Native Plant Use and Ecosystem Services Considerations at Superfund Sites

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What is Superfund?

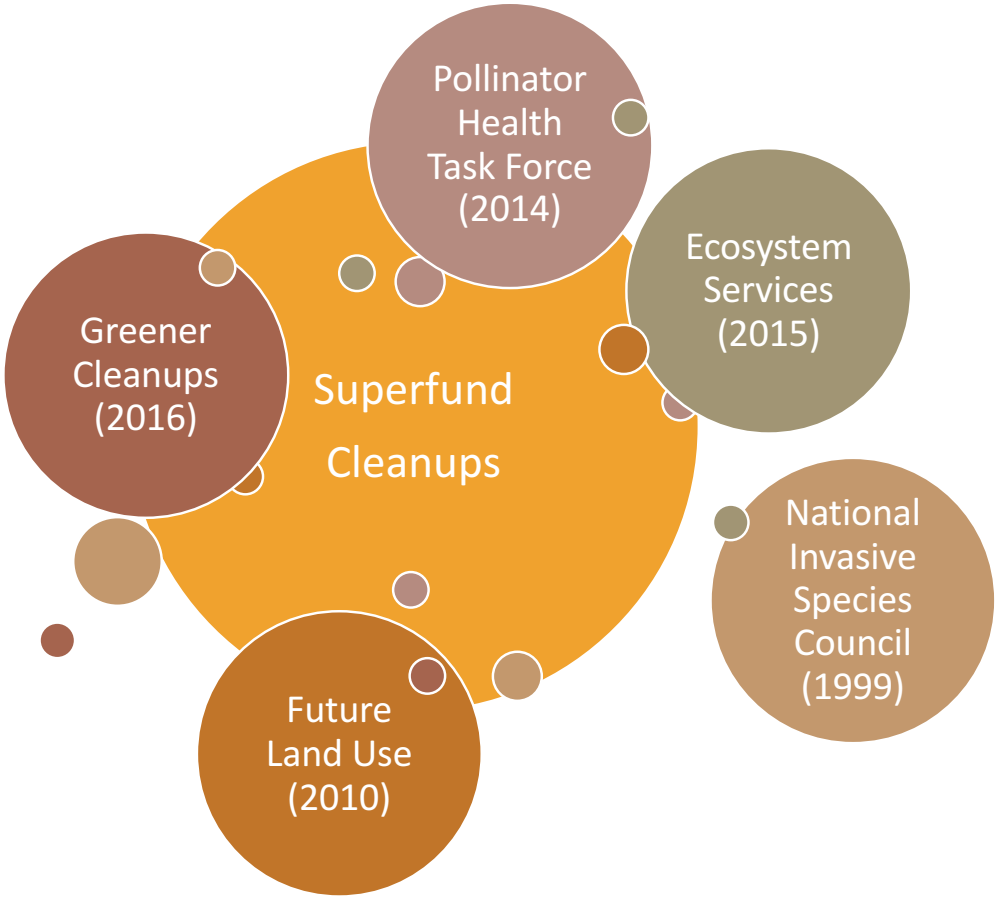
United States federal government program established as the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

Cleanup contaminated sites

- Reduce risks to human health and the environment from chemicals and hazardous waste (lead, organic pollutants)

Revitalization and reuse opportunity

- NOT an ecological restoration program
- Cleanup often involves large-scale revegetation for erosion control, waste cover, etc.

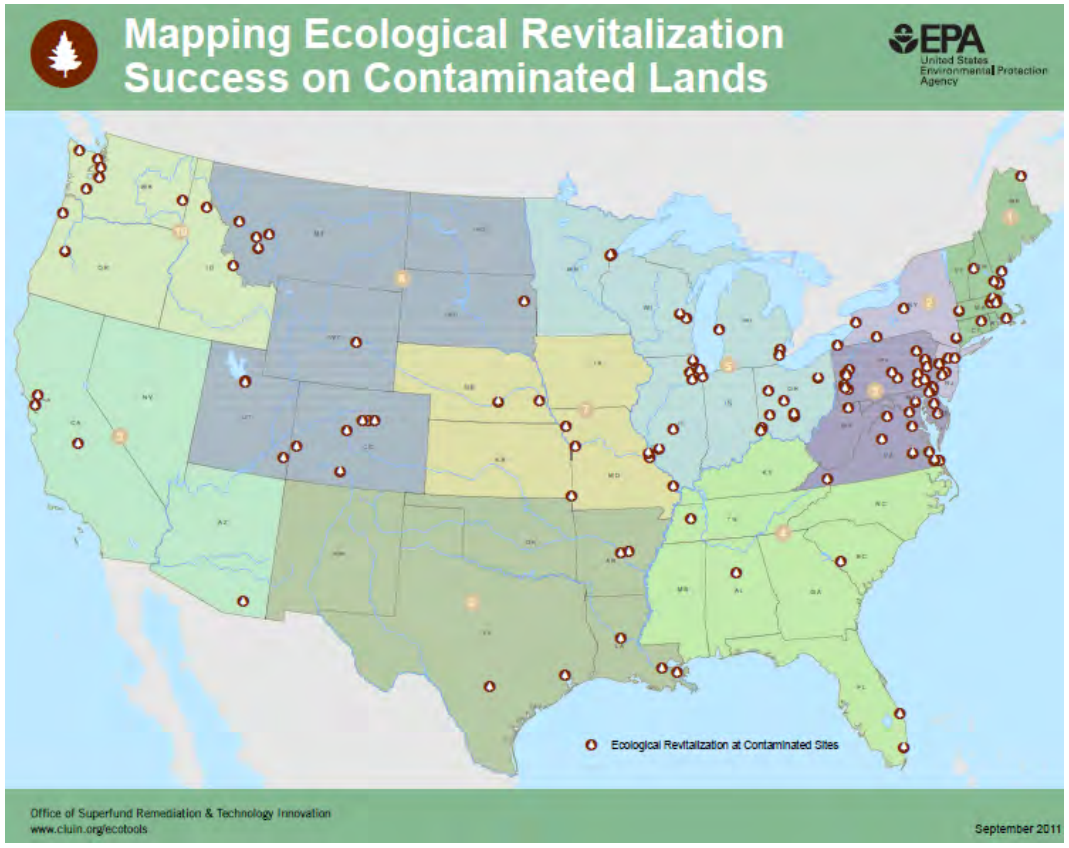


Examples of Relevant Policies and Initiatives

Ecological Reuse

81 Superfund Sites in 2011
(map on the right)

127 Superfund Sites in 2017



Revegetation in Site Remediation

Vegetative Cap at Bayou Verdine, LA

Soil Amendments at Bunker Hill, ID

Evapotranspiration Cover at Onondaga Lake, NY

Revegetation in Site Reuse

Pollinator Prairie Garden at former Chemical Commodities Inc., KS

Lehigh Gap Nature Center at Palmerton Zinc, PA

Recreational Fishing at California Gulch, CO

Palmerton Zinc, PA

https://clu-in.org/ecotools/NARPM2011_EPA_Reuse_new-1.mp4

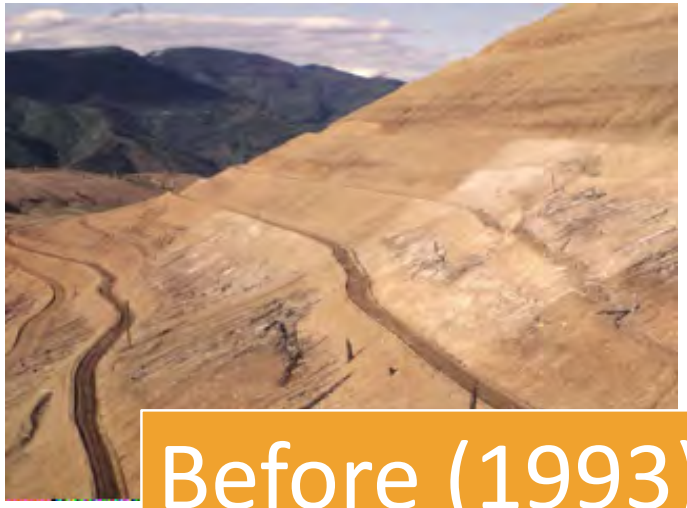
Case Study: Palmerton Zinc

Before (2002)

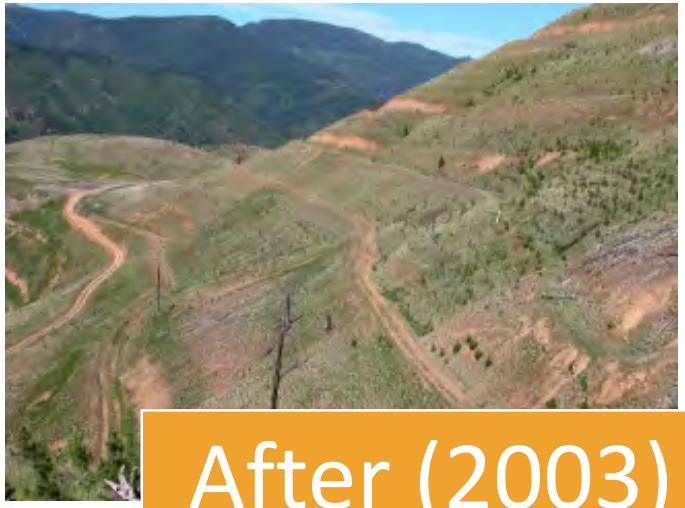
After (2003)

https://clu-in.org/download/issues/ecotools/PalmertonZincCaseStudy-2-2011.pdf

Case Study: Bunker Hill



Before (1993)



After (2003)

https://clu-in.org/ecotools/downloads/bunker_hill_eco_case_study_final_feb2015.pdf

Future Directions: Ecosystem Services

Ecosystem services are the benefits people receive from nature.

There is an ongoing research effort to promote evaluation of ecosystem services at contaminated sites.

Evaluation of Ecosystem Services at Superfund Cleanups

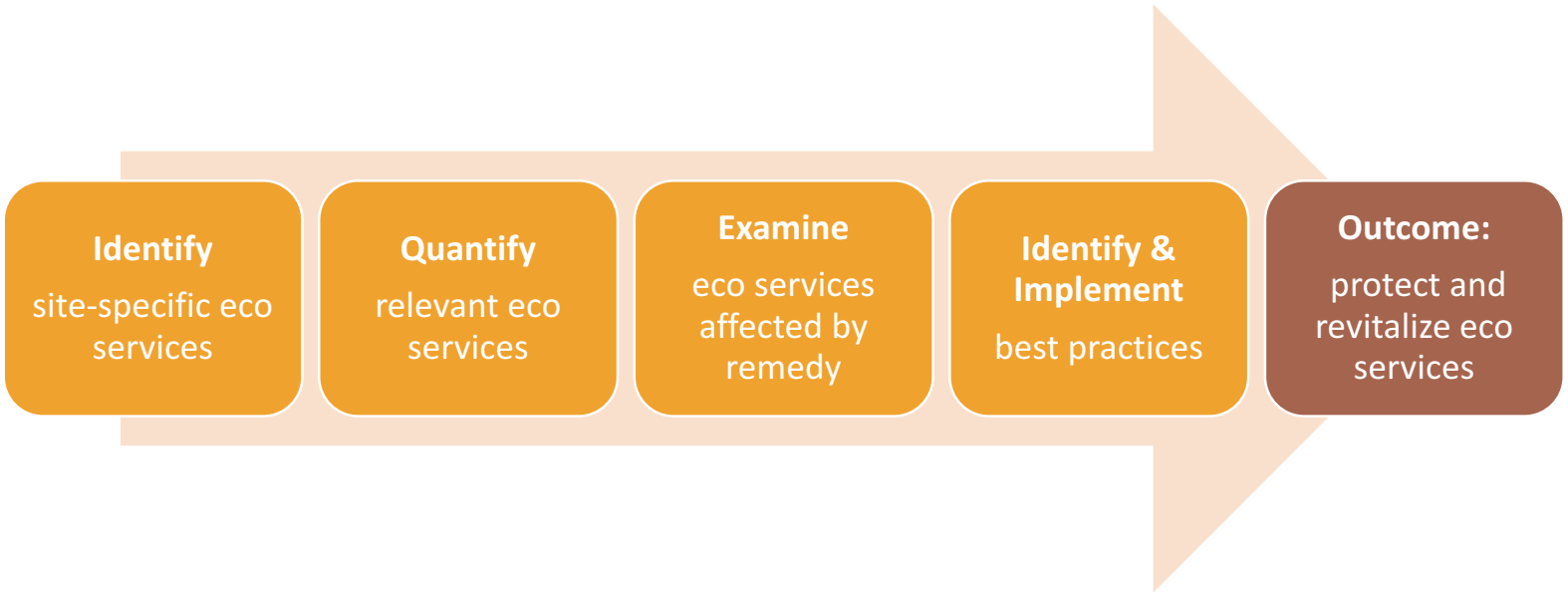
Quantification Tools

- EPA EnviroAtlas
- i-Tree Suite
- EPA Rapid Benefit Indicators Approach Toolkit
- ESII Tool
- Habitat Assessment

Best Practices Tools

- ASTM Standard Guide for Greener Cleanups
- CLU-IN.org EcoTools
- NatiVeg
- Pollinator Partnership Ecoregional Planting Guides

Ecosystem Services Evaluation Framework for Greener Cleanups and Ecological Reuse



Simplified, Hypothetical Example

Ecosystem Services	Quantitative Indicator or Measurement	Affected by Remediation	Example Best Practices
Flood Risk Reduction	Gallons per year	Yes	Incorporate Green Infrastructure
Pollination	Regional Pollinator Species Richness	Yes	Establish pollinator habitat as landfill aps
Air Pollution Removal	Tons of air pollutants per year	Yes	Minimize clearing of trees and other vegetation
Bird Watching	Regional Bird Species Richness	Yes	Ongoing invasive plant species management
Environmental Education	Number of Students within Travel Distance to the Site	Yes	Revegetate with plant species of the regional ecosystem

Need for Seeds

The ecosystem services concept and evaluation will be another opportunity to promote revegetation with native plants at sites.

Superfund site teams will need:

- Technical expertise and partnerships
- Seeds!
  - Where to get large quantities of native seeds?
  - Quality of seeds?
  - Diverse mix of seeds?
  - Cost of seeds?

Contact Information

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Photos, videos, and case studies for sites can be found at https://clu-in.org/ecotools/default.cfm

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This and additional presentations available at http://nativeseed.info

NATIVE SEED NETWORK

Institute for Applied Ecology