Trilateral Committee for Wildlife and Ecosystem Conservation
Plenary Session
Presentation Summary
Wildlife and Climate Change
May 12, 2009

Instructions to document:
The enclosed document was developed to capture all of the information given and discussed during the Plenary Session. The first part describes the proposed resolutions-recommendations from the Plenary Speakers and the Plenary Session Working tables for consideration by the Executive Table. Second part (page 2) highlights key points from Dr. Jessica Hellman's presentation and from the country presentations organized by Breakout Group themes and by country. The third part (p. 9) includes the discussion points from each Plenary working table by themes. The last part (p. 16) includes the bibliographies of key documents submitted by the countries.

Proposed resolutions-recommendations
From Plenary Session Organizing Committee
We recommend that for next year Plenary Session we continue to talk about Climate Change, this year's session provided only an overview, but as you will see from the discussions, there's so much more to learn and share.

From Plenary Speakers:

MEXICO
To facilitate coordination and cooperation among agencies:
Create a Trilateral Committee CC and Wildlife Working Table (cross-cutting, including invasive species)

USA
To further policy and planning:
Trilateral champion the development of a NA Wildlife and Climate Change Adaptation Strategy

From Plenary Session Breakout Groups:

POLICY AND PLANNING
Trilateral Committee should produce a Wildlife and Climate Change Adaptation Resolution that can be used to represent wildlife conservation issues at the full range of climate change-related fora in each country and abroad and that can be used for reporting out on progress and for adapting the Trilateral resolution as needed.

General support for a Trilateral role in championing the development of NA Wildlife and Climate Change Adaptation Strategy
- Facilitating cross-border movement of science-related materials
- Linkage to CEC Biodiversity Conservation Working Group project proposals

Mexico proposal to add Wildlife and Climate Change Adaptation Working Table (WT)

- General view that it is better as a cross-cutting issue addressed by existing WT – compile input from each table as a report from the Trilateral so that can be used in relation to policy formulation and planning
- Climate Adaptation should become a standing work plan item for all WTs - compile input from each table as a report from the Trilateral on wildlife and climate change adaption and mitigation so that it can be used in relation to policy formulation and planning

SCIENCE NEEDS

Need to develop a trilateral clearinghouse for climate change to include all of what is know so far and a place where new information can be added in a standardized way.

COORDINATION/COOPERATION AMONG AGENCIES

Support proposal to create a new table at the trilateral for climate change and Wildlife.

Introduction

Climate change is one of the gravest threats facing wildlife today, and plants and animals around the world are in real danger of failing victim because their habitat is changing too much and too rapidly for them to keep up. Climatic change effects, such as shrinking glaciers, variations in rainfall frequency and intensity, and shifts in growing seasons and disease distributions, are expected to have substantial — and largely negative — impacts on food production, water supply and disease proliferation in many parts of the world. These impacts are expected to exacerbate resource scarcity, increase the intensity and resulting costs of climate-related disasters, and possibly ignite conflict. Human populations that are most dependent on natural resources, as well as those with the least capacity for adaptation, are most vulnerable to the effects of climate change. It is our responsibility to step up our efforts to preserve wildlife that is being affected by climate change today so they are around tomorrow.

To date, climate change adaptation work is still largely at the "idea" stage. The Intergovernmental Panel on Climate Change (IPCC) notes that there are few demonstrated examples of ecosystem-focused adaptation options (see IPCC Fourth Assessment Report, 17.4.2.1 and 4.6.2). (From EPA 2008 Preface).

Key points from Dr. Jessica Hellman presentation

Greenhouse gas emission reduction has to be cornerstone of conservation and wildlife protection in the coming decades.

In contrast to projections, some of the best scientific information that we have about the biological effects of climate change are observational studies of ecological responses that have already taken place or mechanistic studies that explore the relationship between

climatic factors and ecological systems.

There is very broad agreement that climate change will enhance other threats to biodiversity and that a variety of broad ecological impacts – from changes in population size to changes in ecosystem function – will be widespread.
There is a spectrum of approaches or ways of envisioning conservation under climate change. Each of these approaches has pros and cons with respect to cost, likely effectiveness, and potential for incidental damage and include: .

- "established" or "status quo" conservation biology;
- managing for resistance;
- use of corridors;
- managed relocation (or assisted migration or assisted colonization); and
- ex situ conservation.

These five options are not mutually exclusive, and deciding on the balance of them will be just as challenging as deciding among them. One important point is that the precautionary principle does not work in addressing this spectrum of scenarios. There are potential risks of pursuing each of these courses of action and risks of not pursuing them.

It is important to employ and fund adaptive management approaches. Without true adaptive management, none of the strategies outlined are likely to be successful.

The relationship between biodiversity and climate change is not purely scientific. We cannot manage wildlife under climate change without asking ourselves questions such as:

- What kind of world do we want to live in?
- Where it is reasonable to take risks?
- How much are we willing to invest to help wildlife "adapt" to climate change?

Science alone cannot answer these questions. Science can tell us what is possible and what isn't; it can illuminate the landscape of risk; but it cannot tell us what to do.

In response to questions, Dr. Hellman commented that shared ecosystems (such as the Garry oak) provide opportunities for joint action by the Trilateral. However it will be essential to communicate the scale of the problem and the magnitude of the funding need. She also explored the dilemma of how to think about species that shifting their range in response to climate change versus invasives. She noted that we should want a certain level of new species but not to such an extent as to create problems for existing species or others that need to be colonizing as well as part of their adaptation to climate change.

From Country presentations:

Policy and Planning

Canada
Need to be responsive to new knowledge, threats and opportunities for adaptation

Need to "mainstream" climate change adaptation for wildlife

- Example from Province of British Columbia
  http://sharepoint.env.gov.bc.ca/climatechangeadaptation

Need to take action now; proceed with "no-regret" or "low regret" actions that have conservation benefits now as well as for climate change adaptation
Value of using "targeted collaboration" "focused collaborative networks" and structured decision analysis approaches to guide the path forward

Mexico
Special climate change program to be released on Earth Day, June 5, 2009
Policy implementation at national, regional and local scales, and at general or sector-specific levels
Further incorporating research on climate change and vulnerability into policies and practices
Connecting global long-term climate strategies with concrete local near-term benefits
Current emphasis for an adaptation strategy based on

- From bottom up – State-wide action plans
- Focus on local capacity building including establishment of regional academic centers of excellence on climate change adaptation
- State-level modeling of climate change impact scenarios
- Analysis of vulnerability to CC (by region and sector)

Biodiversity Conservation Principles

- High priority to endangered and endemic species
- Conservation vision from static to dynamic
- Differential responses from individual species
- Ecological succession stages may be different from current/known ones
- Possibility of abrupt climatic changes
- Need for different design of Protected Areas
- And one more??

Road-mapping mitigation and adaptation strategies
Need to prioritize policy options, looking for co-benefits
Crucial to develop an analysis of quantitative targets
Face the challenge of designing and implementing inter-sectors policies
Analysis of the legal and institutional framework, and of socio-economic factors

USA
Proposed that the Trilateral tackle a NA Wildlife Climate Change Adaptation Strategy
We are at a time of "Conservation in transition"

- We cannot face this challenge by simply repeating the conservation successes of the past
- We must rapidly develop capacity to envision and deliver conservation across connected networks of habitats, based on scientific understanding and predictions of species needs
- Need to be rigorous in the practice of adaptive management
- Need objectives against which can measure effectiveness – species are a useful lens

- Need to trash our training
- We can't preserve biodiversity – need to be prepared to make difficult choices

USFWS Strategic Plan for responding to climate change in preparation
While the main emphasis is on adaptation, also need to lead by example in relation to green house gas emission mitigation
Need to put greater emphasis on active engagement in adaptation
Evaluate legal, regulatory, and policy framework to identify barriers and opportunities for successful implementation of climate change actions
Foster International coordination for landscape conservation
Facilitate international carbon sequestration
Exchange information and influence policy internationally
Need for structured decision making and adaptive management approaches
Restoration of bottomland hardwood forests produces both wildlife habitat and carbon sequestration benefits
Need to take action now.

Monitoring and Assessment

Canada

Have funded science and research projects on climate change impacts especially in the north (e.g. International Polar Year projects for Arctic biodiversity, tundra and freshwater ecosystems, forests, peatlands, and tree lines)
Designing a knowledge system to manage a changing world

- Use of parks and protected areas as benchmarks for ecological integrity monitoring including effects of climate change among other stressors
- Wildlife/biodiversity monitoring programs for assessing effects (including citizen –based observations)
- Use of remote-sensing monitoring methods for tracking change especially in remote areas

Mexico

Capacity at state and local levels should be improved
Revision of the state-of-the art on the knowledge of climate change and climate variability in the State in quest
Assessment of greenhouse gas emissions (state-level emissions inventory)
Climate change scenarios at the state-level
Design and evaluation of possible climate change mitigation and adaptation measures
Current projects:

- Characterization and assessment to identify priority species
- Interplay of deforestation and cc on selected vertebrate spp
- Focus on impacts on coastal wetlands in Gulf of Mexico
- On rainforests of central Veracruz

USA

Develop a national biological inventory and monitoring (I&M) Partnership
Conduct species and habitat vulnerability assessments

Science Needs

Canada

Need for continued investment in research and monitoring to improve ability to detect and predict effects and to inform and modify adaptation strategies and actions
Perspective of interacting and cumulative effects is critical; need to address climate change in concert with other stressors
Integration of aboriginal traditional knowledge
Developing an integrated environmental monitoring and prediction capability
Managing risks, optimizing opportunities and building resilience
Need for decision support tools (e.g. ecological forecasting and scenario tools)
Need systematic national-scale habitat monitoring
Need to explore and understand how institutional, social and cultural factors influence the uptake of proactive adaptation

Mexico

Analysis of national circumstances
National greenhouse gases (GHG) inventory
GHG emissions, concentrations and impacts modeling, scenarios and projections
Vulnerability assessments to climate variability and extreme events
Design and analysis of policies for GHG mitigation and adaptation to climate change
Need to prioritize climate change research needs
Several climate change research areas are still little explored
Promoting technology development and technology transfer
Research into the effects of climate change and socioeconomic factors is still in its early stages in Mexico but priorities include (from a list of 10 shown)

- Biodiversity indicators for cc
- Effect of extreme events on biodiversity
- Assessment of impacts of cc on endemic and endangered species
- Relation of biodiversity impacts on economic sectors e.g. agriculture and pollinators
- Grasslands
- Desertification
- Invasive species

USA

Need to change way in which we do science to become more predictive rather than relying on our understanding of the past
Development of decision support tools

- Most advanced in coastal zone management
- However, disingenuous to describe on-going conservation as climate change adaptation even though those actions can contribute to climate change adaptation (e.g. flood mitigation i.e. preventing Google from becoming Gurgle)

Acquire regional climate science and modeling expertise
Acquire biological planning and conservation design expertise
Take conservation action for climate-vulnerable species
Develop research and monitoring capability for use in landscape conservation
Further develop collaborative research partnerships
Develop terrestrial carbon sequestration expertise
Conduct carbon sequestration research
Evaluate geologic sequestration
National Climate Change and Wildlife Science Center
Link physical climate models and ecological/biological response to FORECAST at time and space scales useful to management decisions and policy development.
Develop, synthesize, and assess models and tools for decision support

Building Resilience and Managing for Change

Canada
Recognize need for replication of species populations and habitats, and connectivity within conservation networks (including protected areas), to allow for ecosystem changes and species shifts
Expanding the protected areas network in the north of Canada
Incorporation of climate change considerations in to network design and site selection criteria for protected areas
Providing funds to develop private conservation networks and to buffer existing protected areas
Jurisdictions in some protected areas are using active management (restoration, invasive species control, fire) as a way to mitigate climate change and to enable adaptation to its effects

Mexico
Connecting global long-term climate strategies with concrete local near-term benefits
Design and evaluation of possible climate change mitigation and adaptation measures
Integration of the State Climate Action Plan

USA
Loss of Protected Areas from sea level rise – need to think about preparing the land for climate change e.g. in coastal refuges, plugging drainage ditches to keep sea water out while preparing land for salt marsh emergence (i.e. slowing down rate of change so that species can become established)

Promote habitat connectivity
Identify and fill priority freshwater needs
Manage genetic resources
Conserve coastal and marine resources
Reduce susceptibility to diseases, pathogens, pests, and contaminants
Address key ecological processes
Reduce non-climate stressors

Integrate carbon sequestration activities into landscape conservation approaches

Education/Outreach

Canada

Numerous Canadian websites, education/activity kits, media stories, etc., on climate change, but just beginning to focus on wildlife and habitat impacts and on adaptation
Need more efforts to help decision-makers, policy and program planners and conservation practitioners to build knowledge and share information on wildlife and climate change adaptation

Mexico

Web site information per state and sector
Public awareness strategies
Improving the transmission of information to society
Improve public perception about climate change impacts, vulnerability and adaptation at the state and local levels
Take advantage of the "local" knowledge of climate change-related issues, and to support capacity building

USA

Provide educational and training opportunities to federal employees regarding the implications and urgent nature of climate change
Provide educational and training opportunities for all audiences
Provide domestic technical assistance
Learn from others
Provide international assistance for outreach and education

Co-ordination/Cooperation among Agencies

Canada

Need more efforts to help decision-makers, policy and program planners and conservation practitioners to build knowledge and share information on wildlife and climate change adaptation
Need to encourage cross-jurisdictional research and planning
Important to remain active in conservation forums and initiatives across scales grappling with how to incorporate adaptation to climate change

Mexico

Value of a Trilateral wildlife and climate change working table

USA

Establishment of conservation cooperatives e.g. Landscape Conservation in the Northern Rockies but which currently stops at Canadian border
Working together because of interdependencies (not out of convenience)

Discussion

POLICY AND PLANNING ISSUES
Facilitator: Norma Alvarez Recorder: Kathryn Lindsay

US FWS 5 year action plan just about ready to be circulated to partners

- Migratory Birds
- Refuge System

NOAA lead for science on climate change

- Fish harvest – larger safety margin implemented
- Use of ports coordinated between Canada and USA

Mexico

- Forestry Ecosystem Service program for carbon sequestration
- Need to improve implementation of the interagency working committee

Creation of formal Interagency Collaboration Fora and work

- USA – referred to by Dan Ashe
- Mexico – Energy, Environment, Agriculture, Economics

Wildlife considerations also need to be incorporated in to other aspects of the climate change mitigation (e.g. energy) and adaptation agendas

Report on best practices, policy changes, legal reforms

Redirect Trilateral focus to climate change adaptation as climate change is a unifying driving issue across the continent

How do we get a unified voice to speak to conservation issues related to climate change in other policy for a – e.g. climate and energy

Need to use climate change as a motivator for integrating ecological considerations in to policy and planning more broadly

Trilateral should expand their role and presence in policy and planning in the areas of wildlife and climate change adaptation

SCIENCE NEEDS
Facilitator: Jessica Hellman Recorder: Al Bagazo

Gather all the data available on climate change as a starting point (data clearinghouse for climate change)

Science needs is ecosystem modeling for species informative to managers and other similar models could be built

Monitoring and data with standardize methodologies that produce comparable and extrapolated data to use for the models

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NOAA is an authoritative credible source of regional climate change information; need to downscale the global models to a regional basis to detect and understand them at the scale at which things are managed. Diversify information and sources of information, not just sea rise of sea levels.

We need to look at questions for policy makers, produce a connection with them

APHIS to look at connectivity between populations (for avian influenza), and produced a model to follow through years, Modeling as a baseline against which to test changes Better modeling, but ecologist to be able to come to terms with uncertainty in those models. Climate change community talks about probability we do not capture the uncertainty and do not communicate it very well

Monitoring vertebrates (birds) related to wind energy power lines the main themes' have been covered but we need to see what are the problematic for each country maybe we have the same end results but these need to be approached differently for each country, standardize data sampling so it can be combined and compared with the other countries

Models and species models pop dynamics models that describe the factors of abundance, in form as to what can be managed, of pop din models for species

Human population changes need to be considered and included in these predictions social science and economics need to be considered strongly f these decisions are to be accepted by others, and also how does the system work and how each species will be affected

Certain data is not validated and not taking in account diversity of opinion and people disagree on what s gong to happen, for example hurricanes (more warm water will mea less hurricanes, but it is generally accepted they there will be more hurricanes with climate change)

We need to be modeling not only for changes in temperature but on the other effects of climate, such as habitat loss, or larger seas (so birds never make it to the other side) it s like el Niño on steroids as birds rely on these winds to guide the migrations, but if the wind is not there the whole species could be gone. Wind patterns changes can cause huge collapses on the productivity of coastal ecosystems

BUILDING RESILIENCE IN OUR MANAGEMENT OF WILDLIFE AND ECOSYSTEMS

Facilitator: Eduardo Peters Recorder: Patricia Collete

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1. Important factors that we need to address

First common understanding is maintaining more natural system. A system that maintain its characteristics despite Climate Change with minimum intervention
We consider the definition of the Millennium Ecosystem Assessment: *Refers to the amount of disturbance or stress that an ecosystem can absorb and still remain capable of returning to its pre- disturbance state.*
Factors:

- Structure
- Naturalness and Intactness: More natural – and that already have to adapt
- Complexity
- Integrity
- Function: Keeping ecosystem services
- Wilderness
- Maintain Connectivity: landscape perspective
- Consider synergistic effects with other factors that threat ecosystems
- Biodiversity

We need to define the state at which the ecosystem is going to be back before the change
Climate change will affect different ecosystems in different way, and might be looking different in the future
We might not have base lines for all ecosystems, but we should have an idea of state (as for Restoration)
Resilience is a concept is very important in Ecology, and difficult to translate into policies, and how to decide target measures to protect ecosystems for disturbance. AT the management level is a very difficult concept (Example of mountain pine beetle, ecosystem is dissembling).
How we can face and have some kind of good immunological system (resilience) to respond to climate change, and choose some critical areas and define major disturbances.
Have an homeostatic response – integrity of ecosystem should be a key concepts.
Co-utility benefits of ecosystems (as was presented in the Plenary by Canada).
Differential strategy for different terrestrial ecosystem and islands (where you cannot talk about connectivity)
Adding tree species is not enough to maintain ecosystem, What is going to happened and in which group of species? Have a Risk assessment approach would be important.

How robust predictions would be?
Planning based on species –or in habitats? Need to be careful on how much money are you going to invest?

2. Species and ecosystems to move freely. Types of management activities to support shifts of species ranges

- Connectivity
- Corridors

3. **How to implement future planning**

- Different land management private land, reserves, at a landscape level
- Ecoregional planning scale instead provinces or states. Go landscape level
- Challenging for future envision – references are needed, and look different values (water supplies, species, landscapes)
- Differences among ecoregions, landscape, watershed level will need different solutions (a number of strategies for the scale used)
- Start coordination among agencies, documenting more experiences
- Braking down countries barriers, to allow to do the things that need to be done
- Use of tools (SIG, satellite images, databases) – to have a complete picture at a large scale
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Example Baja to Bering- subcontinent and ecoregional level – common actions

4. Social and economic considerations

5. What are the resources and natural capital

MONITORING AND ASSESSMENT
Facilitator: Patrick Pitts and Steve Traxler Recorder: Omar Rocha

How are we going to address the rigorous monitoring needed to assess change and evaluate the effectiveness of management attempts under changing conditions?

- Incorporate paleo-ecological data to establish a baseline for Climate Change
- What to monitor? Prioritize. Predictive tools to help set priorities
- Identify key indicators for different scales;
- Review existing programs and modified CC issues
- Clearly identify objectives
- Develop a working group to develop a 5 Year Action Plan
- Ensure most important physical variables are included in monitoring programs (to prioritize physical variables relates to CC)
- Developments of Guidelines to monitor CC
- Coordinate the future efforts
- Inventory existing monitoring effort (international)
- Identify early and often how we are going to pay for the monitoring

- Look for non government sources of funding such as partnership with forestry companies voluntaries, etc.
- International boundary water commission as a funding source
- Resources extraction industries to expand the scope of monitoring that they fund
- Assessment will relate to the initial design
- Proposing a new infrastructure for assessment of monitoring data
- Develop a central data coordination group
- Use existing bird monitoring programs as a good example
    - IBI for fishes as a good example
    - NAPPC as a good example
    - Invasive species monitoring should be incorporated
    - AMAP as a good example
- Identify an economic hook for monitoring to help fund projects(e.g., ecosystem services)
- CEC as a coordinating body (based in contaminants)
- Phenology as a key variable
- Monitoring and management attempts should have the same objectives and goals
- Adaptive management versus monitoring to develop management actions?
- All of the above should be coordinate across countries and agencies to the extent possible

<u>How are we going to address the integration of the many existing and planned data collection and management efforts across agencies and countries?</u>

- Continue to utilize the effective existing entities (e.g., USGS, NOAA, IBIN, Avian Knowledge Network, Avian Influenza Network)
- Use interdisciplinary teams for monitoring, not just biologists
- Don't reinvent the wheel, use what is working in other agencies and apply it to new teams

<u>EDUCATION OUTREACH</u>
Facilitator: Miles Meyers Recorder: Michael Gabel

People have and will continue to be an integral component of the biosphere and not simply observers and consumers of it. How are we going to communicate with them? How are we going to educate them about the challenges? How are we going to engage them in the solution?

We need to identify the public, which does not have an understanding of the topic. Distribute information via radio, television, etc. Develop things that are easy to understand.

With technology, we have to communicate in a whole different way. People want to see images and connect with what this really means. We also do not necessarily have the funding and the right staff to use multimedia campaigns.

The U.S. Government is increasingly using social and new media issues to communicate.

Talked about teachers in schools and use of Websites in the classroom. Maybe have "For Kids" pages on government Websites. Big Ben National Park was given as a good example. Your Website should be easily accessible and is easy to search.

Project WILD and Project WET – training classes for teachers to talk about these products.

We need climate change specific curriculum. Climate change is a complex topic. There may be a strategy for introducing ideas throughout the education system. Climate change is really about everything we are doing.

There are still some basic literacy goals needed in terms of public engagement. There is not just one way that it happens.

We saw this in the morning talk about the phenology monitoring network. Climate change is really a lens now for conservation, and should be a part of environmental education programs in our countries. Maybe discussions also start with the food chain and other concepts already part of our learning. There was also a point about engaging adults and breaking the urban core. Sometimes, the children can motivate the parents.

In the United States, the state governments make curricular decisions. In Mexico, if you want to get your issue in the curriculum through the Ministry of Education. They also have mandatory events. In Mexico City, the radio stations are really the way to connect to the public, and using the Internet is not the best way to engage rural communities (TV is expensive but still the best outreach tool). There was an example given of using comic books in Mexico for environmental outreach.

There are so many different audiences. It is also important to connect the message to the human element – a direct connection in terms of leading to change behavior. We need to partner with other agencies at all levels of the organization.

There was a suggestion for using Public Service Announcements (PSAs) and recruiting public figures (i.e. Movie stars, etc.) to speak on the issue. Giving tools to interpreters. To target different audiences, an innovative practice saw that certain TV shows were really popular – introduce environmental ideas into the show.

We are putting our messages into publications that target audiences that are already convinced of the need to action.

What is it that we want the public to do?

How do we get the public engaged in devising solutions? Getting individuals on the land acting for the benefit of wildlife is important to people connecting with both the issue and the solution. Demonstrate that there are steps you can take in your backyard, and make

the solution not so overwhelming. In Mexico, the government observed "Green Hour" where they turned off the lights and electrical devices to save energy, which demonstrates the importance of leading by example. This garnered media attention.

North American Monarch Monitoring Plan as a model – Project WILD also as a model. Proposal to use the NAMMP Education and Outreach section as a possible model. Also working across agencies and combining resources. Story was told about Monarch Live broadcast, and another one was told about Google video. There are climate change stories (e.g. indigenous stories, sea change, etc.).

COORDINATION/COOPERATION AMONG AGENCIES

Facilitator: Jane Tutton Recorder: Bill Van Pelt

Traditionally we think about the three c of wildlife entities. Working it up through the bottom works but a better approach is through partnership. Coordinate programs efforts of management actions.

Identify internal coordination for each country. Identify obstacles both internal and external for each agency and entity for exchange ideas. Identify opportunities in place.

Two perspectives: modeling and monitoring of change.

Not sure of the benefits of a table at the trilateral the issues are across many of the tables and there are cost cutting.

Need something to track commitments made by the countries regarding impacts of climate change to wildlife.

Pessimistic view: Can we really change policy to affect change? How can we do the best we can with a poor hand dealt. Look at lesson learned from various efforts in each country.

Intermediate step commitment to have an academic table what stage of change that is currently identified in wildlife. Connection of science to identify needs for policies development for countries.

Generating information to feed into policy. Identification of policymakers to deliver message.

Take 3-5 cases for wildlife with projections of change brought on by climate change. Build a story to build public support.

Build a coalition of absence players. Change traditional component of meeting to embrace other efforts such as health, agriculture, and water quality etc.

Global change is worldwide and the entire world does not value wildlife the same way.

Begin compiling information and send a message to the public. Conserving biodiversity relates to human health. Change in wildlife patterns is not necessarily bad but allowing for adaptation to occur.

Climate change is umbrella issue but the other issue like energy development is creating impacts now that need an immediate change.

A person needs to interpret the impacts of climate change for policymakers on species and ecosystems and condense the message. Come up a solution in a condense message to education and outreach to deliver to policymaker they can understand.

Translation of messages that resonates with the public and policymakers across the countries. Cost of climate change needs to be link to economy.

Top levels need to recognize the importance of climate change. Invite top level people to meeting to speak and generate synergy of support at the upper levels.

Gather information to identify important thing to address climate change. Put resources in the hands of a coordinator. "Clearing house of climate change affecting wildlife with the eventual goal of key messages to different audiences'." Incorporate topics from all other groups.

T.R. Reid talk on healthcare digested it down to issues understandable.

How does climate change's effects on wildlife and ecosystems relate back to individuals (human health, quality of life, etc.)

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