

# MIGRATORY WILDLIFE VULNERABILITY ASSESSMENT

- ◆ Migratory wildlife introduce difficult challenges for VA:
    - Highly extravagant lifestyles
    - Where? Breeding range, wintering range, stopover sites, migration itself, all of above?
    - Synchronicity?
    - Data sparse from parts of range
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# RED KNOT - SUPERMIGRANTS



# RED KNOT MIGRATION AND STOPOVER SITES



# RED KNOT – WHERE ARE THE VULNERABILITIES?

- ◆ Tierra del Fuego?
- ◆ Argentina coast?
- ◆ Brazil?
- ◆ Mid-Atlantic states?
- ◆ Hudson's Bay?
- ◆ High Arctic?
- ◆ Fall or spring?
- ◆ Wind patterns?
- ◆ Synchronicities?

Comprehensive VA  
needed

# Vulnerabilities of Shorebirds to Climate Change

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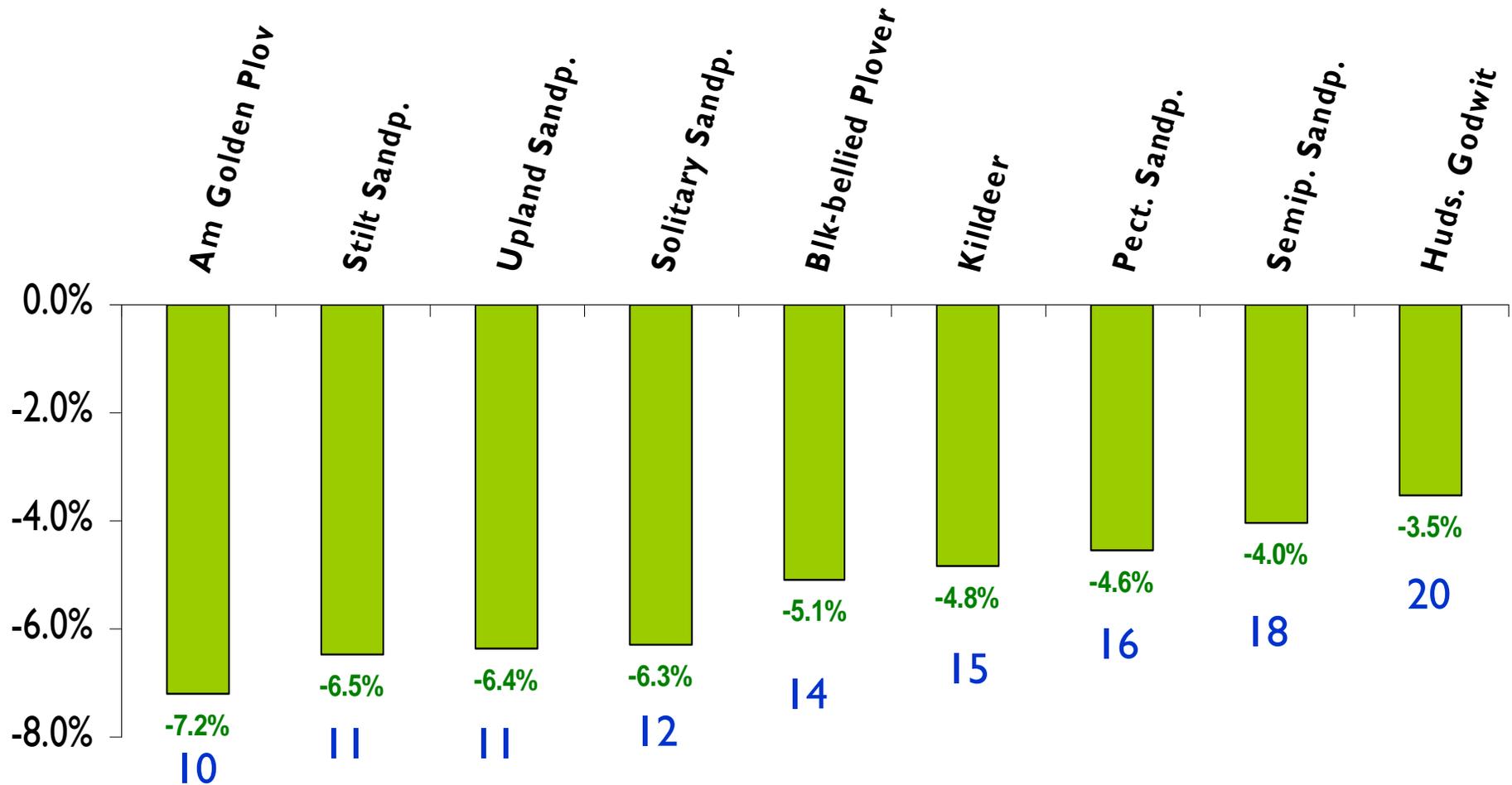
# Objectives

- ◆ Evaluate potential change in extinction risk of North American shorebirds due to climate change
  - directly due to effects of climate change
  - not those due to changed human activities associated with climate change

# Why Shorebirds?

- ◆ Reported widespread declines
- ◆ Proposed to be sentinels of global environmental change – particularly because of their hemispheric ecosystem use during life cycle (Brown et al. 2001; Piersma & Lindström 2004)
- ◆ Migratory aggregations of some species are a spectacular biological phenomenon
- ◆ Iconic species valued by public?

# SHOREBIRDS ARE IN TROUBLE



Based on migration counts in eastern N.America; Bart et al 2007. *J Av. Biol*

## Our Approach

- ◆ Evaluates threats to shorebirds by species
- ◆ Works within the context of the Partners-in-Flight & U.S. Shorebird Conservation Plan risk systems
  - based on population size & trend, breeding & non-breeding distributions, threats to breeding & non-breeding sites



# MAIN QUESTIONS ASKED

- ◆ How much does climate change move the needle on the existing vulnerability categories of USCP/PIF?



# U.S. Shorebird Conservation Plan Risk Categories

- 1) Not at Risk
- 2) Low Concern
- 3) Moderate Concern
- 4) High Concern
- 5) Highly Imperiled
- 6) ~~Holy Smokes!~~  
~~Really, highly~~  
~~imperiled~~—Critical





# Vulnerability Factors

	Score	Arrow
1) Loss/gain in breeding habitat under climate change	3	↑
2) Loss/gain in wintering habitat under climate change	5	↑↑
3) Loss/gain in migration habitat under climate change	3	↑
4) Degree of dependence on ecological synchronicities	5	↑↑
5) Migration distance	4	↑
6) Degree of breeding, wintering, or migration habitat specialization	4	↑↑

# Application

- ◆ Evaluated 49 species of shorebird breeding in North American north of Mexico
- ◆ For each factor, included confidence level
- ◆ Determined shifts in risk category

## Results for 50 North Am. Shorebirds

- ◆ 43 species (86%) predicted to ↑ risk level due to climate change
  - 34 increased by 1 level
  - 9 increased by 2 levels
- ◆ 3 species at lower risk
  - ◆ Solitary sandpiper – more breeding habitat
  - ◆ Bristle-thighed curlew – more breeding & wintering habitat
  - ◆ White-rumped sandpiper – more wintering habitat



# U.S. Shorebird Conservation Plan

<b>Risk Category</b>	<b>Current</b>	<b>Expected with climate change</b>
Not at risk	0	0
Low concern	7	2
Moderate concern	15	7
High concern	23	13
Highly imperiled	4	17
Critical	–	10

## Species in New 'Critical' Category

- ◆ Snowy Plover
- ◆ Wilson's Plover
- ◆ Piping Plover
- ◆ Mountain Plover
- ◆ Am. Oystercatcher
- ◆ Long-billed curlew
- ◆ Bar-tailed godwit
- ◆ Ruddy turnstone
- ◆ Sanderling
- ◆ Short-billed dowitcher



# TAKE HOME MESSAGES

- ◆ For complex spp. We need complex, comprehensive VA
  - ◆ They are doable
  - ◆ Build off of existing structures if possible (PIF, NAWP, etc.)
  - ◆ Must be resilient to lack of data
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- A decorative graphic at the bottom of the slide showing a silhouette of a mountain range in shades of teal and blue.