Monitoring and Managing Recreational Impact on Maine's Public Islands

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NOTES: The notes below correlate to Power Point slides. **Comments in Bold** are part of the slides, each of which also included pictures and/or maps.

Slide 1:
Title Page

Slide 2:
Maine's Coastal Islands
Let's give you a bit of background about the Maine Islands, one of the United States'premier coastal recreation areas:
3000 to 4500 coastal islands with diverse management and ownership: The state of Maine (Bureau of Parks and Lands within Department of Conservation) owns many islands, some of which are open to public recreation through the Maine Island Trail Association. Other owners include private individuals, families, family trusts, land trusts, non-profit conservation organizations, the Federal government, other state agencies etc…
Recreational use of the islands is a popular activity for locals and visitors alike: Island use has increased dramatically over the last ten to 15 years, including a 50 percent increase in use of the public islands during a five year period late 90's to early 2000's.
How are island users impacting the islands? That is the question. No matter how well-educated island users are in techniques to "Leave No Trace" (which is an important educational message coming from many island owners and recreational guides), it is hard to avoid some level of impact on small fragile ecosystems. As the numbers of island users has risen, it has become important to quantify that impact to help managers plan for the island's future.

Slide 3:
Maine Island Trail Association (MITA)
MITA's goal is to establish a model of thoughtful use and volunteer stewardship for the Maine islands that will assure their conservation in a natural state while providing an exceptional recreational asset that is maintained and cared for by the people who use it.
MITA (I am on the board of Trustees and have worked closely with this organization for over a decade) is a unique non-profit organization in that it is a true public-private partnership. MITA manages over 100 island and coastal sites up and down the Maine coast, most of them islands.

Approximately half of the islands are private where property owners have granted MITA members the right to use their islands in exchange for careful island stewardship. The remaining islands are public (within the Bureau of Parks and Lands) and the use capacity of these public islands has been determined with the help of managers, ecologists, island owners, users and other island stakeholders including the kayak outfitting and schooner tour industries. MITA, the non-profit organization, is essentially considered the management arm for the Bureau on the public islands.

Slide 4:

The Recreation Management Plan for the Public Islands on the Maine Island Trail (2004-2014) This plan was created through an extensive stakeholder process and one of the numerous recommendation was the creation of a Monitoring Task Force (the below text comes directly from the plan)

Environmental and Social Monitoring (p. 35)

Program Priorities:

Set up a Monitoring Task Force to develop a long term monitoring plan for the public islands.

- **Identify the social and environmental indicators for visitor experience and use area conditions;**
- **define standards for the level of acceptable change;**
- **determine field research methods to monitor conditions and experiences against established standards;**
- **Enhance existing monitoring programs and data collection techniques to align with new monitoring goals.**

Slide 5:

The Island Monitoring Task Force

***Goal:* To develop recreational use management information and techniques that island owners, managers and volunteers can use to achieve resource and recreation management objectives.**

The Task Force was created in January of 2004 with multiple agencies and non-profits developing methods to reach the above goals. The Maine Sea Grant College Program, as an unbiased and science-based education and research program through the University of Maine, became the Task Force's coordinator.

Slide 6:

Is change due to:

- **Natural causes?**
- **Recreation impact?**
- **Management decisions?**

Ex: What is the cause of blue/green algae scar in IZ?

This image shows a scar in the blue/green algae, the species of algae that dominates the upper level of the intertidal zone on the coast of Maine.

Change is part of the ecological process in any natural system. The challenging question for the Island Monitoring Task Force is to determine the cause of change. The scar, where the

blue/green algae is clearly absent, could certainly have been the result of a natural event such as ice scrapping in the winter. But is it also possible that the scar is a recreational impact from campers who – as trained by current minimum impact educational messages -- dutifully poured their boiling pasta water below the high tide line rather than in the fragile upland vegetation? In that case, did the boiling water cause this scar in the blue/green algae? Taking that line of thinking one step further, could this scar be the result of a management decision that focused on training island users to travel and camp on durable surfaces, such as rocks, and to direct all camp-kitchen activities below the high tide line?

Identifying the cause of change is a constant process in this project.

Slide 7:

Correlating numbers and behavior with impacts

In light of the popularity of the Maine islands as an adventure tourism destination, this project is seeking to determine how tourist behavior affects the local island ecosystem.

Slide 8:

Informing management decisions:

How does data on recreational impacts compare to established standards?

Managers of any recreational area set goals related to the kind of recreational experience they are hoping to provide visitors to that area. They determine what kind of experience they want to provide (front country, back country, wilderness, urban park etc) based on a number of factors (such as island ecology) and inputs (such as public perception).

Monitoring programs are useful when they provide managers with information that tracks changes occurring to the natural landscape of a recreation area, and help managers correlate those changes to the established standards. For example, if a standard is that a campsite's access trail will only be x-meters wide and monitoring shows that the trail-width is growing at a particular pace, managers can then make decisions about how to best manage the trail and the users of that trail.

Slide 9:

Using indicators to define standards of acceptable change…

In the example of the intertidal zone in this slide, managers may have identified that certain species of algae are a good indicator, or measuring stick, to determine change over time. They may have determined that a certain amount of change is ok but change beyond that amount or leading up to that amount ("the limit of acceptable change") can trigger management action such as directing users away from an area or building a board walk to concentrate use.

Slide 10:

Three island zones: **Upland zone, Shoreline zone, Intertidal zone**

Studying recreational impact on islands is a unique undertaking because, unlike large wilderness areas and parks where much recreation ecology research has occurred, recreational use on islands crosses through multiple ecological zones. Island's, by their very nature, draw people to explore. People tend to crawl their way through the islands, some of which are literally no bigger than this

room, or this building. People don't tend to limit their travel to just the shore or just the upland. The Task Force started by identifying indicators of impact in each of these zones.

Slide 11:
What is an indicator?
Tree damage, Soil compaction, Exposed roots, Campsite expansion…
Indicators enable monitors to zero-in on specifically measurable parameters, such as the examples in these slides. Indicators measured just once provide a baseline, or a measurement at that one particular time. Indicators measured repeatedly over time (or monitored) can alert to changes and trends.

Slide 12:
What is an indicator (cont)?
Intertidal trampling, Bank erosion…

Slide 13:
Campsite sprawl, this image shows a campsite that multiplied in impact zone size over the course of just a couple seasons…

Fire scarring, it is hard to educate the public that it is possible to have an extraordinary wilderness camping experience without a campfire, yet campfires leave scars like this one. This is a brand new fire scar which is likely to be visible for years in an area that never before had this type of impact evidence. Education is key.

Slide 14:
Upland impact indicators
(*Methods by *Marion)
-campsite area
-soil exposure
-vegetation trampling
-root exposure
-trails
Having zeroed in on the impacts we should monitor in the three island zones, the next step was identifying existing methods and applying them to our island system. For the campsite areas, we relied heavily on methods developed by Dr. Jeff Marion, US Patuxent Wildlife Research Center, Cooperative Park Studies Unit, Virginia Tech Department of Forestry, Blackburn, VA. Marion is a pioneer scientist in the growing field of Recreation Ecology and has applied some of his campsite monitoring/measuring methods to, among other places, Acadia National Park's Isle au Haut. These methods were modified to apply to our small-island environment.

Slide 15:
Shoreline impact indicators
-condition and shape of shoreline
-access trails
-erosion

The shoreline and intertidal zone are both complicated by multiple factors, chief among them is the sea. It is particularly hard in this zone to differentiate between natural change and that caused by recreational use. Mapping and systematically photographing the shoreline and its condition and features is the primary approach in this zone. Methods devised by the Canadian Department of Fisheries and Oceans were modified for this work.

Slide 16:

Intertidal impact indicators
-composition of IZ
-Barnacle hummocks
-Ascophylum aging
-photo transect

The intertidal zone necessitates a compromise between methods that can be efficiently achieved in the limited time provided by the tide and methods that give enough information to track change over time. For example: Barnacle hummocks and *Ascophylum* (knotted wrack) have been identified by some marine ecologists as good indicators as they are particularly susceptible to trampling, so our methodology includes monitoring these features.

Slide 17:

Baseline inventories
Mapping indicators, habitat inventories, community assessments, diversity surveys, etc…

With a combination of field monitoring techniques and extensive fixed-point photography, the Task Force is gathering baseline information about these selected islands. Humans have used the Maine islands in various ways for centuries, so it is important not to confuse "baseline" with "original condition." Instead, baseline refers to information gathered at a particular point in time which can be used as a reference point for future data comparisons.

Slide 18:

Hell's Half Acre, Deer Isle/Stonington Region

Lets use this comparatively high use public island (circled on the chart) to demonstrate how we interpret the field data using GIS.

Slide 19:

While this map has been updated since this version was created, this gives you a good idea of how GIS can be used to map some of our field information. GIS (for Geographic Information Systems) is a mapping system that displays and layers information to enable analysis. Any future data can be overlaid atop this baseline and changes can be monitored more specifically than in the past.

Slide 20:

This map displays the dimensions of one of the campsites on this island. Using Marion's Radial Transect Method (his contact info is at Slide 14, and a *Google* search will get you to his methods as well), we have gathered the data necessary to map the campsite. In addition, each photo is directly correlated to a fixed point and can be exactly repeated. Field work conducted during future seasons can be replicated to get both a quantitative and a visual perspective on change.

Slide 21:
This map represents data collected during a shoreline survey whose purpose is to identify dominant species and compositions and identify areas of special concern. The sections of shore that are colored purple are the ones that receive the highest level of use (due to a variety of factors) and need the greatest monitoring attention.

Slide 22:
This slide correlates the campsite area with the shape of the shoreline directly adjacent to it. It also quantifies, in table format, impact indicator information such as numbers of trees damaged by users.

(We are creating all of the project maps in the College of the Atlantic GIS lab with extensive help by two COA graduate students: Jodi Jacobs and Sarah Boucher, and the lab's director Gordon Longsworth.)

Slide 23:
Next step: Engaging volunteers, students, recreational boaters and local residents to monitor the places they love to explore.
The Island Monitoring Task Force benefits from the help of volunteers working side by side with staff in the field. The recreational users of the Maine's public islands have been great stewards, thanks in large part to extensive educational and training programs conducted by the Maine Island Trail Association, a nationwide leader in recreational volunteerism. The next step is to engage recreational boaters and island users to become involved in gathering information about island conditions while out using the islands on their own. This will require sitting down with island managers, field technicians, scientists and island users to develop field monitoring methods that can produce quality data. The groundwork has been laid by MITA for top notch volunteerism by users. Now we can to take that to the next level.