

Understanding and Evaluating Ecosystem Services at Superfund Cleanups

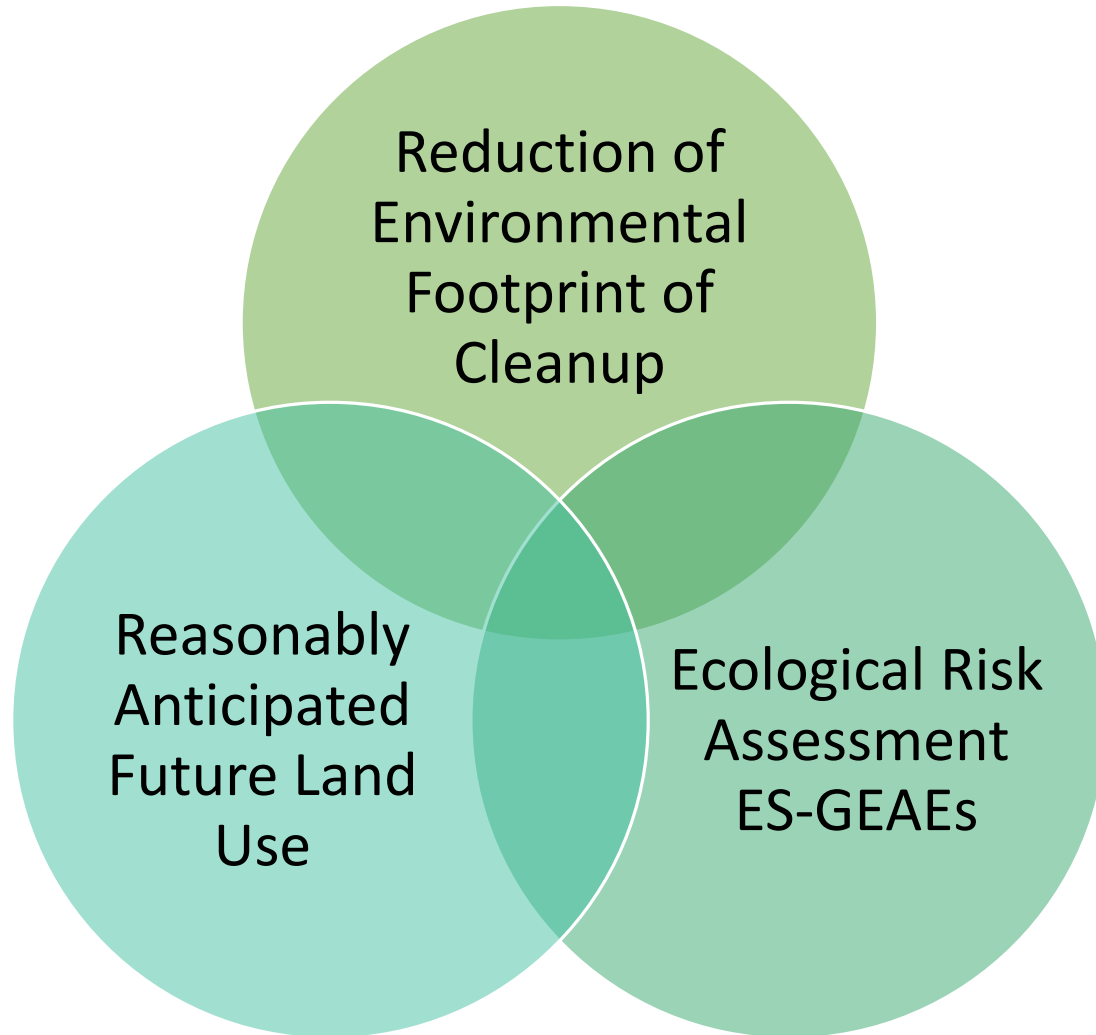
JEWEL LIPPS, RESEARCH PARTICIPANT, OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

US EPA OFFICE OF SUPERFUND REMEDIATION & TECH INNOVATION

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Understanding the relevance of
ecosystem services to Superfund

**SUPERFUND = REDUCE RISKS DUE TO
CHEMICAL STRESSORS**



Basis for
considering
ecosystem
services at
Superfund
cleanups

Methodology for Understanding and Reducing a Project's Environmental Footprint

February 2012

U.S. Environmental Protection Agency

Office of Solid Waste and Emergency Response

Office of Superfund Remediation and Technology Innovation

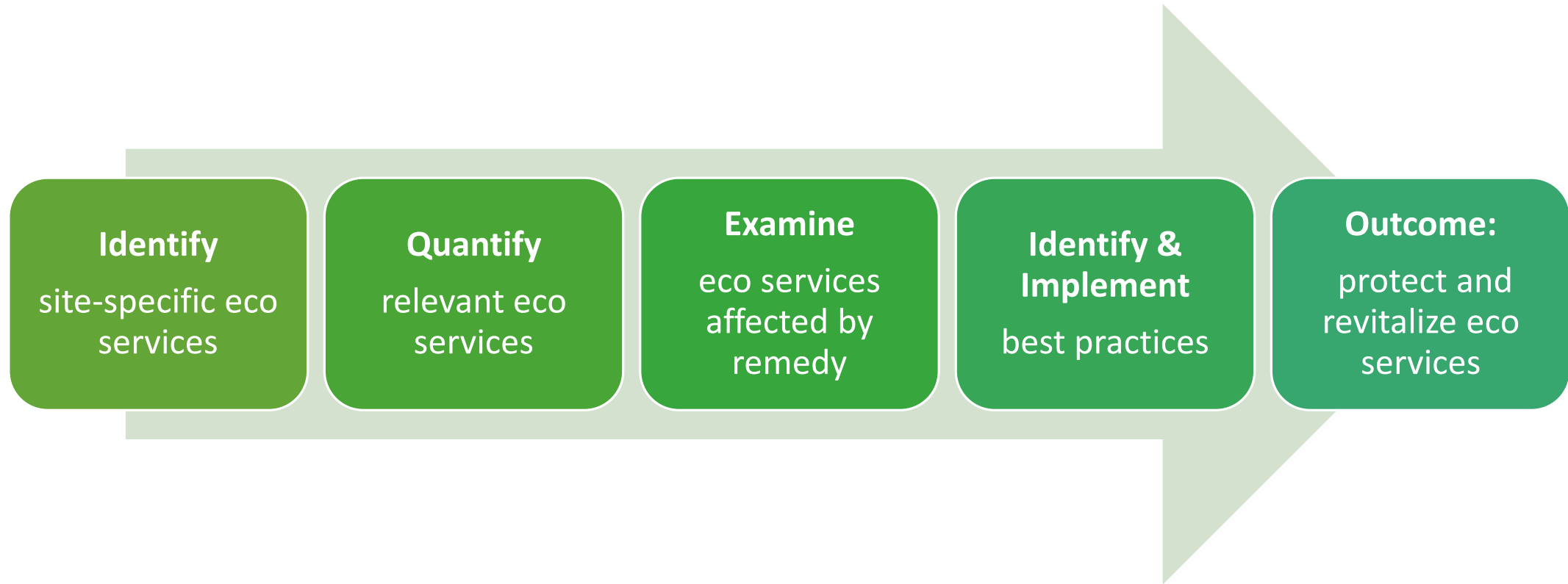
Sponsored by the Technical Support Project
Engineering Forum

www.cluin.org/greenremediation/methodology

Superfund Green Remediation



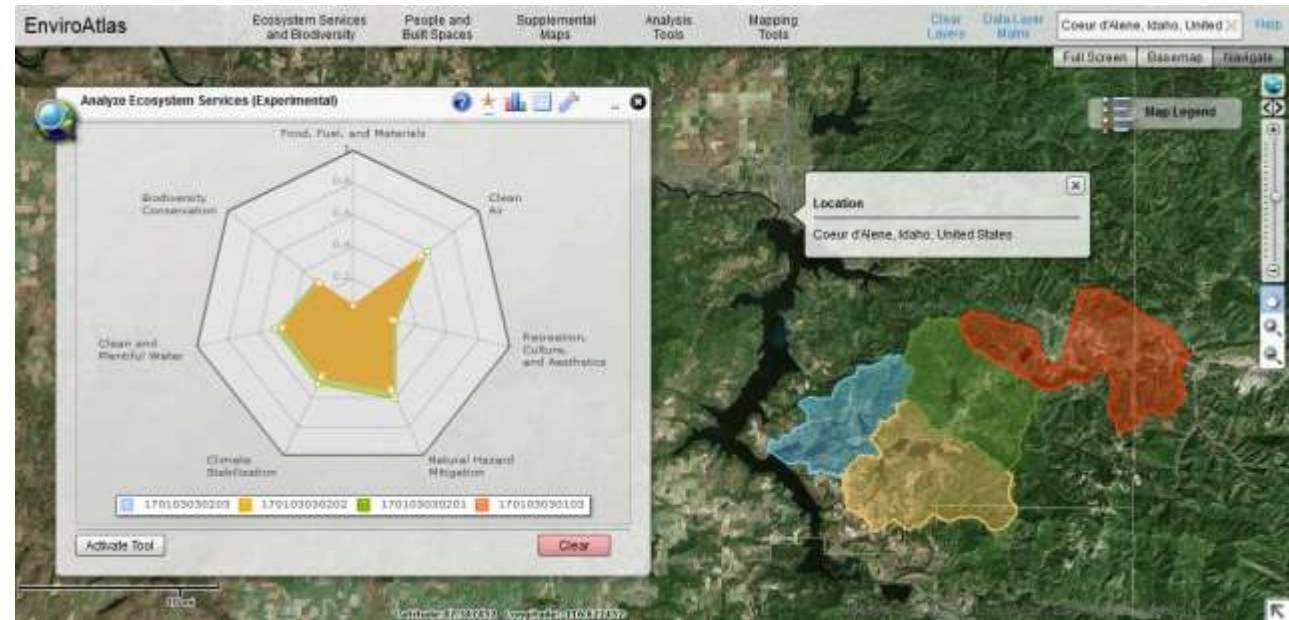
Evaluating ecosystem services at Superfund sites



Conceptual Framework

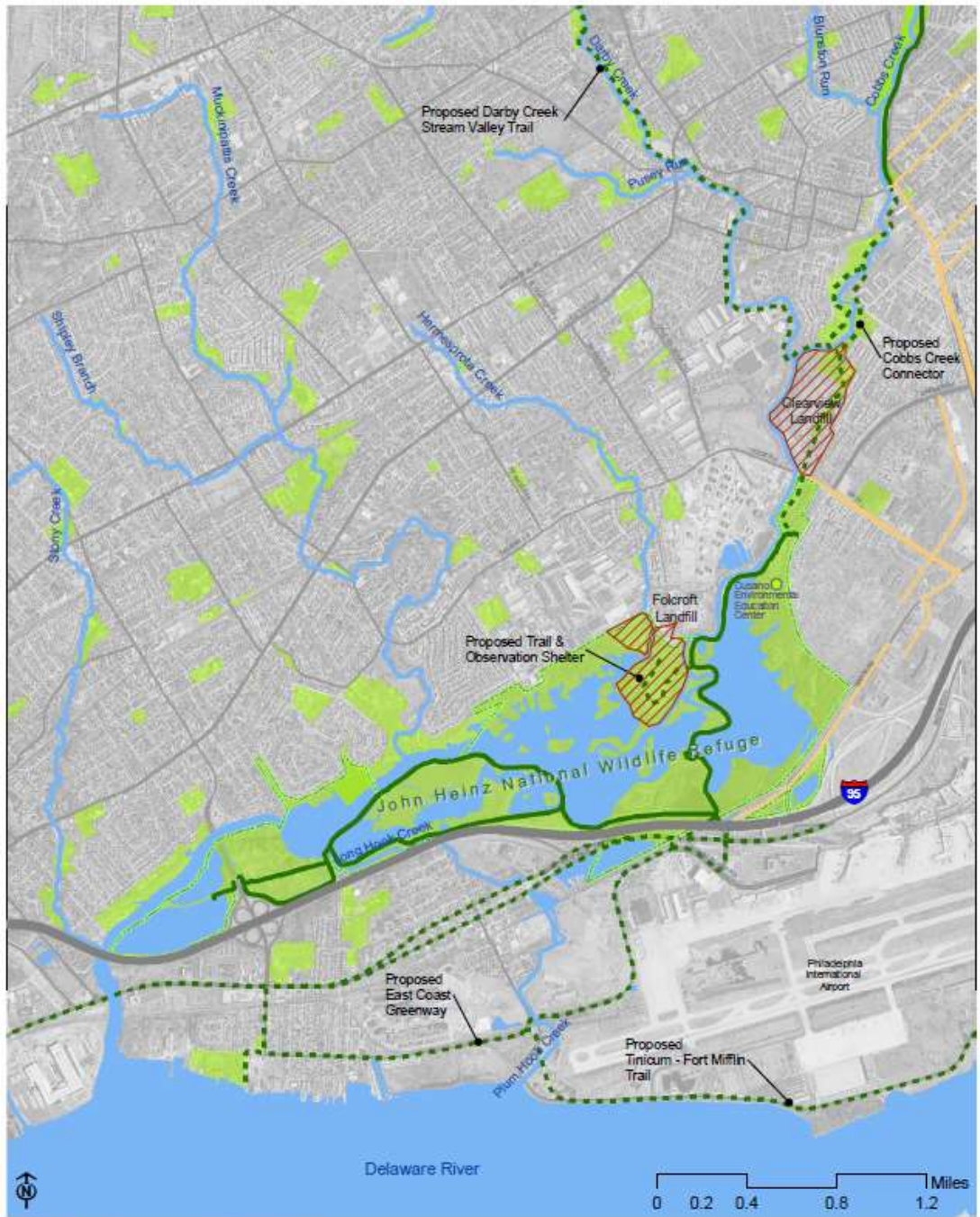
Evaluation tools

- Review tools that can be used to evaluate eco services
- Recommend evaluation tools for use at contaminated sites
- Short list of tools:
 - Final Ecosystem Goods and Services Classification System (FEGS-CS)
 - EPA EnviroAtlas
 - InVEST
 - i-Tree Eco
 - Wetland Ecosystem Services Protocol (WESP)



EPA EnviroAtlas

<https://www.epa.gov/enviroatlas>



Map 3: Green Infrastructure
Lower Darby Creek Area Superfund Site



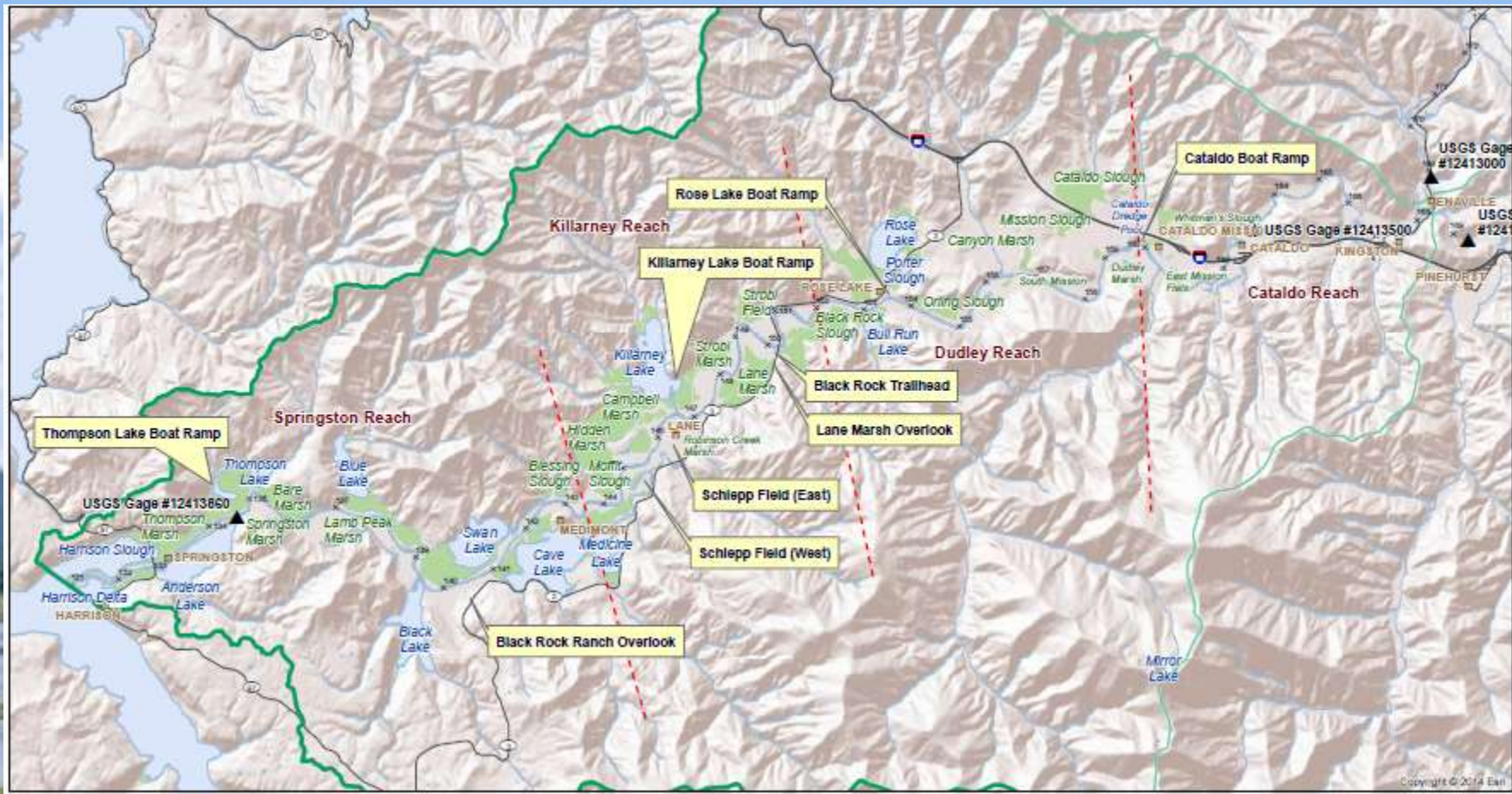
Lower Darby Creek Area, Philadelphia, PA

Urban region, local scale

Lower Darby Ecosystem Services

Environment Type/ Ecological Feature	Beneficiaries	Final Ecosystem Services (currently existing onsite)	Quantitative Value (estimates)
Forest / Trees	Government, Municipal, and Residential	Avoided Stormwater Runoff	505,000 gallons per year
Forest / Trees	Government, Municipal, and Residential	Carbon Sequestration	47 tons of carbon per year
Forest / Trees	Government, Municipal, and Residential	Air Pollution Removal	0.944 tons of air pollutants (O ₃ , PM2.5) per year
Forest / Habitat	Experiencers and viewers	Songbirds that can be viewed	Not quantified
Wetland / Habitat	Educators, Students, Researchers	Opportunities for understanding the tidal marsh ecosystem	Not quantified

Utilized Tools:FECS-CS Query Tool, i-Tree Eco



Lower Coeur d'Alene River Basin, Coeur d'Alene, ID

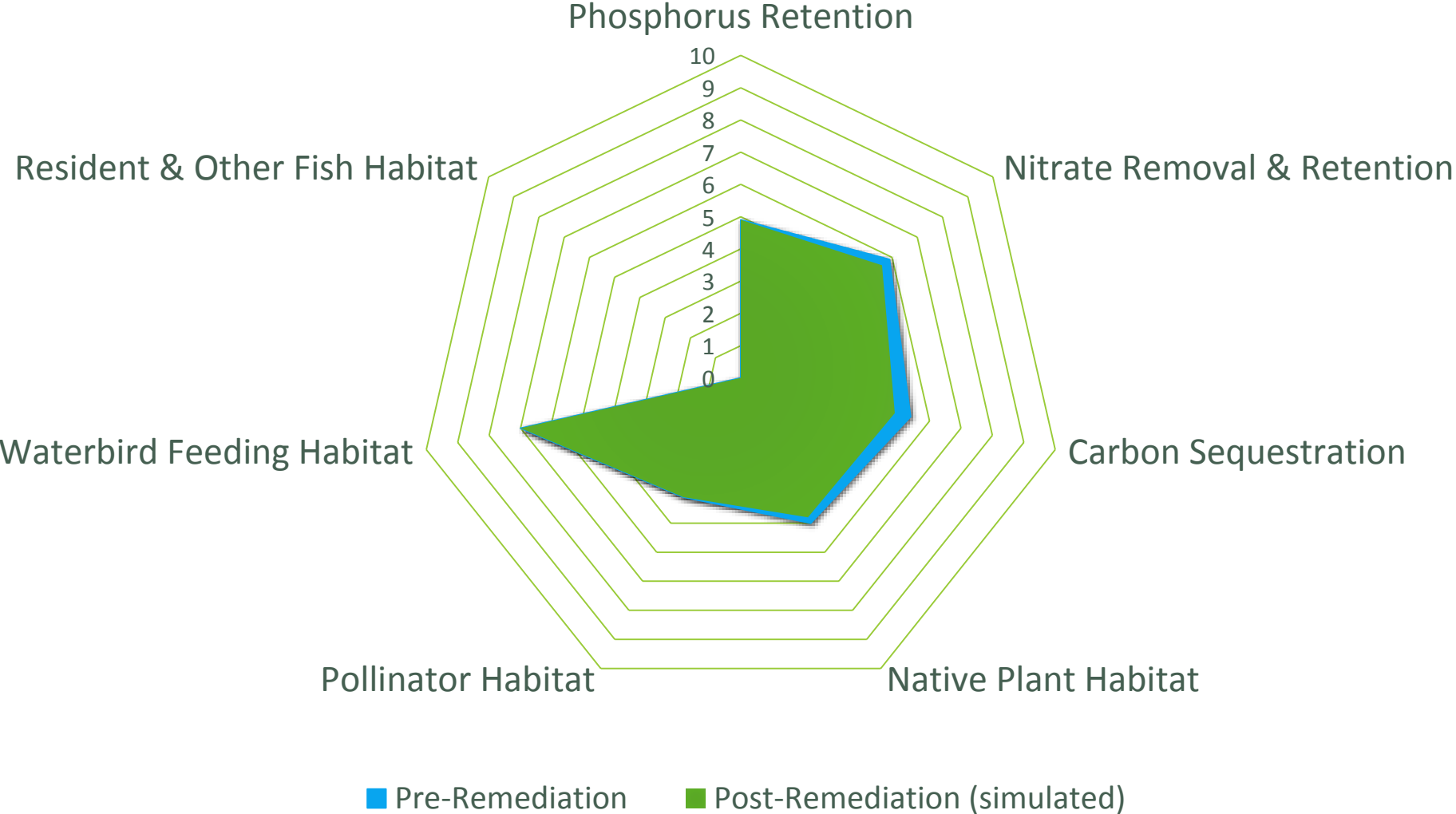
Rural region, watershed scale

Lower Coeur d'Alene Basin Ecosystem Services

Environment Type/ Ecological Feature	Beneficiaries	Final Ecosystem Services (currently existing onsite)
Forest / Trees	Government, Municipal, and Residential	Reduced erosion
Wetland / Soil	Farmers	Suitable soil for crops
Wetland / Water	Anglers	Fish that can be caught
Wetland / Habitat	Experiencers and viewers	Tundra swans that can be viewed
Wetland / Water Potato	Spiritual and Ceremonial Participants	Water potato harvest tradition of Coeur d'Alene Tribe

Utilized Tools: FEGS-CS Query Tool

Preliminary Assessment of Intermediate Ecosystem Services at Lane Marsh, pre- and post- remediation



Utilized Tools:

Wetland Ecosystem Services Protocol (WESP)

Lessons Learned & Next Steps

Ecosystem services at Superfund sites

- Select tools based on characteristics of the environment
- Connect ecosystem services to best management practices
- Tie in community involvement
- Add ecosystem services quantification into the Superfund *Footprint Methodology*
- Demonstrate the usefulness of ecosystem services concepts
- See more examples of sites evaluating ecosystem services



Select Resources

- clu-in.org/ecotools/default.cfm
- clu-in.org/greenremediation/
- Greener Cleanups Policy Memo (August 2016)
- Understanding Ecosystem Services at Superfund Sites (TBD 2017)

Contact Information

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