Decisions in Climate Adaptation
South Atlantic Landscape Conservation Cooperative

Landscape Conservation for Natural and Cultural Resources
Scaling up to the Landscape

- Landscape Conservation Cooperatives are mapping conservation priorities for natural and cultural resources.
Southeast Region
Climate Change
Predicted Warming = Predicted Sea Level Rise
DAILY NEWS

$40 BILLION NATIONAL PARK ASSETS AT RISK FROM SEA LEVEL RISE
$35 BILLION SOUTHEAST REGION ASSETS AT RISK FROM SEA LEVEL RISE...

...not including the value of land predicted to flood.
Fort Sumter
Loggerhead Key
Make decisions

- Bureaucracy
- Blame
- People involved
- People don't like risky investments
- Look for a new job
- How do we engage if we don't know our priorities?
- Communication: How this decision is described
- Partners
- Different issues
- Each place unique
- Preservation and protection for future
- Stakeholders
- Visitors, employees, partners
- Sense of place
- What makes sense?
- Indigenous knowledge
- Local, national, global
Make decisions

- Bureaucracy
- People involved
- If people like it, risky investments
- Blame
- How do we engage if we don't know our priorities?
- Sense of place
- Local identity
- Communication: How the decision is described
- Preserve, protect for future
- What makes sense?
- What are we trying to preserve?
- Stakeholders
- Different issues
- Community
- Each place unique
Make decisions

- Bureaucracy
- People involved
- Blame
- Look for a new job
- How do we engage if we don't know our priorities?

- Priorities
- Budget choices
- Each place unique

- Different issues
- Stakeholders
- Community

- What are we trying to preserve?
- Preserve & protect for future identity

- Communication: How the decision is described
- Sense of place
- What makes sense?
Make decisions

- each place unique
- different issues
- stakeholders
- community
- what are we trying to preserve?

Bureaucracy

- people involved
- budget
- choices
- priorities
- risk
- precedent

Partners

- preserve and protect for future
- identity

Communication: how the decision is described

- sense of place
- meaning
- what makes sense?

Look for a new job

- don't like risks
- invested
- blame

How do we engage if we don't know our priorities?
Make decisions

- Bureaucracy
- People involved
- People don’t like risks, investments
- Blame
- Partners
- How do we engage if we don’t know our priorities?
- Sense of place
- What makes sense?
- Preserve and protect for future
- Local identity

- Corporate
- Visitors, experts, partners
- Different issues
- Community
- Each place unique
- Stakeholders
- What are we trying to preserve?
Make decisions

- Bureaucracy
- People involved
- Blame
- Partners
- Budget
- Priorities
- Different issues
- Stakeholders
- Each place unique
- What are we trying to preserve?
- Preserve and protect for future
- Local identity
- Relationships
- Sense of place
- Maladaptation
- What makes sense?
- Investing in this strategy
- Look for a new job
- How do we engage if we don’t know our priorities?
Make decisions

- each place unique
- what are we trying to preserve?
- preserve and protect for future
- identity
- local
- national
- diverse cultural heritage
- community
- different issues
- priorities
- risk
- budget
- choices

- partners
- communication
  - how the decision is described
  - sense of place
  - what makes sense?

- how do we engage if we don't know our priorities?

- look for a new job
- people involved
- people don't like risks, investments
- blame

- bureaucracy

- precedent
Make decisions

- Bureaucracy
- People involved
- Blame
- Look for new job
- How do we engage if we don't know our priorities?
- Communication on how the decision is described
- Communication on what makes sense?
- Sense of place
- Partners
- Preserve and protect for future
- What are we trying to preserve?
- Visitors, experts, partners
- Stakeholders
- Each place unique
- Community
- Different issues
- Budget, choices
- People like risky investments
Make decisions

- Bureaucracy
- People involved
- People like risks, investments
- How do we engage if we don't know our priorities?
- Look for a new job
- Blame
- Partners
- Communication: how the decision is described
- Sense of place
- What makes sense?
- Stakeholders
- Different issues
- Community
- What are we trying to preserve?
- Preserve, protect for future
- Local, national, global
- Visitors, experts, partners
- Make decisions
- Bureaucracy
- People involved
- People don't like risks, invests
- How do we engage if we don't know our priorities?
- Look for new job
- Communication: How the decision is described
- Sense of place
- Naive depiction
- What makes sense?
- Stakeholders
- Visitors, experts, partners
- What are we trying to preserve?
- Preserve and protect for future
- Identity
- Local vs. national
Make decisions

- precede
- risk
- priorities
- different issues
- each place unique
- what are we trying to preserve?
- preserve & protect for future
- identity
- local
- national
- global
- partners
- communication
- how the decision is described
- sense of place
- what makes sense?
- engage if we don't know our priorities?
- how do we look for a new job
- blame
- Bureaucracy
- people involved
- # people involved
- don't like risky investments
- some don't want to invest
- stakeholders
significance  use or purpose  vulnerability
priority
Case Study
Cape Lookout National Seashore
Pilot Study

• Pilot study for cultural resource planning for two historic villages, Portsmouth Village and Lookout Village at Cape Lookout National Seashore.
Study Framework

• Envision plausible conditions related to sea level rise and storm surge within the next 20 to 30 years.
• Develop feasible management strategies for the historic structures and features within the two villages.
• A stakeholder workshop will be held to identify the values, objectives, and appropriate endpoints for management actions.
• The values will be measured and used to construct a Cultural Resources Vulnerability Index (CRVI)
• The CRVI will be used to explore landscape-level cultural resource decision-making.
Why?

• Cultural resources are vulnerable to climate change, particularly in coastal areas.
• The role of place-based values needs to be explored in relation to climate change vulnerability models.
• Research is needed to examine how cultural resource values and climate change projections are utilized in decision-making processes to prioritize cultural resource conservation actions.
• Therefore, this study takes an initial step to explore the vulnerability of a specific type of cultural resource: coastal historic villages along the eastern seaboard of the United States.
The Problem

• 20 Structures on the National Register of Historic Places
• None are considered “Foundational” to the Park
• None mentioned in the Park’s enabling legislation
• Landscapes are flooding and ecosystems are changing.
• Structures are static.
• Storm Surge is an ever-present threat.
• Intervals between flooding are shortening.
Budget

• $14 million of deferred maintenance in the Park
• $100,000 / year is appropriated for maintenance
• Approximately $5,000 / building
1 Lewis-Davis House (Carrie Arendell Davis)

2 Gaskill-Guthrie House
7 Fishing Cottage #1

8 Fishing Cottage #2
Decision Science
Structured Decision Making

- Problem bounding and formulation
- Objectives
- Alternatives
- Consequences (outcomes)
- Tradeoffs (optimization)
Problem framing

• Formed a core team to determine
  – What is the nature of the decision(s)?
    • scale and complexity?
    • a single activity or prioritization/allocation?
  – Who is (are) the decision maker(s)
  – What are the legal context and constraints?
Objectives

• Identified a group of stakeholders, held a workshop with them to define the objectives
  – Objectives represent an explicit statement of value
  – Distinguish fundamental (where do I want to go?) from means objectives (how do I get there?)
  – The objectives drive everything else in a decision analysis
    • specification of alternatives
    • prediction of outcomes
    • valuation and selection of alternatives
Alternatives

• The Core group is populating the table and identifying the columns and what measures represent each.

  – Ask, how can the objectives be achieved?
    • Use the fundamental objectives to generate alternatives to consider
Measuring Objectives

Priority

Significance

Historic Significance
- Local
- State
- National

Association to district
- One Role
- Two Roles
- > Two Roles
- Many others
- A few others
- Only one

Vulnerability

Uniqueness

Exposure

Sensitivity
Measuring Objectives to Prioritize

<table>
<thead>
<tr>
<th>Structure</th>
<th>Significance</th>
<th>Use</th>
<th>Vulnerability</th>
<th>Total</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bldg 1</td>
<td>1</td>
<td>2</td>
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<td>Bldg 2</td>
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Consequences

• Use of the table as a model to predict consequences attendant to the alternatives, in terms of the objective.
  – What rises to the top if we sort based on significance? Vulnerability? Use?
  – Are there certain structures that rank highly under a variety of scenarios?
Trade-offs and optimization

• Trade-offs exist when no single alternative is expected to perform the best on all objectives

• Choosing the best action (optimization) involves deciding the relative importance of the multiple objectives

• Balancing trade-offs can be more difficult than identifying the objectives themselves
Make decisions

- Bureaucracy
- How do we engage if we don't know our priorities?
- People involved
- Budget
- Blame
- Partners
- Communication: How the decision is described
- Sense of place
- Maladaptive thinking
- What makes sense?
- Testing, trying, iterating
- Visitors, experts, partners
- What are we trying to preserve?
- Preserve & protect for future
- Local identity
- Each place unique
- Different issues
- Community
- Stakeholders
- Paved
t
- Risk
- Priorities
- People involved
- Money, invested
- Don't like risks
- Look for a new job
# Measuring Objectives to Prioritize

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