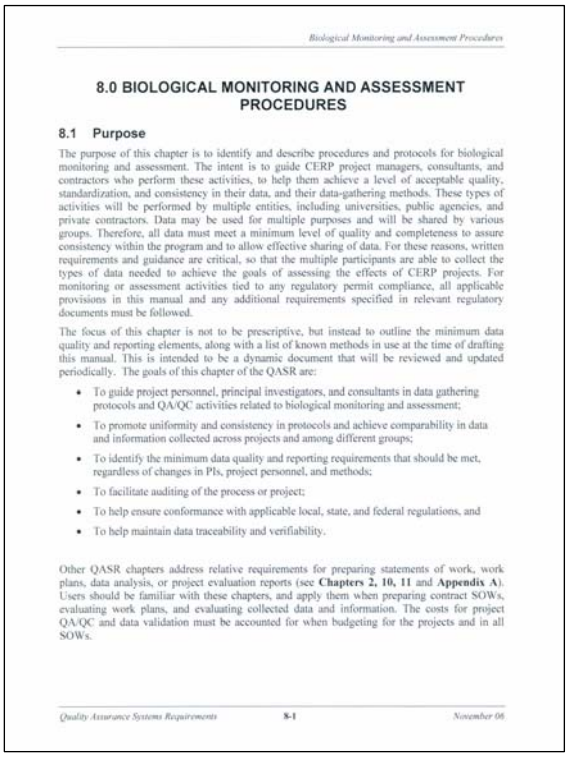
Quality Assurance Systems Requirements (QASR) Manual 2006 Update. BSS updated the Biological Assessment chapter and appendices, and provided technical writing and editing review of the complete manual for the South Florida Water Management District, Environmental Resource Assessment Department. The Quality Assurance Systems Requirements (QASR) manual lays out the protocols and procedures for environmental data gathering activities for the implementation of the Comprehensive Everglades Restoration Plan (CERP). In addition to conducting editorial reviews of the document sections, BSS developed the revised QASR format and outline. BSS worked closely with other project subcontractors throughout the document development cycle, and assembled the completed chapters and appendices into the final draft.



Biological Monitoring and Assessment Procedures

8.0 BIOLOGICAL MONITORING AND ASSESSMENT PROCEDURES

8.1 Purpose

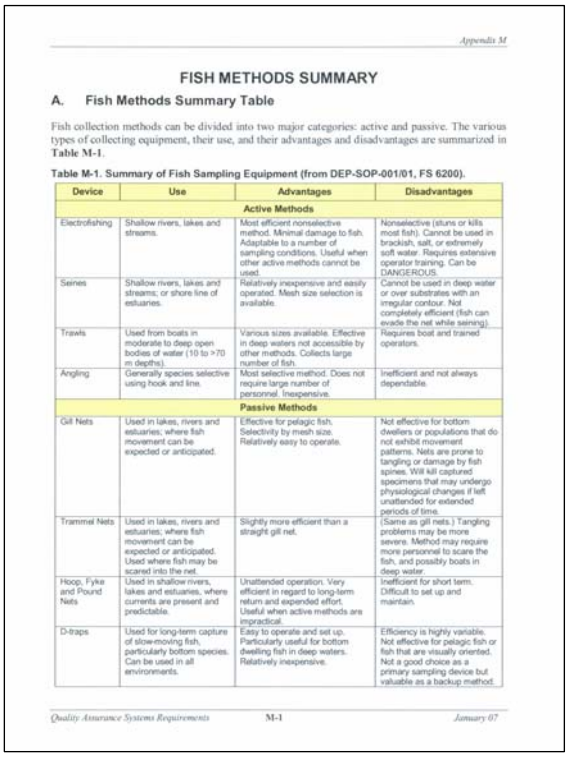
The purpose of this chapter is to identify and describe procedures and protocols for biological monitoring and assessment. The intent is to guide CERP project managers, consultants, and contractors who perform these activities, to help them achieve a level of acceptable quality, standardization, and consistency in their data, and their data-gathering methods. These types of activities will be performed by multiple entities, including universities, public agencies, and private contractors. Data may be used for multiple purposes and will be shared by various groups. Therefore, all data must meet a minimum level of quality and completeness to assure consistency within the program and to allow effective sharing of data. For these reasons, written requirements and guidance are critical, so that the multiple participants are able to collect the types of data needed to achieve the goals of assessing the effects of CERP projects. For monitoring or assessment activities tied to any regulatory permit compliance, all applicable provisions in this manual and any additional requirements specified in relevant regulatory documents must be followed.

The focus of this chapter is not to be prescriptive, but instead to outline the minimum data quality and reporting elements, along with a list of known methods in use at the time of drafting this manual. This is intended to be a dynamic document that will be reviewed and updated periodically. 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;
- 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.

Other QASR chapters address relative requirements for preparing statements of work, work plans, data analysis, or project evaluation reports (see **Chapters 2, 10, 11** and **Appendix A**). Users should be familiar with these chapters, and apply them when preparing contract SOWs, evaluating work plans, and evaluating collected data and information. The costs for project QA/QC and data validation must be accounted for when budgeting for the projects and in all SOWs.

Quality Assurance Systems Requirements **8-1** *November 06*



Appendix M

FISH METHODS SUMMARY

A. Fish Methods Summary Table

Fish collection methods can be divided into two major categories: active and passive. The various types of collecting equipment, their use, and their advantages and disadvantages are summarized in **Table M-1**.

Table M-1. Summary of Fish Sampling Equipment (from DEP-SOP-001/01, FS 6200).

Device	Use	Advantages	Disadvantages
		Active Methods	
Electrofishing	Shallow rivers, lakes and streams.	Most efficient nonselective method. Minimal damage to fish. Adaptable to a number of sampling conditions. Useful when other active methods cannot be used.	Nonselective (stuns or kills most fish). Cannot be used in brackish, salt, or extremely soft water. Requires extensive operator training. Can be DANGEROUS.
Seines	Shallow rivers, lakes and streams; or shore line of estuaries.	Relatively inexpensive and easily operated. Mesh size selection is available.	Cannot be used in deep water or over substrates with an irregular contour. Not completely efficient (fish can evade the net while seining).
Trawls	Used from boats in moderate to deep open bodies of water (10 to >70 m depths).	Various sizes available. Effective in deep waters not accessible by other methods. Collects large number of fish.	Requires boat and trained operators.
Angling	Generally species selective using hook and line.	Most selective method. Does not require large number of personnel. Inexpensive.	Inefficient and not always dependable.
		Passive Methods	
Gill Nets	Used in lakes, rivers and estuaries; where fish movement can be expected or anticipated.	Effective for pelagic fish. Selectivity by mesh size. Relatively easy to operate.	Not effective for bottom dwellers or populations that do not exhibit movement patterns. Nets are prone to tangling or damage by fish spines. Will kill captured specimens that may undergo physiological changes if left unattended for extended periods of time.
Trammel Nets	Used in lakes, rivers and estuaries; where fish movement can be expected or anticipated. Used where fish may be scared into the net.	Slightly more efficient than a straight gill net.	(Same as gill nets.) Tangling problems may be more severe. Method may require more personnel to scare the fish, and possibly boats in deep water.
Hoop, Fyke and Pound Nets	Used in shallow rivers, lakes and estuaries, where currents are present and predictable.	Unattended operation. Very efficient in regard to long-term return and expended effort. Useful when active methods are impractical.	Inefficient for short term. Difficult to set up and maintain.
D-traps	Used for long-term capture of slow-moving fish, particularly bottom species. Can be used in all environments.	Easy to operate and set up. Particularly useful for bottom dwelling fish in deep waters. Relatively inexpensive.	Efficiency is highly variable. Not effective for pelagic fish or fish that are visually oriented. Not a good choice as a primary sampling device but valuable as a backup method.

Quality Assurance Systems Requirements **M-1** *January 07*