

Managing for Change

Ecosystems and Climate Adaptation

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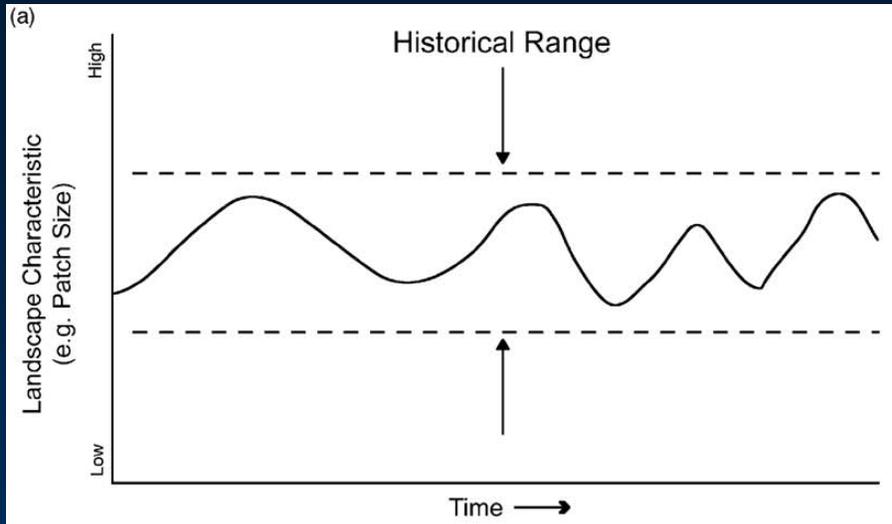
The future ain't what it used to be.
-- Yogi Berra



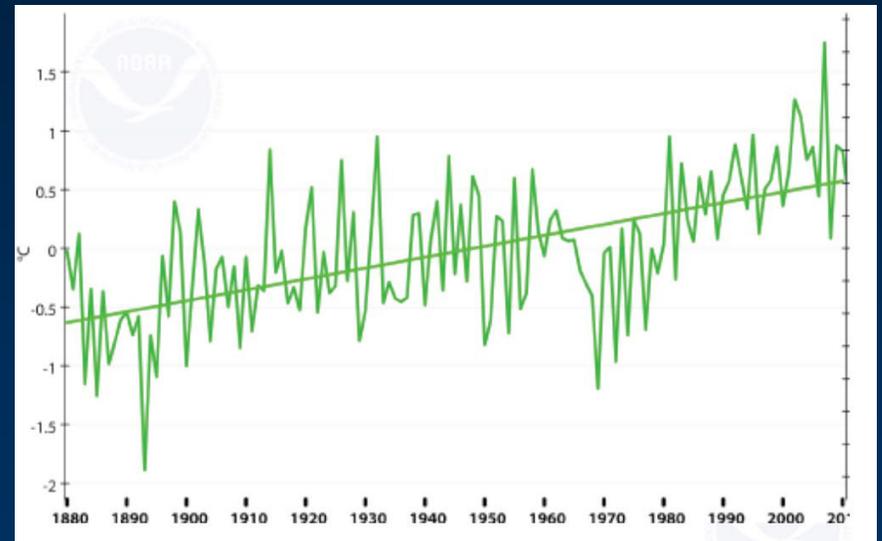
The Future is Now



Managing for Variability



Historical Range of Variability



Global Average January Temperatures.
Source: NOAA 2009

Stationarity is Dead!

Climate Impacts on Species and Ecosystems

- Species

- Range shifts
- Mismatch in timing (phenology)

- Ecosystems

- Altered processes
- Changes in composition, structure

- Existing stresses strengthened

- Habitat loss/fragmentation
- Pests and invasive species
- Pollution toxicity



Red Kott © Hans Hillewaert



Beetle damage, Colorado. Photo Allen Thornton



“I skate to where the puck is going to be, not where it has been.”

--- Wayne Gretzky



Iron Chef Adaptation Edition

What's in Your Basket?



The Secret Sauce for Successful Adaptation



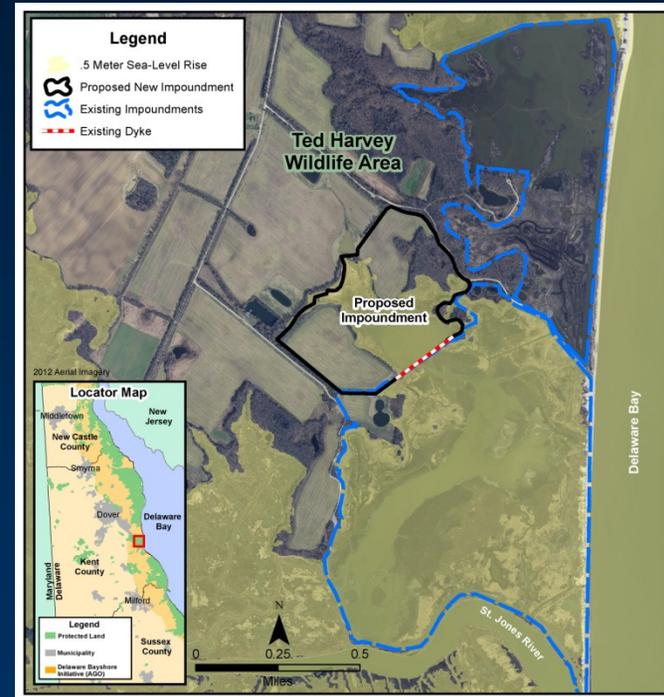
Intentionality

In the face of climate change,
Good Conservation Isn't Good Enough!

Manage for Change Not Just Persistence



Breached levees and inundated coastal impoundments,
Prime Hook National Wildlife Refuge



Creating new impoundments inland
and upland of existing ponds.
Delaware Dept of Fish and Wildlife



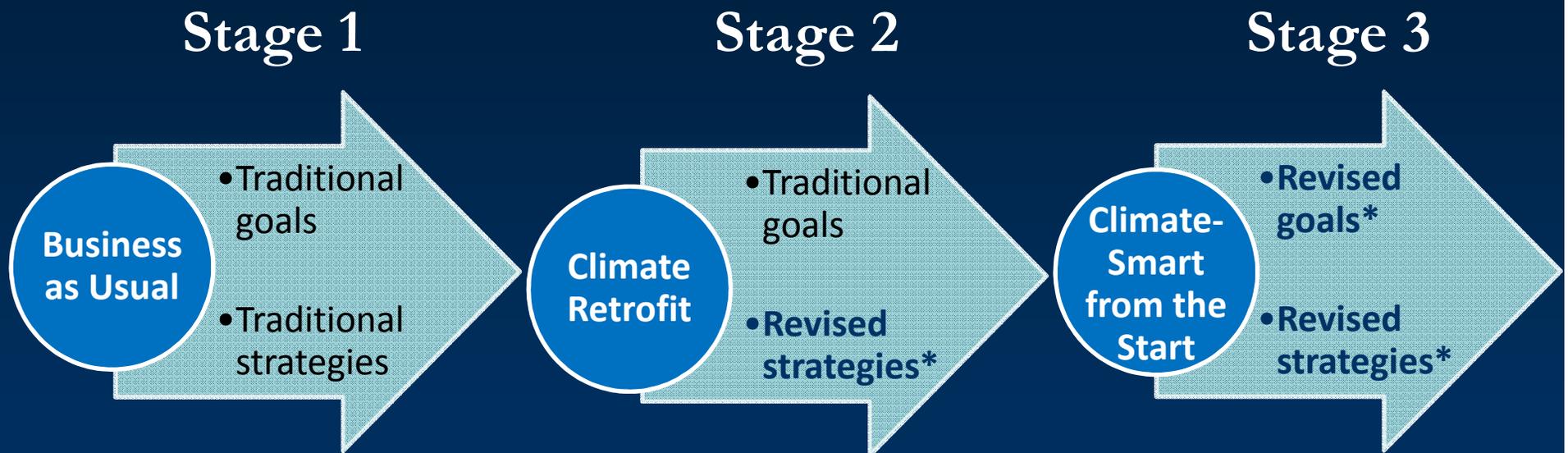
Reconsider Conservation Goals Not Just Strategies

- Goals are the *why*; strategies the *how*
- Many current goals will no longer be feasible



Voyageurs NP, Northern Minnesota

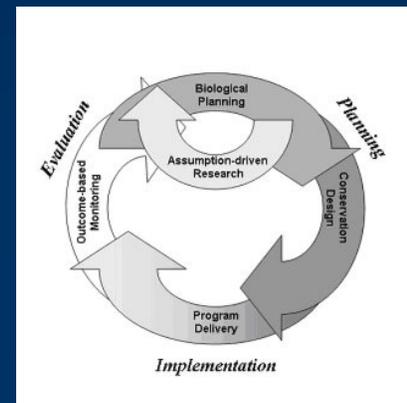
Aligning Climate-Informed Goals and Strategies



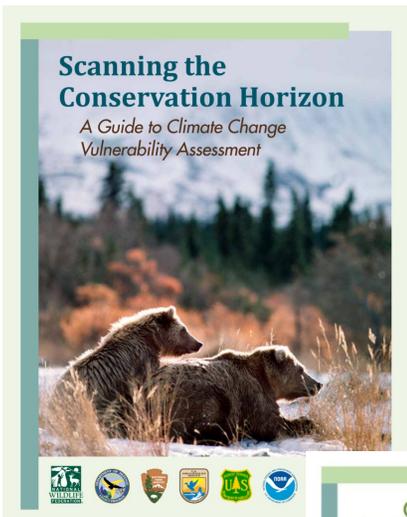
* Review and revised as needed, based on climate change assessments.

Integrate with Existing Work

Not Just Stand-Alone Adaptation Plans



Climate-Smart Conservation



Quick Guide to Climate-Smart Conservation



Act with intentionality
We must explicitly consider and address climate impacts—both direct and indirect—in our conservation actions, and be able to “show our work.” Most adaptation actions will draw from existing conservation techniques, but may differ in when, where, and why they are applied.

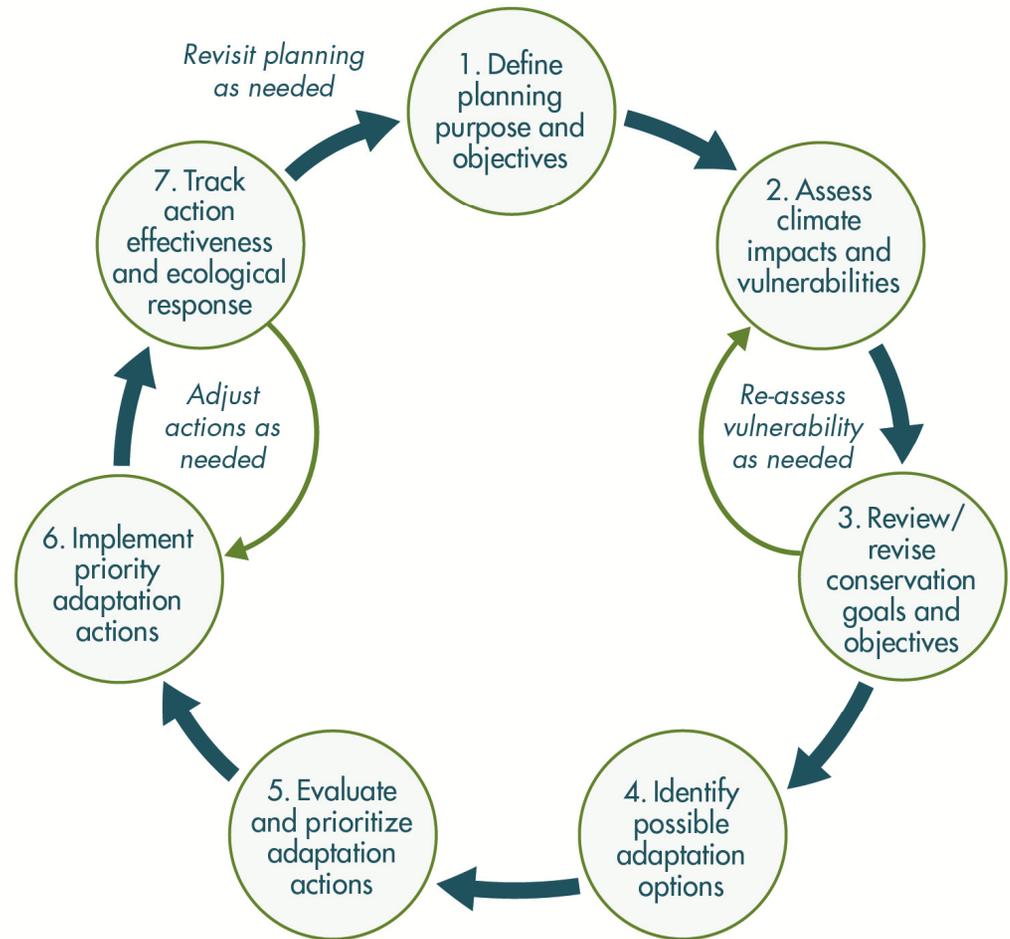
Manage for change, not just persistence
Conservation efforts usually strive to maintain existing conditions or restore back to some historical state. Increasingly, we will be faced with managing systems transformations, and may need to focus on sustaining ecological functions, rather than historical assemblages of plants and animals.

Reconsider goals, not just strategies
As conditions change, many of our current conservation goals and management objectives may no longer be feasible. Successful climate adaptation will depend not only on adjusting strategies, but also on reevaluating—and revising as appropriate—our underlying conservation goals and objectives.

Integrate adaptation into existing work
Getting climate-smart strategies implemented can benefit from incorporating them in ongoing work and existing decision processes. Helping managers address near-term challenges in ways consistent with longer-term adaptation needs is especially important for putting adaptation into practice.

What is Climate-Smart Conservation?
Climate-Smart Conservation is the intentional and deliberative consideration of climate change in natural resource management, realized through forward-looking goals and linking actions to key climate impacts and vulnerabilities.

Making Conservation Climate Smart
The fate of our wildlife and wild places depends on steps we take now to prepare for and cope with the growing impacts of a changing climate, a process known as *climate adaptation*. While managers traditionally have looked to the past for inspiration, increasingly we will be faced with future conditions that may have no historical analogs. Making a transition to forward-looking and climate-smart conservation will require that we pay particular attention to the following overarching themes:



Key Characteristics of Climate-Smart Conservation

- Actions linked to climate impacts
- Forward looking goals
- Broader landscape context
- Robust in an uncertain future
- Agile and informed management
- Minimizes carbon footprint
- Climate influence on project success
- Safeguards people and wildlife
- Avoids maladaptation

Ecosystem-Based Adaptation

- Natural ecosystems provide important services to human communities
 - Disaster risk reduction is among these services
- Ecosystem-based adaptation
 - Emerging concept for safeguarding human communities through use of nature-based solutions



Nature-Based Solutions

- Green infrastructure can be effective for flood protection and stormwater reduction
- Need to better understand where and when nature-based approaches will work
- Need to “green” green infrastructure efforts
 - Ensure green infrastructure projects provide ecological benefit too



Summing Up

- Act with intentionality
- Manage for change, not just persistence
- Reconsider goals, not just strategies
- Integrate adaptation into existing work

