

Endangered Species Act: Safeguarding Species and Ecosystems in a Warming World

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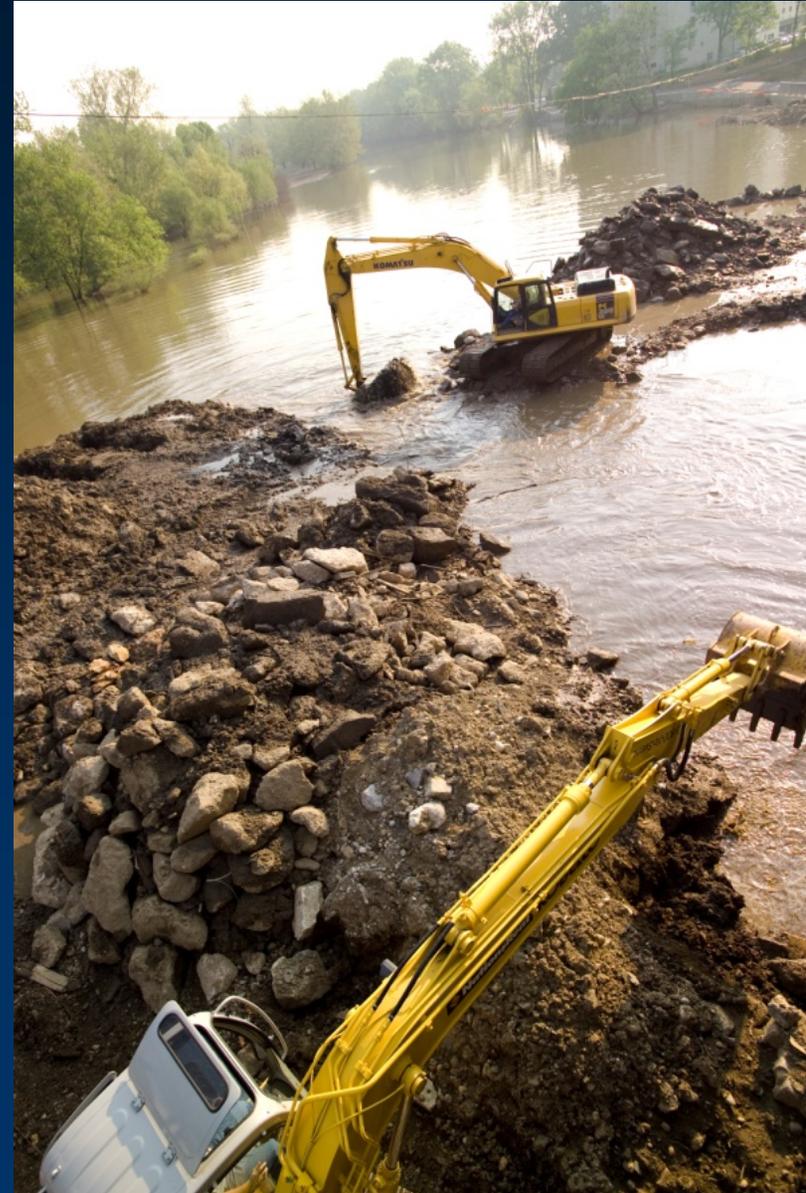
A Visionary Law

- In 1973, Congress recognized that human-caused extinction crisis was underway
- Linked species conservation and human quality of life
- Emphasized species and ecosystem conservation



Threats Identified in 1973

- Climate change was not among them – Congress focused on habitat destruction, over-utilization, disease, etc.
- But it called for action on all threats – see, e.g., 4(b): any factors affecting existence must be considered in listing determination



An Impressive Success Story

- Listing Has Brought Management Attention to Over 1,400 U.S. Species
- Millions of acres of habitats across the U.S. being protected/restored
- Benefits to people and economy include recreational opportunities, filtration and storage of fresh water, flood protection

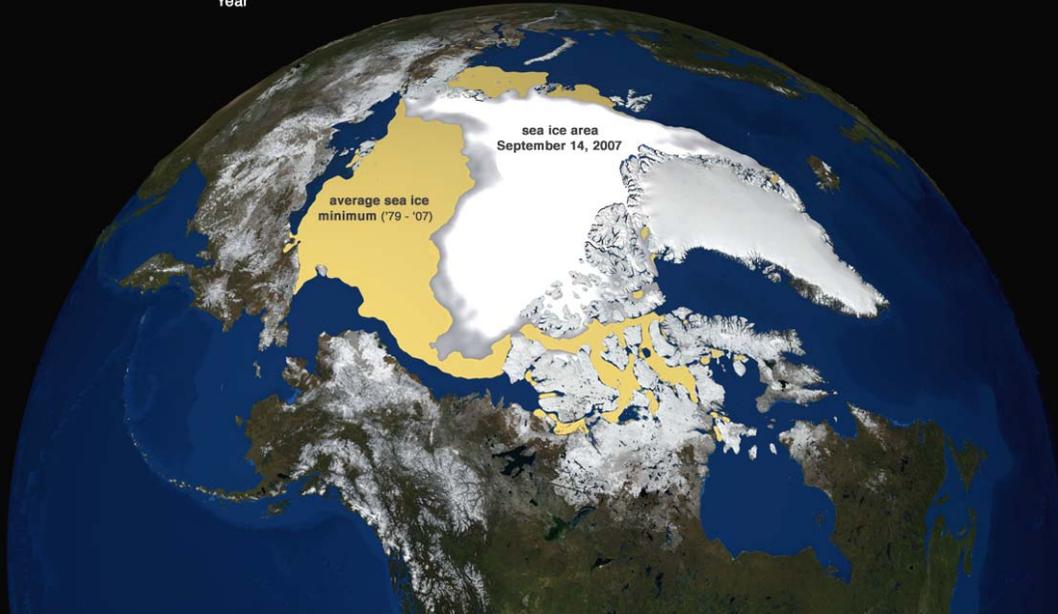
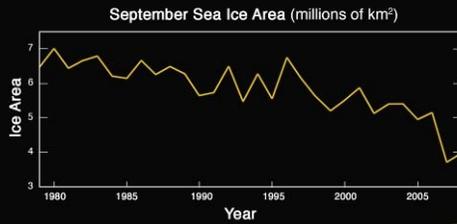


An Impressive Success Story, cont'd

- Extinction prevented for virtually every U.S. species ever protected by ESA
- Negative trends reversed over time
- Bald Eagle, American Alligator, Gray Wolf, Yellowstone Grizzly, Whooping Crane, Florida Panther
- How Can We Build Upon this Success to Meet the Biggest Conservation Challenge Ever?



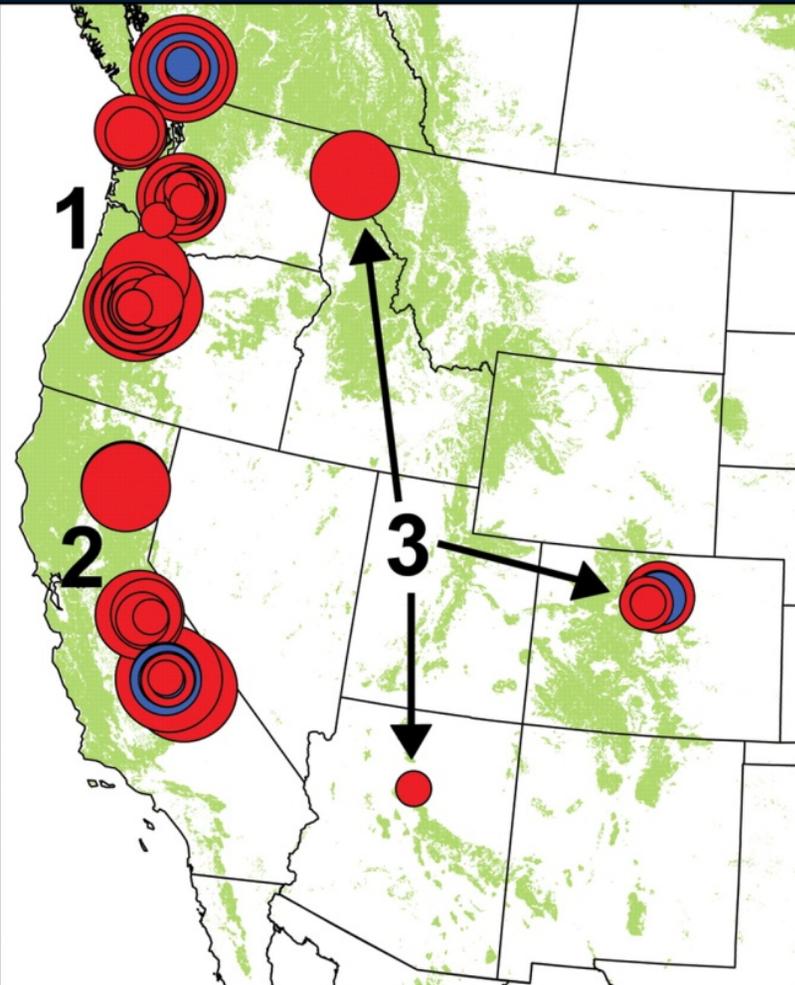
Global Warming is Disrupting Entire Ecosystems ... in Polar Regions



Arctic summer sea ice, Sept. 2007. Source: NASA

Photo: Larry Master

... and in Temperate Zones

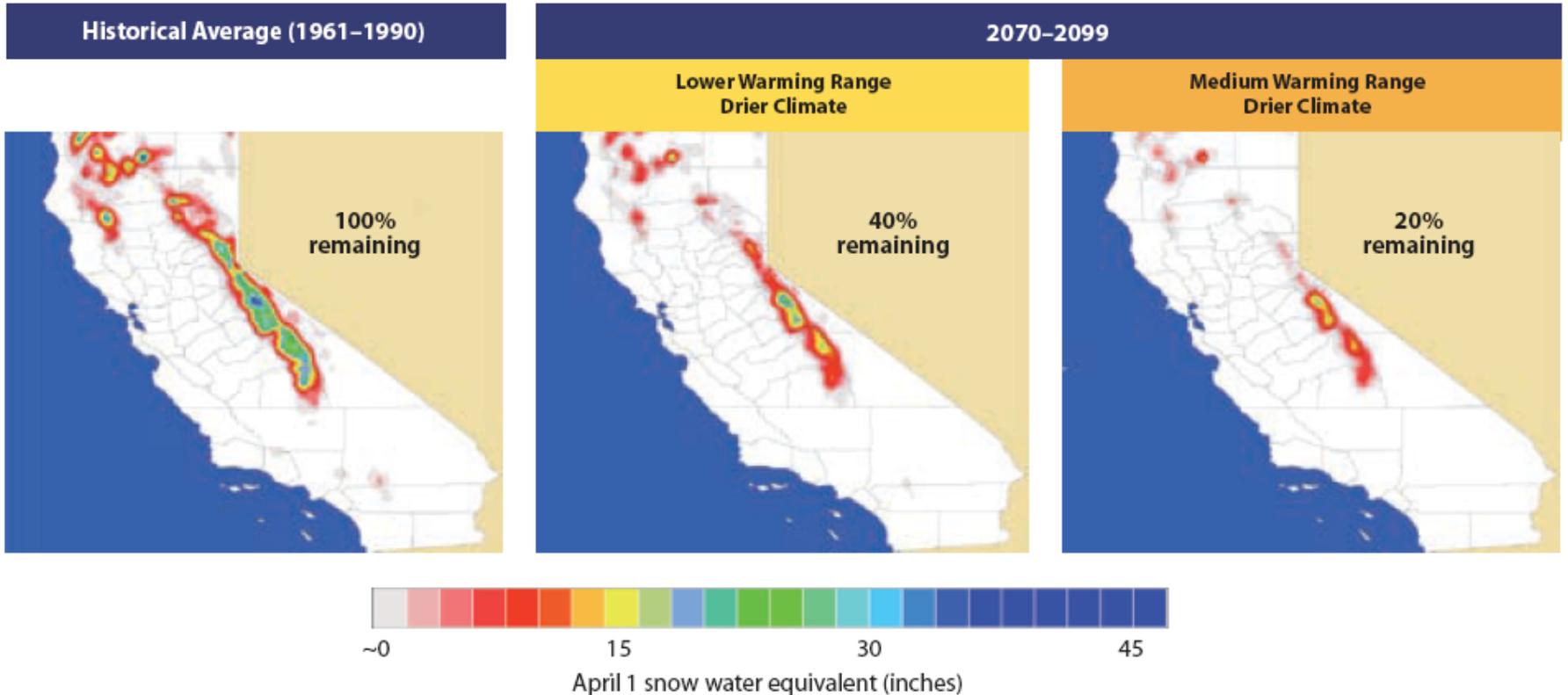


Old Growth Tree Mortality
van Mantgem et al. (2009)

Mountain Pine Beetle Damage, Colorado
Photo: Allen L. Thornton

A Problem of Too Little Water...

Decreasing California Snowpack



... and Too Much Water



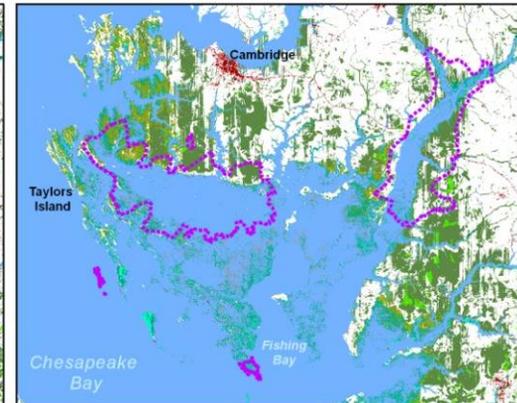
Initial Condition



2025 - A1B Max



2050 - A1B Max



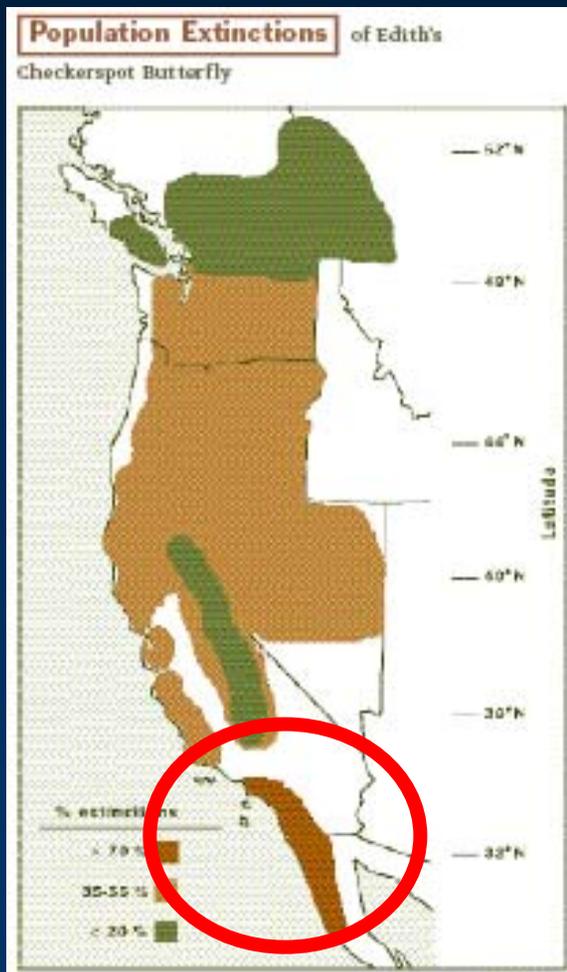
2100 - A1B Max

Hurricane Katrina

Blackwater National Wildlife Refuge



Each Species Thrives in a Climate “Envelope” – What is our Response When the Envelope Shifts?





Species Must
Move *Fast* to
Keep Up With
Shifting
Climates: 27 to
45 feet per day

Is it possible for plants?
Fastest rates in fossil
record are 9 to 13 feet per
day

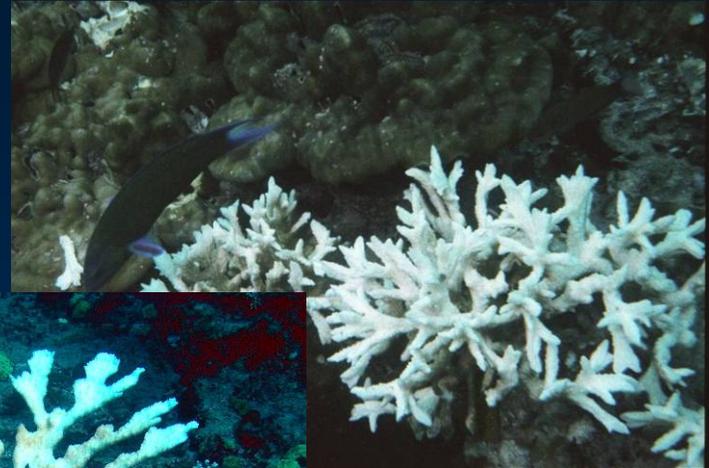
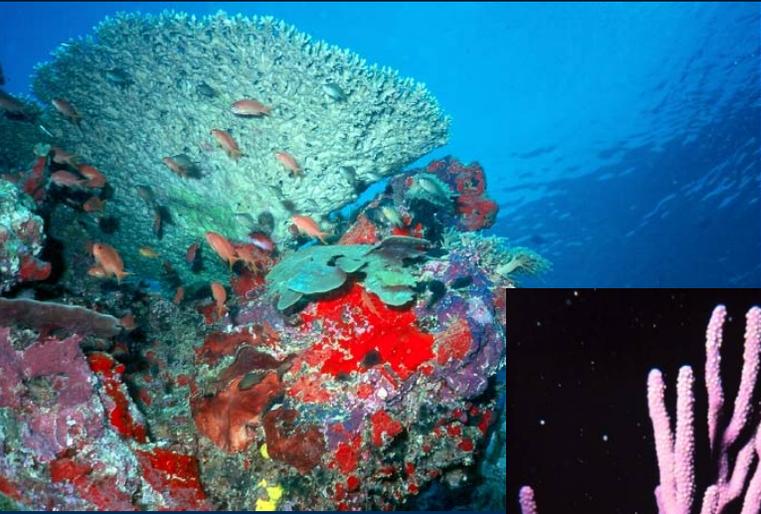


Some Wildlife Species Can Move to More Favorable Climates

How to Manage Disassembly and Reassembly of Ecological Communities? How to Manage the “New” Natives?



Some Species Cannot Shift - Due to Immobility or Barriers to Movement



Three Primary Features of the ESA: What is their Role in Helping Species and Ecosystems Survive Climate Change?

- **Identification** of At-Risk Species and Habitats
- **Protection** of Remaining Populations
- **Recovery** so that the Act's Protections are No Longer Needed



Identification of At-Risk Species and their Habitats

- Listing (§4(a))
- Designation of Critical Habitat (§4(b))



Grappling with Climate Change in Listing and Designating CH

- Thirty percent of world's species at heightened risk of extinction if temperatures rise 3 to 5 degrees F (IPCC 2007) –which deserve listing and CH designation?
- Is there a proactive agency strategy for prioritizing this list? Or will this work continue to be driven by citizen petitions and enforcement actions?
- How to designate CH – will agencies anticipate range shifts?



Protection of Remaining Populations

Key Prohibitions:

- Take (§§ 9 and 4(d))
- Jeopardy (§7(a)(2))
- Prohibition Against Adverse Modification of CH (§7(a)(2))



New Approaches to ESA Protection Will be Needed

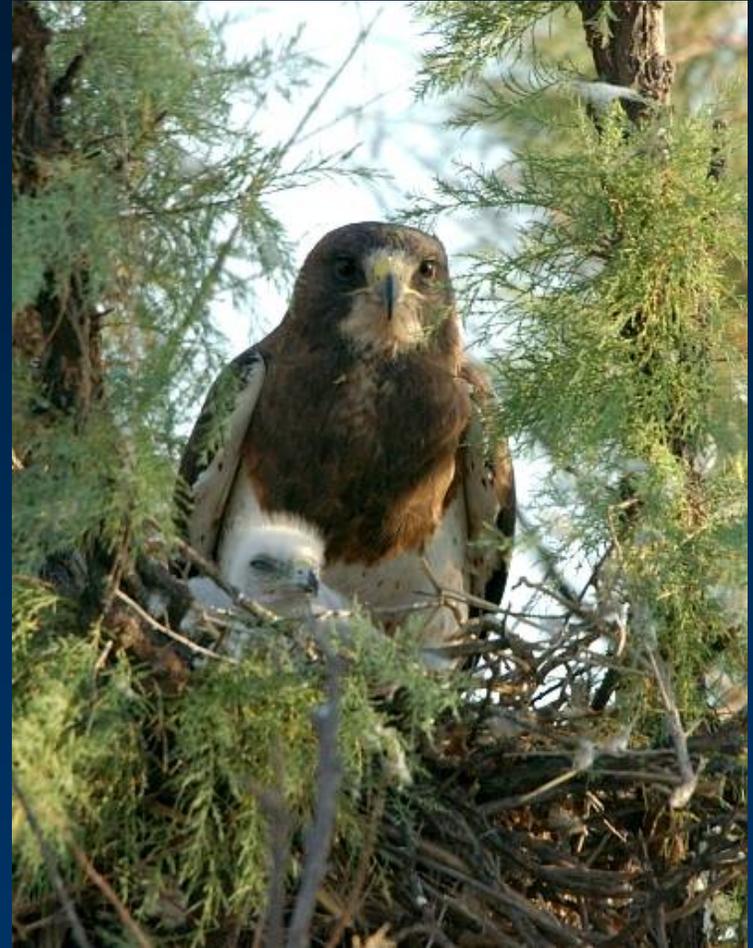
1. Priorities must be reevaluated using climate/ecological models and vulnerability assessments
2. Prioritize habitat connectivity, esp. at northern and upslope edges of species' range
3. Focus on role of habitats in storing fresh water and providing buffers against floods
4. Integrate ESA and non-ESA adaptation planning



Wyoming Toad

Additional ESA Protection Issues

- Can Agencies Continue to Provide “No Surprises” Assurances for Developers While Maintaining Flexibility to Adapt to Climate Change, Other Changed Circumstances?
- How to Address Additions of GHGs to the Atmosphere?



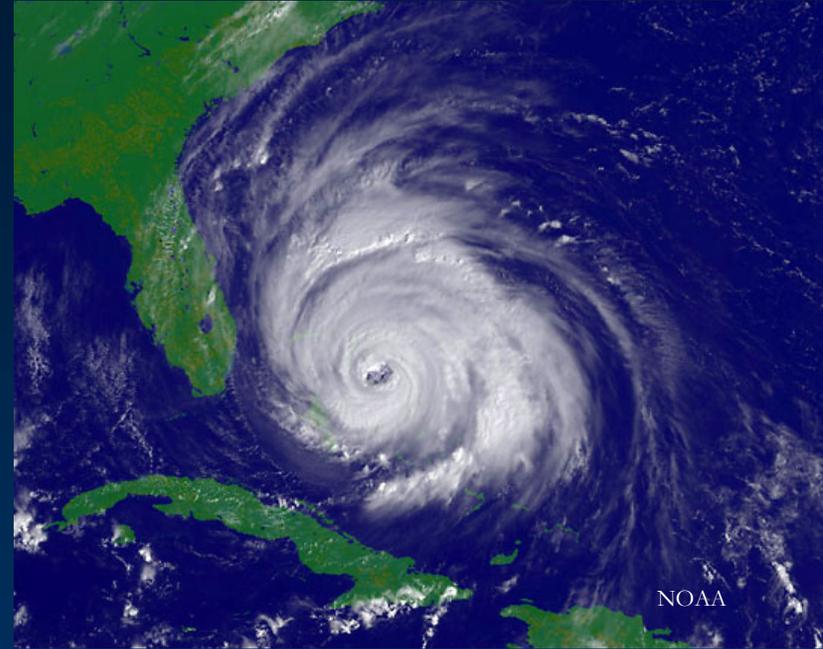
Recovery: Bringing Species to the Point Where ESA is No Longer Needed

- Recovery Plans (§4(f))
- Conservation Programs (§7(a)(1))
- Land Acquisitions (§5)
- Species Introductions (§10(j))
- Safe Harbor Agreements (50 CFR §§ 17.22 and 17.32)
- Critical Habitat Protection (§4(b))



Key Recovery/Delisting Issues

- In a rapidly changing climate, most listed species will be “conservation reliant,” requiring not just protection, but active management and restoration
- ESA will play a crucial role in protecting U.S. species and ecosystems, but its ability to stimulate management and restoration efforts will remain limited until large-scale, dedicated funding is secured



An Historic Moment: Federal Climate Change Legislation

- Unprecedented opportunity to combat global warming and secure large-scale funding for conservation
- \$1B to \$6B/yr potentially available for U.S. ecosystems
- Adaptation and carbon storage programs, with guaranteed large-scale funding, could drive much of ESA implementation

