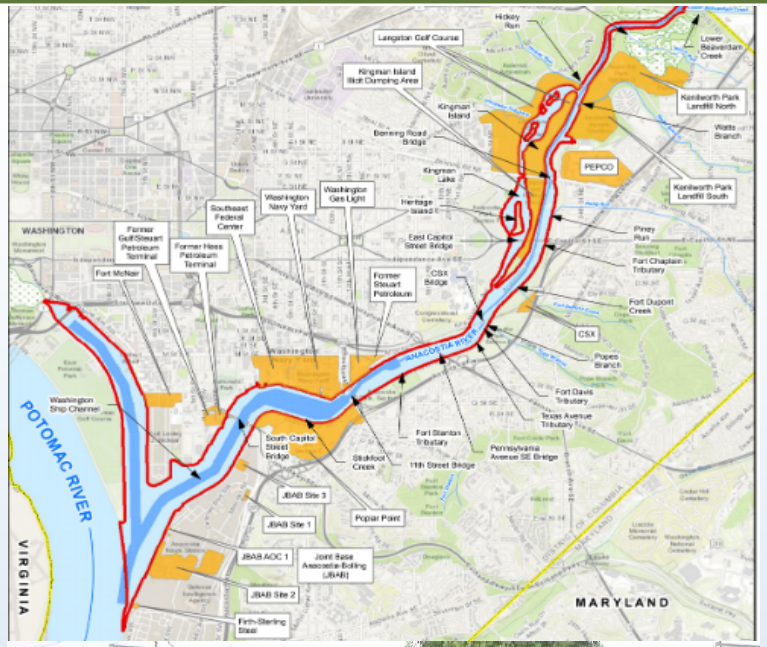
Natural Resource Trustees, Natural Resource Damage Assessments, and Information Needs/Evaluation Approaches

Outline

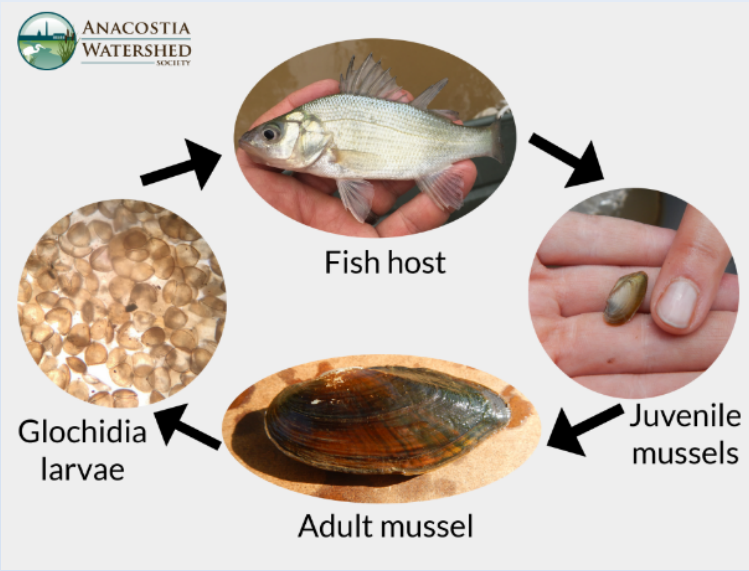
- Introduction to Natural Resource Damage Assessment (NRDA)
- NRDA Laws and Regulations
- Process and Roles
- Injury Assessment
- Scaling Injuries and Restoration
- Information Needs/Technical assistance


POTOMAC RIVER
VIRGINIA
MARYLAND
WASHINGTON
Kingman Island
PEPCO
CSX
Poplar Point
JBAB Site 1
JBAB Site 2
JBAB Site 3

Introduction to Natural Resource Damage Assessment (NRDA)

What is NRDA?

- A legal process to determine
  - Injuries to or lost use of the public's natural resources
  - Appropriate amount & type of restoration needed to offset losses
- Goal is to "make public whole" following release of hazardous substances & oil
- Federal, state and tribal "Trustees" representing the public are required to demonstrate causality between release and resource injury and lost use



NRDA Laws and Regulations

NRDA Statutory Authorities:

- CERCLA (Superfund)
- Oil Pollution Act
- Clean Water Act
- National Marine Sanctuaries Act (16 USC 1431 et seq.)
- Park System Resource Protection Act (16 USC 19 JJ)
- Applicable State laws

NRD Regulatory Authorities:

- CERCLA regulations, DOI (43 CFR Part 11)
- OPA regulations, NOAA (15 CFR Part 990)
- National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300)

Process and Roles

Process:

1. ***Release*** by Responsible Party(s) of oil or hazardous substance
2. ***Response*** by Remedial Agencies, cleanup actions & decisions (e.g., contain/collect, dredge, cap, no action, etc.)
3. ***Assessment and Restoration*** by Trustees, of injured resources/services and lost uses.

Per the National Contingency Plan, Trustees Are…

- State Governors
- Secretaries of Federal Departments
  - Agriculture
  - Commerce (NOAA)
  - Defense
  - Energy
  - Interior
- Tribes
- Foreign Governments (under OPA)

Process and Roles

Trustee Roles:

- Coordinate w/response agencies (e.g., USCG, EPA)
  - Integrate Trustee concerns & science into cleanup
- Assess injuries
- Evaluate & scale restoration alternatives to:
  - Return resources to baseline
  - Compensate for interim lost resources & services
  - “To make the public whole”
- Oversee and/or implement restoration plan
- Recover assessment costs

Process and Roles

Causality:

Release

Pathway

Exposure

Injury

Injury Assessment

- **Combines scientific, economic, and legal analyses**
  - Intended to compensate for all public losses
  - Different methods for private claims

- **Claim = cost of assessment + cost of restoration**
- **(or responsible party implements restoration)**

Injuries

- **Resources:** e.g., fish, marine mammals, turtles, birds, wildlife, etc.
- **Habitat**: e.g., sub-tidal, inter-tidal, beach, estuarine, marsh, etc.
- **Lost Recreational Use:** Fishing, hunting, bird watching, swimming, etc.

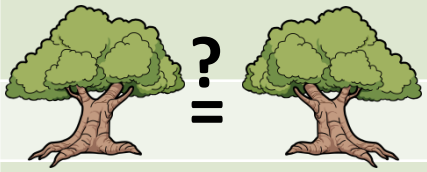
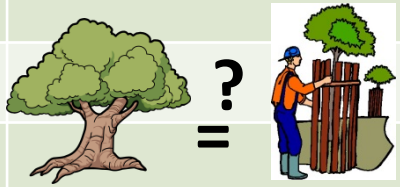
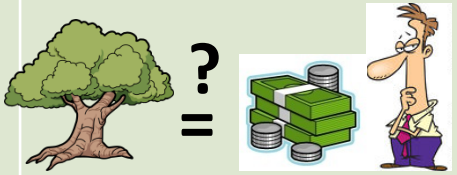
Focus on Restoration

- **Primary Restoration:** Actions taken to decrease injury
- **Compensatory Restoration:** Actions taken to compensate for interim losses of resources, services and human uses

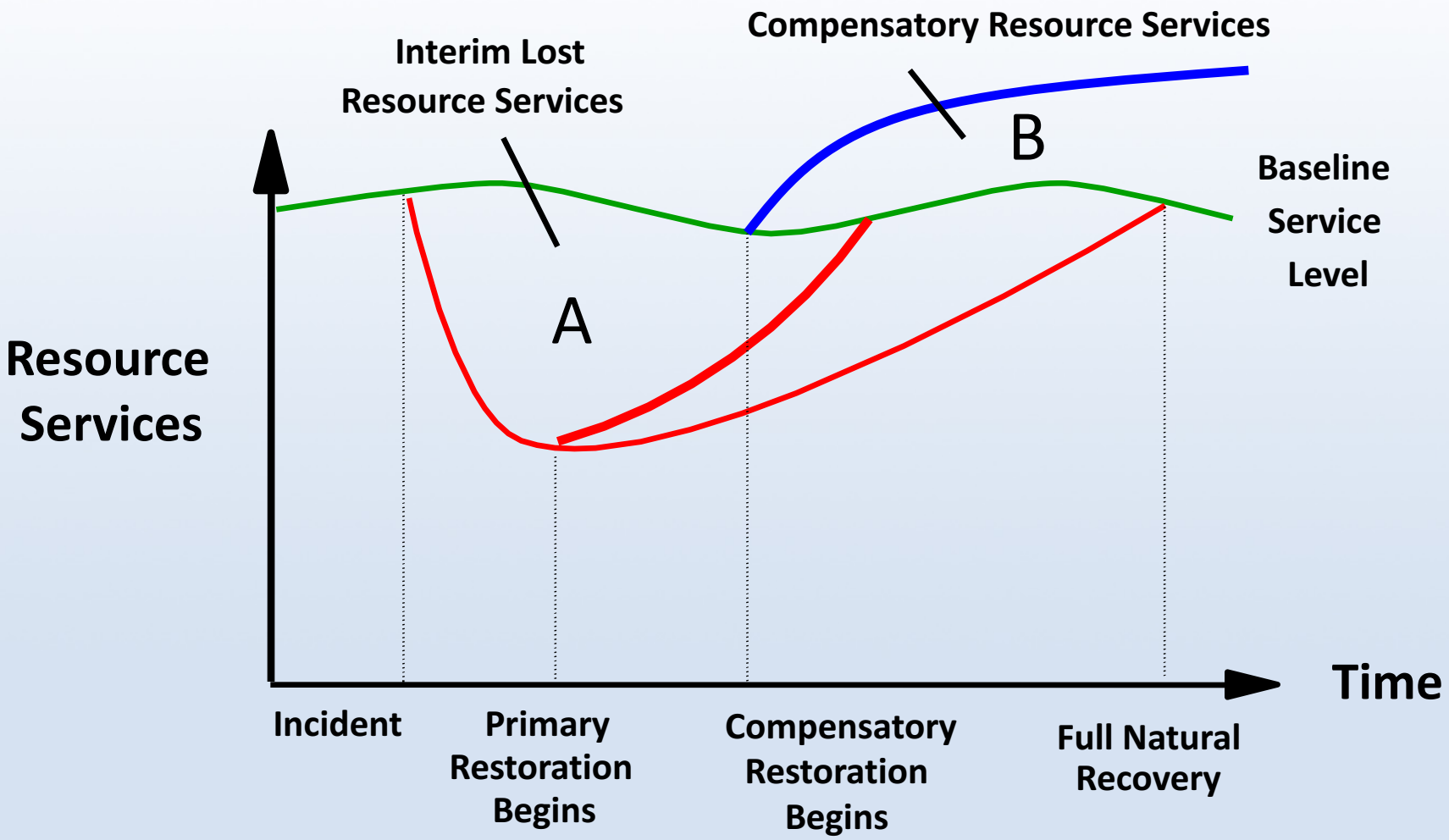
Scaling Approaches

"Debit-to-Credit" Terminology

More Preferred →

Resource-to-resource		
We lost mature trees, so we'll preserve mature trees	Restoration provides **resources** of same type, quality, value	
Service-to-service		
We lost tree services, so we'll restore tree services	Restoration provides **services** of the same type, quality, value	
Value-to-value		
We lost resources/services we value, so we'll restore resources/services of equivalent value	If you cannot match resources or services, restore services of comparable **value** to lost service value	
Value-to-cost		
We lost resources/services we value, so we'll perform projects costing the equivalent	If time or cost precludes valuing replacement services, **spend** the lost value on restoration	

Scaling Injuries and Restoration



When to consider REA

- Injury can be summarized by
  - Dead bodies or
  - Lost biomass
    - Reduced growth
    - Reduced survivorship

- **Restoration projects can credibly generate**
  - Individuals or
  - Lost Biomass

Inputs/Assumptions Needed

- Animal-years lost or Kg-years lost

Animal-year or Kg-year conversion information for each restoration project

- Adverse effect (injury metric relative to baseline)
  - Reduced numbers per m^2
  - Reduced growth percentage
  - Reduced fecundity
  - Life history modeling if necessary
- Injury extent (how many animals/biomass lost)
  - Area of injurious conditions
  - Baseline density/biomass of animals/plants
- Injury duration
  - How long have/will injurious conditions persist?
- Influence of injury on population dynamics (age, length, reproduction, survival/growth relationships)

- **Benefits of restoration for the species**
  - Quantity of individuals/biomass of target life stage generated by restoration projects
- **Maturity/duration of restoration services**

Using HEA/REA

Advantages
- Simple, flexible modeling
- Easily implemented and explained
- Relatively inexpensive
- Avoids putting dollar-values on services
- Wide acceptance by Trustees and RPs for settlement

Challenges
- Ignores ecological complexity
- May not capture all services lost or replaced
- Replacement services must match lost services
- Assumes that the public values restored services similar to lost services
- May not be legally sufficient for litigation
- Doesn’t cover human-use losses

Scaling Injuries and Restoration

Summary

NRDA is Restoration-Focused

- Purpose is to determine type and amount of restoration needed to compensate the public for injuries to their resources
- Restoration is considered early and throughout the process
- Injuries are balanced against, and directly scaled to restoration

NRDA is a Cooperative Process

- Getting to restoration requires a common vision & coordination with Co-Trustees and the public
- Moves faster if Responsible Party shares the same vision and works cooperatively with the Trustees

NRDA is a Legal Process

- Trustees are required to demonstrate causality between release and resource injury and lost use; sound science is key to success!
- Strategy must be encompassing and flexible

Freshwater Mussel Recovery Program (FMRP)

Conservation
Surveys
Restoration
Outreach
Freshwater Mussel Recovery Program
Propagation
Remediation
Habitat
Research & Monitoring

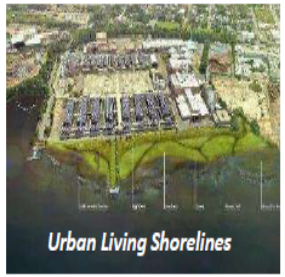
THE ACADEMY OF NATURAL SCIENCES of DREXEL UNIVERSITY

FAIRMOUNT WATER WORKS INTERPRETIVE CENTER

Partnership for the DELAWARE ESTUARY

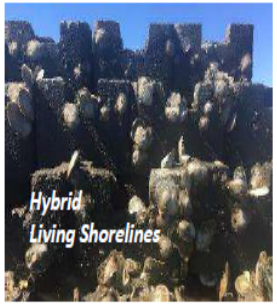
Shellfish Enhancement – We Have the Tech !


Mussel Propagation


Urban Living Shorelines


Shellplanting for Oysters


Bio-Based Living Shorelines


Hybrid Living Shorelines


Fish Host Restoration

Questions:

Baseline Information:
Are mussels present? If so to what extent? Area of the bed?
Density? Different Species?
Historical information?
Monitoring data? Reference areas? Other Sources of stress?

Characterization Information:
Sediment contaminant levels (surface and subsurface) – PCB's, PAH's, heavy metals, others?
Toxicity test data (lab, in situ,) – usually amphipod and fish
Benthic community Analysis
Surface water concentrations
Biological tissue concentrations

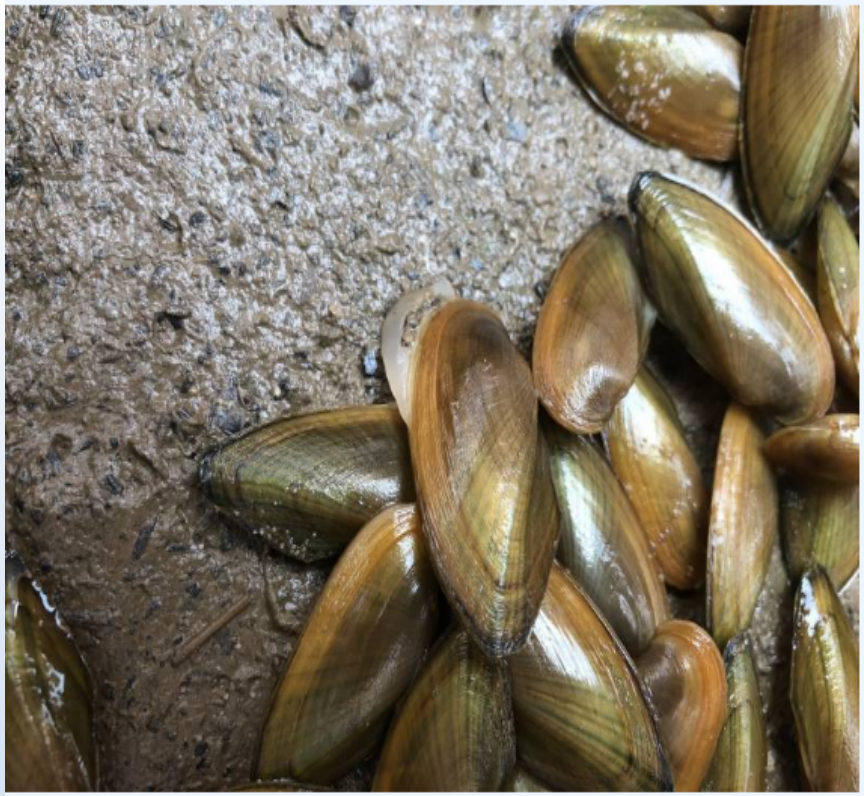
Mussel field surveys? Population models?

Early life stage tests? Bioaccumulation?

Ecosystem service quantification (injury and restoration) metrics – What are the best ones? What are the best approaches for scaling mussel injuries?

Evaluate mussels as part of benthic community or perform focused assessment due to its special status and ecosystem service provisions?

Restoration types.. Propagation, dam removal, shoreline , SAV



Eastern pondmussels fresh from the hatchery in August (2018) and ready for their new home in the Anacostia River. Note the light-colored foot of the mussel in the middle, they use that foot to crawl and to bury themselves into the substrate.

December 5, 2018 | by: Jorge Bogantes

For More Information

www.darrp.noaa.gov

www.doi.gov/restoration

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