making management decisions with incomplete information and high levels of uncertainty under climate change. As agencies struggle with problems associated with climate change under increasingly strained budgets, the flexibility of adaptive management allows agencies to continually acquire new information for decision-making without indefinitely postponing needed actions.

Monitoring

Targeted monitoring is critical to adaptive management and should be comprehensive and detailed enough to evaluate a decision or action but not so complex or expensive that the monitoring program overwhelms an agency's capacity and impedes the management process. The following types of monitoring are explained: 1) status and trends (extensive) monitoring; 2) research (intensive) monitoring; 3) effectiveness monitoring; and 4) implementation monitoring.

Chapter 3: Revision Process

The Revision Process chapter includes a review and summary of existing guidance related to Wildlife Action Plan development. The chapter also provides the following climate change-related guidance specific to each of the "eight elements" required for development of Wildlife Action Plans.

- Element One (species distribution and abundance) states may want to use vulnerability assessments to support the addition/removal of species from their list of species in greatest need of conservation and examine how climate change could impact distribution and abundance of species and their status as native or exotic.

- Element Two (location and condition of key habitats) states may want to assess how habitats and vegetation communities may change as a result of current and future climate change through scenario-building; plan for the appearance and implications of novel communities/ecosystems and consider appropriate spatial and temporal scales including where species and habitats are likely to occur.

- Element Three (descriptions of problems and priority research survey efforts) states may want to consider both direct and indirect impacts of climate change; identify and execute research in partnership with other states/regions to gain economy of scale and consider climate change as an additional "layer" of threats to existing threats.

- Element Four (descriptions of conservation actions) states should consider actions for a range of likely future climate conditions; identify/describe how conservation actions will be prioritized when considering multiple threats; identify actions that minimize, not necessarily eliminate climate change impacts; provide for wildlife adaptation; and provide for resilience and/or facilitate movement to suitable habitats and conditions.

- Element Five (monitoring plans) states should strive to implement streamlined and affordable monitoring programs that inform management decisions under a changing climate and should consider working with other states and partners to monitor species and habitats across their entire range.

- Element Six (plans for revision) states should contact the US Fish and Wildlife Service regional office early in the revision process and refer to the 2007 FWS/AFWA Revision Guidance letter to determine if a "major" or "minor" revision will be required.

- Element Seven (coordinating with partners) states should consider coordinating and collaborating with partners since the scope, scale and uncertainty of climate

change impacts will require a high level of expertise support and collaboration; agencies in coastal states should consider addressing marine environments and/or collaborating with sister agencies with jurisdiction over marine species.

- Element Eight (public participation) states should consider public participation planning since the potential for controversy associated with climate change could be high; strive to improve understanding of the impacts to wildlife and gain public support or acceptance for revising your Wildlife Action Plan; use terms that are tested with the public like "safeguarding wildlife" as opposed to "wildlife adaption" and involve conservation partners early during the public participation planning process, but recognize there may not be agreement on messages or approaches.

The case studies in chapter 3 provide examples of the processes being used in several states to update their Wildlife Action Plan.

Resources Section – Appendix

Finally the guidance document includes a resources section that provides the reader with additional sources of information on the topics discussed in the document. The appendix includes the charter for the work group, legislative text on state adaptation planning and the 2007 FWS/AFWA Revision Guidance Letter. The Association of Fish and Wildlife Agencies will maintain a "living" and expanded version of this document on its website to ensure states have access to the most current information about climate change planning and implementation.