

# 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?



# Wildlife Remains in Trouble

- At risk of extinction (without factoring in climate change):
  - 20% of world's plant species
  - 25% of carnivores
- Climate change heightens extinction risk for 20 to 30% of species (with 3.6 °F increase this century)



# The planet is in trouble

Wildlife work now means addressing system breakdowns across many parts of the planet

- Glaciers and polar ice caps melting
- Coastal communities deluged
- Ocean acidification, coral reef die-offs
- Dead zones
- Groundwater depletion and desertification
- Forest die-offs
- Oil spills, other toxic contamination



# Underlying causes of this crisis

- Population
- Affluence  
(Consumption)
- Technology

PR Ehrlich, JP Holdren, Impact of population growth, *Science*, 1971



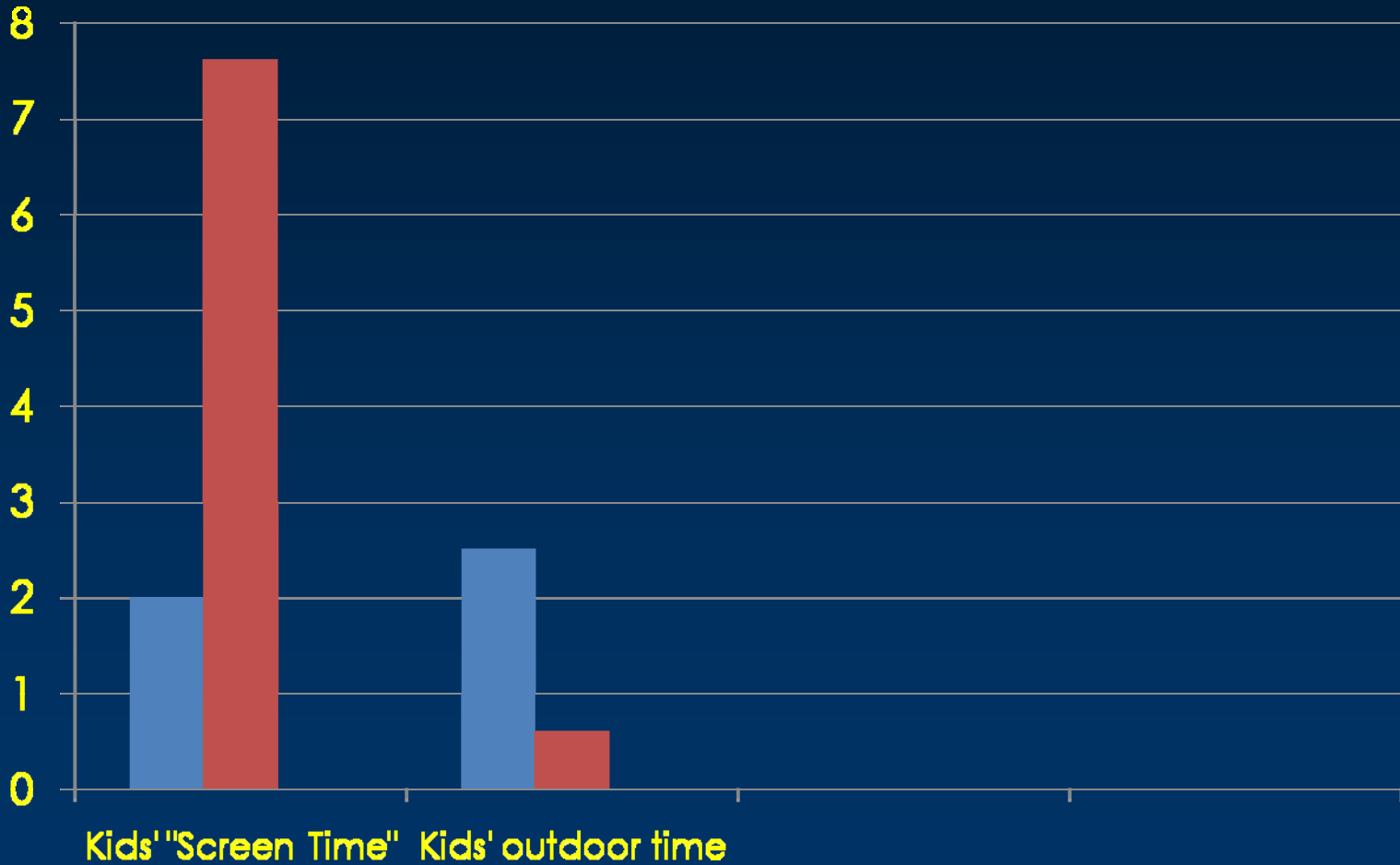


# In the 50 years since Barack and I were born ...

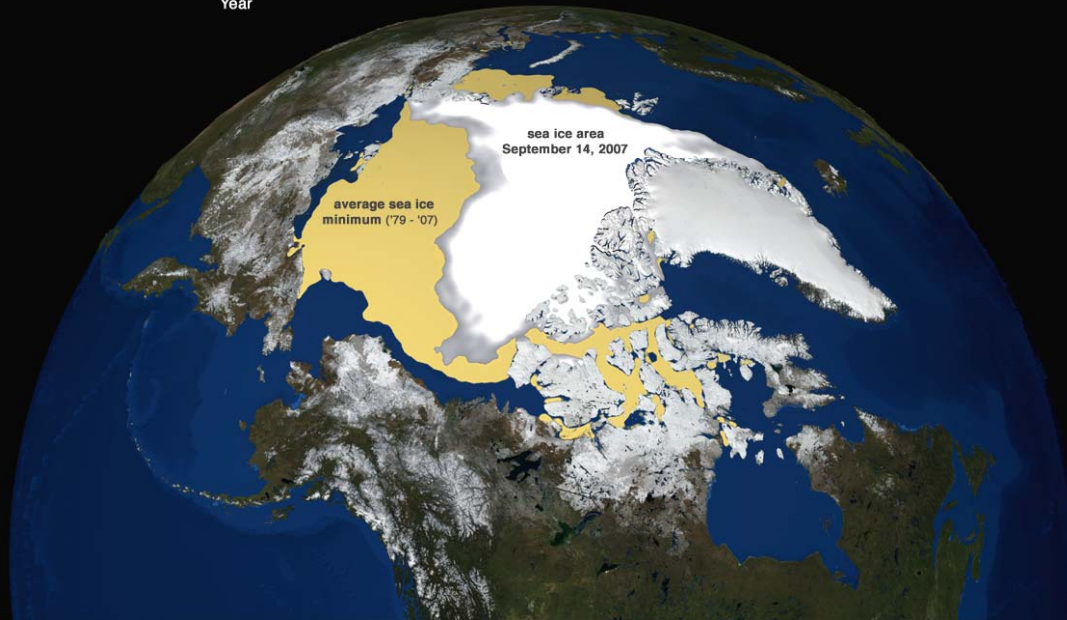
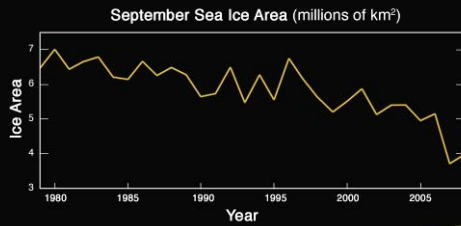
- The planet's population has more than doubled
- Food consumption has tripled
- Fresh water consumption has tripled
- Fossil fuel consumption has quadrupled



# In the Past 25 Years Since Our Major Conservation Laws Were Enacted...



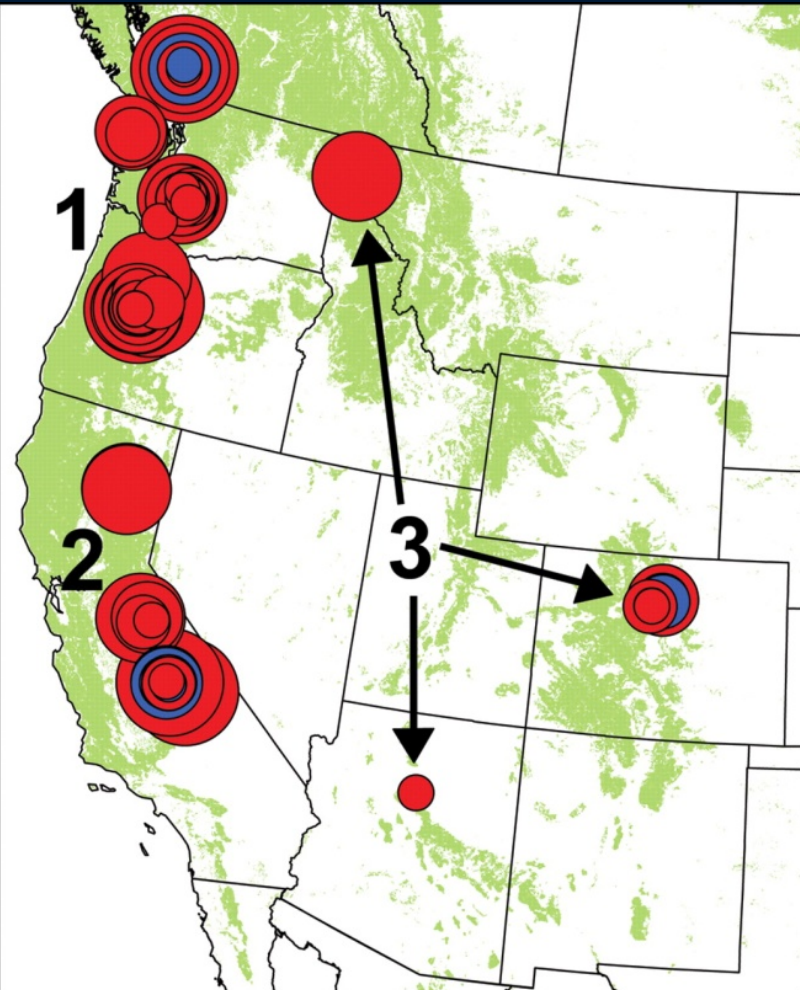
# Global Warming is Disrupting Entire Ecosystems ... in Polar Regions



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

Photo: Larry Master

# ... and in Temperate Zones

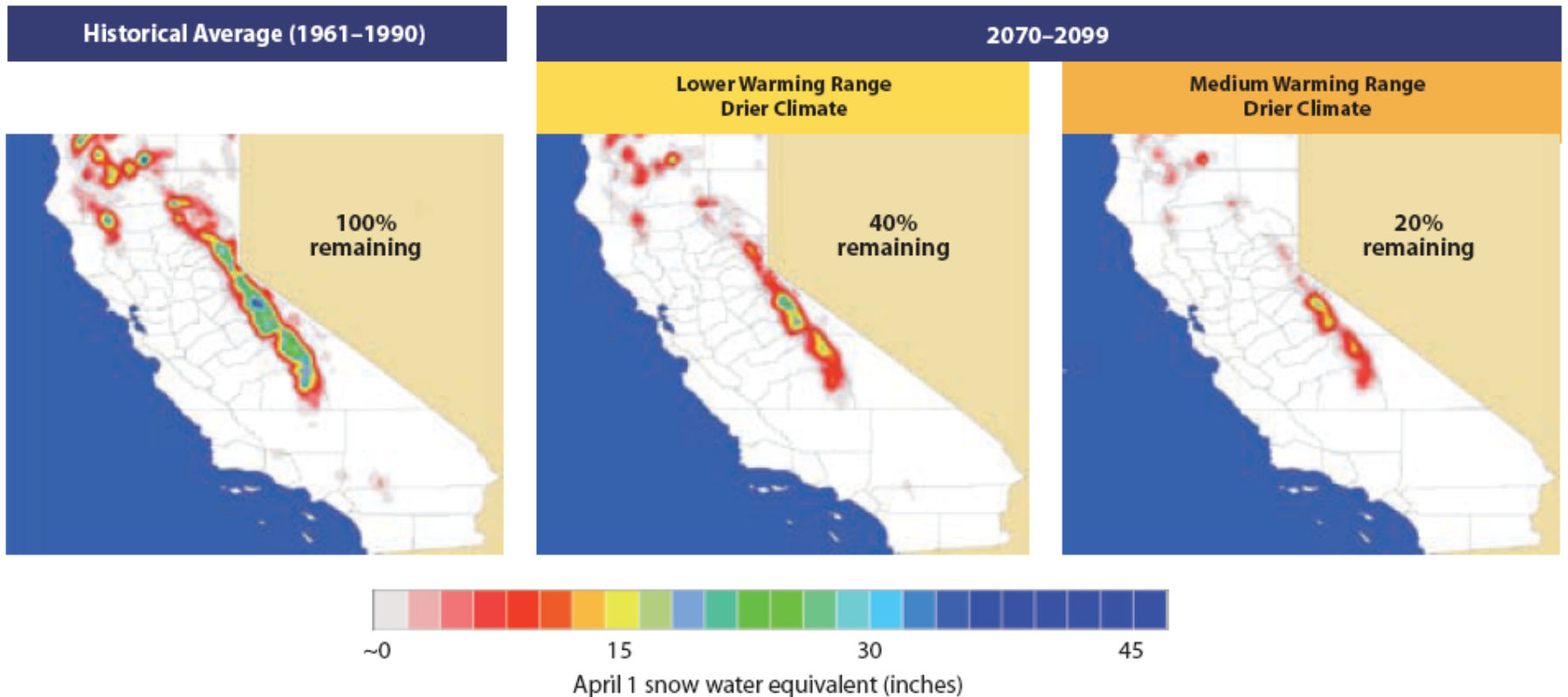


Old Growth Tree Mortality  
van Mantgem et al. (2009)

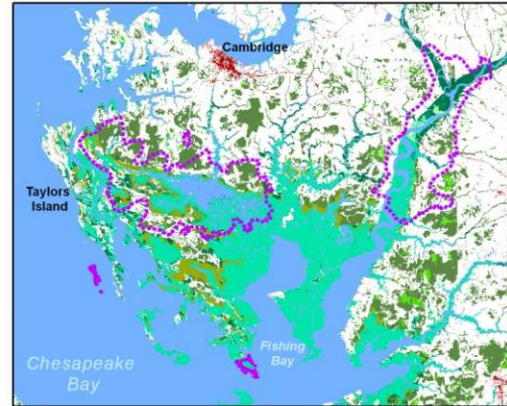
Mountain Pine Beetle Damage, Colorado  
Photo: Allen L. Thornton

# A Problem of Too Little Water...

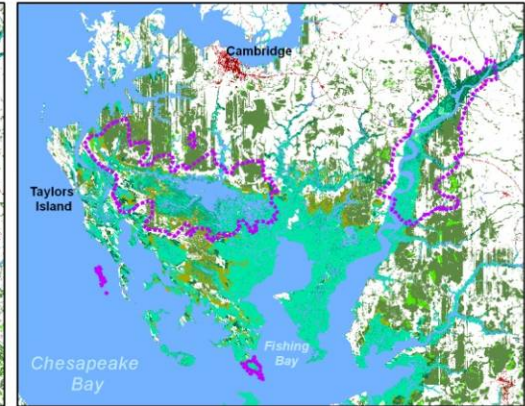
## Decreasing California Snowpack



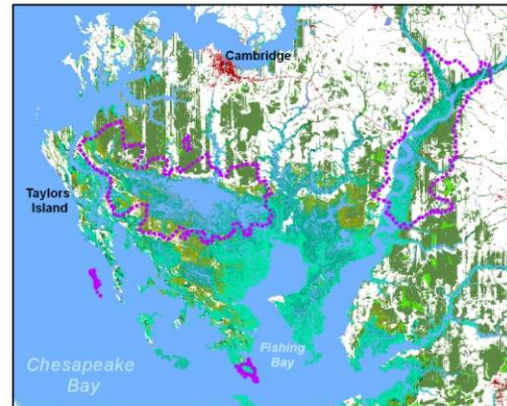
# ... and Too Much Water



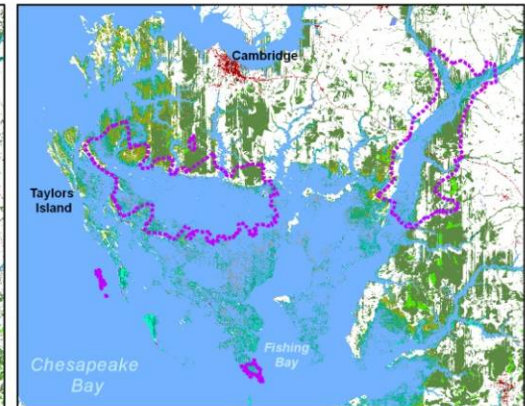
Initial Condition



2025 - A1B Max



2050 - A1B Max



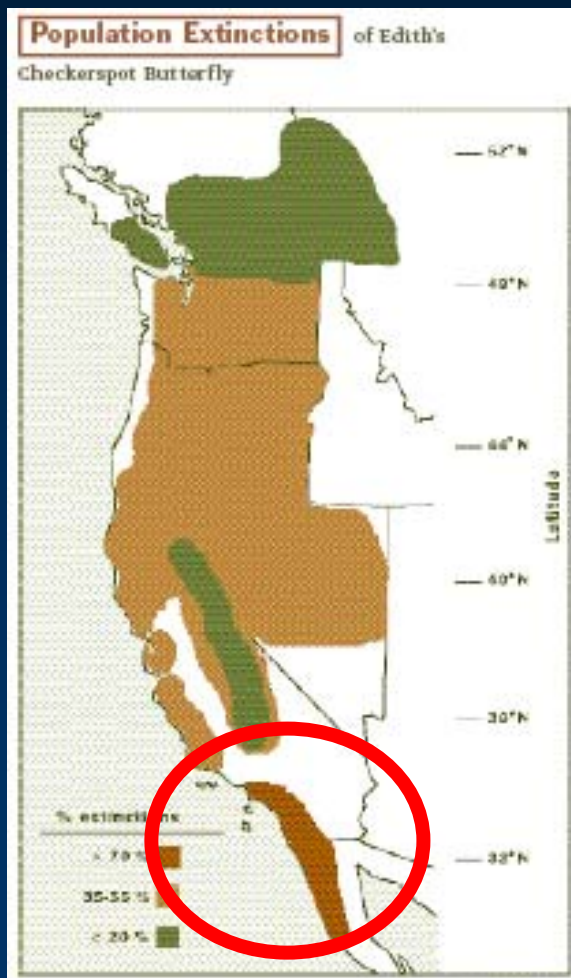
2100 - A1B Max

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



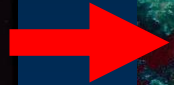
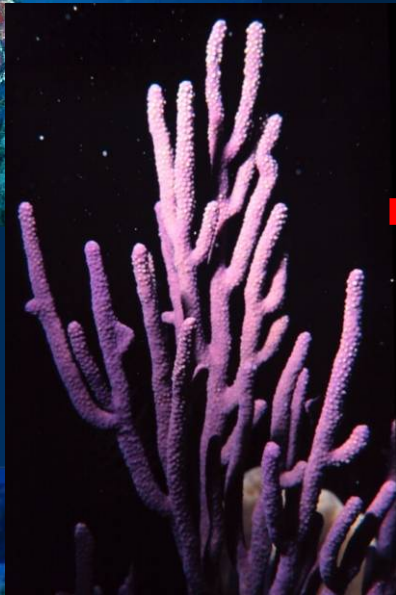
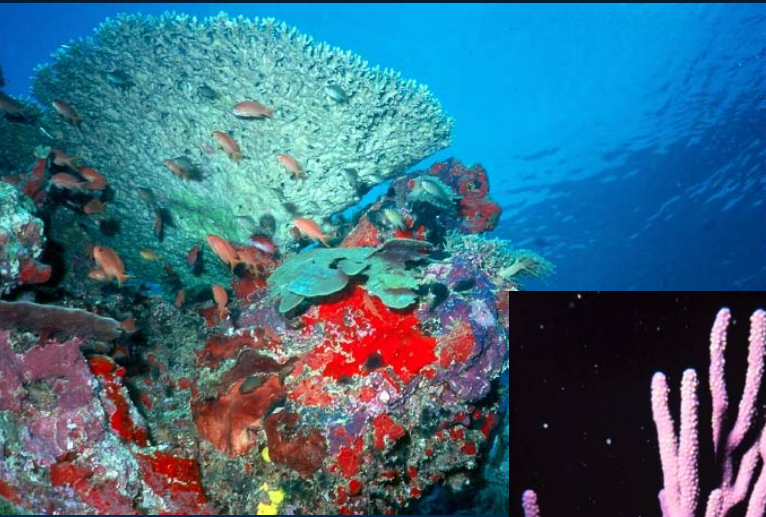


# Some Wildlife Species Can Move to More Favorable Climates

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 in a Warming World?

- **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

- Given the greatly increased number of species at risk of extinction, how to decide 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. Reevaluate priorities 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

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

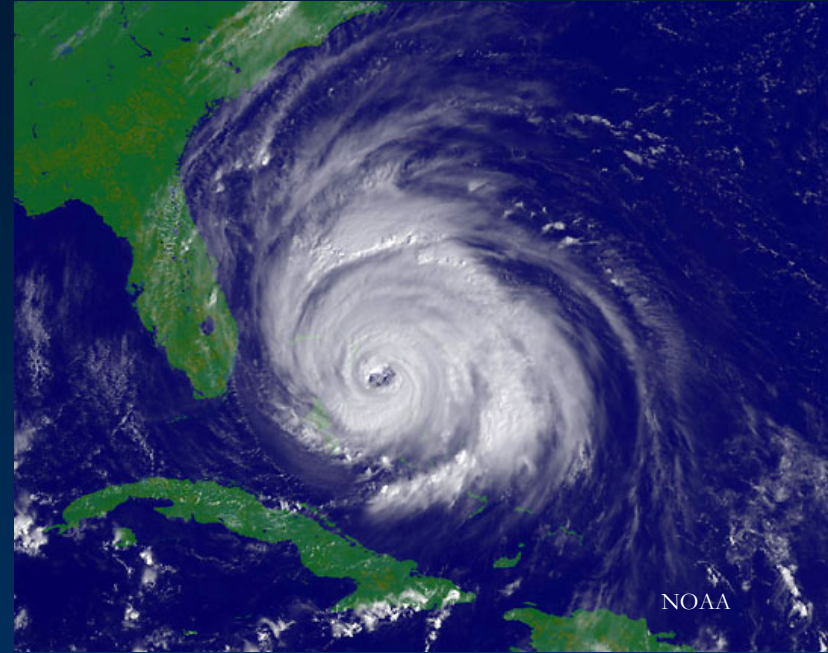
- Recovery Plans (§4(f))
- Conservation Programs (§7(a)(1))
- Land Acquisitions (§5)
- Species Introductions (§10(j))
- Safe Harbor Agreements (50 CFR §§ 17.22 and 17.32)
- Critical Habitat Protection (§4(b))





# 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



# Historic Moment for the U.S. to Renew its Commitment to Wildlife Conservation

- Good news: Americans are interested in clean energy and building a sustainable economy
- Key opportunity to show how wildlife conservation is part of the “green jobs” and sustainability agenda
- National dialogue needed on role of conservation laws in strengthening our economy and quality of life

