Restoration as a Means of Compensating for Damages to Natural Resources

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Oil Spill Liability

- Responsible Party Liable for Damages to Publically-Owned Natural Resource
- Restoration Primary Means of Compensating
- Costs not “Grossly Disproportionate to Value”

Damages Include:

- Lost Use Values, such as …

Use Values for Commercial Species

Recreational Use

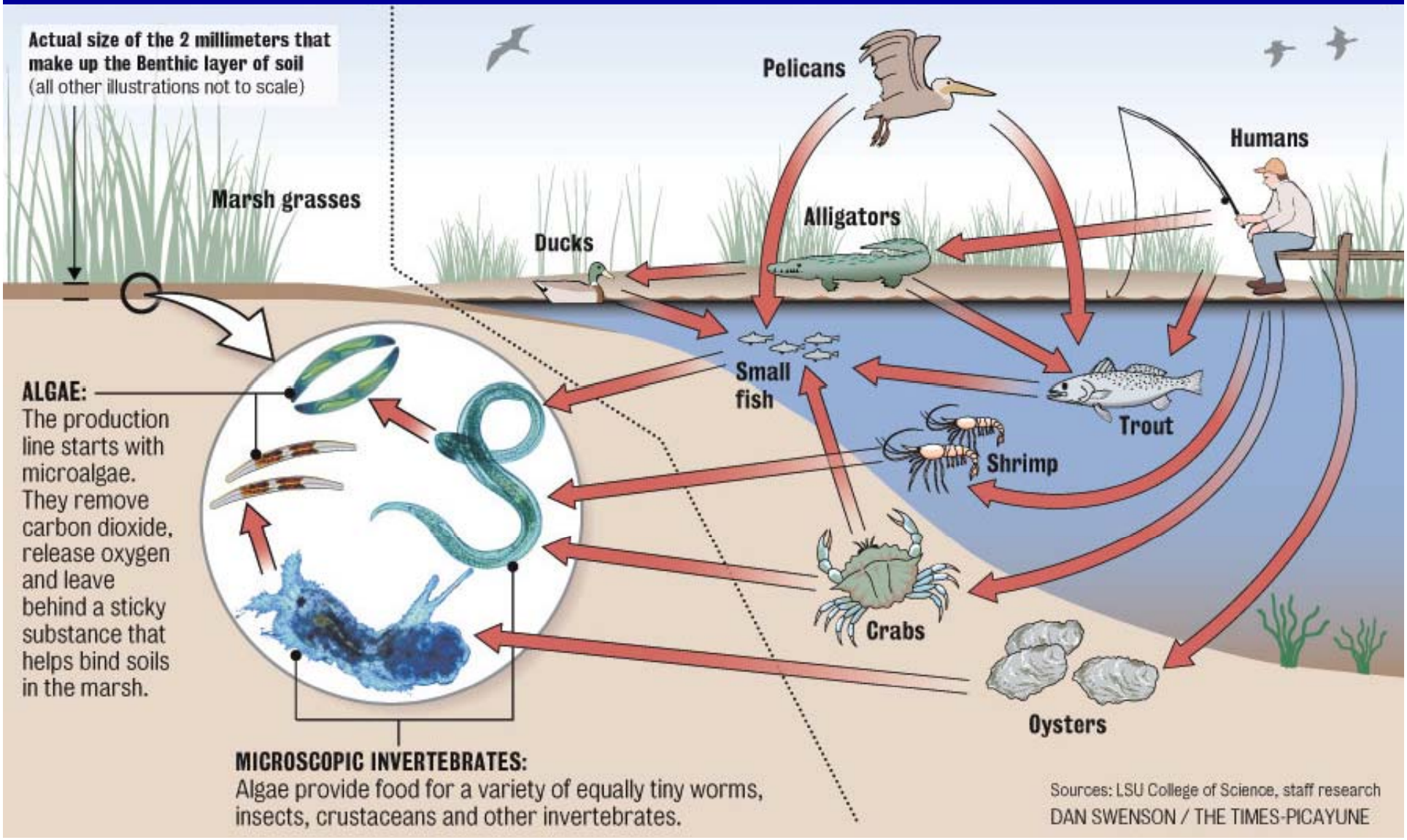
Recreational Use

Recreational Fishing

Damages Include:

- Lost Use Values (e.g., Commercial Recreational Use)
- Indirect Use Values (e.g., Ecological Effects)

Food Web Effects



Habitat Effects

Damages Include:

- Lost Use Values (e.g., Commercial Recreational Use)
- Indirect Use Values (e.g., Ecological Effects)
- Non-Use Values (Passive Use) …

Nonuse Values for Turtles

Nonuse Value for Birds

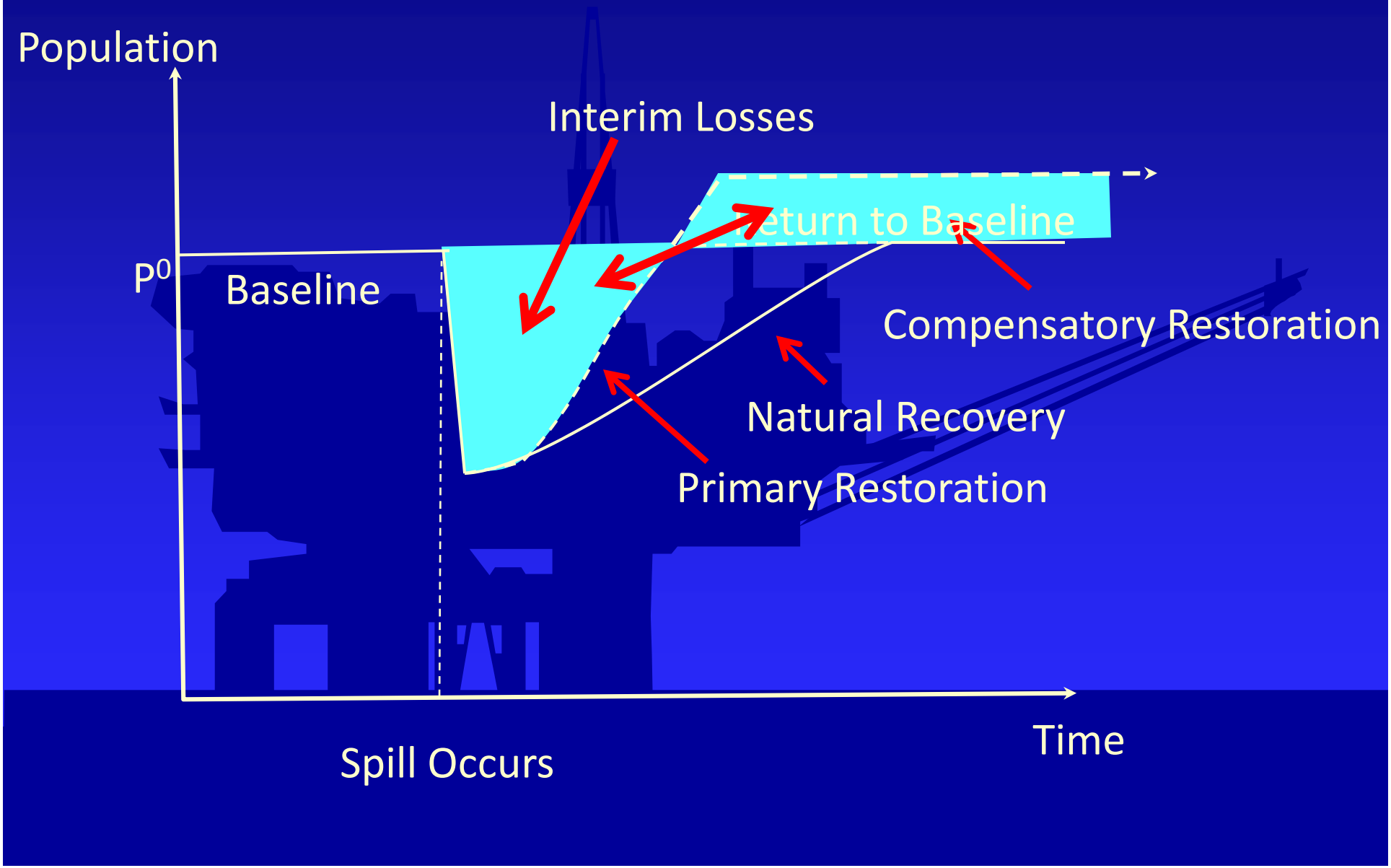
Nonuse Values for Other Marine Communities

By Tom Mackenzie, US Fish and Wildlife Service

Restoration Concepts

- Primary Restoration:
  - Bring Resource to Baseline Conditions
- Compensatory Restoration:
  - Compensate for Interim Losses

Primary & Compensatory Restoration



Restoration Scaling

- How Much to Restore?
- How to Compare Spill-Related Loss to Restoration?

Key Questions

Injury

- What Was Extent of Injury?
- How Quickly System Will Recover?

Restoration

- What is Provided by Restoration?
- How Long will Restoration Project Persist?

Resource-to-Resource

- Balance Lost Resource Against Restored Resource
- How to Restore?

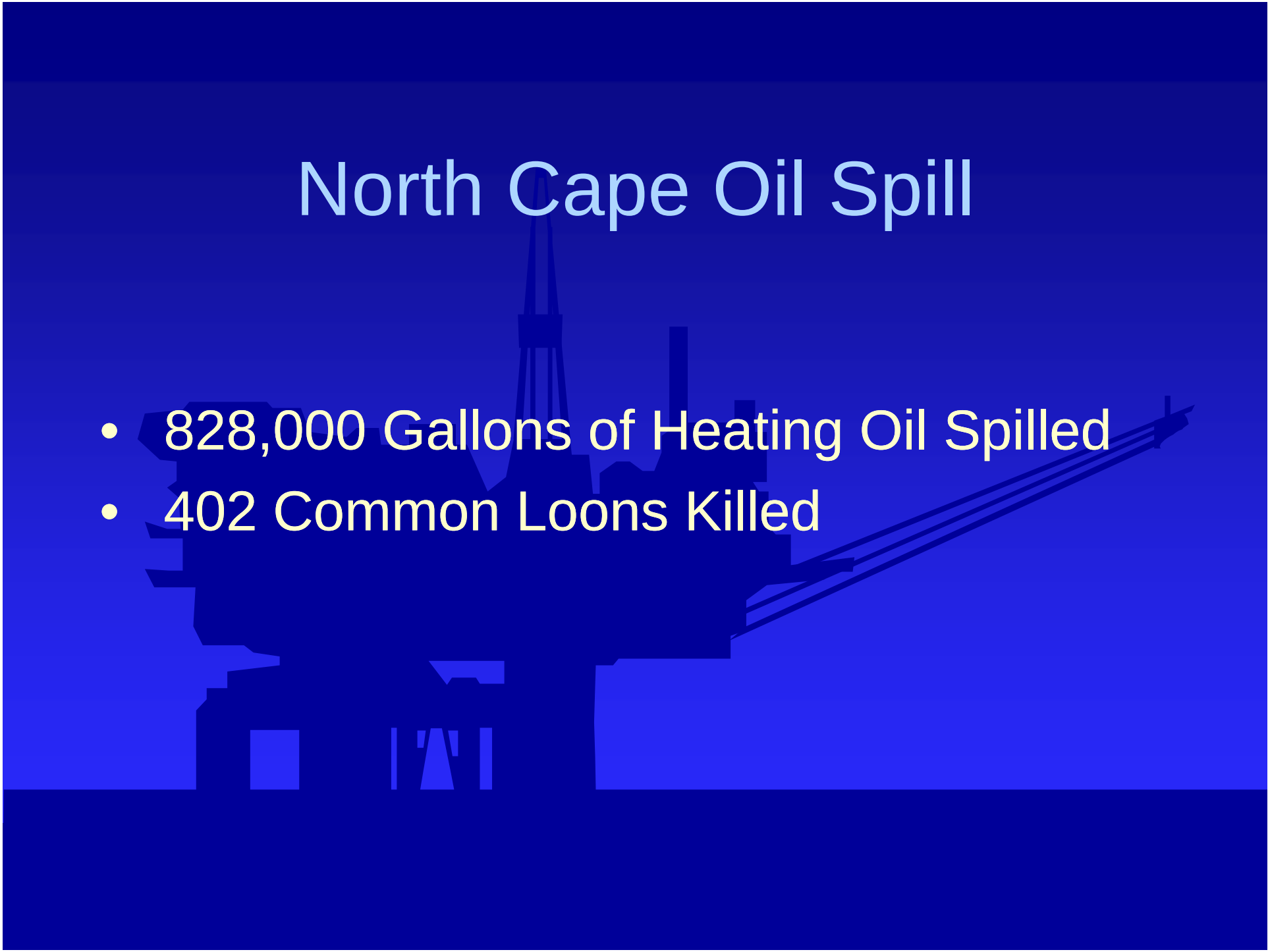
Habitat Equivalency

- Restoration Program Restores Habitat
- Calculate Amount of Habitat Required to Restore Resource

Example: North Cape Oil Spill

January 1996

North Cape Oil Spill



- 828,000 Gallons of Heating Oil Spilled
- 402 Common Loons Killed

North Cape Loon Restoration

- Alternatives:
  - Create Artificial Islands for Breeding Habitat on Lakes in Maine

North Cape Loon Restoration

North Cape Loon Restoration

- Alternatives:
  - Create Artificial Islands for Breeding Habitat on Lakes in Maine
  - Purchase Threatened Lake Habitat
- Protect Loon Nesting Habitat Maine

Restoration Scaling

3,749 Loon-Yrs Lost

- Fledge Success Higher in Undeveloped Lakes
- Life Expectancy 6 Yrs. Per Fledge
- Benefits Calculated for 100 Yrs.
- 33 Nests Equate Lost Loon-Yrs to Discounted Restored Loon-Yrs.

Service-to-Service

- Replace Lost Services w/ Restored Services
  - Recreational Uses
  - Wetlands **Functions &** Services
- Challenges: Must Quantify Services

Value-to-Value

- Lost Value to the Public is Replace by “Equally Valued” Resources

Challenges: Injury

- Quantifying Injury to Natural Resource
- Establishing Baseline
- Forecasting Natural Recovery
- Double Counting?

Challenges: Restoration

- Identifying Successful Restoration Actions
- Link Restoration to Actions
- Forecasting Restoration Recovery to Baseline

Challenges: Restoration

- Quantifying Restoration of Resources, Services, and Values
- Identifying “Grossly Disproportionate”
- Collateral Benefits?

Major Challenge

- Advocacy, Not Science