

Public Values for Marine Protected Areas: An application in the Northeastern U.S.

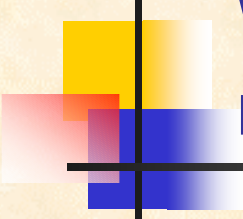


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MPA Objectives

- Fisheries specific
- Non-fisheries specific
 - Conservation of biodiversity or habitat diversity
 - Ecosystem service enhancements
 - Tourism & recreation
 - Future generations
- Economic tools exist to examine benefits/costs resulting from MPAs



What do we know about the economic value of non-fisheries MPAs?

- Use values
 - Tourism/recreation
 - Coral reefs
 - Biodiversity as it relates to use
- Non-use values
 - ??



What do we still need to know?

- What do people care about in relation to MPAs?
 - Do values change in relation to MPA size?
- What are the trade-offs?



Outline

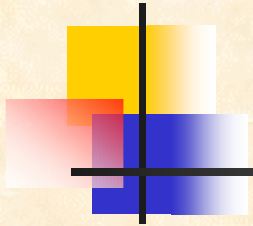
- Methodology
- Questionnaire results
 - Public opinion
 - Preference measurement (Random Utility Models)
- Application of model to current proposals in Northeast
- Next steps



Method

Stated Preference Choice Experiment

- Web-based survey using Knowledge Networks
- **Demographics known for panel
- **Freedom in survey design



Study Details

- Sample drawn from Northeast Region
 - Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Washington D.C., Pennsylvania, Virginia, West Virginia, North Carolina
- Modified Dillman method



What is the 'good'?

Background Info on MPAs

- U.S. Commission on Ocean Policy
 - Stress the importance of ocean-based industries to economies
 - Negative externalities
 - MPA as a potential, partial solution
- Benefits and Costs
- What's the ultimate task?



Benefits

The primary benefits of the Marine Protected Area network are:

- Preservation of the variety of marine life in the Northeast Region (fish, shellfish, plants) in their natural habitats on the bottom of the ocean - regardless of their commercial or recreational importance.
- Preventing future industrial uses within the MPA network boundaries.

There might also be incidental benefits associated with the MPA network, but these are uncertain. Incidental benefits might include increased catches by fisheries outside of the boundaries of the MPA network, a temporary sanctuary for animals that migrate into and out of the region (such as herring and tuna), and possible medical or pharmaceutical discoveries from species that were preserved.

Continue

- Preserve variety of marine life and habitat on sea floor
- Prevent future industrial uses
- Incidental benefits



Costs

Costs

There are also costs associated with Marine Protected Areas.
The primary costs are:

- Higher production costs for industries that are affected by MPAs.
- Higher costs to producers could mean higher prices for consumers.
- Increased regulation of recreationists, scientists, and businesses who are allowed to use the MPAs.
- Financial expenses associated with MPA management, administration, and negotiation with stakeholders, possibly leasing sites from the government, monitoring, and enforcement.

Continue

- Private costs
- Social Costs



Attributes

Size

- Use literature to provide some reference points
- National Academy of Sciences
 - 10 – 30% of a regional ecosystem to protect all species in natural habitat
 - Smaller reserves provide protection



Attributes

Use

- Four allowable use levels
 - No-take
 - Scientific research
 - Tourism and recreation
 - Limited commercial fishing



Attributes

Cost

- Personal cost to respondent
- Reminder of social cost(s)



Experimental Design

- Size (5, 10, 20, 30, 40)
- Use (no take, scientific research, tourism & recreation, limited commercial fishing)
- Cost (10, 25, 50, 100)

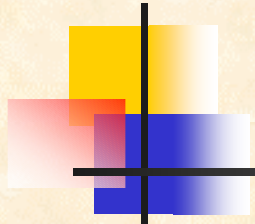
Section 5. What's the Current Situation in the Northeast Region?

The MPA network discussed so far in this survey would be designed to provide lasting protection for ecological diversity on the sea floor. Currently, there are no Marine Protected Areas in the Northeast Region that are designed specifically for this purpose.

Currently there is one official MPA in the Northeast Region - the Stellwagen Bank National Marine Sanctuary near Massachusetts, which covers less than one percent of the federal waters. In addition, other marine managed areas have been set up by federal fishery managers to help rebuild fish stocks and to protect marine mammals from fishing gear. These areas:

- Allow types of fishing that can damage seafloor habitats and catch all types of fish on the sea floor, including fish that will be discarded
- Are designed to protect only a select few number of species of marine life or their habitat
- Can be canceled at any time once the fishery objectives are met (protections is not necessarily lasting)
- Prohibit most industrial activities, such as oil exploration, waste disposal, and sand and gravel mining

Current Situation



Results

- 1,342 panelists sampled, 77% response rate
- Average age: 47
- Median income category: 40 – 49K
- Median education category: some college, no degree



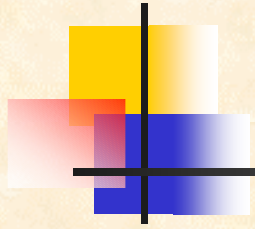
Public Opinion

	Agree/ Strongly Agree	Disagree/ Strongly Disagree	Unsure
MPAs are not needed in the NE region b/c marine life and the ocean are in good shape	28 %	63 %	9 %
I like knowing that part of the ocean in the NE is protected even if I never use it	92 %	5 %	3 %
I would be willing to pay higher prices for items such as seafood and energy to preserve areas of the ocean in the NE region	71 %	22 %	7 %



Public Opinion

	Agree/ Strongly Agree	Disagree/ Strongly Disagree	Unsure
MPAs should be large enough to protect all types of plants and animals regardless of the costs	58 %	34 %	8 %
The areas now used by fishery managers probably provide enough protection for marine life in the NE region	46 %	40 %	14 %



Familiar Good?

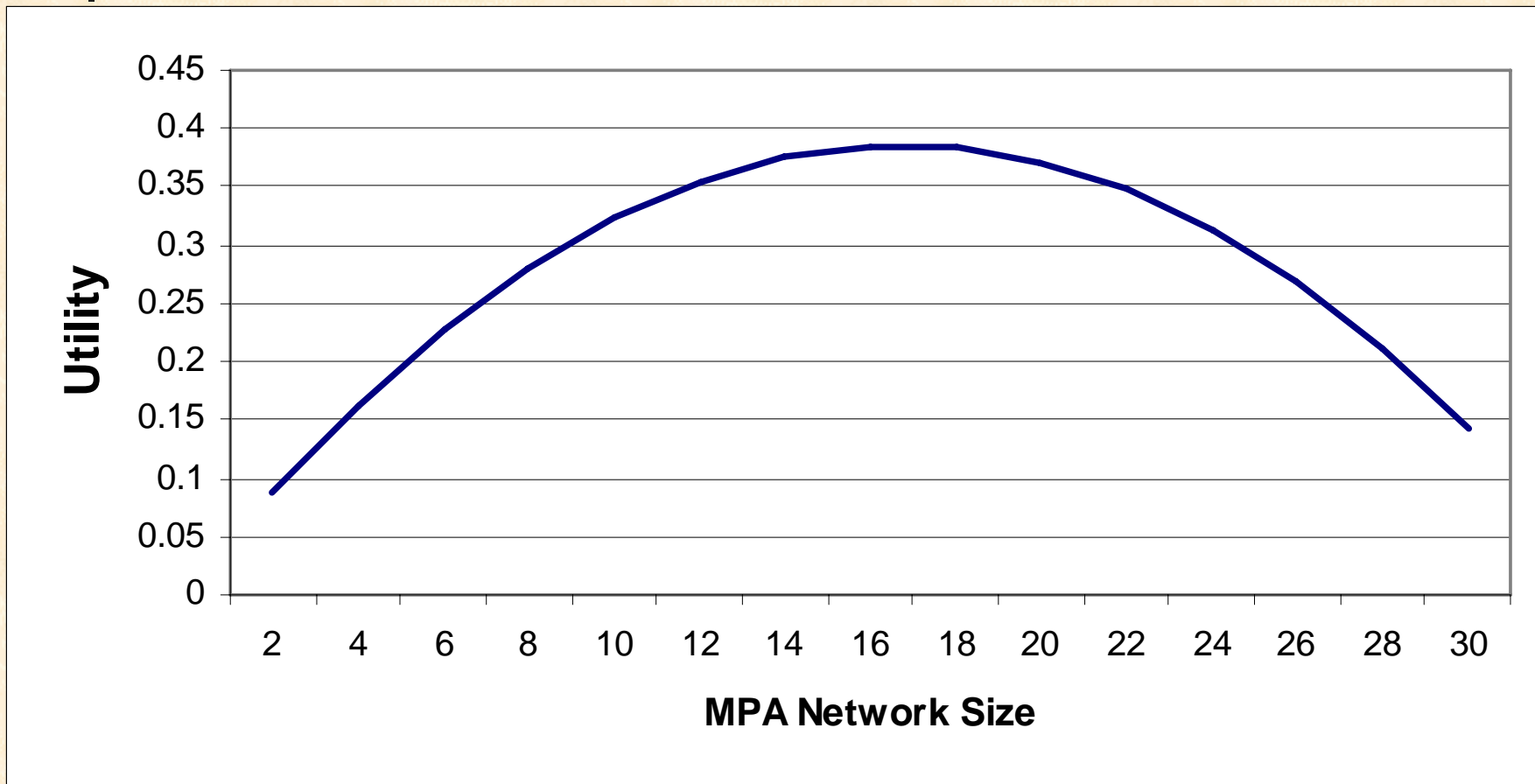
	Very Familiar	Somewhat Familiar	Not Very Familiar
How familiar were you with MPAs before taking this survey?	1 %	18 %	81 %
How familiar are you with MPAs after taking this survey?	13 %	76 %	11 %



Random Utility Model

Attribute	β	t
Size	0.0461	5.61
Size²	-0.0014	-9.50
Use Level	-0.1033	-4.39
Use x Size	0.0097	8.35
Cost	-0.0091	-9.55
Income x Cost	0.0003	3.64
F1	-0.0327	-22.01
F2	0.0149	11.07
F3	-0.1164	-10.07

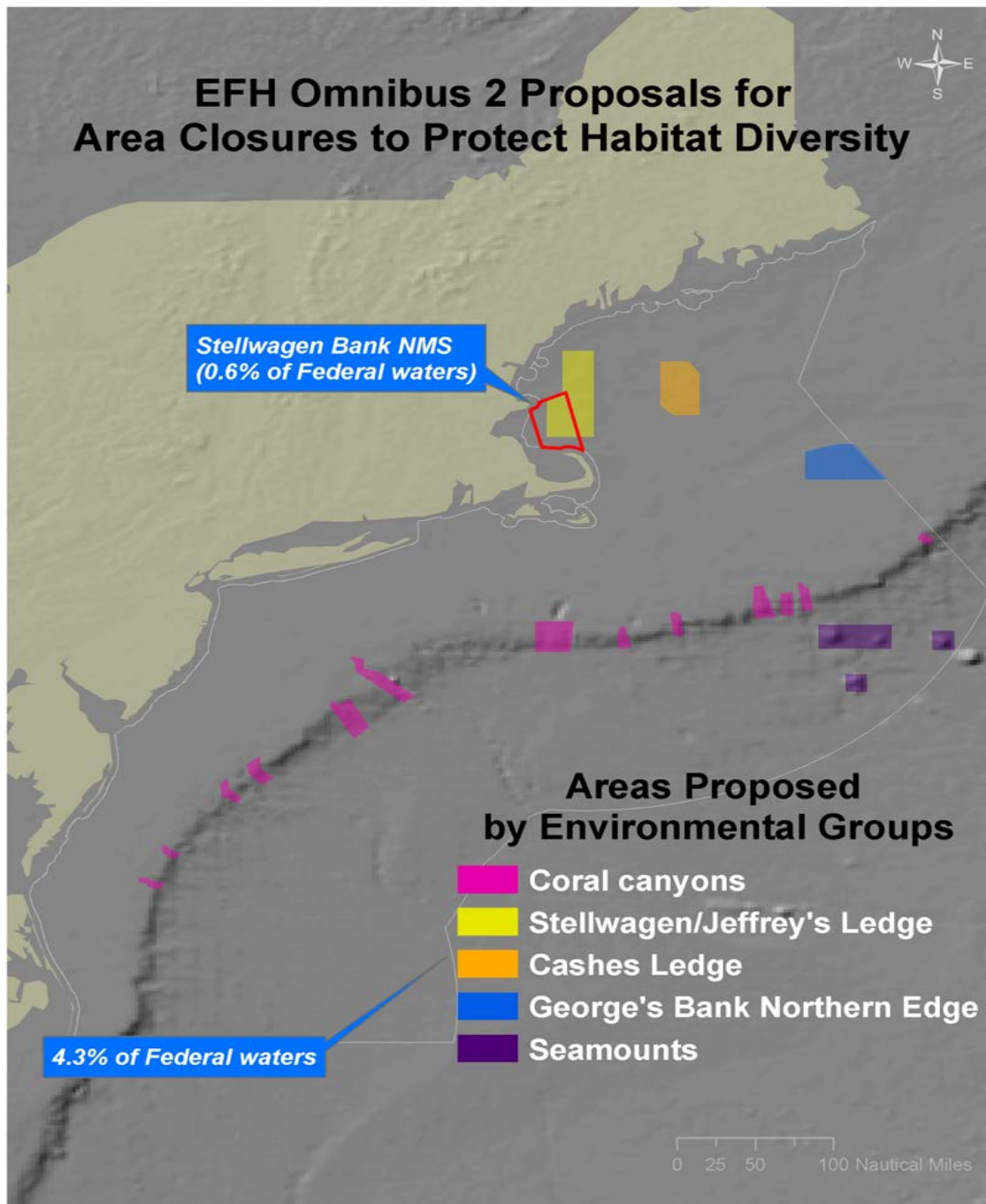
Non-linear preferences for network size





NEFMC RFP

- Call for candidate proposals to identify habitat areas of particular concern
- Criteria for eligibility
 - Importance of historic/current ecological function
 - Sensitivity to anthropogenic stresses
 - Extent of current or future development stresses
 - Rare habitat



Size (% of EEZ)

- Coral Canyons (1.4)
- Jeffrey's Ledge (.95)
- Cashes Ledge (.57)
- GB Northern Edge (.63)
- Seamounts (.71)



Welfare Effects

- All HAPCs proposed; All areas are no-take
- All HAPCs proposed; All areas allow scientific research
- All HAPCs proposed; All areas allow limited fishing
- Coral canyon HAPCs; All areas are no-take



Welfare Effects

- All areas, all no-take
 - \$62 per respondent per year
 - 31,936,499 households in region
- ~ \$2 billion
- All areas, scientific research allowed
 - \$56 per respondent per year
 - 31,936,499 households
- ~\$1.7 billion



Welfare Effects

- All areas, limited commercial fishing allowed
 - \$42 per respondent per year
 - 31,936,499 households
- ~ \$1.3 billion
- Coral canyons, all no-take
 - \$47 per respondent per year
 - 31,936,499 households
- ~\$1.5 billion



When is it too big to be no-take?

- Size = 8

- Use

- No-take \$78
- Limited fishing \$70

- Size = 9

- Use

- No-take \$82
- Limited fishing \$76



When is it too big to be no-take?

- Size = 10

- Use

- No-take \$85
- Limited fishing \$83

- Size = 11

- Use

- No-take \$88
- Limited fishing \$89



General Conclusions

- The public in the northeast region wants (prefers, has value for) an MPA network
 - They want more area in an MPA than is currently protected
 - They don't want too much
 - They don't want big, no-take areas



Next Steps

- Random Parameters model
- Latent Class model