

Benefits of Monitoring Common Loon Restoration Following the *North Cape* Oil Spill

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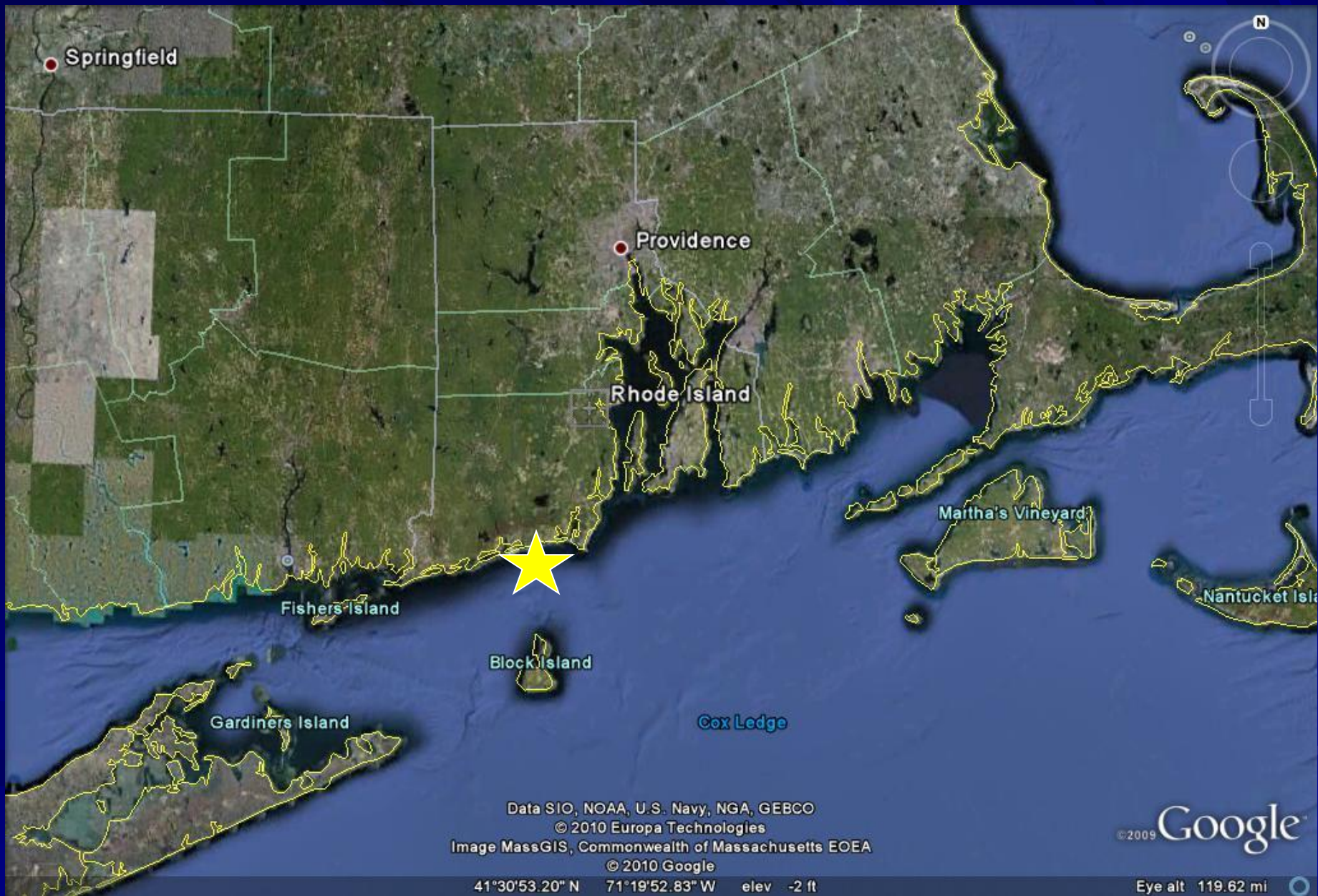
Overview

- Background
- Injury Assessment and Restoration Scaling
- Restoration Implementation and Monitoring
- Implications – Lessons Learned

North Cape Oil Spill

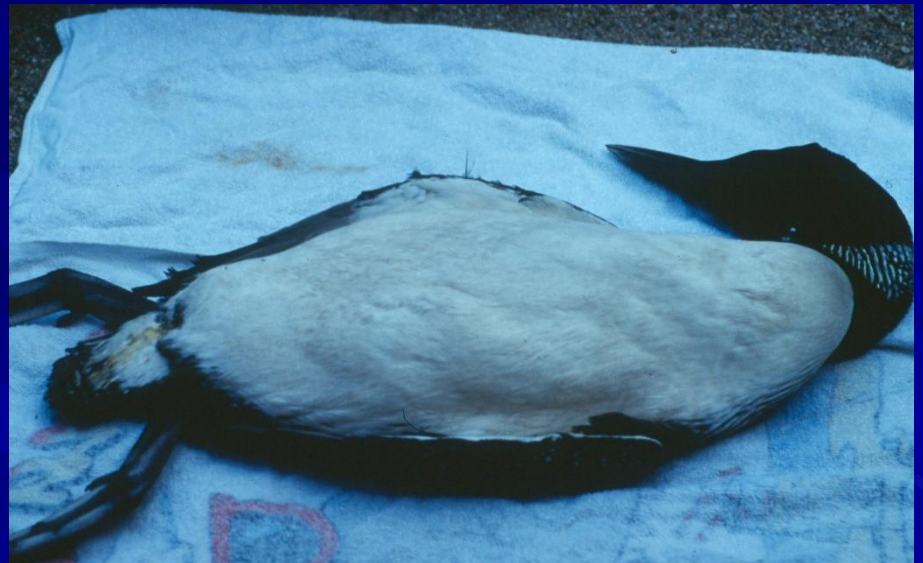


January 19, 1996



Recovered Birds

■ Loons	69
■ Common Eider	59
■ Other Sea Ducks	80
■ Gulls	74
■ Grebes	38
■ Pond birds	33
■ Other marine	27
■ <u>Inland birds</u>	<u>12</u>
Total	392



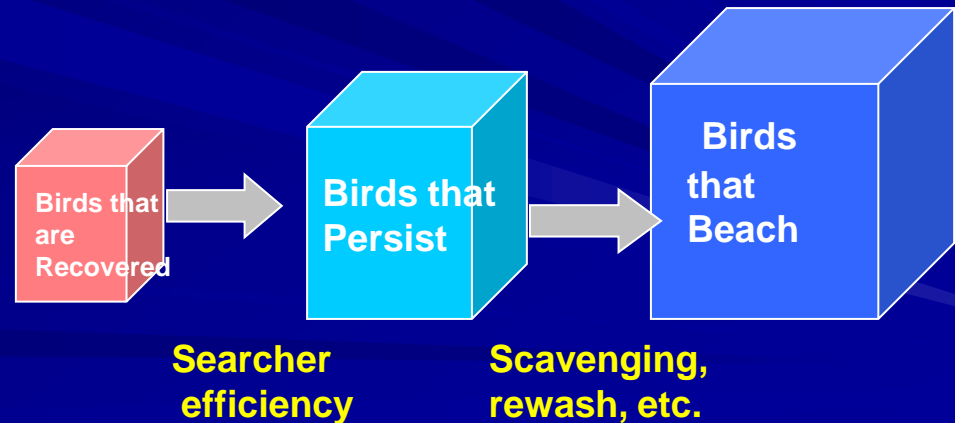
Determine Total Bird Mortality

- Many Birds Not Recovered – sink, drift out to sea, scavenged, overlooked



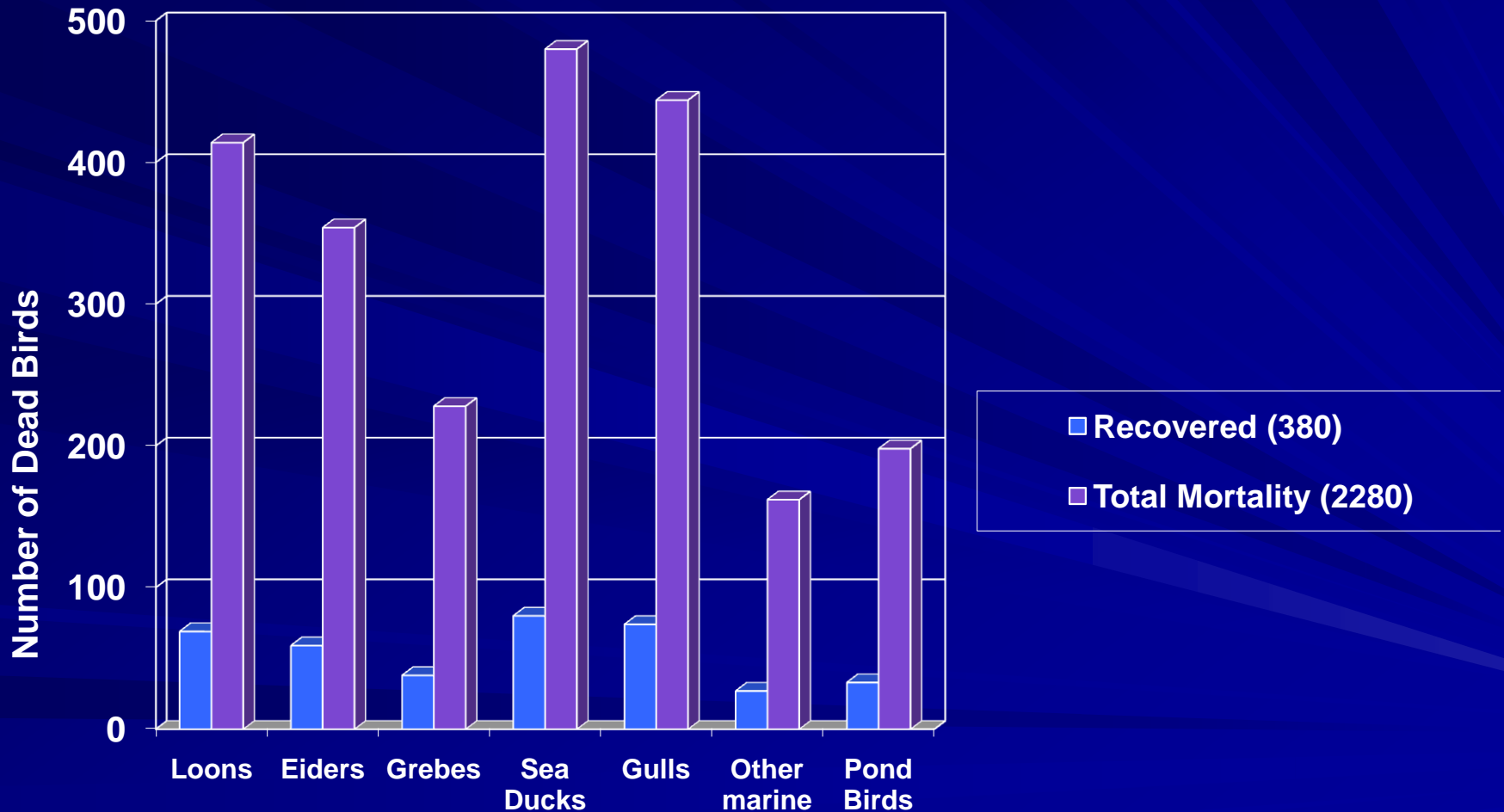
Determine Total Bird Mortality

- Approaches to Estimate Mortality:
 - Multiplier (Burger 1993)
 - Swept Through Calculations (Ford et al 1987)
 - Beached Bird Model (Ford 2006)

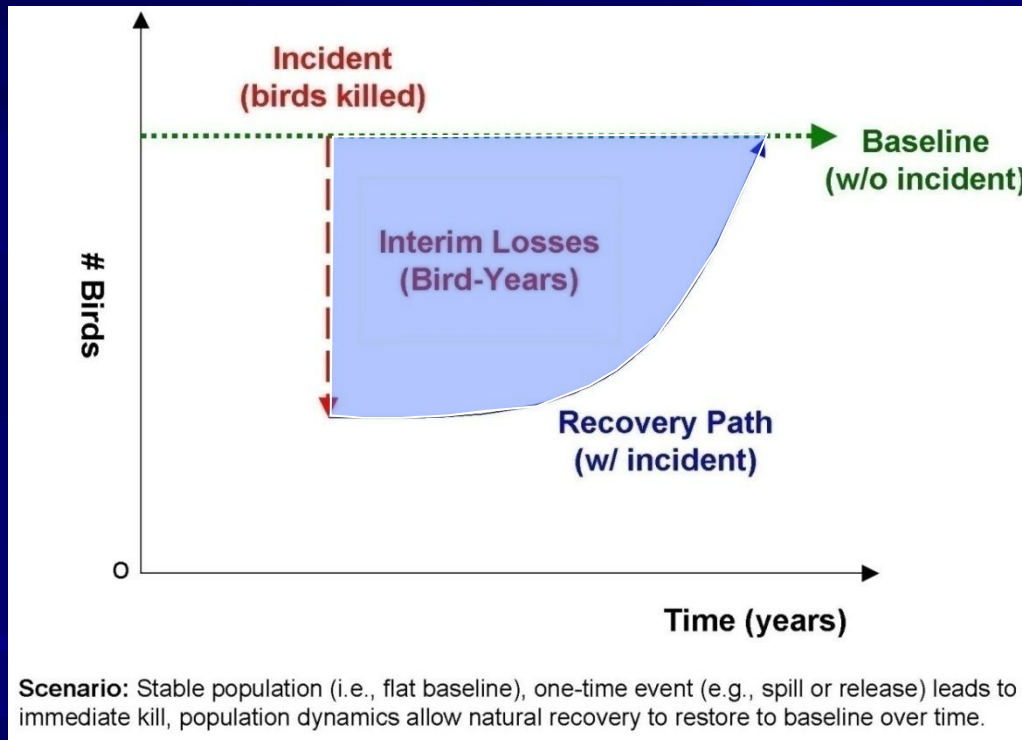


Injury Assessment and
Restoration Scaling

Estimated Total Mortality: 6 Times the Number Recovered



Utilized a REA to Determine Injury and Scale Restoration



From Skrabis 2009

Measured Bird Losses:

- Direct loss of adults and time to recover
- Indirect loss of chicks that would have been produced

Inputs to the REA:

Parameters	Loons
Life expectancy	5.46
Productivity	0.54
First year survival	0.76
Adult survival	0.88
Breeding age	5 yr
Maximum age	24 yr
Percent of adults that breed	0.80
Discount rate	0.03

Identify Restoration Alternatives

- Bird/Habitat creation
- Education
- Nest Site Enhancement
- Habitat Protection

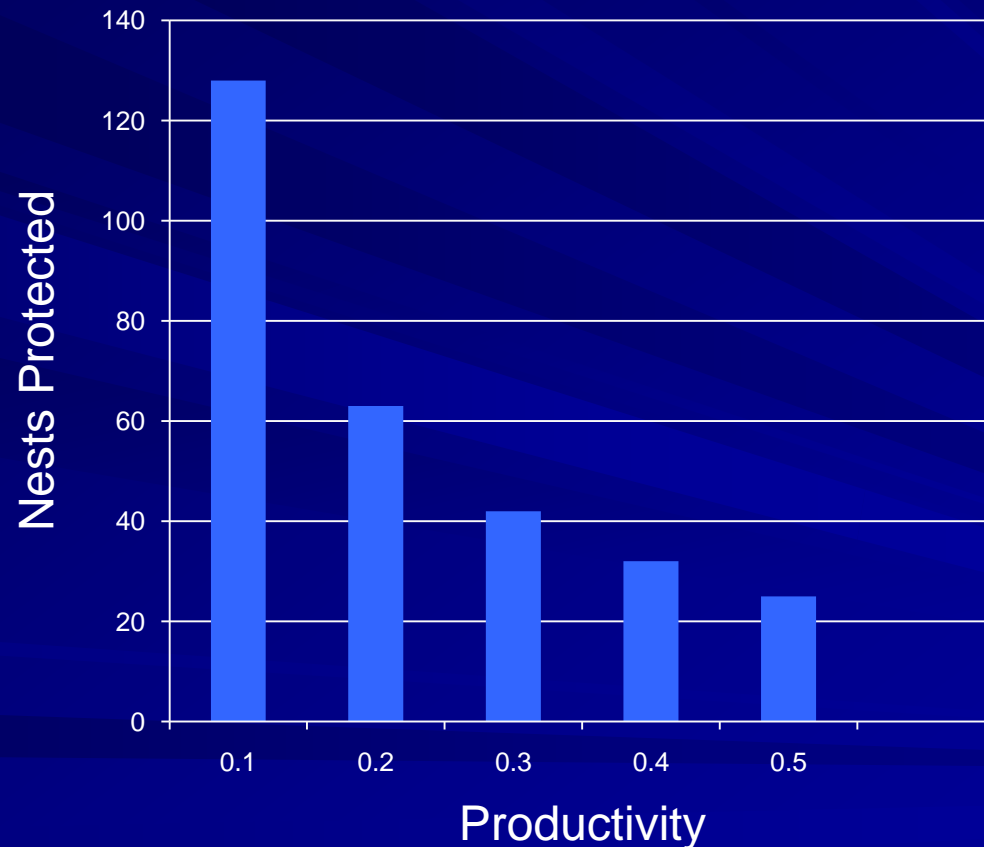


Restoration Inputs to the REA:

Parameters	Loons
Discounted life expectancy	5.46
Productivity	0.54
First year survival	0.76
Adult survival	0.88
Breeding age	5 yr
Maximum age	24 yr
Percent of adults that breed	0.80
Discount rate	0.03
Restoration sites productivity	0.5
Restoration project life span	100 yr

Sensitivity of REAs to Inputs

Protection Requirement Declines with Increasing Productivity



Outputs from the REA:

Dead Loons	414
Total Adult Mortality	2,262
Total Fledge Mortality	658
Total Loss (bird-years)	3,286
Bird-Years/Nest	129
Nests needed for Restoration	25



Estimated Damages and Negotiated Settlement

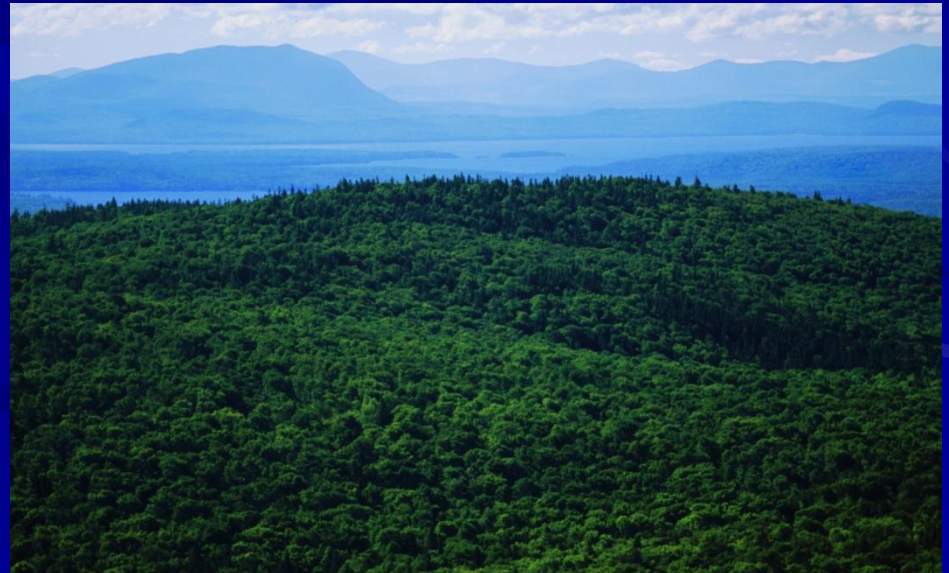
Task	Cost
Land Protection	\$4.3 million (25 nests @ \$159,700/nest)
Monitoring	\$172,520 (3%)
Oversight	\$127,500 (2%)
Contingency	\$1.1 million (25%)
Total Estimate	\$5,769,170

Actual Damages **\$3,000,000**

Loon Restoration Program

■ \$3 Million Settlement

- 3 land protection projects (\$2,850,000)
- Monitoring program (3-5 years for each project area \$356,000 (approx 10%))
- Oversight and planning (approx \$100K)
- Total spent: \$3,306,000



North Cape Restoration Project Areas in Maine

West Branch: 31 pairs, 329,000 acres

Pingree: 38 pairs, 762,000 acres

West Branch Project

Pingree Project

Aroostook

Piscataquis

Somerset

Penobscot

Pingree Project

Franklin

Machias River Project (II)

Downeast Lakes Project

Washington

Machias River Project (I)

Hancock

Oxford

Kennebec

Waldo

Androscoggin

Lincoln

Knox

Sagadahoc

Cumberland

York

Flag Island Project



Map by:
USFWS Gulf of Maine Coastal Program
4R Fundy Rd., Falmouth, ME
<http://gulfofmaine.fws.gov>

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Downeast and Machias River: 79 pairs, 369,000 acres

Loon Monitoring Program

- BioDiversity Research Institute monitored each protected area for 3-5 yrs (identify territories, nesting sites, productivity)
- Local guides and students assisted



Loon Restoration Projects

Project	N Cape Contribution	Total Cost	Loon Pairs	Chicks/ Pair	Loon-Years
Pingree	\$500K	\$28 million	38	0.19	1,399
West Branch	\$800K	\$34 million	31	0.23	1,382
Downeast Lakes	\$1.55 million	\$42 million	79	0.18	2,756
Total	\$2.85 million	\$117 million	148	0.20 (avg)	5,537

Did We Succeed?

Project	Loon Pairs	Chicks/Pair	Loon-Years
Restoration Needed	25	.5	3,286
Total Restoration Achieved	148	0.18	5,537 ✓
Restoration Achieved via North Cape Funds	3.1	0.18	160 ✗

- Helped leverage funds and complete funding for projects
- Incorporated additional protective measures for loons via stipulations in easements/deeds
- Benefit derived from monitoring, education

Benefits of Monitoring Program

- Needed to Evaluate Restoration Success
 - Allows calculation of whether compensation was effective
 - Evaluates inputs to REA (e.g. productivity credit, nests protected, etc.)
 - Provides opportunity to visit protected property and enforce easement if need be



Benefits of Monitoring Program, continued

- Demonstrates Commitment to Project Success
 - Provides a presence in the community
 - Provides basis for future efforts which can be continued by residents
- Education
 - Educates community about project
 - Opportunities to involve youth



Benefits of Monitoring Program, continued

■ Adaptive Management

- Implications for future NRDA's – improves accuracy of claims (e.g. use of lower productivity numbers in future northeast assessments)
- Transfer of life history data from different regions may not be appropriate
- Allows changes to management if desired results aren't achieved (e.g. implementation of loon rafts to try to increase productivity, evaluate other factors such as mercury that could reduce productivity)

Thanks to Our Partners



State of Rhode Island

National Oceanic and Atmospheric Administration

Downeast Lakes Land Trust

New England Forestry Foundation

The Forest Society of Maine

The Nature Conservancy

Maine Department of Inland Fisheries and Wildlife