Can we measure public values for protecting ecosystem services?

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Overview

- Introduction and Motivation

- Study Design

- Study Results

- Discussion and Path Forward

Introduction

- Public values for ecosystem services are what people are *willing to pay, give up* or *trade-off* to obtain nature's benefits

- Under the EPA's Final Ecosystem Goods and Services classification system (FEGS-CS), people are grouped into categories of beneficiaries:

  - **Users** - people who directly use, enjoy or consume ecosystem goods and services, and

  - **Nonusers** - people who may care about the existence of ecosystem goods and services but do not directly use them

Monetary Value of Ecosystem Services to Users

- Monetary value of users is revealed through:

  - People's actions in direct markets (i.e. changes in quantity demanded/supplied of ecosystem goods and services)

  - People's observed behavior where markets do not exist (i.e. willingness to pay to take trips to go fishing, hunting, etc.)

- Techniques used to estimate value are widely accepted

  - Travel cost method, hedonic pricing method, avoided cost, etc.

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Monetary Value of Ecosystem Services to Nonusers

- Monetary value of nonusers is "stated" through:

    - People's responses to hypothetical scenarios in surveys (i.e. contingent valuation method (CVM), choice experiments (CE))

- Techniques used to estimate value subject to controversy due to:

    - Hypothetical bias

    - The general public's lack of knowledge and/or defined preferences for ecosystem services

    - Difficulty in determining whether people are valuing specific good/service as described

Motivation for Study

- Set out to estimate public value (largely nonuse) for protecting migratory shorebird habitat using internet-based contingent valuation (CV) survey

- Pre-test findings revealed large percentage of respondents indicated positive willingness to pay (i.e. voted "yes" to program) at highest dollar amounts ($300, $500, and $1,000)

- Sought to pin down the yes responses (i.e. demand function) to zero or near zero by offering extremely high dollar amounts

Study Design

Breeding Grounds: June-August

Delaware Bay

Stopover: May-June

Total Distance: 9,200 miles

Atlantic Red Knot

Non-breeding Grounds: Oct-Feb
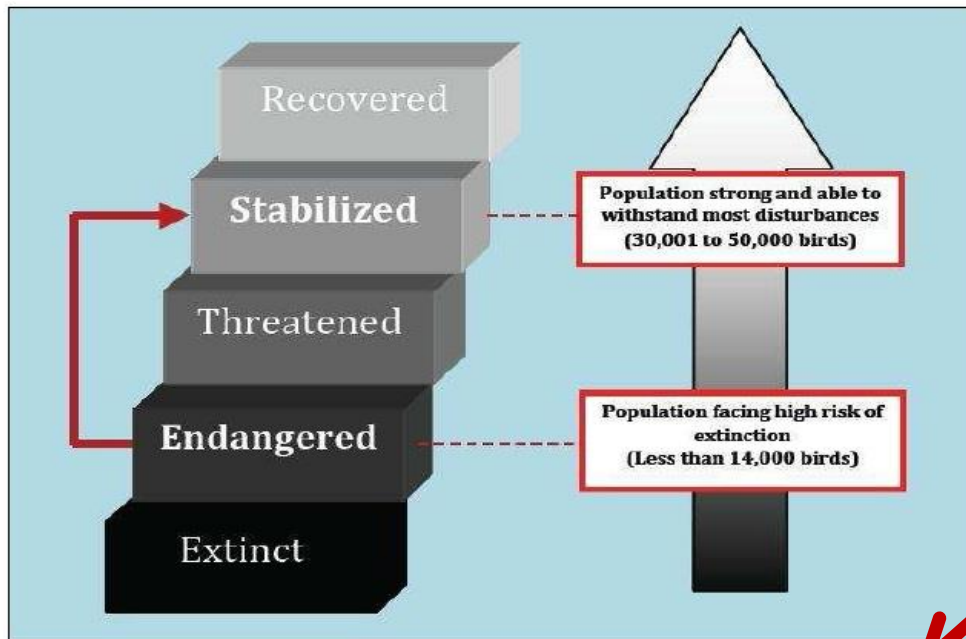
Lagoa de Peixe

San Antonio Oeste

Tierra del Fuego

- Internet based survey of residents in New Jersey and Delaware (sample size n=1,382)

- Respondents asked to vote for or against program that preserves habitat to protect Red Knot

- Follows standard guidelines for conducting state-of the-art CV survey:

  - Referendum format,
  - Yes/no follow-ups,
  - Checks on understanding and acceptance,
  - Reminders of substitute commodities and budget constraints,
  - Accurate description of the program or policy, and
  - Consequential survey design

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Your Vote

Now, suppose the *Red Knot Protection Agreement* was on the ballot and that the actions in the *Agreement* were expected to improve the projected status of the **Atlantic Red Knot** in 10 years from endangered to stabilized as shown below.

Expected Improvement in the Status of the Atlantic Red Knot in 10 Years

Recovered

Stabilized ----- Population strong and able to withstand most disturbances (30,001 to 50,000 birds)

Threatened

Endangered ----- Population facing high risk of extinction (Less than 14,000 birds)

Extinct

3. If the total cost to your household to finance the *Agreement* was a one-time payment of $5000, how would you vote if the *Agreement* were on the ballot in the next election?

Please consider your income, expenses and other possible uses of this money before you vote. Also, please remember that the results of this survey will be provided to policy makers.

○ I would vote for the Agreement

○ I would vote against the Agreement

Next

Dollar Range:
$25
$50
$100
$150
$200
$300
$500
$1,000
$2,000
$3,000
$5,000
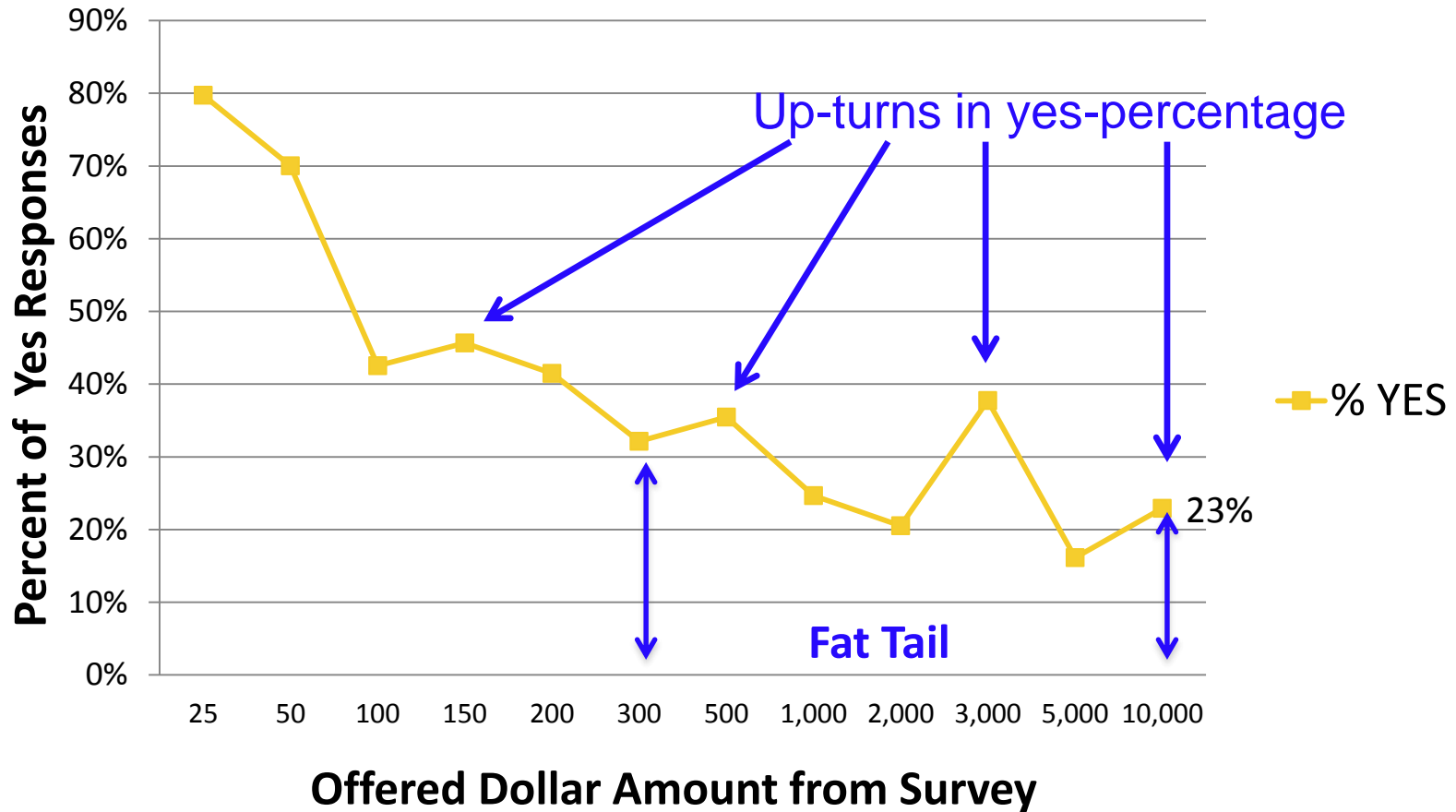$10,000

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Our Expectations

- Percent of yes-responses declines as offered dollar amount rises

- Percent of yes-responses goes to zero or near zero

- Range of offered dollar amounts should not affect final valuation

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Yes Responses by Bid Amount

What Really Happened

- Percent of yes-responses declines as offered dollar amount rises
  - Accept

- Percent of yes-responses goes to zero or near-zero
  - Reject

- Range of offered dollar amounts should not affect final valuation
  - ??

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Mean Willingness to Pay Values

High End Bid Amounts	% of Yes Responses*	Sample Size	Mean WTP
$200	41%	80	$102
$300	32%	90	$134
$500	35%	148	$204
$1,000	25%	132	$327
$2,000	21%	148	$533
$3,000	38%	144	$897
$5,000	16%	143	$1,220
$10,000	23%	136	$2,254

*Significantly different from zero at 99% level of confidence

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What Really Happened

- Percent of yes-responses declines as offered dollar amount rises
  - Accept

- Percent of yes-responses goes to zero
  - Reject

- Range of offered dollar amounts should not affect final valuation
  - Reject

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Discussion

- Manifestation of hypothetical bias
  - Yea-saying, anchoring, warm-glow, not treating survey as real, etc.

- Difficult to defend
  - Absolute values, sensitivity to bid range, and susceptible to manipulation

- Questions reliability of monetary values for ecosystem services from nonusers
  - Motivations behind nonuse values may be incompatible with economic valuation (emotive instead of tradeoff values)

Path Forward

- Encourage more exploration into causes and consequences of hypothetical bias in SP data
  - There is no universal agreement on it's cause, nor is there a consensus on how to correct for it

- Consider the use of methods/tools that determine public value for ecosystem services without requiring monetary trade-offs
  - Stakeholder elicitation, ranking and weighting of environmental attributes, habitat equivalency analysis, etc.

- Adopt a generally accepted framework for determining when nonuse values for ecosystem goods and services are likely to be applicable
  - Irreversible changes to unique resources, lack of available substitutes, etc.

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Questions?