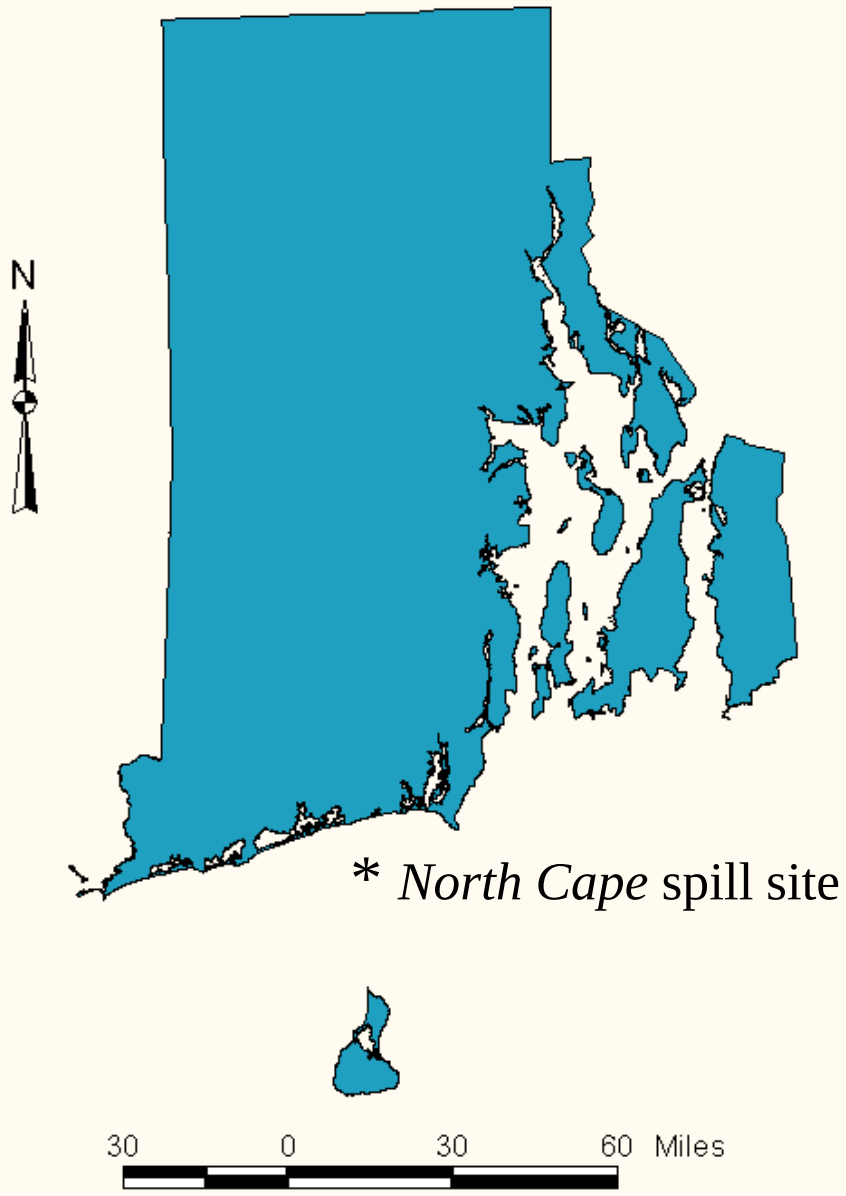
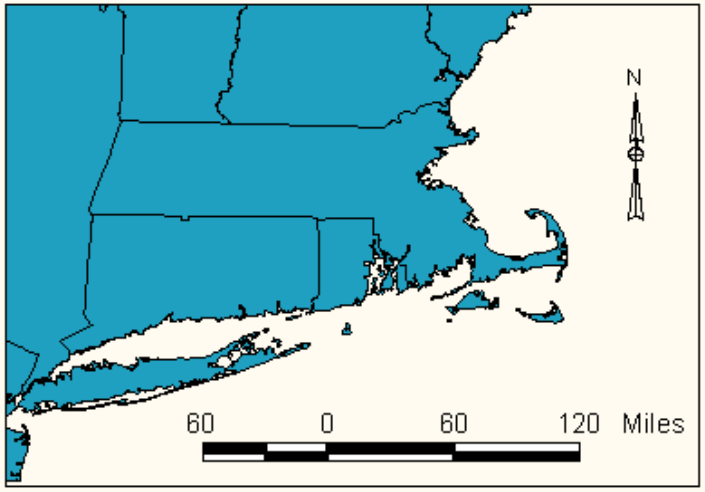
North Cape Oil Spill, RI
Jan 19 1996:
From
Damage Assessment to Restoration

North Cape Oil Spill

- January 19, 1996 grounded just offshore RI coast
- 828,000 gallons of no. 2 fuel oil spill
- Oil spread throughout Block Island Sound and coastal salt ponds
- Heavy wave action drove oil into sediments and mixed oil into water column





Oil Pollution Act of 1990

- Authorizes Trustees to “Restore, replace, or acquire the equivalent of the injured natural resources.”
- Restore to baseline
- Compensate for interim losses pending recovery

OPA's NRDA Process

- Injury Assessment -- identify and quantify injuries
- Restoration Planning -- identify and select restoration alternatives
- Scale restoration alternatives
- Develop restoration plan
- Implementation
- Public input throughout process

Organization of the NRDA

Four cooperative assessment technical working groups formed :

- Birds
- Salt Pond Community
- Marine Community
- Recreational Services

Guidelines for Each TWG

- Quantify the nature and extent of injuries
- Ensure that the damage assessment is complete and defensible
- Assist in the development and scaling of restoration options

Injury Assessment

• Trustees and Responsible Party assembled local academics, consultants, and government personnel to document injuries to natural resources and services

- **Field studies**:
  - lobsters
  - surf clams
  - wintering waterfowl
  - shore birds
  - winter flounder
  - salt pond studies
- **Modeling efforts**
  - determine injuries to benthic animals, finfish, etc

NORTH CAPE OIL SPILL, Summary of Injuries

- **9 million lobsters**
- **364,000 kg surf clams**
- **~1 million kg benthic macrofauna**
- **111,000 kg of fish**
- **2,100 seabirds**
- **5-10 piping plover chicks**
- **3,300 lost party/charter boat trips**
- **fishing closures**

Restoration Summary

Resource	Restoration Alternative
Loons	**habitat protection - 23 nest sites**
Marine birds	**habitat protection - 240 nest sites**
Plovers	**habitat monitoring/protection**
Salt ponds	**shellfish restoration/land acquisition**
Lobsters	**v-notching (1.81 million adult females)**
Surf clams	**shellfish restoration in salt ponds**
Charter boat fishing	**shore access/anadromous fish runs**

North Cape Settlement and Restoration

- Restocking of adult lobsters
- $1.5 million shellfish restoration
- $1.5 million salt pond land acquisition
- $3 million loon habitat protection
- $400,000 for eider nesting habitat protection
- $140,000 piping plover protection
- $160,000 anadromous fish restoration
- Funds for government oversight and

Birds Recovered

Species	Number
Common Loon	69
Common Eider	61
Herring Gull	40
Great Black-backed Gull	34
Red-breasted Merganser	35
Common Goldeneye	33
Horned Grebe	23
Red-necked Grebe	16
Great Cormorant	15
Bufflehead	11
Great Blue Heron	6
Black Duck	5
Common Murre	4
Other	53
Total	**405**

Estimated Total Mortality to be 6 Times the Number of Birds Retrieved

Because:

- Lit Review of 45 oil spills-mean multiplier 4 to 5
- Off-shore winds (transported birds to sea)
- Large number of birds collected at Block Island
- Potential for many birds to be killed (1000's of eider wintering nearby)
- Extent of area oiled

Total Direct Mortality

Species Group	Total Kill
Sea Ducks	648
Goldeneye	198
Loons/Grebes	642
Other Marine Birds	612
Pond Birds	198
Non-water birds	13
TOTAL	2,311

Calculating Total Injury: Loons

- Direct Loss

414 loons * 5.5 yrs (recovery time) = 2262 loon-yrs

- Lost Offspring

Fledges * expected fledge lifespan = 658 loon-yrs

Total Loss: 2262 + 658 = 2920 loon-yrs

Total Bird Injury

Species Group	Total Kill	Recovery Time	Total Bird-Years
Sea Ducks	648	1.4	1,129
Goldeneye	198	1.8	510
Loons/Grebes	642	6.8	10,937
Other Marine Birds	612	1	612
Pond Birds	198	1	198
Non-water birds	13	1	13
TOTAL	2,311		13,399

Objective

- Restore loon and seaduck losses following the North Cape oil spill
  - ✓ Background
  - ✓ Calculate injury
  - ✓Determine restoration

Identify Loon Restoration Alternatives

- Bird/habitat creation
- Education
  - scaling difficulties
- Nest site enhancement
  - Limited opportunity
- Habitat protection (preferred)
  - Nesting habitat is limiting
  - Lakes with development pressure

Identify Seaduck Restoration Alternatives

- Habitat Protection

Scale Habitat Protection for Loons

- Protected loon nest provides 128 loon-yrs
- 23 nests * 128 loon-yrs = 2944 loon-yrs (enough to restore 2920 loon-years lost)
- Credit 0.5 nests for protection of adults

Cost out implementation of Habitat Protection for Loons

- Linear feet of shoreline needed to protect a nest
- Average cost to purchase for representative lake shoreline

Scale Habitat Protection for Remaining Marine Bird Injury

- 315 nests needed to restore remaining marine bird injury of 2933 bird-yrs (9.3 bird-yrs/nest)

Selecting Restoration Alternative: Practical Issues

- Is the injury directly restorable?
- If not, what other means are available to compensate for the loss?
- Is the option technically feasible?
- Is the option cost-effective?
- Is it likely to succeed?
- Is it publicly acceptable?
- How do we scale the project?
- Can we monitor the outcome?

Settlement with Responsible Party

- $3 million to restore loons
- $400,000 to restore marine birds
- Habitat protection to increase future productivity

Pingree Forest Partnership

Eider Nesting Habitat Protection (ME)
Flag Island

- $300k contribution toward purchase of 41 acre island off ME coast (~$950 total cost)
- 600 pair of nesting Eiders on Flag Island
- ~ 315 nests need protection to restore losses from spill

Protective Management Standards for Acquired Lands

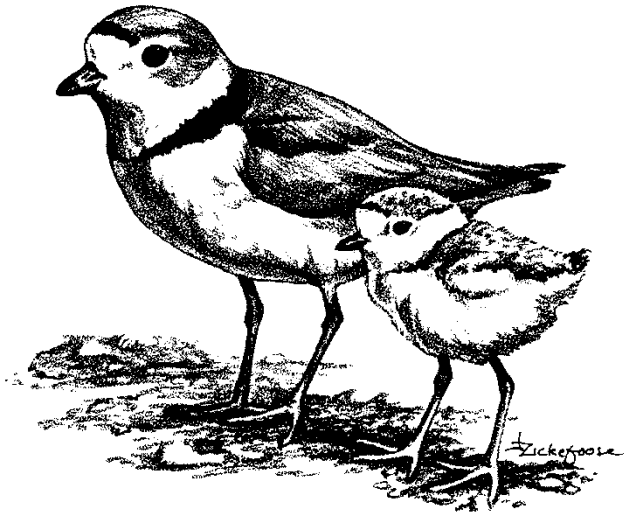
- Purchase of habitat
- Nesting bird ‘friendly’ land management

Injury to Piping Plovers

Injury Calculation

(‘95 productivity - ‘96 productivity) * (# of pairs in ‘96) = lost chicks

(1.56 - 1.0) * 9 pairs = 5.0 fledged chicks



Piping Plover Restoration

•$140k to protect plover nesting habitat on Rhode Island beaches -- ongoing

• Nest exclosures, predator control, people management

Human Use Losses

- Recreational Fishing
- Charter boat trips
- Economic analysis- lost consumer surplus
- Joint surveys of charter boats

Human Use Restoration Alternatives

- Anadramous fish restoration
- Shore access
- Boat ramps

Anadromous Fish Restoration

- $160k for fish passage projects -- Alewife restoration

- Installation of Alaskan steep pass fish ladder on Factory Brook -- trib to Ninigret Pond

- Installation of fish ladder on Indian Lake dam -- trib to Pt. Judith Pond

- Summer/Fall construction

Salt Pond Injuries

Species or Group	Numbers Killed
winter flounder	99
soft shell clam	83,000
bay scallop	49
crabs	810,000
shrimp	825,000
zooplankton	4,300,000
worms, amphipods	6,800,000,000

Marine Injuries

Species Category	Numbers Killed
finfish	2,600,000
crabs	82,400,000
quahogs	16,000
surf clams	81,300,000
mussels	679,000,000
sea stars	2,600,000
worms/amphipods	17,400,000,000

North Cape Restoration Alternatives: Marine and Salt Pond Injuries

Injured Resource	Restoration Alternatives
Shellfish	**Quahog transplant** **Multi-species seeding** Surf clam seeding
Benthic Macrofauna Finfish Crabs	**Salt pond pand acquisition** Salt marsh restoration Finfish stocking Eelgrass restoration Breachway dredging
Lobsters	**V-notching** Hatchery stocking Habitat enhancement

Shellfish Restoration

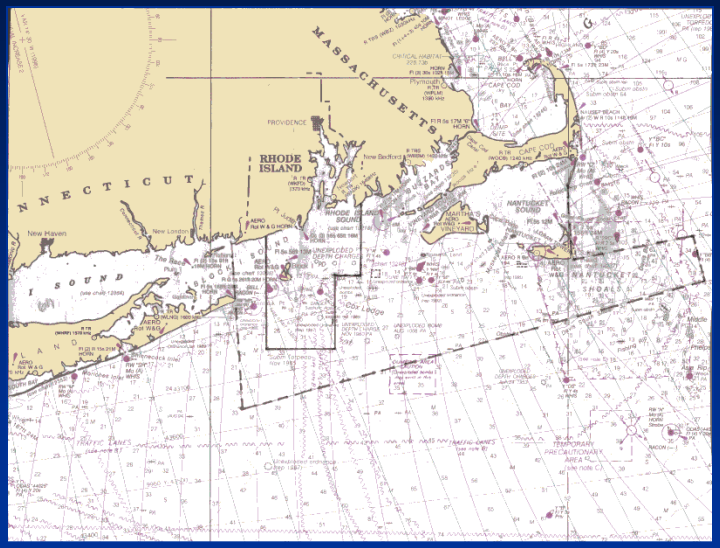
- Goal: to compensate for loss of ~350,000 kg of shellfish (mostly surf clam)
- Quahog transplant
- Bay scallop seeding
- Quahog seeding
- Oyster restoration

- $1.5 million, 4-5 year effort underway


VOLUNTEER

Lobster Restoration

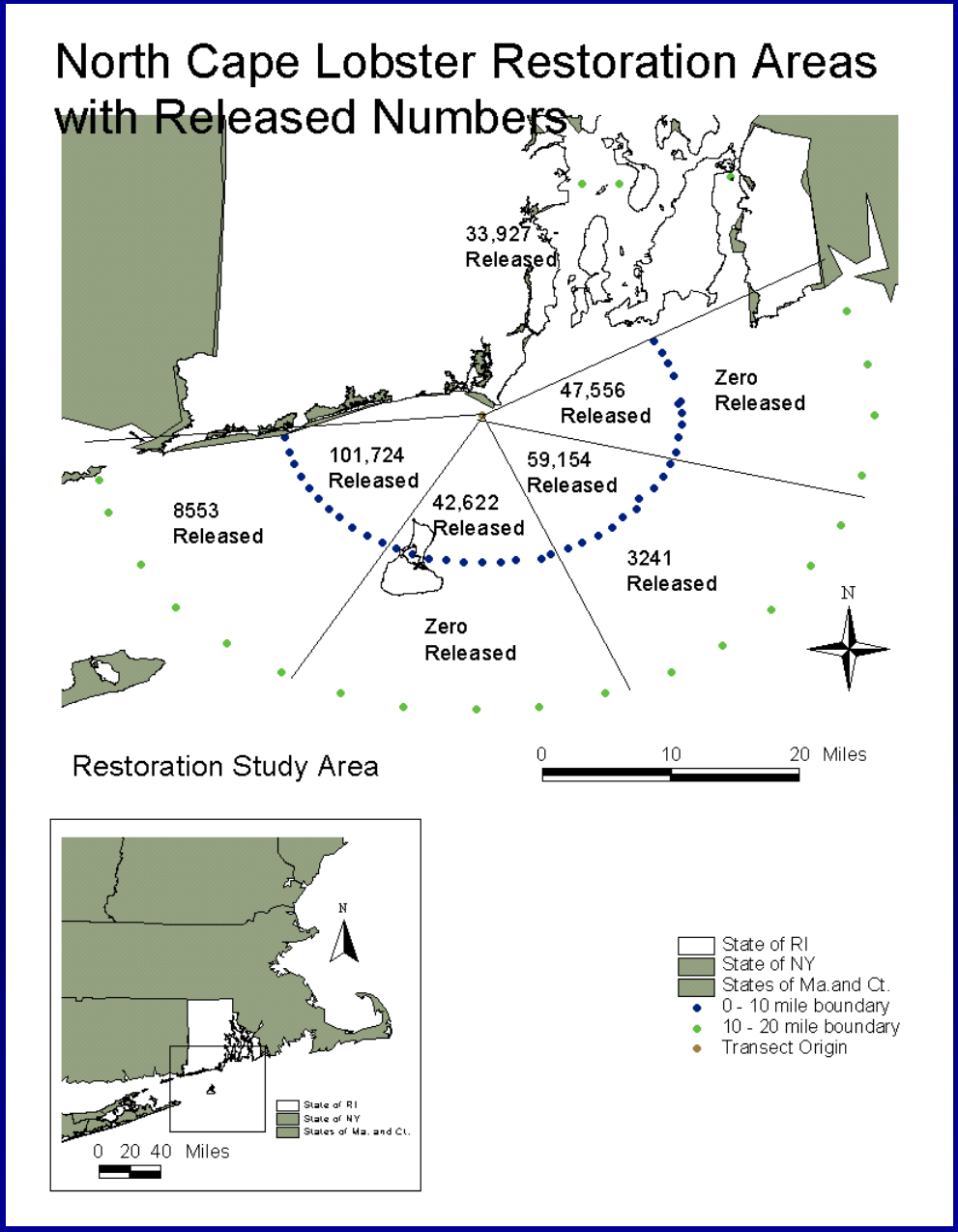
- Goal: To replace the 9 million lobsters killed by spill through increased egg production
- RP to purchase, v-notch and restock 1.25 million lobsters into RI waters
- Prohibition on possession of v-notched lobsters
- Monitor progress



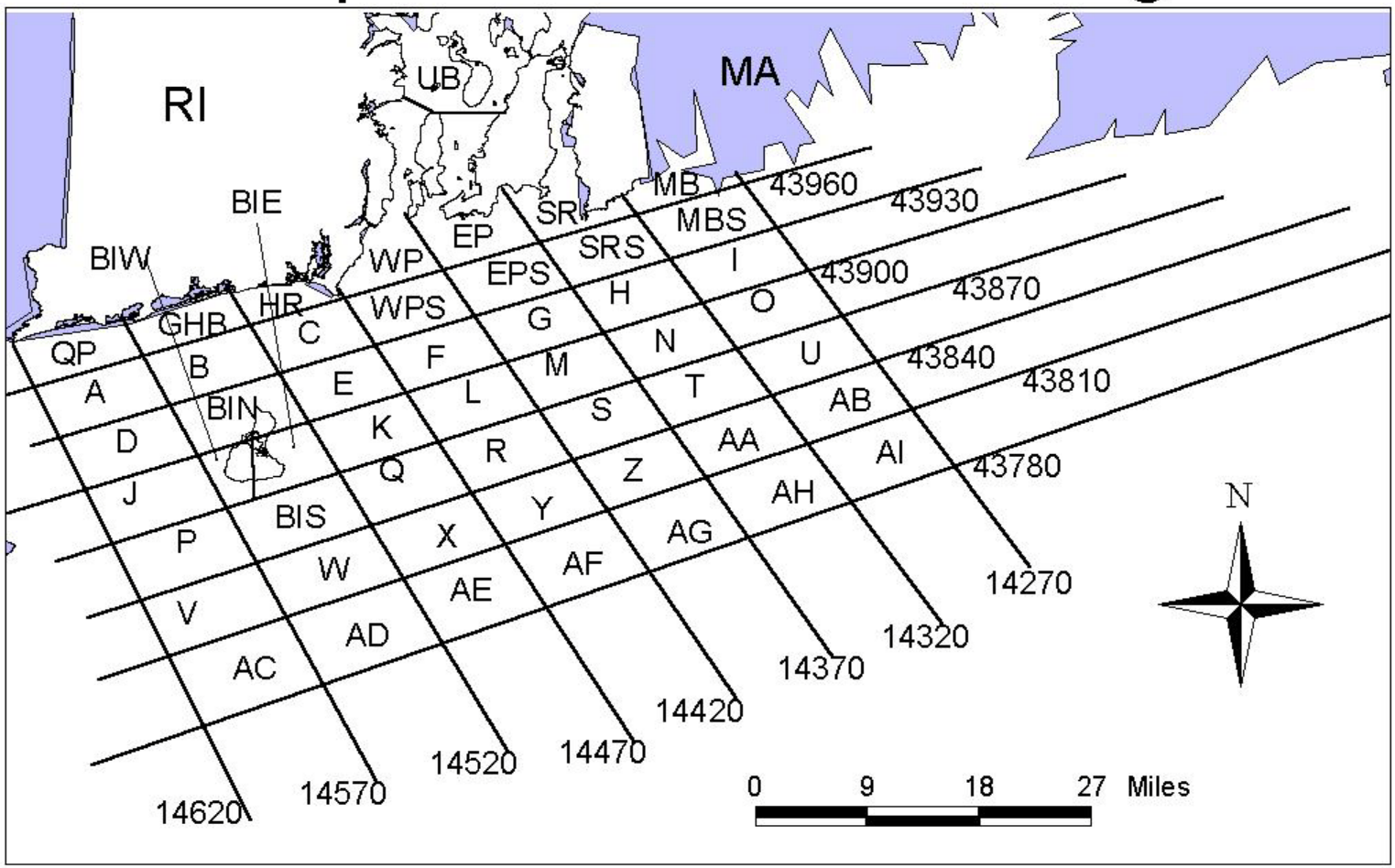
Lobster Restoration Project

Year 1 -- 2000

- ~ 300,000 lobsters v-notched and re-stocked
- **Major problems**
  - flawed project design
  - significant perceived and real impacts on fishery
  - difficult RP representatives and contractors



North Cape Lobster V- Notching Areas



Area Boundaries are LORAN lines.

Areas are about 5 by 3 miles square

The Lobster Goal

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