



the journey to restore  
**America's Everglades**

**CERP Quality Assurance Systems  
Requirements (QASR) - Chapter 8**

**BIOLOGICAL MONITORING AND  
ASSESSMENT PROCEDURES**

# Purpose

- The purpose of this chapter is to identify and describe procedures and protocols for biological monitoring and assessment. The intent is to guide CERP project managers, consultants, and contractors who perform these activities, to help them achieve a level of acceptable quality, standardization, and consistency in their data, and their data-gathering methods.

# Goals

## The goals of this chapter of the QASR are:

- To guide project personnel, principal investigators, and consultants in data gathering protocols and QA/QC activities related to biological monitoring and assessment;
- To promote uniformity and consistency in protocols and achieve comparability in data and information collected across projects and among different groups;

## Goals (continued)

### **The goals of this chapter of the QASR are:**

- To identify the minimum data quality and reporting requirements that should be met, regardless of changes in PIs, project personnel, and methods;
- To facilitate auditing of the process or project;
- To help ensure conformance with applicable local, state, and federal regulations, and
- To help maintain data traceability and verifiability.

# Scope

- Biological monitoring may involve field surveys with sample collection or direct observation as well as laboratory-based sample processing and analysis. This chapter describes the quality assurance and quality control procedures that are critical to ensure that biological data are accurate, traceable, and comparable.

# Scope

- **The types and scope of biological monitoring and assessment that will be conducted vary among projects. Depending on project objectives, activities may include:**
  - Surveys;
  - Identification (taxonomic);
  - Nesting habitat assessment;
  - Prey habits and status;
  - Density estimation;
  - Health (or abnormalities) evaluation;
  - Bioaccumulation tissue sampling, and
  - Correlation with physicochemical composition of the environment.

# Content

## **This chapter covers the following topics:**

- Federal and State requirements and regulations, as well as the regulatory compliance for the capture, handling and care of animals;
- Responsibilities of key personnel involved;
- Training;
- Project planning and review (meeting Data Quality Objectives (DQOs), sampling strategies, method selection);

# Content (continued)

## **This chapter covers the following topics:**

- Procedures for biological monitoring and assessment (see below for taxonomic groups), including field collection and additional procedures for bioaccumulation studies, and sampling handling, receipt, and custody;
- QA/QC, including information on corrective actions, data qualifications, quality control requirements, and procedures, QA requirements, and voucher specimens;

# Content (continued)

## **This chapter covers the following topics:**

- Data management, including information on documentation requirements, data processing and reduction, and data review reporting;
- Reporting formats and elements; and,
- Archiving, including information on data archives and archiving biological specimens.

# Protocols and Methodologies

**Protocols and methodologies were organized according to the following groups:**

- Plankton
- Periphyton
- Vegetation (Macrophytes and submerged aquatic vegetation (SAV))
- Macroinvertebrates (includes benthic and oyster)
- Fish
- Reptiles and amphibians (including alligators, crocodiles, and frogs)
- Birds

# Example QA/QC Checks

- QC checks may be used as a part of an internal QA program (by the entity performing the measurement), and/or via an external QA program. Generally, external QC checks will be performed less frequently than internal QC checks.
- **Round Robin**
  - Typically used in biological or ecological evaluations involving taxonomic identification. Serves as an indicator of deviation from a set statistical range.
- **Skill Verification**
  - Typically used in studies involving biological or ecological indices. Demonstrates an individual's capability in a particular field of study.
- **Replicates**
  - Typically used to demonstrate that observed intra-sample variability that is attributed to collection methods or the heterogeneous of the sampling site or media.

# Example QA/QC Checks

- QC checks may be used as a part of an internal QA program (by the entity performing the measurement), and/or via an external QA program. Generally, external QC checks will be performed less frequently than internal QC checks.
- **Sorting Statistic**
  - Typically used in biological or ecological evaluations involving the sorting and tallying of taxa.
- **Identification Consistency**
  - Used in studies involving taxonomic identification. Establishes the lowest taxonomic level that can be consistently identified. Serves to corroborate identification between taxonomists.
- **Ground-Truthing**
  - Ground truth is usually done on site, performing surface observations and measurements of various properties of the features that are being studied.

# Corrective Actions

- **Corrective Actions**

Corrective actions must be performed for data associated with QC checks failing acceptance criteria. The following describes a general approach for applying corrective actions:

- **Verify Calculations:** The raw data calculations used to generate the failing QC result are re-examined for possible errors.
- **Equipment Maintenance:** Equipment used in the measurement is examined and recalibrated (if applicable).
- **Qualify Data:** Data associated with QC checks that fail must be qualified.
- **Peer Review:** If a QC failure persists, the process used to develop the data must be subjected to peer review.

# Auditing & Assessment

## Audit Procedures

The project QAO or designee shall be responsible for administering periodic Systems and Performance Audits. Audits should consist of one or more of the following:

- An on-site assessment of field or laboratory procedures;
- A review, assessment, and/or validation of data associated with a given CERP project;

# Auditing & Assessment (continued)

## Audit Procedures (continued)

- The submission of performance evaluation specimens (e.g., Round Robin studies) to an organization for identification with results used to evaluate that organization's technical performance for a given CERP project; or
- The submission of other relevant information as specified in a project contract, work plan, order, permit, or other applicable CERP document.

# Questions?

Thomas W. Dreschel, Ph.D.  
Environmental Scientist  
SFWMD  
3301 Gun Club Road, MSC 7252  
West Palm Beach, FL 33406  
Office: (561) 682-6686  
Cell: (561) 301-6458  
[tdresche@sfwmd.gov](mailto:tdresche@sfwmd.gov)

Marie C. López-Baláez  
Chemist  
US Army Corps of Engineers  
701 San Marco Blvd  
Jacksonville, FL 32207-8175  
Telephone: (904) 232-3484  
E-mail:  
[Marie.C.Lopez@usace.army.mil](mailto:Marie.C.Lopez@usace.army.mil)

**Thank you.**