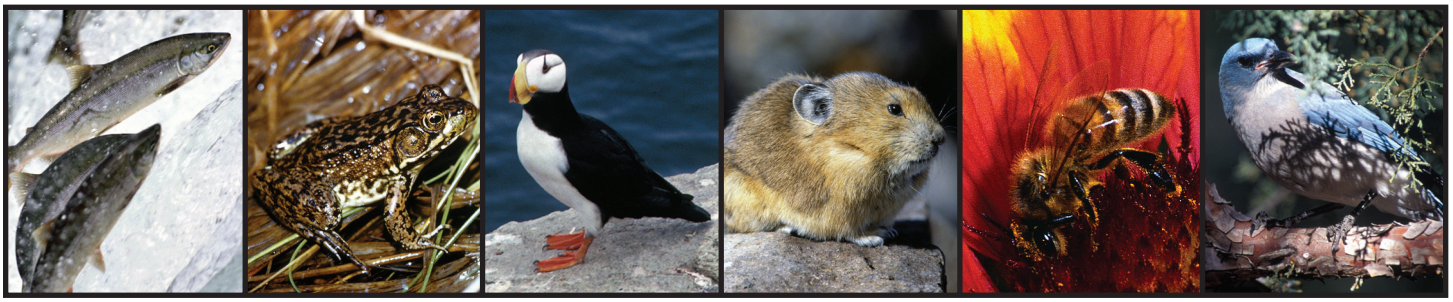

salmon ©Corbis / frog by Gordon Rodda / puffin by USFWS / pika ©Corbis / honeybee ©Corbis / gray-breasted jay by Denny Bingaman

Key Components of a Fish and Wildlife Climate Adaptation Strategy

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Guidance for Natural Resource Managers

March 19, 2010

Introduction

In the face of accelerating climate change, a conservation effort of unprecedented magnitude and scope will be necessary to maintain viable populations of our fish and wildlife[1] and the functioning ecosystems upon which they depend. The effects of climate change on ecosystems will be pervasive and will significantly impact landscapes across the country and around the globe, irrespective of ownership and administrative boundaries. In view of our shared experience and track record of fish, wildlife and natural resource conservation in the United States, it is clear that the Federal Government, States, Tribes, non-governmental conservation organizations, private industry, and private landowners will need to work together in a truly interdependent way to successfully help species and ecosystems adapt.

The conservation community and society as a whole are grappling with how to most effectively and efficiently meet these sobering challenges. Despite persistent uncertainties, the breadth, geographic scope and specific nature of climate change impacts are becoming increasingly clear as new science emerges and predictive models are refined. It is clear that delayed responses or management decisions that do not explicitly consider future climate scenarios, will make it more difficult to fulfill our fish and wildlife conservation mission.

While the specific conservation challenges and necessary actions will vary from place to place, the need and responsibility to act is shared. Many conservation entities have recognized this and are already taking cooperative action to address the diverse array of climate change challenges. Many more are prepared to take action, but in the face of the complexity and scope of the challenges are seeking guidance and context so that their efforts can be most effective and complementary. In light of fiscal realities relative to the magnitude of the issue, the need to act efficiently and in a coordinated and collaborative fashion is self-evident.

As we work to develop a comprehensive national fish and wildlife climate adaptation strategy that is refined by deeper scientific understanding, we should do our best to take actions now that do not foreclose important future options; that provide experience-based learning; and that contribute to long-term science and management needs.

[1] Our reference to "fish and wildlife" throughout this document refers to fish, wildlife and plants and the habitats upon which they depend.

These actions should be undertaken within a framework that puts each of these actions in an appropriate strategic context so they can be evaluated, understood, and refined. Otherwise, they become isolated management actions that do not "add up" in helping the fish and wildlife management community to learn. Such a collaborative, contextual framework will help achieve greater consistency and alignment among strategic and scientific efforts and will help establish more effective relationships between local efforts and broader strategic initiatives in wildlife and other natural resources conservation.

This draft document provides strategic guidance to resource managers for fish and wildlife adaptation planning underway now, at geographic scales ranging from local projects to those at the national level.

Its purpose is to provide a foundation for common action as we collectively make management decisions and develop strategic plans.

Use of this guidance will help ensure that decisions and strategies are consistent and complementary as they are developed and implemented. The document addresses three key components of a fish and wildlife adaptation strategy and provides an outline that can be used as a checklist in strategy development and implementation.

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Bosque del Apache NWR, New Mexico by Jim Clark

Key Components of a Fish and Wildlife Climate Adaptation Strategy

Fish and wildlife climate adaptation strategies (FWAS) for climate change will embody principles that address engagement of stakeholders and partners; assessment of the best available science and ecosystem and species vulnerabilities; and management guidance.

Engagement

- Develop adaptation strategies that are transparent, collaborative, and repeatable, and incorporate comprehensive references to the best available science upon which decisions will be based.
- Develop a process to engage key stakeholders and partners in helping to develop adaptation strategies.
- Engage the public through communication and education to gain broad support for the adaptation strategies.
- List roles of all agencies and organizations involved in the development, implementation, monitoring, or research aspects of the adaptation strategies.
- Conduct education, training, and capacity-building in wildlife and climate change science and adaptation planning to provide the foundation for developing adaptation strategies.

Assessment

- Describe datasets and methodologies (e.g., expert opinion, downscaled model(s)) used to assess climate change impacts to the landscape.
- Document the assumptions and uncertainties associated with climate change model(s) and landscape assessments.
- Describe source and specific climate change information used to establish the adaptation strategy.
- Document underlying assumptions of the species-habitat (conservation action) relationships.
- Describe the empirical or conceptual models used to link an adaptation management action to a predicted species response.
- Identify target species/habitats in the geographic range under consideration; describe the process for selection and anticipated sensitivity/vulnerability of target species/habitats; document the underlying assumptions of the species/habitat selection process.
- Describe monitoring strategies to assess model performance (e.g., species or habitat response).
- Describe research strategies to assess underlying assumptions associated with adaptation strategy.
- Describe mechanisms for research and for monitoring results to incorporate adaptive management processes to improve models based on effectiveness.
- Describe socio-economic trends (e.g., population projections and demographics, development patterns and projections) of the planning area that may facilitate, inhibit, or otherwise challenge the development and implementation of the adaptation strategy.
- Describe opportunities to achieve both ecosystem conservation and socio-economic goals, including strategies to make biological and human communities more resilient to climate change.

Management

- Contribute to the quality of current and future decision-making, and provide improved ways of linking individual adaptation decisions with broader adaptation goals and other conservation management decisions and actions.
- Articulate a strategy that:
  - Is flexible to changing conditions, information, and organizational capabilities;
  - Is targeted, to direct actions to the most important and/or vulnerable species, system elements, and landscapes;
  - Is cost-effective, to get the most adaptation/resiliency endpoints for the investment;
  - Is knowledge-based, to be defensible based on the best information available at the time; and which synthesizes and applies peer-reviewed science and integrates this science with experienced-based judgment from wildlife managers;
  - Is capable of being integrated into the decision-making and planning processes of the responsible organizations;
  - Describes conservation actions that will be implemented and the expected outcome(s) of actions;
  - Describes goals, measurable objectives, timelines for the adaptation strategy and identifies roles of key participants in implementing the strategy; and
  - Describes method(s) and an estimated timeline for updating the adaptation strategy as new information is learned.

Mississippi Sandhill Crane NWR by Garry Tucker/USFWS

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Adaptation Strategy Outline

Engage diverse partners and coordinate across State and regional boundaries.

- Use collaborative approach to developing a national plan:
  - Coordinate Federal, States, Tribes, local governments and NGOs participation in plan development; and
  - Fully integrate Federal, States, Tribes, and local governments and NGOs agency adaptation plans into national strategy.
- Find mechanisms for joint decision-making and implementation (e.g., the Landscape Conservation Cooperatives (LCCs) approach as a model for joint decision-making at the landscape scale).
- Conduct education, training, and capacity-building.

Define goals and objectives for management targets in the context of future climate conditions, ensuring integration at multiple geographic/administrative scales. For example:

- Conserve biological diversity--minimize loss of species and conserve genetic diversity;
- Maintain populations of priority species and the habitats necessary to sustain them;
- Maintain ecological function and ecosystem services (for example, clean water);
- Minimize impacts of key invasive species;
- Limit wildlife diseases and maintain wildlife health; and
- Maintain water quantity and quality.

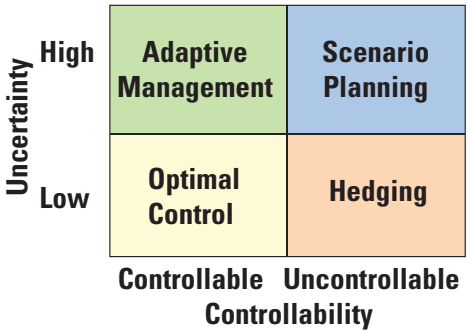
Identify information needs, availability, and gaps; levels and sources of uncertainty; and ways to obtain needed information and fill information gaps. For example:

- Ongoing and expected impacts of climate change on natural resources:
  - High resolution climate projections, and
  - Coupling climate projections with ecological and physical response models;
- Population-habitat relationships;

Horned grebe at Malheur NWR, Oregon by J&K Hollingsworth

- Species distributions; and
- Sea-level rise.

Assess species vulnerability and characterize possible future scenarios, including sources of uncertainty and controllability. Consider appropriate spatial and temporal scales. Decide on a decision-making framework based on uncertainty and controllability. Because the quality of the information, the confidence in this information, and the range of risk management actions will vary, allow for flexibility in choice of assessing, forecasting, and risk management methods.



Design conservation strategies and specific actions for various future scenarios based on the decision-making framework that has been selected. Include risk assessment and criteria for success. For example:

- Reduce the impact of non-climate stressors;
- Restore and maintain habitat connectivity;
- Protect a representative array of ecosystems;
- Identify and protect climate refugia;
- Manage for ecological function and protection of biodiversity; and
- Direct species management:
  - In-situ conservation approaches; and
  - Ex-situ management.

Identify conservation delivery mechanisms (ensuring integration of delivery at multiple geographic/administrative scales) through an integrated response of Federal, State, Tribal and local government agencies, NGOs, and private citizens who are involved in the strategy.

Design evaluation program for FWAS:

- Monitoring results to assess success;
- Research to address assumptions and uncertainties.

Incorporate an iterative process to evaluate and adjust FWAS on a regular basis based on evaluation of plan implementation and new information relative to climate change and species/ecosystem response.

Identify capacity needs for implementing FWAS (education, engagement, and training).

Include a communication plan for stakeholders and the public that identifies:

- Communication, education, and training strategies; and
- Integration across multiple scales and organizations.

Discuss how the FWAS is integrated with other FWAS across administrative/geographic boundaries.

Evaluate FWAS funding mechanisms:

- Budget process;
- Grants; and
- "Cap-and-trade" emissions trading.

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To review draft documents and provide comments, visit http://www.fws.gov/nfwcas.html