

Toward Wildlife-friendly Climate-resilient Development

A Commercial Science Perspective on Wind-Wildlife Issues for the Climate Investment Funds

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Normandeau Associates, Inc.

- Science-focused Environmental Consulting
 - Staff composed primarily of biologists
 - Ecological risk/impact analysis specialists
 - Leader in wind-wildlife interactions
 - Bird biology group
 - Bat biology group
 - U.S. and Latin American wind project experience
 - Diverse clients in wind power sector
 - Private developers
 - Government
 - International finance institutions

Creating wildlife-friendly, climate-resilient development: challenges and opportunities

“The Climate Investment Funds are a pair of funds to help developing countries pilot low-emissions and climate-resilient development. “

Statement from Climate Investment Funds website

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Wildlife Impacts of Electricity Generation Types: A Comparative Analysis

Objective: Compare six forms of electricity generation with respect to wildlife impacts.

Client:

New York State Energy Research and Development Authority (NYSERDA)

Collaborators:

Pandion Systems (now part of Normandeau Associates)
Environmental Bioindicators Foundation
EcoStat, Inc.

Approach:

Whole life-cycle, qualitative comparisons of wildlife impacts

Relative Risk of Adverse Wildlife Impacts From Six Electricity Generation Types

Electricity Generation Type	Life Cycle Phase					
	Resource Extraction	Fuel Transportation	Construction	Generation	Transmission and Distribution	Decommissioning
Coal	Highest	Low	Low	Highest	Moderate	Low
Oil	High	Highest	Low	High	Moderate	Low
Natural Gas	High	Moderate	Lowest	Moderate	Moderate	Lowest
Nuclear	Highest	Lowest	Lowest	Moderate	Moderate	Lowest
Hydro	None	None	Highest	Moderate	Moderate	High
Wind	None	None	Lowest	Moderate	Moderate	Lowest

Wind is Fundamentally Green

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Recommendation #1: Wind power is the greenest choice for energy development

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Opportunity #2: Create a rational framework for incorporating wildlife protection into wind power development

US law drives US Wind Energy Guidelines

- Migratory Bird Treaty Act
- Endangered Species Act
- Bald and Golden Eagle Protection Act
- No legal framework for weighing benefits of climate change mitigation

Bird Collision Mortality in Context

US annual bird mortality estimates (from NAS 2007 except for cats, vehicles)

Buildings/windows	97-976 million
High-tension lines	130-1000 million
Communication towers	5-50 million
Pesticides	>72 million
Domestic cats	500 million
Vehicles	(hundreds of millions)
Wind turbines	150 thousand *

* Based on 2.96 bird fatalities/year/mW (NAS 2007) x 48,611 mW installed US wind energy capacity through Q1 2012 (AWEA)

Bird Collision Mortality in Context

The biggest threats currently facing bird populations are not direct mortality-causing factors

1. climate change
1. habitat loss/destruction

Arnold TW, Zink RM (2011) Collision Mortality Has No Discernible Effect on Population Trends of North American Birds. PLoS ONE 6(9): e24708

Importance of Habitat Issues



Habitat impacts are the most rational focus

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Recommendation #2: Focus on potential habitat impacts

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Challenge #3: Scientific unknowns make decision-making difficult

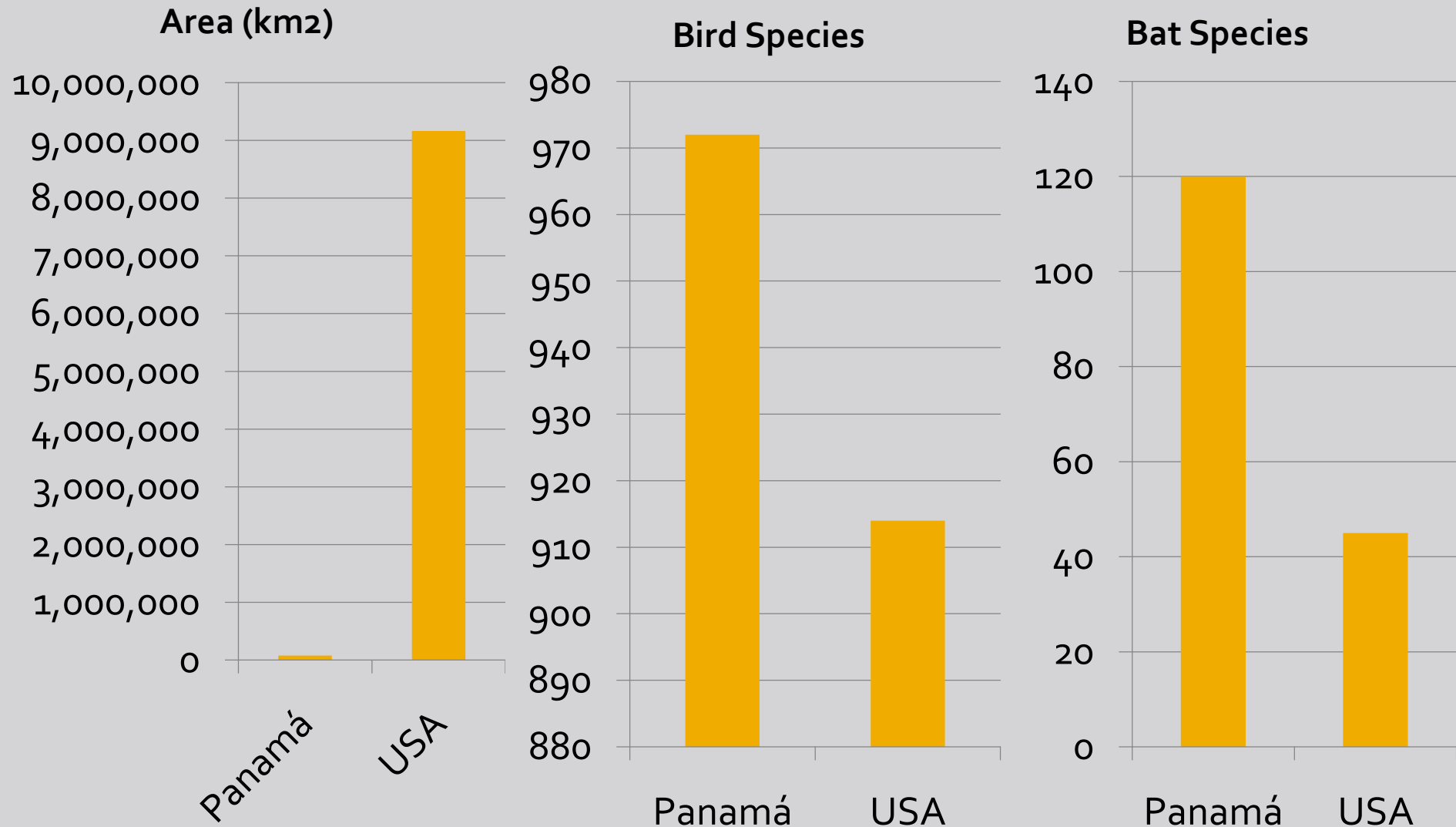
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Opportunity #3: Use pilot projects to gather data, fill knowledge gaps, improve decision-making

High biodiversity in tropical nations



High biodiversity in tropical nations

- Wildlife collision susceptibility
 - Highly species-specific
 - Not easily predicted
 - Not necessarily correlated to abundance
 - Unknown for many tropical bird/bat taxa

Griffon Vulture



White Stork



Scarlet Macaw

Maximize opportunities to learn and improve

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Recommendation #3: Emphasize scientifically rigorous data collection on wildlife impacts, publish results

Summary and Recommendations

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Thanks for your Attention

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