2001 SETAC Short Course: NRDA Cooperative Efforts

Prepared by

NOAA.Staff

Notional Ocean Service

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November 2001

Cooperative Assessments: Overview of Statute and Regulations

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Acronym List

- CERCLA: Comprehensive Environmental, Response, Compensation, and Liability Act
- OPA: Oil Pollution Act
- PRP - under CERCLA - Potentially Responsible Party
- RP - under OPA - Responsible Party
- "Restore" - restore, replace, rehabilitate, or acquire the equivalent
- NRDA - natural resource damage assessment

Goals of Natural Resource Damage Assessment

- Make environment and public whole
- Restore, rehabilitate, replace, and acquire the equivalent of injured natural resources and services

Private Claims under OPA (None under CERCLA)

- Damages to real or personal property;
- Net loss of taxes, royalties, rents, fees, and other lost revenues by federal or state governments;
- Loss of profits or loss of earning capacity due to injury to natural resources;
- Loss of subsistence use of natural resources; and
- Net costs of public services

Natural Resource Damages

- Trustees may assess damages
- Recovered sums must be used to restore
- Natural resource damage assessment regulations
  - OPA: 15 CFR 990
  - CERCLA: 43 CFR 11

Focus and Goals of OPA Regulations

- Focus is on restoration
- Expanded role available to Responsible Party
- Open process with public involvement
- Same approach is consistent with CERCLA regulations

Overview of NRDA Process

- OPA: Three phases
  - Preassessment
  - Restoration Planning
  - Restoration Implementation
- CERCLA: Four Phases
  - Preassessment
  - Assessment Plan
  - Assessment: either Type A or Type B
  - Post Assessment

Preassessment Phase

- OPA
  - Determination of trustee jurisdiction
  - Likelihood of injuries to restore
- CERCLA
  - Preassessment Screen
  - Preassessment Screen Determination

Next Steps

- OPA:
  - Restoration Planning Phase
- CERCLA
  - Assessment Plan Phase
  - Assessment Phase

CERCLA: Assessment Plan Phase

- Necessary to determine if approach is cost-effective and at reasonable cost
- Identify type of procedure
- Confirm exposure
- Preliminary estimate of damages
- Public review of plan

CERCLA: Assessment

- Injury Determination
- Injury Quantification
- Damage Determination**
  - Restoration and Compensation Determination Plan
  - Restoration
  - Costs and valuation

OPA Restoration Planning Phase

- Injury assessment
- Injury determination
- Injury quantification
- Restoration Selection
  - Develop range of restoration alternatives
  - Scale restoration actions
  - Select preferred alternative
- Develop Restoration Plan

After Assessment

- OPA:
  - Responsible party carries out restoration; **OR**
  - Responsible party pays trustees to do restoration
- CERCLA
  - Present demand
  - Recover damages and costs
  - Restoration Plan

Cooperative Assessment Rule Provisions

- OPA
  - Trustees required to invite RP, no later than NOI
  - Guidance in rule for level & type of involvement
  - Preassessment Phase
- CERCLA
  - Trustees required to send NOI to PRP to invite participation
  - Assessment Plan Phase

Emphasis on Cooperation and Settlement

- Focus on restoration, not monetary damages
- Encourage expedited assessments to:
  - achieve restoration more quickly
  - reduce interim losses

Benefits of Cooperative Assessments

- Lower costs with focus on restoration
- Sound restoration plan developed
- Consensus approach to resolving liability
- Litigation avoided

Trustee Needs

- Focus on faster restoration
- Less litigation
- Identified framework for cooperative planning
- Consensus decisions
- Data sharing
- Public participation
- Funding

For Further Information:

- Visit Web Site at:
  www.darp.noaa.gov
- Call Program Coordinator at:
  (301) 713-3038, extension 192

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Mechanisms for Facilitating Cooperative NRDAs

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General Principles in Facilitating Cooperative Assessments

- Cases should not be viewed as isolated events, but part of an ongoing developmental process
- All parties should carefully balance the need to reduce uncertainties versus incurring additional costs
- RPs should not be made worse off by choosing to implement restoration themselves, rather than "cashing out"
- Restoration projects should not be held to higher standards of performance than appropriately chosen control areas

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General Principles in Facilitating Cooperative Assessments (con't)

- Documentation should be a real-time process, recording agreements as they occur, not just at the end of the assessment process
- Opportunities abound for win-win outcomes
  - Expedited assessment approaches that reduce time to restoration implementation phase, while minimizing assessment costs.
  - Creative restoration approaches that generate high-quality, cost-effective projects

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Specific Mechanisms to Facilitate Cooperative Assessments

- Training/Planning outside of cases
- Documentation of Decisions/Agreements
- Use of Third Parties
- Sharing Risk/Uncertainty

Training/Planning

- On-going Opportunities
  - Joint Assessment Team
  - Environmental Functional Team
  - NRDA training opportunities
  - Regional Restoration Plan development

Planning

- Ad-Hoc Opportunities
  - Area Contingency Plans
  - Site NRDA contingency plans
  - Document Review
  - Conference Presentations

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Joint Assessment Team (JAT)*

- "*The Joint Assessment Team seeks to enhance effectiveness and efficiency of conducting natural resource injury and damage assessments and restoration*"
- Trustee, industry representatives
  - Have purposely left out attorneys and consultants
- Meets quarterly on the west coast
  - Attempts to initiate in other regions

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Environmental Functional Team*

- Established by Chevron in 1992
- Manages and provides expert technical advice on environmental issues that emerge during an oil spill
- Provides periodic technical training on specific issues:
  - Open to both Industry and Trustee reps.
    - Chemistry
    - Annual training on general spill response

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Pre-Spill Agreements*

- Texas - NOAA Spill Response MOU*
  - Coordinate response/assessment activities

- NOAA - P&I Club MOU*
  - Foster clear communication
    - periodic meetings
  - Exchange of technical information
    - use of ITOPF during spills
    - joint training exercises

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Conference / Presentations

- IOSC
- SETAC
- API Meetings
- ERF
- Ecological Society

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Documentation of Decisions/Agreements

- Focuses discussion on items to resolve
- Memorializes interim agreements
- Provides a reference record for the future
- Allows for 3rd party review of process
- Examples of agreements

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Examples of Formalized Agreements

- Stipulations
  - aka Expedited Technical Consensus (Tampa)
- MOU/MOA
  - Technical Memorandum attachments (Lavaca)
- Summary of Meeting Agreements
  - Lake Barre
- Phased DARP
  - Tampa Bay
  - Lavaca Bay

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Risk Sharing of Agreements

- Restoration Implementation Contingencies
- Use of Control Areas
- Design Standards
- Performance Standards
- Insurance
- Cooperative Assessment Pilot Project (CAPP)
  - (aka Green Coasts)

Use of Third Parties

- Shared Experts
  - Lavaca Bay
  - North Cape lobster expert
- Alternative Dispute Resolution
  - Mediation - Torch spill in CA
- Expert Panels

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Conclusions

- Individual incidents don't happen in isolation
  - Long-term professional relationships
  - Tenor set during response will often last through the entire assessment
- Understand the constraints each party operates within
- Communication and documentation

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Conclusions (con't.)

- Balance between need for additional information and acceptable uncertainty
- Focus on restoration
  - Need strong nexus between injury and benefits
  - This is the goal of the trustees
- Statutes and regulations leave room for creativity and flexibility

Cooperative NRD Oil/Chemical Industry Perspective

Peter Samuels
ChevronTexaco
Nov. 11, 2001

You Are Preparing for Litigation

- Conduct Actions w/ Attorney
- Trustees have significant litigation strength
- Move quickly to address legal issues so as to open frank Technical/ Science discussions, e.g. MoA, LoC, or Settlement Discussions

Just Do It - Early

- Act Proactively showing your serious about Cooperative Approach
  - At Every Meeting:
    - Discuss next cooperative actions, e.g. Data Sharing
    - Discuss potential restoration actions, move from conceptual to specific

Fit NRDA into the Entire Project

- Integrate NRDA with remedial work in terms of data collection and minimizing impacts of Remedy on natural resources
- Align Strategies of Remediation Program with NRDA Strategies

Try to Determine Your: "Pivot Point"

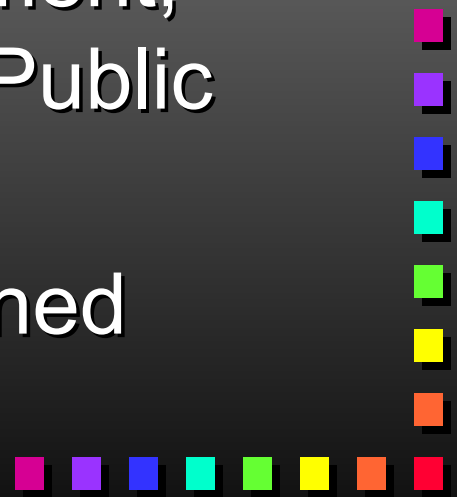
- From your worst case scenario:
  - find most cost effective restoration
  - That project becomes the **End State Vision**
  - Conduct early public stakeholder outreach
- Is this solution "Acceptable"

It All Comes Down to Dollars

- Conduct 50/50 Estimate on restoration action and transaction costs
  - Include
    - Trustee Administrative Costs (Except Attorneys Fees)
    - Contribution from other PRPs
- Is it acceptable?

It All Comes Down to Dollars (continued)

- Compare your costs to “Cash Out”
  - Early Exit
  - 20% premium
  - No Control on Risk Management, Change Management, or of Public Relations Issues
  - No Company knowledge gained
- Is it acceptable?



First Steps in Real Cooperative Negotiations

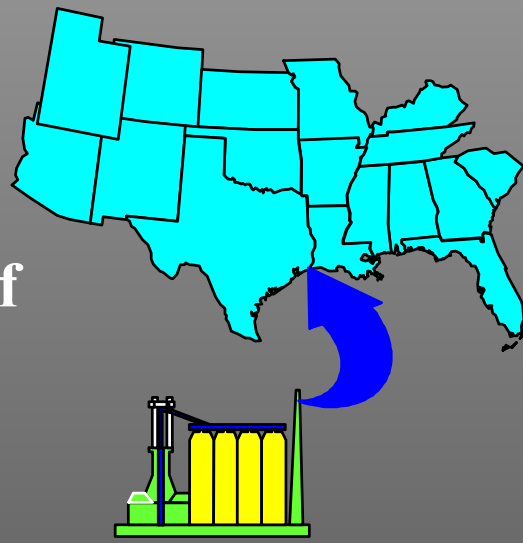
- Illustrate Each Others' Weakness:
  - Trustees: Baseline, Causation, Gray Literature Science, etc.,
  - Industry: Lack of Data, Chemical Concentrations, Physical Mechanisms of Injury, Gray Literature Science, etc.
- Supports Cooperative Approach

Last Steps in Negotiations

- Legal Documents may take the Longest to Negotiate
  - Department of Justice Involvement
  - Clear Criteria of Success and Reaching Certification of Completion Milestones
- Public Comment Period Requirement

WHY PART?

Facility History



- 1901, Initiated Operation by Predecessor to Gulf Oil Company
- Mid 1920's, Gulf's Flagship Refinery and World's Largest Refinery
- 1984, Purchased by Chevron USA
- 1991, Chevron Initiates Voluntary Assessment
- February 1995, Purchased by Clark Refining & Marketing (now Premcor)

Port Arthur Facility

- 3800 Acres of Land
- 14 Miles of Perimeter

Large Facility with 90+ Years of Petroleum Refining Activity

Preparing for the NRDA

- Assembled team and evaluated potential exposure
- Evaluated $ allocation/joint liability
- Identified Trustees and their approach
- Evaluated combining Remediation and NRDA
- Conducted early “at risk” restoration actions

Conducting the NRDA

- Conduct cooperative restoration based settlement negotiations (avoided litigation)
- Provided what the Trustees want (data, maps, etc.)
- Avoid debate on “Injury” by providing cost effective project (e.g. Clearly over compensate)

Implementing the Restoration

- Have Contingency for preferred project failure
  - 2 - 3 alternatives as back up
- Proposing “Global Settlement” of ecological liabilities outside Remedial liabilities (e.g. NRDA, MBTA)
- Prepare for public comment period

Cooperative Mechanisms Related to Injury Assessment, Restoration Project Selection and Restoration Scaling

Sensitivity Analysis

- Essential tool for determining which assumptions have a major impact on the scale of restoration
  - Reduces costs and expedites restoration by identifying potential analyses or studies that would have little impact on the outcome
  - Can help identify data gaps/uncertainties to be addressed by targeted analyses or studies
- Avoid performing arbitrary sensitivity analyses
  - Certain assumptions/parameters are likely highly correlated

Habitat Equivalency Analysis

- HEA calculates compensation for interim lost services, with habitat/resource replacement projects rather than dollars
- HEA determines the amount of habitat/resource to be created or enhanced to provide the same level of services over time as were lost due to the injury
- Requires the implicit assumption that the values per unit of lost services and replacement services are comparable (if not, HEA is still applicable if value differences are known)

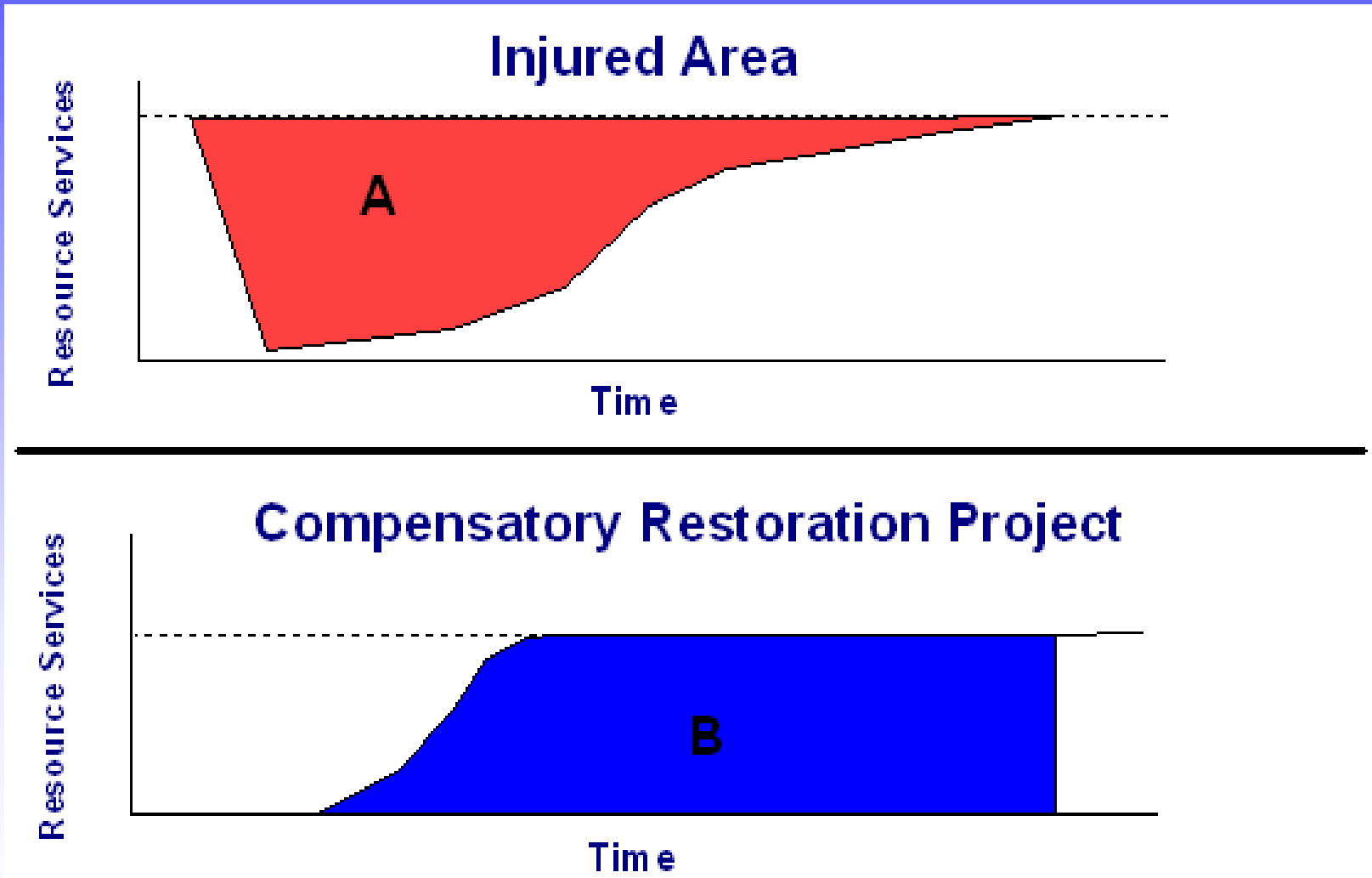
Document and Quantify the Injury

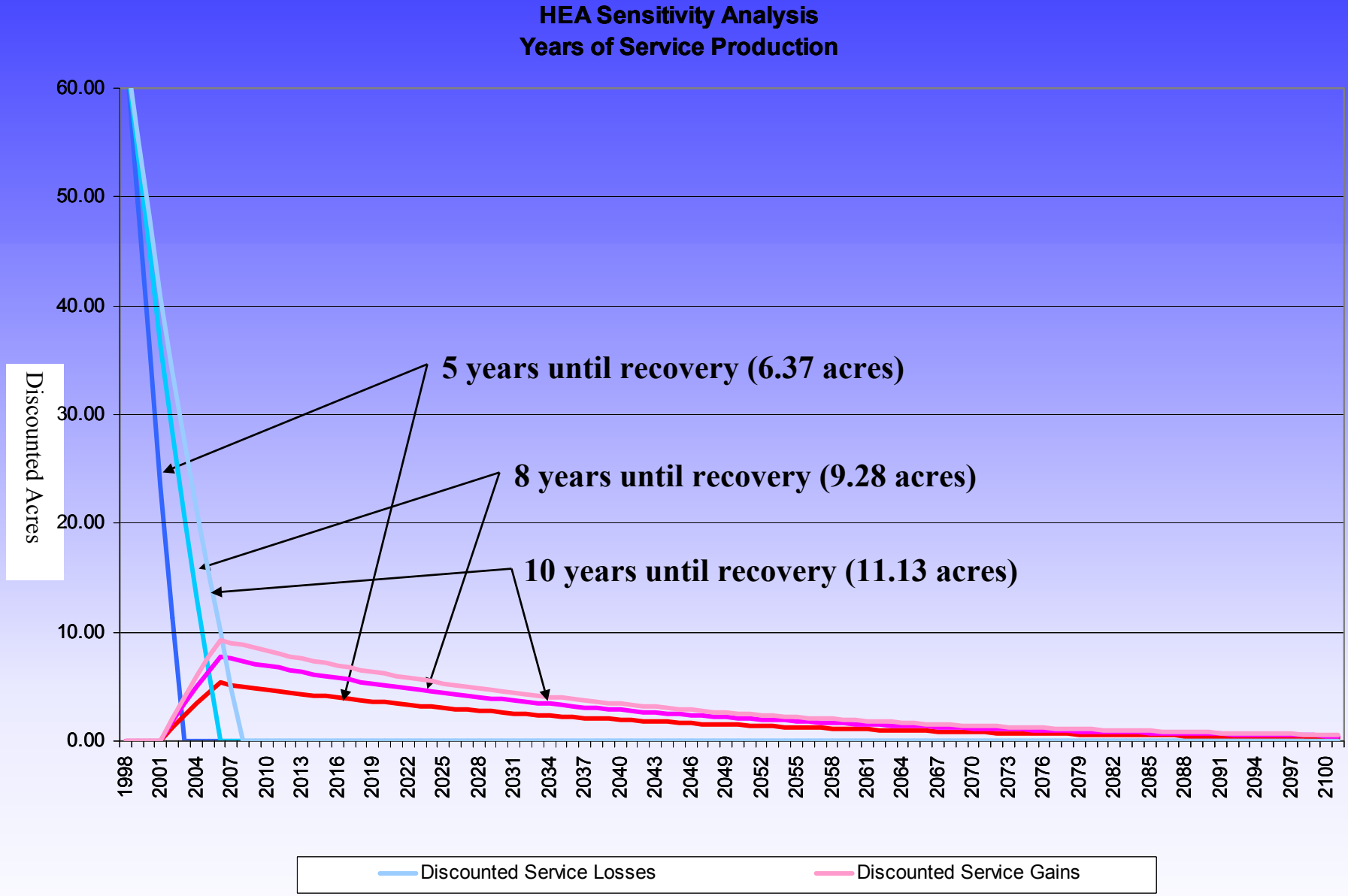
- Identify the types of habitat, biological resources, and resource services that have been injured; identify a metric
- Determine the extent of the injuries
  - Area of injured habitat/resource
  - Severity of the injuries (e.g., 50% loss in services, 100%, etc.)
- Determine the duration of the injury, given trustee choice of primary restoration
  - Will services ever return to baseline?
  - Recovery path

Identify and Evaluate Habitat Replacement Options

- What types of habitats/resources provide services similar to those that were lost?
- Are the values of replacement services and lost services comparable?
- Trustees must determine the productivity of these alternatives relative to the baseline services of the injured resources
- How much time is required to implement the restoration/replacement projects?
- Following implementation, how long will project take to reach maximum function?, how long will project exist?

Graphical Representation of HEA




HEA Sensitivity Analysis
Years of Service Production
Discounted Acres
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1998
2001
2004
2007
2010
2013
2016
2019
2022
2025
2028
2031
2034
2037
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2043
2046
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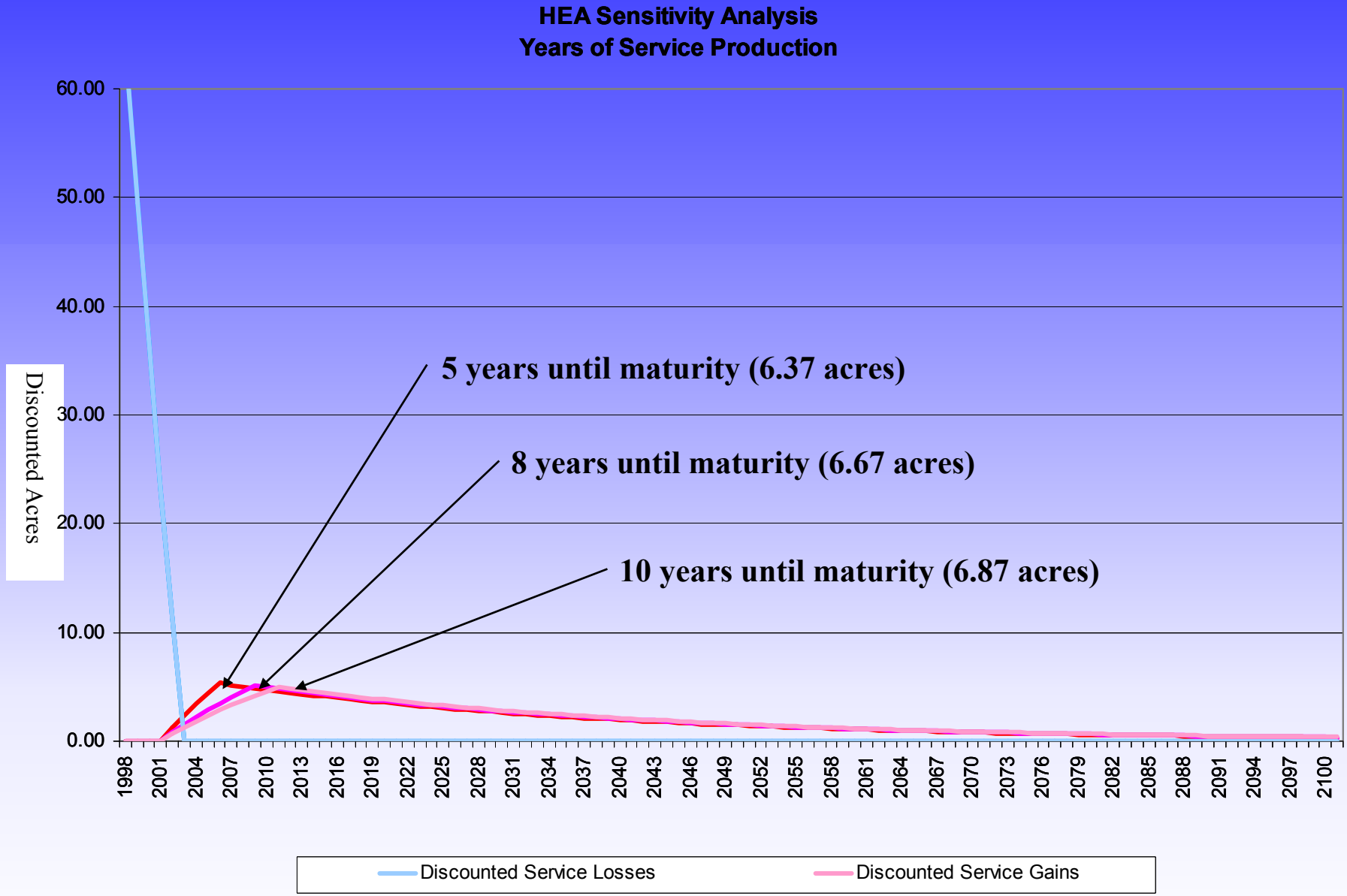
2070
2073
2076
2079
2082
2085
2088
2091
2094
2097
2100
5 years until recovery (6.37 acres)
8 years until recovery (9.28 acres)
10 years until recovery (11.13 acres)
Discounted Service Losses
Discounted Service Gains


HEA Sensitivity Analysis
Years of Service Production
Discounted Acres
60.00
50.00
40.00
30.00
20.00
10.00
0.00
5 years until maturity (6.37 acres)
8 years until maturity (6.67 acres)
10 years until maturity (6.87 acres)
1998
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2007
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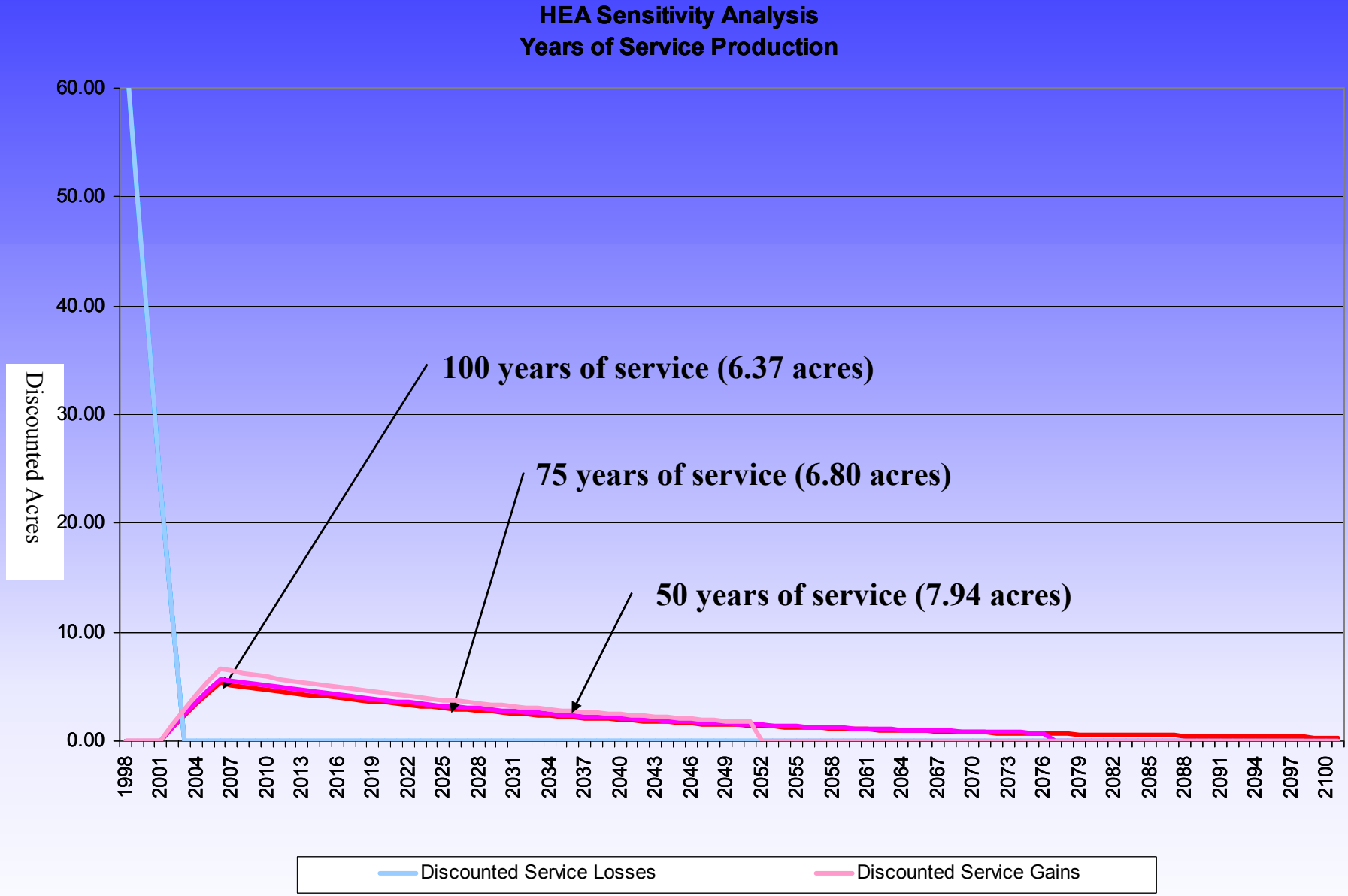
Discounted Service Losses
Discounted Service Gains


HEA Sensitivity Analysis
Years of Service Production
Discounted Acres
60.00
50.00
40.00
30.00
20.00
10.00
0.00
100 years of service (6.37 acres)
75 years of service (6.80 acres)
50 years of service (7.94 acres)
1998
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2100
Discounted Service Losses
Discounted Service Gains

"Reasonable Worst Case" Scenario Approach*

- Approach used to minimize assessment costs and the need for site-specific studies, while ensuring that the public is adequately compensated for resource injuries
- Applicable to CERCLA and OPA cases
- Relies on conservative (i.e. protective) assumptions

"Reasonable Worst Case" Scenario Approach (con't.)

- Identify resources/services potentially adversely affected
- Collect and analyze relevant data on the risk of injury to each resource/service
  - Existing site-specific data, prior scientific studies, literature reviews, data from similar cases, data from RI process, etc.
- Based on existing data, determine whether injury is likely for each category of resources/services erring on side of conservatism (i.e. in favor of finding injury)
  - For categories with little or no reasonable likelihood of injury - no "further consideration required" determination
  - For resources with a likelihood of injury, apply same conservatism to predict extent and severity of injury

Lavaca Bay Example: Rec. Fishing

- Takings ban on finfish and crabs due to mercury contamination since 1988
- Assessment approach: use a model of recreational fishing to estimate the impacts of the ban and the benefits of restoration
- Several models estimated; no one model "correct" in the eyes of trustees, but they felt range of results captured damages
- RWC-like approach: Alcoa agreed to accept model yielding largest damages
  - Trustees assured of sufficient compensation for public
  - Alcoa avoided further cost of refining models

Intentional Overcompensation

- Highlights a critical distinction between cooperative and non-cooperative assessments:

  What trustees can claim vs. what they can accept

- Why would an RP ever intentionally choose to overcompensate the public?
  - Cost-effectiveness
  - Reduce time "on the hook" for monitoring, performance standards, mid-course corrections, etc.
  - Public relations and/or relations with trustees

Example: Dixon Bay Oil Spill

- Chevron oil spill resulted in lost ecological services within 200-250 acre area of *Spartina* and *Phragmites marsh*
- Natural recovery was preferred primary restoration alternative
- For compensatory restoration, creation of 5 acres of marsh was necessary to compensate the public for interim lost services
- Instead of typical “fill and plant” marsh restoration, trustees and Chevron agreed on a freshwater diversion project to restore restoration site’s original hydrology

Example: Dixon Bay Oil Spill

March 1996

5 acres required

October 1997

21 acres created as of 1997, with potential for 50+

Creative Restoration Project Development

- Restoration under CERCLA and OPA: to restore, replace, or acquire the equivalent
- Require a linkage ("nexus") between the resources and services injured, and those provided by the restoration project(s)
- Projects aimed at preventing future events that would injure the same or similar resources may meet this criterion
  - Form of "acquisition of the equivalent"
  - Often argued that "natural" resources are better than "created/restored"
  - Prevention-oriented projects may be cheaper and faster to implement than traditional habitat restoration projects

Example: Blackbird Mine

- Mining activities contaminated Blackbird and Panther Creeks
  - Copper contamination of in-stream habitats and water column.
  - Reduced in-stream biota
- Affected Resources:
  - Salmon and Salmon habitat
  - In-stream biota

Example: Blackbird Mine (con't)

- Restoration Actions:
  - Fencing along stream to prevent cattle from entering salmon spawning/rearing habitat
    - Prevent additional habitat destruction, and salmon redd destruction.
    - Prevent increased sedimentation

Example: Blackbird Mine (con't)

- Settlement
  - Scaled amount of restoration based on benefits of future preventative measures
    - Had estimates of the increased smolt production as a result of protective fencing

Caveats - Preventative Projects

- The benefits of the restoration must be quantifiable and supported by data
  - Avoid projects with ambiguous benefits
- Be careful not to count “sham benefits”, i.e., injuries not likely to be prevented by project
- In using historical data to project benefits, evaluate whether past patterns are likely to hold in the future
- Account for lifespan of project in expected benefit calculation and add necessary maintenance expenses

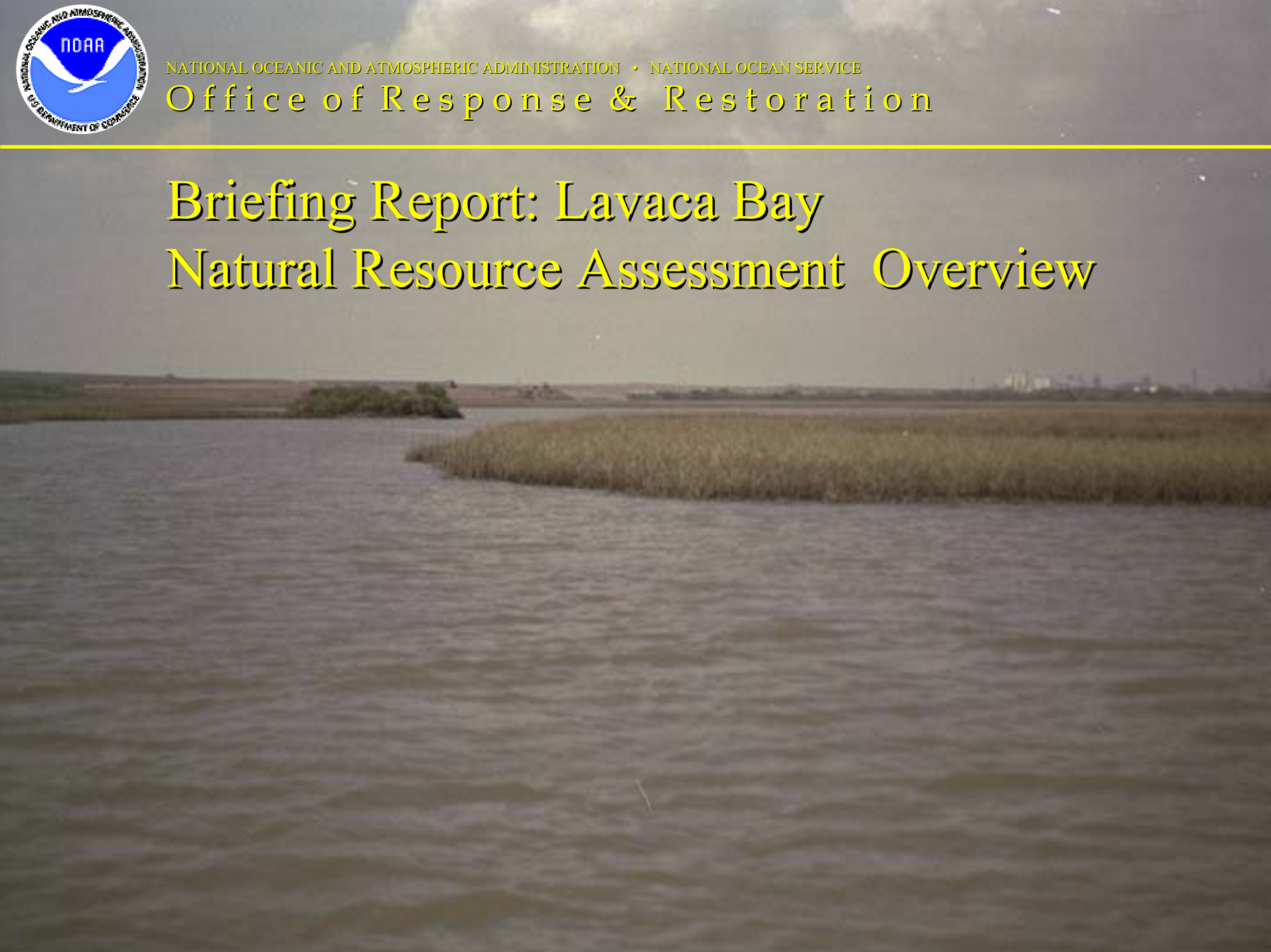
Conclusions

- Individual incidents don't happen in isolation
  - Long-term professional relationships
  - Tenor set during response will often last through the entire assessment
- Understand the constraints each party operates within
- Communication and documentation
- Pre-spill planning goes a long way

Conclusions (con't.)

- Balance between need for additional information and acceptable uncertainty
- Focus on restoration
  - Need strong nexus between injury and benefits
  - This is the goal of the trustees
- Statutes and regulations leave room for creativity and flexibility

Briefing Report: Lavaca Bay
Natural Resource Assessment Overview



NRDA Chronology

• - In 1988, TDH finds Hg in finfish & crabs taken from Lavaca Bay exceed FDA action level (1 ppm) in edible flesh.

• - 4/21/88 - TDH issues order prohibiting taking of finfish & crabs for consumption from 4 sq. mile area of Lavaca Bay.

• - In 1990, NOAA initiates meetings with co-trustees in Texas regarding potential for natural resources injuries due to Hg.

• - 12/90 - First Trustees/Alcoa meeting to discuss cooperative approach to NRDA.

• - 2/14/91 - First of 6 eventual tolling agreements protecting trustee claims during negotiations.

• - 4/14/92 - Preliminary Studies Funding Agreement. Alcoa provided $547K, paid past "assessment costs", and participated. Focused on food web model & sediment sampling

Alcoa (Point Comfort)/Lavaca Bay NPL Site

- Proposed for NPL listing 6/23/93 (58 FR 34018)
- Listing final 3/25/94 (59 FR 8724, 2/23/94)
- EPA/Alcoa AOC, 3/31/94
- Focus of NRDA planning shifted to minimizing & defining NRDA claims via integration and activities paralleling remedial process
- Cooperative Management Agreement (CMA) between response agencies & Trustees, 6/6/94

Subsequent NRDA Agreements (w/Alcoa)

Funding agreements (two) - 2/16/96

- $50K to each Trustee agency ($250K)
- Covered technical consultations for up to two years on NRDA data needs & issues related to RI/FS.

Cooperative NRDA MOA - 1/14/97

- Replaced the 1996 funding agreements.
- Objectives & framework for cooperative NRDA process
- Restoration-focused.
- To build on RI/FS, as appropriate.
- Provided for payment of Trustee costs incurred during assessment process.


Response

The Superfund Remedial Process

General Notification & Coordination

Initiation of PRP Search/Enforcement Activities

Issuance of an RI/FS Special Notice Invitation

PRP Good Faith Offer to Conduct RI/FS

RI/FS Settlement

Issue RD/RA Special Notice Letter

PRP Good Faith Offer to Conduct RD/RA

RD/RA Settlement and Consent Decree

Cost Recovery

EPA -> Trustee notification of planned enforcement

EPA - Trustee exchange info on PRPs

EPA - > Trustee notifies of negotiations with PRPs & encourages Trustee to participate

Trustee - >EPA request EPA enforcement action

Trustee -> EPA provides written notification of intention to participate

EPA-> Trustee evaluate request, 90d

EPA -- >Trustee notify of issue of special notice for RI/FS

Trustee participates in negotiations

EPA -> Trustee provides draft special notice letter

EPA -> Trustee provides copy of PRPs "Good Faith" proposal

EPA -> Trustee provides with negotiated draft agreements

EPA -> Trustee provides draft special notice letter package

EPA -> Trustee provides copy of PRPs "Good Faith" proposal

EPA -> Trustee notifies of conclusion of negotiations and provide signed CD

Trustee -> EPA may review & comment on negotiated draft agreements, 30d

Trustee -> EPA may review & comment on negotiated draft agreements, 30d

EPA - Trustee notifies of decision to issue special notice letter

Trustee -> EPA proposes additions to settlement agreement, 30d

Trustee -> EPA provides info on recoverable costs that may be addressed in draft CD

Trustee -> EPA may review draft consent decree, 30d

Trustee -> DOJ may authorize to issue CNTS

Trustee does not participate in negotiations

EPA -> Trustee provides final special notice letter on request

EPA -> Trustee provides copy of offer on request

EPA -> Trustee notifies of completed negotiations and provides copy of signed settlement agreement

EPA -> Trustee provides copy of final notice & responses to notice letter on request

EPA -> Trustee provides copy of offer on request

Trustee -> EPA notifies before initiating communications with PRP, 60d

EPA <- -> Trustee coordinate on cost recovery

EPA - -> Trustee schedule of cost recover actions

Trustee - >EPA notifies of plan to file NRD claims

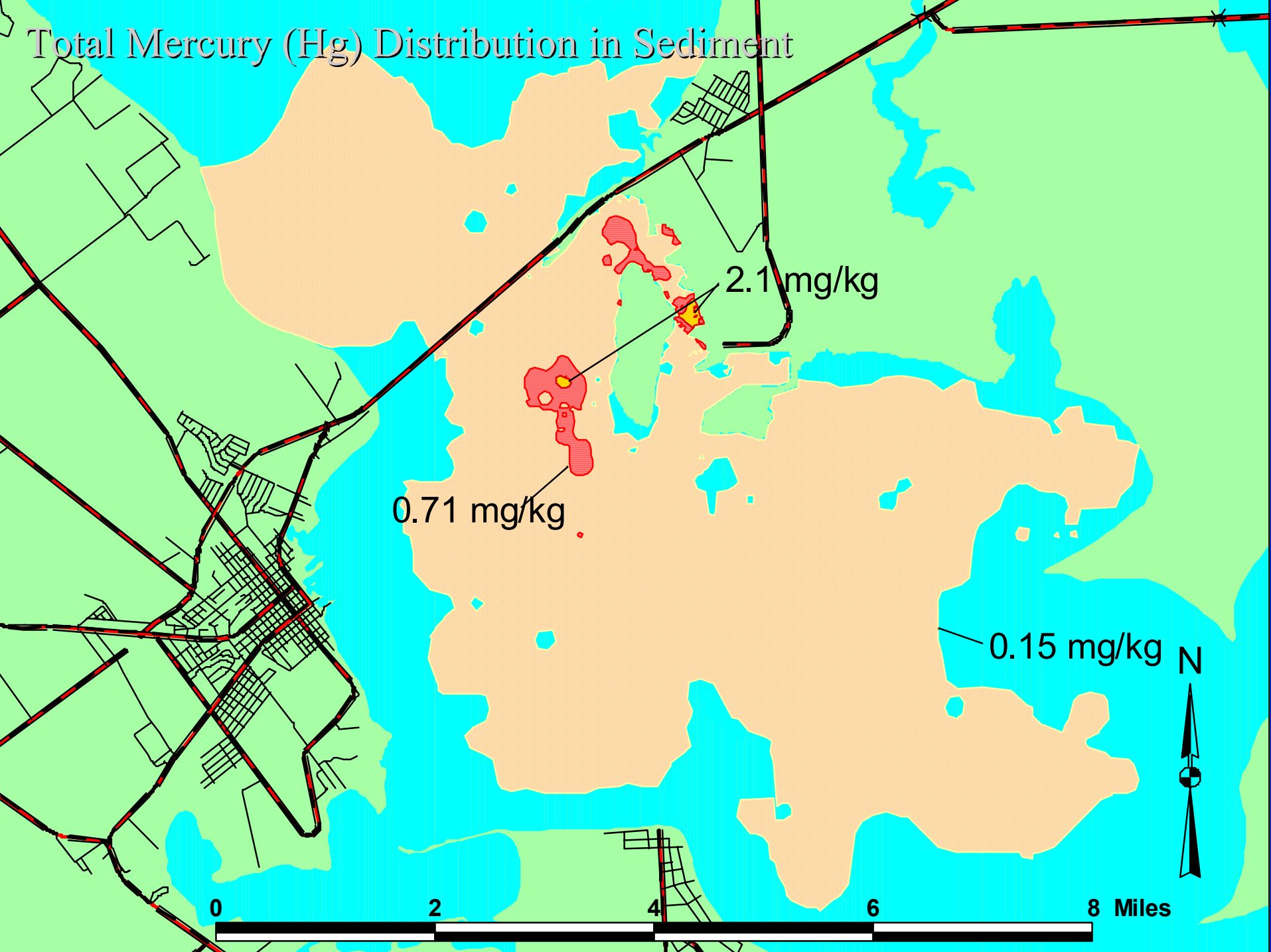
SD PA SI/ESI HRS NPL AOC-SOW RI/FS WPs RI +HH & E RA FS ROD CD RD/RA O&M

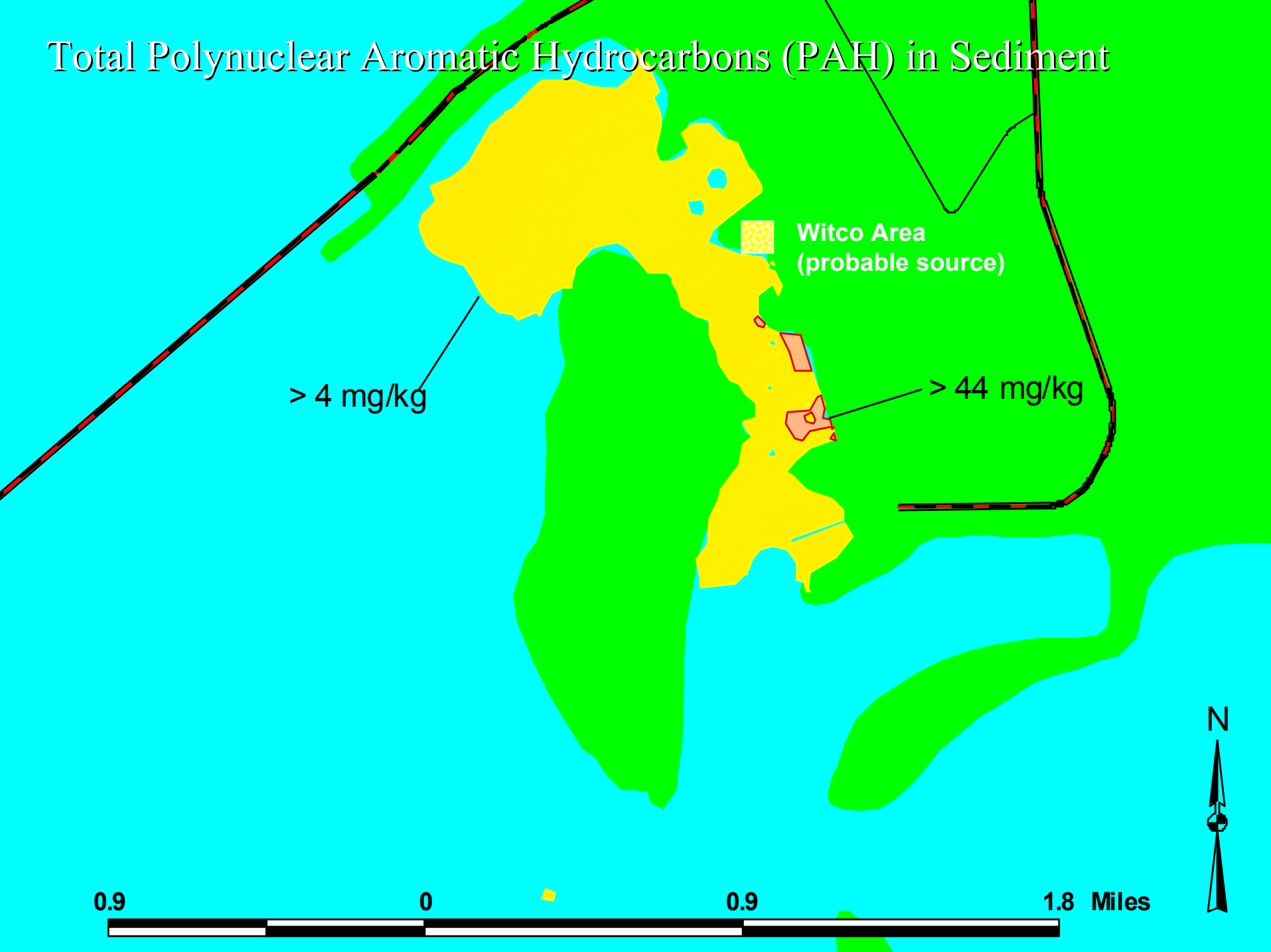
Contaminants of Concern

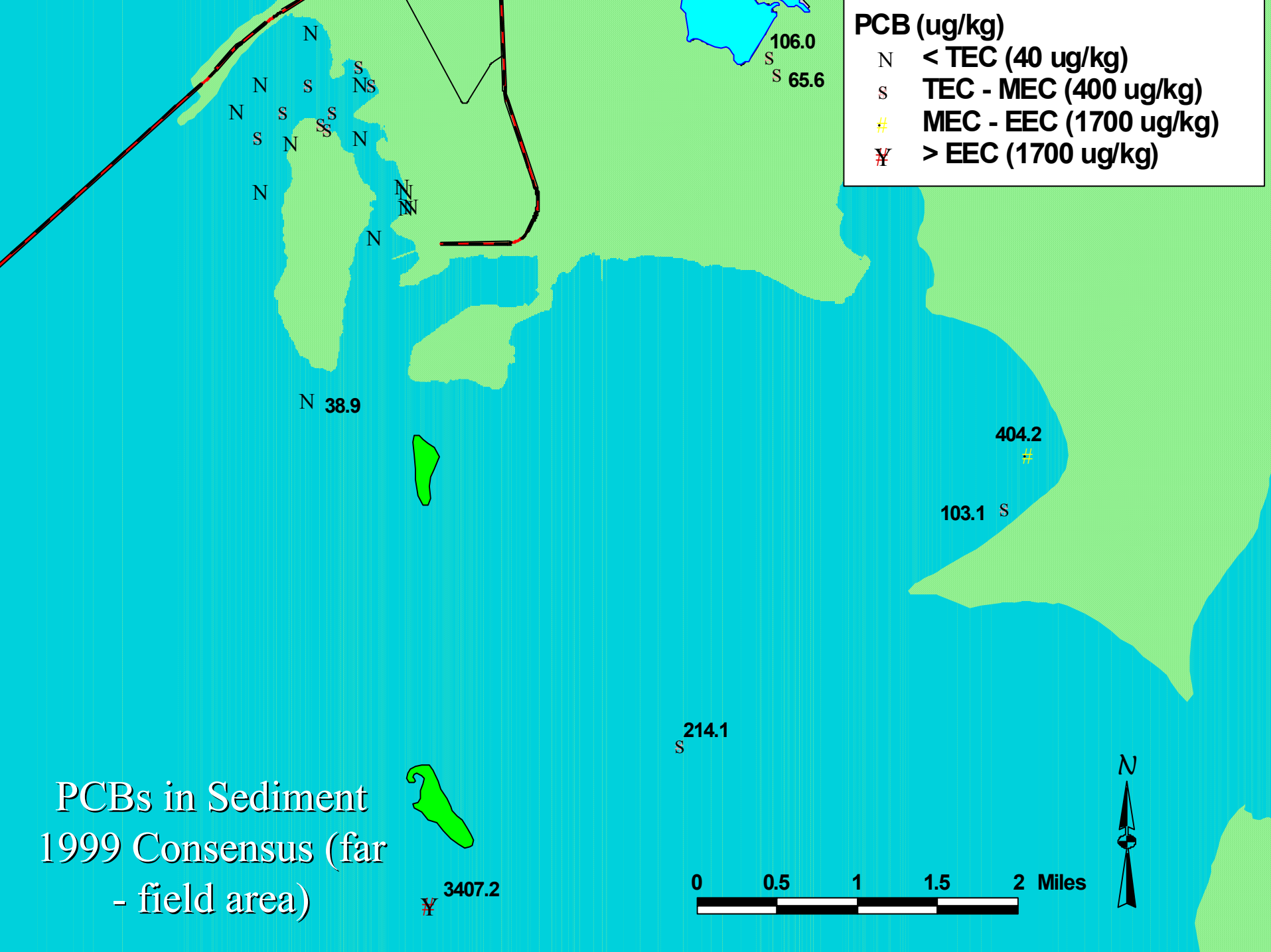
- **Mercury** (Hg) - used in the chlor-alkali plant to manufacture caustic soda for bauxite digestion

- **Polynuclear Aromatic Hydrocarbons** (PAH) - released from carbon paste manufacturing at the site

- **PolyChlorinated Biphenyls** (PCB) - found in the bay at low concentrations - the gradient indicates other sources not related to Alcoa PCO, therefore, dropped as a COC


Total Mercury (Hg) Distribution in Sediment
2.1 mg/kg
0.71 mg/kg
0.15 mg/kg
N
0
2
4
6
8 Miles


Total Polynuclear Aromatic Hydrocarbons (PAH) in Sediment
Witco Area
(probable source)
> 4 mg/kg
> 44 mg/kg
N
0.9
0
0.9
1.8 Miles


PCB (ug/kg)
N < TEC (40 ug/kg)
S TEC - MEC (400 ug/kg)
MEC - EEC (1700 ug/kg)
¥ > EEC (1700 ug/kg)
106.0
65.6
38.9
404.2
103.1
214.1
3407.2
PCBs in Sediment
1999 Consensus (far
- field area)
0 0.5 1 1.5 2 Miles
N

Removals: Source Area Controls

- Hydraulic control of Hg laden GW to Alcoa Channel, May 1998

- Recontouring and armoring Dredge Island Began - Spring 1998

- Dredged 90,000 yd ^{3} of highly contaminanted sediment (~200 mg/kg) - Summer 1998

- Dredged 10,000 yd ^{3} contaminanted sediment (~2 mg/kg) - October 1998

Remedial Schedule

- Removals & treatability studies (1998 & 1999)
- Finalization of Ecological & Health Risk Assessments (September 1999)
- Finalization of Remedial Investigation (March 2000)
- Finalization of Feasibility Study (July 2000)
- Record of Decision (September 2000?)


NRDA

The Reasonable Worst Case Approach

… to natural resource damage assessment recognizes that it is sometimes better to make reasonable, conservative estimates of natural resource injuries/losses using information obtained for other purposes than to spend additional time and money on injury assessment studies.

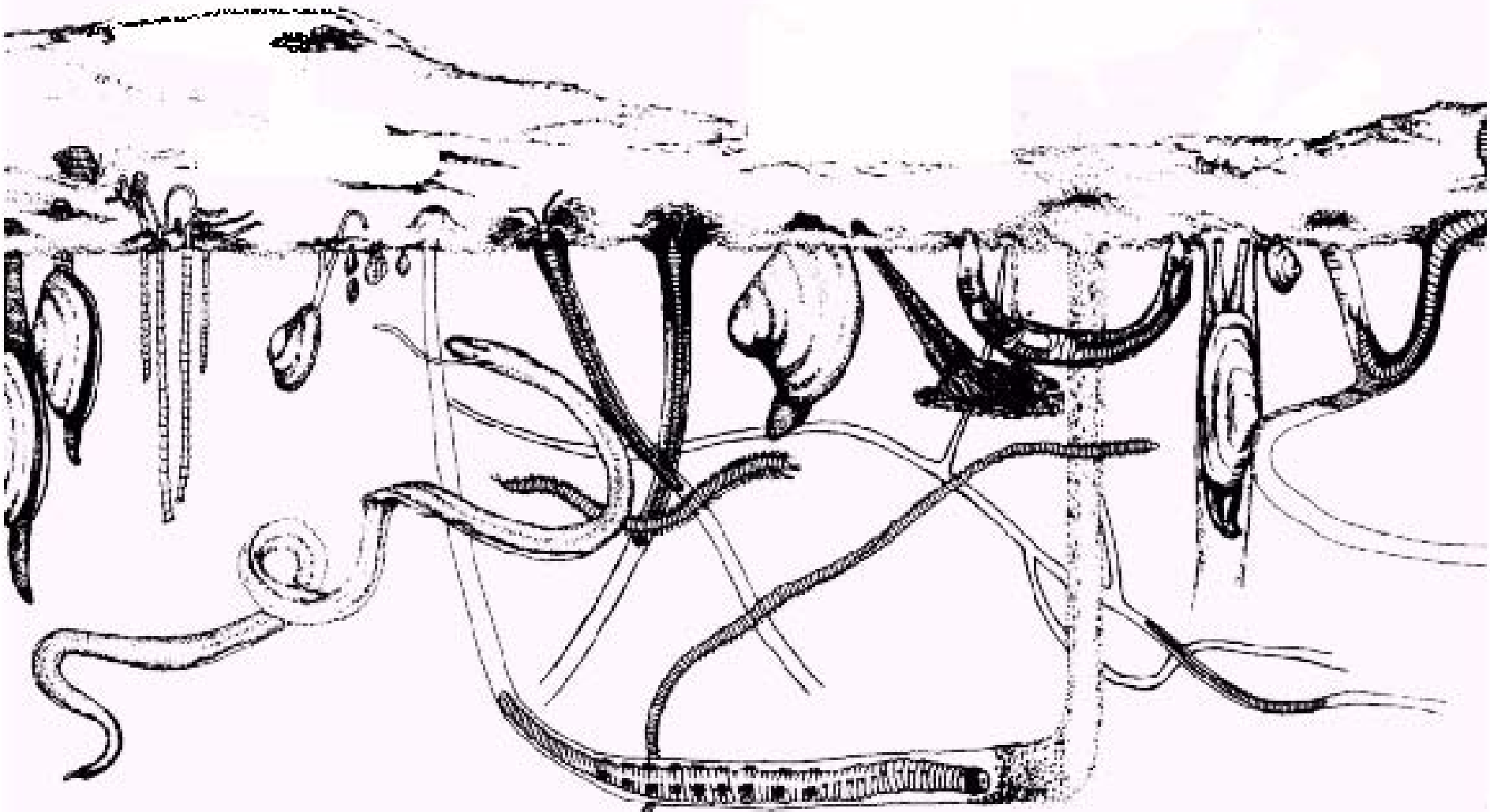
General RWC Process for each injury

- Map contaminant distribution in bay sediment
- Use scientific literature & RI Results
  to establish injury levels
- Measure area of each injury zone
- Complete RWC Technical Memorandum
- Perform Habitat Equivalency Analysis
- Select restoration project(s) by CERCLA criteria

Natural Resource Injuries Considered

- Benthos (oyster reef, open water & salt marsh)
- Birds
- Fish
- Terrestrial habitats
- Ground Water (RWC determined no injury)
- Surface Water (RWC determined no injury)
- Fishing Closure (recreational human use)

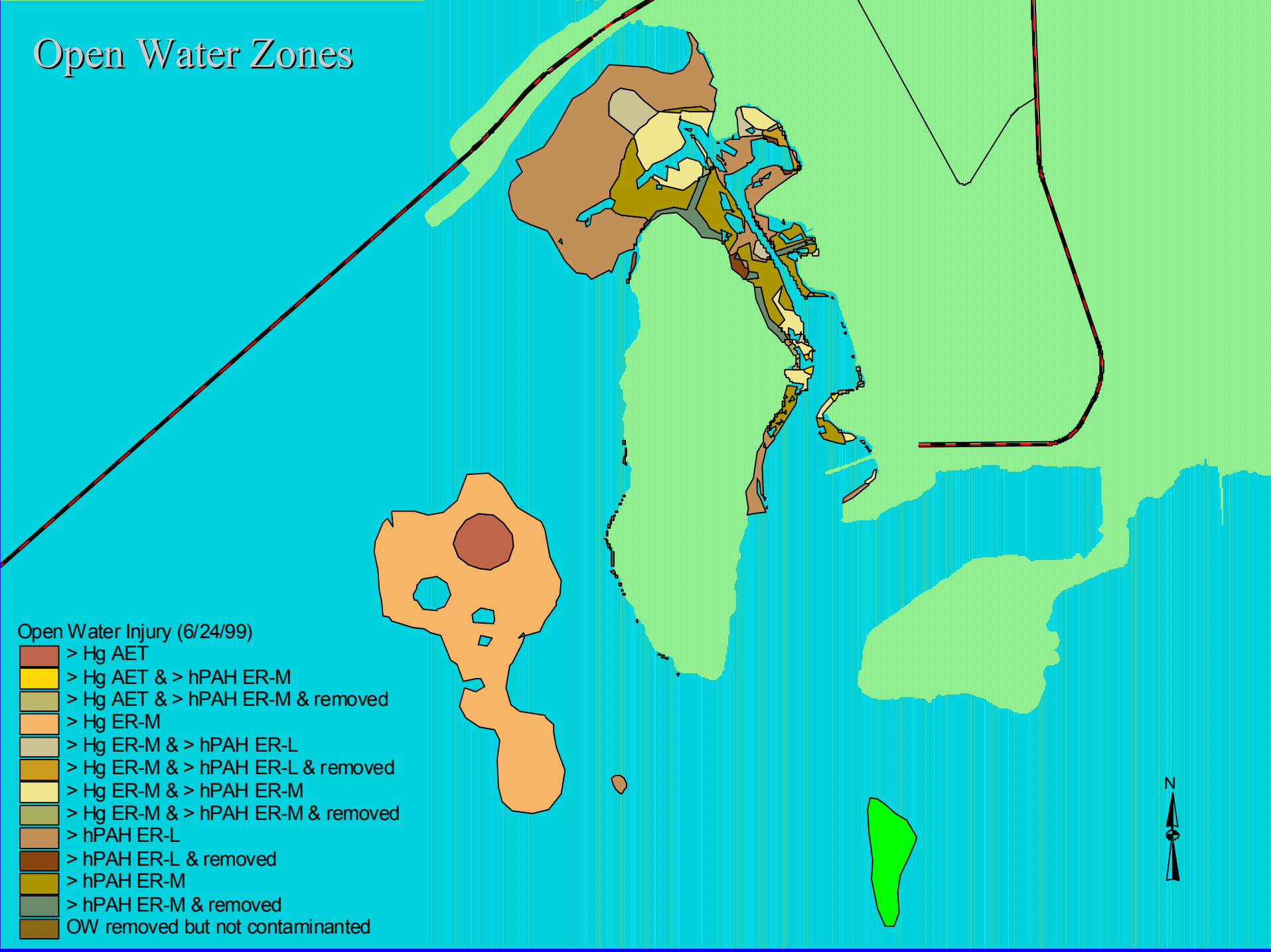
RWC Injury Assessment: Ecological Resources



Information Sources for Benthos Assessment

- Analytical Chemistry RI/FS data (nature and extent)
- Sediment Quality Triad study (SQT)
- RI Ecological Risk Assessment & literature survey for
  - Hg & PAH growth effects
  - Hg & PAH survival effects
  - Hg & PAH reproduction effects
  - Hg behavioral effects
- Percent of Loss of Function (Injury) was conservatively derived from this information

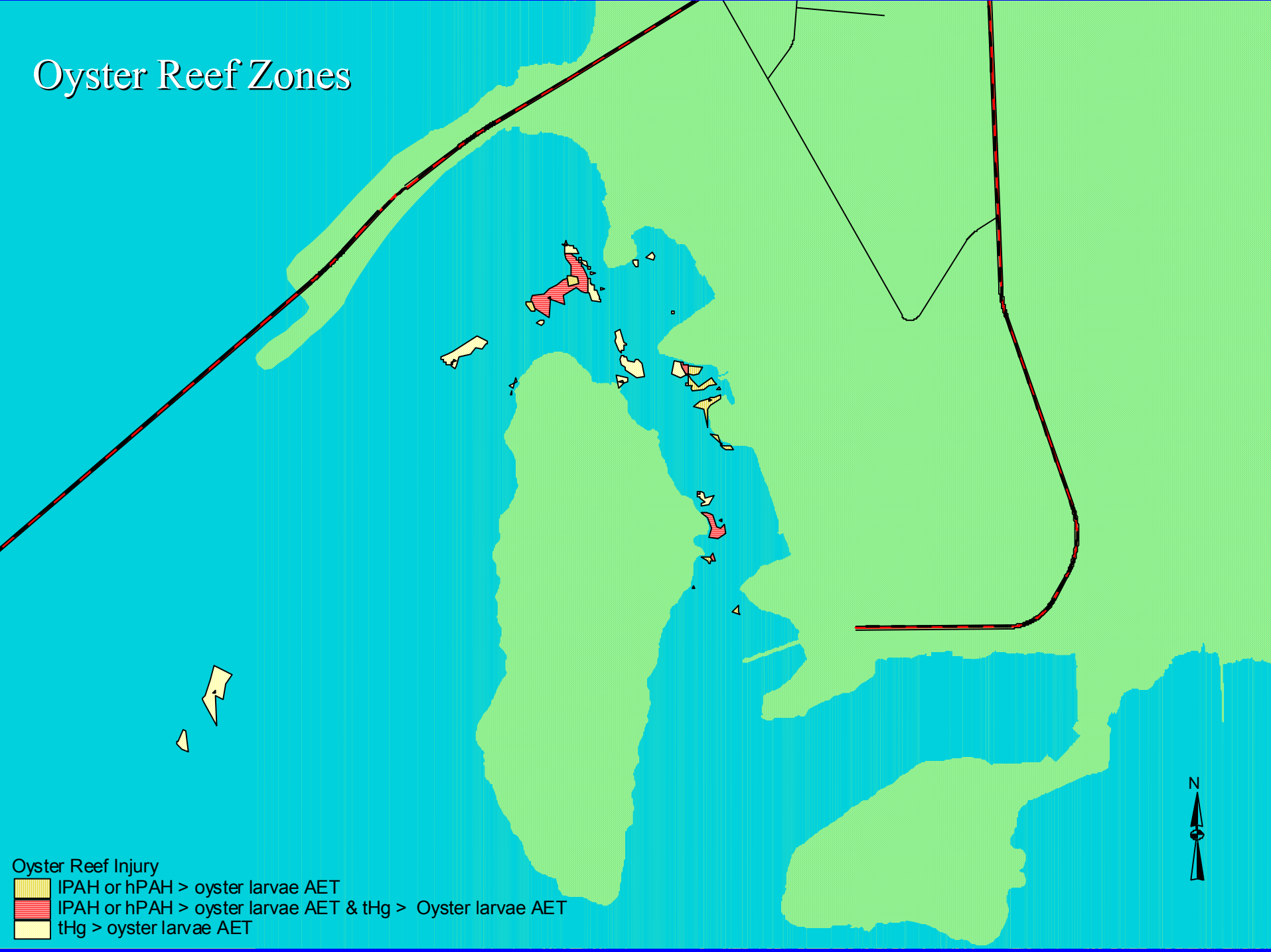
Open Water Zones



Marsh Zones


Estuarine Low Marsh Injury
Marsh Removed & > Hg ER-M & > hPAH ER-L
> Hg ER-M & > hPAH ER-L
> Hg ER-M & > hPAH ER-M
> hPAH ER-L
> hPAH ER-M
Marsh Removed & > Hg ER-M & > hPAH ER-M
Marsh Removed & > hPAH ER-L
Marsh Removed & > hPAH ER-M
Marsh Removed, no chemical injury
N

Oyster Reef Zones



Fish RWC Injury Assessment

- Use scientific literature & RI Results to establish critical tissue values above which injury results

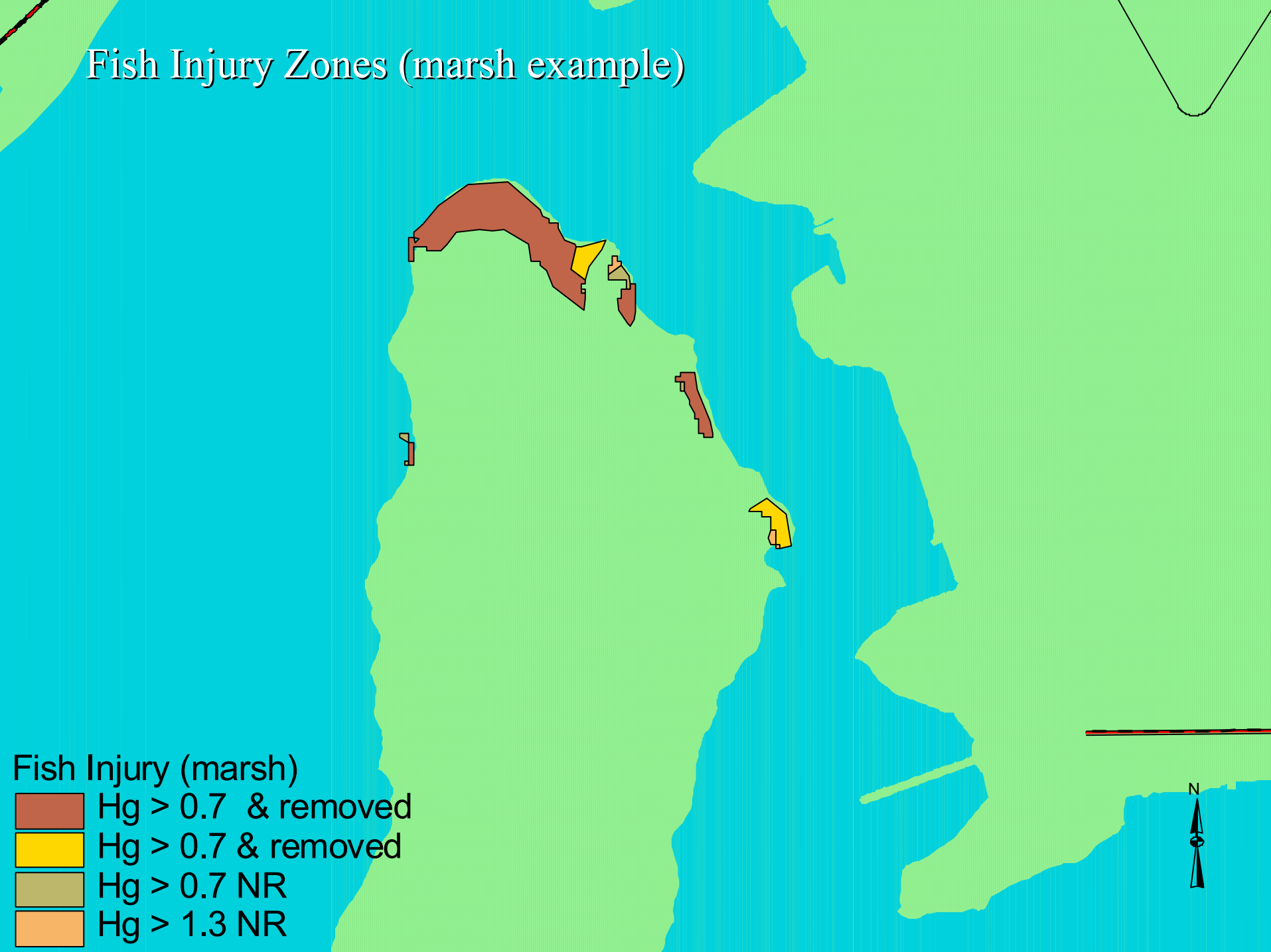
- Use food web model to calculate sediment levels that would result in tissue concentration > critical value

- Measure area of each sediment zone

- Draft Technical Memorandum

- Perform Habitat Equivalency Analysis

Fish Injury Zones (marsh example)



Bird RWC Injury Assessment

- Use scientific literature & RI Results to establish critical tissue values above which injury results
- Determine the dose of Hg that would be be injurious to avian resources using ecological risk assessment information
- Use food web model to calculate a sediment value that would result in the above dose
- Measure area of each sediment zone
- Draft Technical Memorandum
- Perform Habitat Equivalency Analysis

Ground Water RWC Injury Assessment

- Measured [Hg] in zones A, B & C (non-detect in C)
- Compared [Hg] to promulgated criteria
- Determined use classification of ground water
- Determined no public loss under TX or US law

Bay Surface Water RWC Injury Assessment

- Measured [Hg] in Lavaca Bay; detected in Alcoa channel
- Compared [Hg] to Texas Water Quality Standards
- Found no [Hg] greater than chronic TWQS value in Bay
- Determined that no injury has occurred to Bay water

Terrestrial Injury Assessment

- Injury due to remedial actions only
- Addressed in final stage restoration plan

Ecological Restoration Strategy

Injury	Restoration
Oyster Reef	Oyster Reef creation
Marsh	Marsh creation
Soft-bottom Benthos	Marsh/Reef creation
Terrestrial	Terrestrial enhancement
Birds/Fish	Marsh/Reef creation

Restoration Planning

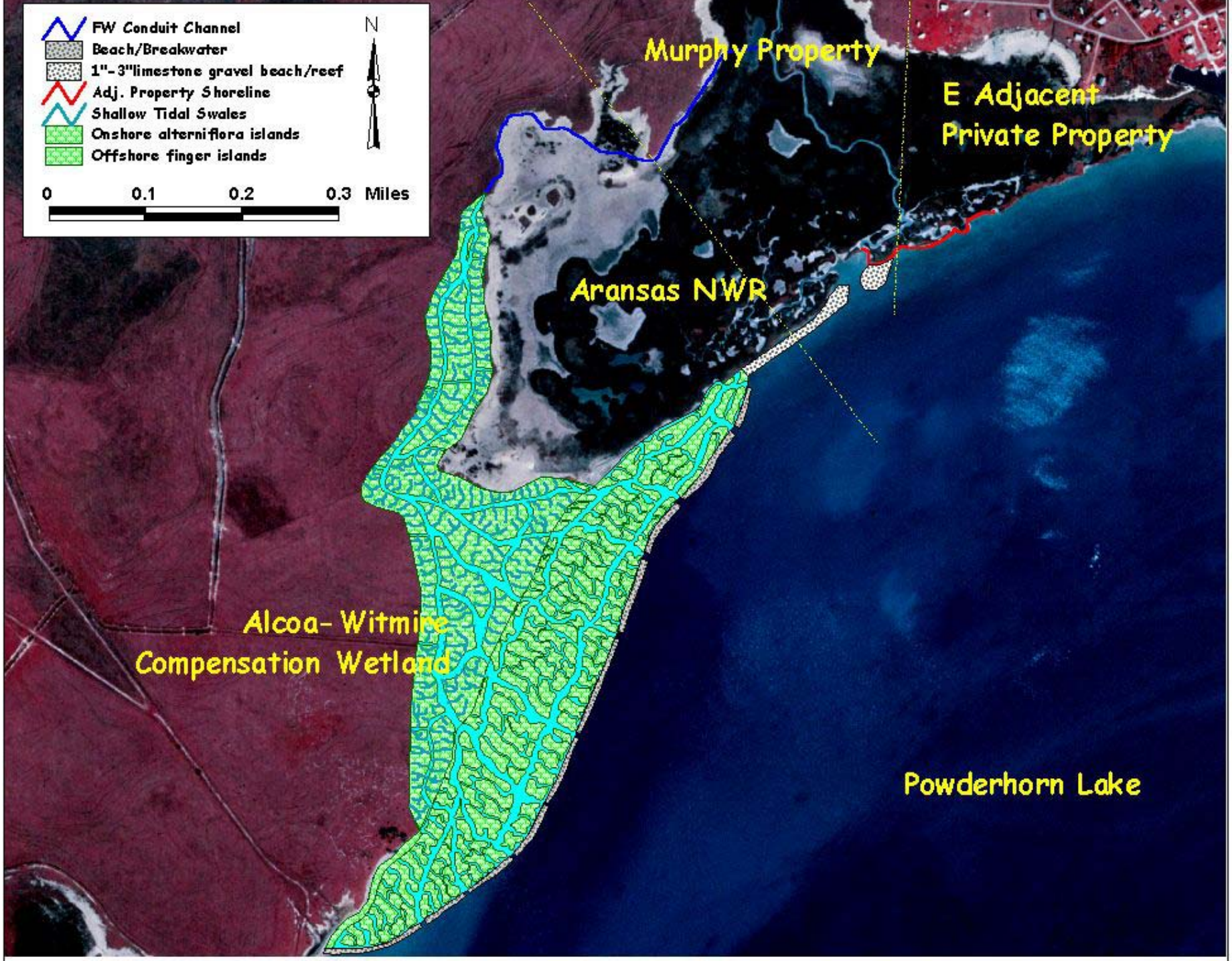
Recreational Fishing - Fishing Closure/Lost Fishing Opportunities

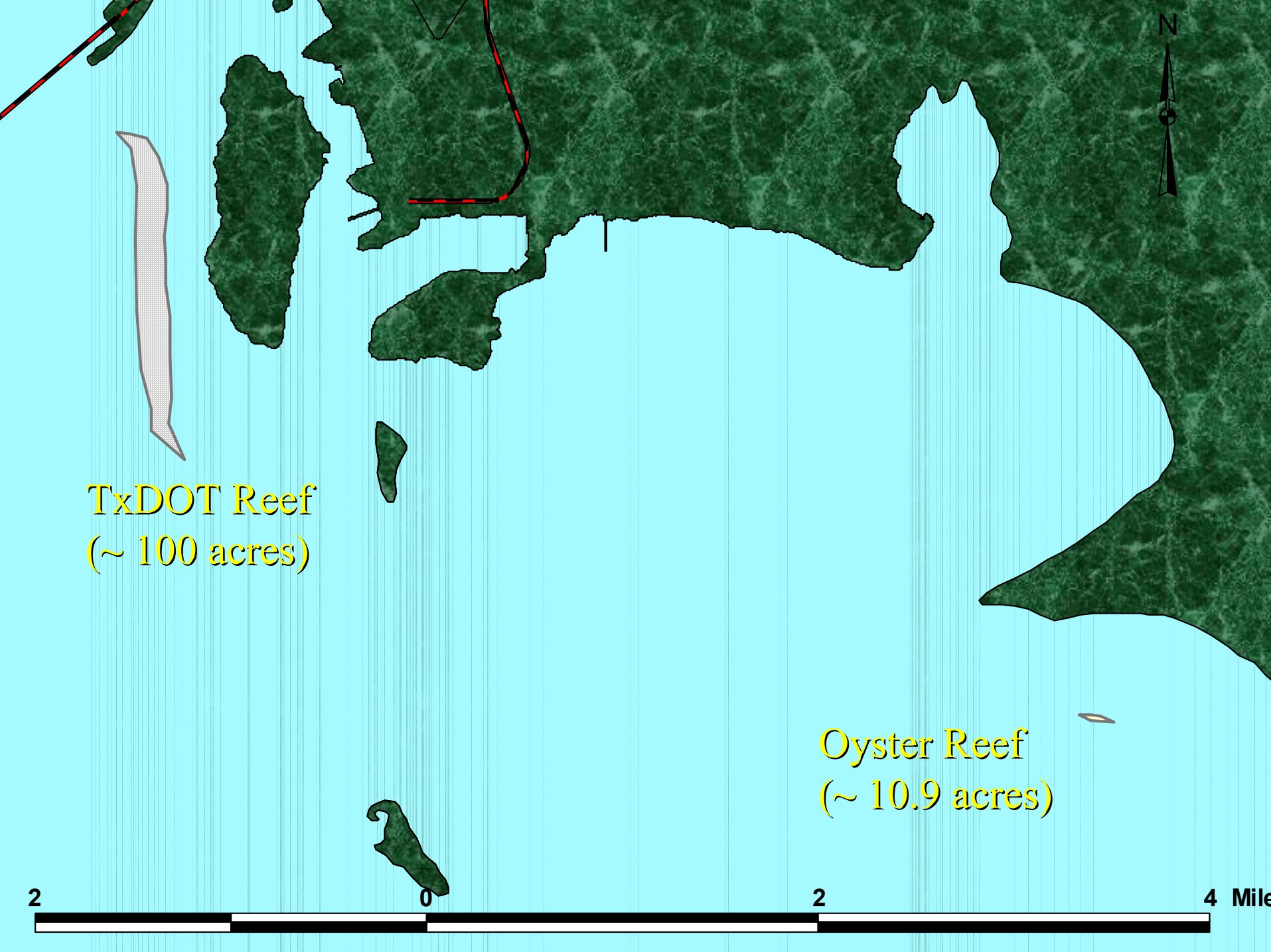
Ecological Stage 1 - Interim (1981-1999) & removal losses through December 1999

Ecological Stage 2 - Remedial losses and continuing injury until return to baseline (recovery)

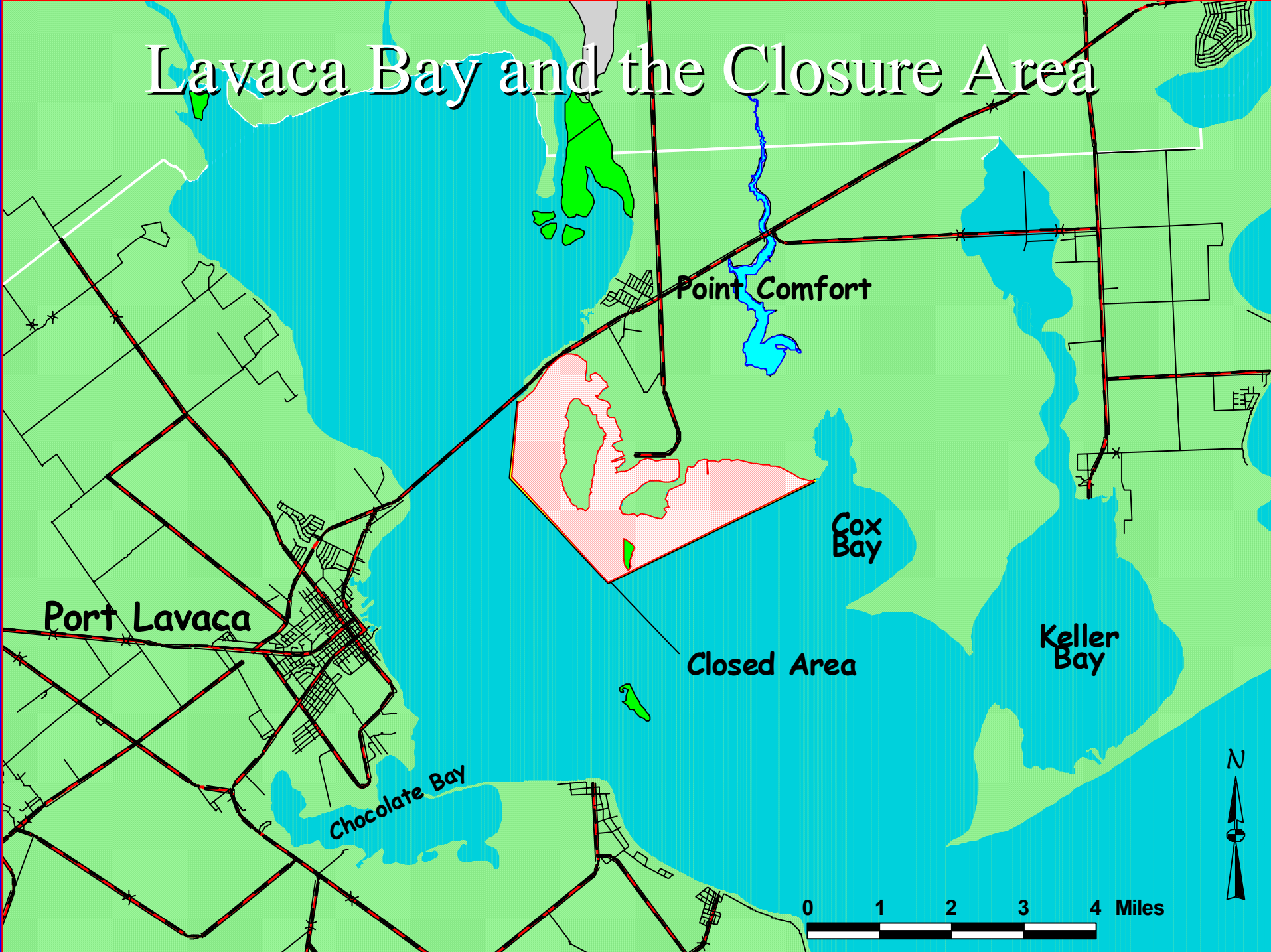
Project Selection Criteria

- proximity to injured habitat
- potential for benthic habitat improvement
- effect on environment
- likelihood of success
- benefits to multiple resources
- effect on public safety
- project cost


FW Conduit Channel
Beach/Breakwater
1"-3"limestone gravel beach/reef
Adj. Property Shoreline
Shallow Tidal Swales
Onshore alterniflora islands
Offshore finger islands
N
0
0.1
0.2
0.3 Miles
Murphy Property
E Adjacent
Private Property
Aransas NWR
Alcoa- Witmire
Compensation Wetland
Powderhorn Lake


N
TxDOT Reef
(~ 100 acres)
Oyster Reef
(~ 10.9 acres)
2
0
2
4 Mile

Recreational Fishing Service Losses


Lavaca Bay and the Closure Area
Point Comfort
Cox Bay
Keller Bay
Port Lavaca
Closed Area
Chocolate Bay
N
0 1 2 3 4 Miles

Recreational Fishing Service Losses

- Loss of recreational opportunity due to consumption ban
- Fish consumption ban affects recreational fishing
  - anglers choose to fish at alternative, less preferred, site
  - anglers who choose to fish in closure area lose satisfaction of fish consumption
- Trustees and Alcoa assessed losses associated with consumption ban

Restoration-Based Compensation

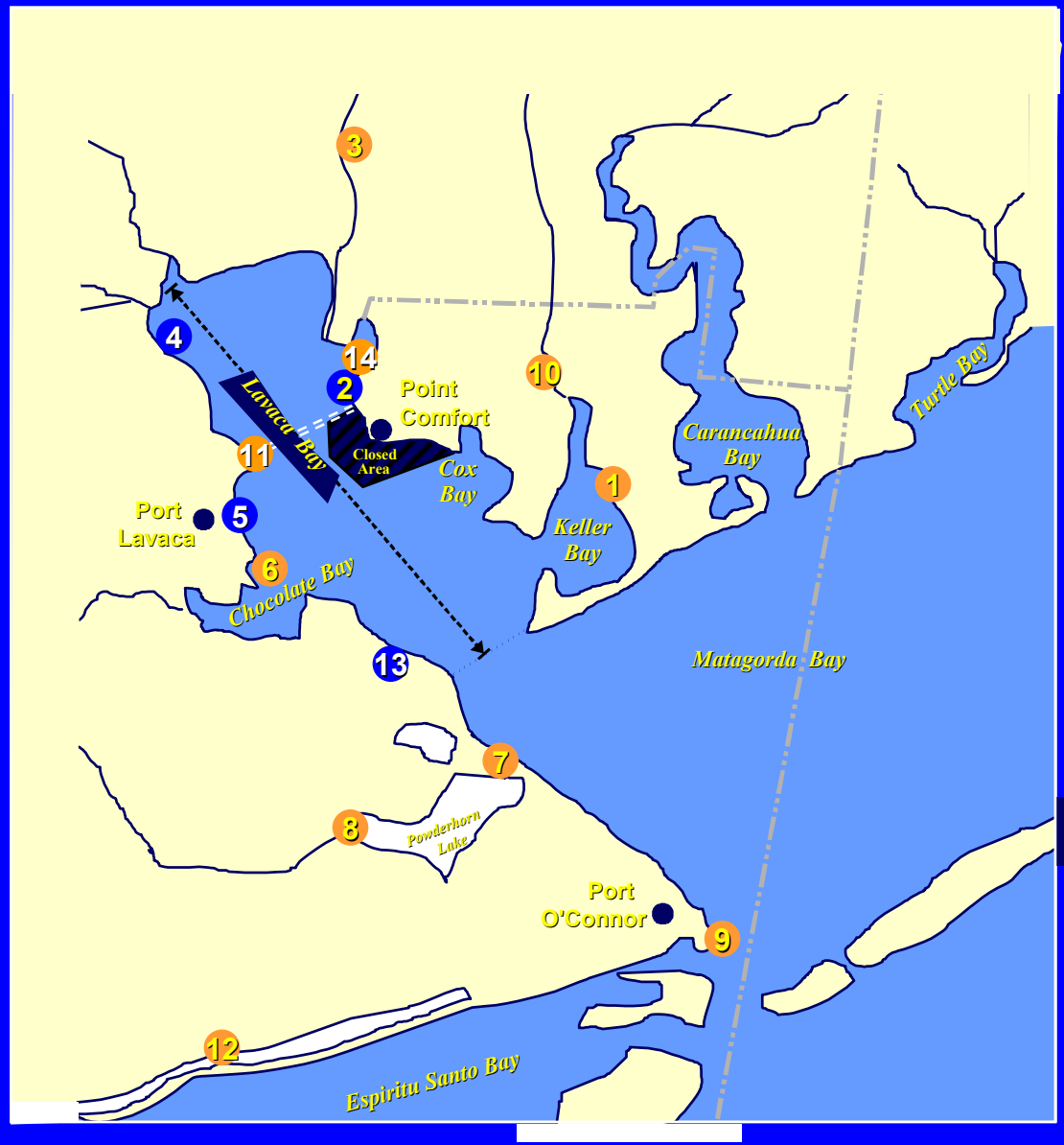
- Compensation for losses based on restoration projects not dollars
- Restoration should be in-kind and near the injury site, i.e., it should provide enhanced recreational fishing opportunities in the vicinity of the injury
- Increasing the quality or quantity of fishing can be done by improving fishing facilities
  - Facilities, such as piers, boat ramps, etc., provide access to the resources and recreational fishing opportunities of the kind that are lost during the consumption ban
- Trustees determine the type and quantity of restoration to compensate for the losses

Estimation of Service Losses and Gains

- Survey anglers about fishing
- Analyze fishing survey data
- Estimate a site-specific recreational fishing model using survey data
- Use the model to estimate the losses associated with the closure and the benefit of any restoration action

Potential Locations for Recreational Fishing Projects

1. Olivia
2. Bean Property
3. Lolita
4. Six-Mile Park (preferred)
5. Port Lavaca Bayfront (preferred)
6. Harbor of Refuge
7. Indianola
8. Powderhorn Lake
9. Port O'Connor
10. Keller Creek
11. Lighthouse Beach (preferred)
12. Fulghum Launch
13. Magnolia Beach (preferred)
14. Point Comfort (preferred)



Restoration Projects

To compensate for boat-mode injuries

- Six-Mile Park - Boat ramp, dock and bulkhead
- Lighthouse Beach Park - dock, clean out & repair the CDF and harbor dredging
- Magnolia Beach - jetty extension and bulkhead repairs

Restoration Projects

To compensate for pier/shore-mode injuries

- New fishing piers at Six-Mile, Point Comfort and Port Lavaca Bayfront

  - One pier at each location
  - Lighted piers, 300-350 linear feet, 8 feet wide
  - Piers include handrails
  - Configuration of piers to be determined
  - Point Comfort site includes construction of parking (~ 10 spaces) and paved access walkway

Recreational Fishing Assessment

Conclusions

- Projects provide in-kind compensation: projects provide recreational fishing services by providing access to fisheries resources
- Projects provide enough compensation should closure remain in place until 2030 (closure only anticipated until 2010)
- Assessment methods and restoration projects are supported by Alcoa

Questions?

U.S. Department of Commerce

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National Oceanic and Atmospheric Administration

National Ocean Service

OFFICE of RESPONSE and RESTORATION

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Factors Leading to Successful Cooperative Assessments

Lisa DiPinto
Injury Assessment Coordinator
Damage Assessment Center

NOAA's Office of Response and Restoration

Introduction

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- What is a cooperative assessment?
- NOAA Philosophy
- Mega Borg: an early example

Provisions for Cooperation

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- Form of cooperation is negotiable. OPA regulations provide basic guidance on:
  - Timing and duration
  - Control and decision-making
  - Level of participation
  - Formal agreements
  - Public involvement
- CERCLA provisions provide little guidance, but OPA guidance is relevant

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Factors That Make Cooperation Work*

- Trust and integrity
- Commitment to restoration
- Focus on most important impacts
- Stipulations to narrow scope of investigations
- Advance funding

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Factors That Make Cooperation Work- 2

- Clear Record of Decisions
- Common laboratory
- Using joint experts
- Shared information
- Injury specific technical working groups

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Factors That Make Cooperation Work- 3

- Strong leadership
- Common PR
- Agree to disagree
- Early technical cooperation
- Willingness to conduct early restoration

What are Some Benefits?

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- Cost sharing
- Logistics sharing
- Open public process
- Focus on restoration
- May speed process
- May avoid litigation
- Early cooperation may reduce or eliminate need for NRDA

What are the Drawbacks ?

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- Distrust may be warranted
- Relationship may dissolve- important to protect interests
- Critical time may be lost negotiating the terms of the cooperative assessment

Drawbacks ? (con't.)

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- Still need for both parties to invest oversight time
- May appear to be a conflict of interest to outside parties
- Cooperation may complicate other claims.

Conclusions

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- OPA encourages cooperation, both OPA and CERCLA require invitation for RP involvement
  - Role of the Responsible Party is evolving, the form of cooperation is flexible
- Cooperative assessments have benefits, challenges and pitfalls.
- NOAA believes that the advantages outweigh the disadvantages.
- Need to be honest, flexible, and committed to the goal of restoration.