

Quality Assurance Guidance for Environmental Data Collection Associated with Habitat Restoration and Invasive Species Projects

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Topics

- Great Lakes Restoration Initiative (GLRI) and habitat restoration projects
- QA challenges for habitat restoration projects
- Interagency Habitat Restoration and Invasive Species Control QA Committee
- Guidance development
- Upcoming conference

Great Lakes Restoration Initiative

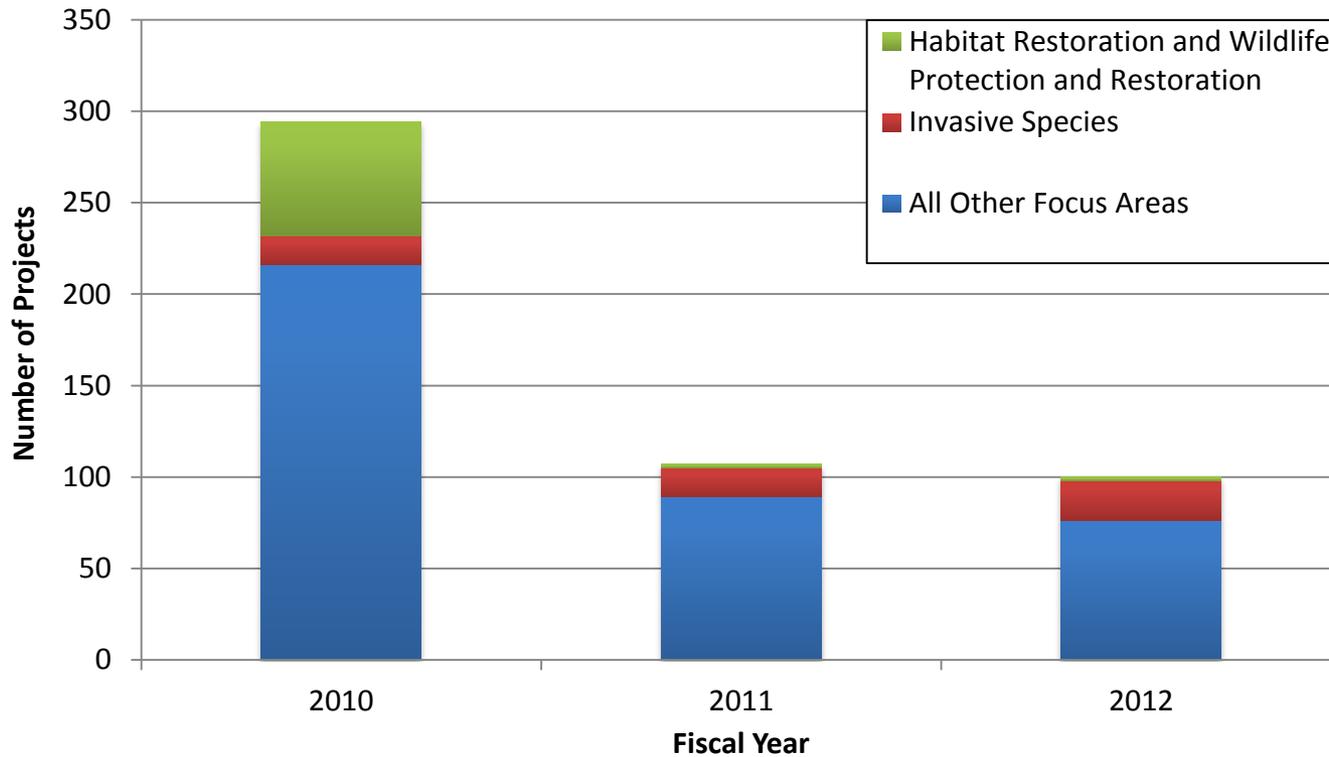
- Toxic Substances and Areas of Concern
- Invasive Species
- Habitat and Wildlife Protection and Restoration
- Nearshore Health and Nonpoint Source Pollution
- Accountability, Education, Monitoring, Evaluation, Communication and Partnerships



<http://www.glri.us>



GLRI Focus Area Distribution for U.S. EPA Projects



Caveat	2010	2011	2012	All Years
Projects with Multiple Focus Areas	16	14	20	50
Percent of "All Other Focus Areas"	7%	16%	26%	13%

Quality Documentation Requirements

- National standards for environmental data collection require quality assurance planning and documentation (e.g., ANSI/ASQ E4-2004)
- EPA is one of the agencies that has adopted these standards for projects with environmental data collection activities that are undertaken or funded by them

Healing Our Waters Coalition

“EPA should re-evaluate their Quality Assurance Protocols to ensure that all requirements are project-appropriate. In many cases, including habitat and wetland restoration work, the QAP formula is a poor fit for measuring the quality of on-the-ground and in-the-water work that the GLRI emphasizes...”

“QAP” is referring to a quality assurance project plan, or project-level quality documentation.

QA Challenges for Habitat Restoration Projects

- Quality objectives
- Training & assessments
- Field sampling methods & data collection
- Data management, verification, & analysis



Interagency Habitat Restoration & Invasive Spp Control QA Committee

- Initiated: June 2012
- Members: 8 federal agencies

Participating Organizations	
NFWF	NOAA
NPS	USACE
USEPA*	USFS
USFWS	USGS

*USEPA also provides CSC contractor support

- Purpose: Share quality concepts, practices, guidance, methods, and tools to improve projects funded by the GLRI

Guidance Development

- Focus of guidance will be on:
 - Defining data quality for ecological measurements
 - Establishing quality objectives
 - Achieving quality objectives
 - Reviewing data & assessing data quality



Defining Data Quality for Ecological Measurements

- Measurement = Best Estimate \pm Uncertainty
- Specific approaches for estimating uncertainty for different measurement types:
 - Field samples – Duplicate/replicate samples
 - Field instruments – Calibration standards, duplicate measurements
 - Observational measurements – ?



Defining Data Quality for Observational Measurements

- **Examples** – species, species counts, species abundance, condition classes, coverage classes, phenology, gender, etc.
- **Recommendation** – (based on USFS Forest Inventory)
Measurement Quality Objective (MQO) =
Tolerance + Expected Frequency of Compliance

Measurement	Tolerance	Compliance Rate
Species ID	Exact (No tolerance)	99% of the time
Cover Class	± 10 %	90% of the time
Decay Class	± 1 class	80% of the time

How to Measure Uncertainty for Observational Measurements

- Re-measurements:
 - Within crews
 - Between crews
 - Expert crews or QA crews
- Where:
 - Reference plots
 - Training plots
 - Routine plots

How to Measure Uncertainty for Observational Measurements (cont'd)

- How:
 - Independent re-measurements
 - Preferably as close to same time as the original measurement
- When:
 - Training/crew certification
 - Early in field season to ID problems
 - During crew assessments/audits
 - As soon as possible following routine data collection effort during the field season

Establishing Quality Objectives

- Selecting qualitative goals and objectives
“Shoreline in project area has been restored”
- Translating these into quantitative objectives with levels of uncertainty
“For 4,000 feet of shoreline the cover of woody invasive species has been reduced to less than 20%. This study will be able to estimate this cover $\pm 10\%$ at the 90% confidence level.”

Establishing Measurement Quality Objectives

State what question(s) the study data are intended to answer



List & describe each planned measurement; include measurement units



Explain how quality is described for each planned measurement



State performance criteria for these data



Describe how and when these performance criteria will be evaluated

Establishing Measurement Quality Objectives – An Example

Question: Have woody invasive species been reduced to less than 20% cover for 4,000 ft of shoreline?

Measurements: Cover classes of woody invasive species (11 classes – 0 to 100% in 10% increments) measured on 16 plots

Quality Measured:
MQO = Tolerance + Frequency

Performance Criteria:
Cover Class MQO = ± 1 class, 90% of time

Evaluated: Re-measurements at training, crew certification, field audits, cold checks

Achieving Quality Objectives

- Selecting or preparing SOPs
- Training and crew certification
- Techniques for collecting field data
- Assessments
 - Proficiency testing
 - Frequency of audits
 - Re-measurement sites
 - Blind/non-blind checks for field crews



Data Review and Data Quality Assessment

- Data verification
 - Procedures followed? Data entered correctly into database?
- Data validation
 - Were quality objectives achieved?
- Evaluating quality of existing data also important
- Ensuring metadata are prepared
- Evaluating data usability (for the intended use of the data)

Upcoming Conference

- World Conference on Ecological Restoration (SER): October 6-11, 2013, Madison, Wisconsin
 - Application of Quality Assurance and Quality Control Principles for Ecological Restoration: Sunday, October 4, 8:00am – 5:00pm
 - Explanation of quality principles and how they apply to ecological restoration activities
 - Examples and tools from various restoration projects conducted in different regions of the U.S.
 - Participants will work in groups to address real-life case studies

<http://www.ser2013.org/program/training-courses/>



Upcoming Conference

- SER Conference also features one of the committee's guest presenters (Nina Garfield, NOAA) – Restoration Project Planning, Design and Evaluation: Saturday, October 5, 8:00am – 5:00pm



The screenshot shows the top portion of the SER 2013 website. On the left is the SER logo, which consists of the letters 'SER' in a blue serif font, with a stylized green leaf graphic to its right. To the right of the logo is the text 'SOCIETY FOR ECOLOGICAL RESTORATION'. The main banner area features a background image of a large tree in a field under a blue sky. Text on the banner includes '5th World Conference on Ecological Restoration', 'Madison, Wisconsin, USA • October 6 -11, 2013', and the tagline 'Reflections on the Past, *Directions for the Future*'. Below the banner is a dark blue navigation bar with white text for 'HOME', 'ABOUT', 'LOCATION', 'PROGRAM', 'REGISTRATION', 'EXHIBITORS/SPONSORS', and 'AWARDS'. Underneath the navigation bar, the text 'TRAINING COURSES' is visible on the left, and a yellow button with the text 'CALL FOR ABSTRACTS' is on the right.

<http://www.ser2013.org/program/training-courses/>

Acknowledgments

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Thank You!



Please send all comments and questions to:

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