Biodiversity on the Brink: the Role of Assisted Migration in Managing South Florida Species Threatened with Rising Seas

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Overview

The best available science predicts climate change will cause significant sea level rise in south Florida and may also increase storm intensity. More than half of the federally listed endangered and threatened species in Florida are threatened by sea level rise. Compounding the threats of climate change and sea level rise in south Florida is continuing population growth. Coastal species face displacement and even extinction due to loss of habitat. They are at risk of being trapped between rising sea levels and human development. This threat is exacerbated by armoring beaches -- unyielding coastal fortifications. This coalescence of factors leads to the phenomenon known as "coastal squeeze" - the loss of transitional habitat between land and the sea.

"Assisted Migration" refers to one policy prescription to address this problem. The federal government has the authority to use active and passive assisted migration under the Endangered Species Act for species threatened with habitat loss due to sea level rise. The federally protected Florida panther, loggerhead sea turtle, Key tree-cactus, and Lower Keys marsh rabbit are from differing taxa, habitat types, and natural histories, but all are threatened by climate change and coastal squeeze. Active and passive assisted migration, coupled with preserve and corridor protection and dramatic reductions in greenhouse gas emissions, are necessary for the conservation of south Florida species threatened with sea level rise.

South Florida Climate Change Impacts

Climate change -- including sea level rise, changes in global temperatures and precipitation, and ocean acidification -- will directly impact species by diminishing habitat, impacting prey quality and availability, and increasing predation, competition, and disease.

- Global mean sea levels are predicted to rise three to six feet by 2100.
- Sea level rise is already affecting south Florida by accelerating erosion and increasing saltwater intrusion to ground and surface water.
- It is producing ideal conditions for salt-loving plants, which move landward and crowd out freshwater plants.
- Based on mid-range climate change scenarios, 38-52% of species will need to shift their ranges to survive climate change, and 15-37% of species will be committed to extinction by 2050.

Compounding the threats of climate change and sea level rise in south Florida is population growth.

- Population density along the coast is three times greater than inland.
- In the Florida Keys, nearly all vacant land will be filled by projected population growth.

With rising seas in a growing population comes additional coastal fortification. These coastal hardening structures can actually increase erosion and prevent species' landward migration, catching species in a "coastal squeeze."

Assisted Migration under the Endangered Species Act

"Assisted migration" refers to the intentional act of moving a species to a location outside of its known historical distribution in order to maintain biological diversity or ecosystem functioning as an adaptation strategy for climate change. The Endangered Species Act provides the U.S. Fish and Wildlife Service with several tools to implement active and passive assisted migration to aid species in surviving climate change. These tools include:

- releasing populations outside their current range (Section 10);
- designating unoccupied critical habitat (Section 4); and
- implementing recommendations of recovery plans (Section 4).

Congress passed the Endangered Species Act in response to growing concern over the extinction of fish, wildlife and plants.

- It establishes "that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act."
- The Act defines "conservation" to mean "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary."

In the context of federal management of the Florida panther, loggerhead sea turtle, Key tree-cactus, and Lower Keys marsh rabbit, these tools may buy these species the time and space they need to adapt.

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